Response to Comments

This document includes a reproduction of, and responses to, comments received during the Draft IS/MND public review period. Comments are presented in their original format (attached), along with annotations that identify each comment letter.

Responses to those individual comments are provided in this document alongside the text of each corresponding comment. Comment letters are categorized by:

- Written Comments:
    - State Agencies
    - Regional Agencies
    - Local Agencies
    - Organizations
    - General Public

Where the same comment has been made more than once, a response may direct the reader to an earlier numbered comment and response so as to avoid repetition. Where a response requires revisions to the Draft IS/MND, the revisions are explained here and shown in Final IS/MND.

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SA1

State of California - Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Inland Deserts Region
3602 Inland Empire Blvd., Suite C-220
Ontario, CA 91764
(909) 484-0459
www.wildlife.ca.gov

EDMUND G. BROWN, Jr., Governor
CHARLTON H. BONHAM, Director

February 26, 2015

Travis Martin, Assistant Planner
City of San Bernardino
Planning Department
300 North D Street – 3rd Floor
San Bernardino, CA 92418

Subject: Initial Study and Mitigated Negative Declaration
Waterman Industrial Center Project
SCH No. 2016021002

Dear Mr. Martin:

The Department of Fish and Wildlife (Department) appreciates the opportunity to comment on the Initial Study (IS) and Mitigated Negative Declaration (MND) for the Waterman Industrial Center Project (project) [SCH No. 2016021002]. The Department is responding to the IS and MND as a Trustee Agency for fish and wildlife resources (California Fish and Game Code Sections 711.7 and 1802, and the California Environmental Quality Act [CEQA] Guidelines Section 15386), and as a Responsible Agency regarding any discretionary actions (CEQA Guidelines Section 15381), such as the issuance of a Lake or Streambed Alteration Agreement (California Fish and Game Code Sections 1600 *et seq.*) and/or a California Endangered Species Act (CESA) Permit for Incidental Take of Endangered, Threatened, and/or Candidate species (California Fish and Game Code Sections 2080 and 2080.1).

The approximately 26-acre project site is located on the southwest corner of the intersection of East Dumas Street and South Waterman Avenue, north of Park Center Drive, and east of South Washington Avenue, within the City of San Bernardino, San Bernardino County, California.

The Project proposes to develop a 564,652 square foot industrial building with office space, parking, a pump house, and landscaping. The site is anticipated to include 103,585 square feet of landscaping, with a stormwater detention basin in the southwest corner. Roadway frontage improvements are proposed for South Waterman Avenue and East Dumas Street. Five of the eight existing Southern California Edison (SCE) power poles on the site are proposed to be relocated to allow for the roadway improvements.

Comments and Recommendations

Following review of the IS and MND, the Department offers the comments and recommendations presented below to assist the City of San Bernardino (City; the CEQA lead agency) in adequately identifying and/or mitigating the project's significant, or potentially significant, impacts on biological resources:

SA1-1

Burrowing Owl

Due to the open, sparsely vegetated habitat on the project site and the presence of California ground squirrels, the Department is concerned that the project site may support burrowing owl, a California Species of Special Concern. The project has the potential to cause the loss of nesting and/or foraging habitat for burrowing owl.

SA1-2

The Department recommends that the City follow the recommendations and guidelines provided in the Staff Report on Burrowing Owl Mitigation (Department of Fish and Game, March 2012); available for download from the Department's website:

https://www.dfg.ca.gov/wildlife/nongame/survey_monitor.html. The Department expects that the City will follow the Staff Report on Burrowing Owl Mitigation, which specifies that the steps for project impact evaluations include:

a. A habitat assessment;
b. Surveys; and
c. An impact assessment

SA1-3

As stated in the *Staff Report on Burrowing Owl Mitigation*, the three progressive steps are effective in evaluating whether a project will result in impacts to burrowing owls, and the information gained from the steps will inform any subsequent avoidance, minimization, and mitigation measures. Habitat assessments are conducted to evaluate the likelihood that a site supports burrowing owl. Burrowing owl surveys provide information needed to determine the potential effects of proposed projects and activities on burrowing owls, and to avoid take in accordance with FGC sections 86, 3503, and 3503.5. Impact assessments evaluate the extent to which burrowing owls and their habitat may be impacted, directly or indirectly, on and within a reasonable distance of a proposed CEQA project activity or non-CEQA project.

SA1-4

Please note that CEQA Guidelines §15126.4, subdivision (a)(1)(8) states formulation of feasible mitigation measures should not be deferred until some future date. The Court of Appeal in *San Joaquin Raptor Rescue Center* v. *County* of *Merced* (2007) 149 Cal.App.4th 645 struck down mitigation measures which required formulating management plans developed in consultation with State and Federal wildlife agencies after Project approval. Courts have also repeatedly not supported conclusions that impacts are mitigable when essential studies, and therefore impact assessments, are incomplete *(Sundstrom* v. *County* of *Mendocino* (1988) 202 Cal. App. 3d. 296; *Gentry* v. *City* of *Murrieta (1995)* 36 Cal. App. 4th 1359; *Endangered Habitat League, Inc.* v. *County* of *Orange* (2005) 131 Cal. App. 4th 777). SA1-4 Cont.

Nesting Birds

Mitigation Measure B-1a states that surveys for nesting birds will be conducted within 14 days prior to removal of trees or shrubs, if trees or shrubs are scheduled for removal between February 1 and September 15. Because some bird species may construct a nest and begin to lay eggs in fewer than 14 days, the Department recommends that nesting bird surveys take place no more than 72 hours prior to the initiation of project activities. Please note that surveys should be conducted over the entire site, not just in vegetated areas, as some species nest directly on the ground. Additionally, as some species (e.g., owls) may commence nesting as early as February 1 and others may not fledge until later than September 15, the Department recommends that the site be checked for nesting activity regardless of the time of year. SA1-5

Further Coordination

The Department appreciates the opportunity to comment on the IS and MND for the Waterman Industrial Center Project (SCH No. 2016021002), and requests that the City address the Department's comments and concerns prior to the MND's adoption. If you should have any questions pertaining to these comments, please contact Gabriele Quillman at (909) 980-3818 or gabriele.quillman@wildlife.ca.gov.

Sincerely,

For

Leslie MacNair
Regional Manager

cc: State Clearinghouse, Sacramento

STATE OF CALIFORNIA EDMUND G. BROWN JR., *Governor*

PUBLIC UTILITIES COMMISSION
320 WEST 4TH STREET, SUITE 500
LOS ANGELES, CA 90013
(213) 576-7083

March 1, 2016

Travis Martin
City of San Bernardino
300 North D Street, 3rd Floor
San Bernardino, CA 92418

Dear Travis:

Re: SCH 2016021002 San Bernardino (SBC) Waterman Industrial Center Project - DMND

The California Public Utilities Commission (Commission) has jurisdiction over the safety of highway-rail crossings (crossings) in California. The California Public Utilities Code requires Commission approval for the construction or alteration of crossings and grants the Commission exclusive power on the design, alteration, and closure of crossings in California. The Commission Rail Crossings and Engineering Branch (RCEB) has received the *Mitigated Negative Declaration* for the proposed Waterman Industrial Center Project. The City of San Bernardino (City) is the lead agency.

The project area is located southwest of the intersection of Dumas Street and Waterman Avenue. The Waterman Avenue crossing (CPUC 002U-3.00 and DOT 027220Y) is located approximately 20 feet north of the intersection. Construction traffic is anticipated throughout the duration of the project. Traffic volume is anticipated to increase at the crossing during the project construction and in the future.

RCEB recommends that the City add language to the project so that any development adjacent to or near the railroad/light rail right-of-way (ROW) is planned with the safety of the rail corridor in mind. Construction and future business activities may increase traffic volumes not only on streets and at intersections, but also at railroad crossings. Mitigation measures to consider include, but are not limited to, improvements to existing railroad crossings due to increase in traffic volumes, and continuous vandal resistant fencing or other appropriate barriers to limit the access of trespassers onto the railroad ROW. SA2-1

If you have any questions in this matter, please contact Sergio Licon at (213) 576-7085, Sergio.licon@cpuc.ca.gov.

Sincerely,

Ken Chiang, P.E.
Utilities Engineer
Rail Crossings and Engineering Branch
Safety and Enforcement Division

C: State Clearinghouse

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 8
PLANNING (MS 725)
464 WEST 4th STREET, 6th FLOOR
SAN BERNARDINO, CA 92401-1400
PHONE (909) 388-7017
FAX (909) 383-5936
TTY 711
www.dot.ca.gov/dist8

RECEIVED
MAR - 8 2016
BY:

Serious Drought.
Help save water!

March 2, 2016 **File: 08-SBd-10-PM 25.2**

Travis Martin
City of San Bernardino
300 North "D" Street, 3rd Floor
San Bernardino, CA 92418

Dear Mr. Martin:

Waterman Industrial Center project – Traffic Impact Analysis

Thank you for providing the California Department of Transportation (Caltrans) the opportunity to review and comment on the Traffic Impact Analysis (TIA) for the City of San Bernardino Waterman Industrial Center project (Project). The project is located on the southwest corner of the Waterman Avenue at Dumas Street intersection in the City of San Bernardino. The proposed project is a 564,652 square foot high-cube warehouse distribution center on an approximately 25 acre land.

As the owner and operator of the State Highway System (SHS), it is our responsibility to coordinate and consult with local jurisdictions when proposed development may impact our facilities. As the responsible agency under the California Environmental Quality Act, it is also our responsibility to make recommendations to offset associated impacts with the proposed project. Although the project is under the jurisdiction of the City of San Bernardino, due to the project's potential impact to the State facilities, including Interstate 10 (I-10) and Interstate 215 (I-215), it is also subject to the policies and regulations that govern the SHS. We offer the following comments:

- Include I-10 and I-215 freeways/ramps on your exhibits. SA3-1
- Confirm proposed project will not have any significant impact, i.e. LOS on I-10 and I-215 freeways/ramps. SA3-2
- Indicate if truck volume is lower during regular AM/PM Peak Hours and use counts to prepare exhibits. Truck traffic does not follow regular commuter patterns. SA3-3

SA3-4 • Explain growth rate used to determine traffic volumes for 2017 and beyond. Clarify if the growth rate is consistent with the regional growth rate.

SA3-5 • State if any assumptions/changes were made to update the SBTAM, including network, projects, SED, etc.

SA3-6 • Use the Highway Capacity Manual (HCM) 2010 methodology instead of the HCM 2000 for all traffic analyses.

SA3-7 • Include the project fair–share of the improvement costs to mitigate the impacted intersections in the TIA.

SA-8 • Provide preferential parking for vanpools and carpools, as well as secure and convenient bicycle parking within the project area.

All comments should be addressed and the TIA should be resubmitted. These recommendations are preliminary and summarize our review of materials provided for our evaluation. Please continue to keep us informed of the project and other future updates, which could potentially impact the SHS and interfacing transportation facilities. If you have any questions or need to contact us, please do not hesitate to contact Adrineh Melkonian at (909) 806-3928 or myself at (909) 383-4557.

Sincerely,

Mark Roberts

MARK ROBERTS
Office Chief
Intergovernmental Review, Community and Regional Planning

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

March 2, 2016

RECEIVED
MAR - 8 2016
BY:

Travis Martin
City of San Bernardino
300 North D Street, 3rd Floor
San Bernardino, CA 92418

Subject: Waterman Industrial Center (Development Permit Type D 15-11)
SCH#: 2016021002

Dear Travis Martin:

The State Clearinghouse submitted the above named Mitigated Negative Declaration to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on March 1, 2016, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that: SA4-1

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Scott Morgan

Scott Morgan
Director, State Clearinghouse

Enclosures
cc: Resources Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2016021002
Project Title Waterman Industrial Center (Development Permit Type D 15-11)
Lead Agency San Bernardino, City of

Type MND Mitigated Negative Declaration

Description The proposed Waterman Industrial Center (proposed project) is a 564,652-SF industrial buildingw tih office space, parking, a pump house, and landscaping on an approx. 26 acre property located in the southwest corner of the intersection of East Dumas Street and South Waterman Avenue in the City of San Bernardino.
The industrial building would be one floor with a maximum height of 47 feet. The building would be a cross dock warehouse facility with 10,000 SF of dedicated office/mazzaninespace. The site will also include a 427-SF pump house. The building would pave 49 dock doors on its northern frontage and 49 on its southern frontage. Total on-site parking would be 452 stalls, with 286 dedicated to warehouse parking (including office) and 166 trailer parking spaces. landscaping in the amount of 103,585 SF is anticipated for the site and the southwest corner of the site would be used as a storm water/water quality control basin. Roadway frontage improvements would be provided on South Waterman Ave. and East Dumas Street.

Lead Agency Contact

Name Travis Martin
Agency City of San Bernardino
Phone 909-384-5313 ***Fax***
email
Address 300 North D Street, 3rd Floor
City San Bernardino ***State*** CA ***Zip*** 92418

Project Location

County San Bernardino
City San Bernardino
Region
Lat / Long 34° 4' 40" N / 117° 16' 50" W
Cross Streets East Dumas Avenue and South Waterman Avenue
Parcel No.
Township 1S ***Range*** 4W ***Section*** ***Base*** Meridian

Proximity to:

Highways I-10, 215
Airports SB Int'l Airport
Railways BNSF
Waterways Santa Ana River, Twin Creek channel
Schools Loma Linda Academy
Land Use Industrial and Open Space/Industrial Light (IL), Office Industrial Park (OIP), Public Commercial Recreation (PCR)

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Geologic/Seismic; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Sewer Capacity; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Landuse; Cumulative Effects; Other Issues

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Reviewing Agencies Resources Agency; Department of Fish and Wildlife, Region 6; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; Caltrans, Division of Aeronautics; California Highway Patrol; Caltrans, District 8; Air Resources Board; State Water Resources Control Board, Division of Water Quality; Regional Water Quality Control Board, Region 8; Department of Toxic Substances Control; Native American Heritage Commission; Public Utilities Commission

Note: Blanks in data fields result from insufficient information provided by lead agency.

Document Details Report
State Clearinghouse Data Base

Date Received 02/01/2016 ***Start of Review*** 02/01/2016 ***End of Review*** 03/01/2016

STATE OF CALIFORNIA EDMUND G. BROWN JR., *Governor*

PUBLIC UTILITIES COMMISSION
320 WEST 4TH STREET, SUITE 500
LOS ANGELES, CA 90013
(213) 576-7083

March 1, 2016

Governor's Office of Planning & Research
MAR 01 2016
STATE CLEARINGHOUSE

clear 3/1/16 E

Travis Martin
City of San Bernardino
300 North D Street, 3rd Floor
San Bernardino, CA 92418

Dear Travis:

Re: SCH 2016021002 San Bernardino (SBC) Waterman Industrial Center Project - DMND

The California Public Utilities Commission (Commission) has jurisdiction over the safety of highway-rail crossings (crossings) in California. The California Public Utilities Code requires Commission approval for the construction or alteration of crossings and grants the Commission exclusive power on the design, alteration, and closure of crossings in California. The Commission Rail Crossings and Engineering Branch (RCEB) has received the *Mitigated Negative Declaration* for the proposed Waterman Industrial Center Project. The City of San Bernardino (City) is the lead agency.

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If you have any questions in this matter, please contact Sergio Licon at (213) 576-7085, Sergio.licon@cpuc.ca.gov.

Sincerely,

Ken Chiang

Ken Chiang, P.E.
Utilities Engineer
Rail Crossings and Engineering Branch
Safety and Enforcement Division

C: State Clearinghouse

State of California - Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Inland Deserts Region
3602 Inland Empire Blvd., Suite C-220
Ontario, CA 91764
(909) 484-0459
www.wildlife.ca.gov

CLEAR
3-1-16
E

EDMUND G. BROWN, Jr., Governor
CHARLTON H. BONHAM, Director

February 26, 2015

Travis Martin, Assistant Planner
City of San Bernardino
Planning Department
300 North D Street – 3rd Floor
San Bernardino, CA 92418

Subject: Initial Study and Mitigated Negative Declaration
Waterman Industrial Center Project
SCH No. 2016021002

Dear Mr. Martin:

The Department of Fish and Wildlife (Department) appreciates the opportunity to comment on the Initial Study (IS) and Mitigated Negative Declaration (MND) for the Waterman Industrial Center Project (project) [SCH No. 2016021002]. The Department is responding to the IS and MND as a Trustee Agency for fish and wildlife resources (California Fish and Game Code Sections 711.7 and 1802, and the California Environmental Quality Act [CEQA] Guidelines Section 15386), and as a Responsible Agency regarding any discretionary actions (CEQA Guidelines Section 15381), such as the issuance of a Lake or Streambed Alteration Agreement (California Fish and Game Code Sections 1600 *et seq.*) and/or a California Endangered Species Act (CESA) Permit for Incidental Take of Endangered, Threatened, and/or Candidate species (California Fish and Game Code Sections 2080 and 2080.1).

The approximately 26-acre project site is located on the southwest corner of the intersection of East Dumas Street and South Waterman Avenue, north of Park Center Drive, and east of South Washington Avenue, within the City of San Bernardino, San Bernardino County, California.

The Project proposes to develop a 564,652 square foot industrial building with office space, parking, a pump house, and landscaping. The site is anticipated to include 103,585 square feet of landscaping, with a stormwater detention basin in the southwest corner. Roadway frontage improvements are proposed for South Waterman Avenue and East Dumas Street. Five of the eight existing Southern California Edison (SCE) power poles on the site are proposed to be relocated to allow for the roadway improvements.

Comments and Recommendations

Following review of the IS and MND, the Department offers the comments and recommendations presented below to assist the City of San Bernardino (City; the CEQA lead agency) in adequately identifying and/or mitigating the project's significant, or potentially significant, impacts on biological resources:

Burrowing Owl

Due to the open, sparsely vegetated habitat on the project site and the presence of California ground squirrels, the Department is concerned that the project site may support burrowing owl, a California Species of Special Concern. The project has the potential to cause the loss of nesting and/or foraging habitat for burrowing owl.

The Department recommends that the City follow the recommendations and guidelines provided in the Staff Report on Burrowing Owl Mitigation (Department of Fish and Game, March 2012); available for download from the Department's website:

https://www.dfg.ca.gov/wildlife/nongame/survey_monitor.html. The Department expects that the City will follow the Staff Report on Burrowing Owl Mitigation, which specifies that the steps for project impact evaluations include:

a. A habitat assessment;
b. Surveys; and
c. An impact assessment

As stated in the *Staff Report on Burrowing Owl Mitigation*, the three progressive steps are effective in evaluating whether a project will result in impacts to burrowing owls, and the information gained from the steps will inform any subsequent avoidance, minimization, and mitigation measures. Habitat assessments are conducted to evaluate the likelihood that a site supports burrowing owl. Burrowing owl surveys provide information needed to determine the potential effects of proposed projects and activities on burrowing owls, and to avoid take in accordance with FGC sections 86, 3503, and 3503.5. Impact assessments evaluate the extent to which burrowing owls and their habitat may be impacted, directly or indirectly, on and within a reasonable distance of a proposed CEQA project activity or non-CEQA project.

Please note that CEQA Guidelines §15126.4, subdivision (a)(1)(8) states formulation of feasible mitigation measures should not be deferred until some future date. The Court of Appeal in *San Joaquin Raptor Rescue Center* v. *County* of *Merced* (2007) 149 Cal.App.4th 645 struck down mitigation measures which required formulating management plans developed in consultation with State and Federal wildlife agencies after Project approval. Courts have also repeatedly not supported conclusions that impacts are mitigable when essential studies, and therefore impact assessments, are incomplete (*Sundstrom* v. *County* of *Mendocino* (1988) 202 Cal. App. 3d. 296; *Gentry* v. *City* of *Murrieta (1995)* 36 Cal. App. 4th 1359; *Endangered Habitat League, Inc.* v. *County* of *Orange* (2005) 131 Cal. App. 4th 777).

Nesting Birds

Mitigation Measure B-1a states that surveys for nesting birds will be conducted within 14 days prior to removal of trees or shrubs, if trees or shrubs are scheduled for removal between February 1 and September 15. Because some bird species may construct a nest and begin to lay eggs in fewer than 14 days, the Department recommends that nesting bird surveys take place no more than 72 hours prior to the initiation of project activities. Please note that surveys should be conducted over the entire site, not just in vegetated areas, as some species nest directly on the ground. Additionally, as some species (e.g., owls) may commence nesting as early as February 1 and others may not fledge until later than September 15, the Department recommends that the site be checked for nesting activity regardless of the time of year.

Further Coordination

The Department appreciates the opportunity to comment on the IS and MND for the Waterman Industrial Center Project (SCH No. 2016021002), and requests that the City address the Department's comments and concerns prior to the MND's adoption. If you should have any questions pertaining to these comments, please contact Gabriele Quillman at (909) 980-3818 or gabriele.quillman@wildlife.ca.gov.

Sincerely,

For Leslie MacNair
Regional Manager

cc: State Clearinghouse, Sacramento

LA1

825 East Third Street, San Bernardino, CA 92415-0835 | Phone: 909.387.8109 Fax: 909.387.7876
www.SBCounty.gov

SAN BERNARDINO COUNTY

Department of Public Works
Environmental & Construction • Flood Control
Operations • Solid Waste Management
Surveyor • Transportation

Gerry Newcombe
Director

February 29, 2016

City of San Bernardino
Travis Martin, Assistant Planner
Planning Department
300 N. D Street – 3rd Floor
San Bernardino, CA. 92418
Martin_tr@sbcity.org

File: 10(ENV)-4.01

RE: CEQA – NOTICE OF AVAILABILITY OF A MITIGATED NEGATIVE DECLARATION FOR THE WATERMAN INDUSTRIAL CENTER PROJECT FOR THE CITY OF SAN BERNARDINO

Dear Mr. Martin:

Thank you for giving the San Bernardino County Department of Public Works the opportunity to comment on the above-referenced project. **We received this request on February 4, 2016** and pursuant to our review, the following comments are provided:

Water Resources Division (Mary Lou Mermilliod, PWE III, 909-387-8213):

1. We have reviewed the MND and it appears the proposed project lies within the City of San Bernardino, not the County of San Bernardino as stated on page 46, Discussion, item h). The County of San Bernardino has no jurisdiction for development within the City. LA1-1

2. Item h) on page 46 of the Initial Study states that *"The County of San Bernardino Flood Control indicates that a building within Flood Zone A shall have finished floor elevation or exterior waterproofing elevation of two-feet higher than the highest adjacent finished grade"*. The San Bernardino County Flood Control District (District) does not regulate development within floodplains; this is regulated by the County's Land Use Services Department. Additionally, FEMA's elevation requirement, as well as the County's, is above highest adjacent grade (HAG), which is the highest natural grade (prior to any grading) directly adjacent to a structure's footprint. LA1-2

3. We recommend that the City enforces FEMA's, and its most current, regulations for construction within floodplains. LA1-3

Flood Control Planning Division (David Lovell, PWE III, 909-387-7964):

1. The Project is located within the City of San Bernardino approximately 400 feet east of the District's Twin Creek Channel-COE and is subject to the District's Comprehensive Storm Drain Plan No. 7, dated December 1982. Sufficient data and exhibits, showing storm water flowlines and the proposed underground filtration basins to meet onsite containment, are needed to address potential impacts to the local drainage system. LA1-4

Environmental Management Division (Brandy Wood, Ecological Resource Specialist, 909-387-7971):

LA1-5

1. Page 2 of the MND indicates a nesting bird survey would be conducted if more than 14 days pass and construction has not been initiated. The construction of a nest and egg-laying can be as quick as 3 days. Fourteen days is too long to wait to ensure no impacts to nesting birds. It is recommended a nesting bird survey be conducted within 3 days of the start of work and if more than 3 days pass and construction has not been initiated, another survey would be required.

LA1-6

2. The MND has no minimization or mitigation measures for the potential of burrowing owl to be on site. Burrowing owl is a State of California species of special concern and the site contains suitable habitat for burrowing owl.

If you have any questions, please contact the individuals who provided the specific comment, as listed above.

Sincerely,

NIDHAM ARAM ALRAYES, MSCE, PE, QSD/P
Public Works Engineer III
Environmental Management

NAA:PE:sr

From: Steve von Rajcs <svonrajcs@chfcares.com>
Sent: Thursday, February 11, 2016 12:05 PM
To: Travis Martin
Cc: Desiree Lavin Glover
Subject: Comments re: Waterman Industrial Center (proposed)

Follow Up Flag: Follow up
Flag Status: Flagged

Hi, Travis,

I just received the Notice of Intent for the Waterman Industrial Center proposed to be located at W. Dumas and S. Waterman Avenue.

As owners of the Inland Regional Center buildings (across the street from the project), I have only two concerns:

1.When the SCE towers are relocated, the overhead wires ***cannot*** be moved any closer to our buildings. OR1-1
2. Large volumes of truck traffic at the site will undoubtedly cause severe congestion on S. Waterman. OR1-2

Thank you for hearing our concerns.

Steve von Rajcs
President/CEO
California Housing Foundation
1200 California Street, Suite 104
Redlands, CA , 92374
(909) 793-9800
svonrajcs@CHFcares.com

OR2

SOBOBA BAND OF LUISEÑO INDIANS
EST. JUNE 19, 1883

February 24, 2016

Attn: Travis Martin, Assistant Planner
City of San Bernardino
Community Development Department
300 North "D" Street
San Bernardino, CA 92418-0001

RE: AB 52 Consultation; Waterman Industrial Center Project (Development Permit Type-D 15-11)

The Soboba Band of Luiseño Indians has received your notification pursuant under Assembly Bill 52.

The Soboba Band of Luiseño Indians appreciates your observance of Tribal Cultural Resources and their preservation in your project. The information provided to us on said project(s) has been assessed through our Cultural Resource Department. At this time the Soboba Band does not have any specific concerns regarding known cultural resources in the specified areas that the project encompasses, but does request that the appropriate consultation continue to take place between concerned tribes, project proponents, and local agencies. OR2-1

Also, working in and around traditional use areas intensifies the possibility of encountering cultural resources during any future construction/excavation phases that may take place. For this reason the Soboba Band of Luiseño Indians requests that approved Native American Monitor(s) be present during any future ground disturbing proceedings, including surveys and archaeological testing, associated with this project. The Soboba Band wishes to defer to the San Manuel Band of Mission Indians, who are in closer proximity to the project. Please feel free to contact me with any additional questions or concerns. OR2-2

Sincerely,

Joseph Ontiveros
Cultural Resource Director
Soboba Band of Luiseño Indians
P.O. Box 487
San Jacinto, CA 92581
Phone (951) 654-5544 ext. 4137
Cell (951) 663-5279
jontiveros@soboba-nsn.gov

Confidentiality: The entirety of the contents of this letter shall remain confidential between Soboba and the City of San Bernardino. No part of the contents of this letter may be shared, copied, or utilized in any way with any other individual, entity, municipality, or tribe, whatsoever, without the expressed written permission of the Soboba Band of Luiseño Indians.

OR3

LOZEAU DRURY LLP

T 510.836.4200
F 510.836.4205

410 12th Street, Suite 250
Oakland, Ca 94607

www.lozeaudrury.com
doug@lozeaudrury.com

BY EMAIL and OVERNIGHT MAIL

March 1, 2016

Travis Martin, Assistant Planner
City of San Bernardino
9093845313
300 North D Street, 3rd Floor
San Bernardino, CA 92418
martin_tr@sbcity.org

Re: Mitigated Negative Declaration for Waterman Industrial Center (Development Permit Type D – 15-11) – SCH No. 2016021002

Dear Mr. Martin:

This letter is submitted on behalf of Laborers International Union of North America, Local Union 783, and its hundreds of members living in San Bernardino County (collectively, "LIUNA" or "Commenters") concerning the City of San Bernardino's (the "City") Initial Study and Mitigated Negative Declaration ("IS/MND") prepared for the Waterman Industrial Center, Development Permit Type D – 15-11) (SCH No. 2016021002) (the "Project").

The Project is a 564,652 square foot industrial building that includes office space, parking, a pump house, and landscaping. The Project is located at the intersection of East Dumas Street and South Waterman Avenue in the City of San Bernardino.

These comments have been prepared with the assistance of Matt Hagemann, P.G., C.Hg., QSD, QSP, an expert hydrogeologist; and Jessie Jaeger, air quality specialist from SWAPE. Their comments and curriculum vitae are attached as Exhibit A hereto ("Hagemann") and are incorporated by reference in their entirety. The City should respond to Mr. Hagemann's comments separately. See OR4

Commenters request that the City withdraw the IS/MND and instead prepare an environmental impact report ("EIR") for the Project, as there is substantial evidence that the Project will have significant unmitigated impacts on the environment as discussed OR3-1

OR3-1 Cont. below. There is a fair argument that the Project may have significant unmitigated impacts, including:

OR3-2
1. Significant and unmitigated air quality impacts associated with the operation of the Project.

OR3-3
2. Significant and unmitigated human health risks from diesel particulate matter emissions associated with Project construction.

OR3-4 An EIR is required to analyze these and other impacts and to adopt feasible mitigation measures to reduce the impacts to the extent feasible.

OR3-5

PROJECT DESCRIPTION

The Project is a proposed 564,652-square-foot (SF) industrial center building on the southwest corner of the intersection of East Dumas Street and South Waterman Avenue in the City of San Bernardino. It also includes office space, parking, a pump house, and landscaping on an approximately 26-acre property. The future tenant of the building is not currently known, so associated operational details are not known. Additionally, there are 8 Southern California Edison (SCE) power poles that contain 6 wires of high voltage 66kv Edison transmission lines, a 3 wire 12kv system and a 3 wire 4kv system. The City concluded that the Project, with proposed mitigation measures identified in the IS/MND, will not have a significant effect on the environment and that an EIR is therefore not required.

OR3-6

STANDING

Members of LIUNA, Local Union No. 783 live, work, and recreate in the immediate vicinity of the Project site. These members will suffer the impacts of a poorly executed or inadequately mitigated Project, just as would the members of any nearby homeowners association, community group or environmental group. Hundreds of LIUNA Local Union No. 783 members live and work in areas that will be affected by air pollution generated by the project. Therefore, LIUNA Local Union No. 883 and its members have a direct interest in ensuring that the Project is adequately analyzed and that its environmental and public health impacts are mitigated to the fullest extent feasible.

OR3-7 Pursuant to CEQA, LIUNA Local Union No. 783 submits these comments in response to the City's proposed IS/MND. Under the circumstances presented here, CEQA clearly requires the preparation of an EIR and accordingly, the City should decline to adopt the proposed IS/MND.

OR3-8

LEGAL STANDARD

As the California Supreme Court recently held, "[i]f no EIR has been prepared for a nonexempt project, but substantial evidence in the record supports a fair argument that the project may result in significant adverse impacts, the proper remedy is to order preparation of an EIR." (*Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 319-320 ["*CBE v. SCAQMD*"], citing, *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 75, 88; *Brentwood Assn. for No Drilling, Inc. v. City of Los Angeles* (1982) 134 Cal.App.3d 491, 504–505.) "The 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." (*Communities for a Better Environment v. Calif. Resources Agency* (2002) 103 Cal.App.4th 98, 109 ["*CBE v. CRA*"].) OR3-8 Cont.

The EIR is the very heart of CEQA. (*Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1214; *Pocket Protectors v. City of Sacramento* (2004) 124 Cal.App.4th 903, 927.) The EIR is an "environmental 'alarm bell' whose purpose is to alert the public and its responsible officials to environmental changes before they have reached the ecological points of no return." (*Bakersfield Citizens*, *supra,* 124 Cal.App.4th at 1220.) The EIR also functions as a "document of accountability," intended to "demonstrate to an apprehensive citizenry that the agency has, in fact, analyzed and considered the ecological implications of its action." (*Laurel Heights Improvements Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 392.) The EIR process "protects not only the environment but also informed self-government." (*Pocket Protectors*, *supra,* 124 Cal.App.4th at 927.) OR3-9

An EIR is required if "there is substantial evidence, in light of the whole record before the lead agency, that the project may have a significant effect on the environment." (Pub. Resources Code, § 21080(d); see also *Pocket Protectors*, *supra,* 124 Cal.App.4th at 927.) In very limited circumstances, an agency may avoid preparing an EIR by issuing a negative declaration, a written statement briefly indicating that a project will have no significant impact thus requiring no EIR (14 Cal. Code Regs., § 15371 ["CEQA Guidelines"]), only if there is not even a "fair argument" that the project will have a significant environmental effect. (Pub. Resources Code, §§ 21100, 21064.) Since "[t]he adoption of a negative declaration . . . has a terminal effect on the environmental review process," by allowing the agency "to dispense with the duty [to prepare an EIR]," negative declarations are allowed only in cases where "the proposed project will not affect the environment at all." (*Citizens of Lake Murray v. San Diego* (1989) 129 Cal.App.3d 436, 440.) OR3-10

Where an initial study shows that the project may have a significant effect on the environment, a mitigated negative declaration may be appropriate. However, a mitigated negative declaration is proper *only* if the project revisions would avoid or mitigate the potentially significant effects identified in the initial study "to a point where clearly no significant effect on the environment would occur, and…there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (Public OR3-11

OR3-11 Cont. Resources Code §§ 21064.5 and 21080(c)(2); *Mejia v. City of Los Angeles* (2005) 130 Cal.App.4th 322, 331.) In that context, "may" means a *reasonable possibility* of a significant effect on the environment. (Pub. Resources Code, §§ 21082.2(a), 21100, 21151(a); *Pocket Protectors*, *supra,* 124 Cal.App.4th at 927; *League for Protection of Oakland's etc. Historic Resources v. City of Oakland* (1997) 52 Cal.App.4th 896, 904–905.)

OR3-12 Under the "fair argument" standard, an EIR is required if any substantial evidence in the record indicates that a project may have an adverse environmental effect—even if contrary evidence exists to support the agency's decision. (CEQA Guidelines, § 15064(f)(1); *Pocket Protectors*, *supra*, 124 Cal.App.4th at 931; *Stanislaus Audubon Society v. County of Stanislaus* (1995) 33 Cal.App.4th 144, 150-15; *Quail Botanical Gardens Found., Inc. v. City of Encinitas* (1994) 29 Cal.App.4th 1597, 1602.) The "fair argument" standard creates a "low threshold" favoring environmental review through an EIR rather than through issuance of negative declarations or notices of exemption from CEQA. (*Pocket Protectors*, *supra*, 124 Cal.App.4th at 928.)

OR3-13 The "fair argument" standard is virtually the opposite of the typical deferential standard accorded to agencies. As a leading CEQA treatise explains:

> This 'fair argument' standard is very different from the standard normally followed by public agencies in making administrative determinations. Ordinarily, public agencies weigh the evidence in the record before them and reach a decision based on a preponderance of the evidence. [Citations]. The fair argument standard, by contrast, prevents the lead agency from weighing competing evidence to determine who has a better argument concerning the likelihood or extent of a potential environmental impact. The lead agency's decision is thus largely legal rather than factual; it does not resolve conflicts in the evidence but determines only whether substantial evidence exists in the record to support the prescribed fair argument.

OR3-14 (Kostka & Zishcke, *Practice Under CEQA*, §6.29, pp. 273-274.) The Courts have explained that "it is a question of law, not fact, whether a fair argument exists, and the courts owe no deference to the lead agency's determination. Review is de novo, with a ***preference for resolving doubts in favor of environmental review***." (*Pocket Protectors*, *supra*, 124 Cal.App.4th at 928 [emphasis in original].)

OR3-15 As a matter of law, "substantial evidence includes . . . expert opinion." (Pub. Resources Code, § 21080(e)(1); CEQA Guidelines, § 15064(f)(5).) CEQA Guidelines demand that where experts have presented conflicting evidence on the extent of the environmental effects of a project, the agency must consider the environmental effects to be significant and prepare an EIR. (CEQA Guidelines § 15064(f)(5); Pub. Res. Code § 21080(e)(1); *Pocket Protectors*, *supra*,124 Cal.App.4th at 935.) "Significant environmental effect" is defined very broadly as "a substantial or potentially substantial adverse change in the environment." (Pub. Resources Code, § 21068; see also CEQA Guidelines, § 15382.) An effect on the environment need not be "momentous" to meet the CEQA test for significance; it is enough that the impacts are "not trivial." (*No Oil, Inc., supra,* 13 Cal.3d at 83.) In *Pocket Protectors*, the court explained how expert opinion is considered. The Court limited agencies and courts to weighing the admissibility of the evidence. (*Pocket Protectors*, *supra,* 124 Cal.App.4th at 935.) In the context of reviewing a negative declaration, "neither the lead agency nor a court may 'weigh' conflicting substantial evidence to determine whether an EIR must be prepared in the first instance." (*Id*.) Where a disagreement arises regarding the validity of a negative declaration, the courts require an EIR. As the Court explained, "[i]t is the function of an EIR, not a negative declaration, to resolve conflicting claims, based on substantial evidence, as to the environmental effects of a project." (*Id*.)

OR3-15 Cont.

DISCUSSION

A. AN EIR IS REQUIRED BECAUSE THE PROJECT WILL MAY HAVE SIGNIFICANT UNMITIGATED ENVIRONMENTAL IMPACTS.

An EIR is required whenever substantial evidence in the entire record before the agency supports a fair argument that a project may have a significant effect on the environment. (*CBE v. SCAQMD, supra,* 48 Cal.4th at 319-20; Public Resources Code § 21080(d); *see also, Pocket Protectors, supra,* 124 Cal.App.4th at 927.) As set forth below, there is a fair argument supported by substantial evidence that the Project may result in significant environmental impacts from the operation of the Project. Therefore, the City is required to prepare an EIR to evaluate the Project's impacts and analyze mitigation measures needed to reduce such impacts to a less than significant level.

OR3-16

1. Substantial Evidence Supports a Fair Argument that the Project Will Result in Significant Unmitigated Impacts to Air Quality By Failing to Input Correct Parameters into the IS/MND's Emissions Calculations.

The IS/MND used the California Emissions Estimator Model Version CalEEMod.2013.2.2 ("CalEEMod") to calculate emissions from the Project. However, Mr. Hagemann observes that several of the assumptions used and values input into CalEEMod were inconsistent with both information disclosed in the IS/MND as well as recommended procedures and values set forth by the South Coast Air Quality Management District ("SCAQMD") for a high-cube warehouse (the type of Project at issue). Had the Project's emissions been calculated using the correct parameters, the Project would have a potentially significant impact on air quality. As such, the Project's air quality impacts have not been properly analyzed and mitigated. Accordingly, the following points constitute substantial evidence that support a fair argument that the IS/MND failed to properly calculate the Project's emissions and that the Project will thus have significant unmitigated impacts.

OR3-17

OR3-18

a. The IS/MND Improperly Assumes That the Project Will Not Involve Refrigeration.

The IS/MND significantly underestimated the Project's operational emissions by assuming that all warehouses at the Project will be unrefrigerated. The CalEEMod calculations were premised entirely on the notion that the proposed industrial building was modeled as an unrefrigerated warehouse. (IS/MND, Appendix A, pp. 52, 182.) However, the IS/MND is clear that the future tenant of the industrial building is not currently known. SCAQMD requires the use of a conservative air quality impact analysis to afford the fullest possible protection of the environment. In this case, a conservative analysis would dictate modeling the proposed warehouse as either entirely or partially refrigerated. Mr. Hagemann's letter explains that refrigerated warehouses release more air pollutants and greenhouse gas ("GHG") emissions when compared to unrefrigerated warehouses. Thus, by failing to include refrigerated warehouses a potential land use in the CalEEMod calculations, the Project's operational emissions may be substantially underestimated, and would thus likely result in a significant impact on regional air quality. This constitutes substantial evidence that an EIR should be prepared to evaluate the impacts of the Project's operational emissions and to mitigate those impacts.

OR3-19

b. The IS/MND Incorrectly Relies on the Fontana Truck Trip Study to for the Truck Trip Rate and for the Fleet Mix.

The IS/MND also significantly underestimated the Project's operational mobile-source emissions by relying on an improper truck trip rate and fleet mix percentage. Specifically, the IS/MND's Traffic Impact Assessment (Appendix F, p. 3) and its Air Quality/GHG Assessment (Appendix A, p. 60) improperly rely on the August 2003 City of Fontana *Truck Trip Generation Study* ("Fontana Study") to determine the number of vehicle and truck trips the Project will generate during operation. As Mr. Hagemann's letter details, SCAQMD has found numerous problems with the Fontana Study and has thus recommended specific figures to use for the truck trip rate for a high-cube warehouse distribution center.

OR3-20

Mr. Hagemann used SCAQMD's recommended rate to calculate the Project's number of truck trips and found the number of truck trips associated with the Project increased by approximately 87% from the number contained in the IS/MND's model, which is based on the Fontana Study's truck trip rate. Thus, the IS/MND's improper reliance on the Fontana Study likely misrepresented the actual air quality impacts of the Project.

OR3-21

Similarly, the IS/MND relied on the Fontana Study's total truck fleet mix of 20%, which sets forth the operational mix of cars, 2-axle trucks, 3-axle trucks, and 4-axle trucks to input into CalEEMod. As Mr. Hagemann notes, this approach "is not consistent with recommendations set forth by SCAQMD, and does not accurately represent the percentage of trucks that access a high-cube warehouse on a daily basis." (Hagemann, p. 6.) To avoid underestimating the number of trucks visiting warehouse facilities, SCAQMD recommends a truck fleet mix of 40%. This number is double that used by the IS/MND, and is a conservative value especially given that the future tenant of the warehouse is unknown. Based on this recommendation, Mr. Hagemann's letter sets forth a fleet mix percentage that the City should have input into CalEEMod that more accurately represents the number of trips that would likely occur during Project operation. As such, the IS/MND uses an inaccurate rate for the fleet mix percentage that does not adequately asses and mitigates the Project's air quality and GHG impacts. As EIR should be prepared that adequately assesses and mitigates these impacts. OR3-21 Cont.

c. The IS/MND Incorrectly Input Fleet Mix Percentage into CalEEMod.

Mr. Hagemann's letter explains how the IS/MND input the aforementioned artificially low fleet mix percentage in the CalEEMod model incorrectly. Instead of inputting the fleet mix values into the model as fleet mix percentages, the values were used to adjust the trip type percentages for the Project. This approach is plainly inconsistent with Appendix A of the CalEEMod User's Guide instructions on how to calculate the trip type. The IS/MND incorrectly assumed that commercial-work ("C-W") trip are made exclusively by trucks and commercial-nonwork ("C-NW") trips are made exclusively by passenger cars. In fact, both C-W and C-NW trips include trips made by a mix of vehicle types. Mr. Hagemann notes that "[a]s a result, the Project's operational mobile-source emissions are both greatly underestimated and extremely inaccurate." (Hagemann, p. 6.) An EIR should be prepared that inputs the proper data into the CalEEMod model and accurately analyzes the Project's mobile-source emissions and provides mitigation measures for those impacts. OR3-22

2. Substantial Evidence Supports a Fair Argument that the Project Will Result in Significant Unmitigated Impacts to Human Health from Diesel Particulate Emissions Associated with Project Construction.

The IS/MND conclusion that the health risk posed to nearby sensitive receptors from exposure to diesel particulate matter ("DPM") emissions released during Project construction would be less than significant fails to quantify this risk and compare it to applicable thresholds. The IS/MND fails to include a health risk assessment ("HRA"). OR3-23

The IS/MND concludes that health risk from construction activities would be less than significant because construction would occur over a period of time shorter than 70 years. However, this conclusion directly contrasts with guidance published by the Office of Environmental Heal Hazard Assessment ("OEHHA"), which recommends that all OR3-24

OR3-24 Cont. short-term projects lasting at least two months be evaluated for cancer risks to nearby sensitive receptors. The IS/MND is devoid of this analysis.

OR-25 Mr. Hagemann prepared a simple screening-level health risk assessment which demonstrates that construction related DPM emissions from the Project may result in a potentially significant health risk impact. (Hagemann, pp. 8-9.) Using annual estimates from the Project's CalEEMod model, Mr. Hagemann used the EPA's recommended AERSCREEN air dispersion model to generate the maximum reasonable estimates of single hour downwind DPM concentrations from the Project Site. Mr. Hagemann then calculated the excess cancer risk for each sensitive receptor location using applicable HRA methodologies prescribed by OEHHA. (*Id.*, pp. 9-10.) He found that "[t]he infantile exposure for the sensitive receptors exceeds the SCAQMD threshold of 10 in one million." (*Id.*, p. 10.) Further, it is likely that this impact would be even greater since the estimates from the Project's CalEEMod model were artificially low, as demonstrated above. Thus, Mr. Hagemann states that "a refined health risk assessment must be prepared to examine air quality impacts generated by Project construction using site-specific meteorology and specific equipment usage schedules." (*Id.*, p. 10.)

OR3-26 Mr. Hagemann's analysis clearly provides substantial evidence supporting a fair argument that construction emissions from the Project may have significant impacts on human health and the environment. Accordingly, the City must prepare an EIR to analyze these impacts and evaluate potential mitigation measures to address the impacts.

OR3-27

CONCLUSION

For the foregoing reasons, the IS/MND for the Project should be withdrawn, an EIR should be prepared and the draft EIR should be circulated for public review and comment in accordance with CEQA. Thank you for considering our comments.

Sincerely,

Douglas Chermak
Lozeau Drury LLP

EXHIBIT A

See OR4

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

2656 29th Street, Suite 201
Santa Monica, California 90405

Matt Hagemann
Tel: (949) 887-9013
Email: mhagemann@swape.com

February 29, 2016

Douglas Chermak
Lozeau | Drury LLP
410 12th Street, Suite 250
Oakland, CA 94607

Subject: **Comments on the Waterman Industrial Center Project**

Dear Mr. Chermak:

We have reviewed the February 1, 2016 Initial Study/Mitigated Negative Declaration (IS/MND) for the Waterman Industrial Center Project ("Project"). The Project includes construction of a 564,652-square foot (SF) speculative warehouse building on a 26-acre property located on the southwest corner of the intersection of East Dumas Street and South Waterman Avenue in the City of San Bernardino. The building would be a cross dock warehouse facility with 10,000 SF of dedicated office/mezzanine space. The site will also include a 427-SF pump house. The building would have 49 dock doors on its northern frontage and 49 on its southern frontage. Total on-site parking would be 452 stalls, with 286 dedicated to warehouse parking (including office) and 166 trailer parking spaces. Landscaping in the amount of 103,585 SF is anticipated for the site and the southwest corner of the site would be used as a storm water/water quality control basin. Roadway frontage improvements would be provided on South Waterman Avenue and East Dumas Street.

Our review concludes that the IS/MND fails to adequately evaluate the Project's Hazards and Hazardous Waste, Air Quality and Greenhouse Gas impacts. Specifically, we find the following issues with the analyses conducted in the IS/MND: OR4-1

- The IS/MND models the Project's construction and operational criteria air pollutant and greenhouse gas emissions using incorrect input parameters. As a result, the Project's pollutant emissions are greatly underestimated. OR4-2
- Furthermore, the IS/MND concludes that the health risk posed to nearby sensitive receptors exposed to diesel exhaust emitted during Project construction will be less-than-significant, yet fails to provide substantial evidence to support this claim. When a health risk assessment is actually prepared to quantify the impacts from Project construction, we find that the health risk posed to these nearby sensitive receptors will be potentially significant. OR4-3

OR4-3 Cont.

A Draft Environmental Impact Report (DEIR) should be prepared to address these issues, and should identify and incorporate additional mitigation measures where necessary.

Air Quality

Unsubstantiated Input Parameters Used to Estimate Project Emissions

OR4-4

The IS/MND relies on emissions calculated from the California Emissions Estimator Model Version CalEEMod.2013.2.2 ("CalEEMod").[1] CalEEMod provides recommended default values based on site specific information, such as land use type, meteorological data, total lot acreage, project type and typical equipment associated with project type. If more specific project information is known, the user can change the default values and input project-specific values, but CEQA requires that such changes be justified by substantial evidence.[2] Once all the values are inputted into the model, the Project's construction and operational emissions are calculated, and "output files" are generated. These output files, which are part of the Project's Air Quality Technical Report (Appendix A), disclose to the reader what parameters were utilized in calculating the Project's air pollutant emissions, and make known which default values were changed as well as provide justification for the values selected.[3]

OR4-5

According to the IS/MND, the Project is subject to significance criteria, guidance, and regulations set forth by the South Coast Air Quality Management District (SCAQMD) (IS/MND, p. 26). When reviewing the Project's CalEEMod output files, however, we found that several of the assumptions used and values inputted into the model were not consistent with recommended procedures and values set forth by the SCAQMD for high-cube warehouses, and were not consistent with information disclosed in the IS/MND. When the Project's emissions are modeled using correct input parameters, we find that the Project will have a potentially significant impact on regional air quality. As a result, a DEIR should be prepared to include an updated air pollution model that uses correct input values, consistent with the IS/MND and recommendations set forth by the SCAQMD.

Assumes Unrefrigerated Land Use

OR4-6

Because the IS/MND assumes that all warehouses will be unrefrigerated, the Project's operational emissions may be grossly underestimated. According to the CalEEMod output files provided in Appendix A of the IS/MND, the proposed industrial building was modeled as an "Unrefrigerated Warehouse-No Rail" (see excerpt below) (Appendix A, p. 52, pp. 182).

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	564.65	1000sqft	12.96	564,652.00	0
Other Asphalt Surfaces	5.84	Acre	5.84	254,390.40	0
Other Non-Asphalt Surfaces	103.59	1000sqft	2.38	103,585.00	0
Parking Lot	452.00	Space	4.07	180,800.00	0

[1] CalEEMod website, *available at*: http://www.caleemod.com/

[2] CalEEMod User Guide, pp. 2, 9, *available at:* http://www.caleemod.com/

[3] CalEEMod User Guide, pp. 7, 13, *available at:* http://www.caleemod.com/ (A key feature of the CalEEMod program is the "remarks" feature, where the user explains why a default setting was replaced by a "user defined" value. These remarks are included in the report.)

Assuming that the proposed building will be composed of unrefrigerated warehouses, exclusively, however, is inconsistent with information disclosed in the IS/MND, and may result in an underestimation of the Project's operational emissions. According to the IS/MND, future tenants of the proposed warehouses are currently unknown. The IS/MND states, "The industrial building is currently planned as a 'spec building.' Thus, <u>the future tenant of the building is not currently known</u>" (IS/MND, p. 3). Therefore, by assuming that the proposed Project buildings will be composed solely of unrefrigerated warehouses is unsubstantiated, as the Project's future tenants remain unknown. OR4-6 Cont.

As discussed by SCAQMD, "CEQA requires the use of 'conservative analysis' to afford 'fullest possible protection of the environment.'"[4] As a result, the most conservative analysis should be conducted. With this in mind, the proposed building should be modeled as "Refrigerated Warehouse-No Rail," or at the very least, a portion of the building should be modeled as "Refrigerated Warehouse-No Rail," with the remaining portion of the building modeled as "Unrefrigerated Warehouse-No Rail," so as to take into consideration the possibility that future tenants may require both cold storage and non-cold storage. OR4-7

Refrigerated warehouses release more air pollutants and greenhouse gas (GHG) emissions when compared to unrefrigerated warehouses for several reasons. First, warehouses equipped with cold storage (refrigerators and freezers, for example) are known to consume more energy when compared to warehouses without cold storage.[5] Second, warehouses equipped with cold storage typically require refrigerated trucks, which are known to idle for much longer, even up to an hour, when compared to unrefrigerated hauling trucks.[6] Lastly, according to a July 2014 *Warehouse Truck Trip Study Data Results and Usage* presentation prepared by the SCAQMD, it was found that hauling trucks that require refrigeration result in greater truck trip rates when compared to non-refrigerated hauling trucks.[7] OR4-8

By not including refrigerated warehouses as a potential land use in the air quality model, the Project's operational emissions may be grossly underestimated, as the future tenants are currently unknown. Unless the Project Applicant can demonstrate that the future tenants of these proposed buildings will be limited to unrefrigerated warehouse uses, exclusively, it should be assumed that a mix of cold and non-cold storage will be provided on-site. A DEIR should be prepared to account for the possibility of refrigerated warehouse needs by future tenants. OR4-9

Incorrect Usage of Fontana Truck Trip Study for Fleet Mix and Truck Trip Rate

OR4-10

Because the IS/MND relies upon an artificially low truck trip rate and truck fleet mix percentage, the Project's operational mobile-source emissions are greatly underestimated. The IS/MND's Traffic Impact

[4] "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Inland Empire Logistics Council, June 2014, *available at*: http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/final-ielc_6-19-2014.pdf?sfvrsn=2

[5] Managing Energy Costs in Warehouses, Business Energy Advisor, *available at*: http://bizenergyadvisor.com/warehouses

[6] "Estimation of Fuel Use by Idling Commercial Trucks," p. 8, *available at:* http://www.transportation.anl.gov/pdfs/TA/373.pdf

[7] "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile Source Committee, July 2014, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/finaltrucktripstudymsc072514.pdf?sfvrsn=2, p. 7, 9

OR4-10 Cont.

Assessment (Appendix F) and Air Quality/GHG Assessment (Appendix A) rely on the August 2003 City of Fontana *Truck Trip Generation Study* ("Fontana Study"),[8] and the 2012 Institute of Transportation Engineers 9th Edition *Trip Generation Manual* ("Trip Generation Manual") to determine the number of vehicle and truck trips the Project will generate during operation (Appendix A, p. 60; Appendix F, p. 3). While the Trip Generation Manual is a widely accepted resource, the Fontana Study is not, and according to SCAQMD Staff, has limited applicability.

OR4-11

As is disclosed in the IS/MND and associated appendices, the proposed industrial building will consist of high-cube distribution warehouses (IS/MND, p. 64; Appendix F, p. 3). According to SCAQMD staff, the "Fontana Study, by itself, is not characteristic of high cube warehouses."[9] Furthermore, SCAQMD staff finds the following additional issues with the Fontana Study: [10]

OR4-12

- The overall trip rate is based on only four warehouses total, which includes two warehouses with zeros. In other words, the results of the Fontana Study were based on only two data points. As is disclosed in the Fontana Study, the daily trip rate was only based on data from a Target warehouse and a TAB warehouse.[11]

OR4-13

- The Fontana Study does not report any 24-hour daily truck trip rates. According to the Fontana Study, "Trip generation statistics for daily truck trips were not calculated because vehicle classifications counts could not be obtained from the driveway 24-hour counts."[12]

OR4-14

- The trip rates using the Fontana study are calculated based on a 20 percent truck fleet mix, which is inconsistent with SCAQMD's recommendation that agencies use a truck fleet mix of 40%.

OR4-15

Due to these reasons, SCAQMD recommends that Project Applicants either "use ITE default values until Governing Board action" (Option 1) or refer to the flow chart below (Option 2). [13]

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[8] "Truck Trip Generation Study." City of Fontana, County of San Bernardino, State of California, August 2003, *available at*: http://www.fontana.org/DocumentCenter/Home/View/622

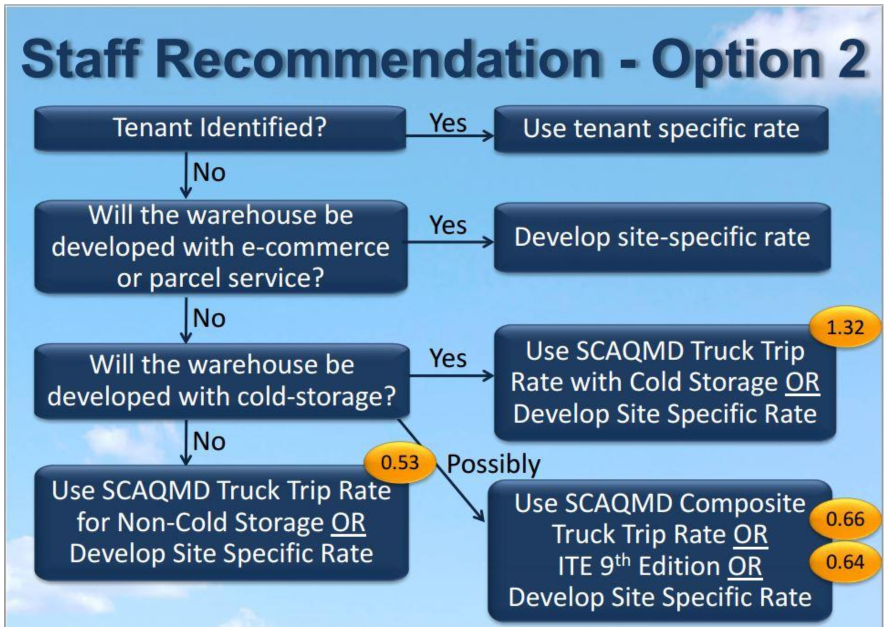
[9] "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile Source Committee, July 2014, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/finaltrucktripstudymsc072514.pdf?sfvrsn=2, p. 10

[10] "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile Source Committee, July 2014, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/finaltrucktripstudymsc072514.pdf?sfvrsn=2, p. 10

[11] "Truck Trip Generation Study." City of Fontana, County of San Bernardino, State of California, August 2003, *available at*: http://www.fontana.org/DocumentCenter/Home/View/622, p. 35

[12] "Truck Trip Generation Study." City of Fontana, County of San Bernardino, State of California, August 2003, *available at*: http://www.fontana.org/DocumentCenter/Home/View/622, p. 6

[13] "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile Source Committee, July 2014, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/finaltrucktripstudymsc072514.pdf?sfvrsn=2, p. 11



OR4-15 Cont.

Following Option 1, a truck trip rate of 0.64[14] should be used for *high-cube warehouse/distribution center* land uses (ITE Code 152), rather than the 0.34 truck trip rate used in the IS/MND (p. 64). Following Option 2, a truck trip rate of 0.66 or 0.64 should be used (assuming that the warehouse could be developed with cold-storage). Therefore, regardless of the option implemented, a minimum daily truck trip rate of 0.64 should be used, according to the SCAQMD.

OR4-16

As previously discussed, the proposed building is anticipated to be a high-cube warehouse distribution center. When the recommended truck trip rate of 0.64 is used in place of the 0.34 truck trip rate used in the IS/MND, we find that the number of truck trips increase by approximately 87%, with an increase of approximately 168 trips per day, and an increase of approximately 61,000 truck trips per year (see table below).

OR4-17

		IS/MND Model		SWAPE Model	
Building	**Size (square feet)**	**Truck Trip Rate[1]**	**# of Daily Truck Trips**	**Truck Trip Rate[1]**	**# of Daily Truck Trips**
High-Cube Warehouse	564,652	0.34	194	0.64	361
Total Daily Truck Trips		-	**194**	-	**361**
Total Annual Truck Trips		-	**70,692**	-	**131,903**
[1] Truck Trip Rate Per 1,000 Square Feet		**Increase in Daily Truck Trips**			**168**
[2] Increase in Trips = SWAPE Model - IS/MND Model		**Increase in Annual Truck Trips[3]**			**61,211**
[3] Annual Trips = Daily Trips x 365 Days		**Percent Increase[2]**			**87%**

The IS/MND and associated appendices also rely on a total truck fleet mix of approximately 20%, which is taken from the Fontana Study. Appendix A of the IS/MND states, "The vehicle mix followed the OR4-18

[14] 0.64 truck trips per 1,000 square feet.

OR4-18 Cont.

recommendations of the Fontana Truck Trip Generation Study with a mix of 79.57 percent cars, 3.46 percent 2-axle trucks, 4.64 percent 3-axle trucks and 12.33 percent 4-axle trucks" (p. 60). This fleet mix used in the IS/MND and associated appendices, however, is not consistent with recommendations set forth by SCAQMD, and does not accurately represent the percentage of trucks that access a high-cube warehouse on a daily basis. Rather, SCAQMD recommends that lead agencies assume a truck fleet mix of 40%. According to *Appendix E: Technical Source Documentation* of the CalEEMod User's Guide, "in order to avoid underestimating the number of trucks visiting warehouse facilities," SCAQMD staff "recommends that lead agencies conservatively assume that an average of 40% of total trips are truck trips [(0.48*10 + 0.2*4)/(10+4)=0.4)]."[15] If Project-specific data is not available, such as detailed trip rates based on a known tenant schedule, this average of 40% provides a reasonably conservative value based on currently available data. As is stated in the IS/MND, since the future tenant is unknown, "an exact number of future employees or hours of operation cannot be determined," which means that the tenant schedule is not known; therefore, a 40% truck fleet mix should be assumed (IS/MND, p. 3).

OR4-19

Specifically, the following fleet mix percentage should have been used within the CalEEMod model.

CalEEMod Parameter		IS/MND Model Input	SWAPE Model Input
Operational Mobile Fleet Mix	Passenger Cars (LDA)	79.57%	59.14%
	2 Axle Trucks (LHDT1)	3.46%	6.92%
	3 Axle Trucks (MHD)	4.64%	9.28%
	4+ Axle Trucks (HHDT)	12.33%	24.66%

The "Operational Mobile Fleet Mix" percentages for trucks (LHDT1, MHD, and HHDT) in the table above were adjusted to reflect a truck trip percentage of approximately 40%, which is consistent with recommended procedures set forth by SCAQMD staff. This fleet mix more accurately represents the number of trips that are likely to occur during Project operation. As such, an updated air quality analysis should be prepared in a DEIR that adequately assesses the Project's air quality and greenhouse gas impacts.

Incorrectly Applied Percent Fleet Mix to Trip Type Percentage

Not only did the IS/MND rely upon an artificially low truck fleet mix percentage to estimate the Project's mobile-source emissions, but it also inputted this fleet mix percentage into the CalEEMod model incorrectly. As a result, the Project's operational mobile-source emissions are both greatly underestimated and extremely inaccurate.

OR4-20

As is discussed in the section above, Appendix A of the IS/MND states that "the vehicle mix followed the recommendations of the Fontana Truck Trip Generation Study with a mix of 79.57 percent cars, 3.46 percent 2-axle trucks, 4.64 percent 3-axle trucks and 12.33 percent 4-axle trucks" (p. 60). According to the SCAQMD, "in order to convert the axle based fleet mix to the vehicle classes utilized by EMFAC" (which is what CalEEMod relies upon to estimate mobile-source emissions), 2-axle trucks can be

[15] "Appendix E Technical Source Documentation." CalEEMod User's Guide, July 2013, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/high-cube-resource-caleemod-appendix-e.pdf?sfvrsn=2, pp. 15

represented by the LHDT1 vehicle class, 3-axle trucks can be represented by the MHDT vehicle class, 4-axle trucks can be represented by the HHDT vehicle class, and all others can be represented by the LDA vehicle class.[16] Therefore, assuming that the fleet mix percentage provided in the Fontana Study is correct, the following percentages should have been inputted for each vehicle class, with all others vehicle classes set to zero (see table below). OR4-21

Truck Type Number of Axles	Truck Type EMFAC Vehicle Class	Fleet Mix (%)
4-axle	HHDT	12.33
3-axle	MHDT	4.64
2-axle	LHDT1	3.46
Passenger Cars	LDA	79.57

Review of the IS/MND's CalEEMod output files, however, indicate that these values were not inputted into the model as the fleet mix percentages. Rather, these values were used to adjust the trip type percentages for the Project. According to the CalEEMod output files, a truck trip percentage of 20.43% was applied to commercial-work (C-W) trip types to represent the number of truck trips that would occur, and a car trip percentage of 79.57% was applied to commercial-nonwork (C-NW) trips to represent the number of passenger car trips that would occur during Project operation (Appendix A, pp. 183). OR4-22

The application of these percentages to the trip types within CalEEMod, however, is entirely incorrect. According to Appendix A of the CalEEMod User's Guide, "the trip type breakdown describes the purpose of the trip generated at each land use," and "multiplying the total trips for a land use by trip type breakdown percentage yields trips for a given trip type."[17] This trip type, however, does not specifically apply to vehicle classes, as is assumed by the IS/MND. Commercial-work (C-W) trips are not made by trucks, exclusively, and commercial-nonwork (C-NW) trips are not made by passenger cars, exclusively. Rather, "the commercial-work trip represents a trip made by someone who is employed by the commercial land use sector," which can include trips made by employees in light-duty trucks and passenger cars as well as trips made by vendors in light-duty and heavy-duty trucks.[18] Similarly, "the commercial-nonwork trip represents a trip associated with the commercial land use other than by customers or workers," such as "trips made by delivery vehicles of goods associated with the land use."[19] Therefore, applying a trip percentage of 20.43% to C-W trips to represent the number of truck trips that will occur during Project operation is incorrect, as C-W trips include trips made by a mix of OR4-23

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[16] "Appendix E Technical Source Documentation." CalEEMod User's Guide, July 2013, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/high-cube-resource-caleemod-appendix-e.pdf?sfvrsn=2, pp. 15
[17] "CalEEMod User's Guide, Appendix A: Calculation Details for CalEEMod." SCAQMD, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/caleemod-appendixa.pdf?sfvrsn=2, p. 20
[18] "CalEEMod User's Guide, Appendix A: Calculation Details for CalEEMod." SCAQMD, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/caleemod-appendixa.pdf?sfvrsn=2, p. 20
[19] "CalEEMod User's Guide, Appendix A: Calculation Details for CalEEMod." SCAQMD, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/caleemod-appendixa.pdf?sfvrsn=2, p. 20

OR4-23 Cont.

vehicle types, including passenger cars. Similarly, applying a trip percentage of 79.57% to C-NW trips to represent the number of passenger car trips that will occur during Project operation is incorrect, as C-NW trips include trips made by a mix of vehicle types, including trucks. Due to these reasons, we require that an updated air quality analysis be prepared in a DEIR in order to adequately assess the Project's air quality and greenhouse gas impacts.

OR4-24

Diesel Particulate Matter Health Risk Emissions Inadequately Evaluated

The IS/MND concludes that the health risk posed to nearby sensitive receptors from exposure to diesel particulate matter ("DPM") emissions released during Project construction would be less than significant, yet fails to quantify the risk and compare it to applicable thresholds (IS/MND, p. 20). The IS/MND attempts to justify the omission of an actual health risk assessment ("HRA"), stating, "Given the relatively limited number of heavy duty construction equipment and the short-term construction schedule, the proposed project would not result in a long-term (i.e., 70 years) substantial source of toxic air contaminant emissions and corresponding individual cancer risk. Therefore, no significant short-term toxic air contaminant impacts would occur during construction of the proposed project" (IS/MND, p. 20). This justification, however, is incorrect.

The IS/MND assumes that because construction would occur over a period of time shorter than 70 years, health risk from construction activities would be less than significant. This determination, however, is in contrast to the most recent guidance published by the Office of Environmental Health Hazard Assessment (OEHHA), the organization responsible for providing recommendations for health risk assessments in California. In February of 2015, OEHHA released its most recent *Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments*, which was formally adopted in March of 2015.[20] This guidance document describes the types of projects that warrant the preparation of a health risk assessment. Construction of the Project will produce emissions of DPM, a human carcinogen, through the exhaust stacks of construction equipment over a construction period of 10 months, from June 2016 to March 2017 (IS/MND, p. 17). The OEHHA document recommends that all short-term projects lasting at least two months be evaluated for cancer risks to nearby sensitive receptors.[21] This recommendation reflects the most recent health risk assessment policy, and as such, an assessment of health risks to nearby sensitive receptors from construction should be included in a revised CEQA evaluation for the Project.

OR4-25

Furthermore, simply because there is a "relatively limited number of heavy duty construction equipment" (IS/MND, p. 20) does not mean that the emissions from the construction equipment would not pose a significant risk to nearby receptors. In an effort to demonstrate this, we prepared a simple screening-level health risk assessment. The results of our assessment, as described below, demonstrate that construction-related DPM emissions may result in a potentially significant health risk impact.

[20] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/hotspots2015.html

[21] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf, p. 8-18

As of 2011, the EPA recommends AERSCREEN as the leading air dispersion model, due to improvements in simulating local meteorological conditions based on simple input parameters.[22] The model replaced SCREEN3, which is included in OEHHA[23] and CAPCOA[24] guidance as the appropriate air dispersion model for Level 2 health risk screening assessments ("HRSAs"). A Level 2 HRSA utilizes a limited amount of site-specific information to generate maximum reasonable downwind concentrations of air contaminants to which nearby sensitive receptors may be exposed. If an unacceptable air quality hazard is determined to be possible using AERSCREEN, a more refined modeling approach is required prior to approval of the Project. OR4-26

We prepared a preliminary health risk screening assessment of the Project's construction emissions using the annual estimates from the Project's CalEEMod model, which can be found within Appendix D of the IS/MND's Air Quality, Global Climate Change, and Health Risk Assessment Impact Analysis. The CalEEMod annual emissions indicate that construction activities will generate approximately 450.2 pounds of DPM over a 303 day construction period. The AERSCREEN model relies on a continuous average emissions rate to simulate maximum downwind concentrations from point, area, and volume emission sources. To account for the variability in construction equipment usage over the seven phases of Project construction, we calculated an average DPM emission rate by the following equation.

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{450.2\ lbs}{303\ days} \times \frac{453.6\ grams}{lb} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} \approx \mathbf{0.0078}\ {}^{\boldsymbol{g}}\!/_{\boldsymbol{s}}$$

OR4-27

Construction activity was simulated as a 25.6 acre rectangular area source in AERSCREEN, with dimensions of 377 meters by 275 meters. A release height of three meters was selected to represent the height of exhaust stacks on construction equipment, and an initial vertical dimension of one and a half meters was used to simulate instantaneous plume dispersion upon release. An urban meteorological setting was selected with model-default inputs for wind speed and direction distribution.

The AERSCREEN model generated maximum reasonable estimates of single hour downwind DPM concentrations from the Project site. EPA guidance suggests that in screening procedures, the annualized average concentration of an air pollutant may be estimated by multiplying the single-hour concentration by 10%.[25] The maximum single-hour downwind concentration in the AERSCREEN output was approximately 2.742 μg/m^3 DPM 25 meters downwind, a distance that is most representative of the sensitive receptor location at 20 meters (65 feet). The annualized average concentration for the sensitive receptor was estimated to be 0.2742 μg/m^3.

We calculated the excess cancer risk for each sensitive receptor location, for adults, children, and/or infant receptors using applicable HRA methodologies prescribed by OEHHA. OEHHA recommends the OR4-28

[22] "AERSCREEN Released as the EPA Recommended Screening Model," USEPA, April 11, 2011, *available at:* http://www.epa.gov/ttn/scram/guidance/clarification/20110411_AERSCREEN_Release_Memo.pdf
[23] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf
[24] "Health Risk Assessments for Proposed Land Use Projects," CAPCOA, July 2009, *available at:* http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf
[25] http://www.epa.gov/ttn/scram/guidance/guide/EPA-454R-92-019_OCR.pdf

OR4-28 Cont.

use of Age Sensitivity Factors ("ASFs") to account for the heightened susceptibility of young children to the carcinogenic toxicity of air pollution.[26] According to the revised guidance, quantified cancer risk should be multiplied by a factor of ten during the first two years of life (infant), and by a factor of three for the subsequent fourteen years of life (child aged two until sixteen). Furthermore, in accordance with guidance set forth by the SCAQMD and OEHHA, we used 95th percentile breathing rates for infants and 80th percentile breathing rates for children and adults.[27] We used a cancer potency factor of 1.1 (mg/kg-day)$^{-1}$ and an averaging time of 25,550 days. The results of our calculations are shown below.

Parameter	Description	Units	Adult	Child	Infant
C_{air}	Concentration	μg/m³	0.2742	0.2742	0.2742
DBR	Daily breathing rate	L/kg-day	230	640	1090
EF	Exposure Frequency	days/year	350	350	350
ED	Exposure Duration	years	0.8	0.8	0.8
AT	Averaging Time	days	25550	25550	25550
	Inhaled Dose	(mg/kg-day)	9.1E-07	1.7E-06	1.7E-06
CPF	Cancer Potency Factor	1/(mg/kg-day)	1.1	1.1	1.1
ASF	Age Sensitivity Factor	-	1	3	10
	Cancer Risk		**7.60E-07**	**6.35E-06**	**3.60E-05**

OR4-29

The excess cancer risk to adults, children, and infants during Project construction for the sensitive receptors 25 meters away are 0.76, 6.35, and 36 in one million, respectively. Consistent with OEHHA guidance, exposure was assumed to begin in the infantile stage of life to provide the most conservative estimates of air quality hazards. The infantile exposure for the sensitive receptors exceeds the SCAQMD threshold of 10 in one million. As a result, a refined health risk assessment must be prepared to examine air quality impacts generated by Project construction using site-specific meteorology and specific equipment usage schedules. It should be noted that the Project's health risk impact may be greater than what is estimated in our independent screening-level assessment, as the DPM emission value relied upon to conduct this analysis was taken from the IS/MND's CalEEMod model. As was discussed in the previous sections, the IS/MND's CalEEMod model relies upon incorrect input parameters that artificially reduce the Project's construction and operational emissions. Therefore, the health risk posed to nearby sensitive receptors as a result of the Project may be greater. Even though our assessment may still underestimate the Project's health risk impact, our analysis still demonstrates that the Project poses a significant health risk as a result of DPM emissions. Therefore, a DEIR must be prepared to adequately evaluate the Project's health risk impact, and should include additional mitigation measures to reduce this impact to a less-than-significant level.

[26] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf

[27] "Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics 'Hot Spots' Information and Assessment Act," SCAQMD, June 5, 2015, *available at:* http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588-risk-assessment-guidelines.pdf?sfvrsn=6, p. 19

Sincerely,

Matt Hagemann, P.G., C.Hg.

Jessie Jaeger

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

1640 5th St.., Suite 204 Santa
Santa Monica, California 90401
Tel: (949) 887-9013
Email: mhagemann@swape.com

Matthew F. Hagemann, P.G., C.Hg., QSD, QSP

Geologic and Hydrogeologic Characterization
Industrial Stormwater Compliance
Investigation and Remediation Strategies
Litigation Support and Testifying Expert
CEQA Review

Education:

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.
B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

Professional Certifications:

California Professional Geologist
California Certified Hydrogeologist
Qualified SWPPP Developer and Practitioner

Professional Experience:

Matt has 25 years of experience in environmental policy, assessment and remediation. He spent nine years with the U.S. EPA in the RCRA and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) while also working with permit holders to improve hydrogeologic characterization and water quality monitoring.

Matt has worked closely with U.S. EPA legal counsel and the technical staff of several states in the application and enforcement of RCRA, Safe Drinking Water Act and Clean Water Act regulations. Matt has trained the technical staff in the States of California, Hawaii, Nevada, Arizona and the Territory of Guam in the conduct of investigations, groundwater fundamentals, and sampling techniques.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Geology Instructor, Golden West College, 2010 – 2104;
- Senior Environmental Analyst, Komex H2O Science, Inc. (2000 -- 2003);

- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, Matt's responsibilities have included:

- Lead analyst and testifying expert in the review of over 100 environmental impact reports since 2003 under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, Valley Fever, greenhouse gas emissions, and geologic hazards. Make recommendations for additional mitigation measures to lead agencies at the local and county level to include additional characterization of health risks and implementation of protective measures to reduce worker exposure to hazards from toxins and Valley Fever.
- Stormwater analysis, sampling and best management practice evaluation at industrial facilities.
- Manager of a project to provide technical assistance to a community adjacent to a former Naval shipyard under a grant from the U.S. EPA.
- Technical assistance and litigation support for vapor intrusion concerns.
- Lead analyst and testifying expert in the review of environmental issues in license applications for large solar power plants before the California Energy Commission.
- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.
- Expert witness on two cases involving MTBE litigation.
- Expert witness and litigation support on the impact of air toxins and hazards at a school.
- Expert witness in litigation at a former plywood plant.

With Komex H2O Science Inc., Matt's duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.

- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.

- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Executive Director:

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the discharge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, Matt worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for his contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. He prepared geologic reports, conducted public hearings, and responded to public comments from residents who were very concerned about the impact of designation.

- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.
- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation-wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

Policy:

Served senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advised the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaped EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific principles into the policy-making process.
- Established national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, Matt led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities were as follows:

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, Matt taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.

Matt taught physical geology (lecture and lab and introductory geology at Golden West College in Huntington Beach, California from 2010 to 2014.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S. EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Coloradao.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal repesentatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

Hagemann, M.F., 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invited presentation to the California Assembly Natural Resources Committee.

Hagemann, M.F., 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. From Tank to Tap: A Chronology of MTBE in Groundwater. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to Address Impacts to Groundwater. Presentation to the annual meeting of the Society of Environmental Journalists.

Hagemann, M.F., 2002. An Estimate of the Cost to Address MTBE Contamination in Groundwater (and Who Will Pay). Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to a meeting of the U.S. EPA and State Underground Storage Tank Program managers.

Hagemann, M.F., 2001. From Tank to Tap: A Chronology of MTBE in Groundwater. Unpublished report.

Hagemann, M.F., 2001. Estimated Cleanup Cost for MTBE in Groundwater Used as Drinking Water. Unpublished report.

Hagemann, M.F., 2001. Estimated Costs to Address MTBE Releases from Leaking Underground Storage Tanks. Unpublished report.

Hagemann, M.F., and VanMouwerik, M., 1999. Potential Water Quality Concerns Related to Snowmobile Usage. Water Resources Division, National Park Service, Technical Report.

VanMouwerik, M. and **Hagemann, M.F**. 1999, Water Quality Concerns Related to Personal Watercraft Usage. Water Resources Division, National Park Service, Technical Report.

Hagemann, M.F., 1999, Is Dilution the Solution to Pollution in National Parks? The George Wright Society Biannual Meeting, Asheville, North Carolina.

Hagemann, M.F., 1997, The Potential for MTBE to Contaminate Groundwater. U.S. EPA Superfund Groundwater Technical Forum Annual Meeting, Las Vegas, Nevada.

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval Air Station, Conference on Intrinsic Remediation of Chlorinated Hydrocarbons, Salt Lake City.

Hagemann, M.F., Fukunaga, G.L., 1996, The Vulnerability of Groundwater to Anthropogenic Contaminants on the Island of Maui, Hawaii. Hawaii Water Works Association Annual Meeting, Maui, October 1996.

Hagemann, M. F., Fukanaga, G. L., 1996, Ranking Groundwater Vulnerability in Central Oahu, Hawaii. Proceedings, Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Characterization and Cleanup at Closing Military Bases in California. Proceedings, California Groundwater Resources Association Meeting.

Hagemann, M.F. and Sabol, M.A., 1993. Role of the U.S. EPA in the High Plains States Groundwater Recharge Demonstration Program. Proceedings, Sixth Biennial Symposium on the Artificial Recharge of Groundwater.

Hagemann, M.F., 1993. U.S. EPA Policy on the Technical Impracticability of the Cleanup of DNAPL-contaminated Groundwater. California Groundwater Resources Association Meeting.

Hagemann, M.F., 1992. Dense Nonaqueous Phase Liquid Contamination of Groundwater: An Ounce of Prevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.

<u>Other Experience:</u>

Selected as subject matter expert for the California Professional Geologist licensing examination, 2009-2011.

JESSIE MARIE JAEGER

SOIL WATER AIR PROTECTION ENTERPRISE
2656 29th Street, Suite 201
Santa Monica, California 90405
Mobile: (530) 867-6202
Office: (310) 452-5555
Fax: (310) 452-5550
Email: jessie@swape.com

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

EDUCATION

UNIVERSITY OF CALIFORNIA, LOS ANGELES **B.S. CONSERVATION BIOLOGY & ENVIRONMENTAL SCIENCES** *JUNE 2014*

PROJECT EXPERIENCE

SOIL WATER AIR PROTECTION ENTERPRISE ***SANTA MONICA, CA***

AIR QUALITY SPECIALIST

SENIOR ANALYST: CEQA ANALYSIS & MODELING

- Calculated roadway, stationary source, and cumulative impacts for risk and hazard analyses at proposed land use projects.
- Quantified criteria air pollutant and greenhouse gas emissions released during construction and operational activities of proposed land use projects using CalEEMod and EMFAC2011 emission factors.
- Utilized AERSCREEN, a screening dispersion model, to determine the ambient air concentrations at sensitive receptor locations.
- Organized presentations containing figures and tables comparing results of particulate matter analyses to CEQA thresholds.
- Prepared reports that discuss results of the health risk analyses conducted for several land use redevelopment projects.

SENIOR ANALYST: GREENHOUSE GAS MODELING AND DETERMINATION OF SIGNIFICANCE

- Quantified greenhouse gas (GHG) emissions of a "business as usual" scenario for proposed land use projects using CalEEMod.
- Determined compliance of proposed projects with AB 32 GHG reduction targets, with measures described in CARB's Scoping Plan for each land use sector, and with GHG significance thresholds recommended by various Air Quality Management Districts in California.
- Produced tables and figures that compare the results of the GHG analyses to applicable CEQA thresholds and reduction targets.

PROJECT MANAGER: OFF-GASSING OF FORMALDEHYDE FROM FLOORING PRODUCTS

- Determined the appropriate standard test methods to effectively measure formaldehyde emissions from flooring products.
- Compiled and analyzed laboratory testing data. Produced tables, charts, and graphs to exhibit emission levels.
- Compared finalized testing data to Proposition 65 No Significant Risk Level (NSRL) and to CARB's Phase 2 Standard.
- Prepared a final analytical report and organized supporting data for use as Expert testimony in environmental litigation.
- Participated in meetings with clients to discuss project strategy and identify solutions to achieve short and long term goals.

PROJECT ANALYST: EXPOSURE ASSESSMENT OF CONTAMINANTS EMITTED BY INCINERATOR

- Reviewed and organized sampling data, and determined the maximum levels of arsenic, dioxin, and lead in soil samples.
- Determined cumulative and hourly particulate deposition of incinerator and modeled particle dispersion locations using GIS and AERMOD.
- Conducted risk assessment using guidance set forth by the Office of Environmental Health Hazard Assessment (OEHHA).
- Utilized LeadSpread8 to evaluate exposure, and the potential adverse health effects from exposure, to lead in the environment.
- Compared final results of assessment to the Environmental Protection Agency's (EPA) Regional Screening Levels (RSLs).

ACCOMPLISHMENTS

- **Recipient**, Bruins Advantage Scholarship, University of California, Los Angeles ***SEPT 2010 – JUNE 2014***
- **Academic Honoree,** Dean's List, University of California, Los Angeles ***SEPT 2013 – JUNE 2014***
- **Academic Wellness Director**, UCLA Undergraduate Students Associated Council ***SEPT 2013 – JUNE 2014***
- **Student Groups Support Committee Member**, UCLA Undergraduate Students Associated Council ***SEPT 2012 – JUNE 2013***

Nedra A. Myricks
170 E. Dumas Street
San Bernardino CA 92408
(909) 884-3967
namyricks@aol.com

February 29, 2016

Travis Martin, Assistant Planner
City of San Bernardino
Planning Department
300 North D Street, 3rd Floor
San Bernardino CA 92418

RE: Proposed Waterman Industrial Center – Waterman Ave. and Dumas Street

Dear Mr. Martin:

I am not in support of the project referenced above. I do not believe this is a viable project for this area at this time, and see it as frivolous and unnecessary, primarily based on the number of vacant warehouse spaces currently available in typically the same area as Newcastle Partners wants to build this new facility; and the number of residents who will have to be displaced to accommodate it's completion. GP1-1

I am well aware of the air cargo business expected to "boom" at San Bernardino International Airport some time in the future; and the displacement that will cause for some long time residents in this area, but that is not happening NOW! There are newly built, empty warehouse spaces all along Central Ave., Orange Show Road, Tippecanoe Ave. and Arrowhead Ave. at Central. Wouldn't it be prudent to find occupants for these warehouse spaces first before building new ones? Especially a new "spec building" with no known tenant confirmed for occupation. GP1-2

Dumas Street is currently wide enough to accommodate one lane of traffic in each direction and is easily congested, as evidenced during the weekend of February 13-14 when Waterman Ave. was closed in both directions at Dumas and Orange Show Road; the same weekend as the High Times Cannabis Festival was held at the National Orange Show. The traffic on Dumas that weekend was horrific! I witnessed several "near misses". The street would definitely have to be widened to accommodate large trucks; and the "Draft Mitigated Negative Declaration and Initial GP1-3

GP1-3 Cont. Study" regarding this project stated that the completion of this project would "require the removal and displacement of five existing single family residences on the project site".

GP1-4 Having indicated my opposition to this project, but fully aware that construction will probably proceed as planned, I have two questions for your department:

1) Which five (5) homes on Dumas are being addressed for "removal and displacement"?

GP1-5 2) Would property owners be better off selling their properties on the open market as opposed to waiting for Imminent Domain to displace them?

Thank you in advance for responding to my inquiries.

Yours truly,

Nedra A. Myricks

cc: Senator Barbara Boxer
Assemblywoman Cheryl R. Brown
Supervisor Josie Gonzalez
Councilman John Valdivia

From: Wacy Armstrong [mailto:wacyesq@gmail.com]
Sent: Monday, February 29, 2016 4:29 PM
To: Travis Martin
Cc: 'Wacy Armstrong'; sbgolfclub@gmail.com
Subject: APN # 0141-431-16

Mr. Martin,

Attached hereto please find a copy of my client's Notice of Intent to Preserve Interest as recorded on October 8, 2015 as to APN # 0141-431-16 which is a parcel included within the Waterman Industrial Center.

The well is located roughly on the northwest center of the parcel.

The floating/meandering easement to the well, the equipment, water pipes, etc. blankets the entire parcel.

It occurs to me that the above real property interests of my client should be addressed prior to the city adopting a Negative Declaration.

Once you have had the opportunity to review the above please contact me to discuss this matter in greater detail.

Thank you.

GP2-1

Wacy Armstrong, Jr.
Attorney at Law
Real Estate Broker
Armstrong Law Building
824 E. Highland Avenue
San Bernardino, CA 92404
Office (909) 886-0707
Fax (909) 881-2759
Email: wacyesq@gmail.com

DAVID ALVAREZ
RECORDING REQUESTED BY

AND WHEN RECORDED MAIL DOCUMENT TO:

NAME J.G. Golf Enterprises, Inc.
STREET ADDRESS 1494 South Waterman Avenue
CITY, STATE & ZIP CODE San Bernardino, CA 92404

Recorded in Official Records, County of San Bernardino 10/08/2015 1:00 PM LB SAN

BOB DUTTON
ASSESSOR - RECORDER - CLERK

P Counter

Doc#: 2015-0440794 Titles: 1 Pages: 3

Fees	21.00
Taxes	0.00
Other	0.00
PAID	$21.00

SPACE ABOVE FOR RECORDER'S USE ONLY

NOTICE OF INTENT TO PRESERVE INTEREST

Title of Document

THIS AREA FOR RECORDER'S USE ONLY

COUNTY OF SAN BERNARDINO 1853

THIS COVER SHEET ADDED TO PROVIDE ADEQUATE SPACE FOR RECORDING INFORMATION
($3.00 Additional Recording Fee Applies)

Recording Requested By:

When recorded please mail to:

J.G. Golfing Enterprises, Inc.
1494 South Waterman Avenue
San Bernardino, CA 92404

NOTICE OF INTENT TO PRESERVE INTEREST

This Notice is intended to preserve an Interest in Real Property from extinguishment pursuant to Title5(commencing with Section 880.020) of Part 2 of the Civil Code (Marketable Record Title).

Claimant: J.G. Golfing Enterprises, Inc.
1494 South Waterman Avenue
San Bernardino, CA 92404

Interest: The interest of J.G. Golfing Enterprises, Inc. as set forth in the terms, conditions and provisions of that certain exclusive and perpetual right to develop water and Artisan Wells Agreement, dated May 13, 1901, by and between Elizabeth A Paine, party of the first part; and the Riverside Water Company, a Corporation, recorded May 22, 1901 in the San Bernardino County Recorders Office, in Book 305, Page 197, of deeds.

Reference if hereby made to the record of said document for further and other particulars. Reference is also made to amendments to said agreement recorded in the San Bernardino County Recorders Office on June 13, 1902, in Book 316, Page 56, of Deeds; and assignment of contract recorded in the San Bernardino County Recorders Office on June 13, 1902, in Book 316, Page 38, of Deeds.

Claimant's interests also includes a floating easement for access over the real property described below.

Real Property: THAT PORTION OF LOT 25, BLOCK 54 OF MISCELLANEOUS SURVEY OF THE RANCHO SAN BERNARDINO, IN THE COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AS PER PLAT RECORDED IN BOOK 7 OF MAPS, PAGE(S) 2, RECORDS OF SAID COUNTY, DESCRIBED AS FOLLOWS: BEGINNING AT A POINT 30 RODS SOUTH OF THE NORTHEAST CORNER OF SAID LOT 25; THENCE RUNNING SOUTH 24 RODS ALONG THE EAST LINE OF SAID LOT; THENCE RUNNING WEST 80 RODS TO THE WEST LINE OF SAID LOT; THENCE RUNNING NORTH 24 RODS; THENCE EAST ALONG THE SOUTH LINE OF WHAT IS KNOW AS THE BUTTON PROPERTY TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE COUNTY OF SAN BERNARDINO BY DEED RECORDED APRIL 5, 1960, IN BOOK 5102, PAGE 203, OFFICIAL RECORDS.

APN: 0141-431-16

I assert under Penalty of Perjury that this Notice is not recorded for the purpose of slandering Title to Real Property and I am informed and believe that the information contained in this notice is true. If this Notice is made of behalf of a Claimant, I assert under Penalty of Perjury that I am authorized to act on behalf of the Claimant.

J.G. Golfing Enterprises, Inc.

Dated: October 6, 2015

Tom S. Self

By: Tom Self, President

Comment Number	Comment	Response
State Agencies		
California Department of Fish and Wildlife		
SA1-1	Burrowing Owl Due to the open, sparsely vegetated habitat on the project site and the presence of California ground squirrels, the Department is concerned that the project site may support burrowing owl, a California Species of Special Concern. The project has the potential to cause the loss of nesting and/or foraging habitat for burrowing owl.	It is acknowledged that at times, burrowing owls may inhabit areas where California ground squirrels are observed. However, per Rocks Biological Consulting (RBC), there were no suitable burrows observed during the October 2015 site visit. In addition, the California Natural Diversity Database (CNDDB) records search conducted prior to the site visit did not identify burrowing owl within a one-mile radius of the site. As a precautionary measure, the applicant will be conditioned to conduct pre-construction burrowing owl surveys during nesting season in accordance with the 2012 CDFW Staff Report on Burrowing Owl Mitigation protocol.
SA1-2	The Department recommends that the City follow the recommendations and guidelines provided in the Staff Report on Burrowing Owl Mitigation (Department of Fish and Game, March 2012); available for download from the Department's website: https://www .dfg.ca.gov/wild life/nongame/survey monitor .html. The Department expects that the City will follow the Staff Report on Burrowing Owl Mitigation, which specifies that the steps for project impact evaluations include: a. A habitat assessment; b. Surveys; and c. An impact assessment	Please refer to the response to Comment SA1-1. There was no suitable habitat for burrowing owl observed during the October 2015 site visit conducted by RBC.
SA1-3	As stated in the *Staff Report on Burrowing Owl Mitigation*, the three progressive steps are effective in evaluating whether a project will result in impacts to burrowing owls, and the information gained from the steps will inform any subsequent avoidance, minimization, and mitigation measures. Habitat assessments are conducted to evaluate the likelihood that a site supports burrowing owl. Burrowing owl surveys provide information needed to determine the potential effects of proposed projects and activities on	Please refer to the response to Comment SA1-1. There was no suitable habitat for burrowing owl observed during the October 2015 site visit conducted by RBC.

Comment Number	Comment	Response
	burrowing owls, and to avoid take in accordance with FGC sections 86, 3503, and 3503.5. Impact assessments evaluate the extent to which burrowing owls and their habitat may be impacted, directly or indirectly, on and within a reasonable distance of a proposed CEQA project activity or non-CEQA project.	
SA1-4	Please note that CEQA Guidelines §15126.4, subdivision (a)(1)(8) states formulation of feasible mitigation measures should not be deferred until some future date. The Court of Appeal in San Joaquin Raptor Rescue Center v. County of Merced (2007) 149 Cai.App.4th 645 struck down mitigation measures which required formulating management plans developed in consultation with State and Federal wildlife agencies after Project approval. Courts have also repeatedly not supported conclusions that impacts are mitigable when essential studies, and therefore impact assessments, are incomplete (*Sundstrom v. County of Mendocino* (1988) 202 Cal. App . 3d. 296; *Gentry v. City of Murrieta (1995)* 36 Cal. App . 4th 1359; *Endangered Habitat League, Inc. v. County of Orange* (2005) 131 Cal. App . 4th 777).	Please refer to the response to Comment SA1-1. There was no suitable habitat for burrowing owl observed during the October 2015 site visit conducted by RBC and therefore, no mitigation measures are proposed. Nonetheless, as specified in Comment SA1-1, pre-construction surveys for the burrowing owl will be required.
SA1-5	Nesting Birds Mitigation Measure B-1a states that surveys for nesting birds will be conducted within 14 days prior to removal of trees or shrubs, if trees or shrubs are scheduled for removal between February 1 and September 15. Because some bird species may construct a nest and begin to lay eggs in fewer than 14 days, the Department recommends that nesting bird surveys take place no more than 72 hours prior to the initiation of project activities . Please note that surveys should be conducted over the entire site, not just in vegetated areas, as some species nest directly on the ground. Additionally, as some species (e.g., owls) may commence nesting as early as February 1 and others may not fledge until later than September 15, the Department recommends that the site be checked for nesting activity regardless of the time of year.	Mitigation Measure B-1a has been revised as follows: " ~~If removal of t~~Trees and ~~shrubs is to be done during the nesting season (February 1 to September 15), all trees and~~ other suitable nesting habitat within the limits of work shall be surveyed by a qualified biologist prior to initiating construction-related activities. A pre-construction survey would be conducted no more than **72 hours** ~~14 days~~ prior to the start of work. If no nests are observed, construction activities should be initiated within **72 hours** ~~14 days~~. If more than **72 hours** ~~14 days~~ pass and construction has not been initiated, another survey would be required." Refer to the Final IS/MND. This response does not entail the addition of a mitigation measure, but rather is an amplification of the mitigation measure.

Comment Number	Comment	Response
CA Public Utilities Commission		
SA2-1	RCEB recommends that the City add language to the project so that any development adjacent to or near the railroad/light rail right-of-way (ROW) is planned with the safety of the rail corridor in mind. Construction and future business activities may increase traffic volumes not only on streets and at intersections, but also at railroad crossings. Mitigation measures to consider include, but are not limited to, improvements to existing railroad crossings due to increase in traffic volumes, and continuous vandal resistant fencing or other appropriate barriers to limit the access of trespassers onto the railroad ROW.	Comment noted. Based upon previous discussions with the City of San Bernardino staff, no improvements are currently planned or funded for the railroad crossing on Waterman Avenue (north of Dumas Street).
CA Department of Transportation		
SA3-1	Include I-10 and I-215 freeways/ramps on your exhibits.	Comment so noted. Figure 1 has been revised to include the I-10 Freeway and I-215 Freeway/ramps and is attached (See attached letter dated March 28, 2016).
SA3-2	Confirm proposed project will not have any significant impact, i.e. LOS on I-10 and I-2 15 freeways/ramps.	As noted on Figure 17 of the Traffic Impact Analysis (TIA), the proposed project does not contribute trips greater than the I-10 Freeway and I-215 Freeway threshold volume of 100 two-way peak hour trips. In addition, the project does not contribute trips greater than the arterial link threshold volume of 50 two-way trips in the peak hours on the I-10 Freeway ramps and I-215 Freeway ramps. In addition, the signed scoping agreement (see Appendix B of the TIA) with the City of San Bernardino provided no nexus to study the I-10 Freeway ramps and I-215 Freeway ramps.
SA3-3	Indicate if truck volume is lower during regular AM/PM Peak Hours and use counts to prepare exhibits. Truck traffic does not follow regular commuter patterns.	The Waterman Industrial Center Traffic Impact Analysis (Revised) dated April 22, 2016 uses a more "conservative" analysis for the proposed project land use based upon the South Coast Air Quality Management District (SCAQMD) trip generation rates. In addition, the truck trip distribution for the project site is included in Figure 13 and is different from the passenger car trip distribution. It should be noted that no

Comment Number	Comment	Response
		change in mitigation measures from the previous traffic study to the supplemental TIA were recommended at the study area intersections with the revised SCAQMD trip generation rates.
SA3-4	Explain growth rate used to determine traffic volumes for 2017 and beyond. Clarify if the growth rate is consistent with the regional growth rate.	To account for ambient growth on roadways (see Section IV.A.1 of the TIA), Opening Year (2017) traffic volumes have been interpolated from the Year 2035 traffic volumes based upon a proportion of the future growth increment from the San Bernardino Transportation Analysis Model (SBTAM) traffic model Year 2008 and Year 2035 average daily traffic volume forecasts. This SBTAM provided by the Southern California Associated Governments (SCAG) is the regional traffic model for this study area.
SA3-5	State if any assumptions/changes were made to update the SBTAM, including network, projects, SED, etc.	As stated in Section IV.A.4 of the TIA, the project traffic volumes were manually added to the Year 2035 SBTAM traffic model volumes. No adjustments were made to the SBTAM traffic data provided by SCAG.
SA3-6	Use the Highway Capacity Manual (HCM) 2010 methodology instead of the HCM 2000 for all traffic analyses.	The Levels of Service were calculated based upon the Highway Capacity Manual (HCM) 2010 methodology for all traffic analyses (see attached Tables and Appendix B). It should be noted that no change in mitigation measures from the traffic study were added with the Highway Capacity Manual (HCM) 2010 methodology.
SA3-7	Include the project fair-share of the improvement costs to mitigate the impacted intersections in the TIA.	The Circulation Recommendations are shown on Figure 40 of the TIA. The proposed project will pay for the improvements shown on Figure 40. No additional off-site improvements are required and therefore no fair-share improvement costs are included in the traffic study. However, as noted in Section V of the TIA: As mitigation for the potential traffic impacts, the proposed project shall contribute through local and regional adopted traffic impact fee programs in addition to any fair share contributions shown within the traffic study which is not covered within these fee programs.

Comment Number	Comment	Response
SA3-8	Provide preferential parking for vanpools and carpools, as well as secure and convenient bicycle parking within the project area.	Comment so noted.
CA Governor's Office of Planning and Research		
SA4-1	The State Clearinghouse submitted the above named Mitigated Negative Declaration to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on March 1, 2016, and the comments from the responding agency(ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly. Please note that Section 21 104(c) of the California Public Resources Code states that: "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation" These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California	This is not a comment letter, but an acknowledgement from the Governor's Office of Planning and Research, State Clearinghouse and Planning Unit, (SCH) that the City complied with the State Clearinghouse review requirements for draft environmental documents pursuant to the requirements of CEQA.

Comment Number	Comment	Response
	Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.	
Local Agencies		
San Bernardino County, Department of Public Works		
LA1-1	<u>Water Resources Division (Mary Lou Mermilliod, PWE III,909-387-8213):</u> 1. We have reviewed the MND and it appears the proposed project lies within the City of San Bernardino, not the County of San Bernardino as stated on page 46, Discussion, item h). The County of San Bernardino has no jurisdiction for development within the City.	Comment noted. The storm drain design and drainage study will be prepared in accordance with all applicable local, state and federal requirements. Proposed project plans and associated technical studies will be reviewed and approved by the City of San Bernardino.
LA1-2	2. Item h) on page 46 of the Initial Study states that *"The County of San Bernardino Flood Control indicates that a building within Flood Zone A shall have finished floor elevation or exterior waterproofing elevation of two-feet higher than the highest adjacent finished grade"*. The San Bernardino County Flood Control District (District) does not regulate development within floodplains; this is regulated by the County's Land Use Services Department. Additionally , FEMA's elevation requirement, as well as the County's, is above highest adjacent grade (HAG), which is the highest natural grade (prior to any grading) directly adjacent to a structure's footprint.	Comment noted. Waterproofing will be provided to an elevation two-feet greater than the highest adjacent grade directly adjacent to the building footprint. This complies with the waterproofing requirements specified by the County's Land Use Services Department.
LA1-3	3. We recommend that the City enforces FEMA's, and its most current, regulations for construction within floodplains.	Comment noted. The proposed project will be designed in accordance with all applicable local, state and federal requirements.
LA1-4	<u>Flood Control Planning Division (David Lovell, PWE III, 909-387-7964):</u> 1. The Project is located within the City of San Bernardino approximately 400 feet east of the District's Twin Creek	A Preliminary Drainage Report for the Waterman Industrial Center (September 2015) was reviewed and approved by the City. The report includes preliminary storm drain flowlines and underground infiltration basin sizes as well as existing and

Comment Number	Comment	Response
	Channel-COE and is subject to the District's Comprehensive Storm Drain Plan No. 7, dated December 1982. Sufficient data and exhibits, showing storm water flowlines and the proposed underground filtration basins to meet onsite containment, are needed to address potential impacts to the local drainage system.	proposed hydrology maps, existing hydrology calculations, proposed hydrology calculations, and hydraulic work map and calculations which indicate all preliminary storm drain flowlines on site and their connections to the underground infiltration basins. Note, there will be no connection to any existing local drainage system in Waterman Avenue and there is no existing drainage system in Dumas Avenue.
LA1-5	<u>Environmental Management Division (Brandy Wood, Ecological Resource Specialist, 909-387- 7971):</u> 1. Page 2 of the MND indicates a nesting bird survey would be conducted if more than 14 days pass and construction has not been initiated. The construction of a nest and egg-laying can be as quick as 3 days. Fourteen days is too long to wait to ensure no impacts to nesting birds. It is recommended a nesting bird survey be conducted within 3 days of the start of work and if more than 3 days pass and construction has not been initiated, another survey would be required.	Please refer to the response to Comment SA1-5.
LA1-6	2. The MND has no minimization or mitigation measures for the potential of burrowing owl to be on site. Burrowing owl is a State of California species of special concern and the site contains suitable habitat for burrowing owl.	Please refer to the response to Comment SA1-1. There was no suitable habitat for burrowing owl observed during the October 2015 site visit conducted by RBC and therefore, no mitigation measures are proposed. As a precautionary measure, the applicant will be conditioned to conduct pre-construction burrowing owl surveys during nesting season in accordance with the 2012 CDFW Staff Report on Burrowing Owl Mitigation protocol.
Organizations		
California Housing Foundation		
OR1-1	1. When the SCE towers are relocated, the overhead wires cannot be moved any closer to our buildings.	Comment Noted. The proposed relocation of the five existing power poles which lie within the proposed improvement envelope on Dumas Avenue will not impact any buildings east of Waterman Avenue. The two existing power poles on Dumas Street, west of Waterman Avenue nearest the intersection of Dumas Street and Waterman Avenue will remain in place,

Comment Number	Comment	Response
		thus, the power lines to the east of Waterman Avenue will not be impacted or relocated.
OR1-2	2. Large volumes of truck traffic at the site will undoubtedly cause severe congestion on S. Waterman.	While the proposed project will add truck trips to Waterman Avenue, the Waterman Avenue study area intersections are projected to operate within acceptable Levels of Service during the peak hours for Year 2035 With Project traffic conditions (as shown in Table 12 of the TIA.
Soboba Band of Luiseño Indians		
OR2-1	The Soboba Band of Luiseño Indians appreciates your observance of Tribal Cultural Resources and their preservation in your project. The information provided to us on said project(s) has been assessed through our Cultural Resource Department. At this time the Soboba Band does not have any specific concerns regarding known cultural resources in the specified areas that the project encompasses, but does request that the appropriate consultation continue to take place between concerned tribes, project proponents, and local agencies.	This is an acknowledgement by the Soboba Band of Luiseno Indians that the Draft IS/MND was distributed to their organization for review. The City will continue the required consultation with the tribes under the applicable state and federal regulations.
OR2-2	Also, working in and around traditional use areas intensifies the possibility of encountering cultural resources during any future construction/excavation phases that may take place. For this reason the Soboba Band of Luiseño Indians requests that approved Native American Monitor(s) be present during any future ground disturbing proceedings, including surveys and archaeological testing, associated with this project. The Soboba Band wishes to defer to the San Manuel Band of Mission Indians, who are in closer proximity to the project. Please feel free to contact me with any additional questions or concerns.	Mitigation Measure CR-1 requires the project applicant to retain an archaeological monitor to monitor initial ground-disturbing activities in an effort to identify any unknown archaeological resources. The City also invites the appropriate local tribe representative to be present during initial ground-disturbing activities.
Lozeau Drury LLP on behalf of Laborers International Union North America, Local Union 783		

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OR3-1	Commenters request that the City withdraw the IS/MND and instead prepare an environmental impact report ("EIR") for the Project, as there is substantial evidence that the Project will have significant unmitigated impacts on the environment as discussed below. There is a fair argument that the Project may have significant unmitigated impacts, including:	The Draft IS/MND includes mitigation measures to address impacts identified as significant or potentially significant. The Draft IS/MND concludes that all significant or potentially significant impacts by the proposed project can be mitigated to a less than significant level under CEQA; therefore, an IS/MND is the appropriate CEQA document.
OR3-2	1. Significant and unmitigated air quality impacts associated with the operation of the Project.	There are no significant or unmitigated air quality impacts associated with the operation of the proposed project. Section 3 Air Quality, pages 15 through 24 of the Draft IS/MND shows that project-related emissions are less than significant for the proposed project. Project construction-source emissions would not exceed applicable regional thresholds of significance established by the SCAQMD. For localized emissions, the proposed project will not exceed applicable Localized Significance Thresholds (LSTs) established by the SCAQMD. Project construction-source emissions would not conflict with the Basin Air Quality Management Plan (AQMP). As discussed herein, the proposed project will comply with all applicable SCAQMD construction-source emission reduction rules and guidelines. Project construction source emissions would not cause or substantively contribute to violation of the California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS). Established requirements addressing construction equipment operations, and construction material use, storage, and disposal requirements act to minimize odor impacts that may result from construction activities. Moreover, construction-source odor emissions would be temporary, short-term, and intermittent in nature and would not result in persistent impacts that would affect substantial numbers of people. Potential construction-source odor impacts are therefore considered less-than-significant. The project operational-sourced emissions would not exceed applicable regional thresholds of significance established by

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		the SCAQMD. Project operational-source emissions would not result in or cause a significant localized air quality impact as discussed in the Operations-Related Local Air Quality Impacts section of this report. Additionally, project-related traffic will not cause or result in CO concentrations exceeding applicable state and/or federal standards (CO "hotspots). The Diesel Emissions Health Risk Assessment conducted for the proposed project show that DPM emissions from project-related truck traffic will not cause a significantly elevated cancer risk or significant non-cancer-related health risk to nearby receptors. Project operational-source emissions would therefore not adversely affect sensitive receptors within the vicinity of the proposed project. Project operational-source emissions would not conflict with the Basin Air Quality Management Plan (AQMP). The proposed project's emissions meet SCAQMD regional thresholds and will not result in a significant cumulative impact. The proposed project does not propose any such uses or activities that would result in potentially significant operational-source odor impacts. Potential operational-source odor impacts are therefore considered less-than significant.
OR3-3	2. Significant and unmitigated human health risks from diesel particulate matter emissions associated with Project construction.	As stated on page 20 of the Draft IS/MND, "The greatest potential for toxic air contaminant emissions would be diesel particulate emissions associated with heavy equipment operations during construction. According to SCAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of "individual cancer risk". "Individual Cancer Risk" is the likelihood that a person exposed to concentrations of toxic air contaminants over a 70-year lifetime will contract cancer, based on the use of standard risk-assessment methodology. Given the relatively limited number of heavy duty construction equipment and the short-term construction schedule, the proposed project would not result in a long-term (i.e., 70 years) substantial source of toxic air contaminant emissions and corresponding

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		individual cancer risk. Therefore, no significant short-term toxic air contaminant impacts would occur during construction of the proposed project." On page 59 of the AQ-GHG-HRA analysis report (AQR), conducted in support of the Draft IS/MND, the footnotes detail the fact that currently SCAQMD staff are in the process of updating their HRA assessment guidance per the February 2015 Office of Environmental Health Hazard Assessment (OEHHA) Risk Assessment Guidelines recommendations. Per staff at SCAQMD (personal communication with Dr. Jillian Wong [6-19-2015 and 12-22-2015]), it is acceptable to use SCAQMD's current methodology, Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis. Current SCAQMD guidance/methodology does not require construction-based health risk assessments.
OR3-4	An EIR is required to analyze these and other impacts and to adopt feasible mitigation measures to reduce the impacts to the extent feasible.	Please refer to the response to Comment OR3-1.
OR3-5	PROJECT DESCRIPTION The Project is a proposed 564,652-square-foot (SF) industrial center building on the southwest corner of the intersection of East Dumas Street and South Waterman Avenue in the City of San Bernardino. It also includes office space, parking, a pump house, and landscaping on an approximately 26-acre property. The future tenant of the building is not currently known, so associated operational details are not known. Additionally, there are 8 Southern California Edison (SCE) power poles that contain 6 wires of high voltage 66kv Edison transmission lines, a 3 wire 12kv system and a 3 wire 4kv system. The City concluded that the Project, with proposed mitigation measures identified in the IS/MND, will not have a significant effect on the environment and that an EIR is therefore not required.	Comment noted.

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OR3-6	<u>STANDING</u> Members of LIUNA, Local Union No. 783 live, work, and recreate in the immediate vicinity of the Project site. These members will suffer the impacts of a poorly executed or inadequately mitigated Project, just as would the members of any nearby homeowners association, community group or environmental group. Hundreds of LIUNA Local Union No. 783 members live and work in areas that will be affected by air pollution generated by the project. Therefore, LIUNA Local Union No. 883 and its members have a direct interest in ensuring that the Project is adequately analyzed and that its environmental and public health impacts are mitigated to the fullest extent feasible.	Comment noted.
OR3-7	Pursuant to CEQA, LIUNA Local Union No. 783 submits these comments in response to the City's proposed IS/MND. Under the circumstances presented here, CEQA clearly requires the preparation of an EIR and accordingly, the City should decline to adopt the proposed IS/MND.	Please refer to the response to Comment OR3-1.
OR3-8	LEGAL STANDARD As the California Supreme Court recently held, "[i]f no EIR has been prepared for a nonexempt project, but substantial evidence in the record supports a fair argument that the project may result in significant adverse impacts, the proper remedy is to order preparation of an EIR." *(Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 319-320 ["CBE v. SCAQMD"], citing, *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 75, 88; *Brentwood Assn. for No Drilling, Inc. v. City of Los Angeles* (1982) 134 Cal.App.3d 491, 504–505.) "The 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." *(Communities for a Better Environment v. Calif. Resources Agency* (2002)	The City of San Bernardino acknowledges the legal standard used to determine whether or not to prepare an EIR.

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	103 Cal.App.4th 98, 109 [“CBE v. CRA”].)	
OR3-9	The EIR is the very heart of CEQA. *(Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1214; *Pocket Protectors v. City of Sacramento* (2004) 124 Cal.App.4th 903, 927.) The EIR is an “environmental ‘alarm bell’ whose purpose is to alert the public and its responsible officials to environmental changes before they have reached the ecological points of no return.” (*Bakersfield Citizens, supra,* 124 Cal.App.4th at 1220.) The EIR also functions as a “document of accountability,” intended to “demonstrate to an apprehensive citizenry that the agency has, in fact, analyzed and considered the ecological implications of its action.” (*Laurel Heights Improvements Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 392.) The EIR process “protects not only the environment but also informed self- government.” (Pocket Protectors, supra, 124 Cal.App.4th at 927.)	The City of San Bernardino acknowledges the relationship between an EIR and CEQA.
OR3-10	An EIR is required if “there is substantial evidence, in light of the whole record before the lead agency, that the project may have a significant effect on the environment.” (Pub. Resources Code, § 21080(d); see also Pocket Protectors, supra, 124 Cal.App.4th at 927.) In very limited circumstances, an agency may avoid preparing an EIR by issuing a negative declaration, a written statement briefly indicating that a project will have no significant impact thus requiring no EIR (14 Cal. Code Regs., § 15371 [“CEQA Guidelines”]), only if there is not even a “fair argument” that the project will have a significant environmental effect. (Pub. Resources Code, §§ 21100, 21064.) Since “[t]he adoption of a negative declaration . . . has a terminal effect on the environmental review process,” by allowing the agency “to dispense with the duty [to prepare an EIR],” negative declarations are allowed only in cases where “the proposed project will not affect the environment at all.” (*Citizens of Lake Murray v. San Diego* (1989) 129 Cal.App.3d 436, 440.)	The City of San Bernardino acknowledges the CEQA provisions regarding the standard of review governing the decision as to whether to prepare an EIR or a negative declaration.

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OR3-11	Where an initial study shows that the project may have a significant effect on the environment, a mitigated negative declaration may be appropriate. However, a mitigated negative declaration is proper *only* if the project revisions would avoid or mitigate the potentially significant effects identified in the initial study "to a point where clearly no significant effect on the environment would occur, and…there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (Public Resources Code §§ 21064.5 and 21080(c)(2); Mejia v. City of Los Angeles (2005) 130 Cal.App.4th 322, 331.) In that context, "may" means a *reasonable possibility* of a significant effect on the environment. (Pub. Resources Code, §§ 21082.2(a), 21100, 21151(a*); Pocket Protectors, supra,* 124 Cal.App.4th at 927; *League for Protection of Oakland's etc. Historic Resources v. City of Oakland* (1997) 52 Cal.App.4th 896, 904–905.)	The City of San Bernardino acknowledges the standards for determining when a mitigated negative declaration is appropriate.
OR3-12	Under the "fair argument" standard, an EIR is required if any substantial evidence in the record indicates that a project may have an adverse environmental effect—even if contrary evidence exists to support the agency's decision. (CEQA Guidelines, § 15064(f)(1); *Pocket Protectors, supra,* 124 Cal.App.4th at 931; *Stanislaus Audubon Society v. County of Stanislaus* (1995) 33 Cal.App.4th 144, 150-15; *Quail Botanical Gardens Found., Inc. v. City of Encinitas* (1994) 29 Cal.App.4th 1597, 1602.) The "fair argument" standard creates a "low threshold" favoring environmental review through an EIR rather than through issuance of negative declarations or notices of exemption from CEQA. (*Pocket Protectors, supra,* 124 Cal.App.4th at 928.)	The City of San Bernardino acknowledges the "fair argument" standard and how it applies in determining whether an EIR or a negative declaration is appropriate.
OR3-13	The "fair argument" standard is virtually the opposite of the typical deferential standard accorded to agencies. As a leading CEQA treatise explains: This 'fair argument' standard is very different from the standard normally followed by public agencies in making	The City of San Bernardino acknowledges the differences between the "fair argument" standard and the standard normally followed by public agencies.

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	administrative determinations. Ordinarily, public agencies weigh the evidence in the record before them and reach a decision based on a preponderance of the evidence. [Citations]. The fair argument standard, by contrast, prevents the lead agency from weighing competing evidence to determine who has a better argument concerning the likelihood or extent of a potential environmental impact. The lead agency's decision is thus largely legal rather than factual; it does not resolve conflicts in the evidence but determines only whether substantial evidence exists in the record to support the prescribed fair argument. (Kostka & Zishcke, *Practice Under CEQA*, §6.29, pp. 273-274.)	
OR3-14	The Courts have explained that "it is a question of law, not fact, whether a fair argument exists, and the courts owe no deference to the lead agency's determination. Review is de novo, with a preference for resolving doubts in favor of environmental review." (*Pocket Protectors, supra*, 124 Cal.App.4th at 928 [emphasis in original].)	The City of San Bernardino acknowledges that whether a fair argument exists is a question of law.
OR3-15	As a matter of law, "substantial evidence includes . . . expert opinion." (Pub. Resources Code, § 21080(e)(1); CEQA Guidelines, § 15064(f)(5).) CEQA Guidelines demand that where experts have presented conflicting evidence on the extent of the environmental effects of a project, the agency must consider the environmental effects to be significant and prepare an EIR. (CEQA Guidelines § 15064(f)(5); Pub. Res. Code § 21080(e)(1); *Pocket Protectors, supra*,124 Cal.App.4th at 935.) "Significant environmental effect" is defined very broadly as "a substantial or potentially substantial adverse change in the environment." (Pub. Resources Code, § 21068; see also CEQA Guidelines, § 15382.) An effect on the environment need not be "momentous" to meet the CEQA test for significance; it is enough that the impacts are "not trivial." (No Oil, Inc., supra, 13 Cal.3d at 83.) In Pocket Protectors, the court explained how expert opinion is considered. The Court limited agencies and courts to	The City of San Bernardino acknowledges that substantial evidence includes expert opinion and what constitutes a "significant environmental effect".

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	weighing the admissibility of the evidence. (*Pocket Protectors, supra,* 124 Cal.App.4th at 935.) In the context of reviewing a negative declaration, "neither the lead agency nor a court may 'weigh' conflicting substantial evidence to determine whether an EIR must be prepared in the first instance." (*Id*.) Where a disagreement arises regarding the validity of a negative declaration, the courts require an EIR. As the Court explained, "[i]t is the function of an EIR, not a negative declaration, to resolve conflicting claims, based on substantial evidence, as to the environmental effects of a project." (*Id*.)	
OR3-16	<u>DISCUSSION</u> A. AN EIR IS REQUIRED BECAUSE THE PROJECT WILL MAY HAVE SIGNIFICANT UNMITIGATED ENVIRONMENTAL IMPACTS. An EIR is required whenever substantial evidence in the entire record before the agency supports a fair argument that a project may have a significant effect on the environment. (*CBE v. SCAQMD, supra*, 48 Cal.4th at 319-20; Public Resources Code § 21080(d); see also, *Pocket Protectors, supra*, 124 Cal.App.4th at 927.) As set forth below, there is a fair argument supported by substantial evidence that the Project may result in significant environmental impacts from the operation of the Project. Therefore, the City is required to prepare an EIR to evaluate the Project's impacts and analyze mitigation measures needed to reduce such impacts to a less than significant level.	The City of San Bernardino acknowledges when an EIR is required. The City of San Bernardino disagrees with the comment, regarding whether an EIR is required for this proposed project; there is not a fair argument supported by substantial evidence that development of the proposed project may result in significant environmental effects.
OR3-17	1. Substantial Evidence Supports a Fair Argument that the Project Will Result in Significant Unmitigated Impacts to Air Quality By Failing to Input Correct Parameters into the IS/MND's Emissions Calculations. The IS/MND used the California Emissions Estimator Model Version CalEEMod.2013.2.2 ("CalEEMod") to calculate	As stated on page 20 of the Draft IS/MND, "vehicle trips were based on the Waterman Industrial Center Traffic Impact Analysis (TIA) (Kunzman, 2015). Due to the proposed project's location and proposed unrefrigerated warehouse land uses, the average customer based trip length was increased to 40 miles, while all other trip lengths were based

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	emissions from the Project. However, Mr. Hagemann observes that several of the assumptions used and values input into CalEEMod were inconsistent with both information disclosed in the IS/MND as well as recommended procedures and values set forth by the South Coast Air Quality Management District ("SCAQMD") for a high-cube warehouse (the type of Project at issue). Had the Project's emissions been calculated using the correct parameters, the Project would have a potentially significant impact on air quality. As such, the Project's air quality impacts have not been properly analyzed and mitigated. Accordingly, the following points constitute substantial evidence that support a fair argument that the IS/MND failed to properly calculate the Project's emissions and that the Project will thus have significant unmitigated impacts.	on the urban default values." The Air Quality analysis used the project-specific traffic data (including vehicle mix and trip generation rates) that were given in the TIA (as shown in Table 13, *Project Trip Generation,* on page 64 of the Draft IS/MND). The traffic mix and trip generation rate was approved by the City of San Bernardino prior to commencement of the traffic analysis through the City -required traffic scoping process.
OR3-18	**a. The IS/MND Improperly Assumes That the Project Will Not Involve Refrigeration.** The IS/MND significantly underestimated the Project's operational emissions by assuming that all warehouses at the Project will be unrefrigerated. The CalEEMod calculations were premised entirely on the notion that the proposed industrial building was modeled as an unrefrigerated warehouse. (IS/MND, Appendix A, pp. 52, 182.) However, the IS/MND is clear that the future tenant of the industrial building is not currently known. SCAQMD requires the use of a conservative air quality impact analysis to afford the fullest possible protection of the environment. In this case, a conservative analysis would dictate modeling the proposed warehouse as either entirely or partially refrigerated. Mr. Hagemann's letter explains that refrigerated warehouses release more air pollutants and greenhouse gas ("GHG") emissions when compared to unrefrigerated warehouses. Thus, by failing to include refrigerated warehouses a potential land use in the CalEEMod calculations, the Project's operational emissions may be substantially underestimated, and would thus likely	Per the project applicant, the proposed project will only be used for unrefrigerated warehouse uses; therefore modeling the project's emissions as an unrefrigerated warehouse is correct and does not underestimate emissions. The City shall also prohibit the proposed project from including refrigerated warehouse space.

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	result in a significant impact on regional air quality. This constitutes substantial evidence that an EIR should be prepared to evaluate the impacts of the Project's operational emissions and to mitigate those impacts.	
OR3-19	**b. The IS/MND Incorrectly Relies on the Fontana Truck Trip Study to for the Truck Trip Rate and for the Fleet Mix.** The IS/MND also significantly underestimated the Project's operational mobile- source emissions by relying on an improper truck trip rate and fleet mix percentage. Specifically, the IS/MND's Traffic Impact Assessment (Appendix F, p. 3) and its Air Quality/GHG Assessment (Appendix A, p. 60) improperly rely on the August 2003 City of Fontana *Truck Trip Generation Study* ("Fontana Study") to determine the number of vehicle and truck trips the Project will generate during operation. As Mr. Hagemann's letter details, SCAQMD has found numerous problems with the Fontana Study and has thus recommended specific figures to use for the truck trip rate for a high-cube warehouse distribution center.	Based upon this and other comments from this commenter, the Waterman Industrial Center Traffic Impact Analysis (Supplemental) was prepared by Kunzman Associates, Inc. (April 22, 2016). This supplemental report was created in response to comments, and merely amplifies the analysis of the Draft IS/MND. The trip generation formula used in the initial TIA was modified based upon the commenter to reflect the South Coast Air Quality Management District guidelines for high-cube warehouse distribution center projects. The car - truck ratios were altered to reflect the higher truck splits. As shown in Table 3 of the supplemental TIA, the **61.9% car (1.04/1.68) and 38.1% truck (0.64/1.68)** values are from ITE and approved alternative documented by SCAQMD. Consequently, the truck mix was obtained from SCAQMD document specifying the use of **(LHD2 = 0.0645, MHD = 0.0645, HHD = 0.2300)** when using the ITE 0.64 truck trip rate. Based upon this modified formula, no new impacts were disclosed, and thus no change in mitigation measures from the TIA to the supplemental TIA were recommended at the study area intersections with the revised trip generation rates.
OR3-20	Mr. Hagemann used SCAQMD's recommended rate to calculate the Project's number of truck trips and found the number of truck trips associated with the Project increased by approximately 87% from the number contained in the IS/MND's model, which is based on the Fontana Study's truck trip rate. Thus, the IS/MND's improper reliance on the Fontana Study likely misrepresented the actual air quality impacts of the Project.	The initial TIA found that the proposed project created 755 automobile round trips, 33 2-axle truck round trips, 44 3-axle truck round trips, and 117 4+-axle truck round trips per day. The supplemental TIA showed that the proposed project generated 587 automobile round trips, 61 2-axle truck round trips, 82 3-axle truck round trips, and 218 4+-axle truck round trips per day. However, the supplemental TIA showed that even with the relative increase in the number of trucks, the proposed project's mitigated emissions still do not exceed any

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		SCAQMD thresholds.
OR3-21	Similarly, the IS/MND relied on the Fontana Study's total truck fleet mix of 20%, which sets forth the operational mix of cars, 2-axle trucks, 3-axle trucks, and 4-axle trucks to input into CalEEMod. As Mr. Hagemann notes, this approach "is not consistent with recommendations set forth by SCAQMD, and does not accurately represent the percentage of trucks that access a high-cube warehouse on a daily basis." (Hagemann, p. 6.) To avoid underestimating the number of trucks visiting warehouse facilities, SCAQMD recommends a truck fleet mix of 40%. This number is double that used by the IS/MND, and is a conservative value especially given that the future tenant of the warehouse is unknown. Based on this recommendation, Mr. Hagemann's letter sets forth a fleet mix percentage that the City should have input into CalEEMod that more accurately represents the number of trips that would likely occur during Project operation. As such, the IS/MND uses an inaccurate rate for the fleet mix percentage that does not adequately asses and mitigates the Project's air quality and GHG impacts. As EIR should be prepared that adequately assesses and mitigates these impacts.	See Response to OR3-19 and OR3-20.
OR3-22	c. The IS/MND Incorrectly Input Fleet Mix Percentage into CalEEMod. Mr. Hagemann's letter explains how the IS/MND input the aforementioned artificially low fleet mix percentage in the CalEEMod model incorrectly. Instead of inputting the fleet mix values into the model as fleet mix percentages, the values were used to adjust the trip type percentages for the Project. This approach is plainly inconsistent with Appendix A of the CalEEMod User's Guide instructions on how to calculate the trip type. The IS/MND incorrectly assumed that commercial-work ("C-W") trip are made exclusively by trucks and commercial-nonwork ("C-NW") trips are made exclusively by passenger cars. In fact, both C-W and C-NW	The commenter is incorrect. The inputs for the operational-mobile portion of the analysis modified the default settings for unrefrigerated warehouse - no rail land use. The trip generation rate was changed from the default 2.59 trips/TSF to 1.68 trips/TSF per the TIA. The trip type was also adjusted on the same tab in CalEEMod. According to page 20 of Appendix A: Calculation Details for CalEEMod, "Commercial trip type: These include commercial-customer (C-C), commercial-work (C-W) and commercial-nonwork (C-NW). A commercial-customer trip represents a trip made by someone who is visiting the commercial land use to partake in the services offered by the site." The default settings in CalEEMod for the land use selected shows 59% of trips are Non Res C-W and 41% of trips are Non Res C-NW.

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	trips include trips made by a mix of vehicle types. Mr. Hagemann notes that "[a]s a result, the Project's operational mobile-source emissions are both greatly underestimated and extremely inaccurate." (Hagemann, p. 6.) An EIR should be prepared that inputs the proper data into the CalEEMod model and accurately analyzes the Project's mobile-source emissions and provides mitigation measures for those impacts.	Those default settings were revised to match the TIA. C-W trips most closely resembled the proposed projects truck trips and the C-NW trips resembled the trips from project-related automobiles. Therefore, C-W was changed to 20.43% for the percentage of trucks reported in the TIA and C-NW was changed to 79.57% for the percentage of automobiles reported in the TIA. The trip length was also increased for C-W from the default 16.6 miles to 40 miles (per SCAQMD recommendations). The supplemental analysis also followed a similar methodology, but as the truck and automobile percentages were modified per the SCAQMD-recommended ITE-based truck rate, C-W trip percentage was changed to 38.1% for trucks and C-NW changed to 61.9% for automobiles. In both the initial and supplemental analyses, the fleet mix percentages were also revised to the ratios depicted in Table 10, *CalEEMod Revised Vehicle Mix Parameters for Warehouse Uses*, located in the AQR for this proposed project. The evidence for this can also be found in the CalEEMod output in Appendices B and C of the AQR as the CalEEMod output shows a table that details where the changes take place in the model, what the default values are and what the new value (the changes) are. Therefore, the analysis of operational emissions from project-related traffic is accurate and reflects the project-specific values for vehicles dictated by the TIA. The supplemental analysis that used the SCAQMD-recommended truck and auto ratios (as detailed above in response to comment OR3-19) and with mitigation, the emissions do not exceed SCAQMD regional operational thresholds, and impacts are still less than significant.
OR3-23	**2. Substantial Evidence Supports a Fair Argument that the Project Will Result in Significant Unmitigated Impacts to Human Health from Diesel Particulate Emissions**	See response to Comment OR3-3 above. Additionally, even though no construction HRAs are required by either the lead agency or SCAQMD, analysis of the potential health risks from

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	Associated with Project Construction. The IS/MND conclusion that the health risk posed to nearby sensitive receptors from exposure to diesel particulate matter ("DPM") emissions released during Project construction would be less than significant fails to quantify this risk and compare it to applicable thresholds. The IS/MND fails to include a health risk assessment ("HRA").	construction-based emissions were performed using AERMOD dispersion modeling and the worst-case emissions from construction. The dispersion model used in this analysis is more refined than the screening model used by the commenters. The AERSCREEN Model used by the commenter is a screening model, and screening models are usually applied before the refined air quality model to determine if refined modeling is needed will produce estimates of "worst-case" 1-hour concentrations for a single source, without the need for hourly meteorological data, and also includes conversion factors to estimate "worst-case" 3-hour, 8-hour, 24-hour, and annual concentrations. AERSCREEN is intended to produce concentration estimates that are equal to or greater than the estimates produced by AERMOD with a fully developed set of meteorological and terrain data, but the degree of conservatism will vary depending on the application. Therefore, the results obtained using AERMOD instead of AERSCREEN are more accurate due to the precision of the refined AERMOD dispersion model. The results of the analysis (which used the most recent OEHHA methodology for calculating risk to infants, children and adults). The analysis showed that the increased cancer risks from construction-based DPM emissions: to infants is 5.7 in one million; children is 1 in 1 million; and adults is 0.12 in 1 million; and none of the adjacent sensitive receptors exceed the SCAQMD TAC threshold of 10 in 1 million.
OR3-24	The IS/MND concludes that health risk from construction activities would be less than significant because construction would occur over a period of time shorter than 70 years. However, this conclusion directly contrasts with guidance published by the Office of Environmental Heal Hazard Assessment ("OEHHA"), which recommends that all short-term projects lasting at least two months be evaluated for cancer risks to nearby sensitive receptors. The IS/MND is devoid of this analysis.	See responses to Comment OR3-3 and OR3-23 above.

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OR3-25	Mr. Hagemann prepared a simple screening-level health risk assessment which demonstrates that construction related DPM emissions from the Project may result in a potentially significant health risk impact. (Hagemann, pp. 8-9.) Using annual estimates from the Project's CaiEEMod model, Mr. Hagemann used the EPA's recommended AERSCREEN air dispersion model to generate the maximum reasonable estimates of single hour downwind DPM concentrations from the Project Site. Mr. Hagemann then calculated the excess cancer risk for each sensitive receptor location using applicable HRA methodologies prescribed by OEHHA. (*Id*., pp. 9-10.) He found that "[t]he infantile exposure for the sensitive receptors exceeds the SCAQMD threshold of 10 in one million." (*Id*., p. 10.) Further, it is likely that this impact would be even greater since the estimates from the Project's CaiEEMod model were artificially low, as demonstrated above. Thus, Mr. Hagemann states that "a refined health risk assessment must be prepared to examine air quality impacts generated by Project construction using site-specific meteorology and specific equipment usage schedules." (*Id*., p. 10.)	See response to OR3-3 and OR3-23 above. Furthermore, Mr. Hagemann's analysis did not use the project-specific emissions factor (0.0948 tons/year) for construction equipment that was given for the overlapping construction phases of building construction, paving and architectural coating; the emissions for grading was slightly less, 0.0807 tons/year, so the higher emissions rate was used (for an analysis of worst-case impacts). Mr. Hagemann's analysis also used a default exposure frequency of 350 days, when the entire construction period only lasts 226 days. The overlapping construction phase lasts 151 days and grading only lasts 45 days; therefore, the exposure calculated by the commenter is over-estimated, resulting in incorrect risk impact values.
OR3-26	Mr. Hagemann's analysis clearly provides substantial evidence supporting a fair argument that construction emissions from the Project may have significant impacts on human health and the environment. Accordingly, the City must prepare an EIR to analyze these impacts and evaluate potential mitigation measures to address the impacts.	See response to comments OR3-3, OR3-23 and OR3-26 above.
OR3-27	<u>CONCLUSION</u> For the foregoing reasons, the IS/MND for the Project should be withdrawn, an EIR should be prepared and the draft EIR should be circulated for public review and comment in accordance with CEQA. Thank you for considering our comments.	Please refer to the response to Comment OR3-1.
SWAPE/Lozeau Drury LLP on behalf of Laborers International Union North America, Local Union 783		

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OR4-1	Our review concludes that the IS/MND fails to adequately evaluate the Project's Hazards and Hazardous Waste, Air Quality and Greenhouse Gas impacts. Specifically, we find the following issues with the analyses conducted in the IS/MND:	Please refer to the responses to Comments OR3-2 and OR3-3.
OR4-2	▪ The IS/MND models the Project's construction and operational criteria air pollutant and greenhouse gas emissions using incorrect input parameters. As a result, the Project's pollutant emissions are greatly underestimated.	See responses to Comment OR3-2, OR3-17, OR3-18, OR3-19, OR3-20 and OR3-22 above. Furthermore, the supplemental analysis (which used the SCAQMD-recommended truck/traffic trip rates and ratios) shows that the proposed project's GHG emissions still do not exceed the SCAQMD industrial threshold. Additionally, the proposed project's year 2020 GHG emissions are reduced by 36.5% from baseline (year 2010) emissions; therefore, the proposed project meets the reduction requirements of the SANBAG GHG Reduction Plan and will not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.
OR4-3	▪ Furthermore, the IS/MND concludes that the health risk posed to nearby sensitive receptors exposed to diesel exhaust emitted during Project construction will be less-than-significant, yet fails to provide substantial evidence to support this claim. When a health risk assessment is actually prepared to quantify the impacts from Project construction, we find that the health risk posed to these nearby sensitive receptors will be potentially significant. A Draft Environmental Impact Report (DEIR) should be prepared to address these issues, and should identify and incorporate additional mitigation measures where necessary.	See responses to Comments OR3-3, OR3-23, and OR3-25 above.
OR4-4	Air Quality Unsubstantiated Input Parameters Used to Estimate Project	See response to Comment OR4-2 above.

Comment Number	Comment	Response
	Emissions The IS/MND relies on emissions calculated from the California Emissions Estimator Model Version CalEEMod.2013.2.2 ("CalEEMod").[1] CalEEMod provides recommended default values based on site specific information, such as land use type, meteorological data, total lot acreage, project type and typical equipment associated with project type. If more specific project information is known, the user can change the default values and input project-specific values, but CEQA requires that such changes be justified by substantial evidence.[2] Once all the values are inputted into the model, the Project's construction and operational emissions are calculated, and "output files" are generated. These output files, which are part of the Project's Air Quality Technical Report (Appendix A), disclose to the reader what parameters were utilized in calculating the Project's air pollutant emissions, and make known which default values were changed as well as provide justification for the values selected.[3] [1] CalEEMod website, *available at*: http://www.caleemod.com/ [2] CalEEMod User Guide, pp. 2, 9, *available at:* http://www.caleemod.com/ [3] CalEEMod User Guide, pp. 7, 13, *available at:* http://www.caleemod.com/ (A key feature of the CalEEMod program is the "remarks" feature, where the user explains why a default setting was replaced by a "user defined" value. These remarks are included in the report.)	
OR4-5	According to the IS/MND, the Project is subject to significance criteria, guidance, and regulations set forth by the South Coast Air Quality Management District (SCAQMD) (IS/MND, p. 26). When reviewing the Project's CalEEMod output files, however, we found that several of the assumptions used and values inputted into the model were not consistent with recommended procedures and values set forth by the SCAQMD for high-cube warehouses, and were not consistent with information disclosed in the IS/MND.	See response to Comment OR4-2 above.

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	When the Project's emissions are modeled using correct input parameters, we find that the Project will have a potentially significant impact on regional air quality. As a result, a DEIR should be prepared to include an updated air pollution model that uses correct input values, consistent with the IS/MND and recommendations set forth by the SCAQMD.	
OR4-6	Assumes Unrefrigerated Land Use Because the IS/MND's assumes that all warehouses will be unrefrigerated, the Project's operational emissions may be grossly underestimated. According to the CalEEMod output files provided in Appendix A of the IS/MND, the proposed industrial building was modeled as an "Unrefrigerated Warehouse-No Rail" (see excerpt below) (Appendix A, p. 52, pp. 182). (See Comment Letter OR1 within Appendix A for referenced graphic.) Assuming that the proposed building will be composed of unrefrigerated warehouses, exclusively, however, is inconsistent with information disclosed in the IS/MND, and may result in an underestimation of the Project's operational emissions. According to the IS/MND, future tenants of the proposed warehouses are currently unknown. The IS/MND states, "The industrial building is currently planned as a 'spec building.' Thus, <u>the future tenant of the building is not currently known</u>" (IS/MND, p. 3). Therefore, by assuming that the proposed Project buildings will be composed solely of unrefrigerated warehouses is unsubstantiated, as the Project's future tenants remain unknown.	See response to Comment OR3-18 above.
OR4-7	As discussed by SCAQMD, "CEQA requires the use of 'conservative analysis' to afford 'fullest possible protection of the environment.'"[4] As a result, the most conservative analysis should be conducted. With this in mind, the	See response to Comment OR3-18 above.

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	proposed building should be modeled as "Refrigerated Warehouse-No Rail," or at the very least, a portion of the building should be modeled as "Refrigerated Warehouse-No Rail," with the remaining portion of the building modeled as "Unrefrigerated Warehouse-No Rail," so as to take into consideration the possibility that future tenants may require both cold storage and non-cold storage. 4 "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Inland Empire Logistics Council, June 2014, *available at*: http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip- rate-study-for-air-quality-analysis/final-ielc_6-19-2014.pdf?sfvrsn=2	
OR4-8	Refrigerated warehouses release more air pollutants and greenhouse gas (GHG) emissions when compared to unrefrigerated warehouses for several reasons. First, warehouses equipped with cold storage (refrigerators and freezers, for example) are known to consume more energy when compared to warehouses without cold storage.[5] Second, warehouses equipped with cold storage typically require refrigerated trucks, which are known to idle for much longer, even up to an hour, when compared to unrefrigerated hauling trucks.[6] Lastly, according to a July 2014 *Warehouse Truck Trip Study Data Results and Usage* presentation prepared by the SCAQMD, it was found that hauling trucks that require refrigeration result in greater truck trip rates when compared to non-refrigerated hauling trucks.[7] 5 Managing Energy Costs in Warehouses, Business Energy Advisor, *available at*: http://bizenergyadvisor.com/warehouses 6 "Estimation of Fuel Use by Idling Commercial Trucks," p. 8, *available at:* http://www.transportation.anl.gov/pdfs/TA/373.pdf 7 "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile Source Committee, July 2014, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate- study-for-air-quality-analysis/finaltrucktripstudymsc072514.pdf?sfvrsn=2, p. 7, 9	See response to Comment OR3-18 above.

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OR4-9	By not including refrigerated warehouses as a potential land use in the air quality model, the Project's operational emissions may be grossly underestimated, as the future tenants are currently unknown. Unless the Project Applicant can demonstrate that the future tenants of these proposed buildings will be limited to unrefrigerated warehouse uses, exclusively, it should be assumed that a mix of cold and non-cold storage will be provided on-site. A DEIR should be prepared to account for the possibility of refrigerated warehouse needs by future tenants.	See response to Comment OR3-18 above.
OR4-10	*Incorrect Usage of Fontana Truck Trip Study for Fleet Mix and Truck Trip Rate* Because the IS/MND relies upon an artificially low truck trip rate and truck fleet mix percentage, the Project's operational mobile-source emissions are greatly underestimated. The IS/MND's Traffic Impact Assessment (Appendix F) and Air Quality/GHG Assessment (Appendix A) rely on the August 2003 City of Fontana *Truck Trip Generation Study* ("Fontana Study"),[8] and the 2012 Institute of Transportation Engineers 9th Edition *Trip Generation Manual* ("Trip Generation Manual") to determine the number of vehicle and truck trips the Project will generate during operation (Appendix A, p. 60; Appendix F, p. 3). While the Trip Generation Manual is a widely accepted resource, the Fontana Study is not, and according to SCAQMD Staff, has limited applicability. 8 Truck Trip Generation Study." City of Fontana, County of San Bernardino, State of California, August 2003, *available at*: http://www.fontana.org/DocumentCenter/Home/View/622	See responses to Comments OR3-2, OR3-17, OR3-18, OR3-19, OR3-20, OR3-22, and OR4-2 above.
OR4-11	As is disclosed in the IS/MND and associated appendices, the proposed industrial building will consist of high-cube distribution warehouses (IS/MND, p. 64; Appendix F, p. 3). According to SCAQMD staff, the "Fontana Study, by itself, is not characteristic of high cube warehouses."[9] Furthermore, SCAQMD staff finds the following additional issues with the	See response to Comment OR3-19.

Comment Number	Comment	Response
	Fontana Study: [10] 9 "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile Source Committee, July 2014, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate- p. 10 10 "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile Source Committee, July 2014, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate- p. 10	
OR4-12	▪ The overall trip rate is based on only four warehouses total, which includes two warehouses with zeros. In other words, the results of the Fontana Study were based on only two data points. As is disclosed in the Fontana Study, the daily trip rate was only based on data from a Target warehouse and a TAB warehouse.[11] 11 "Truck Trip Generation Study." City of Fontana, County of San Bernardino, State of California, August 2003, available at: http://www.fontana.org/DocumentCenter/Home/View/622, p. 35	See response to Comment OR3-19.
OR4-13	▪ The Fontana Study does not report any 24-hour daily truck trip rates. According to the Fontana Study, "Trip generation statistics for daily truck trips were not calculated because vehicle classifications counts could not be obtained from the driveway 24-hour counts."[12] 12 "Truck Trip Generation Study." City of Fontana, County of San Bernardino, State of California, August 2003, *available at*: http://www.fontana.org/DocumentCenter/Home/View/622, p. 6 "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile	See response to Comment OR3-19.
OR4-14	▪ The trip rates using the Fontana study are calculated based on a 20 percent truck fleet mix, which is inconsistent with SCAQMD's recommendation that agencies use a truck fleet mix of 40%.	See response to Comment OR3-19.
OR4-15	Due to these reasons, SCAQMD recommends that Project Applicants either "use ITE default values until Governing Board action" (Option 1) or refer to the flow chart below	See response to Comment OR3-19.

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	(Option 2). [13] (See Comment Letter OR4 within Appendix A for referenced graphic.) [13] "Truck Trip Generation Study." City of Fontana, County of San Bernardino, State of California, August 2003, *available at*: http://www.fontana.org/DocumentCenter/Home/View/622, p. 6 "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile	
OR4-16	Following Option 1, a truck trip rate of 0.64[14] should be used for *high-cube warehouse/distribution center* land uses (ITE Code 152), rather than the 0.34 truck trip rate used in the IS/MND (p. 64). Following Option 2, a truck trip rate of 0.66 or 0.64 should be used (assuming that the warehouse could be developed with cold-storage). Therefore, regardless of the option implemented, a minimum daily truck trip rate of 0.64 should be used, according to the SCAQMD. [14] "Truck Trip Generation Study." City of Fontana, County of San Bernardino, State of California, August 2003, *available at*: http://www.fontana.org/DocumentCenter/Home/View/622, p. 6 "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile	See response to Comment OR3-19.
OR4-17	As previously discussed, the proposed building is anticipated to be a high-cube warehouse distribution center. When the recommended truck trip rate of 0.64 is used in place of the 0.34 truck trip rate used in the IS/MND, we find that the number of truck trips increase by approximately 87%, with an increase of approximately 168 trips per day, and an increase of approximately 61,000 truck trips per year (see table below). (See Comment Letter OR4 within Appendix A for referenced graphic.)	See response to Comment OR3-19.
OR4-18	The IS/MND and associated appendices also rely on a total truck fleet mix of approximately 20%, which is taken from the	See response to Comment OR3-19.

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	Fontana Study. Appendix A of the IS/MND states, “The vehicle mix followed the recommendations of the Fontana Truck Trip Generation Study with a mix of 79.57 percent cars, 3.46 percent 2-axle trucks, 4.64 percent 3-axle trucks and 12.33 percent 4-axle trucks” (p. 60). This fleet mix used in the IS/MND and associated appendices, however, is not consistent with recommendations set forth by SCAQMD, and does not accurately represent the percentage of trucks that access a high-cube warehouse on a daily basis. Rather, SCAQMD recommends that lead agencies assume a truck fleet mix of 40%. According to *Appendix E: Technical Source Documentation* of the CalEEMod User’s Guide, “in order to avoid underestimating the number of trucks visiting warehouse facilities,” SCAQMD staff “recommends that lead agencies conservatively assume that an average of 40% of total trips are truck trips [(0.48*10 + 0.2*4)/(10+4)=0.4)]."[15] If Project-specific data is not available, such as detailed trip rates based on a known tenant schedule, this average of 40% provides a reasonably conservative value based on currently available data. As is stated in the IS/MND, since the future tenant is unknown, “an exact number of future employees or hours of operation cannot be determined,” which means that the tenant schedule is not known; therefore, a 40% truck fleet mix should be assumed (IS/MND, p. 3). [15] “Appendix E Technical Source Documentation.” CalEEMod User’s Guide, July 2013, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality- analysis/high-cube-resource-caleemod-appendix-e.pdf?sfvrsn=2, pp. 15	
OR4-19	Specifically, the following fleet mix percentage should have been used within the CalEEMod model. (See Comment Letter OR4 within Appendix A for referenced graphic.) The “Operational Mobile Fleet Mix” percentages for trucks (LHDT1, MHD, and HHDT) in the table above were adjusted	See response to Comment OR3-19.

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	to reflect a truck trip percentage of approximately 40%, which is consistent with recommended procedures set forth by SCAQMD staff. This fleet mix more accurately represents the number of trips that are likely to occur during Project operation. As such, an updated air quality analysis should be prepared in a DEIR that adequately assesses the Project's air quality and greenhouse gas impacts.	
OR4-20	Incorrectly Applied Percent Fleet Mix to Trip Type Percentage Not only did the IS/MND rely upon an artificially low truck fleet mix percentage to estimate the Project's mobile-source emissions, but it also inputted this fleet mix percentage into the CalEEMod model incorrectly. As a result, the Project's operational mobile-source emissions are both greatly underestimated and extremely inaccurate.	See responses to Comments OR3-2, OR3-17, OR3-18, OR3-19, OR3-20, OR3-22, and OR4-2 above.
OR4-21	As is discussed in the section above, Appendix A of the IS/MND states that "the vehicle mix followed the recommendations of the Fontana Truck Trip Generation Study with a mix of 79.57 percent cars, 3.46 percent 2-axle trucks, 4.64 percent 3-axle trucks and 12.33 percent 4-axle trucks" (p. 60). According to the SCAQMD, "in order to convert the axle based fleet mix to the vehicle classes utilized by EMFAC" (which is what CalEEMod relies upon to estimate mobile-source emissions), 2-axle trucks can be represented by the LHDT1 vehicle class, 3-axle trucks can be represented by the MHDT vehicle class, 4- axle trucks can be represented by the HHDT vehicle class, and all others can be represented by the LDA vehicle class.[16] Therefore, assuming that the fleet mix percentage provided in the Fontana Study is correct, the following percentages should have been inputted for each vehicle class, with all others vehicle classes set to zero (see table below). (See Comment Letter OR4 within Appendix A for referenced graphic.)	See responses to Comments OR3-2, OR3-17, OR3-18, OR3-19, OR3-20, OR3-22, and OR4-2 above.

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	[16] Appendix E Technical Source Documentation." CalEEMod User's Guide, July 2013, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality- analysis/high-cube-resource-caleemod-appendix-e.pdf?sfvrsn=2, pp. 15	
OR4-22	Review of the IS/MND's CalEEMod output files, however, indicate that these values were not inputted into the model as the fleet mix percentages. Rather, these values were used to adjust the trip type percentages for the Project. According to the CalEEMod output files, a truck trip percentage of 20.43% was applied to commercial-work (C-W) trip types to represent the number of truck trips that would occur, and a car trip percentage of 79.57% was applied to commercial-nonwork (C-NW) trips to represent the number of passenger car trips that would occur during Project operation (Appendix A, pp. 183).	See responses to Comments OR3-2, OR3-17, OR3-18, OR3-19, OR3-20, OR3-22, and OR4-2 above.
OR4-23	The application of these percentages to the trip types within CalEEMod, however, is entirely incorrect. According to Appendix A of the CalEEMod User's Guide, "the trip type breakdown describes the purpose of the trip generated at each land use," and "multiplying the total trips for a land use by trip type breakdown percentage yields trips for a given trip type."[17] This trip type, however, does not specifically apply to vehicle classes, as is assumed by the IS/MND. Commercial-work (C-W) trips are not made by trucks, exclusively, and commercial-nonwork (C-NW) trips are not made by passenger cars, exclusively. Rather, "the commercial-work trip represents a trip made by someone who is employed by the commercial land use sector," which can include trips made by employees in light-duty trucks and passenger cars as well as trips made by vendors in light-duty and heavy-duty trucks.[18] Similarly, "the commercial-nonwork trip represents a trip associated with the commercial land use other than by customers or workers," such as "trips made by delivery vehicles of goods associated with the land use."[19] Therefore, applying a trip percentage of 20.43% to C-W trips to	See responses to Comments OR3-2, OR3-17, OR3-18, OR3-19, OR3-20, OR3-22, and OR4-2 above.

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	represent the number of truck trips that will occur during Project operation is incorrect, as C-W trips include trips made by a mix of vehicle types, including passenger cars. Similarly, applying a trip percentage of 79.57% to C-NW trips to represent the number of passenger car trips that will occur during Project operation is incorrect, as C- NW trips include trips made by a mix of vehicle types, including trucks. Due to these reasons, we require that an updated air quality analysis be prepared in a DEIR in order to adequately assess the Project's air quality and greenhouse gas impacts. ——— [17] "CalEEMod User's Guide, Appendix A: Calculation Details for CalEEMod." SCAQMD, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/caleemod-appendixa.pdf?sfvrsn=2, p. 20 [18] "CalEEMod User's Guide, Appendix A: Calculation Details for CalEEMod." SCAQMD, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/caleemod-appendixa.pdf?sfvrsn=2, p. 20 [19] "CalEEMod User's Guide, Appendix A: Calculation Details for CalEEMod." SCAQMD, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/caleemod-appendixa.pdf?sfvrsn=2, p. 20	
OR4-24	Diesel Particulate Matter Health Risk Emissions Inadequately Evaluated The IS/MND concludes that the health risk posed to nearby sensitive receptors from exposure to diesel particulate matter ("DPM") emissions released during Project construction would be less than significant, yet fails to quantify the risk and compare it to applicable thresholds (IS/MND, p. 20). The IS/MND attempts to justify the omission of an actual health risk assessment ("HRA"), stating, "Given the relatively limited number of heavy duty construction equipment and the short-term construction schedule, the proposed project would not result in a long-term (i.e., 70 years) substantial source of toxic air contaminant emissions and corresponding individual cancer risk. Therefore, no significant short-term toxic air contaminant impacts would occur during construction of the	See responses to Comments OR3-3, OR3-23, and OR3-25 above. Furthermore, the supplemental AQR (which used the SCAQMD-recommended warehouse truck rates) shows that the health risks from operation of the proposed project would not exceed a cancer risk of 6.52 in a million at adjacent sensitive receptor locations, which does not exceed the SCAQMD TAC threshold of 10 in 1 million. No further analysis or mitigation is required.

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	proposed project" (IS/MND, p. 20). This justification, however, is incorrect. The IS/MND assumes that because construction would occur over a period of time shorter than 70 years, health risk from construction activities would be less than significant. This determination, however, is in contrast to the most recent guidance published by the Office of Environmental Health Hazard Assessment (OEHHA), the organization responsible for providing recommendations for health risk assessments in California. In February of 2015, OEHHA released its most recent Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments, which was formally adopted in March of 2015.20 This guidance document describes the types of projects that warrant the preparation of a health risk assessment. Construction of the Project will produce emissions of DPM, a human carcinogen, through the exhaust stacks of construction equipment over a construction period of 10 months, from June 2016 to March 2017 (IS/MND, p. 17). The OEHHA document recommends that all short-term projects lasting at least two months be evaluated for cancer risks to nearby sensitive receptors.21 This recommendation reflects the most recent health risk assessment policy, and as such, an assessment of health risks to nearby sensitive receptors from construction should be included in a revised CEQA evaluation for the Project. [20] Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/hotspots2015.html [21] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf, p. 8-18	
OR4-25	Furthermore, simply because there is a "relatively limited number of heavy duty construction equipment" (IS/MND, p. 20) does not mean that the emissions from the construction equipment would not pose a significant risk to nearby	See responses to Comments OR3-3, OR3-23, and OR3-25 above.

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	receptors. In an effort to demonstrate this, we prepared a simple screening-level health risk assessment. The results of our assessment, as described below, demonstrate that construction-related DPM emissions may result in a potentially significant health risk impact. [22] AERSCREEN Released as the EPA Recommended Screening Model," USEPA, April 11, 2011, *available at:* http://www.epa.gov/ttn/scram/guidance/clarification/20110411_AERSCREEN_Release_Memo.pdf [23] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf "Health Risk Assessments for Proposed Land Use Projects," CAPCOA, July 2009, *available at:* http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf	
OR4-26	As of 2011, the EPA recommends AERSCREEN as the leading air dispersion model, due to improvements in simulating local meteorological conditions based on simple input parameters.22 The model replaced SCREEN3, which is included in OEHHA23 and CAPCOA24 guidance as the appropriate air dispersion model for Level 2 health risk screening assessments ("HRSAs"). A Level 2 HRSA utilizes a limited amount of site- specific information to generate maximum reasonable downwind concentrations of air contaminants to which nearby sensitive receptors may be exposed. If an unacceptable air quality hazard is determined to be possible using AERSCREEN, a more refined modeling approach is required prior to approval of the Project.	The EPA lists AERMOD as one of their preferred/ recommended models. AERSCREEN is a screening version of AERMOD. This analysis used AERMOD for the operational HRA and to determine whether there were any potential construction-related health risk impacts to adjacent uses. Therefore, the dispersion modeling employed in this analysis is more refined and detailed than the screening analysis conducted by the commenter. Furthermore, the AERMOD dispersion model is the model that SCAQMD requires for HRA modeling for projects within their jurisdiction.
OR4-27	We prepared a preliminary health risk screening assessment of the Project's construction emissions using the annual estimates from the Project's CalEEMod model, which can be found within Appendix D of the IS/MND's Air Quality, Global Climate Change, and Health Risk Assessment Impact Analysis. The CalEEMod annual emissions indicate that construction activities will generate approximately 450.2	See responses to OR3-3, OR3-23, and OR3-25 above.

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	pounds of DPM over a 303 day construction period. The AERSCREEN model relies on a continuous average emissions rate to simulate maximum downwind concentrations from point, area, and volume emission sources. To account for the variability in construction equipment usage over the seven phases of Project construction, we calculated an average DPM emission rate by the following equation. (See Comment Letter OR4 within Appendix A for referenced graphic.) Construction activity was simulated as a 25.6 acre rectangular area source in AERSCREEN, with dimensions of 377 meters by 275 meters. A release height of three meters was selected to represent the height of exhaust stacks on construction equipment, and an initial vertical dimension of one and a half meters was used to simulate instantaneous plume dispersion upon release. An urban meteorological setting was selected with model-default inputs for wind speed and direction distribution. The AERSCREEN model generated maximum reasonable estimates of single hour downwind DPM concentrations from the Project site. EPA guidance suggests that in screening procedures, the annualized average concentration of an air pollutant may be estimated by multiplying the single-hour concentration by 10%.25 The maximum single-hour downwind concentration in the AERSCREEN output was approximately 2.742 µg/m3 DPM 25 meters downwind, a distance that is most representative of the sensitive receptor location at 20 meters (65 feet). The annualized average concentration for the sensitive receptor was estimated to be 0.2742 µg/m3. [24] http://www.epa.gov/ttn/scram/guidance/guide/EPA-454R-92-019_OCR.pdf	
OR4-28	We calculated the excess cancer risk for each sensitive receptor location, for adults, children, and/or infant	See responses to Comments OR3-3, OR3-23, and OR3-25 above.

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	receptors using applicable HRA methodologies prescribed by OEHHA. OEHHA recommends the use of Age Sensitivity Factors ("ASFs") to account for the heightened susceptibility of young children to the carcinogenic toxicity of air pollution.26 According to the revised guidance, quantified cancer risk should be multiplied by a factor of ten during the first two years of life (infant), and by a factor of three for the subsequent fourteen years of life (child aged two until sixteen). Furthermore, in accordance with guidance set forth by the SCAQMD and OEHHA, we used 95th percentile breathing rates for infants and 80th percentile breathing rates for children and adults.27 We used a cancer potency factor of 1.1 (mg/kg- day)-1 and an averaging time of 25,550 days. The results of our calculations are shown below. (See Comment Letter OR4 within Appendix A for referenced graphic.) ——— [25] Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf [26] "Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics 'Hot Spots' Information and Assessment Act," SCAQMD, June 5, 2015, *available at:* http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588-risk-assessment-guidelines.pdf?sfvrsn=6, p. 19	
OR4-29	The excess cancer risk to adults, children, and infants during Project construction for the sensitive receptors 25 meters away are 0.76, 6.35, and 36 in one million, respectively. Consistent with OEHHA guidance, exposure was assumed to begin in the infantile stage of life to provide the most conservative estimates of air quality hazards. The infantile exposure for the sensitive receptors exceeds the SCAQMD threshold of 10 in one million. As a result, a refined health risk assessment must be prepared to examine air quality impacts generated by Project construction using site-specific meteorology and specific equipment usage schedules. It should be noted that the Project's health risk impact may be greater than what is estimated in our independent	See responses to Comments OR3-3, OR3-23, and OR3-25 above.

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	screening-level assessment, as the DPM emission value relied upon to conduct this analysis was taken from the IS/MND's CalEEMod model. As was discussed in the previous sections, the IS/MND's CalEEMod model relies upon incorrect input parameters that artificially reduce the Project's construction and operational emissions. Therefore, the health risk posed to nearby sensitive receptors as a result of the Project may be greater. Even though our assessment may still underestimate the Project's health risk impact, our analysis still demonstrates that the Project poses a significant health risk as a result of DPM emissions. Therefore, a DEIR must be prepared to adequately evaluate the Project's health risk impact, and should include additional mitigation measures to reduce this impact to a less-than-significant level.	
General Public		
Nedra Myricks		
GP1-1	I am not in support of the project referenced above. I do not believe this is a viable project for this area at this time, and see it as frivolous and unnecessary, primarily based on the number of vacant warehouse spaces currently available in typically the same area as Newcastle Partners wants to build this new facility; and the number of residents who will have to be displaced to accommodate it's completion.	The commenter does not provide any evidence concerning the assertions made in the comment, and does not specify the exact locations or size of the purported vacant warehouse spaces so it is difficult to determine if these warehouse spaces are equivalent in size or location to the proposed project. According to Lee and Associates, a leading commercial real estate brokerage firm in the Inland Empire, the Inland Empire has incurred 5 million square feet of commercial/industrial absorption through the first two and half months of 2016. Vacancy rates remain low (near 6.6%) for space above 100,000 square feet. Further, the comment does not raise any environmental impact. As discussed in response to Comment GP1-4, the project applicant is currently in escrow to purchase all lots that make up the proposed project at "fair market value".
GP1-2	I am well aware of the air cargo business expected to "boom" at San Bernardino International Airport some time in the	Please refer to the response to Comment GP1-1.

Comment Number	Comment	Response
	future; and the displacement that will cause for some long time residents in this area, but that is not happening NOW! There are newly built, empty warehouse spaces all along Central Ave., Orange Show Road, Tippecanoe Ave. and Arrowhead Ave. at Central. Wouldn't it be prudent to find occupants for these warehouse spaces first before building new ones? Especially a new "spec building" with no known tenant confirmed for occupation.	
GP1-3	Dumas Street is currently wide enough to accommodate one lane of traffic in each direction and is easily congested, as evidenced during the weekend of February 13-14 when Waterman Ave. was closed in both directions at Dumas and Orange Show Road; the same weekend as the High Times Cannabis Festival was held at the National Orange Show. The traffic on Dumas that weekend was horrific! I witnessed several "near misses". The street would definitely have to be widened to accommodate large trucks;	The proposed project will include improvements on Dumas Street, which will consist of widening the roadway on the south side of the centerline. The improvements on Dumas Street will consist of an additional 13 feet of roadway, curb and gutter, a 6 foot sidewalk, and two commercial driveway approaches with cross-gutter, and the relocation of five power poles. These improvements would be implemented to accommodate the proposed trucks and vehicles accessing the project. Accordingly, the proposed project would result in less than significant impacts with mitigation to traffic and surrounding roadways. The applicant will be adding an additional lane to Dumas Road with this proposed project. This will create a two-way left-turn median from approximately the west property boundary to Waterman Avenue. This lane will allow for pass through traffic without blocking the travel lane with trucks desiring to turn left into the project site. As discussed in the initial TIA and supplemental TIA, the proposed project will not have any significant unavoidable impacts, including traffic impacts on Dumas Street.
GP1-4	and the "Draft Mitigated Negative Declaration and Initial Study" regarding this project stated that the completion of this project would "require the removal and displacement of five existing single family residences on the project site". Having indicated my opposition to this project, but fully aware that construction will probably proceed as planned, I	The comment does not specify any environmental impact. As discussed on page 3 of the Draft IS/MND, there are four parcels with single-family residential homes within the proposed project. The project applicant is currently in escrow to purchase these lots at “fair market value”. In addition, the project applicant has stopped the foreclosure process on

Comment Number	Comment	Response
	have two questions for your department: 1) Which five (5) homes on Dumas are being addressed for "removal and displacement"?	some properties that make up the proposed project.
GP1-5	2) Would property owners be better off selling their properties on the open market as opposed to waiting for Imminent Domain to displace them?	Please refer to the response to Comment GP1-4. In addition, the City and applicant are not proposing to use "eminent domain" for this proposed project.
Wacy Armstrong, Jr., Attorney at Law		
GP2-1	Attached hereto please find a copy of my client's Notice of Intent to Preserve Interest as recorded on October 8, 2015 as to APN #0141-431-16 which is a parcel included within the Waterman Industrial Center. The well is located roughly on the northwest center of the parcel. The floating/meandering easement to the well, the equipment, water pipes, etc. blankets the entire parcel. It occurs to me that the above real property interests of my client should be addressed prior to the city adopting a Negative Declaration	The comment does not reference any environmental impact. The project applicant has met with the City of Riverside, owner of the well referenced by the commenter. According to the City of Riverside, the City of Riversides leases the golf course to the commenter's client. The project applicant is in negotiations with the City of Riverside (as the owner of the well) to relocate or provide access to another well.

April 8, 2016

Mr. Jackson Smith, Partner
NEWCASTLE PARTNERS, INC.
4740 Green River Road, Suite 118
Corona, CA 92880

Dear Mr. Smith:

INTRODUCTION

The firm of Kunzman Associates, Inc. is pleased to provide a supplemental traffic analysis regarding the Waterman Industrial Center project in the City of San Bernardino. This traffic analysis supplements the Waterman Industrial Center Traffic Impact Analysis was prepared by Kunzman Associates, Inc. (March 22, 2016) and responses to comments received from the California Department of Transportation – District 8 in a letter dated March 2, 2016 (see Appendix A).

RESPONSE TO COMMENT 1

Comment so noted. Figure 1 has been revised to include the I-10 Freeway and I-215 Freeway/ramps and is attached.

RESPONSE TO COMMENT 2

As noted on Figure 17 of the traffic study, the proposed project does not contribute trips greater than the I-10 Freeway and I-215 Freeway threshold volume of 100 two-way peak hour trips. In addition, the project does not contribute trips greater than the arterial link threshold volume of 50 two-way trips in the peak hours on the I-10 Freeway ramps and I-215 Freeway ramps. In addition, the signed scoping agreement (see Appendix B of the traffic study) with the City of San Bernardino provided no nexus to study the I-10 Freeway ramps and I-215 Freeway ramps.

RESPONSE TO COMMENT 3

The Waterman Industrial Center Traffic Impact Analysis (Revised) dated March 22, 2016 uses a more "conservative" analysis for the proposed project land use based upon the South Coast Air Quality Management District (SCAQMD) trip generation rates. In addition, the truck trip distribution for the project site is included in Figure 13 and is different from the passenger car trip distribution.

It should be noted that no change in mitigation measures from the previous traffic study to the revised traffic study were recommended at the study area intersections with the revised SCAQMD trip generation rates.

RESPONSE TO COMMENT 4

To account for ambient growth on roadways (see Section IV.A.1 of the traffic study), Opening Year (2017) traffic volumes have been interpolated from the Year 2035 traffic volumes based upon a proportion of the future growth increment from the San Bernardino Transportation Analysis Model (SBTAM) traffic model Year 2008 and Year 2035 average daily traffic volume forecasts. This SBTAM provided by the Southern California Associated Governments (SCAG) is the regional traffic model for this study area.

RESPONSE TO COMMENT 5

As stated in Section IV.A.4 of the traffic study, the project traffic volumes were manually added to the Year 2035 SBTAM traffic model volumes. No adjustments were made to the SBTAM traffic data provided by SCAG.

RESPONSE TO COMMENT 6

The Levels of Service were calculated based upon the Highway Capacity Manual (HCM) 2010 methodology for all traffic analyses (see attached Tables and Appendix B). It should be noted that no change in mitigation measures from the traffic study were added with the Highway Capacity Manual (HCM) 2010 methodology.

RESPONSE TO COMMENT 7

The Circulation Recommendations are shown on Figure 40 of the traffic study. The proposed project will pay for the improvements shown on Figure 40. No additional off-site improvements are required and therefore no fair-share improvement costs are included in the traffic study.

However, as noted in Section V of the traffic study: As mitigation for the potential traffic impacts, the proposed project shall contribute through local and regional adopted traffic impact fee programs in addition to any fair share contributions shown within the traffic study which is not covered within these fee programs.

RESPONSE TO COMMENT 8

Comment so noted.

It has been a pleasure to service your needs on the Waterman Industrial Center project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 973-8383.

Sincerely,

KUNZMAN ASSOCIATES, INC.

Carl Ballard, LEED GA
Principal

KUNZMAN ASSOCIATES, INC.

William Kunzman

William Kunzman, P.E.
Principal

Jn5629g

Table 1

Existing Intersection Delay and Level of Service

Intersection	Jurisdiction	Traffic Control[2]	Intersection Approach Lanes[1]												Peak Hour					
			Northbound			Southbound			Eastbound			Westbound			Morning			Evening		
			L	T	R	L	T	R	L	T	R	L	T	R	Delay[3]	LOS[4]	V/C[4]	Delay[3]	LOS[4]	V/C[4]
E Street (NS) at:																				
Orange Show Road (EW) - #1	City of SB	TS	2	1.5	0.5	2	2	1>	2	2	1	2	2	1>	22.4	C	0.398	26.1	C	0.710
Washington Avenue (NS) at:																				
Orange Show Road (EW) - #2	City of SB	TS	0.5	0.5	d	0.5	0.5	d	1	2	d	1	2	d	19.1	B	0.307	17.1	B	0.386
Waterman Avenue (NS) at:																				
Orange Show Road (EW) - #5	City of SB	TS	1	2	d	1	2	d	1	2	d	1	2	d	20.6	C	0.525	26.1	C	0.717
Dumas Street (EW) - #6	City of SB	CSS	1	2	0	0	2	d	0.5	0	0.5	0	0	0	19.8	C	N/A	20.8	C	N/A
Park Center Circle N (EW) - #7	City of SB	CSS	0	2	d	1	2	0	0	0	0	1	0	d	20.8	C	N/A	19.0	C	N/A
Park Center Circle S (EW) - #8	City of SB	TS	1	2	1	1	2	d	0.5	0.5	d	0.5	0.5	d	3.6	A	0.412	8.9	A	0.487
Vanderbilt Way (EW) - #9	City of SB	TS	1	2	1	1	2.5	0.5	0	1	0	1.5	0.5	1	16.4	B	0.632	21.0	C	0.786

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; > = Right Turn Overlap; d = De Facto Right Turn.

[2] TS = Traffic Signal; CSS = Cross Street Stop

[3] Delay, Level of Service (LOS) and Volume to Capacity Ratio (V/C) has been calculated using the following analysis software: VISTRO, Version 4.00-00. Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[4] LOS = Level of Service; V/C = Volume to Capacity.

Table 5

Existing Plus Project Intersection Delay and Level of Service

Intersection	Jurisdiction	Traffic Control[2]	Intersection Approach Lanes[1]												Peak Hour					
			Northbound			Southbound			Eastbound			Westbound			Morning			Evening		
			L	T	R	L	T	R	L	T	R	L	T	R	Delay[3]	LOS[4]	V/C[4]	Delay[3]	LOS[4]	V/C[4]
E Street (NS) at:																				
Orange Show Road (EW) - #1	City of SB	TS	2	1.5	0.5	2	2	1>	2	2	1	2	2	1>	22.6	C	0.408	26.2	C	0.714
Washington Avenue (NS) at:																				
Orange Show Road (EW) - #2	City of SB	TS	0.5	0.5	d	0.5	0.5	d	1	2	d	1	2	d	19.4	B	0.322	17.4	B	0.415
Project West Access (NS) at:																				
Dumas Street (EW) - #3	City of SB	**CSS**	**0.5**	0	**0.5**	0	0	0	0	0.5	0.5	0.5	0.5	0	8.8	A	N/A	8.8	A	N/A
Project East Access (NS) at:																				
Dumas Street (EW) - #4	City of SB	**CSS**	**0.5**	0	**0.5**	0	0	0	0	0.5	0.5	0.5	0.5	0	8.4	A	N/A	8.4	A	N/A
Waterman Avenue (NS) at:																				
Orange Show Road (EW) - #5	City of SB	TS	1	2	d	1	2	d	1	2	d	1	2	d	21.1	C	0.548	27.1	C	0.733
Dumas Street (EW) - #6	City of SB	CSS	1	2	0	0	2	d	1	0	**1**	0	0	0	20.9	C	N/A	24.6	C	N/A
Park Center Circle N (EW) - #7	City of SB																			
Without Improvements		CSS	**1**	2	d	1	2	**1**	**0.5**	**0.5**	**1**	0.5	0.5	d	67.3	F	N/A	99.9[5]	F	N/A
With Improvements		**TS**	**1**	2	d	1	2	**1**	**0.5**	**0.5**	**1**	0.5	0.5	d	6.4	A	0.392	5.8	A	0.408
Park Center Circle S (EW) - #8	City of SB	TS	1	2	1	1	2	d	0.5	0.5	d	0.5	0.5	d	3.7	A	0.604	9.0	A	0.496
Vanderbilt Way (EW) - #9	City of SB	TS	1	2	1	1	2.5	0.5	0	1	0	1.5	0.5	1	16.6	B	0.631	21.5	C	0.792

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; d = De Facto Right Turn; **BOLD** = Improvements.

[2] TS = Traffic Signal; CSS = Cross Street Stop

[3] Delay, Level of Service (LOS) and Volume to Capacity Ratio (V/C) has been calculated using the following analysis software: VISTRO, Version 4.00-00. Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[4] LOS = Level of Service; V/C = Volume to Capacity.

[5] 99.9 - F = Delay high, intersection unstable, Level of Service F.

Table 7

Existing Plus Ambient Growth Intersection Delay and Level of Service

Intersection	Jurisdiction	Traffic Control[2]	Intersection Approach Lanes[1]												Peak Hour					
			Northbound			Southbound			Eastbound			Westbound			Morning			Evening		
			L	T	R	L	T	R	L	T	R	L	T	R	Delay[3]	LOS[4]	V/C[4]	Delay[3]	LOS[4]	V/C[4]
E Street (NS) at:																				
Orange Show Road (EW) - #1	City of SB	TS	2	1.5	0.5	2	2	1>	2	2	1	2	2	1>	22.6	C	0.409	26.4	C	0.723
Washington Avenue (NS) at:																				
Orange Show Road (EW) - #2	City of SB	TS	0.5	0.5	d	0.5	0.5	d	1	2	d	1	2	d	19.5	B	0.313	17.4	B	0.407
Waterman Avenue (NS) at:																				
Orange Show Road (EW) - #5	City of SB	TS	1	2	d	1	2	d	1	2	d	1	2	d	20.8	C	0.532	26.9	C	0.732
Dumas Street (EW) - #6	City of SB	CSS	1	2	0	0	2	d	0.5	0	0.5	0	0	0	20.5	C	N/A	24.5	C	N/A
Park Center Circle N (EW) - #7	City of SB																			
Without Improvements		CSS	0	2	d	1	2	0	0	0	0	1	0	d	21.2	C	N/A	19.7	C	N/A
With Improvements		**<u>TS</u>**	0	2	d	1	2	0	0	0	0	1	0	d	4.1	A	0.321	4.0	A	0.437
Park Center Circle S (EW) - #8	City of SB	TS	1	2	1	1	2	d	0.5	0.5	d	0.5	0.5	d	3.8	A	0.606	9.4	A	0.502
Vanderbilt Way (EW) - #9	City of SB	TS	1	2	1	1	2.5	0.5	0	1	0	1.5	0.5	1	16.7	B	0.643	22.4	C	0.825

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; d = De Facto Right Turn; **<u>BOLD</u>** = Improvements.

[2] TS = Traffic Signal; CSS = Cross Street Stop

[3] Delay, Level of Service (LOS) and Volume to Capacity Ratio (V/C) has been calculated using the following analysis software: VISTRO, Version 4.00-00. Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[4] LOS = Level of Service; V/C = Volume to Capacity.

[5] Traffic signal is projected to be warranted.

Table 8

Opening Year (2017) Without Project Intersection Delay and Level of Service

			Intersection Approach Lanes[1]												Peak Hour					
		Traffic	Northbound			Southbound			Eastbound			Westbound			Morning			Evening		
Intersection	Jurisdiction	Control[2]	L	T	R	L	T	R	L	T	R	L	T	R	Delay[3]	LOS[4]	V/C[4]	Delay[3]	LOS[4]	V/C[4]
E Street (NS) at:																				
Orange Show Road (EW) - #1	City of SB	TS	2	1.5	0.5	2	2	1>	2	2	1	2	2	1>	22.6	C	0.434	27.5	C	0.731
Washington Avenue (NS) at:																				
Orange Show Road (EW) - #2	City of SB	TS	0.5	0.5	d	0.5	0.5	d	1	2	d	1	2	d	20.0	B	0.331	17.7	B	0.415
Waterman Avenue (NS) at:																				
Orange Show Road (EW) - #5	City of SB	TS	1	2	d	1	2	d	1	2	d	1	2	d	21.3	C	0.554	29.5	C	0.768
Dumas Street (EW) - #6	City of SB	CSS	1	2	0	0	2	d	0.5	0	0.5	0	0	0	21.4	C	N/A	22.9	C	N/A
Park Center Circle N (EW) - #7	City of SB																			
Without Improvements		CSS	0	2	d	1	2	0	0	0	0	1	0	d	22.7	C	N/A	20.6	C	N/A
With Improvements		**TS**	0	2	d	1	2	0	0	0	0	1	0	d	4.1	A	0.343	4.0	A	0.459
Park Center Circle S (EW) - #8	City of SB	TS	1	2	1	1	2	d	0.5	0.5	d	0.5	0.5	d	3.8	A	0.626	9.4	A	0.522
Vanderbilt Way (EW) - #9	City of SB	TS	1	2	1	1	2.5	0.5	0	1	0	1.5	0.5	1	17.9	B	0.667	22.4	C	0.834

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; d = De Facto Right Turn; **BOLD** = Improvements.

[2] TS = Traffic Signal; CSS = Cross Street Stop

[3] Delay, Level of Service (LOS) and Volume to Capacity Ratio (V/C) has been calculated using the following analysis software: VISTRO, Version 4.00-00. Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individ movement (or movements sharing a single lane) are shown.

[4] LOS = Level of Service; V/C = Volume to Capacity.

Table 9

Opening Year (2017) With Project Intersection Delay and Level of Service

			Intersection Approach Lanes[1]												Peak Hour					
		Traffic	Northbound			Southbound			Eastbound			Westbound			Morning			Evening		
Intersection	Jurisdiction	Control[2]	L	T	R	L	T	R	L	T	R	L	T	R	Delay[3]	LOS[4]	V/C[4]	Delay[3]	LOS[4]	V/C[4]
E Street (NS) at:																				
Orange Show Road (EW) - #1	City of SB	TS	2	1.5	0.5	2	2	1>	2	2	1	2	2	1>	22.9	C	0.444	27.8	C	0.736
Washington Avenue (NS) at:																				
Orange Show Road (EW) - #2	City of SB	TS	0.5	0.5	d	0.5	0.5	d	1	2	d	1	2	d	20.3	C	0.345	18.1	B	0.449
Project West Access (NS) at:																				
Dumas Street (EW) - #3	City of SB	**CSS**	**0.5**	0	**0.5**	0	0	0	0	0.5	0.5	0.5	0.5	0	8.8	A	N/A	8.8	A	N/A
Project East Access (NS) at:																				
Dumas Street (EW) - #4	City of SB	**CSS**	**0.5**	0	**0.5**	0	0	0	0	0.5	0.5	0.5	0.5	0	8.4	A	N/A	8.4	A	N/A
Waterman Avenue (NS) at:																				
Orange Show Road (EW) - #5	City of SB	TS	1	2	d	1	2	d	1	2	d	1	2	d	21.9	C	0.578	30.7	C	0.786
Dumas Street (EW) - #6	City of SB	CSS	1	2	0	0	2	d	1	0	**1**	0	0	0	22.6	C	N/A	23.8	C	N/A
Park Center Circle N (EW) - #7	City of SB																			
Without Improvements		CSS	**1**	2	d	1	2	**1**	**0.5**	**0.5**	**1**	0.5	0.5	d	87.0	F	N/A	99.9[5]	F	N/A
With Improvements		**TS**	**1**	2	d	1	2	**1**	**0.5**	**0.5**	**1**	0.5	0.5	d	5.6	A	0.476	7.5	A	0.581
Park Center Circle S (EW) - #8	City of SB	TS	1	2	1	1	2	d	0.5	0.5	d	0.5	0.5	d	3.8	A	0.642	9.6	A	0.533
Vanderbilt Way (EW) - #9	City of SB	TS	1	2	1	1	2.5	0.5	0	1	0	1.5	0.5	1	18.1	B	0.666	22.9	C	0.840

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; d = De Facto Right Turn; **BOLD** = Improvements.

[2] TS = Traffic Signal; CSS = Cross Street Stop

[3] Delay, Level of Service (LOS) and Volume to Capacity Ratio (V/C) has been calculated using the following analysis software: VISTRO, Version 4.00-00. Per the 2010 Highway Capacity Manual, overall averag intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst indiv movement (or movements sharing a single lane) are shown.

[4] LOS = Level of Service; V/C = Volume to Capacity.

[5] 99.9 - F = Delay high, intersection unstable, Level of Service F.

Table 11

Year 2035 Without Project Intersection Delay and Level of Service

Intersection	Jurisdiction	Traffic Control[2]	Intersection Approach Lanes[1]												Peak Hour					
			Northbound			Southbound			Eastbound			Westbound			Morning			Evening		
			L	T	R	L	T	R	L	T	R	L	T	R	Delay[3]	LOS[4]	V/C[4]	Delay[3]	LOS[4]	V/C[4]
E Street (NS) at:																				
Orange Show Road (EW) - #1	City of SB	TS	2	1.5	0.5	2	2	1>	2	2	1	2	2	1>	23.3	C	0.500	31.8	C	0.807
Washington Avenue (NS) at:																				
Orange Show Road (EW) - #2	City of SB	TS	0.5	0.5	d	0.5	0.5	d	1	2	d	1	2	d	19.5	B	0.346	17.4	B	0.547
Waterman Avenue (NS) at:																				
Orange Show Road (EW) - #5	City of SB	TS	1	2	d	1	2	d	1	2	d	1	2	d	22.1	C	0.614	36.2	D	0.824
Dumas Street (EW) - #6	City of SB	CSS	1	2	0	0	2	d	0.5	0	0.5	0	0	0	23.1	C	N/A	28.0	D	N/A
Park Center Circle N (EW) - #7	City of SB																			
Without Improvements		CSS	0	2	d	1	2	0	0	0	0	1	0	d	22.8	C	N/A	24.7	C	N/A
With Improvements		**TS**	0	2	d	1	2	0	0	0	0	1	0	d	3.8	A	0.336	4.3	A	0.512
Park Center Circle S (EW) - #8	City of SB	TS	1	2	1	1	2	d	0.5	0.5	d	0.5	0.5	d	5.7	A	0.713	11.7	B	0.596
Vanderbilt Way (EW) - #9	City of SB	TS	1	2	1	1	2.5	0.5	0	1	0	1.5	0.5	1	20.0	C	0.720	34.2	C	0.977

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; d = De Facto Right Turn; **BOLD** = Improvements.

[2] TS = Traffic Signal; CSS = Cross Street Stop

[3] Delay, Level of Service (LOS) and Volume to Capacity Ratio (V/C) has been calculated using the following analysis software: VISTRO, Version 4.00-00. Per the 2010 Highway Capacity Manual, overall averag intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst indiv movement (or movements sharing a single lane) are shown.

[4] LOS = Level of Service; V/C = Volume to Capacity.

Table 12

Year 2035 With Project Intersection Delay and Level of Service

Intersection	Jurisdiction	Traffic Control[2]	Intersection Approach Lanes[1]												Peak Hour					
			Northbound			Southbound			Eastbound			Westbound			Morning			Evening		
			L	T	R	L	T	R	L	T	R	L	T	R	Delay[3]	LOS[4]	V/C[4]	Delay[3]	LOS[4]	V/C[4]
E Street (NS) at:																				
Orange Show Road (EW) - #1	City of SB	TS	2	1.5	0.5	2	2	1>	2	2	1	2	2	1>	23.1	C	0.511	32.2	C	0.811
Washington Avenue (NS) at:																				
Orange Show Road (EW) - #2	City of SB	TS	0.5	0.5	d	0.5	0.5	d	1	2	d	1	2	d	19.9	B	0.359	17.1	B	0.643
Project West Access (NS) at:																				
Dumas Street (EW) - #3	City of SB	**CSS**	**0.5**	0	**0.5**	0	0	0	0	0.5	0.5	0.5	0.5	0	8.8	A	N/A	8.9	A	N/A
Project East Access (NS) at:																				
Dumas Street (EW) - #4	City of SB	**CSS**	**0.5**	0	**0.5**	0	0	0	0	0.5	0.5	0.5	0.5	0	8.4	A	N/A	8.4	A	N/A
Waterman Avenue (NS) at:																				
Orange Show Road (EW) - #5	City of SB	TS	1	2	d	1	2	d	1	2	d	1	2	d	22.9	C	0.643	38.0	D	0.832
Dumas Street (EW) - #6	City of SB	CSS	1	2	0	0	2	d	1	0	**1**	0	0	0	24.3	C	N/A	29.1	D	N/A
Park Center Circle N (EW) - #7	City of SB																			
Without Improvements		CSS	**1**	2	d	1	2	**1**	**0.5**	**0.5**	**1**	0.5	0.5	d	99.9[5]	F	N/A	99.9	F	N/A
With Improvements		**TS**	**1**	2	d	1	2	**1**	**0.5**	**0.5**	**1**	0.5	0.5	d	5.4	A	0.432	8.1	A	0.953
Park Center Circle S (EW) - #8	City of SB	TS	1	2	1	1	2	d	0.5	0.5	d	0.5	0.5	d	5.8	A	0.715	11.8	B	0.605
Vanderbilt Way (EW) - #9	City of SB	TS	1	2	1	1	2.5	0.5	0	1	0	1.5	0.5	1	20.1	C	0.720	34.3	C	0.981

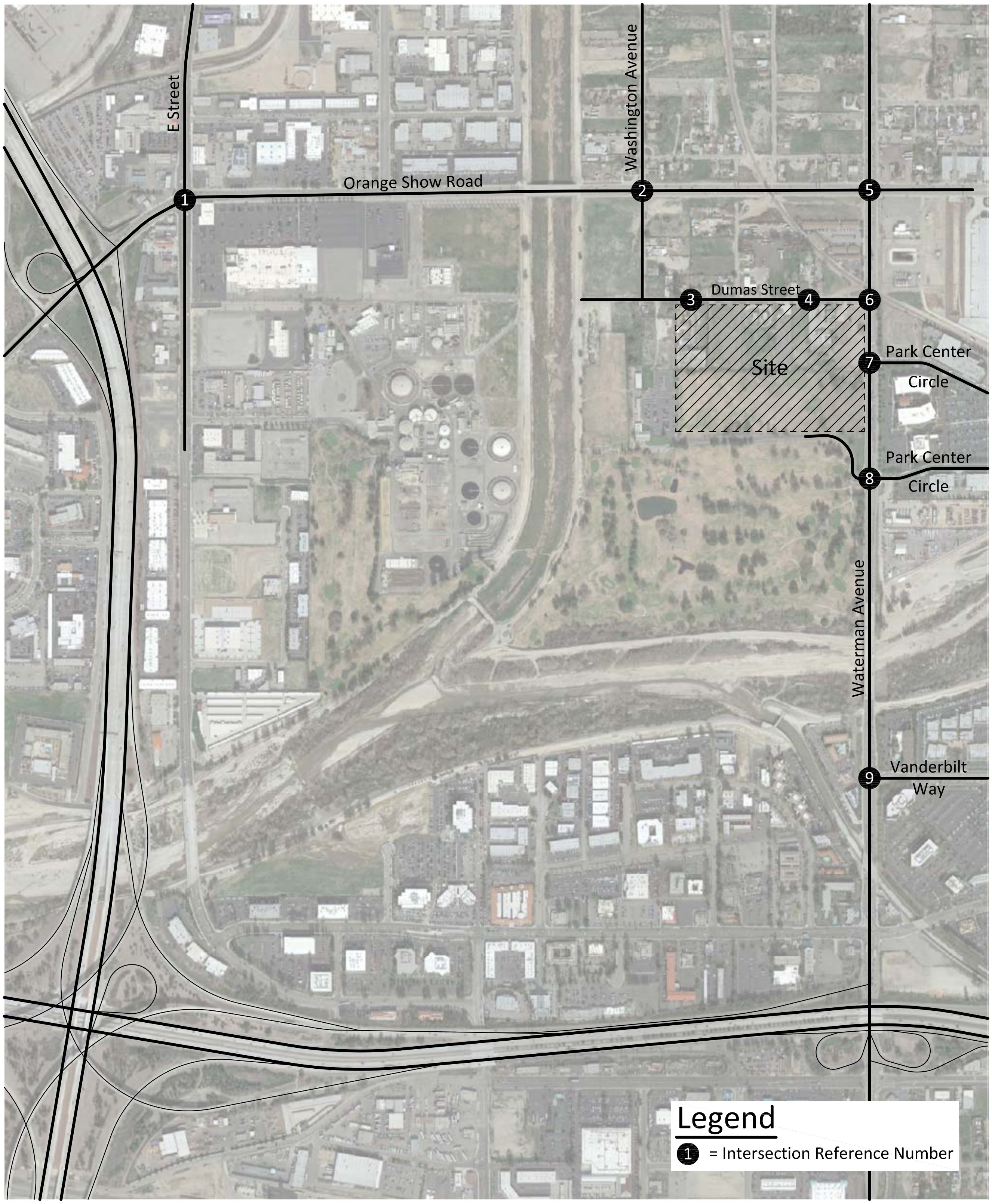
[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; d = De Facto Right Turn; **BOLD** = Improvements.

[2] TS = Traffic Signal; CSS = Cross Street Stop

[3] Delay, Level of Service (LOS) and Volume to Capacity Ratio (V/C) has been calculated using the following analysis software: VISTRO, Version 4.00-00. Per the 2010 Highway Capacity Manual, overall averag intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst indiv movement (or movements sharing a single lane) are shown.

[4] LOS = Level of Service; V/C = Volume to Capacity.

Figure 1
Project Location Map



KUNZMAN ASSOCIATES, INC.
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JN 5629g

APPENDIX A

COMMENT LETTER

APPENDIX B

INTERSECTION DELAY WORKSHEETS

Existing

Intersection Level Of Service Report
Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	22.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.398

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	97	88	41	51	124	57	221	801	337	76	385	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	97	88	41	51	124	57	221	801	337	76	385	27
Peak Hour Factor	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	25	12	14	35	16	62	226	95	21	109	8
Total Analysis Volume [veh/h]	109	99	46	58	140	64	249	904	380	86	435	30
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	13	23	0	9	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	19	19	3	18	18	6	18	18	4	15	15
g / C, Green / Cycle	0.07	0.32	0.32	0.05	0.30	0.30	0.10	0.30	0.30	0.06	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.03	0.04	0.04	0.02	0.04	0.04	0.07	0.25	0.24	0.02	0.12	0.02
s, saturation flow rate [veh/h]	3514	1900	1704	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	252	610	547	190	1096	489	372	1064	475	231	918	410
d1, Uniform Delay [s]	26.80	14.47	14.51	27.43	15.23	15.25	25.94	20.03	19.65	26.98	19.08	17.10
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.22	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.16	0.41	0.49	0.90	0.24	0.55	2.09	2.01	6.35	1.00	0.38	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

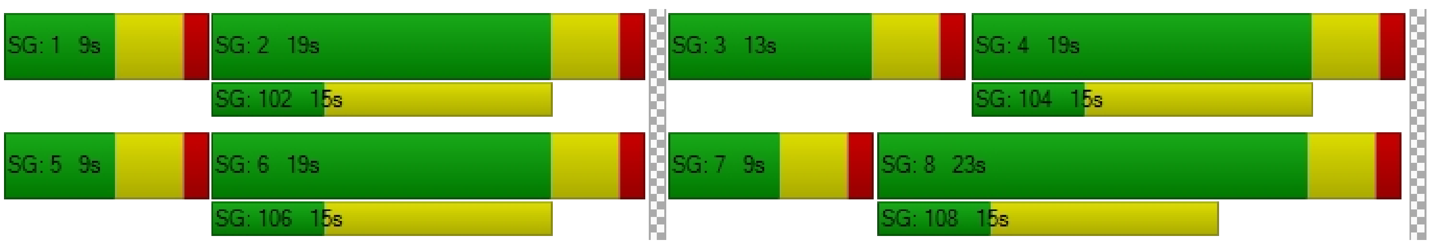
X, volume / capacity	0.43	0.12	0.13	0.31	0.13	0.13	0.67	0.85	0.80	0.37	0.47	0.07
d, Delay for Lane Group [s/veh]	27.97	14.88	15.00	28.32	15.47	15.80	28.03	22.04	26.00	27.97	19.46	17.18
Lane Group LOS	C	B	B	C	B	B	C	C	C	C	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.73	0.69	0.66	0.39	0.64	0.63	1.67	5.38	5.03	0.57	2.30	0.29
50th-Percentile Queue Length [ft]	18.16	17.23	16.61	9.80	16.04	15.72	41.63	134.46	125.71	14.34	57.47	7.17
95th-Percentile Queue Length [veh]	1.31	1.24	1.20	0.71	1.15	1.13	3.00	9.18	8.71	1.03	4.14	0.52
95th-Percentile Queue Length [ft]	32.68	31.01	29.90	17.63	28.87	28.30	74.93	229.54	217.65	25.81	103.44	12.90

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.97	14.91	15.00	28.32	15.47	15.80	28.03	22.04	26.00	27.97	19.46	17.18
Movement LOS	C	B	B	C	B	B	C	C	C	C	B	B
d_A, Approach Delay [s/veh]	20.53			18.40			24.00			20.66		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	22.39											
Intersection LOS	C											
Intersection V/C	0.398											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	19.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.307

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	6	3	2	6	0	10	34	836	12	3	378	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	3	2	6	0	10	34	836	12	3	378	11
Peak Hour Factor	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	1	2	0	3	10	235	3	1	106	3
Total Analysis Volume [veh/h]	7	3	2	7	0	11	38	941	14	3	426	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	9	32	0	9	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	29	29	29	29	23	19	19	23	17	17
g / C, Green / Cycle	0.48	0.48	0.48	0.48	0.39	0.32	0.32	0.39	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.02	0.00	0.01	0.01	0.03	0.26	0.01	0.00	0.12	0.01
s, saturation flow rate [veh/h]	650	1615	552	1615	1135	3618	1615	726	3618	1615
c, Capacity [veh/h]	411	768	382	768	532	1154	515	319	1027	458
d1, Uniform Delay [s]	10.69	8.29	20.20	8.33	11.66	18.85	14.07	12.90	17.49	15.55
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.11	0.01	0.09	0.03	0.06	1.46	0.02	0.01	0.27	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

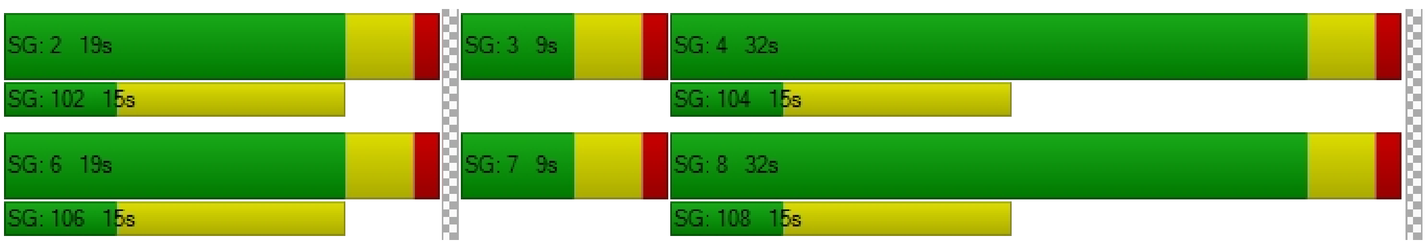
X, volume / capacity	0.02	0.00	0.02	0.01	0.07	0.82	0.03	0.01	0.41	0.03
d, Delay for Lane Group [s/veh]	10.80	8.29	20.28	8.37	11.71	20.32	14.09	12.91	17.76	15.57
Lane Group LOS	B	A	C	A	B	C	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.07	0.01	0.08	0.07	0.27	5.35	0.12	0.02	2.12	0.11
50th-Percentile Queue Length [ft]	1.78	0.33	2.12	1.80	6.85	133.64	2.91	0.54	53.01	2.68
95th-Percentile Queue Length [veh]	0.13	0.02	0.15	0.13	0.49	9.14	0.21	0.04	3.82	0.19
95th-Percentile Queue Length [ft]	3.21	0.59	3.82	3.24	12.32	228.44	5.24	0.97	95.43	4.82

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.80	10.80	8.29	20.28	20.28	8.37	11.71	20.32	14.09	12.91	17.76	15.57
Movement LOS	B	B	A	C	C	A	B	C	B	B	B	B
d_A, Approach Delay [s/veh]	10.38			13.00			19.90			17.67		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	19.06											
Intersection LOS	B											
Intersection V/C	0.307											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	20.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.525

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	63	593	54	48	512	80	160	381	270	75	256	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	63	593	54	48	512	80	160	381	270	75	256	67
Peak Hour Factor	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	169	15	14	146	23	46	108	77	21	73	19
Total Analysis Volume [veh/h]	72	675	62	55	583	91	182	434	308	85	292	76
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	13	23	0	9	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	23	23	3	23	23	8	14	14	4	10	10
g / C, Green / Cycle	0.06	0.38	0.38	0.05	0.38	0.38	0.13	0.24	0.24	0.06	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.04	0.03	0.16	0.06	0.10	0.12	0.19	0.05	0.08	0.05
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	108	1384	618	93	1355	605	230	852	380	117	625	279
d1, Uniform Delay [s]	27.70	14.09	11.92	27.91	14.03	12.47	25.48	19.97	21.71	27.62	22.38	21.59
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.15	0.11	0.12	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.96	1.23	0.32	5.89	1.00	0.53	8.04	0.47	4.72	8.41	0.54	0.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

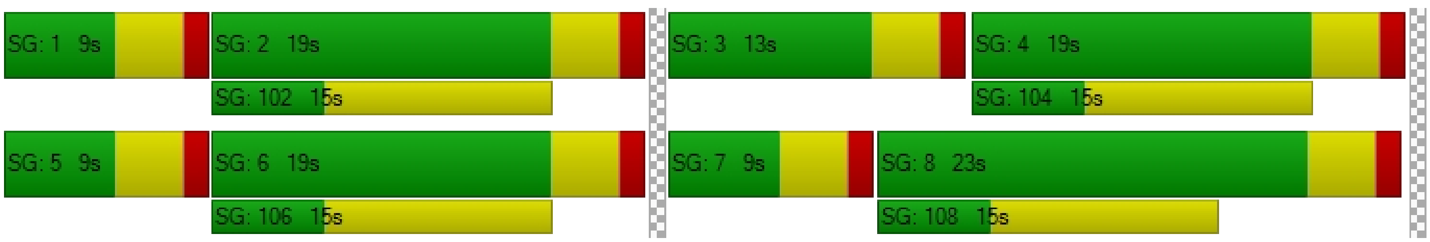
X, volume / capacity	0.67	0.49	0.10	0.59	0.43	0.15	0.79	0.51	0.81	0.73	0.47	0.27
d, Delay for Lane Group [s/veh]	34.66	15.32	12.24	33.80	15.03	13.00	33.52	20.44	26.44	36.03	22.93	22.11
Lane Group LOS	C	B	B	C	B	B	C	C	C	D	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.10	2.93	0.47	0.84	2.49	0.73	2.79	2.38	4.09	1.37	1.71	0.88
50th-Percentile Queue Length [ft]	27.53	73.22	11.85	20.88	62.26	18.18	69.71	59.49	102.14	34.20	42.74	21.88
95th-Percentile Queue Length [veh]	1.98	5.27	0.85	1.50	4.48	1.31	5.02	4.28	7.35	2.46	3.08	1.58
95th-Percentile Queue Length [ft]	49.56	131.79	21.33	37.59	112.07	32.73	125.48	107.09	183.86	61.56	76.94	39.38

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.66	15.32	12.24	33.80	15.03	13.00	33.52	20.44	26.44	36.03	22.93	22.11
Movement LOS	C	B	B	C	B	B	C	C	C	D	C	C
d_A, Approach Delay [s/veh]	16.81			16.19			25.02			25.25		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	20.57											
Intersection LOS	C											
Intersection V/C	0.525											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	19.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.024

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	3	716	838	8	5	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	716	838	8	5	6
Peak Hour Factor	0.8593	0.8593	0.8593	0.8593	0.8593	0.8593
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	208	244	2	1	2
Total Analysis Volume [veh/h]	3	833	975	9	6	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.02	0.01
d_M, Delay for Movement [s/veh]	10.09	0.00	0.00	0.00	19.77	12.17
Movement LOS	B	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.01	0.00	0.00	0.00	0.12	0.12
95th-Percentile Queue Length [ft]	0.32	0.00	0.00	0.00	2.88	2.88
d_A, Approach Delay [s/veh]	0.04		0.00		15.68	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.13					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	20.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	711	27	77	749	1	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	711	27	77	749	1	6
Peak Hour Factor	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	207	8	22	218	0	2
Total Analysis Volume [veh/h]	828	31	90	872	1	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.11	0.01	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	10.14	0.00	20.79	11.14
Movement LOS	A	A	B	A	C	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.38	0.00	0.01	0.04
95th-Percentile Queue Length [ft]	0.00	0.00	9.59	0.00	0.33	0.90
d_A, Approach Delay [s/veh]	0.00		0.95		12.35	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.55					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	3.6
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.412

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	5	704	161	21	726	7	8	4	11	23	0	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	704	161	21	726	7	8	4	11	23	0	7
Peak Hour Factor	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	196	45	6	203	2	2	1	3	6	0	2
Total Analysis Volume [veh/h]	6	786	180	23	810	8	9	4	12	26	0	8
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	24	0	9	24	0	0	32	0	0	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	C	R	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	55	49	49	55	50	50	2	2	2	2
g / C, Green / Cycle	0.84	0.75	0.75	0.84	0.77	0.77	0.04	0.04	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.01	0.22	0.11	0.03	0.22	0.00	0.09	0.01	0.15	0.00
s, saturation flow rate [veh/h]	738	3618	1615	777	3618	1615	140	1615	174	1615
c, Capacity [veh/h]	732	2715	1212	762	2781	1242	99	60	117	60
d1, Uniform Delay [s]	1.05	2.59	2.28	1.07	2.24	1.75	32.53	30.42	32.54	30.34
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.27	0.26	0.02	0.27	0.01	0.60	1.60	0.95	0.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.01	0.29	0.15	0.03	0.29	0.01	0.13	0.20	0.22	0.13
d, Delay for Lane Group [s/veh]	1.07	2.86	2.54	1.09	2.51	1.76	33.12	32.02	33.48	31.33
Lane Group LOS	A	A	A	A	A	A	C	C	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.00	0.46	0.23	0.00	0.30	0.01	0.21	0.20	0.43	0.13
50th-Percentile Queue Length [ft]	0.10	11.46	5.78	0.08	7.51	0.16	5.37	5.06	10.77	3.33
95th-Percentile Queue Length [veh]	0.01	0.83	0.42	0.01	0.54	0.01	0.39	0.36	0.78	0.24
95th-Percentile Queue Length [ft]	0.19	20.63	10.40	0.15	13.52	0.28	9.66	9.10	19.38	5.99

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.07	2.86	2.54	1.09	2.51	1.76	33.12	33.12	32.02	33.48	33.48	31.33
Movement LOS	A	A	A	A	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	2.79			2.46			32.59			32.98		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	3.59											
Intersection LOS	A											
Intersection V/C	0.412											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	16.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.632

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	24	657	371	246	505	4	3	2	2	61	1	221
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	657	371	246	505	4	3	2	2	61	1	221
Peak Hour Factor	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	186	105	70	143	1	1	1	1	17	0	63
Total Analysis Volume [veh/h]	27	744	420	279	572	5	3	2	2	69	1	250
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	20	30	0	0	21	0	0	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	26	26	11	35	35	11	11	11	11
g / C, Green / Cycle	0.03	0.42	0.42	0.19	0.58	0.58	0.19	0.19	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.01	0.21	0.26	0.15	0.10	0.10	0.00	0.02	0.03	0.15
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1892	1623	1435	1521	1615
c, Capacity [veh/h]	59	1531	683	338	2090	1093	395	346	408	308
d1, Uniform Delay [s]	28.59	12.60	13.53	23.51	5.99	5.99	19.79	21.79	20.13	23.33
k, delay calibration	0.11	0.50	0.50	0.12	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.54	1.11	4.10	5.61	0.19	0.36	0.02	0.11	0.10	5.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

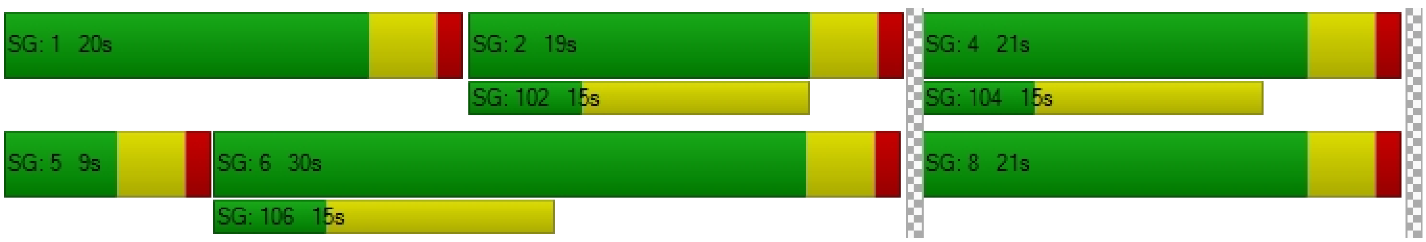
X, volume / capacity	0.46	0.49	0.61	0.82	0.18	0.18	0.02	0.09	0.10	0.81
d, Delay for Lane Group [s/veh]	34.13	13.71	17.63	29.11	6.18	6.36	19.81	21.90	20.23	28.51
Lane Group LOS	C	B	B	C	A	A	B	C	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	0.43	2.96	4.08	3.76	0.74	0.83	0.08	0.36	0.44	3.59
50th-Percentile Queue Length [ft]	10.73	73.90	101.91	93.91	18.45	20.63	1.92	9.08	10.92	89.75
95th-Percentile Queue Length [veh]	0.77	5.32	7.34	6.76	1.33	1.49	0.14	0.65	0.79	6.46
95th-Percentile Queue Length [ft]	19.32	133.01	183.44	169.05	33.20	37.13	3.45	16.34	19.66	161.55

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.13	13.71	17.63	29.11	6.24	6.36	19.81	19.81	19.81	21.90	20.23	28.51
Movement LOS	C	B	B	C	A	A	B	B	B	C	C	C
d_A, Approach Delay [s/veh]	15.56			13.70			19.81			26.86		
Approach LOS	B			B			B			C		
d_I, Intersection Delay [s/veh]	16.42											
Intersection LOS	B											
Intersection V/C	0.632											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	26.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.710

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	457	288	128	145	157	258	120	893	299	143	776	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	457	288	128	145	157	258	120	893	299	143	776	42
Peak Hour Factor	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	123	78	35	39	42	70	32	241	81	39	209	11
Total Analysis Volume [veh/h]	493	311	138	156	169	278	129	963	322	154	837	45
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	24	0	9	19	0	13	23	0	9	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	21	21	5	15	15	5	19	19	5	19	19
g / C, Green / Cycle	0.15	0.32	0.32	0.07	0.24	0.24	0.07	0.29	0.29	0.07	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.14	0.12	0.12	0.04	0.05	0.17	0.04	0.27	0.20	0.04	0.23	0.03
s, saturation flow rate [veh/h]	3514	1900	1705	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	541	605	543	256	859	383	246	1050	469	255	1059	473
d1, Uniform Delay [s]	27.09	17.25	17.25	29.27	19.85	22.85	29.22	22.34	20.48	29.27	21.17	16.74
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.19	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.36	1.89	2.11	2.35	0.51	11.34	1.74	3.75	3.22	2.29	1.36	0.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

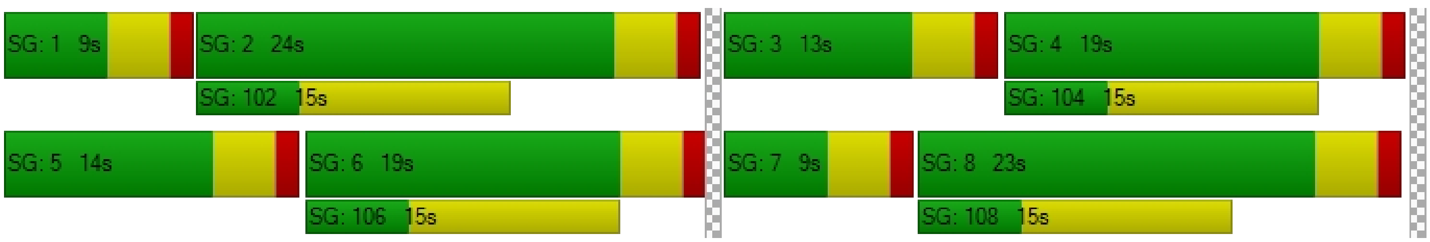
X, volume / capacity	0.91	0.39	0.39	0.61	0.20	0.72	0.53	0.92	0.69	0.60	0.79	0.10
d, Delay for Lane Group [s/veh]	33.44	19.15	19.36	31.62	20.36	34.19	30.96	26.09	23.69	31.56	22.53	16.82
Lane Group LOS	C	B	B	C	C	C	C	C	C	C	C	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	3.90	2.75	2.50	1.18	0.99	4.72	0.96	6.75	4.22	1.16	5.33	0.45
50th-Percentile Queue Length [ft]	97.58	68.73	62.48	29.46	24.71	118.00	24.03	168.87	105.59	29.05	133.14	11.18
95th-Percentile Queue Length [veh]	7.03	4.95	4.50	2.12	1.78	8.28	1.73	11.02	7.59	2.09	9.11	0.80
95th-Percentile Queue Length [ft]	175.64	123.71	112.46	53.04	44.48	207.08	43.25	275.42	189.86	52.29	227.76	20.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.44	19.20	19.36	31.62	20.36	34.19	30.96	26.09	23.69	31.56	22.53	16.82
Movement LOS	C	B	B	C	C	C	C	C	C	C	C	B
d_A, Approach Delay [s/veh]	26.68			29.65			25.99			23.63		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	26.09											
Intersection LOS	C											
Intersection V/C	0.710											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	17.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.386

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	2	2	1	4	0	11	29	1120	12	6	934	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	2	1	4	0	11	29	1120	12	6	934	15
Peak Hour Factor	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	1	0	1	0	3	8	305	3	2	255	4
Total Analysis Volume [veh/h]	2	2	1	4	0	12	32	1221	13	7	1018	16
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	9	32	0	9	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	23	23	23	23	29	24	24	29	23	23
g / C, Green / Cycle	0.39	0.39	0.39	0.39	0.48	0.40	0.40	0.48	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.01	0.00	0.01	0.01	0.04	0.34	0.01	0.01	0.28	0.01
s, saturation flow rate [veh/h]	775	1615	540	1615	744	3618	1615	589	3618	1615
c, Capacity [veh/h]	389	624	328	624	395	1457	650	318	1365	609
d1, Uniform Delay [s]	12.66	11.32	22.04	11.40	10.31	16.20	10.82	11.14	16.23	11.78
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.05	0.00	0.07	0.06	0.09	1.36	0.01	0.03	0.83	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

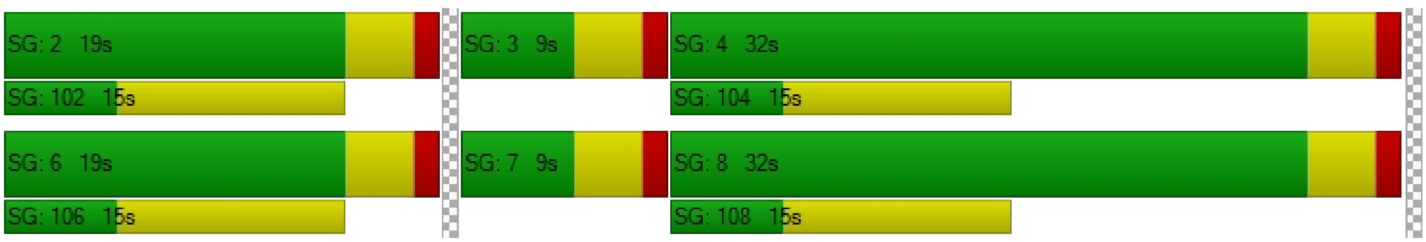
X, volume / capacity	0.01	0.00	0.01	0.02	0.08	0.84	0.02	0.02	0.75	0.03
d, Delay for Lane Group [s/veh]	12.71	11.33	22.11	11.46	10.39	17.56	10.83	11.16	17.07	11.80
Lane Group LOS	B	B	C	B	B	B	B	B	B	B
Critical Lane Group	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.03	0.01	0.05	0.10	0.18	6.39	0.09	0.04	5.16	0.12
50th-Percentile Queue Length [ft]	0.87	0.20	1.29	2.46	4.60	159.71	2.23	1.00	128.91	2.92
95th-Percentile Queue Length [veh]	0.06	0.01	0.09	0.18	0.33	10.53	0.16	0.07	8.88	0.21
95th-Percentile Queue Length [ft]	1.56	0.37	2.33	4.43	8.28	263.34	4.01	1.80	222.02	5.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	12.71	12.71	11.33	22.11	22.11	11.46	10.39	17.56	10.83	11.16	17.07	11.80
Movement LOS	B	B	B	C	C	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	12.43			14.12			17.31			16.94		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	17.11											
Intersection LOS	B											
Intersection V/C	0.386											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	26.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.717

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	188	549	110	99	692	91	126	746	209	156	679	85
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	188	549	110	99	692	91	126	746	209	156	679	85
Peak Hour Factor	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	145	29	26	183	24	33	197	55	41	179	22
Total Analysis Volume [veh/h]	199	580	116	105	731	96	133	788	221	165	717	90
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	19	0	12	19	0	10	19	0	10	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	19	19	5	15	15	6	15	15	6	15	15
g / C, Green / Cycle	0.13	0.31	0.31	0.08	0.25	0.25	0.09	0.25	0.25	0.10	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.11	0.16	0.07	0.06	0.20	0.06	0.07	0.22	0.14	0.09	0.20	0.06
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	242	1133	506	138	925	413	171	884	395	181	904	404
d1, Uniform Delay [s]	25.34	16.88	15.27	27.22	20.86	17.70	26.58	21.93	19.87	26.76	21.07	17.89
k, delay calibration	0.23	0.50	0.50	0.11	0.50	0.50	0.15	0.11	0.11	0.25	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.86	1.66	1.06	8.45	6.85	1.32	9.94	3.39	1.25	29.30	1.62	0.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

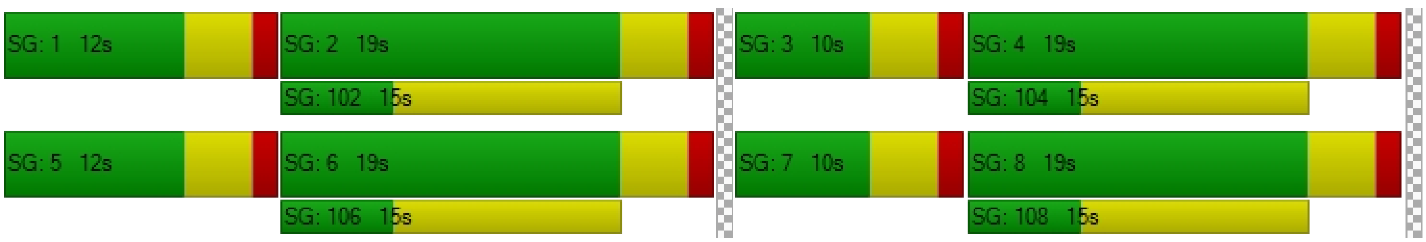
X, volume / capacity	0.82	0.51	0.23	0.76	0.79	0.23	0.78	0.89	0.56	0.91	0.79	0.22
d, Delay for Lane Group [s/veh]	39.20	18.54	16.33	35.67	27.71	19.01	36.52	25.32	21.12	56.06	22.69	18.17
Lane Group LOS	D	B	B	D	C	B	D	C	C	E	C	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	3.31	2.91	1.11	1.62	4.84	1.03	2.16	5.07	2.50	3.60	4.29	0.90
50th-Percentile Queue Length [ft]	82.83	72.77	27.69	40.46	120.92	25.82	54.05	126.85	62.61	89.89	107.34	22.57
95th-Percentile Queue Length [veh]	5.96	5.24	1.99	2.91	8.44	1.86	3.89	8.77	4.51	6.47	7.69	1.63
95th-Percentile Queue Length [ft]	149.10	130.99	49.84	72.83	211.09	46.47	97.29	219.21	112.70	161.80	192.30	40.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.20	18.54	16.33	35.67	27.71	19.01	36.52	25.32	21.12	56.06	22.69	18.17
Movement LOS	D	B	B	D	C	B	D	C	C	E	C	B
d_A, Approach Delay [s/veh]	22.84			27.71			25.81			27.93		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	26.11											
Intersection LOS	C											
Intersection V/C	0.717											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	20.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.021

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	2	869	1085	5	5	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	869	1085	5	5	7
Peak Hour Factor	0.9233	0.9233	0.9233	0.9233	0.9233	0.9233
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	235	294	1	1	2
Total Analysis Volume [veh/h]	2	941	1175	5	5	8
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.02	0.02
d_M, Delay for Movement [s/veh]	11.03	0.00	0.00	0.00	20.84	13.30
Movement LOS	B	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.01	0.00	0.00	0.00	0.12	0.12
95th-Percentile Queue Length [ft]	0.25	0.00	0.00	0.00	3.03	3.03
d_A, Approach Delay [s/veh]	0.02		0.00		16.20	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.11					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	19.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.034

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	717	2	9	1151	8	63
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	717	2	9	1151	8	63
Peak Hour Factor	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	192	1	2	308	2	17
Total Analysis Volume [veh/h]	768	2	10	1232	9	67
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					Yes	
Number of Storage Spaces in Median	0		0		1	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.01	0.03	0.11
d_M, Delay for Movement [s/veh]	0.00	0.00	9.27	0.00	19.04	11.51
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.04	0.00	0.10	0.36
95th-Percentile Queue Length [ft]	0.00	0.00	0.89	0.00	2.62	9.04
d_A, Approach Delay [s/veh]	0.00		0.07		12.40	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.50					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	8.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.487

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	9	693	17	6	1087	7	1	0	10	170	0	25
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	693	17	6	1087	7	1	0	10	170	0	25
Peak Hour Factor	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	181	4	2	284	2	0	0	3	44	0	7
Total Analysis Volume [veh/h]	9	723	18	6	1134	7	1	0	10	177	0	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	0	0	7	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	0	0	5	0	0
Maximum Green [s]	30	30	0	30	30	0	30	0	0	30	0	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0
Split [s]	9	19	0	9	19	0	32	0	0	32	0	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	5	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	10	0	0	10	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall	No	No		No	No		No			No		
Maximum Recall	No	No		No	No		No			No		
Pedestrian Recall	No	No		No	No		No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	R	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	41	36	36	41	36	36	11	11	11	11
g / C, Green / Cycle	0.68	0.60	0.60	0.68	0.60	0.60	0.19	0.19	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.02	0.20	0.01	0.01	0.31	0.00	0.00	0.01	0.12	0.02
s, saturation flow rate [veh/h]	591	3618	1615	807	3618	1615	1440	1615	1440	1615
c, Capacity [veh/h]	493	2193	979	660	2179	973	335	300	335	300
d1, Uniform Delay [s]	4.03	5.82	4.71	3.33	6.91	4.77	21.73	20.04	24.76	20.24
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	0.40	0.03	0.01	0.89	0.01	0.00	0.04	1.29	0.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

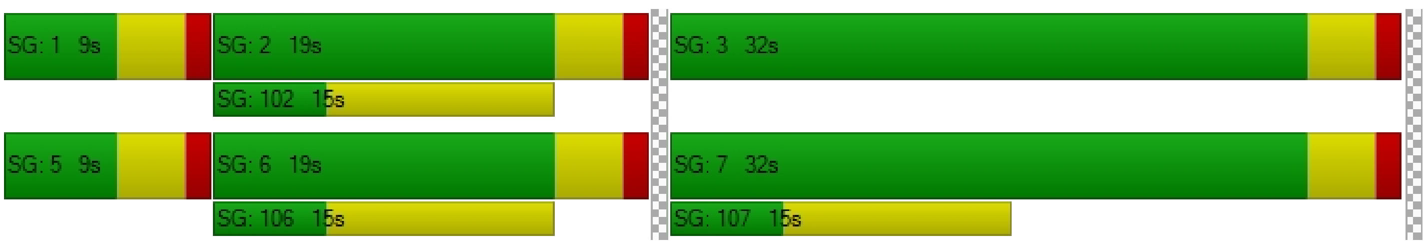
X, volume / capacity	0.02	0.33	0.02	0.01	0.52	0.01	0.00	0.03	0.53	0.09
d, Delay for Lane Group [s/veh]	4.10	6.22	4.74	3.34	7.80	4.78	21.73	20.08	26.05	20.36
Lane Group LOS	A	A	A	A	A	A	C	C	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.02	1.38	0.06	0.01	2.63	0.02	0.01	0.11	2.39	0.29
50th-Percentile Queue Length [ft]	0.58	34.62	1.51	0.26	65.70	0.59	0.29	2.78	59.87	7.31
95th-Percentile Queue Length [veh]	0.04	2.49	0.11	0.02	4.73	0.04	0.02	0.20	4.31	0.53
95th-Percentile Queue Length [ft]	1.05	62.32	2.71	0.46	118.26	1.07	0.52	5.00	107.77	13.15

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	4.10	6.22	4.74	3.34	7.80	4.78	21.73	0.00	20.08	26.05	0.00	20.36
Movement LOS	A	A	A	A	A	A	C		C	C		C
d_A, Approach Delay [s/veh]	6.16			7.76			20.23			25.32		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	8.95											
Intersection LOS	A											
Intersection V/C	0.487											

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	21.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.786

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	40	510	147	175	1059	13	10	4	15	313	2	229
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	510	147	175	1059	13	10	4	15	313	2	229
Peak Hour Factor	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	138	40	47	286	4	3	1	4	84	1	62
Total Analysis Volume [veh/h]	43	550	159	189	1143	14	11	4	16	338	2	247
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	17	27	0	0	24	0	0	24	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	20	20	8	26	26	20	20	20	20
g / C, Green / Cycle	0.04	0.34	0.34	0.13	0.42	0.42	0.33	0.33	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.02	0.15	0.10	0.10	0.21	0.21	0.09	0.01	0.45	0.15
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1888	340	1414	710	1615
c, Capacity [veh/h]	81	1219	544	242	1540	804	193	134	354	533
d1, Uniform Delay [s]	28.11	15.59	14.66	25.22	12.56	12.56	15.91	29.85	23.05	15.95
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.27	1.21	1.36	5.47	1.13	2.16	0.38	0.50	28.96	0.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

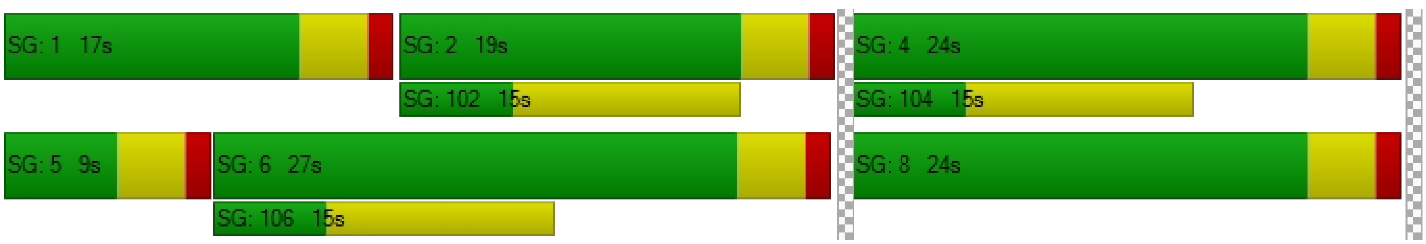
X, volume / capacity	0.53	0.45	0.29	0.78	0.49	0.49	0.16	0.15	0.91	0.46
d, Delay for Lane Group [s/veh]	33.39	16.80	16.02	30.69	13.69	14.72	16.29	30.35	52.00	16.57
Lane Group LOS	C	B	B	C	B	B	B	C	D	B
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.65	2.57	1.49	2.62	3.04	3.40	0.28	0.29	7.26	2.50
50th-Percentile Queue Length [ft]	16.37	64.20	37.27	65.55	75.91	84.99	7.04	7.34	181.58	62.62
95th-Percentile Queue Length [veh]	1.18	4.62	2.68	4.72	5.47	6.12	0.51	0.53	11.68	4.51
95th-Percentile Queue Length [ft]	29.46	115.56	67.08	117.99	136.63	152.97	12.67	13.21	292.08	112.72

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.39	16.80	16.02	30.69	14.04	14.72	16.29	16.29	16.29	50.72	52.00	16.57
Movement LOS	C	B	B	C	B	B	B	B	B	D	D	B
d_A, Approach Delay [s/veh]	17.58			16.38			16.29			36.36		
Approach LOS	B			B			B			D		
d_I, Intersection Delay [s/veh]	21.03											
Intersection LOS	C											
Intersection V/C	0.786											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Existing Plus Project

Intersection Level Of Service Report
Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	22.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.408

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	97	88	41	51	124	57	221	832	337	76	396	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	97	88	41	51	124	57	221	832	337	76	396	27
Peak Hour Factor	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	25	12	14	35	16	62	235	95	21	112	8
Total Analysis Volume [veh/h]	109	99	46	58	140	64	249	939	380	86	447	30
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	61
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	13	23	0	9	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	20	20	3	19	19	6	18	18	4	16	16
g / C, Green / Cycle	0.07	0.32	0.32	0.05	0.30	0.30	0.10	0.30	0.30	0.06	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.03	0.04	0.04	0.02	0.04	0.04	0.07	0.26	0.24	0.02	0.12	0.02
s, saturation flow rate [veh/h]	3514	1900	1704	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	246	611	548	185	1100	491	366	1086	485	225	941	420
d1, Uniform Delay [s]	27.28	14.65	14.68	27.90	15.41	15.42	26.41	20.22	19.58	27.45	19.10	17.05
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.23	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.25	0.41	0.49	0.96	0.24	0.55	2.23	2.21	5.80	1.06	0.37	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

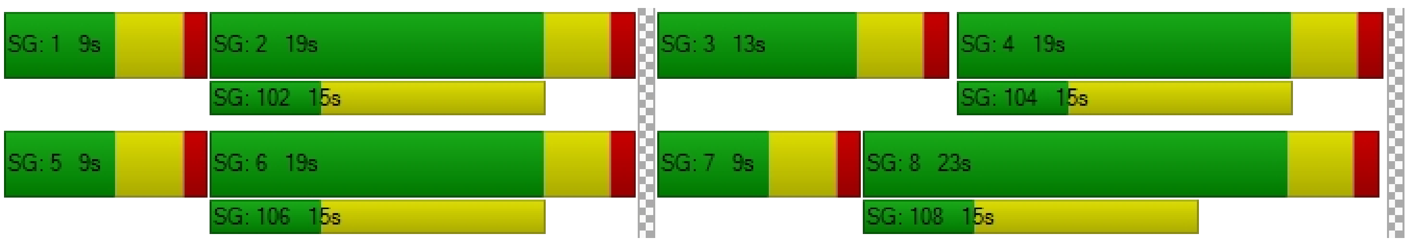
X, volume / capacity	0.44	0.12	0.13	0.31	0.13	0.13	0.68	0.86	0.78	0.38	0.48	0.07
d, Delay for Lane Group [s/veh]	28.53	15.05	15.17	28.86	15.65	15.97	28.64	22.43	25.38	28.52	19.47	17.12
Lane Group LOS	C	B	B	C	B	B	C	C	C	C	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.74	0.70	0.68	0.40	0.65	0.64	1.70	5.73	5.01	0.59	2.39	0.29
50th-Percentile Queue Length [ft]	18.57	17.54	16.91	10.01	16.34	15.99	42.60	143.36	125.37	14.66	59.85	7.24
95th-Percentile Queue Length [veh]	1.34	1.26	1.22	0.72	1.18	1.15	3.07	9.66	8.69	1.06	4.31	0.52
95th-Percentile Queue Length [ft]	33.42	31.57	30.44	18.02	29.41	28.78	76.68	241.54	217.18	26.39	107.74	13.03

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	28.53	15.08	15.17	28.86	15.65	15.97	28.64	22.43	25.38	28.52	19.47	17.12
Movement LOS	C	B	B	C	B	B	C	C	C	C	B	B
d_A, Approach Delay [s/veh]	20.87			18.65			24.13			20.73		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	22.55											
Intersection LOS	C											
Intersection V/C	0.408											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	19.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.322

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	10	4	2	6	2	10	34	855	24	3	385	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	4	2	6	2	10	34	855	24	3	385	11
Peak Hour Factor	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	1	1	2	1	3	10	241	7	1	108	3
Total Analysis Volume [veh/h]	11	5	2	7	2	11	38	963	27	3	433	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	62
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	9	32	0	9	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	30	30	30	30	24	20	20	24	18	18
g / C, Green / Cycle	0.48	0.48	0.48	0.48	0.39	0.32	0.32	0.39	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.02	0.00	0.01	0.01	0.03	0.27	0.02	0.00	0.12	0.01
s, saturation flow rate [veh/h]	669	1615	630	1615	1126	3618	1615	710	3618	1615
c, Capacity [veh/h]	417	771	403	771	524	1171	523	308	1045	467
d1, Uniform Delay [s]	10.95	8.51	11.01	8.55	11.96	19.37	14.45	13.33	17.85	15.83
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.17	0.01	0.10	0.03	0.06	1.51	0.04	0.01	0.26	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

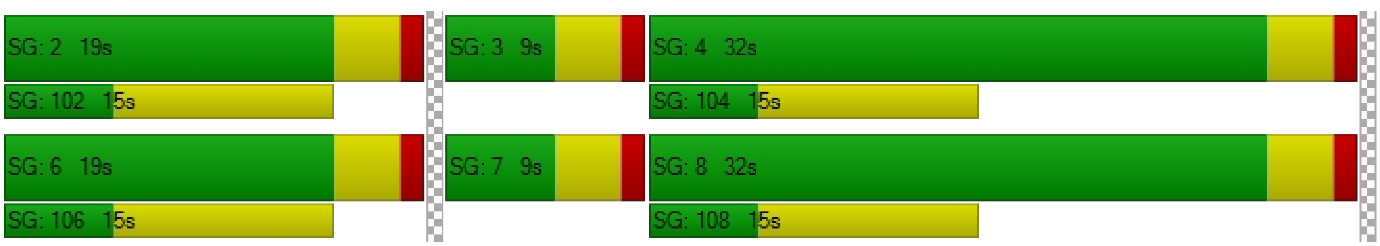
X, volume / capacity	0.04	0.00	0.02	0.01	0.07	0.82	0.05	0.01	0.41	0.03
d, Delay for Lane Group [s/veh]	11.12	8.51	11.11	8.59	12.01	20.87	14.49	13.34	18.11	15.85
Lane Group LOS	B	A	B	A	B	C	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.12	0.01	0.07	0.07	0.29	5.71	0.23	0.02	2.23	0.11
50th-Percentile Queue Length [ft]	2.96	0.34	1.67	1.87	7.13	142.79	5.87	0.56	55.87	2.77
95th-Percentile Queue Length [veh]	0.21	0.02	0.12	0.13	0.51	9.63	0.42	0.04	4.02	0.20
95th-Percentile Queue Length [ft]	5.34	0.61	3.00	3.37	12.84	240.78	10.56	1.01	100.56	4.99

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.12	11.12	8.51	11.11	11.11	8.59	12.01	20.87	14.49	13.34	18.11	15.85
Movement LOS	B	B	A	B	B	A	B	C	B	B	B	B
d_A, Approach Delay [s/veh]	10.83			9.72			20.38			18.02		
Approach LOS	B			A			C			B		
d_I, Intersection Delay [s/veh]	19.42											
Intersection LOS	B											
Intersection V/C	0.322											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Project West Driveway (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	8.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Project West Driveway		Dumas St		Dumas Street	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Project West Driveway		Dumas St		Dumas Street	
Base Volume Input [veh/h]	4	1	11	14	8	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	1	11	14	8	12
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	3	4	2	3
Total Analysis Volume [veh/h]	4	1	12	15	9	13
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	8.78	8.40	0.00	0.00	7.26	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.02	0.02	0.00	0.00	0.04	0.04
95th-Percentile Queue Length [ft]	0.39	0.39	0.00	0.00	1.05	1.05
d_A, Approach Delay [s/veh]	8.70		0.00		2.97	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.02					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 4: Project East DriveWay (NS) at Dumas Street (EW)

Control Type:	Two-way stop	Delay (sec / veh):	8.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	Project East DriveWay		Dumas Street		Dumas St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Project East DriveWay		Dumas Street		Dumas St	
Base Volume Input [veh/h]	0	3	12	0	18	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	3	12	0	18	20
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	1	3	0	5	5
Total Analysis Volume [veh/h]	0	3	13	0	20	22
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	8.36	0.00	0.00	7.25	0.00
Movement LOS		A	A		A	A
95th-Percentile Queue Length [veh]	0.00	0.01	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	0.00	0.21	0.00	0.00	2.00	2.00
d_A, Approach Delay [s/veh]	8.36		0.00		3.45	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.93					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	21.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.548

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	70	596	57	48	522	80	160	381	289	85	256	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	596	57	48	522	80	160	381	289	85	256	67
Peak Hour Factor	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	170	16	14	149	23	46	108	82	24	73	19
Total Analysis Volume [veh/h]	80	679	65	55	595	91	182	434	329	97	292	76
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	13	23	0	9	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	22	22	3	21	21	8	15	15	4	11	11
g / C, Green / Cycle	0.06	0.37	0.37	0.05	0.36	0.36	0.13	0.25	0.25	0.07	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.04	0.03	0.16	0.06	0.10	0.12	0.20	0.05	0.08	0.05
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	113	1322	590	93	1281	572	230	893	399	128	688	307
d1, Uniform Delay [s]	27.65	14.91	12.62	27.91	15.02	13.30	25.48	19.39	21.43	27.45	21.45	20.70
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.15	0.11	0.16	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.77	1.43	0.38	5.89	1.21	0.60	8.04	0.41	6.30	8.92	0.42	0.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

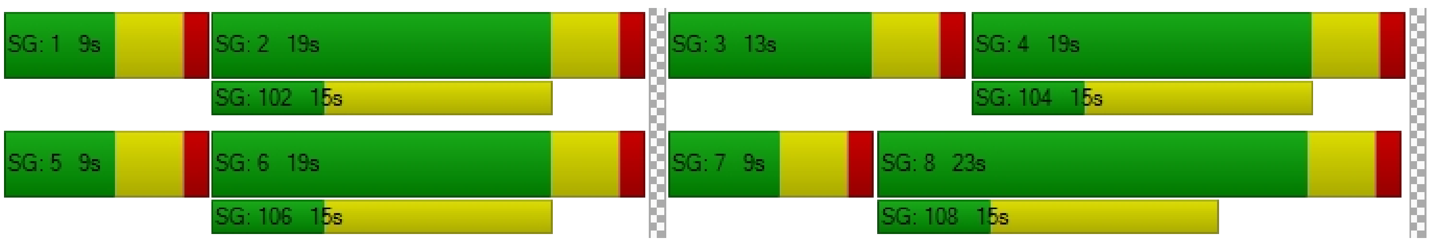
X, volume / capacity	0.71	0.51	0.11	0.59	0.46	0.16	0.79	0.49	0.83	0.76	0.42	0.25
d, Delay for Lane Group [s/veh]	35.42	16.34	13.00	33.80	16.23	13.89	33.52	19.80	27.73	36.37	21.87	21.11
Lane Group LOS	D	B	B	C	B	B	C	B	C	D	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.24	3.10	0.52	0.84	2.70	0.77	2.79	2.33	4.51	1.56	1.66	0.85
50th-Percentile Queue Length [ft]	30.93	77.38	13.02	20.88	67.41	19.16	69.71	58.20	112.83	39.12	41.41	21.18
95th-Percentile Queue Length [veh]	2.23	5.57	0.94	1.50	4.85	1.38	5.02	4.19	8.00	2.82	2.98	1.53
95th-Percentile Queue Length [ft]	55.68	139.28	23.44	37.59	121.34	34.49	125.48	104.76	199.93	70.42	74.53	38.13

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	35.42	16.34	13.00	33.80	16.23	13.89	33.52	19.80	27.73	36.37	21.87	21.11
Movement LOS	D	B	B	C	B	B	C	B	C	D	C	C
d_A, Approach Delay [s/veh]	17.93			17.25			25.20			24.77		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	21.14											
Intersection LOS	C											
Intersection V/C	0.548											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	20.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.026

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	14	730	862	22	5	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	730	862	22	5	10
Peak Hour Factor	0.8593	0.8593	0.8593	0.8593	0.8593	0.8593
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	212	251	6	1	3
Total Analysis Volume [veh/h]	16	850	1003	26	6	12
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.01	0.00	0.03	0.02
d_M, Delay for Movement [s/veh]	10.40	0.00	0.00	0.00	20.86	12.41
Movement LOS	B	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.07	0.00	0.00	0.00	0.15	0.15
95th-Percentile Queue Length [ft]	1.80	0.00	0.00	0.00	3.82	3.82
d_A, Approach Delay [s/veh]	0.19		0.00		15.23	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.23					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	67.3
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.218

Intersection Setup

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	215.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			No		

volumes

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Base Volume Input [veh/h]	18	722	27	77	753	24	14	0	6	1	0	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	722	27	77	753	24	14	0	6	1	0	6
Peak Hour Factor	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	210	8	22	219	7	4	0	2	0	0	2
Total Analysis Volume [veh/h]	21	841	31	90	877	28	16	0	7	1	0	7
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.00	0.12	0.01	0.00	0.22	0.00	0.01	0.01	0.00	0.01
d_M, Delay for Movement [s/veh]	9.87	0.00	0.00	10.20	0.00	0.00	67.34	0.00	11.38	53.28	0.00	11.20
Movement LOS	A	A	A	B	A	A	F		B	F		B
95th-Percentile Queue Length [veh]	0.09	0.00	0.00	0.39	0.00	0.00	0.76	0.00	0.04	0.04	0.00	0.04
95th-Percentile Queue Length [ft]	2.13	0.00	0.00	9.71	0.00	0.00	18.94	0.00	0.93	1.00	0.00	0.90
d_A, Approach Delay [s/veh]	0.23			0.92			50.31			16.46		
Approach LOS	A			A			F			C		
d_I, Intersection Delay [s/veh]	1.26											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	3.7
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.604

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	5	733	161	21	737	7	8	4	11	23	0	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	733	161	21	737	7	8	4	11	23	0	7
Peak Hour Factor	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	205	45	6	206	2	2	1	3	6	0	2
Total Analysis Volume [veh/h]	6	818	180	23	823	8	9	4	12	26	0	8
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	47	0	9	47	0	0	19	0	0	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	C	R	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	50	44	44	50	45	45	2	2	2	2
g / C, Green / Cycle	0.83	0.73	0.73	0.83	0.75	0.75	0.04	0.04	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.01	0.23	0.11	0.03	0.23	0.00	0.17	0.01	0.31	0.00
s, saturation flow rate [veh/h]	735	3618	1615	764	3618	1615	78	1615	83	1615
c, Capacity [veh/h]	729	2647	1182	749	2715	1212	104	65	123	65
d1, Uniform Delay [s]	1.13	2.80	2.44	1.17	2.43	1.88	30.07	27.92	30.07	27.85
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.18	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.30	0.27	0.02	0.29	0.01	0.87	1.36	3.88	0.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.01	0.31	0.15	0.03	0.30	0.01	0.12	0.18	0.21	0.12
d, Delay for Lane Group [s/veh]	1.15	3.10	2.71	1.19	2.71	1.89	30.93	29.28	33.95	28.69
Lane Group LOS	A	A	A	A	A	A	C	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.00	0.47	0.23	0.00	0.31	0.01	0.21	0.18	0.50	0.12
50th-Percentile Queue Length [ft]	0.10	11.85	5.72	0.09	7.69	0.16	5.14	4.58	12.42	3.02
95th-Percentile Queue Length [veh]	0.01	0.85	0.41	0.01	0.55	0.01	0.37	0.33	0.89	0.22
95th-Percentile Queue Length [ft]	0.19	21.32	10.29	0.15	13.83	0.28	9.25	8.24	22.36	5.43

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.15	3.10	2.71	1.19	2.71	1.89	30.93	30.93	29.28	33.95	33.95	28.69
Movement LOS	A	A	A	A	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	3.02			2.67			30.14			32.72		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	3.74											
Intersection LOS	A											
Intersection V/C	0.604											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	16.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.631

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	24	686	371	246	516	4	3	2	2	61	1	221
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	686	371	246	516	4	3	2	2	61	1	221
Peak Hour Factor	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	194	105	70	146	1	1	1	1	17	0	63
Total Analysis Volume [veh/h]	27	777	420	279	585	5	3	2	2	69	1	250
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	61
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	20	30	0	0	21	0	0	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	26	26	11	36	36	12	12	12	12
g / C, Green / Cycle	0.03	0.43	0.43	0.19	0.58	0.58	0.19	0.19	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.01	0.21	0.26	0.15	0.11	0.11	0.00	0.02	0.03	0.15
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1892	1620	1435	1437	1615
c, Capacity [veh/h]	58	1547	691	337	2105	1101	391	316	389	306
d1, Uniform Delay [s]	29.07	12.76	13.54	23.93	5.99	5.99	20.15	23.19	20.65	23.75
k, delay calibration	0.11	0.50	0.50	0.13	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.61	1.17	3.96	6.01	0.19	0.37	0.02	0.13	0.12	5.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

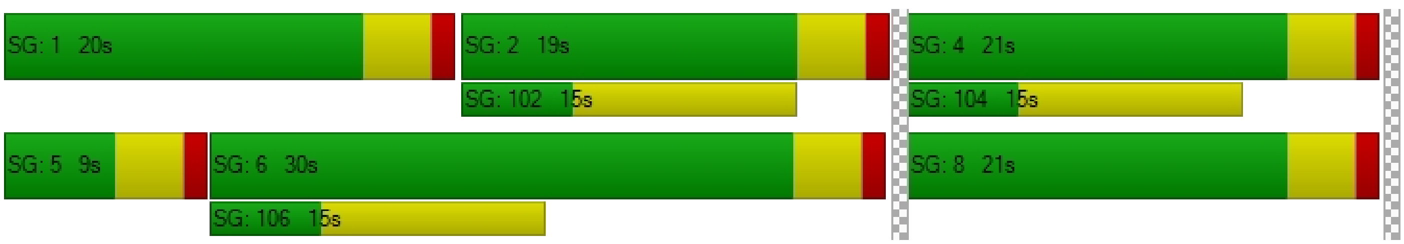
X, volume / capacity	0.46	0.50	0.61	0.83	0.18	0.18	0.02	0.09	0.10	0.82
d, Delay for Lane Group [s/veh]	34.69	13.93	17.49	29.94	6.18	6.36	20.17	23.32	20.77	29.04
Lane Group LOS	C	B	B	C	A	A	C	C	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	0.44	3.17	4.10	3.87	0.77	0.86	0.08	0.36	0.47	3.67
50th-Percentile Queue Length [ft]	10.94	79.18	102.61	96.75	19.17	21.41	1.96	9.12	11.65	91.68
95th-Percentile Queue Length [veh]	0.79	5.70	7.39	6.97	1.38	1.54	0.14	0.66	0.84	6.60
95th-Percentile Queue Length [ft]	19.69	142.52	184.69	174.16	34.50	38.53	3.53	16.42	20.97	165.02

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.69	13.93	17.49	29.94	6.24	6.36	20.17	20.17	20.17	23.32	20.77	29.04
Movement LOS	C	B	B	C	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	15.61			13.85			20.17			27.46		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	16.56											
Intersection LOS	B											
Intersection V/C	0.631											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Signalized	Delay (sec / veh):	6.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.392

Intersection Setup

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	215.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			No		

volumes

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Base Volume Input [veh/h]	18	722	27	77	753	24	14	0	6	1	0	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	722	27	77	753	24	14	0	6	1	0	6
Peak Hour Factor	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	210	8	22	219	7	4	0	2	0	0	2
Total Analysis Volume [veh/h]	21	841	31	90	877	28	16	0	7	1	0	7
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	0	0	7	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	0	0	5	0	0
Maximum Green [s]	30	30	0	30	30	0	30	0	0	30	0	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0
Split [s]	96	32	0	83	19	0	15	0	0	15	0	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	5	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	10	0	0	10	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall	No	No		No	No		No			No		
Maximum Recall	No	No		No	No		No			No		
Pedestrian Recall	No	No		No	No		No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	R	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	9	9	2	10	10	1	1	1	1
g / C, Green / Cycle	0.03	0.37	0.37	0.10	0.44	0.44	0.03	0.03	0.03	0.03
(v / s)_i Volume / Saturation Flow Rate	0.01	0.23	0.02	0.05	0.24	0.02	0.01	0.00	0.00	0.00
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1440	1615	1440	1615
c, Capacity [veh/h]	51	1345	600	174	1591	710	301	50	301	50
d1, Uniform Delay [s]	11.44	6.16	4.82	10.29	4.96	3.82	11.97	11.30	11.97	11.30
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.18	0.48	0.04	2.36	0.30	0.02	0.07	1.28	0.00	1.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

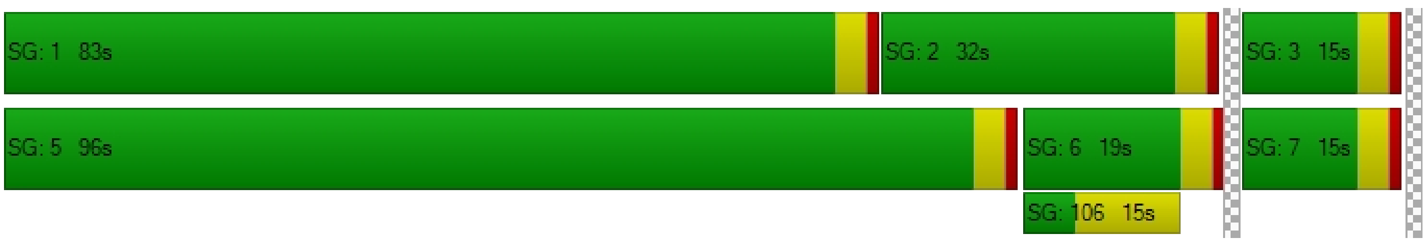
X, volume / capacity	0.41	0.63	0.05	0.52	0.55	0.04	0.05	0.14	0.00	0.14
d, Delay for Lane Group [s/veh]	16.61	6.64	4.85	12.65	5.26	3.85	12.05	12.57	11.97	12.57
Lane Group LOS	B	A	A	B	A	A	B	B	B	B
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh]	0.13	0.30	0.02	0.32	0.07	0.00	0.07	0.04	0.00	0.04
50th-Percentile Queue Length [ft]	3.25	7.38	0.44	8.06	1.66	0.11	1.66	1.06	0.10	1.06
95th-Percentile Queue Length [veh]	0.23	0.53	0.03	0.58	0.12	0.01	0.12	0.08	0.01	0.08
95th-Percentile Queue Length [ft]	5.85	13.28	0.80	14.51	2.98	0.20	3.00	1.91	0.18	1.91

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.61	6.64	4.85	12.65	5.26	3.85	12.05	0.00	12.57	11.97	0.00	12.57
Movement LOS	B	A	A	B	A	A	B		B	B		B
d_A, Approach Delay [s/veh]	6.81			5.89			12.21			12.50		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	6.42											
Intersection LOS	A											
Intersection V/C	0.392											

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	26.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.714

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	457	288	128	145	157	258	120	906	299	143	807	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	457	288	128	145	157	258	120	906	299	143	807	42
Peak Hour Factor	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	123	78	35	39	42	70	32	244	81	39	218	11
Total Analysis Volume [veh/h]	493	311	138	156	169	278	129	977	322	154	870	45
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	19	0	14	19	0	11	23	0	9	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	20	20	5	15	15	5	19	19	5	19	19
g / C, Green / Cycle	0.15	0.32	0.32	0.07	0.23	0.23	0.07	0.29	0.29	0.07	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.14	0.12	0.12	0.04	0.05	0.17	0.04	0.27	0.20	0.04	0.24	0.03
s, saturation flow rate [veh/h]	3514	1900	1705	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	541	600	538	255	848	379	245	1061	474	254	1071	478
d1, Uniform Delay [s]	27.08	17.39	17.39	29.27	19.99	23.02	29.22	22.25	20.29	29.26	21.22	16.58
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.19	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.38	1.94	2.16	2.37	0.53	11.95	1.75	3.85	3.06	2.32	1.55	0.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

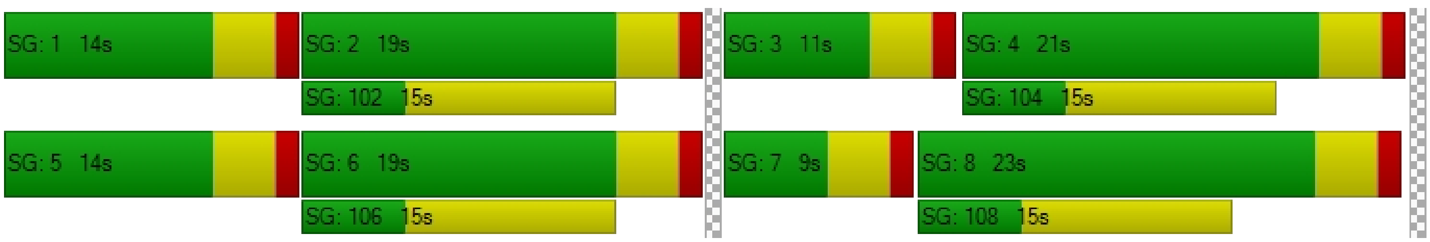
X, volume / capacity	0.91	0.39	0.39	0.61	0.20	0.73	0.53	0.92	0.68	0.61	0.81	0.09
d, Delay for Lane Group [s/veh]	33.46	19.33	19.55	31.64	20.52	34.97	30.97	26.10	23.35	31.58	22.77	16.66
Lane Group LOS	C	B	B	C	C	C	C	C	C	C	C	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	3.90	2.76	2.51	1.18	0.99	4.78	0.96	6.87	4.19	1.16	5.59	0.44
50th-Percentile Queue Length [ft]	97.60	69.12	62.85	29.47	24.83	119.58	24.03	171.65	104.71	29.06	139.81	11.12
95th-Percentile Queue Length [veh]	7.03	4.98	4.52	2.12	1.79	8.37	1.73	11.16	7.54	2.09	9.47	0.80
95th-Percentile Queue Length [ft]	175.68	124.42	113.12	53.05	44.69	209.25	43.26	279.08	188.47	52.31	236.77	20.01

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.46	19.39	19.55	31.64	20.52	34.97	30.97	26.10	23.35	31.58	22.77	16.66
Movement LOS	C	B	B	C	C	C	C	C	C	C	C	B
d_A, Approach Delay [s/veh]	26.78			30.06			25.92			23.78		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	26.17											
Intersection LOS	C											
Intersection V/C	0.714											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	17.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.415

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	14	4	1	4	1	11	29	1130	16	6	953	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	4	1	4	1	11	29	1130	16	6	953	15
Peak Hour Factor	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	1	0	1	0	3	8	308	4	2	260	4
Total Analysis Volume [veh/h]	15	4	1	4	1	12	32	1232	17	7	1039	16
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	61
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	9	32	0	9	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24	24	29	25	25	29	23	23
g / C, Green / Cycle	0.39	0.39	0.39	0.39	0.48	0.40	0.40	0.48	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.03	0.00	0.01	0.01	0.04	0.34	0.01	0.01	0.29	0.01
s, saturation flow rate [veh/h]	601	1615	592	1615	733	3618	1615	583	3618	1615
c, Capacity [veh/h]	339	627	336	627	386	1462	653	312	1371	612
d1, Uniform Delay [s]	13.29	11.45	13.21	11.52	10.59	16.46	10.97	11.39	16.55	11.91
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.32	0.00	0.08	0.06	0.09	1.40	0.02	0.03	0.88	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

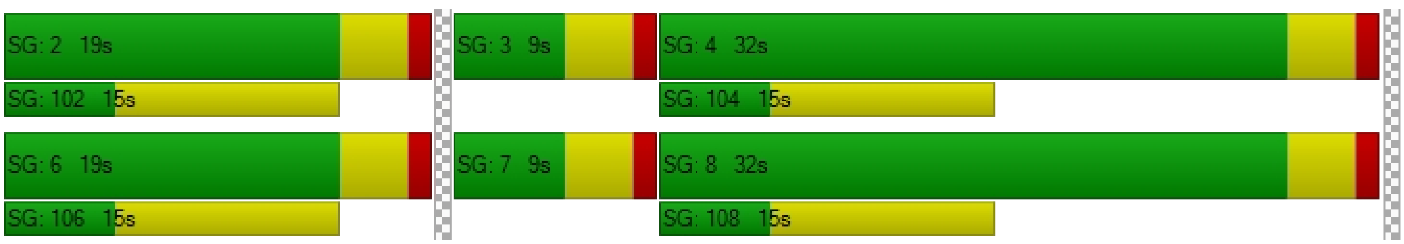
X, volume / capacity	0.06	0.00	0.01	0.02	0.08	0.84	0.03	0.02	0.76	0.03
d, Delay for Lane Group [s/veh]	13.60	11.45	13.29	11.58	10.68	17.86	10.99	11.42	17.43	11.93
Lane Group LOS	B	B	B	B	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.17	0.01	0.05	0.10	0.19	6.61	0.12	0.04	5.42	0.12
50th-Percentile Queue Length [ft]	4.33	0.21	1.13	2.50	4.71	165.24	2.98	1.03	135.39	2.98
95th-Percentile Queue Length [veh]	0.31	0.01	0.08	0.18	0.34	10.83	0.21	0.07	9.23	0.21
95th-Percentile Queue Length [ft]	7.79	0.37	2.03	4.51	8.49	270.64	5.37	1.85	230.80	5.37

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	13.60	13.60	11.45	13.29	13.29	11.58	10.68	17.86	10.99	11.42	17.43	11.93
Movement LOS	B	B	B	B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	13.50			12.08			17.59			17.31		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	17.39											
Intersection LOS	B											
Intersection V/C	0.415											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Project West Driveway (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	8.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name	Project West Driveway		Dumas St		Dumas Street	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Project West Driveway		Dumas St		Dumas Street	
Base Volume Input [veh/h]	14	4	10	4	4	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	4	10	4	4	16
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	1	3	1	1	4
Total Analysis Volume [veh/h]	15	4	11	4	4	17
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.76	8.43	0.00	0.00	7.23	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.06	0.06	0.00	0.00	0.04	0.04
95th-Percentile Queue Length [ft]	1.46	1.46	0.00	0.00	0.99	0.99
d_A, Approach Delay [s/veh]	8.69		0.00		1.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.53					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 4: Project East DriveWay (NS) at Dumas Street (EW)

Control Type:	Two-way stop	Delay (sec / veh):	8.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Project East DriveWay		Dumas Street		Dumas St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Project East DriveWay		Dumas Street		Dumas St	
Base Volume Input [veh/h]	0	7	14	0	9	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	7	14	0	9	20
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	4	0	2	5
Total Analysis Volume [veh/h]	0	8	15	0	10	22
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	8.39	0.00	0.00	7.24	0.00
Movement LOS		A	A		A	A
95th-Percentile Queue Length [veh]	0.00	0.02	0.00	0.00	0.06	0.06
95th-Percentile Queue Length [ft]	0.00	0.56	0.00	0.00	1.51	1.51
d_A, Approach Delay [s/veh]	8.39		0.00		2.26	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.54					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.733

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	207	559	120	99	696	91	126	746	219	160	679	85
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	207	559	120	99	696	91	126	746	219	160	679	85
Peak Hour Factor	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	148	32	26	184	24	33	197	58	42	179	22
Total Analysis Volume [veh/h]	219	590	127	105	735	96	133	788	231	169	717	90
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	19	0	12	19	0	10	19	0	10	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	19	19	5	15	15	6	15	15	6	15	15
g / C, Green / Cycle	0.13	0.31	0.31	0.08	0.25	0.25	0.09	0.25	0.25	0.10	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.12	0.16	0.08	0.06	0.20	0.06	0.07	0.22	0.14	0.09	0.20	0.06
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	242	1133	506	138	925	413	171	884	395	181	904	404
d1, Uniform Delay [s]	25.66	16.94	15.38	27.22	20.89	17.70	26.58	21.93	20.02	26.82	21.07	17.89
k, delay calibration	0.29	0.50	0.50	0.11	0.50	0.50	0.15	0.11	0.11	0.27	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	25.65	1.71	1.19	8.45	7.02	1.32	9.94	3.38	1.45	34.07	1.62	0.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

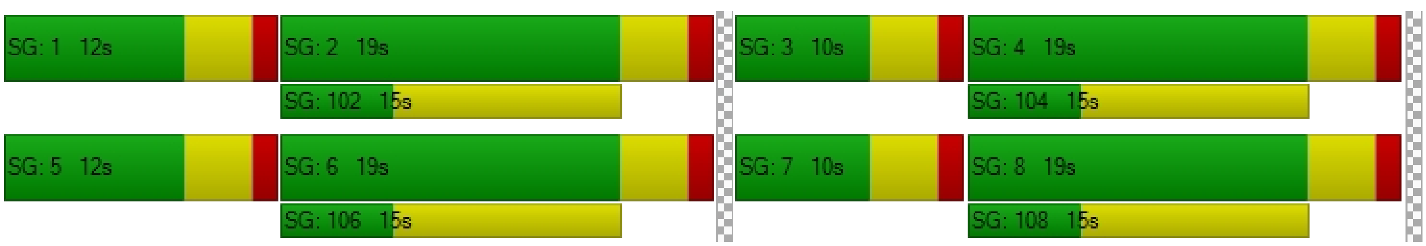
X, volume / capacity	0.91	0.52	0.25	0.76	0.80	0.23	0.78	0.89	0.59	0.93	0.79	0.22
d, Delay for Lane Group [s/veh]	51.30	18.65	16.57	35.67	27.91	19.02	36.52	25.31	21.47	60.89	22.69	18.17
Lane Group LOS	D	B	B	D	C	B	D	C	C	E	C	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	4.38	2.97	1.22	1.62	4.89	1.03	2.16	5.07	2.65	3.89	4.29	0.90
50th-Percentile Queue Length [ft]	109.43	74.37	30.62	40.46	122.13	25.82	54.05	126.84	66.29	97.30	107.34	22.57
95th-Percentile Queue Length [veh]	7.81	5.35	2.20	2.91	8.51	1.86	3.89	8.77	4.77	7.01	7.69	1.63
95th-Percentile Queue Length [ft]	195.21	133.87	55.12	72.83	212.75	46.47	97.29	219.19	119.33	175.15	192.29	40.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.30	18.65	16.57	35.67	27.91	19.02	36.52	25.31	21.47	60.89	22.69	18.17
Movement LOS	D	B	B	D	C	B	D	C	C	E	C	B
d_A, Approach Delay [s/veh]	26.01			27.87			25.84			28.88		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	27.10											
Intersection LOS	C											
Intersection V/C	0.733											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	24.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.026

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	7	907	1096	12	5	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	907	1096	12	5	18
Peak Hour Factor	0.9233	0.9233	0.9233	0.9233	0.9233	0.9233
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	246	297	3	1	5
Total Analysis Volume [veh/h]	8	982	1187	13	5	19
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.03	0.04
d_M, Delay for Movement [s/veh]	11.20	0.00	0.00	0.00	24.60	13.68
Movement LOS	B	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.04	0.00	0.00	0.00	0.22	0.22
95th-Percentile Queue Length [ft]	1.03	0.00	0.00	0.00	5.45	5.45
d_A, Approach Delay [s/veh]	0.09		0.00		15.96	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.21					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	165.9
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.731

Intersection Setup

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	215.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			No		

volumes

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Base Volume Input [veh/h]	8	722	2	9	1162	11	38	0	18	8	0	63
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	722	2	9	1162	11	38	0	18	8	0	63
Peak Hour Factor	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	193	1	2	311	3	10	0	5	2	0	17
Total Analysis Volume [veh/h]	9	773	2	10	1244	12	41	0	19	9	0	67
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.00	0.01	0.01	0.00	0.73	0.00	0.04	0.10	0.00	0.11
d_M, Delay for Movement [s/veh]	11.53	0.00	0.00	9.29	0.00	0.00	165.91	0.00	13.66	49.32	0.00	11.54
Movement LOS	B	A	A	A	A	A	F		B	E		B
95th-Percentile Queue Length [veh]	0.05	0.00	0.00	0.04	0.00	0.00	3.09	0.00	0.14	0.32	0.00	0.36
95th-Percentile Queue Length [ft]	1.22	0.00	0.00	0.89	0.00	0.00	77.21	0.00	3.42	8.06	0.00	9.08
d_A, Approach Delay [s/veh]	0.13			0.07			117.70			16.01		
Approach LOS	A			A			F			C		
d_I, Intersection Delay [s/veh]	3.88											
Intersection LOS	F											

Intersection Level Of Service Report

Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	9.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.496

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	9	706	17	6	1116	7	1	0	10	170	0	25
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	706	17	6	1116	7	1	0	10	170	0	25
Peak Hour Factor	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	184	4	2	291	2	0	0	3	44	0	7
Total Analysis Volume [veh/h]	9	737	18	6	1165	7	1	0	10	177	0	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	0	0	7	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	0	0	5	0	0
Maximum Green [s]	30	30	0	30	30	0	30	0	0	30	0	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0
Split [s]	9	19	0	9	19	0	32	0	0	32	0	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	5	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	10	0	0	10	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall	No	No		No	No		No			No		
Maximum Recall	No	No		No	No		No			No		
Pedestrian Recall	No	No		No	No		No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	R	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	41	36	36	41	36	36	11	11	11	11
g / C, Green / Cycle	0.68	0.60	0.60	0.68	0.60	0.60	0.19	0.19	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.02	0.20	0.01	0.01	0.32	0.00	0.00	0.01	0.12	0.02
s, saturation flow rate [veh/h]	578	3618	1615	798	3618	1615	1440	1615	1440	1615
c, Capacity [veh/h]	483	2193	979	653	2179	973	335	300	335	300
d1, Uniform Delay [s]	4.11	5.85	4.71	3.35	7.00	4.77	21.73	20.04	24.76	20.24
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	0.41	0.03	0.01	0.94	0.01	0.00	0.04	1.29	0.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

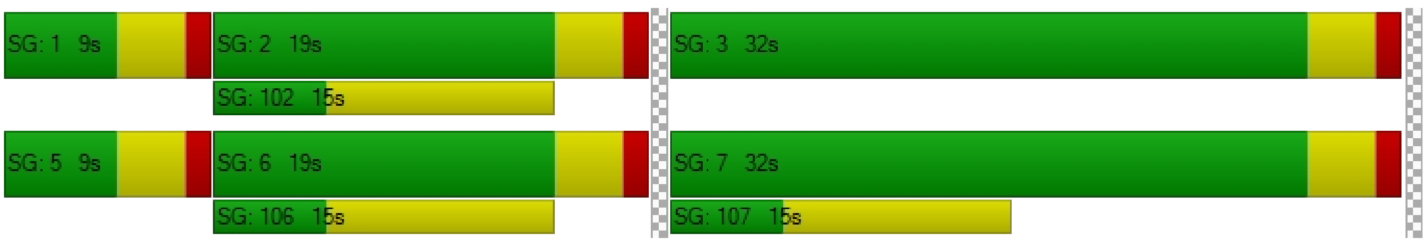
X, volume / capacity	0.02	0.34	0.02	0.01	0.53	0.01	0.00	0.03	0.53	0.09
d, Delay for Lane Group [s/veh]	4.18	6.26	4.74	3.35	7.94	4.78	21.73	20.08	26.05	20.36
Lane Group LOS	A	A	A	A	A	A	C	C	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.02	1.42	0.06	0.01	2.74	0.02	0.01	0.11	2.39	0.29
50th-Percentile Queue Length [ft]	0.59	35.48	1.51	0.26	68.47	0.59	0.29	2.78	59.87	7.31
95th-Percentile Queue Length [veh]	0.04	2.55	0.11	0.02	4.93	0.04	0.02	0.20	4.31	0.53
95th-Percentile Queue Length [ft]	1.06	63.86	2.71	0.46	123.24	1.07	0.52	5.00	107.77	13.15

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	4.18	6.26	4.74	3.35	7.94	4.78	21.73	0.00	20.08	26.05	0.00	20.36
Movement LOS	A	A	A	A	A	A	C		C	C		C
d_A, Approach Delay [s/veh]	6.20			7.90			20.23			25.32		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	9.00											
Intersection LOS	A											
Intersection V/C	0.496											

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	21.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.792

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	40	523	147	175	1088	13	10	4	15	313	2	229
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	523	147	175	1088	13	10	4	15	313	2	229
Peak Hour Factor	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	141	40	47	294	4	3	1	4	84	1	62
Total Analysis Volume [veh/h]	43	564	159	189	1174	14	11	4	16	338	2	247
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	61
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	17	27	0	0	24	0	0	24	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	21	21	8	26	26	20	20	20	20
g / C, Green / Cycle	0.04	0.34	0.34	0.13	0.43	0.43	0.33	0.33	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.02	0.16	0.10	0.10	0.22	0.22	0.09	0.01	0.45	0.15
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1889	338	1414	708	1615
c, Capacity [veh/h]	81	1250	558	241	1571	820	190	131	348	525
d1, Uniform Delay [s]	28.59	15.51	14.52	25.66	12.48	12.48	16.32	30.37	23.67	16.45
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.37	1.18	1.28	5.55	1.13	2.15	0.40	0.49	32.50	0.66
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

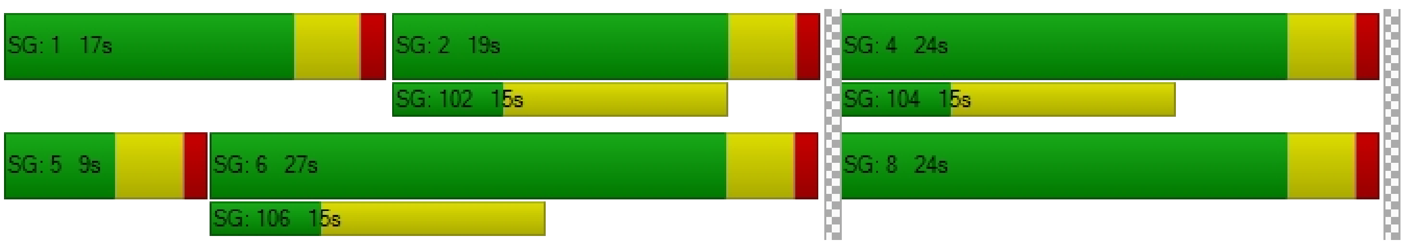
X, volume / capacity	0.53	0.45	0.28	0.78	0.50	0.50	0.16	0.14	0.92	0.47
d, Delay for Lane Group [s/veh]	33.97	16.69	15.80	31.20	13.61	14.63	16.72	30.86	56.17	17.11
Lane Group LOS	C	B	B	C	B	B	B	C	E	B
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.67	2.65	1.49	2.68	3.14	3.51	0.29	0.28	7.66	2.59
50th-Percentile Queue Length [ft]	16.70	66.27	37.25	66.95	78.51	87.79	7.27	6.98	191.61	64.68
95th-Percentile Queue Length [veh]	1.20	4.77	2.68	4.82	5.65	6.32	0.52	0.50	12.20	4.66
95th-Percentile Queue Length [ft]	30.06	119.29	67.04	120.51	141.32	158.03	13.08	12.57	305.11	116.43

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.97	16.69	15.80	31.20	13.95	14.63	16.72	16.72	16.72	54.77	56.17	17.11
Movement LOS	C	B	B	C	B	B	B	B	B	D	E	B
d_A, Approach Delay [s/veh]	17.48			16.32			16.72			38.93		
Approach LOS	B			B			B			D		
d_I, Intersection Delay [s/veh]	21.46											
Intersection LOS	C											
Intersection V/C	0.792											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Signalized	Delay (sec / veh):	5.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.434

Intersection Setup

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	215.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			No		

volumes

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Base Volume Input [veh/h]	8	722	2	9	1162	11	38	0	18	8	0	63
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	722	2	9	1162	11	38	0	18	8	0	63
Peak Hour Factor	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	193	1	2	311	3	10	0	5	2	0	17
Total Analysis Volume [veh/h]	9	773	2	10	1244	12	41	0	19	9	0	67
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	0	0	7	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	0	0	5	0	0
Maximum Green [s]	30	30	0	30	30	0	30	0	0	30	0	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0
Split [s]	26	36	0	9	19	0	15	0	0	15	0	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	5	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	10	0	0	10	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall	No	No		No	No		No			No		
Maximum Recall	No	No		No	No		No			No		
Pedestrian Recall	No	No		No	No		No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	R	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	44	44	1	44	44	4	4	4	4
g / C, Green / Cycle	0.01	0.73	0.73	0.01	0.73	0.73	0.06	0.06	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.00	0.21	0.00	0.01	0.34	0.01	0.03	0.01	0.01	0.04
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1440	1615	1440	1615
c, Capacity [veh/h]	25	2617	1168	27	2621	1170	171	101	171	101
d1, Uniform Delay [s]	29.41	2.93	2.30	29.36	3.48	2.30	28.79	26.77	28.15	27.60
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.71	0.29	0.00	8.29	0.62	0.02	0.72	0.90	0.13	7.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

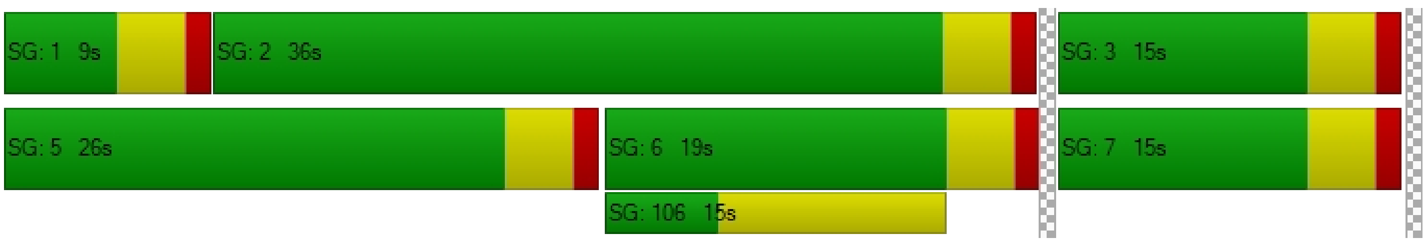
X, volume / capacity	0.36	0.30	0.00	0.37	0.47	0.01	0.24	0.19	0.05	0.67
d, Delay for Lane Group [s/veh]	38.12	3.22	2.31	37.65	4.10	2.31	29.51	27.67	28.27	34.96
Lane Group LOS	D	A	A	D	A	A	C	C	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	0.17	0.49	0.00	0.19	0.96	0.01	0.59	0.27	0.13	1.10
50th-Percentile Queue Length [ft]	4.37	12.34	0.06	4.73	23.92	0.36	14.81	6.77	3.15	27.48
95th-Percentile Queue Length [veh]	0.31	0.89	0.00	0.34	1.72	0.03	1.07	0.49	0.23	1.98
95th-Percentile Queue Length [ft]	7.86	22.22	0.11	8.52	43.05	0.65	26.65	12.19	5.66	49.47

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	38.12	3.22	2.31	37.65	4.10	2.31	29.51	0.00	27.67	28.27	0.00	34.96
Movement LOS	D	A	A	D	A	A	C		C	C		C
d_A, Approach Delay [s/veh]	3.61			4.34			28.92			34.17		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	5.79											
Intersection LOS	A											
Intersection V/C	0.434											

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Existing Plus Ambient Growth

Intersection Level Of Service Report
Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	22.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.409

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	99	89	42	53	129	58	224	825	351	79	393	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	99	89	42	53	129	58	224	825	351	79	393	27
Peak Hour Factor	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	25	12	15	36	16	63	233	99	22	111	8
Total Analysis Volume [veh/h]	112	100	47	60	146	65	253	931	396	89	444	30
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	13	23	0	9	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	19	19	3	18	18	6	18	18	4	16	16
g / C, Green / Cycle	0.07	0.31	0.31	0.05	0.30	0.30	0.11	0.30	0.30	0.07	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.03	0.04	0.04	0.02	0.04	0.04	0.07	0.26	0.25	0.03	0.12	0.02
s, saturation flow rate [veh/h]	3514	1900	1703	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	255	596	534	194	1072	479	376	1082	483	234	936	418
d1, Uniform Delay [s]	26.79	14.78	14.82	27.38	15.55	15.55	25.90	19.95	19.62	26.95	18.89	16.88
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.25	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.19	0.44	0.52	0.90	0.26	0.59	2.09	2.14	7.65	1.01	0.37	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

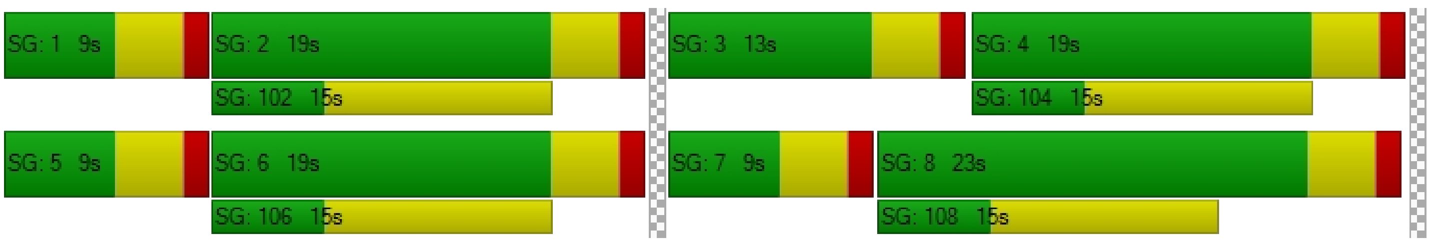
X, volume / capacity	0.44	0.13	0.13	0.31	0.14	0.14	0.67	0.86	0.82	0.38	0.47	0.07
d, Delay for Lane Group [s/veh]	27.98	15.22	15.34	28.28	15.82	16.14	28.00	22.09	27.27	27.96	19.26	16.95
Lane Group LOS	C	B	B	C	B	B	C	C	C	C	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.75	0.71	0.69	0.40	0.68	0.65	1.69	5.55	5.40	0.59	2.33	0.28
50th-Percentile Queue Length [ft]	18.66	17.78	17.13	10.12	17.01	16.23	42.27	138.78	135.07	14.83	58.25	7.10
95th-Percentile Queue Length [veh]	1.34	1.28	1.23	0.73	1.22	1.17	3.04	9.42	9.21	1.07	4.19	0.51
95th-Percentile Queue Length [ft]	33.59	32.00	30.83	18.21	30.62	29.21	76.09	235.38	230.37	26.70	104.85	12.78

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.98	15.25	15.34	28.28	15.82	16.14	28.00	22.09	27.27	27.96	19.26	16.95
Movement LOS	C	B	B	C	B	B	C	C	C	C	B	B
d_A, Approach Delay [s/veh]	20.77			18.65			24.33			20.51		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	22.61											
Intersection LOS	C											
Intersection V/C	0.409											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	19.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.313

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	6	3	2	6	0	10	34	850	23	7	380	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	3	2	6	0	10	34	850	23	7	380	11
Peak Hour Factor	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	1	2	0	3	10	239	6	2	107	3
Total Analysis Volume [veh/h]	7	3	2	7	0	11	38	957	26	8	428	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	62
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	9	32	0	9	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	29	29	29	29	25	20	20	25	18	18
g / C, Green / Cycle	0.47	0.47	0.47	0.47	0.40	0.32	0.32	0.40	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.02	0.00	0.01	0.01	0.03	0.26	0.02	0.01	0.12	0.01
s, saturation flow rate [veh/h]	651	1615	555	1615	1128	3618	1615	732	3618	1615
c, Capacity [veh/h]	407	764	378	764	531	1164	520	319	1061	474
d1, Uniform Delay [s]	11.09	8.65	20.86	8.69	11.78	19.44	14.53	13.20	17.61	15.64
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.11	0.01	0.09	0.03	0.06	1.52	0.04	0.03	0.25	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

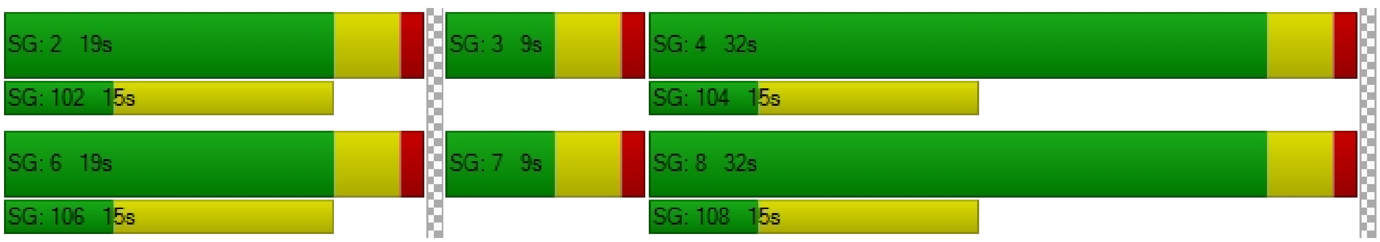
X, volume / capacity	0.02	0.00	0.02	0.01	0.07	0.82	0.05	0.03	0.40	0.03
d, Delay for Lane Group [s/veh]	11.20	8.65	20.95	8.73	11.84	20.96	14.57	13.23	17.85	15.66
Lane Group LOS	B	A	C	A	B	C	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.07	0.01	0.09	0.08	0.28	5.69	0.23	0.06	2.19	0.11
50th-Percentile Queue Length [ft]	1.87	0.34	2.20	1.90	7.06	142.23	5.67	1.49	54.66	2.75
95th-Percentile Queue Length [veh]	0.13	0.02	0.16	0.14	0.51	9.60	0.41	0.11	3.94	0.20
95th-Percentile Queue Length [ft]	3.37	0.62	3.97	3.41	12.71	240.02	10.21	2.68	98.39	4.95

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.20	11.20	8.65	20.95	20.95	8.73	11.84	20.96	14.57	13.23	17.85	15.66
Movement LOS	B	B	A	C	C	A	B	C	B	B	B	B
d_A, Approach Delay [s/veh]	10.78			13.48			20.46			17.71		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	19.48											
Intersection LOS	B											
Intersection V/C	0.313											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	20.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.532

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	63	596	54	50	538	84	164	386	274	78	264	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	63	596	54	50	538	84	164	386	274	78	264	70
Peak Hour Factor	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	170	15	14	153	24	47	110	78	22	75	20
Total Analysis Volume [veh/h]	72	679	62	57	613	96	187	440	312	89	301	80
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	13	23	0	9	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	23	23	3	22	22	8	14	14	4	10	10
g / C, Green / Cycle	0.06	0.38	0.38	0.05	0.37	0.37	0.13	0.24	0.24	0.07	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.04	0.03	0.17	0.06	0.10	0.12	0.19	0.05	0.08	0.05
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	108	1367	610	95	1342	599	235	861	384	119	628	280
d1, Uniform Delay [s]	27.70	14.33	12.10	27.88	14.33	12.66	25.38	19.89	21.65	27.61	22.41	21.61
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.16	0.11	0.13	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.96	1.29	0.33	5.98	1.12	0.57	8.60	0.47	5.00	8.99	0.57	0.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

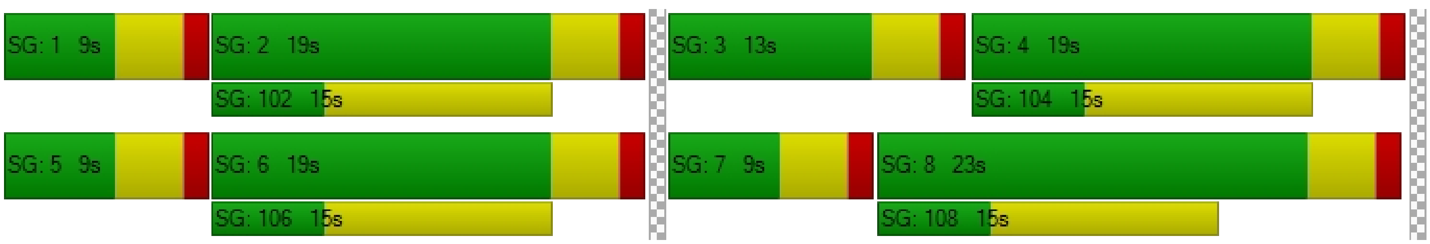
X, volume / capacity	0.67	0.50	0.10	0.60	0.46	0.16	0.79	0.51	0.81	0.75	0.48	0.29
d, Delay for Lane Group [s/veh]	34.66	15.62	12.44	33.86	15.46	13.23	33.98	20.36	26.65	36.59	22.97	22.16
Lane Group LOS	C	B	B	C	B	B	C	C	C	D	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.10	2.99	0.48	0.87	2.68	0.78	2.90	2.41	4.16	1.44	1.77	0.92
50th-Percentile Queue Length [ft]	27.53	74.75	12.00	21.64	66.92	19.44	72.41	60.17	104.08	36.12	44.15	23.08
95th-Percentile Queue Length [veh]	1.98	5.38	0.86	1.56	4.82	1.40	5.21	4.33	7.49	2.60	3.18	1.66
95th-Percentile Queue Length [ft]	49.56	134.55	21.60	38.95	120.46	35.00	130.34	108.31	187.34	65.02	79.48	41.54

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.66	15.62	12.44	33.86	15.46	13.23	33.98	20.36	26.65	36.59	22.97	22.16
Movement LOS	C	B	B	C	B	B	C	C	C	D	C	C
d_A, Approach Delay [s/veh]	17.06			16.55			25.16			25.42		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	20.79											
Intersection LOS	C											
Intersection V/C	0.532											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	20.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.025

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	3	726	874	8	5	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	726	874	8	5	6
Peak Hour Factor	0.8593	0.8593	0.8593	0.8593	0.8593	0.8593
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	211	254	2	1	2
Total Analysis Volume [veh/h]	3	845	1017	9	6	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	10.28	0.00	0.00	0.00	20.50	12.42
Movement LOS	B	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.01	0.00	0.00	0.00	0.12	0.12
95th-Percentile Queue Length [ft]	0.33	0.00	0.00	0.00	3.01	3.01
d_A, Approach Delay [s/veh]	0.04		0.00		16.15	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.13					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	21.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	721	27	78	779	1	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	721	27	78	779	1	9
Peak Hour Factor	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	210	8	23	227	0	3
Total Analysis Volume [veh/h]	840	31	91	907	1	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.12	0.01	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	10.20	0.00	21.22	11.23
Movement LOS	A	A	B	A	C	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.39	0.00	0.01	0.05
95th-Percentile Queue Length [ft]	0.00	0.00	9.82	0.00	0.34	1.30
d_A, Approach Delay [s/veh]	0.00		0.93		12.14	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.56					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	3.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.606

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	5	715	163	23	748	7	8	4	11	23	0	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	715	163	23	748	7	8	4	11	23	0	7
Peak Hour Factor	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	199	45	6	209	2	2	1	3	6	0	2
Total Analysis Volume [veh/h]	6	798	182	26	835	8	9	4	12	26	0	8
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	47	0	9	47	0	0	19	0	0	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	C	R	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	50	44	44	50	45	45	2	2	2	2
g / C, Green / Cycle	0.83	0.73	0.73	0.83	0.75	0.75	0.04	0.04	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.01	0.22	0.11	0.03	0.23	0.00	0.17	0.01	0.31	0.00
s, saturation flow rate [veh/h]	728	3618	1615	779	3618	1615	78	1615	83	1615
c, Capacity [veh/h]	723	2637	1177	762	2715	1212	104	65	123	65
d1, Uniform Delay [s]	1.14	2.84	2.49	1.17	2.44	1.88	30.07	27.92	30.07	27.85
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.18	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.30	0.28	0.02	0.29	0.01	0.87	1.36	3.88	0.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.01	0.30	0.15	0.03	0.31	0.01	0.12	0.18	0.21	0.12
d, Delay for Lane Group [s/veh]	1.16	3.13	2.77	1.18	2.73	1.89	30.93	29.28	33.95	28.69
Lane Group LOS	A	A	A	A	A	A	C	C	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.00	0.48	0.24	0.00	0.31	0.01	0.21	0.18	0.50	0.12
50th-Percentile Queue Length [ft]	0.10	12.07	6.04	0.10	7.84	0.16	5.14	4.58	12.42	3.02
95th-Percentile Queue Length [veh]	0.01	0.87	0.43	0.01	0.56	0.01	0.37	0.33	0.89	0.22
95th-Percentile Queue Length [ft]	0.19	21.73	10.86	0.17	14.11	0.28	9.25	8.24	22.36	5.43

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.16	3.13	2.77	1.18	2.73	1.89	30.93	30.93	29.28	33.95	33.95	28.69
Movement LOS	A	A	A	A	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	3.05			2.68			30.14			32.72		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	3.76											
Intersection LOS	A											
Intersection V/C	0.606											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	16.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.643

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	25	661	374	253	533	4	4	3	3	64	1	225
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	661	374	253	533	4	4	3	3	64	1	225
Peak Hour Factor	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	187	106	72	151	1	1	1	1	18	0	64
Total Analysis Volume [veh/h]	28	749	424	287	604	5	5	3	3	73	1	255
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	21	31	0	0	20	0	0	20	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	25	25	11	35	35	12	12	12	12
g / C, Green / Cycle	0.03	0.42	0.42	0.19	0.58	0.58	0.19	0.19	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.02	0.21	0.26	0.16	0.11	0.11	0.01	0.02	0.03	0.16
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1892	1488	1432	1333	1615
c, Capacity [veh/h]	60	1504	671	347	2078	1087	374	286	375	312
d1, Uniform Delay [s]	28.56	12.95	13.93	23.34	6.13	6.13	19.73	23.98	20.36	23.27
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.13
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.49	1.18	4.48	5.07	0.21	0.39	0.03	0.15	0.14	6.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

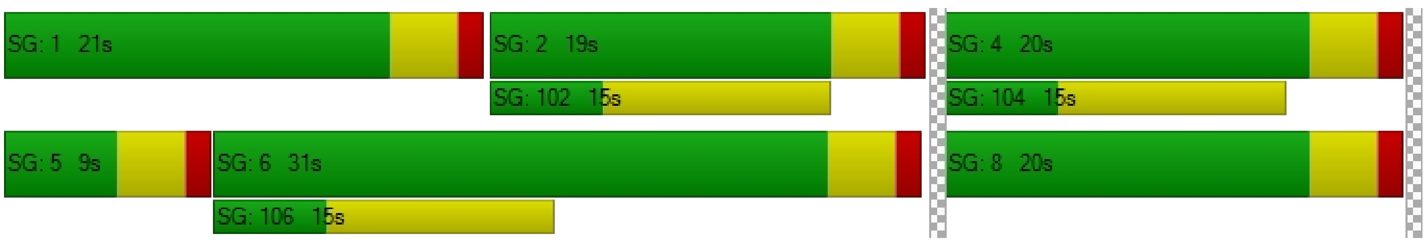
X, volume / capacity	0.47	0.50	0.63	0.83	0.19	0.19	0.03	0.10	0.12	0.82
d, Delay for Lane Group [s/veh]	34.05	14.14	18.41	28.41	6.33	6.52	19.76	24.13	20.50	29.56
Lane Group LOS	C	B	B	C	A	A	B	C	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	0.44	3.05	4.25	3.80	0.80	0.89	0.12	0.36	0.51	3.75
50th-Percentile Queue Length [ft]	11.08	76.24	106.17	95.02	19.93	22.28	3.01	9.11	12.76	93.84
95th-Percentile Queue Length [veh]	0.80	5.49	7.63	6.84	1.44	1.60	0.22	0.66	0.92	6.76
95th-Percentile Queue Length [ft]	19.95	137.23	190.66	171.04	35.88	40.11	5.43	16.39	22.96	168.92

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.05	14.14	18.41	28.41	6.40	6.52	19.76	19.76	19.76	24.13	20.50	29.56
Movement LOS	C	B	B	C	A	A	B	B	B	C	C	C
d_A, Approach Delay [s/veh]	16.11			13.45			19.76			27.84		
Approach LOS	B			B			B			C		
d_I, Intersection Delay [s/veh]	16.73											
Intersection LOS	B											
Intersection V/C	0.643											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Signalized	Delay (sec / veh):	4.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.321

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	721	27	78	779	1	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	721	27	78	779	1	9
Peak Hour Factor	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	210	8	23	227	0	3
Total Analysis Volume [veh/h]	840	31	91	907	1	10
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal group	2	0	1	6	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	15	0	30	45	15	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
l1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	43	4	51	1	1
g / C, Green / Cycle	0.72	0.72	0.07	0.85	0.02	0.02
(v / s)_i Volume / Saturation Flow Rate	0.23	0.02	0.05	0.25	0.00	0.01
s, saturation flow rate [veh/h]	3618	1615	1810	3618	1810	1615
c, Capacity [veh/h]	2589	1156	124	3078	29	26
d1, Uniform Delay [s]	3.17	2.48	27.47	0.89	29.14	29.31
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.33	0.04	7.98	0.24	0.48	9.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.32	0.03	0.73	0.29	0.03	0.39
d, Delay for Lane Group [s/veh]	3.50	2.52	35.45	1.14	29.62	38.42
Lane Group LOS	A	A	D	A	C	D
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh]	0.62	0.04	1.40	0.10	0.02	0.20
50th-Percentile Queue Length [ft]	15.60	1.07	35.08	2.61	0.44	5.05
95th-Percentile Queue Length [veh]	1.12	0.08	2.53	0.19	0.03	0.36
95th-Percentile Queue Length [ft]	28.07	1.93	63.15	4.70	0.78	9.09

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.50	2.52	35.45	1.14	29.62	38.42
Movement LOS	A	A	D	A	C	D
d_A, Approach Delay [s/veh]	3.46		4.26		37.62	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	4.09					
Intersection LOS	A					
Intersection V/C	0.321					

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report

Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	26.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.723

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	459	292	129	148	159	263	124	913	303	148	808	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	459	292	129	148	159	263	124	913	303	148	808	44
Peak Hour Factor	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	124	79	35	40	43	71	33	246	82	40	218	12
Total Analysis Volume [veh/h]	495	315	139	160	171	284	134	984	327	160	871	47
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	24	0	9	19	0	11	23	0	9	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	20	20	5	15	15	5	19	19	5	19	19
g / C, Green / Cycle	0.15	0.31	0.31	0.07	0.23	0.23	0.07	0.29	0.29	0.07	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.14	0.13	0.13	0.05	0.05	0.18	0.04	0.27	0.20	0.05	0.24	0.03
s, saturation flow rate [veh/h]	3514	1900	1705	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	541	598	536	256	845	377	247	1062	474	256	1071	478
d1, Uniform Delay [s]	27.09	17.48	17.48	29.28	20.05	23.18	29.22	22.29	20.34	29.28	21.22	16.59
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.20	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.61	1.99	2.22	2.49	0.54	13.01	1.85	4.10	3.33	2.49	1.55	0.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

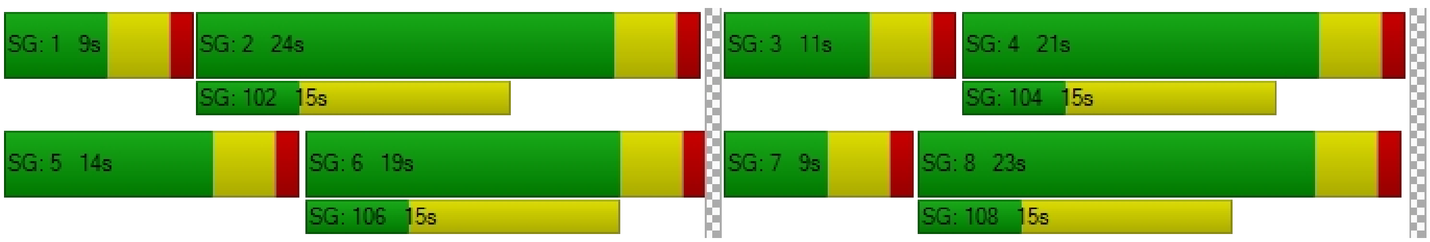
X, volume / capacity	0.92	0.40	0.40	0.62	0.20	0.75	0.54	0.93	0.69	0.62	0.81	0.10
d, Delay for Lane Group [s/veh]	33.71	19.47	19.70	31.78	20.59	36.19	31.07	26.39	23.67	31.78	22.77	16.68
Lane Group LOS	C	B	B	C	C	D	C	C	C	C	C	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	3.94	2.81	2.56	1.21	1.01	4.99	1.00	6.96	4.29	1.21	5.60	0.46
50th-Percentile Queue Length [ft]	98.44	70.25	63.90	30.31	25.19	124.73	25.02	173.96	107.32	30.31	139.91	11.62
95th-Percentile Queue Length [veh]	7.09	5.06	4.60	2.18	1.81	8.65	1.80	11.28	7.69	2.18	9.48	0.84
95th-Percentile Queue Length [ft]	177.19	126.46	115.02	54.56	45.34	216.32	45.03	282.11	192.27	54.56	236.91	20.91

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.71	19.52	19.70	31.78	20.59	36.19	31.07	26.39	23.67	31.78	22.77	16.68
Movement LOS	C	B	B	C	C	D	C	C	C	C	C	B
d_A, Approach Delay [s/veh]	26.95			30.70			26.21			23.84		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	26.43											
Intersection LOS	C											
Intersection V/C	0.723											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	17.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.407

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	8	8	4	4	0	15	29	1130	13	7	957	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	8	4	4	0	15	29	1130	13	7	957	15
Peak Hour Factor	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	2	1	1	0	4	8	308	4	2	261	4
Total Analysis Volume [veh/h]	9	9	4	4	0	16	32	1232	14	8	1043	16
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	61
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	9	32	0	9	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24	24	29	25	25	29	23	23
g / C, Green / Cycle	0.39	0.39	0.39	0.39	0.48	0.40	0.40	0.48	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.02	0.00	0.01	0.01	0.04	0.34	0.01	0.01	0.29	0.01
s, saturation flow rate [veh/h]	755	1615	519	1615	730	3618	1615	586	3618	1615
c, Capacity [veh/h]	381	626	319	626	385	1461	652	314	1374	614
d1, Uniform Delay [s]	13.00	11.50	22.64	11.59	10.57	16.47	10.96	11.37	16.52	11.87
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.23	0.02	0.07	0.08	0.09	1.40	0.01	0.03	0.88	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

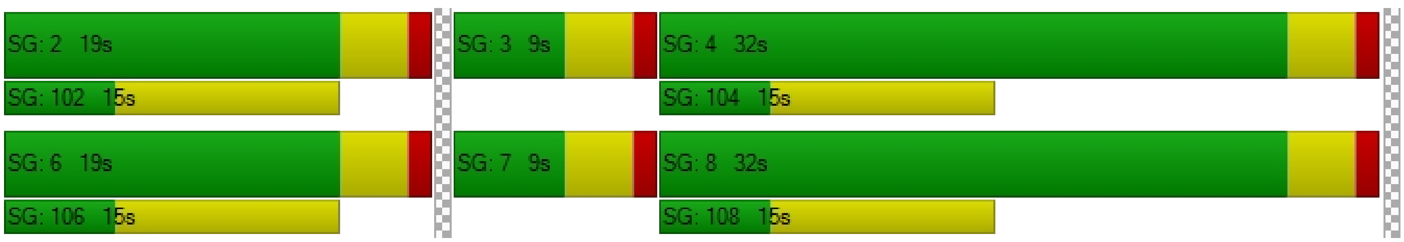
X, volume / capacity	0.05	0.01	0.01	0.03	0.08	0.84	0.02	0.03	0.76	0.03
d, Delay for Lane Group [s/veh]	13.24	11.52	22.72	11.67	10.66	17.87	10.97	11.41	17.40	11.89
Lane Group LOS	B	B	C	B	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.16	0.03	0.05	0.13	0.19	6.61	0.10	0.05	5.43	0.12
50th-Percentile Queue Length [ft]	4.03	0.83	1.33	3.36	4.70	165.35	2.45	1.17	135.80	2.97
95th-Percentile Queue Length [veh]	0.29	0.06	0.10	0.24	0.34	10.83	0.18	0.08	9.25	0.21
95th-Percentile Queue Length [ft]	7.25	1.50	2.40	6.04	8.46	270.79	4.41	2.11	231.36	5.35

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	13.24	13.24	11.52	22.72	22.72	11.67	10.66	17.87	10.97	11.41	17.40	11.89
Movement LOS	B	B	B	C	C	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	12.93			13.88			17.62			17.28		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	17.39											
Intersection LOS	B											
Intersection V/C	0.407											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	26.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.732

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	194	574	114	102	708	92	128	754	211	161	694	88
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	194	574	114	102	708	92	128	754	211	161	694	88
Peak Hour Factor	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	152	30	27	187	24	34	199	56	43	183	23
Total Analysis Volume [veh/h]	205	606	120	108	748	97	135	796	223	170	733	93
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	19	0	12	19	0	10	19	0	10	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	19	19	5	15	15	6	15	15	6	15	15
g / C, Green / Cycle	0.13	0.31	0.31	0.08	0.25	0.25	0.10	0.25	0.25	0.10	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.11	0.17	0.07	0.06	0.21	0.06	0.07	0.22	0.14	0.09	0.20	0.06
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	242	1121	501	141	921	411	173	887	396	181	903	403
d1, Uniform Delay [s]	25.43	17.18	15.45	27.15	21.04	17.75	26.53	21.94	19.85	26.84	21.21	17.94
k, delay calibration	0.25	0.50	0.50	0.11	0.50	0.50	0.16	0.11	0.11	0.27	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	16.72	1.87	1.13	8.26	7.74	1.35	10.26	3.55	1.26	35.34	1.82	0.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

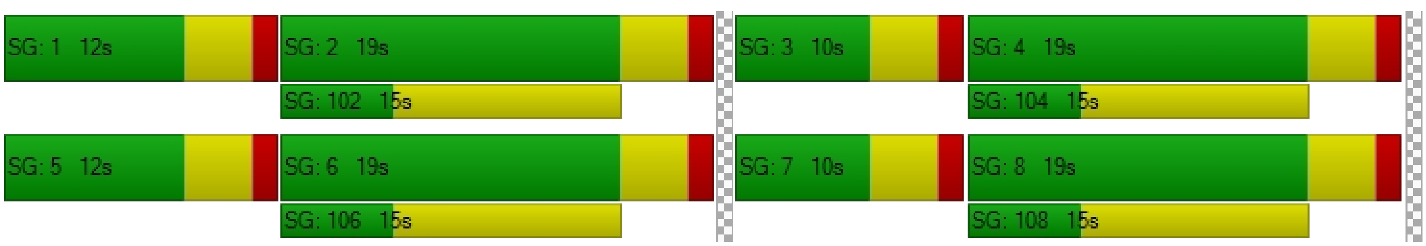
X, volume / capacity	0.85	0.54	0.24	0.76	0.81	0.24	0.78	0.90	0.56	0.94	0.81	0.23
d, Delay for Lane Group [s/veh]	42.15	19.05	16.58	35.40	28.77	19.10	36.79	25.49	21.11	62.18	23.02	18.23
Lane Group LOS	D	B	B	D	C	B	D	C	C	E	C	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	3.59	3.10	1.16	1.66	5.07	1.05	2.21	5.15	2.53	3.97	4.43	0.94
50th-Percentile Queue Length [ft]	89.66	77.61	28.98	41.38	126.80	26.18	55.20	128.66	63.14	99.27	110.84	23.38
95th-Percentile Queue Length [veh]	6.46	5.59	2.09	2.98	8.77	1.89	3.97	8.87	4.55	7.15	7.89	1.68
95th-Percentile Queue Length [ft]	161.39	139.70	52.16	74.48	219.14	47.13	99.35	221.67	113.66	178.68	197.17	42.09

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	42.15	19.05	16.58	35.40	28.77	19.10	36.79	25.49	21.11	62.18	23.02	18.23
Movement LOS	D	B	B	D	C	B	D	C	C	E	C	B
d_A, Approach Delay [s/veh]	23.82			28.54			25.97			29.26		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	26.89											
Intersection LOS	C											
Intersection V/C	0.732											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	24.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.026

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	3	896	1114	7	5	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	896	1114	7	5	7
Peak Hour Factor	0.9233	0.9233	0.9233	0.9233	0.9233	0.9233
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	243	302	2	1	2
Total Analysis Volume [veh/h]	3	970	1207	8	5	8
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.03	0.02
d_M, Delay for Movement [s/veh]	11.23	0.00	0.00	0.00	24.52	13.62
Movement LOS	B	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.02	0.00	0.00	0.00	0.14	0.14
95th-Percentile Queue Length [ft]	0.39	0.00	0.00	0.00	3.46	3.46
d_A, Approach Delay [s/veh]	0.03		0.00		17.82	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.12					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	19.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.039

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	748	2	9	1182	9	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	748	2	9	1182	9	66
Peak Hour Factor	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	200	1	2	316	2	18
Total Analysis Volume [veh/h]	801	2	10	1265	10	71
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.01	0.04	0.12
d_M, Delay for Movement [s/veh]	0.00	0.00	9.39	0.00	19.71	11.74
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.04	0.00	0.12	0.40
95th-Percentile Queue Length [ft]	0.00	0.00	0.91	0.00	3.05	9.91
d_A, Approach Delay [s/veh]	0.00		0.07		12.72	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.52					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	9.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.502

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	10	718	21	9	1113	10	1	0	10	178	0	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	718	21	9	1113	10	1	0	10	178	0	31
Peak Hour Factor	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	187	5	2	290	3	0	0	3	46	0	8
Total Analysis Volume [veh/h]	10	749	22	9	1161	10	1	0	10	186	0	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	0	0	7	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	0	0	5	0	0
Maximum Green [s]	30	30	0	30	30	0	30	0	0	30	0	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0
Split [s]	9	19	0	9	19	0	32	0	0	32	0	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	5	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	10	0	0	10	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall	No	No		No	No		No			No		
Maximum Recall	No	No		No	No		No			No		
Pedestrian Recall	No	No		No	No		No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	R	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	40	36	36	40	36	36	12	12	12	12
g / C, Green / Cycle	0.67	0.59	0.59	0.67	0.59	0.59	0.19	0.19	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.02	0.21	0.01	0.01	0.32	0.01	0.00	0.01	0.13	0.02
s, saturation flow rate [veh/h]	583	3618	1615	797	3618	1615	1440	1615	1440	1615
c, Capacity [veh/h]	480	2151	960	643	2147	959	346	312	346	312
d1, Uniform Delay [s]	4.31	6.22	5.00	3.54	7.30	4.99	21.33	19.66	24.48	19.93
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.08	0.45	0.04	0.01	0.98	0.02	0.00	0.04	1.29	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

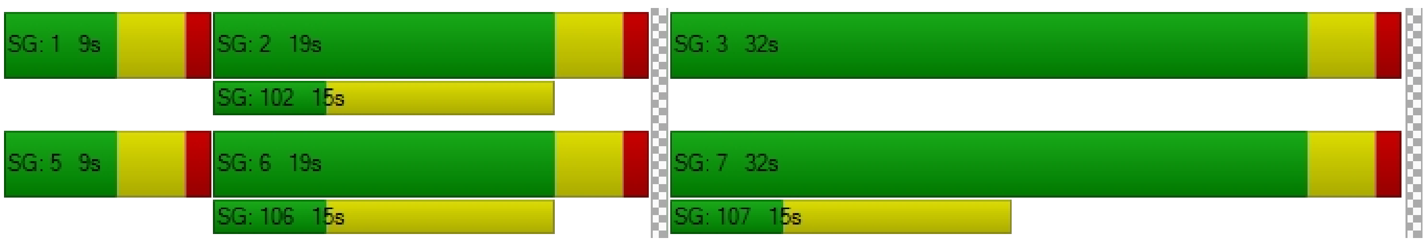
X, volume / capacity	0.02	0.35	0.02	0.01	0.54	0.01	0.00	0.03	0.54	0.10
d, Delay for Lane Group [s/veh]	4.39	6.67	5.04	3.54	8.29	5.01	21.34	19.70	25.78	20.07
Lane Group LOS	A	A	A	A	A	A	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.03	1.54	0.08	0.02	2.86	0.04	0.01	0.11	2.50	0.36
50th-Percentile Queue Length [ft]	0.69	38.56	1.96	0.42	71.50	0.89	0.29	2.74	62.62	8.91
95th-Percentile Queue Length [veh]	0.05	2.78	0.14	0.03	5.15	0.06	0.02	0.20	4.51	0.64
95th-Percentile Queue Length [ft]	1.24	69.40	3.52	0.75	128.71	1.60	0.52	4.93	112.71	16.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	4.39	6.67	5.04	3.54	8.29	5.01	21.34	0.00	19.70	25.78	0.00	20.07
Movement LOS	A	A	A	A	A	A	C		B	C		C
d_A, Approach Delay [s/veh]		6.59			8.22			19.85			24.94	
Approach LOS		A			A			B			C	
d_I, Intersection Delay [s/veh]	9.36											
Intersection LOS	A											
Intersection V/C	0.502											

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	22.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.825

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	44	526	160	186	1080	14	10	4	15	324	2	234
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	526	160	186	1080	14	10	4	15	324	2	234
Peak Hour Factor	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	142	43	50	291	4	3	1	4	87	1	63
Total Analysis Volume [veh/h]	47	568	173	201	1166	15	11	4	16	350	2	253
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	17	27	0	0	24	0	0	24	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	20	20	8	25	25	20	20	20	20
g / C, Green / Cycle	0.05	0.33	0.33	0.14	0.42	0.42	0.33	0.33	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.03	0.16	0.11	0.11	0.21	0.21	0.09	0.01	0.47	0.16
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1888	336	1414	706	1615
c, Capacity [veh/h]	86	1190	531	255	1527	797	192	132	353	534
d1, Uniform Delay [s]	28.02	16.07	15.18	24.98	12.79	12.79	15.89	29.90	23.32	15.97
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.34	1.37	1.63	5.40	1.21	2.31	0.39	0.44	36.50	0.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

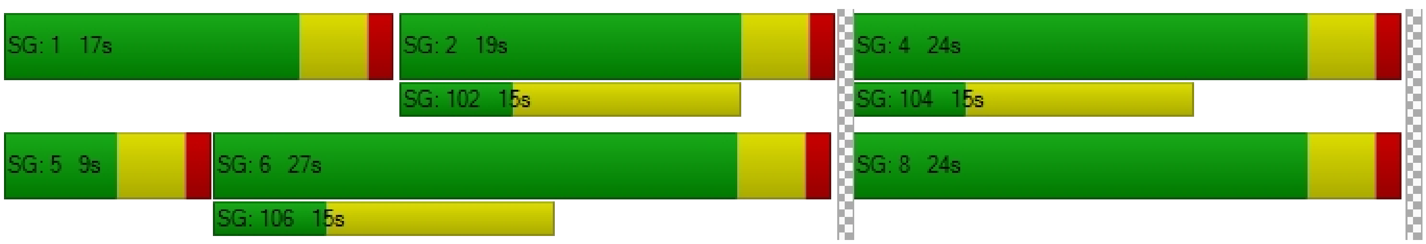
X, volume / capacity	0.55	0.48	0.33	0.79	0.51	0.51	0.16	0.13	0.95	0.47
d, Delay for Lane Group [s/veh]	33.36	17.45	16.80	30.39	14.00	15.10	16.28	30.34	59.82	16.62
Lane Group LOS	C	B	B	C	B	B	B	C	E	B
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.71	2.73	1.68	2.77	3.15	3.53	0.28	0.25	8.20	2.58
50th-Percentile Queue Length [ft]	17.81	68.15	41.93	69.27	78.77	88.28	7.04	6.37	204.96	64.39
95th-Percentile Queue Length [veh]	1.28	4.91	3.02	4.99	5.67	6.36	0.51	0.46	12.89	4.64
95th-Percentile Queue Length [ft]	32.05	122.67	75.48	124.69	141.78	158.91	12.67	11.47	322.35	115.90

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.36	17.45	16.80	30.39	14.37	15.10	16.28	16.28	16.28	58.35	59.82	16.62
Movement LOS	C	B	B	C	B	B	B	B	B	E	E	B
d_A, Approach Delay [s/veh]	18.26			16.70			16.28			40.91		
Approach LOS	B			B			B			D		
d_I, Intersection Delay [s/veh]	22.35											
Intersection LOS	C											
Intersection V/C	0.825											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Signalized	Delay (sec / veh):	4.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.437

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	748	2	9	1182	9	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	748	2	9	1182	9	66
Peak Hour Factor	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	200	1	2	316	2	18
Total Analysis Volume [veh/h]	801	2	10	1265	10	71
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal group	2	0	1	6	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	30	0	15	45	15	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	43	1	48	4	4
g / C, Green / Cycle	0.72	0.72	0.01	0.80	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.22	0.00	0.01	0.35	0.01	0.04
s, saturation flow rate [veh/h]	3618	1615	1810	3618	1810	1615
c, Capacity [veh/h]	2611	1166	27	2906	115	103
d1, Uniform Delay [s]	2.99	2.33	29.36	1.79	26.51	27.58
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.30	0.00	8.29	0.48	0.32	7.92
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.31	0.00	0.37	0.44	0.09	0.69
d, Delay for Lane Group [s/veh]	3.29	2.33	37.65	2.27	26.83	35.50
Lane Group LOS	A	A	D	A	C	D
Critical Lane Group	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	0.53	0.00	0.19	0.19	0.14	1.17
50th-Percentile Queue Length [ft]	13.31	0.06	4.73	4.81	3.46	29.35
95th-Percentile Queue Length [veh]	0.96	0.00	0.34	0.35	0.25	2.11
95th-Percentile Queue Length [ft]	23.95	0.11	8.52	8.66	6.23	52.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.29	2.33	37.65	2.27	26.83	35.50
Movement LOS	A	A	D	A	C	D
d_A, Approach Delay [s/veh]	3.29		2.55		34.43	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	4.02					
Intersection LOS	A					
Intersection V/C	0.437					

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Opening Year (2017) Without Project

Intersection Level Of Service Report
Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	22.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.434

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	109	92	42	54	134	58	224	878	369	79	421	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	92	42	54	134	58	224	878	369	79	421	28
Peak Hour Factor	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	26	12	15	38	16	63	248	104	22	119	8
Total Analysis Volume [veh/h]	123	104	47	61	151	65	253	991	416	89	475	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	13	23	0	9	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	18	18	3	17	17	6	19	19	4	16	16
g / C, Green / Cycle	0.07	0.30	0.30	0.05	0.28	0.28	0.11	0.31	0.31	0.07	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.04	0.04	0.04	0.02	0.04	0.04	0.07	0.27	0.26	0.03	0.13	0.02
s, saturation flow rate [veh/h]	3514	1900	1707	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	259	574	516	191	1023	457	372	1128	504	231	983	439
d1, Uniform Delay [s]	26.74	15.28	15.31	27.36	16.14	16.12	25.91	19.61	19.18	26.94	18.37	16.28
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.27	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.35	0.49	0.58	0.95	0.30	0.65	2.19	2.38	8.24	1.06	0.37	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

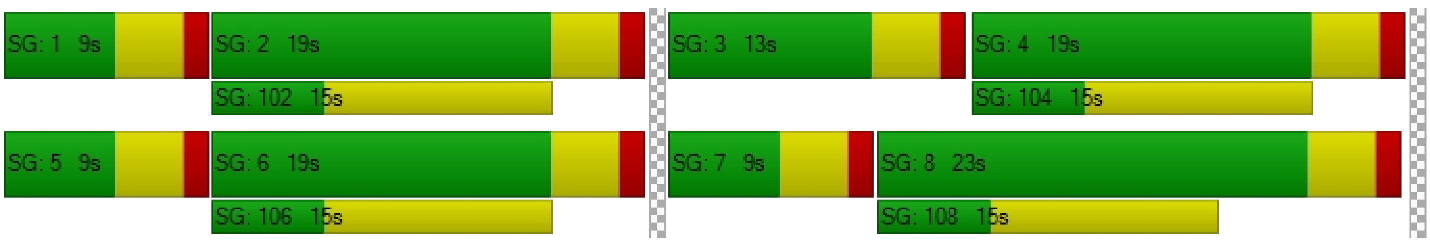
X, volume / capacity	0.48	0.14	0.14	0.32	0.15	0.14	0.68	0.88	0.83	0.39	0.48	0.07
d, Delay for Lane Group [s/veh]	28.10	15.76	15.89	28.31	16.45	16.77	28.10	22.00	27.42	28.00	18.74	16.35
Lane Group LOS	C	B	B	C	B	B	C	C	C	C	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.82	0.75	0.72	0.41	0.72	0.67	1.69	5.92	5.70	0.59	2.45	0.30
50th-Percentile Queue Length [ft]	20.54	18.75	18.05	10.29	18.10	16.70	42.34	147.92	142.61	14.84	61.36	7.39
95th-Percentile Queue Length [veh]	1.48	1.35	1.30	0.74	1.30	1.20	3.05	9.91	9.62	1.07	4.42	0.53
95th-Percentile Queue Length [ft]	36.97	33.76	32.48	18.52	32.58	30.06	76.21	247.65	240.53	26.72	110.45	13.30

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	28.10	15.80	15.89	28.31	16.45	16.77	28.10	22.00	27.42	28.00	18.74	16.35
Movement LOS	C	B	B	C	B	B	C	C	C	C	B	B
d_A, Approach Delay [s/veh]	21.33			19.13			24.29			19.99		
Approach LOS	C			B			C			B		
d_I, Intersection Delay [s/veh]	22.58											
Intersection LOS	C											
Intersection V/C	0.434											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	20.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.331

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	6	3	2	6	0	10	34	906	23	7	410	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	3	2	6	0	10	34	906	23	7	410	11
Peak Hour Factor	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	1	1	2	0	3	10	255	6	2	115	3
Total Analysis Volume [veh/h]	7	3	2	7	0	11	38	1020	26	8	462	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	9	32	0	9	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	30	30	30	30	27	22	22	27	20	20
g / C, Green / Cycle	0.47	0.47	0.47	0.47	0.41	0.34	0.34	0.41	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.02	0.00	0.01	0.01	0.03	0.28	0.02	0.01	0.13	0.01
s, saturation flow rate [veh/h]	653	1615	558	1615	1094	3618	1615	692	3618	1615
c, Capacity [veh/h]	399	753	371	753	517	1219	544	302	1118	499
d1, Uniform Delay [s]	11.76	9.28	21.94	9.33	11.92	19.94	14.55	13.67	17.83	15.67
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.12	0.01	0.09	0.04	0.06	1.60	0.04	0.04	0.24	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

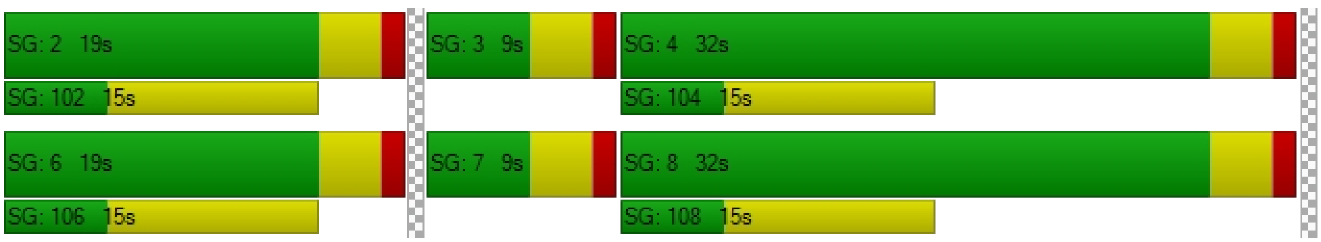
X, volume / capacity	0.03	0.00	0.02	0.01	0.07	0.84	0.05	0.03	0.41	0.02
d, Delay for Lane Group [s/veh]	11.88	9.29	22.03	9.37	11.98	21.54	14.59	13.71	18.07	15.68
Lane Group LOS	B	A	C	A	B	C	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.08	0.01	0.09	0.08	0.29	6.42	0.23	0.06	2.46	0.11
50th-Percentile Queue Length [ft]	2.02	0.37	2.33	2.05	7.33	160.39	5.85	1.55	61.57	2.83
95th-Percentile Queue Length [veh]	0.15	0.03	0.17	0.15	0.53	10.57	0.42	0.11	4.43	0.20
95th-Percentile Queue Length [ft]	3.63	0.67	4.20	3.69	13.20	264.24	10.53	2.79	110.82	5.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.88	11.88	9.29	22.03	22.03	9.37	11.98	21.54	14.59	13.71	18.07	15.68
Movement LOS	B	B	A	C	C	A	B	C	B	B	B	B
d_A, Approach Delay [s/veh]	11.45			14.29			21.04			17.94		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	19.95											
Intersection LOS	B											
Intersection V/C	0.331											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	21.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.554

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	63	610	102	52	549	84	164	442	274	98	294	71
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	63	610	102	52	549	84	164	442	274	98	294	71
Peak Hour Factor	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	174	29	15	156	24	47	126	78	28	84	20
Total Analysis Volume [veh/h]	72	695	116	59	625	96	187	503	312	112	335	81
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	13	22	0	10	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	22	22	3	21	21	8	14	14	5	11	11
g / C, Green / Cycle	0.06	0.36	0.36	0.05	0.36	0.36	0.13	0.24	0.24	0.08	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.07	0.03	0.17	0.06	0.10	0.14	0.19	0.06	0.09	0.05
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	108	1308	584	97	1286	574	235	860	384	147	684	305
d1, Uniform Delay [s]	27.70	15.18	13.21	27.85	15.11	13.29	25.38	20.29	21.65	27.06	21.80	20.83
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.16	0.11	0.15	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.96	1.55	0.76	6.07	1.32	0.63	8.60	0.63	5.67	7.90	0.55	0.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

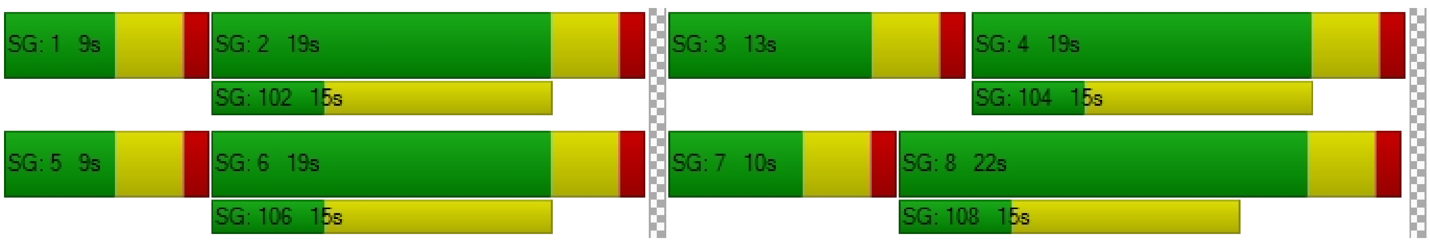
X, volume / capacity	0.67	0.53	0.20	0.61	0.49	0.17	0.79	0.58	0.81	0.76	0.49	0.27
d, Delay for Lane Group [s/veh]	34.66	16.73	13.97	33.92	16.42	13.91	33.98	20.92	27.33	34.96	22.35	21.29
Lane Group LOS	C	B	B	C	B	B	C	C	C	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.10	3.23	0.98	0.90	2.86	0.81	2.90	2.82	4.23	1.76	1.93	0.91
50th-Percentile Queue Length [ft]	27.53	80.63	24.48	22.40	71.46	20.23	72.41	70.41	105.84	43.90	48.36	22.72
95th-Percentile Queue Length [veh]	1.98	5.81	1.76	1.61	5.15	1.46	5.21	5.07	7.61	3.16	3.48	1.64
95th-Percentile Queue Length [ft]	49.56	145.13	44.06	40.31	128.64	36.41	130.34	126.74	190.21	79.02	87.04	40.89

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.66	16.73	13.97	33.92	16.42	13.91	33.98	20.92	27.33	34.96	22.35	21.29
Movement LOS	C	B	B	C	B	B	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	17.83			17.44			25.36			24.86		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	21.26											
Intersection LOS	C											
Intersection V/C	0.554											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	21.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.027

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	3	788	905	8	5	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	788	905	8	5	6
Peak Hour Factor	0.8593	0.8593	0.8593	0.8593	0.8593	0.8593
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	229	263	2	1	2
Total Analysis Volume [veh/h]	3	917	1053	9	6	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.03	0.01
d_M, Delay for Movement [s/veh]	10.45	0.00	0.00	0.00	21.40	12.65
Movement LOS	B	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.01	0.00	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft]	0.34	0.00	0.00	0.00	3.16	3.16
d_A, Approach Delay [s/veh]	0.03		0.00		16.69	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.12					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	22.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	783	27	78	810	1	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	783	27	78	810	1	9
Peak Hour Factor	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	228	8	23	236	0	3
Total Analysis Volume [veh/h]	912	31	91	943	1	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.12	0.01	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	10.58	0.00	22.67	11.58
Movement LOS	A	A	B	A	C	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.42	0.00	0.01	0.05
95th-Percentile Queue Length [ft]	0.00	0.00	10.53	0.00	0.37	1.37
d_A, Approach Delay [s/veh]	0.00		0.93		12.59	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.55					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	3.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.626

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	5	777	163	23	779	7	8	4	11	23	0	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	777	163	23	779	7	8	4	11	23	0	7
Peak Hour Factor	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	217	45	6	217	2	2	1	3	6	0	2
Total Analysis Volume [veh/h]	6	867	182	26	869	8	9	4	12	26	0	8
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	52	0	9	52	0	0	19	0	0	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	C	R	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	50	44	44	50	45	45	2	2	2	2
g / C, Green / Cycle	0.83	0.73	0.73	0.83	0.75	0.75	0.04	0.04	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.01	0.24	0.11	0.04	0.24	0.00	0.17	0.01	0.32	0.00
s, saturation flow rate [veh/h]	708	3618	1615	739	3618	1615	77	1615	81	1615
c, Capacity [veh/h]	705	2635	1176	727	2713	1211	104	66	123	66
d1, Uniform Delay [s]	1.17	2.92	2.50	1.23	2.47	1.89	30.07	27.90	30.07	27.83
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.19	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.33	0.28	0.02	0.31	0.01	0.92	1.33	3.88	0.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.01	0.33	0.15	0.04	0.32	0.01	0.12	0.18	0.21	0.12
d, Delay for Lane Group [s/veh]	1.19	3.25	2.78	1.25	2.79	1.90	30.98	29.22	33.96	28.65
Lane Group LOS	A	A	A	A	A	A	C	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.00	0.54	0.24	0.00	0.34	0.01	0.21	0.18	0.50	0.12
50th-Percentile Queue Length [ft]	0.11	13.59	6.07	0.10	8.38	0.16	5.17	4.57	12.42	3.01
95th-Percentile Queue Length [veh]	0.01	0.98	0.44	0.01	0.60	0.01	0.37	0.33	0.89	0.22
95th-Percentile Queue Length [ft]	0.19	24.46	10.93	0.18	15.08	0.29	9.31	8.22	22.36	5.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.19	3.25	2.78	1.25	2.79	1.90	30.98	30.98	29.22	33.96	33.96	28.65
Movement LOS	A	A	A	A	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	3.16			2.73			30.14			32.71		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	3.80											
Intersection LOS	A											
Intersection V/C	0.626											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	17.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.667

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	25	695	374	256	561	4	4	3	3	64	1	253
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	695	374	256	561	4	4	3	3	64	1	253
Peak Hour Factor	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	197	106	73	159	1	1	1	1	18	0	72
Total Analysis Volume [veh/h]	28	787	424	290	636	5	5	3	3	73	1	287
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	20	30	0	0	21	0	0	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	24	24	12	33	33	13	13	13	13
g / C, Green / Cycle	0.03	0.40	0.40	0.19	0.56	0.56	0.21	0.21	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.02	0.22	0.26	0.16	0.12	0.12	0.01	0.02	0.03	0.18
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1892	1509	1432	1345	1615
c, Capacity [veh/h]	60	1428	637	349	2006	1049	408	315	404	344
d1, Uniform Delay [s]	28.56	14.09	14.95	23.33	6.76	6.76	18.76	22.91	19.35	22.67
k, delay calibration	0.11	0.50	0.50	0.14	0.50	0.50	0.11	0.11	0.11	0.16
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.49	1.54	5.42	6.32	0.24	0.46	0.03	0.13	0.12	7.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

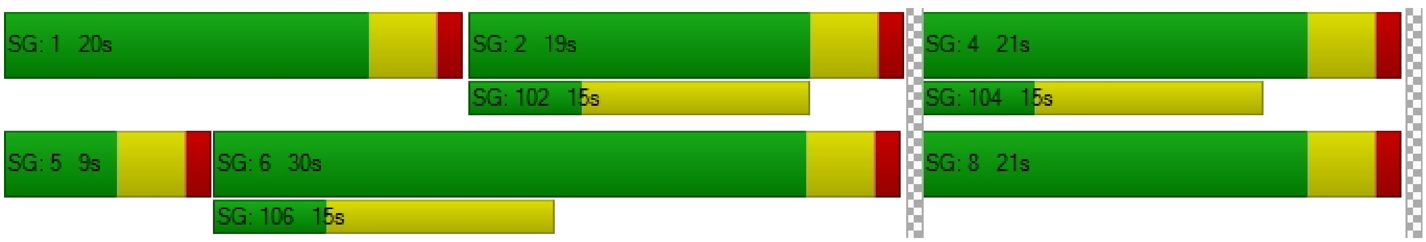
X, volume / capacity	0.47	0.55	0.67	0.83	0.21	0.21	0.03	0.10	0.11	0.84
d, Delay for Lane Group [s/veh]	34.05	15.62	20.36	29.65	6.99	7.21	18.79	23.04	19.47	30.24
Lane Group LOS	C	B	C	C	A	A	B	C	B	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	0.44	3.47	4.57	3.96	0.93	1.03	0.12	0.37	0.48	4.31
50th-Percentile Queue Length [ft]	11.08	86.63	114.30	99.00	23.17	25.84	2.92	9.14	12.05	107.66
95th-Percentile Queue Length [veh]	0.80	6.24	8.08	7.13	1.67	1.86	0.21	0.66	0.87	7.71
95th-Percentile Queue Length [ft]	19.95	155.93	201.97	178.20	41.71	46.51	5.25	16.45	21.69	192.75

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.05	15.62	20.36	29.65	7.07	7.21	18.79	18.79	18.79	23.04	19.47	30.24
Movement LOS	C	B	C	C	A	A	B	B	B	C	B	C
d_A, Approach Delay [s/veh]	17.66			14.10			18.79			28.33		
Approach LOS	B			B			B			C		
d_I, Intersection Delay [s/veh]	17.88											
Intersection LOS	B											
Intersection V/C	0.667											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Signalized	Delay (sec / veh):	4.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.343

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	783	27	78	810	1	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	783	27	78	810	1	9
Peak Hour Factor	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	228	8	23	236	0	3
Total Analysis Volume [veh/h]	912	31	91	943	1	10
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal group	2	0	1	6	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	15	0	30	45	15	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	43	4	51	1	1
g / C, Green / Cycle	0.72	0.72	0.07	0.85	0.02	0.02
(v / s)_i Volume / Saturation Flow Rate	0.25	0.02	0.05	0.26	0.00	0.01
s, saturation flow rate [veh/h]	3618	1615	1810	3618	1810	1615
c, Capacity [veh/h]	2589	1156	124	3078	29	26
d1, Uniform Delay [s]	3.25	2.48	27.47	0.90	29.14	29.31
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.38	0.04	7.98	0.26	0.48	9.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.35	0.03	0.73	0.31	0.03	0.39
d, Delay for Lane Group [s/veh]	3.63	2.52	35.45	1.16	29.62	38.42
Lane Group LOS	A	A	D	A	C	D
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh]	0.70	0.04	1.40	0.11	0.02	0.20
50th-Percentile Queue Length [ft]	17.44	1.07	35.08	2.76	0.44	5.05
95th-Percentile Queue Length [veh]	1.26	0.08	2.53	0.20	0.03	0.36
95th-Percentile Queue Length [ft]	31.39	1.93	63.15	4.96	0.78	9.09

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.63	2.52	35.45	1.16	29.62	38.42
Movement LOS	A	A	D	A	C	D
d_A, Approach Delay [s/veh]	3.59		4.18		37.62	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	4.09					
Intersection LOS	A					
Intersection V/C	0.343					

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	27.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.731

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	478	297	129	149	164	263	124	939	321	148	871	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	478	297	129	149	164	263	124	939	321	148	871	46
Peak Hour Factor	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	129	80	35	40	44	71	33	253	87	40	235	12
Total Analysis Volume [veh/h]	515	320	139	161	177	284	134	1012	346	160	939	50
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	23	0	12	19	0	10	26	0	9	25	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	12	23	23	5	16	16	5	21	21	5	22	22
g / C, Green / Cycle	0.17	0.32	0.32	0.07	0.22	0.22	0.07	0.31	0.31	0.07	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.15	0.13	0.13	0.05	0.05	0.18	0.04	0.28	0.21	0.05	0.26	0.03
s, saturation flow rate [veh/h]	3514	1900	1707	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	602	615	553	253	812	363	234	1106	494	247	1119	499
d1, Uniform Delay [s]	28.19	18.35	18.35	31.62	22.15	25.57	31.73	23.45	21.50	31.73	22.58	17.25
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.21	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.61	1.88	2.09	2.66	0.62	15.49	2.21	3.49	3.43	2.86	1.77	0.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

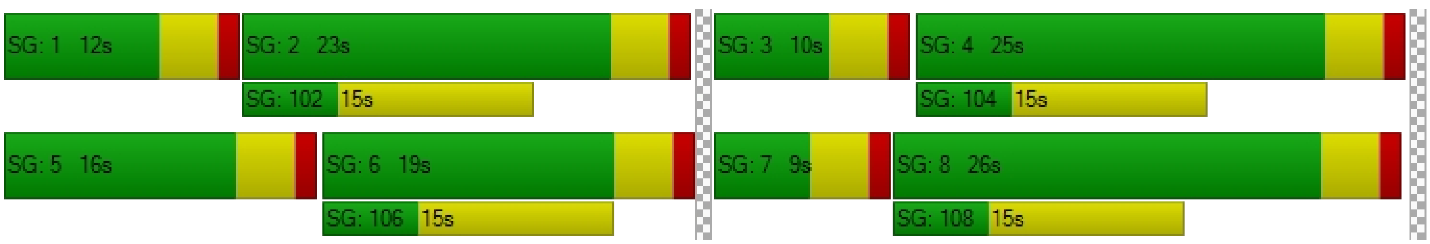
X, volume / capacity	0.86	0.39	0.39	0.64	0.22	0.78	0.57	0.92	0.70	0.65	0.84	0.10
d, Delay for Lane Group [s/veh]	31.80	20.23	20.44	34.28	22.77	41.06	33.94	26.94	24.92	34.59	24.35	17.34
Lane Group LOS	C	C	C	C	C	D	C	C	C	C	C	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	4.16	3.04	2.77	1.34	1.16	5.61	1.10	7.67	4.94	1.33	6.67	0.53
50th-Percentile Queue Length [ft]	103.99	76.09	69.18	33.38	29.11	140.35	27.61	191.64	123.47	33.37	166.67	13.30
95th-Percentile Queue Length [veh]	7.49	5.48	4.98	2.40	2.10	9.50	1.99	12.21	8.58	2.40	10.90	0.96
95th-Percentile Queue Length [ft]	187.19	136.96	124.52	60.09	52.39	237.50	49.69	305.15	214.59	60.06	272.54	23.94

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	31.80	20.28	20.44	34.28	22.77	41.06	33.94	26.94	24.92	34.59	24.35	17.34
Movement LOS	C	C	C	C	C	D	C	C	C	C	C	B
d_A, Approach Delay [s/veh]	26.39			34.10			27.10			25.47		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	27.52											
Intersection LOS	C											
Intersection V/C	0.731											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	17.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.415

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	8	8	4	4	0	15	29	1158	13	7	1023	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	8	4	4	0	15	29	1158	13	7	1023	15
Peak Hour Factor	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	2	1	1	0	4	8	316	4	2	279	4
Total Analysis Volume [veh/h]	9	9	4	4	0	16	32	1262	14	8	1115	16
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	62
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	9	32	0	9	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24	24	30	25	25	30	24	24
g / C, Green / Cycle	0.38	0.38	0.38	0.38	0.49	0.41	0.41	0.49	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.02	0.00	0.01	0.01	0.05	0.35	0.01	0.01	0.31	0.01
s, saturation flow rate [veh/h]	754	1615	519	1615	695	3618	1615	571	3618	1615
c, Capacity [veh/h]	376	620	315	620	367	1486	663	307	1399	625
d1, Uniform Delay [s]	13.33	11.83	23.07	11.92	10.98	16.57	10.89	11.57	16.89	11.80
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.24	0.02	0.07	0.08	0.10	1.45	0.01	0.03	1.08	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

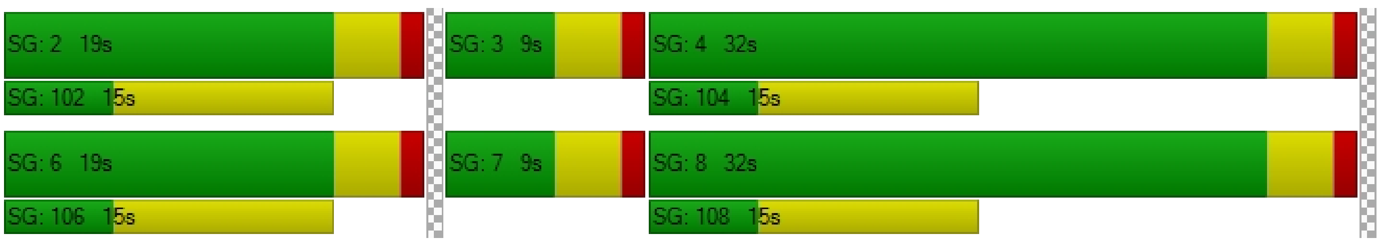
X, volume / capacity	0.05	0.01	0.01	0.03	0.09	0.85	0.02	0.03	0.80	0.03
d, Delay for Lane Group [s/veh]	13.57	11.85	23.15	11.99	11.09	18.02	10.90	11.61	17.97	11.82
Lane Group LOS	B	B	C	B	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.17	0.03	0.05	0.14	0.19	6.91	0.10	0.05	6.04	0.12
50th-Percentile Queue Length [ft]	4.14	0.86	1.36	3.45	4.75	172.75	2.47	1.18	150.99	2.99
95th-Percentile Queue Length [veh]	0.30	0.06	0.10	0.25	0.34	11.22	0.18	0.08	10.07	0.22
95th-Percentile Queue Length [ft]	7.45	1.54	2.45	6.22	8.55	280.53	4.44	2.12	251.75	5.39

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	13.57	13.57	11.85	23.15	23.15	11.99	11.09	18.02	10.90	11.61	17.97	11.82
Movement LOS	B	B	B	C	C	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	13.25			14.22			17.77			17.84		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	17.74											
Intersection LOS	B											
Intersection V/C	0.415											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	29.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.768

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	194	584	138	103	724	92	128	782	211	206	760	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	194	584	138	103	724	92	128	782	211	206	760	90
Peak Hour Factor	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	154	36	27	191	24	34	206	56	54	201	24
Total Analysis Volume [veh/h]	205	617	146	109	765	97	135	826	223	218	803	95
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	21	0	10	19	0	12	21	0	13	22	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	18	18	5	15	15	6	17	17	9	19	19
g / C, Green / Cycle	0.12	0.28	0.28	0.08	0.24	0.24	0.10	0.26	0.26	0.14	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.11	0.17	0.09	0.06	0.21	0.06	0.07	0.23	0.14	0.12	0.22	0.06
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	223	1023	457	141	860	384	173	921	411	251	1075	480
d1, Uniform Delay [s]	28.20	20.17	18.39	29.42	23.98	20.11	28.74	23.43	20.98	27.45	20.65	17.07
k, delay calibration	0.29	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.27	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	29.67	2.63	1.84	8.56	13.31	1.58	7.34	3.43	1.12	19.63	1.06	0.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.92	0.60	0.32	0.77	0.89	0.25	0.78	0.90	0.54	0.87	0.75	0.20
d, Delay for Lane Group [s/veh]	57.87	22.80	20.23	37.98	37.28	21.69	36.08	26.86	22.09	47.07	21.70	17.27
Lane Group LOS	E	C	C	D	D	C	D	C	C	D	C	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	4.62	3.78	1.70	1.83	6.43	1.20	2.25	5.85	2.75	4.40	4.98	0.97
50th-Percentile Queue Length [ft]	115.59	94.60	42.62	45.72	160.86	29.98	56.26	146.36	68.64	109.94	124.45	24.24
95th-Percentile Queue Length [veh]	8.15	6.81	3.07	3.29	10.59	2.16	4.05	9.82	4.94	7.84	8.64	1.75
95th-Percentile Queue Length [ft]	203.75	170.28	76.72	82.29	264.86	53.96	101.27	245.56	123.55	195.92	215.93	43.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	57.87	22.80	20.23	37.98	37.28	21.69	36.08	26.86	22.09	47.07	21.70	17.27
Movement LOS	E	C	C	D	D	C	D	C	C	D	C	B
d_A, Approach Delay [s/veh]	29.84			35.80			27.02			26.28		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	29.48											
Intersection LOS	C											
Intersection V/C	0.768											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	22.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.024

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	3	930	1175	7	5	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	930	1175	7	5	7
Peak Hour Factor	0.9233	0.9233	0.9233	0.9233	0.9233	0.9233
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	252	318	2	1	2
Total Analysis Volume [veh/h]	3	1007	1273	8	5	8
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.02	0.02
d_M, Delay for Movement [s/veh]	11.60	0.00	0.00	0.00	22.88	14.00
Movement LOS	B	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.02	0.00	0.00	0.00	0.13	0.13
95th-Percentile Queue Length [ft]	0.41	0.00	0.00	0.00	3.35	3.35
d_A, Approach Delay [s/veh]	0.03		0.00		17.42	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.11					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	20.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.041

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	782	2	9	1243	9	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	782	2	9	1243	9	66
Peak Hour Factor	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	209	1	2	333	2	18
Total Analysis Volume [veh/h]	837	2	10	1331	10	71
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.01	0.04	0.12
d_M, Delay for Movement [s/veh]	0.00	0.00	9.53	0.00	20.57	11.95
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.04	0.00	0.13	0.41
95th-Percentile Queue Length [ft]	0.00	0.00	0.94	0.00	3.23	10.22
d_A, Approach Delay [s/veh]	0.00		0.07		13.01	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.51					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	9.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.522

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	10	752	21	9	1174	10	1	0	10	178	0	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	752	21	9	1174	10	1	0	10	178	0	31
Peak Hour Factor	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	196	5	2	306	3	0	0	3	46	0	8
Total Analysis Volume [veh/h]	10	785	22	9	1225	10	1	0	10	186	0	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	0	0	7	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	0	0	5	0	0
Maximum Green [s]	30	30	0	30	30	0	30	0	0	30	0	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0
Split [s]	9	32	0	9	32	0	19	0	0	19	0	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	5	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	10	0	0	10	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall	No	No		No	No		No			No		
Maximum Recall	No	No		No	No		No			No		
Pedestrian Recall	No	No		No	No		No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	R	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	41	36	36	41	36	36	11	11	11	11
g / C, Green / Cycle	0.68	0.60	0.60	0.68	0.60	0.60	0.19	0.19	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.02	0.22	0.01	0.01	0.34	0.01	0.00	0.01	0.13	0.02
s, saturation flow rate [veh/h]	555	3618	1615	774	3618	1615	1440	1615	1440	1615
c, Capacity [veh/h]	462	2164	966	629	2159	964	342	307	342	307
d1, Uniform Delay [s]	4.40	6.19	4.91	3.50	7.37	4.91	21.50	19.81	24.67	20.08
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.09	0.47	0.04	0.01	1.09	0.02	0.00	0.04	1.35	0.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.02	0.36	0.02	0.01	0.57	0.01	0.00	0.03	0.54	0.10
d, Delay for Lane Group [s/veh]	4.49	6.66	4.96	3.51	8.46	4.93	21.50	19.85	26.02	20.23
Lane Group LOS	A	A	A	A	A	A	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.03	1.61	0.08	0.02	3.05	0.03	0.01	0.11	2.52	0.36
50th-Percentile Queue Length [ft]	0.68	40.19	1.92	0.40	76.30	0.87	0.29	2.76	63.02	8.96
95th-Percentile Queue Length [veh]	0.05	2.89	0.14	0.03	5.49	0.06	0.02	0.20	4.54	0.65
95th-Percentile Queue Length [ft]	1.23	72.35	3.46	0.73	137.34	1.57	0.52	4.96	113.43	16.13

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	4.49	6.66	4.96	3.51	8.46	4.93	21.50	0.00	19.85	26.02	0.00	20.23
Movement LOS	A	A	A	A	A	A	C		B	C		C
d_A, Approach Delay [s/veh]	6.59			8.40			20.00			25.17		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	9.40											
Intersection LOS	A											
Intersection V/C	0.522											

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	22.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.834

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	44	543	160	191	1136	14	10	4	15	324	2	251
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	543	160	191	1136	14	10	4	15	324	2	251
Peak Hour Factor	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	147	43	52	306	4	3	1	4	87	1	68
Total Analysis Volume [veh/h]	47	586	173	206	1226	15	11	4	16	350	2	271
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	17	27	0	0	24	0	0	24	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	20	20	9	25	25	20	20	20	20
g / C, Green / Cycle	0.05	0.33	0.33	0.14	0.42	0.42	0.33	0.33	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.03	0.16	0.11	0.11	0.23	0.23	0.09	0.01	0.47	0.17
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1888	335	1414	706	1615
c, Capacity [veh/h]	86	1179	526	260	1527	797	192	132	353	534
d1, Uniform Delay [s]	28.02	16.31	15.31	24.89	12.97	12.97	15.89	29.89	23.32	16.18
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.34	1.50	1.67	5.38	1.34	2.56	0.39	0.44	36.57	0.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

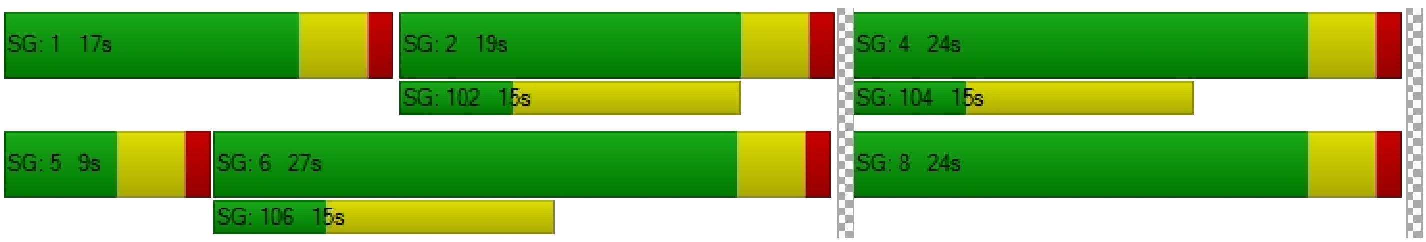
X, volume / capacity	0.55	0.50	0.33	0.79	0.53	0.53	0.16	0.13	0.95	0.51
d, Delay for Lane Group [s/veh]	33.36	17.81	16.98	30.27	14.31	15.52	16.28	30.33	59.89	16.93
Lane Group LOS	C	B	B	C	B	B	B	C	E	B
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.71	2.86	1.69	2.83	3.37	3.78	0.28	0.25	8.21	2.80
50th-Percentile Queue Length [ft]	17.81	71.41	42.26	70.82	84.20	94.62	7.04	6.32	205.19	70.03
95th-Percentile Queue Length [veh]	1.28	5.14	3.04	5.10	6.06	6.81	0.51	0.45	12.91	5.04
95th-Percentile Queue Length [ft]	32.05	128.53	76.06	127.48	151.55	170.31	12.67	11.37	322.65	126.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.36	17.81	16.98	30.27	14.72	15.52	16.28	16.28	16.28	58.44	59.89	16.93
Movement LOS	C	B	B	C	B	B	B	B	B	E	E	B
d_A, Approach Delay [s/veh]	18.54			16.94			16.28			40.39		
Approach LOS	B			B			B			D		
d_I, Intersection Delay [s/veh]	22.40											
Intersection LOS	C											
Intersection V/C	0.834											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Signalized	Delay (sec / veh):	4.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.459

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	782	2	9	1247	9	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	782	2	9	1247	9	66
Peak Hour Factor	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	209	1	2	334	2	18
Total Analysis Volume [veh/h]	837	2	10	1335	10	71
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal group	2	0	1	6	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	15	0	30	45	15	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
l1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	43	1	48	4	4
g / C, Green / Cycle	0.72	0.72	0.01	0.80	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.23	0.00	0.01	0.37	0.01	0.04
s, saturation flow rate [veh/h]	3618	1615	1810	3618	1810	1615
c, Capacity [veh/h]	2611	1166	27	2906	115	103
d1, Uniform Delay [s]	3.03	2.33	29.36	1.85	26.51	27.58
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.32	0.00	8.29	0.53	0.32	7.92
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.32	0.00	0.37	0.46	0.09	0.69
d, Delay for Lane Group [s/veh]	3.35	2.33	37.65	2.37	26.83	35.50
Lane Group LOS	A	A	D	A	C	D
Critical Lane Group	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	0.56	0.00	0.19	0.21	0.14	1.17
50th-Percentile Queue Length [ft]	14.11	0.06	4.73	5.30	3.46	29.35
95th-Percentile Queue Length [veh]	1.02	0.00	0.34	0.38	0.25	2.11
95th-Percentile Queue Length [ft]	25.39	0.11	8.52	9.54	6.23	52.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.35	2.33	37.65	2.37	26.83	35.50
Movement LOS	A	A	D	A	C	D
d_A, Approach Delay [s/veh]	3.35		2.63		34.43	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	4.04					
Intersection LOS	A					
Intersection V/C	0.459					

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Opening Year (2017) With Project

Intersection Level Of Service Report

Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	22.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.444

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	109	92	42	54	134	58	224	909	369	79	433	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	92	42	54	134	58	224	909	369	79	433	28
Peak Hour Factor	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	26	12	15	38	16	63	256	104	22	122	8
Total Analysis Volume [veh/h]	123	104	47	61	151	65	253	1026	416	89	489	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	61
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	13	23	0	9	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	19	19	3	17	17	6	19	19	4	17	17
g / C, Green / Cycle	0.07	0.30	0.30	0.05	0.28	0.28	0.10	0.32	0.32	0.06	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.04	0.04	0.04	0.02	0.04	0.04	0.07	0.28	0.26	0.03	0.14	0.02
s, saturation flow rate [veh/h]	3514	1900	1707	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	254	577	519	188	1031	460	368	1144	511	226	998	446
d1, Uniform Delay [s]	27.23	15.42	15.46	27.84	16.29	16.26	26.38	19.93	19.23	27.42	18.51	16.33
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.28	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.43	0.48	0.57	0.99	0.30	0.64	2.29	2.79	7.82	1.11	0.37	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

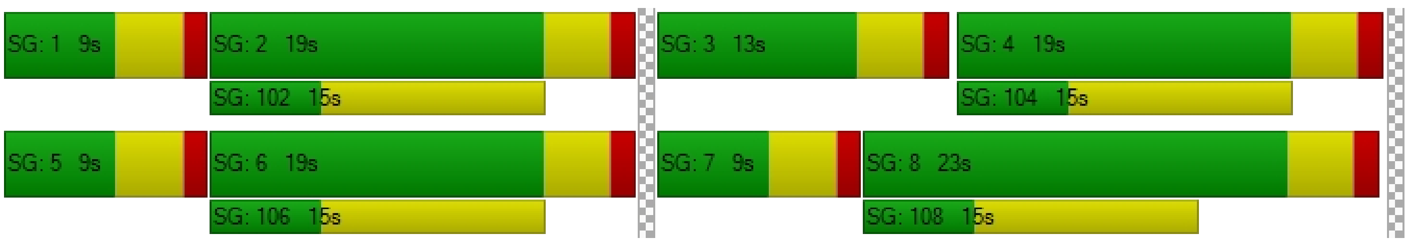
X, volume / capacity	0.48	0.13	0.14	0.32	0.15	0.14	0.69	0.90	0.81	0.39	0.49	0.07
d, Delay for Lane Group [s/veh]	28.66	15.91	16.03	28.83	16.59	16.90	28.67	22.72	27.05	28.53	18.89	16.40
Lane Group LOS	C	B	B	C	B	B	C	C	C	C	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.84	0.76	0.73	0.42	0.74	0.68	1.73	6.34	5.73	0.61	2.57	0.30
50th-Percentile Queue Length [ft]	21.01	19.05	18.32	10.51	18.39	16.94	43.30	158.62	143.17	15.17	64.36	7.49
95th-Percentile Queue Length [veh]	1.51	1.37	1.32	0.76	1.32	1.22	3.12	10.48	9.65	1.09	4.63	0.54
95th-Percentile Queue Length [ft]	37.82	34.29	32.98	18.92	33.10	30.49	77.94	261.90	241.29	27.31	115.85	13.48

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	28.66	15.94	16.03	28.83	16.59	16.90	28.67	22.72	27.05	28.53	18.89	16.40
Movement LOS	C	B	B	C	B	B	C	C	C	C	B	B
d_A, Approach Delay [s/veh]	21.67			19.36			24.67			20.16		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	22.91											
Intersection LOS	C											
Intersection V/C	0.444											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	20.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.345

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	10	4	2	6	2	10	34	925	35	7	417	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	4	2	6	2	10	34	925	35	7	417	11
Peak Hour Factor	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882	0.8882
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	1	1	2	1	3	10	260	10	2	117	3
Total Analysis Volume [veh/h]	11	5	2	7	2	11	38	1041	39	8	469	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	67
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	9	32	0	9	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31	31	28	23	23	28	21	21
g / C, Green / Cycle	0.47	0.47	0.47	0.47	0.41	0.34	0.34	0.41	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.02	0.00	0.01	0.01	0.04	0.29	0.02	0.01	0.13	0.01
s, saturation flow rate [veh/h]	671	1615	633	1615	1085	3618	1615	678	3618	1615
c, Capacity [veh/h]	405	756	392	756	509	1234	551	292	1134	506
d1, Uniform Delay [s]	12.04	9.51	12.09	9.57	12.22	20.46	14.93	14.13	18.17	15.94
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.18	0.01	0.11	0.04	0.06	1.66	0.05	0.04	0.24	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

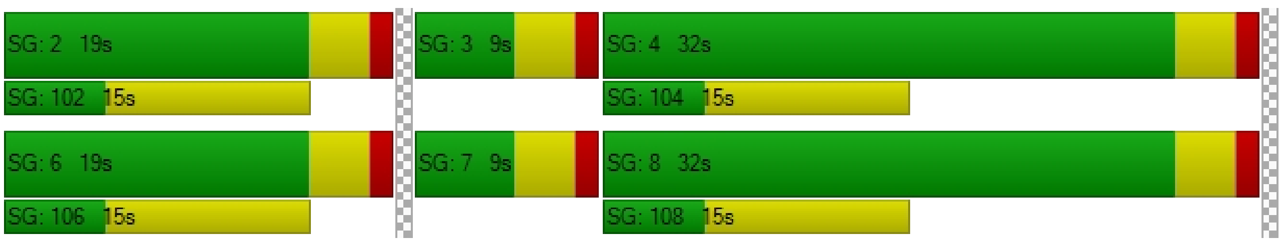
X, volume / capacity	0.04	0.00	0.02	0.01	0.07	0.84	0.07	0.03	0.41	0.02
d, Delay for Lane Group [s/veh]	12.22	9.52	12.20	9.60	12.28	22.12	14.99	14.17	18.42	15.95
Lane Group LOS	B	A	B	A	B	C	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.13	0.02	0.08	0.09	0.30	6.82	0.37	0.06	2.58	0.12
50th-Percentile Queue Length [ft]	3.34	0.38	1.88	2.13	7.61	170.44	9.14	1.61	64.62	2.92
95th-Percentile Queue Length [veh]	0.24	0.03	0.14	0.15	0.55	11.10	0.66	0.12	4.65	0.21
95th-Percentile Queue Length [ft]	6.02	0.69	3.38	3.83	13.70	277.49	16.45	2.89	116.32	5.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	12.22	12.22	9.52	12.20	12.20	9.60	12.28	22.12	14.99	14.17	18.42	15.95
Movement LOS	B	B	A	B	B	A	B	C	B	B	B	B
d_A, Approach Delay [s/veh]	11.92			10.77			21.54			18.29		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	20.33											
Intersection LOS	C											
Intersection V/C	0.345											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Project West Driveway (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	8.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Project West Driveway		Dumas St		Dumas Street	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Project West Driveway		Dumas St		Dumas Street	
Base Volume Input [veh/h]	4	1	11	14	8	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	1	11	14	8	12
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	3	4	2	3
Total Analysis Volume [veh/h]	4	1	12	15	9	13
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	8.78	8.40	0.00	0.00	7.26	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.02	0.02	0.00	0.00	0.04	0.04
95th-Percentile Queue Length [ft]	0.39	0.39	0.00	0.00	1.05	1.05
d_A, Approach Delay [s/veh]	8.70		0.00		2.97	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.02					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 4: Project East DriveWay (NS) at Dumas Street (EW)

Control Type:	Two-way stop	Delay (sec / veh):	8.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	Project East DriveWay		Dumas Street		Dumas St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Project East DriveWay		Dumas Street		Dumas St	
Base Volume Input [veh/h]	0	3	12	0	18	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	3	12	0	18	20
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	1	3	0	5	5
Total Analysis Volume [veh/h]	0	3	13	0	20	22
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	8.36	0.00	0.00	7.25	0.00
Movement LOS		A	A		A	A
95th-Percentile Queue Length [veh]	0.00	0.01	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	0.00	0.21	0.00	0.00	2.00	2.00
d_A, Approach Delay [s/veh]	8.36		0.00		3.45	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.93					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	21.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.578

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	70	614	105	52	559	84	164	442	293	108	294	71
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	614	105	52	559	84	164	442	293	108	294	71
Peak Hour Factor	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	175	30	15	159	24	47	126	83	31	84	20
Total Analysis Volume [veh/h]	80	699	120	59	637	96	187	503	334	123	335	81
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	13	21	0	11	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	21	21	3	20	20	8	15	15	5	12	12
g / C, Green / Cycle	0.06	0.34	0.34	0.05	0.33	0.33	0.13	0.25	0.25	0.09	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.07	0.03	0.18	0.06	0.10	0.14	0.21	0.07	0.09	0.05
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	113	1241	554	97	1207	539	235	899	401	161	751	335
d1, Uniform Delay [s]	27.65	16.09	14.03	27.85	16.20	14.19	25.38	19.72	21.41	26.78	20.82	19.89
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.16	0.11	0.19	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.77	1.85	0.90	6.07	1.65	0.72	8.60	0.55	7.68	7.32	0.42	0.37
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.71	0.56	0.22	0.61	0.53	0.18	0.79	0.56	0.83	0.76	0.45	0.24
d, Delay for Lane Group [s/veh]	35.42	17.95	14.92	33.92	17.85	14.91	33.98	20.27	29.09	34.10	21.23	20.26
Lane Group LOS	D	B	B	C	B	B	C	C	C	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.24	3.42	1.07	0.90	3.10	0.85	2.90	2.76	4.73	1.89	1.87	0.88
50th-Percentile Queue Length [ft]	30.93	85.49	26.64	22.40	77.57	21.35	72.41	68.89	118.25	47.37	46.71	21.93
95th-Percentile Queue Length [veh]	2.23	6.16	1.92	1.61	5.58	1.54	5.21	4.96	8.30	3.41	3.36	1.58
95th-Percentile Queue Length [ft]	55.68	153.89	47.95	40.31	139.62	38.44	130.34	124.00	207.42	85.26	84.07	39.48

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	35.42	17.95	14.92	33.92	17.85	14.91	33.98	20.27	29.09	34.10	21.23	20.26
Movement LOS	D	B	B	C	B	B	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	19.10			18.69			25.65			24.02		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	21.88											
Intersection LOS	C											
Intersection V/C	0.578											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	22.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.028

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	14	802	930	22	5	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	802	930	22	5	10
Peak Hour Factor	0.8593	0.8593	0.8593	0.8593	0.8593	0.8593
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	233	271	6	1	3
Total Analysis Volume [veh/h]	16	933	1082	26	6	12
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.01	0.00	0.03	0.02
d_M, Delay for Movement [s/veh]	10.79	0.00	0.00	0.00	22.63	12.93
Movement LOS	B	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.08	0.00	0.00	0.00	0.17	0.17
95th-Percentile Queue Length [ft]	1.93	0.00	0.00	0.00	4.17	4.17
d_A, Approach Delay [s/veh]	0.18		0.00		16.16	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.22					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	87.0
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.270

Intersection Setup

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	215.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			No		

volumes

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Base Volume Input [veh/h]	18	794	27	78	814	24	14	0	6	1	0	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	794	27	78	814	24	14	0	6	1	0	9
Peak Hour Factor	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	231	8	23	237	7	4	0	2	0	0	3
Total Analysis Volume [veh/h]	21	925	31	91	948	28	16	0	7	1	0	10
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.00	0.13	0.01	0.00	0.27	0.00	0.01	0.02	0.00	0.02
d_M, Delay for Movement [s/veh]	10.19	0.00	0.00	10.66	0.00	0.00	86.98	0.00	11.73	65.30	0.00	11.65
Movement LOS	B	A	A	B	A	A	F		B	F		B
95th-Percentile Queue Length [veh]	0.09	0.00	0.00	0.43	0.00	0.00	0.95	0.00	0.04	0.05	0.00	0.06
95th-Percentile Queue Length [ft]	2.27	0.00	0.00	10.67	0.00	0.00	23.64	0.00	0.98	1.25	0.00	1.38
d_A, Approach Delay [s/veh]	0.22			0.91			64.07			16.52		
Approach LOS	A			A			F			C		
d_I, Intersection Delay [s/veh]	1.37											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	3.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.636

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	5	806	163	23	790	7	8	4	11	23	0	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	806	163	23	790	7	8	4	11	23	0	7
Peak Hour Factor	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960	0.8960
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	225	45	6	220	2	2	1	3	6	0	2
Total Analysis Volume [veh/h]	6	900	182	26	882	8	9	4	12	26	0	8
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	52	0	9	52	0	0	19	0	0	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	C	R	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	50	44	44	50	45	45	2	2	2	2
g / C, Green / Cycle	0.83	0.73	0.73	0.83	0.75	0.75	0.04	0.04	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.01	0.25	0.11	0.04	0.24	0.00	0.17	0.01	0.32	0.00
s, saturation flow rate [veh/h]	701	3618	1615	721	3618	1615	77	1615	81	1615
c, Capacity [veh/h]	699	2635	1176	711	2713	1211	104	66	123	66
d1, Uniform Delay [s]	1.18	2.95	2.50	1.26	2.49	1.89	30.07	27.90	30.07	27.83
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.19	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.35	0.28	0.02	0.32	0.01	0.92	1.33	3.88	0.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.01	0.34	0.15	0.04	0.33	0.01	0.12	0.18	0.21	0.12
d, Delay for Lane Group [s/veh]	1.20	3.31	2.78	1.28	2.81	1.90	30.98	29.22	33.96	28.65
Lane Group LOS	A	A	A	A	A	A	C	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.00	0.57	0.24	0.00	0.34	0.01	0.21	0.18	0.50	0.12
50th-Percentile Queue Length [ft]	0.11	14.30	6.07	0.10	8.55	0.16	5.17	4.57	12.42	3.01
95th-Percentile Queue Length [veh]	0.01	1.03	0.44	0.01	0.62	0.01	0.37	0.33	0.89	0.22
95th-Percentile Queue Length [ft]	0.19	25.74	10.93	0.18	15.39	0.29	9.31	8.22	22.36	5.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.20	3.31	2.78	1.28	2.81	1.90	30.98	30.98	29.22	33.96	33.96	28.65
Movement LOS	A	A	A	A	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	3.21			2.75			30.14			32.71		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	3.82											
Intersection LOS	A											
Intersection V/C	0.636											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	18.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.666

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	25	724	374	256	572	4	4	3	3	64	1	253
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	724	374	256	572	4	4	3	3	64	1	253
Peak Hour Factor	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826	0.8826
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	205	106	73	162	1	1	1	1	18	0	72
Total Analysis Volume [veh/h]	28	820	424	290	648	5	5	3	3	73	1	287
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	61
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	20	30	0	0	21	0	0	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	24	24	12	34	34	13	13	13	13
g / C, Green / Cycle	0.03	0.40	0.40	0.19	0.56	0.56	0.21	0.21	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.02	0.23	0.26	0.16	0.12	0.12	0.01	0.02	0.03	0.18
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1893	1504	1432	1342	1615
c, Capacity [veh/h]	60	1444	645	348	2021	1057	405	313	401	342
d1, Uniform Delay [s]	29.04	14.27	14.96	23.75	6.76	6.76	19.11	23.31	19.71	23.09
k, delay calibration	0.11	0.50	0.50	0.14	0.50	0.50	0.11	0.11	0.11	0.16
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.56	1.62	5.18	6.75	0.24	0.46	0.03	0.13	0.12	8.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

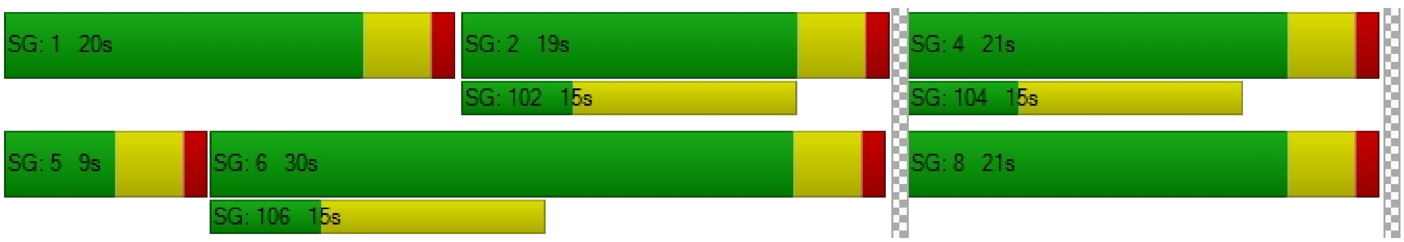
X, volume / capacity	0.47	0.57	0.66	0.83	0.21	0.21	0.03	0.10	0.11	0.84
d, Delay for Lane Group [s/veh]	34.60	15.89	20.15	30.50	7.00	7.22	19.14	23.45	19.83	31.15
Lane Group LOS	C	B	C	C	A	A	B	C	B	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	0.45	3.71	4.59	4.08	0.96	1.07	0.12	0.37	0.49	4.43
50th-Percentile Queue Length [ft]	11.30	92.63	114.84	102.00	23.98	26.70	2.98	9.34	12.31	110.78
95th-Percentile Queue Length [veh]	0.81	6.67	8.11	7.34	1.73	1.92	0.21	0.67	0.89	7.88
95th-Percentile Queue Length [ft]	20.33	166.74	202.72	183.60	43.16	48.07	5.36	16.81	22.15	197.08

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.60	15.89	20.15	30.50	7.07	7.22	19.14	19.14	19.14	23.45	19.83	31.15
Movement LOS	C	B	C	C	A	A	B	B	B	C	B	C
d_A, Approach Delay [s/veh]	17.72			14.28			19.14			29.13		
Approach LOS	B			B			B			C		
d_I, Intersection Delay [s/veh]	18.06											
Intersection LOS	B											
Intersection V/C	0.666											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Signalized	Delay (sec / veh):	5.6
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.476

Intersection Setup

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	215.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			No		

volumes

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Base Volume Input [veh/h]	18	794	27	78	814	24	14	0	6	1	0	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	794	27	78	814	24	14	0	6	1	0	9
Peak Hour Factor	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587	0.8587
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	231	8	23	237	7	4	0	2	0	0	3
Total Analysis Volume [veh/h]	21	925	31	91	948	28	16	0	7	1	0	10
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	15	0	26	32	0	0	19	0	0	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	C	R	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	42	42	4	45	45	2	2	2	2
g / C, Green / Cycle	0.03	0.71	0.71	0.07	0.75	0.75	0.03	0.03	0.03	0.03
(v / s)_i Volume / Saturation Flow Rate	0.01	0.26	0.02	0.05	0.26	0.02	0.12	0.00	0.01	0.01
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	131	1615	114	1615
c, Capacity [veh/h]	48	2544	1136	124	2695	1203	123	46	123	46
d1, Uniform Delay [s]	28.83	3.56	2.70	27.48	2.65	1.99	30.06	28.50	29.97	28.55
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.00	0.40	0.04	8.07	0.36	0.04	0.47	1.48	0.03	2.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

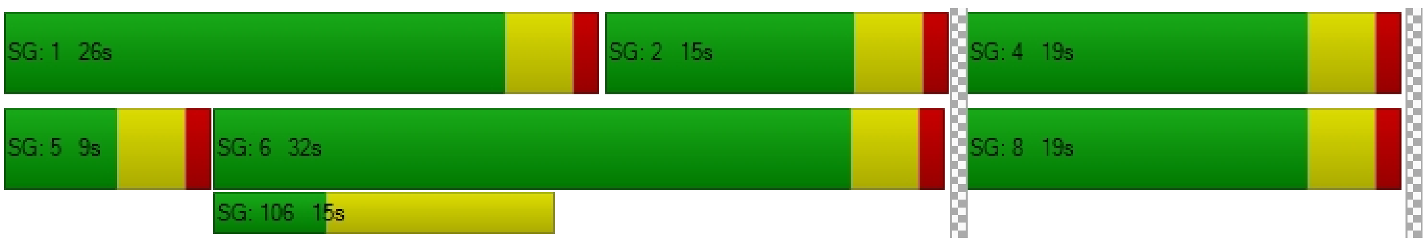
X, volume / capacity	0.43	0.36	0.03	0.73	0.35	0.02	0.13	0.15	0.01	0.22
d, Delay for Lane Group [s/veh]	34.82	3.96	2.75	35.55	3.01	2.03	30.53	29.98	29.99	30.83
Lane Group LOS	C	A	A	D	A	A	C	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh]	0.35	0.84	0.05	1.41	0.41	0.02	0.24	0.11	0.01	0.16
50th-Percentile Queue Length [ft]	8.64	21.11	1.24	35.15	10.33	0.61	5.98	2.82	0.37	4.09
95th-Percentile Queue Length [veh]	0.62	1.52	0.09	2.53	0.74	0.04	0.43	0.20	0.03	0.29
95th-Percentile Queue Length [ft]	15.55	38.01	2.24	63.27	18.59	1.09	10.76	5.08	0.66	7.37

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.82	3.96	2.75	35.55	3.01	2.03	30.53	30.53	29.98	29.99	29.99	30.83
Movement LOS	C	A	A	D	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	4.59			5.76			30.36			30.75		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	5.62											
Intersection LOS	A											
Intersection V/C	0.476											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	27.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.736

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	478	297	129	149	164	263	124	953	321	148	907	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	478	297	129	149	164	263	124	953	321	148	907	46
Peak Hour Factor	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275	0.9275
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	129	80	35	40	44	71	33	257	87	40	244	12
Total Analysis Volume [veh/h]	515	320	139	161	177	284	134	1027	346	160	978	50
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	23	0	12	19	0	10	26	0	9	25	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	12	22	22	5	16	16	5	22	22	5	22	22
g / C, Green / Cycle	0.17	0.32	0.32	0.07	0.22	0.22	0.07	0.31	0.31	0.07	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.15	0.13	0.13	0.05	0.05	0.18	0.04	0.28	0.21	0.05	0.27	0.03
s, saturation flow rate [veh/h]	3514	1900	1707	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	602	612	550	253	805	359	234	1113	497	247	1126	503
d1, Uniform Delay [s]	28.19	18.46	18.46	31.62	22.27	25.70	31.73	23.45	21.37	31.73	22.77	17.15
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.21	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.61	1.91	2.12	2.66	0.63	16.15	2.21	3.76	3.33	2.86	2.20	0.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

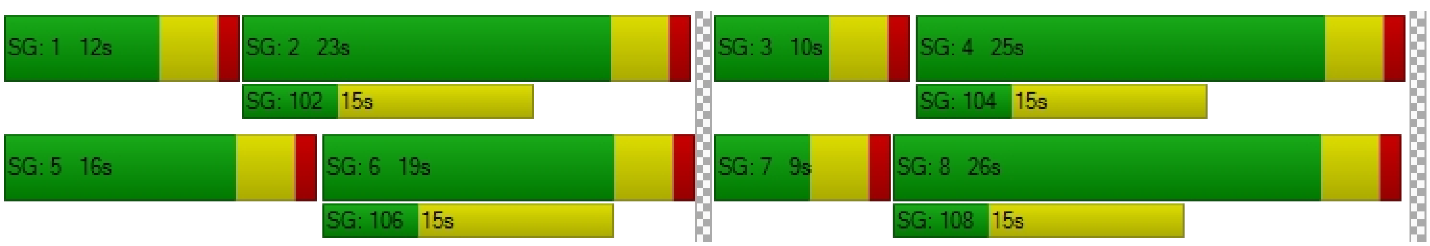
X, volume / capacity	0.86	0.40	0.40	0.64	0.22	0.79	0.57	0.92	0.70	0.65	0.87	0.10
d, Delay for Lane Group [s/veh]	31.80	20.37	20.58	34.28	22.90	41.85	33.94	27.21	24.70	34.59	24.97	17.23
Lane Group LOS	C	C	C	C	C	D	C	C	C	C	C	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	4.16	3.06	2.78	1.34	1.17	5.68	1.10	7.83	4.91	1.33	7.07	0.53
50th-Percentile Queue Length [ft]	103.99	76.47	69.53	33.38	29.23	142.01	27.61	195.72	122.75	33.37	176.75	13.24
95th-Percentile Queue Length [veh]	7.49	5.51	5.01	2.40	2.10	9.59	1.99	12.42	8.54	2.40	11.43	0.95
95th-Percentile Queue Length [ft]	187.19	137.65	125.16	60.09	52.61	239.73	49.69	310.44	213.60	60.06	285.77	23.84

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	31.80	20.42	20.58	34.28	22.90	41.85	33.94	27.21	24.70	34.59	24.97	17.23
Movement LOS	C	C	C	C	C	D	C	C	C	C	C	B
d_A, Approach Delay [s/veh]	26.46			34.50			27.23			25.94		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	27.75											
Intersection LOS	C											
Intersection V/C	0.736											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	18.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.449

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	20	10	4	4	1	15	29	1167	17	7	1047	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	10	4	4	1	15	29	1167	17	7	1047	15
Peak Hour Factor	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174	0.9174
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	3	1	1	0	4	8	318	5	2	285	4
Total Analysis Volume [veh/h]	22	11	4	4	1	16	32	1272	19	8	1141	16
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	63
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	9	32	0	9	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24	24	31	26	26	31	24	24
g / C, Green / Cycle	0.39	0.39	0.39	0.39	0.49	0.41	0.41	0.49	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.05	0.00	0.01	0.01	0.05	0.35	0.01	0.01	0.32	0.01
s, saturation flow rate [veh/h]	637	1615	568	1615	683	3618	1615	566	3618	1615
c, Capacity [veh/h]	341	623	322	623	357	1489	665	301	1403	626
d1, Uniform Delay [s]	13.85	11.93	13.79	12.02	11.36	16.86	11.06	11.85	17.28	11.95
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.56	0.02	0.09	0.08	0.11	1.50	0.02	0.04	1.19	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

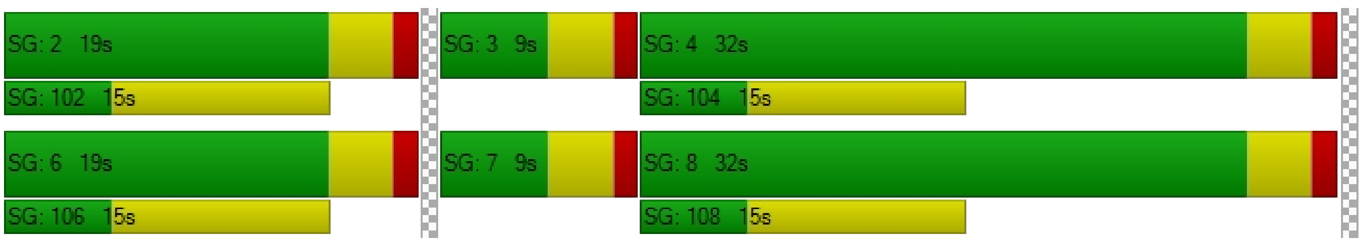
X, volume / capacity	0.10	0.01	0.02	0.03	0.09	0.85	0.03	0.03	0.81	0.03
d, Delay for Lane Group [s/veh]	14.42	11.95	13.88	12.10	11.47	18.35	11.08	11.89	18.47	11.97
Lane Group LOS	B	B	B	B	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.32	0.03	0.05	0.14	0.19	7.14	0.14	0.05	6.38	0.12
50th-Percentile Queue Length [ft]	7.94	0.87	1.18	3.51	4.87	178.58	3.43	1.21	159.60	3.05
95th-Percentile Queue Length [veh]	0.57	0.06	0.09	0.25	0.35	11.53	0.25	0.09	10.53	0.22
95th-Percentile Queue Length [ft]	14.29	1.56	2.13	6.31	8.77	288.16	6.17	2.18	263.20	5.50

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	14.42	14.42	11.95	13.88	13.88	12.10	11.47	18.35	11.08	11.89	18.47	11.97
Movement LOS	B	B	B	B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	14.15			12.52			18.08			18.34		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	18.10											
Intersection LOS	B											
Intersection V/C	0.449											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Project West Driveway (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	8.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name	Project West Driveway		Dumas St		Dumas Street	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Project West Driveway		Dumas St		Dumas Street	
Base Volume Input [veh/h]	14	4	10	4	4	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	4	10	4	4	20
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	1	3	1	1	5
Total Analysis Volume [veh/h]	15	4	11	4	4	22
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.78	8.43	0.00	0.00	7.23	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.06	0.06	0.00	0.00	0.05	0.05
95th-Percentile Queue Length [ft]	1.47	1.47	0.00	0.00	1.23	1.23
d_A, Approach Delay [s/veh]	8.71		0.00		1.11	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.24					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 4: Project East DriveWay (NS) at Dumas Street (EW)

Control Type:	Two-way stop	Delay (sec / veh):	8.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Project East DriveWay		Dumas Street		Dumas St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Project East DriveWay		Dumas Street		Dumas St	
Base Volume Input [veh/h]	0	7	14	0	9	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	7	14	0	9	24
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	4	0	2	7
Total Analysis Volume [veh/h]	0	8	15	0	10	26
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	8.39	0.00	0.00	7.24	0.00
Movement LOS		A	A		A	A
95th-Percentile Queue Length [veh]	0.00	0.02	0.00	0.00	0.07	0.07
95th-Percentile Queue Length [ft]	0.00	0.56	0.00	0.00	1.71	1.71
d_A, Approach Delay [s/veh]	8.39		0.00		2.01	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.36					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	30.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.786

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	213	594	148	103	728	92	128	782	221	213	765	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	213	594	148	103	728	92	128	782	221	213	765	90
Peak Hour Factor	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468	0.9468
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	56	157	39	27	192	24	34	206	58	56	202	24
Total Analysis Volume [veh/h]	225	627	156	109	769	97	135	826	233	225	808	95
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	22	0	10	19	0	13	20	0	13	20	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	19	19	5	15	15	6	16	16	9	19	19
g / C, Green / Cycle	0.14	0.29	0.29	0.08	0.23	0.23	0.10	0.25	0.25	0.14	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.12	0.17	0.10	0.06	0.21	0.06	0.07	0.23	0.14	0.12	0.22	0.06
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	251	1061	474	141	841	376	173	884	395	251	1039	464
d1, Uniform Delay [s]	27.56	19.64	17.97	29.43	24.32	20.38	28.73	24.06	21.70	27.56	21.28	17.56
k, delay calibration	0.29	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.13	0.29	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	24.13	2.42	1.85	8.74	16.07	1.66	7.36	5.32	1.63	24.13	1.30	0.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

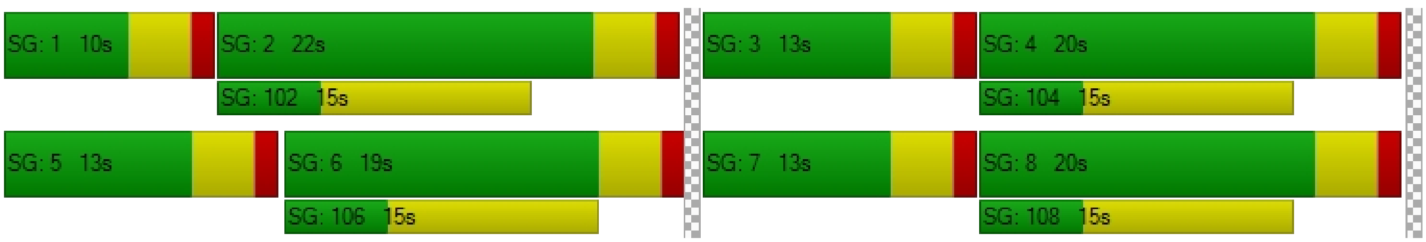
X, volume / capacity	0.90	0.59	0.33	0.77	0.91	0.26	0.78	0.93	0.59	0.90	0.78	0.20
d, Delay for Lane Group [s/veh]	51.69	22.06	19.83	38.17	40.40	22.04	36.09	29.38	23.33	51.69	22.57	17.78
Lane Group LOS	D	C	B	D	D	C	D	C	C	D	C	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	4.70	3.76	1.79	1.83	6.80	1.21	2.25	6.16	2.98	4.82	5.14	0.99
50th-Percentile Queue Length [ft]	117.59	94.06	44.87	45.85	170.04	30.34	56.26	154.07	74.55	120.52	128.47	24.72
95th-Percentile Queue Length [veh]	8.26	6.77	3.23	3.30	11.08	2.18	4.05	10.23	5.37	8.42	8.86	1.78
95th-Percentile Queue Length [ft]	206.52	169.32	80.77	82.53	276.96	54.62	101.27	255.85	134.19	210.54	221.42	44.49

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.69	22.06	19.83	38.17	40.40	22.04	36.09	29.38	23.33	51.69	22.57	17.78
Movement LOS	D	C	B	D	D	C	D	C	C	D	C	B
d_A, Approach Delay [s/veh]	28.33			38.32			28.96			27.98		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	30.67											
Intersection LOS	C											
Intersection V/C	0.786											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	23.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.025

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	8	968	1189	14	5	18
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	968	1189	14	5	18
Peak Hour Factor	0.9233	0.9233	0.9233	0.9233	0.9233	0.9233
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	262	322	4	1	5
Total Analysis Volume [veh/h]	9	1048	1288	15	5	19
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.01	0.00	0.02	0.05
d_M, Delay for Movement [s/veh]	11.80	0.00	0.00	0.00	23.75	14.36
Movement LOS	B	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.05	0.00	0.00	0.00	0.23	0.23
95th-Percentile Queue Length [ft]	1.27	0.00	0.00	0.00	5.63	5.63
d_A, Approach Delay [s/veh]	0.10		0.00		16.31	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.21					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	264.8
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	215.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			No		

volumes

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Base Volume Input [veh/h]	8	787	2	9	1258	11	38	0	18	9	0	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	787	2	9	1258	11	38	0	18	9	0	66
Peak Hour Factor	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	211	1	2	337	3	10	0	5	2	0	18
Total Analysis Volume [veh/h]	9	842	2	10	1347	12	41	0	19	10	0	71
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.00	0.01	0.01	0.00	0.94	0.00	0.05	0.14	0.00	0.12
d_M, Delay for Movement [s/veh]	12.15	0.00	0.00	9.55	0.00	0.00	262.11	264.79	14.40	62.04	99.29	11.98
Movement LOS	B	A	A	A	A	A	F	F	B	F	F	B
95th-Percentile Queue Length [veh]	0.05	0.00	0.00	0.04	0.00	0.00	3.77	3.77	0.15	0.45	0.45	0.41
95th-Percentile Queue Length [ft]	1.34	0.00	0.00	0.95	0.00	0.00	94.13	94.13	3.71	11.27	11.27	10.26
d_A, Approach Delay [s/veh]	0.13			0.07			183.67			18.16		
Approach LOS	A			A			F			C		
d_I, Intersection Delay [s/veh]	5.37											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	9.6
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	10	765	21	9	1207	10	1	0	10	178	0	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	765	21	9	1207	10	1	0	10	178	0	31
Peak Hour Factor	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583	0.9583
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	200	5	2	315	3	0	0	3	46	0	8
Total Analysis Volume [veh/h]	10	798	22	9	1260	10	1	0	10	186	0	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	0	0	7	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	0	0	5	0	0
Maximum Green [s]	30	30	0	30	30	0	30	0	0	30	0	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0
Split [s]	9	19	0	9	19	0	32	0	0	32	0	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	5	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	10	0	0	10	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall	No	No		No	No		No			No		
Maximum Recall	No	No		No	No		No			No		
Pedestrian Recall	No	No		No	No		No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	R	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	40	36	36	40	36	36	12	12	12	12
g / C, Green / Cycle	0.67	0.59	0.59	0.67	0.59	0.59	0.19	0.19	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.02	0.22	0.01	0.01	0.35	0.01	0.00	0.01	0.13	0.02
s, saturation flow rate [veh/h]	542	3618	1615	767	3618	1615	1440	1615	1440	1615
c, Capacity [veh/h]	450	2151	960	620	2147	959	346	312	346	312
d1, Uniform Delay [s]	4.62	6.33	5.00	3.59	7.61	4.99	21.33	19.66	24.48	19.93
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.09	0.49	0.04	0.01	1.18	0.02	0.00	0.04	1.29	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

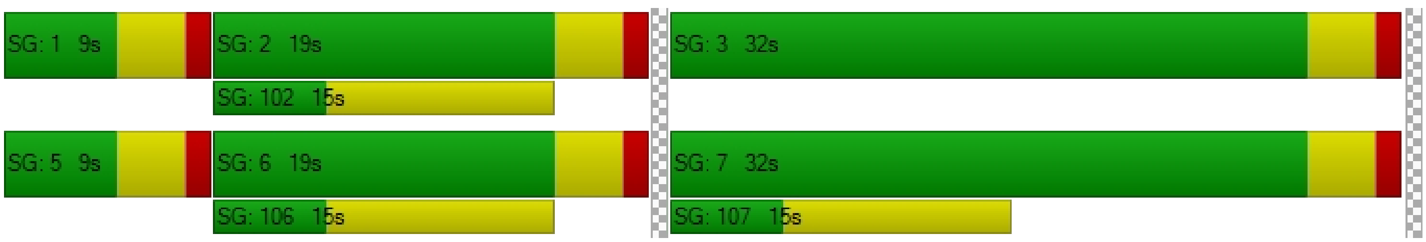
X, volume / capacity	0.02	0.37	0.02	0.01	0.59	0.01	0.00	0.03	0.54	0.10
d, Delay for Lane Group [s/veh]	4.71	6.82	5.04	3.60	8.79	5.01	21.34	19.70	25.78	20.07
Lane Group LOS	A	A	A	A	A	A	C	B	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.03	1.67	0.08	0.02	3.26	0.04	0.01	0.11	2.50	0.36
50th-Percentile Queue Length [ft]	0.71	41.86	1.96	0.42	81.40	0.89	0.29	2.74	62.62	8.91
95th-Percentile Queue Length [veh]	0.05	3.01	0.14	0.03	5.86	0.06	0.02	0.20	4.51	0.64
95th-Percentile Queue Length [ft]	1.27	75.35	3.52	0.75	146.52	1.60	0.52	4.93	112.71	16.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	4.71	6.82	5.04	3.60	8.79	5.01	21.34	0.00	19.70	25.78	0.00	20.07
Movement LOS	A	A	A	A	A	A	C		B	C		C
d_A, Approach Delay [s/veh]	6.75			8.73			19.85			24.94		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	9.59											
Intersection LOS	A											
Intersection V/C	0.533											

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	22.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.840

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	44	556	160	191	1169	14	10	4	15	324	2	251
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	556	160	191	1169	14	10	4	15	324	2	251
Peak Hour Factor	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266	0.9266
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	150	43	52	315	4	3	1	4	87	1	68
Total Analysis Volume [veh/h]	47	600	173	206	1262	15	11	4	16	350	2	271
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	61
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	17	27	0	0	24	0	0	24	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	20	20	9	26	26	20	20	20	20
g / C, Green / Cycle	0.05	0.33	0.33	0.14	0.43	0.43	0.33	0.33	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.03	0.17	0.11	0.11	0.23	0.23	0.09	0.01	0.48	0.17
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1889	333	1414	704	1615
c, Capacity [veh/h]	85	1210	540	259	1558	814	188	129	347	526
d1, Uniform Delay [s]	28.50	16.23	15.17	25.32	12.90	12.90	16.31	30.41	23.95	16.70
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.45	1.45	1.56	5.46	1.34	2.55	0.41	0.42	41.33	0.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

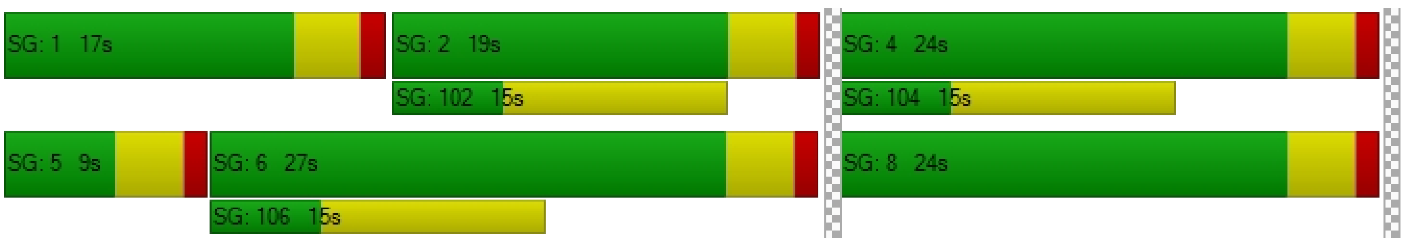
X, volume / capacity	0.55	0.50	0.32	0.79	0.54	0.54	0.16	0.12	0.97	0.51
d, Delay for Lane Group [s/veh]	33.95	17.69	16.73	30.79	14.24	15.45	16.71	30.83	65.28	17.48
Lane Group LOS	C	B	B	C	B	B	B	C	E	B
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.73	2.94	1.69	2.89	3.50	3.92	0.29	0.24	8.72	2.89
50th-Percentile Queue Length [ft]	18.17	73.57	42.20	72.36	87.38	98.07	7.27	5.88	217.95	72.35
95th-Percentile Queue Length [veh]	1.31	5.30	3.04	5.21	6.29	7.06	0.52	0.42	13.56	5.21
95th-Percentile Queue Length [ft]	32.71	132.42	75.96	130.25	157.28	176.53	13.08	10.59	339.00	130.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.95	17.69	16.73	30.79	14.65	15.45	16.71	16.71	16.71	63.73	65.28	17.48
Movement LOS	C	B	B	C	B	B	B	B	B	E	E	B
d_A, Approach Delay [s/veh]	18.42			16.90			16.71			43.62		
Approach LOS	B			B			B			D		
d_I, Intersection Delay [s/veh]	22.95											
Intersection LOS	C											
Intersection V/C	0.840											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Signalized	Delay (sec / veh):	7.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.581

Intersection Setup

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	215.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			No		

volumes

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Base Volume Input [veh/h]	8	787	2	9	1258	11	38	0	18	9	0	66
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	787	2	9	1258	11	38	0	18	9	0	66
Peak Hour Factor	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342	0.9342
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	211	1	2	337	3	10	0	5	2	0	18
Total Analysis Volume [veh/h]	9	842	2	10	1347	12	41	0	19	10	0	71
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	26	36	0	9	19	0	0	15	0	0	15	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	C	R	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	40	40	1	40	40	7	7	7	7
g / C, Green / Cycle	0.01	0.66	0.66	0.01	0.66	0.66	0.12	0.12	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.00	0.23	0.00	0.01	0.37	0.01	1.95	0.01	0.59	0.04
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	21	1615	17	1615
c, Capacity [veh/h]	25	2393	1068	27	2398	1070	122	200	122	200
d1, Uniform Delay [s]	29.41	4.49	3.45	29.36	5.45	3.45	30.08	23.35	30.07	24.14
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.71	0.41	0.00	8.29	0.96	0.02	7.25	0.20	1.32	1.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

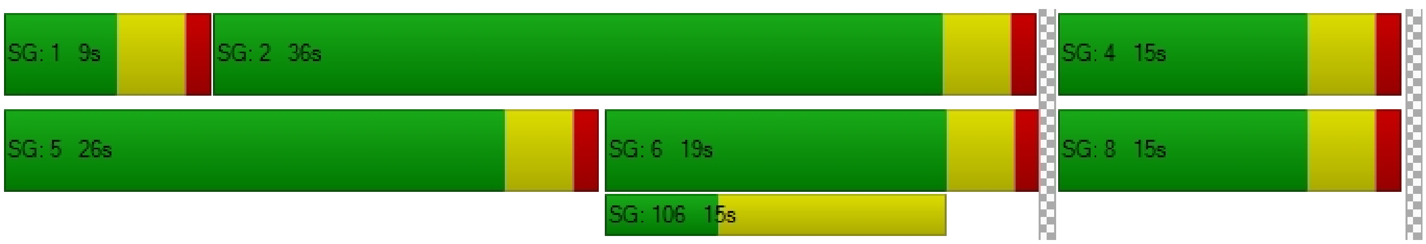
X, volume / capacity	0.36	0.35	0.00	0.37	0.56	0.01	0.34	0.09	0.08	0.35
d, Delay for Lane Group [s/veh]	38.12	4.90	3.45	37.65	6.41	3.47	37.33	23.56	31.39	25.20
Lane Group LOS	D	A	A	D	A	A	D	C	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh]	0.17	1.14	0.00	0.19	2.27	0.03	0.83	0.24	0.18	0.93
50th-Percentile Queue Length [ft]	4.37	28.56	0.12	4.73	56.67	0.69	20.70	5.93	4.59	23.28
95th-Percentile Queue Length [veh]	0.31	2.06	0.01	0.34	4.08	0.05	1.49	0.43	0.33	1.68
95th-Percentile Queue Length [ft]	7.86	51.41	0.21	8.52	102.00	1.24	37.26	10.67	8.26	41.90

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	38.12	4.90	3.45	37.65	6.41	3.47	37.33	37.33	23.56	31.39	31.39	25.20
Movement LOS	D	A	A	D	A	A	D	D	C	C	C	C
d_A, Approach Delay [s/veh]	5.25			6.61			32.97			25.96		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	7.45											
Intersection LOS	A											
Intersection V/C	2.581											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Year 2035 Without Project

Intersection Level Of Service Report
Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	23.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.500

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	110	92	54	78	186	74	238	1098	457	107	466	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	92	54	78	186	74	238	1098	457	107	466	30
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	24	14	21	49	19	63	289	120	28	123	8
Total Analysis Volume [veh/h]	116	97	57	82	196	78	251	1156	481	113	491	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	18	28	0	9	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	17	17	4	17	17	7	23	23	4	21	21
g / C, Green / Cycle	0.07	0.27	0.27	0.06	0.26	0.26	0.11	0.36	0.36	0.07	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.03	0.04	0.04	0.02	0.05	0.05	0.07	0.32	0.30	0.03	0.14	0.02
s, saturation flow rate [veh/h]	3514	1900	1674	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	240	511	450	213	944	421	372	1292	577	238	1155	516
d1, Uniform Delay [s]	29.23	18.17	18.23	29.44	18.81	18.70	28.04	19.77	19.16	29.24	17.47	15.40
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.29	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.50	0.65	0.79	1.14	0.50	0.97	2.13	2.43	8.17	1.46	0.25	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

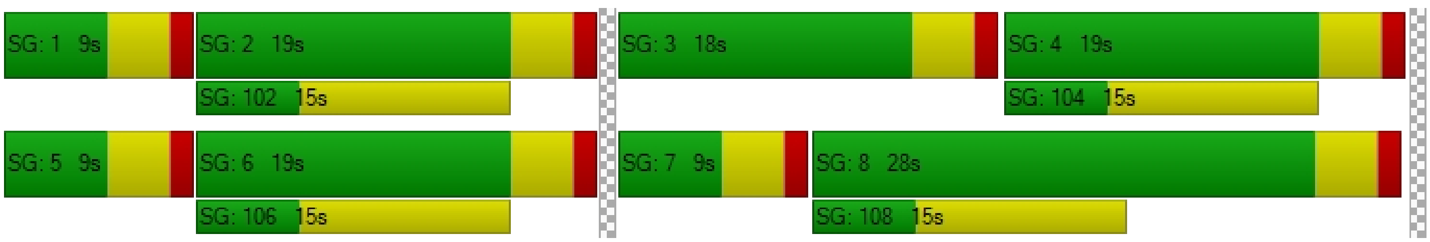
X, volume / capacity	0.48	0.16	0.17	0.39	0.21	0.19	0.67	0.89	0.83	0.47	0.43	0.06
d, Delay for Lane Group [s/veh]	30.73	18.82	19.02	30.58	19.31	19.66	30.17	22.20	27.33	30.70	17.71	15.45
Lane Group LOS	C	B	B	C	B	B	C	C	C	C	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.86	0.91	0.87	0.61	1.11	0.94	1.84	7.45	6.96	0.84	2.58	0.30
50th-Percentile Queue Length [ft]	21.51	22.79	21.79	15.17	27.63	23.40	46.12	186.17	174.08	20.94	64.49	7.48
95th-Percentile Queue Length [veh]	1.55	1.64	1.57	1.09	1.99	1.68	3.32	11.92	11.29	1.51	4.64	0.54
95th-Percentile Queue Length [ft]	38.72	41.02	39.22	27.31	49.74	42.11	83.01	298.06	282.27	37.69	116.07	13.46

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.73	18.86	19.02	30.58	19.31	19.66	30.17	22.20	27.33	30.70	17.71	15.45
Movement LOS	C	B	B	C	B	B	C	C	C	C	B	B
d_A, Approach Delay [s/veh]		23.99			21.98			24.57			19.91	
Approach LOS		C			C			C			B	
d_I, Intersection Delay [s/veh]						23.28						
Intersection LOS						C						
Intersection V/C						0.500						

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	19.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.346

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	10	5	4	8	0	11	38	967	70	20	408	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	5	4	8	0	11	38	967	70	20	408	12
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	1	1	2	0	3	10	254	18	5	107	3
Total Analysis Volume [veh/h]	11	5	4	8	0	12	40	1018	74	21	429	13
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	10	32	0	9	31	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	30	30	30	30	28	22	22	28	21	21
g / C, Green / Cycle	0.45	0.45	0.45	0.45	0.42	0.34	0.34	0.42	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.02	0.00	0.01	0.01	0.04	0.28	0.05	0.03	0.12	0.01
s, saturation flow rate [veh/h]	641	1615	539	1615	1116	3618	1615	730	3618	1615
c, Capacity [veh/h]	383	731	354	731	548	1219	544	327	1163	519
d1, Uniform Delay [s]	12.23	9.78	22.56	9.83	11.33	19.93	15.01	13.28	17.01	15.11
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	0.01	0.12	0.04	0.06	1.58	0.11	0.08	0.20	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

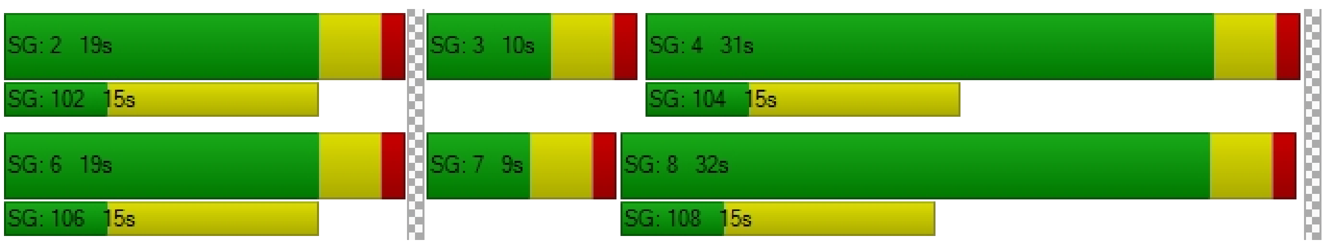
X, volume / capacity	0.04	0.01	0.02	0.02	0.07	0.84	0.14	0.06	0.37	0.03
d, Delay for Lane Group [s/veh]	12.44	9.80	22.67	9.87	11.39	21.51	15.12	13.36	17.20	15.13
Lane Group LOS	B	A	C	A	B	C	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.13	0.03	0.11	0.09	0.30	6.40	0.69	0.16	2.20	0.12
50th-Percentile Queue Length [ft]	3.36	0.77	2.72	2.32	7.46	159.91	17.20	3.95	55.11	2.99
95th-Percentile Queue Length [veh]	0.24	0.06	0.20	0.17	0.54	10.54	1.24	0.28	3.97	0.22
95th-Percentile Queue Length [ft]	6.06	1.39	4.90	4.18	13.42	263.60	30.96	7.11	99.19	5.39

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	12.44	12.44	9.80	22.67	22.67	9.87	11.39	21.51	15.12	13.36	17.20	15.13
Movement LOS	B	B	A	C	C	A	B	C	B	B	B	B
d_A, Approach Delay [s/veh]	11.91			14.99			20.74			16.97		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	19.49											
Intersection LOS	B											
Intersection V/C	0.346											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	22.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.614

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	70	637	54	71	787	111	196	435	319	94	290	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	637	54	71	787	111	196	435	319	94	290	87
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	168	14	19	207	29	52	114	84	25	76	23
Total Analysis Volume [veh/h]	74	671	57	75	828	117	206	458	336	99	305	92
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	13	23	0	9	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	21	21	4	21	21	8	15	15	4	11	11
g / C, Green / Cycle	0.06	0.35	0.35	0.06	0.35	0.35	0.14	0.25	0.25	0.07	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.04	0.04	0.23	0.07	0.11	0.13	0.21	0.05	0.08	0.06
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	111	1260	563	112	1262	563	257	909	406	133	659	294
d1, Uniform Delay [s]	27.69	15.72	13.27	27.68	16.58	13.79	25.03	19.36	21.35	27.39	22.02	21.38
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.21	0.11	0.18	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.66	1.61	0.36	6.75	2.68	0.84	10.33	0.43	6.89	8.08	0.51	0.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

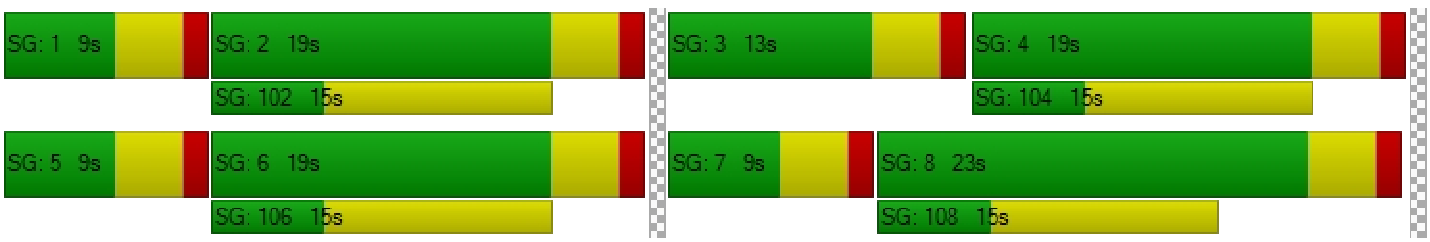
X, volume / capacity	0.67	0.53	0.10	0.67	0.66	0.21	0.80	0.50	0.83	0.75	0.46	0.31
d, Delay for Lane Group [s/veh]	34.35	17.33	13.63	34.43	19.26	14.62	35.36	19.79	28.24	35.47	22.53	21.98
Lane Group LOS	C	B	B	C	B	B	D	B	C	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.12	3.19	0.47	1.14	4.26	1.02	3.30	2.46	4.67	1.57	1.77	1.06
50th-Percentile Queue Length [ft]	28.11	79.80	11.84	28.52	106.44	25.52	82.47	61.51	116.73	39.30	44.17	26.42
95th-Percentile Queue Length [veh]	2.02	5.75	0.85	2.05	7.64	1.84	5.94	4.43	8.21	2.83	3.18	1.90
95th-Percentile Queue Length [ft]	50.60	143.64	21.31	51.34	191.05	45.94	148.44	110.72	205.32	70.74	79.50	47.55

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.35	17.33	13.63	34.43	19.26	14.62	35.36	19.79	28.24	35.47	22.53	21.98
Movement LOS	C	B	B	C	B	B	D	B	C	D	C	C
d_A, Approach Delay [s/veh]	18.64			19.84			25.84			25.01		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	22.13											
Intersection LOS	C											
Intersection V/C	0.614											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	23.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.034

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	4	763	1099	9	7	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	763	1099	9	7	11
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	201	289	2	2	3
Total Analysis Volume [veh/h]	4	803	1157	9	7	12
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.03	0.03
d_M, Delay for Movement [s/veh]	10.98	0.00	0.00	0.00	23.10	13.48
Movement LOS	B	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.02	0.00	0.00	0.00	0.19	0.19
95th-Percentile Queue Length [ft]	0.50	0.00	0.00	0.00	4.74	4.74
d_A, Approach Delay [s/veh]	0.05		0.00		17.02	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.18					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	22.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	841	30	83	1019	1	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	841	30	83	1019	1	9
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	221	8	22	268	0	2
Total Analysis Volume [veh/h]	885	32	87	1073	1	9
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.12	0.01	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	10.41	0.00	22.76	11.44
Movement LOS	A	A	B	A	C	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.39	0.00	0.01	0.05
95th-Percentile Queue Length [ft]	0.00	0.00	9.76	0.00	0.37	1.21
d_A, Approach Delay [s/veh]	0.00		0.78		12.57	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.49					
Intersection LOS	C					

Intersection Level Of Service Report

Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	5.7
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.713

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	6	826	187	37	959	14	12	6	12	28	0	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	826	187	37	959	14	12	6	12	28	0	12
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	217	49	10	252	4	3	2	3	7	0	3
Total Analysis Volume [veh/h]	6	869	197	39	1009	15	13	6	13	29	0	13
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	62
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	10	10	0	10	10	0	0	10	0	0	10	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	44	0	10	45	0	0	21	0	0	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	C	R	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	49	40	40	49	44	44	5	5	5	5
g / C, Green / Cycle	0.79	0.64	0.64	0.79	0.71	0.71	0.08	0.08	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.01	0.24	0.12	0.05	0.28	0.01	0.05	0.01	0.36	0.01
s, saturation flow rate [veh/h]	647	3618	1615	815	3618	1615	380	1615	80	1615
c, Capacity [veh/h]	609	2316	1034	732	2545	1136	130	138	123	138
d1, Uniform Delay [s]	1.95	5.29	4.58	2.00	3.79	2.76	26.40	26.21	31.04	26.21
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	0.47	0.41	0.03	0.46	0.02	0.51	0.29	4.49	0.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.01	0.38	0.19	0.05	0.40	0.01	0.15	0.09	0.24	0.09
d, Delay for Lane Group [s/veh]	1.98	5.76	4.99	2.03	4.25	2.78	26.91	26.50	35.53	26.50
Lane Group LOS	A	A	A	A	A	A	C	C	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.00	1.51	0.65	0.01	1.06	0.03	0.27	0.18	0.58	0.18
50th-Percentile Queue Length [ft]	0.12	37.72	16.27	0.15	26.58	0.65	6.65	4.51	14.40	4.51
95th-Percentile Queue Length [veh]	0.01	2.72	1.17	0.01	1.91	0.05	0.48	0.32	1.04	0.32
95th-Percentile Queue Length [ft]	0.22	67.90	29.28	0.27	47.85	1.18	11.98	8.12	25.92	8.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.98	5.76	4.99	2.03	4.25	2.78	26.91	26.91	26.50	35.53	35.53	26.50
Movement LOS	A	A	A	A	A	A	C	C	C	D	D	C
d_A, Approach Delay [s/veh]	5.60			4.15			26.75			32.74		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	5.72											
Intersection LOS	A											
Intersection V/C	0.713											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	20.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.720

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	27	720	404	343	735	5	5	3	3	82	1	285
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	720	404	343	735	5	5	3	3	82	1	285
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	189	106	90	193	1	1	1	1	22	0	75
Total Analysis Volume [veh/h]	28	758	425	361	774	5	5	3	3	86	1	300
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	22	32	0	0	19	0	0	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	21	21	14	33	33	13	13	13	13
g / C, Green / Cycle	0.03	0.35	0.35	0.23	0.55	0.55	0.22	0.22	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.02	0.21	0.26	0.20	0.14	0.14	0.01	0.02	0.04	0.19
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1894	1445	1432	1305	1615
c, Capacity [veh/h]	60	1264	564	421	1986	1040	402	307	403	352
d1, Uniform Delay [s]	28.56	16.10	17.27	22.12	7.12	7.12	18.52	23.27	19.29	22.58
k, delay calibration	0.11	0.50	0.50	0.19	0.50	0.50	0.11	0.11	0.11	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.49	2.11	8.99	8.44	0.31	0.60	0.03	0.16	0.14	11.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

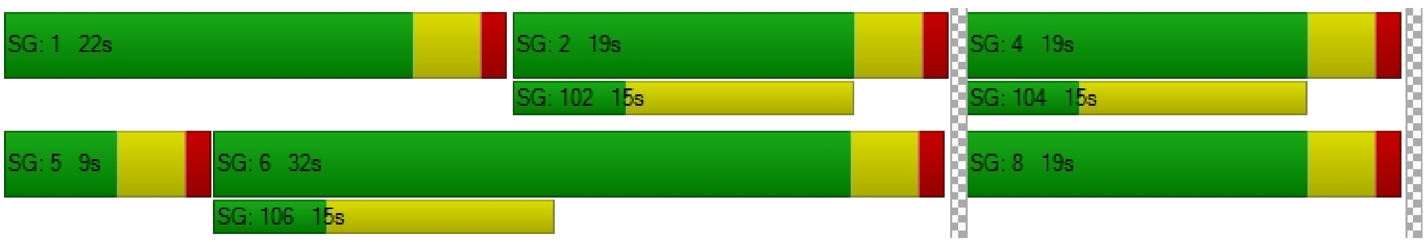
X, volume / capacity	0.47	0.60	0.75	0.86	0.26	0.26	0.03	0.11	0.13	0.85
d, Delay for Lane Group [s/veh]	34.05	18.21	26.26	30.56	7.44	7.72	18.55	23.43	19.43	34.12
Lane Group LOS	C	B	C	C	A	A	B	C	B	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	0.44	3.74	5.47	5.06	1.19	1.33	0.12	0.43	0.58	4.88
50th-Percentile Queue Length [ft]	11.08	93.62	136.74	126.45	29.75	33.21	2.89	10.64	14.40	121.99
95th-Percentile Queue Length [veh]	0.80	6.74	9.31	8.75	2.14	2.39	0.21	0.77	1.04	8.50
95th-Percentile Queue Length [ft]	19.95	168.51	232.63	218.66	53.54	59.78	5.21	19.16	25.93	212.56

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.05	18.21	26.26	30.56	7.53	7.72	18.55	18.55	18.55	23.43	19.43	34.12
Movement LOS	C	B	C	C	A	A	B	B	B	C	B	C
d_A, Approach Delay [s/veh]	21.40			14.83			18.55			31.18		
Approach LOS	C			B			B			C		
d_I, Intersection Delay [s/veh]	20.04											
Intersection LOS	C											
Intersection V/C	0.720											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Signalized	Delay (sec / veh):	3.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.336

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	841	30	83	1019	1	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	841	30	83	1019	1	9
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	221	8	22	268	0	2
Total Analysis Volume [veh/h]	885	32	87	1073	1	9
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal group	2	0	1	6	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	15	0	30	45	15	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
l1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	43	4	51	1	1
g / C, Green / Cycle	0.72	0.72	0.06	0.85	0.01	0.01
(v / s)_i Volume / Saturation Flow Rate	0.24	0.02	0.05	0.30	0.00	0.01
s, saturation flow rate [veh/h]	3618	1615	1810	3618	1810	1615
c, Capacity [veh/h]	2604	1162	119	3083	27	24
d1, Uniform Delay [s]	3.13	2.41	27.57	0.93	29.21	29.36
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.36	0.04	8.23	0.31	0.56	9.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.03	0.73	0.35	0.04	0.37
d, Delay for Lane Group [s/veh]	3.48	2.45	35.80	1.25	29.77	38.74
Lane Group LOS	A	A	D	A	C	D
Critical Lane Group	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	0.63	0.04	1.35	0.13	0.02	0.19
50th-Percentile Queue Length [ft]	15.73	1.05	33.81	3.33	0.44	4.64
95th-Percentile Queue Length [veh]	1.13	0.08	2.43	0.24	0.03	0.33
95th-Percentile Queue Length [ft]	28.32	1.89	60.85	6.00	0.80	8.35

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.48	2.45	35.80	1.25	29.77	38.74
Movement LOS	A	A	D	A	C	D
d_A, Approach Delay [s/veh]	3.45		3.84		37.84	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	3.83					
Intersection LOS	A					
Intersection V/C	0.336					

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	31.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.807

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	533	318	152	181	194	316	128	1018	338	197	1061	54
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	533	318	152	181	194	316	128	1018	338	197	1061	54
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	140	84	40	48	51	83	34	268	89	52	279	14
Total Analysis Volume [veh/h]	561	335	160	191	204	333	135	1072	356	207	1117	57
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	75
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	24	0	13	20	0	10	29	0	9	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	23	23	6	16	16	5	25	25	5	25	25
g / C, Green / Cycle	0.17	0.31	0.31	0.08	0.22	0.22	0.06	0.33	0.33	0.07	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.16	0.14	0.14	0.05	0.06	0.21	0.04	0.30	0.22	0.06	0.31	0.04
s, saturation flow rate [veh/h]	3514	1900	1695	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	609	597	532	282	799	357	222	1178	526	235	1192	532
d1, Uniform Delay [s]	30.51	20.48	20.48	33.57	24.14	28.69	34.26	24.26	21.90	34.72	24.41	17.49
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.20	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.29	2.33	2.62	2.82	0.77	33.38	2.70	3.11	2.78	10.20	4.24	0.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

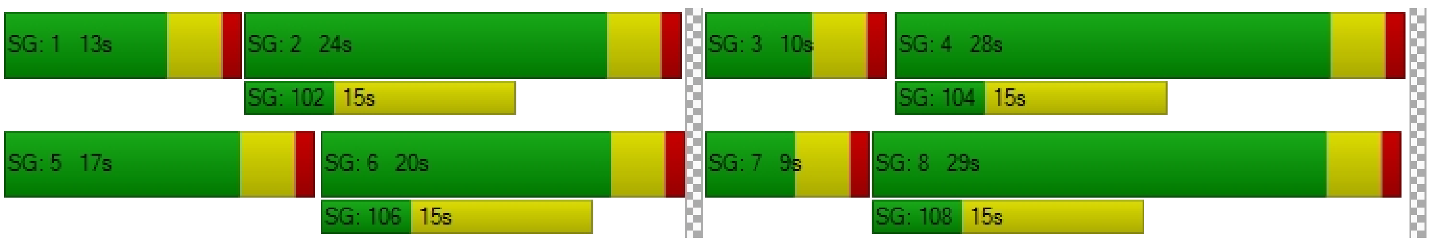
X, volume / capacity	0.92	0.44	0.44	0.68	0.26	0.93	0.61	0.91	0.68	0.88	0.94	0.11
d, Delay for Lane Group [s/veh]	36.80	22.81	23.10	36.39	24.91	62.07	36.96	27.38	24.68	44.92	28.66	17.58
Lane Group LOS	D	C	C	D	C	E	D	C	C	D	C	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	5.17	3.72	3.36	1.71	1.48	8.73	1.22	8.66	5.29	2.11	9.28	0.64
50th-Percentile Queue Length [ft]	129.22	92.89	83.98	42.75	37.05	218.22	30.49	216.40	132.26	52.63	231.93	16.00
95th-Percentile Queue Length [veh]	8.90	6.69	6.05	3.08	2.67	13.57	2.20	13.48	9.06	3.79	14.27	1.15
95th-Percentile Queue Length [ft]	222.43	167.20	151.17	76.94	66.70	339.36	54.89	337.02	226.56	94.73	356.81	28.80

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.80	22.87	23.10	36.39	24.91	62.07	36.96	27.38	24.68	44.92	28.66	17.58
Movement LOS	D	C	C	D	C	E	D	C	C	D	C	B
d_A, Approach Delay [s/veh]	30.31			44.92			27.59			30.64		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	31.76											
Intersection LOS	C											
Intersection V/C	0.807											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	17.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.547

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	40	21	19	5	0	15	32	1236	26	14	1175	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	21	19	5	0	15	32	1236	26	14	1175	17
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	6	5	1	0	4	8	325	7	4	309	4
Total Analysis Volume [veh/h]	42	22	20	5	0	16	34	1301	27	15	1237	18
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	61
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	9	32	0	9	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	22	22	31	26	26	31	25	25
g / C, Green / Cycle	0.36	0.36	0.36	0.36	0.51	0.42	0.42	0.51	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.13	0.01	0.01	0.01	0.05	0.36	0.02	0.03	0.34	0.01
s, saturation flow rate [veh/h]	497	1615	340	1615	645	3618	1615	574	3618	1615
c, Capacity [veh/h]	277	583	240	583	358	1528	682	324	1465	654
d1, Uniform Delay [s]	17.29	12.65	25.59	12.62	10.95	15.93	10.37	11.06	16.46	10.95
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.95	0.11	0.16	0.09	0.11	1.43	0.02	0.06	1.41	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

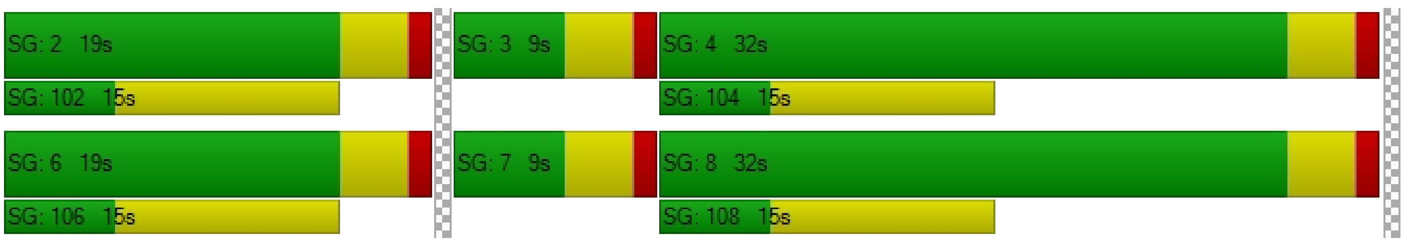
X, volume / capacity	0.23	0.03	0.02	0.03	0.09	0.85	0.04	0.05	0.84	0.03
d, Delay for Lane Group [s/veh]	19.24	12.76	25.75	12.70	11.06	17.36	10.40	11.12	17.87	10.97
Lane Group LOS	B	B	C	B	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.68	0.18	0.07	0.14	0.19	6.86	0.18	0.08	6.64	0.13
50th-Percentile Queue Length [ft]	16.91	4.47	1.85	3.57	4.63	171.53	4.54	2.03	165.89	3.15
95th-Percentile Queue Length [veh]	1.22	0.32	0.13	0.26	0.33	11.16	0.33	0.15	10.86	0.23
95th-Percentile Queue Length [ft]	30.43	8.05	3.32	6.42	8.33	278.93	8.18	3.65	271.51	5.67

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	19.24	19.24	12.76	25.75	25.75	12.70	11.06	17.36	10.40	11.12	17.87	10.97
Movement LOS	B	B	B	C	C	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	17.69			15.81			17.06			17.69		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	17.36											
Intersection LOS	B											
Intersection V/C	0.547											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	36.2
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.824

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	261	794	126	115	857	128	170	799	239	164	811	106
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	261	794	126	115	857	128	170	799	239	164	811	106
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	69	209	33	30	226	34	45	210	63	43	213	28
Total Analysis Volume [veh/h]	275	836	133	121	902	135	179	841	252	173	854	112
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	75
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	27	0	13	24	0	12	23	0	12	23	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	12	26	26	6	20	20	8	19	19	8	19	19
g / C, Green / Cycle	0.16	0.34	0.34	0.09	0.27	0.27	0.11	0.25	0.25	0.11	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.15	0.23	0.08	0.07	0.25	0.08	0.10	0.23	0.16	0.10	0.24	0.07
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	290	1241	554	155	971	434	193	910	406	193	910	406
d1, Uniform Delay [s]	31.21	21.06	17.65	33.62	26.74	21.90	33.22	27.39	24.91	33.10	27.52	22.59
k, delay calibration	0.35	0.50	0.50	0.11	0.50	0.50	0.30	0.11	0.15	0.28	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	33.50	2.94	1.02	8.27	16.06	1.87	34.34	4.62	2.20	27.89	5.48	0.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

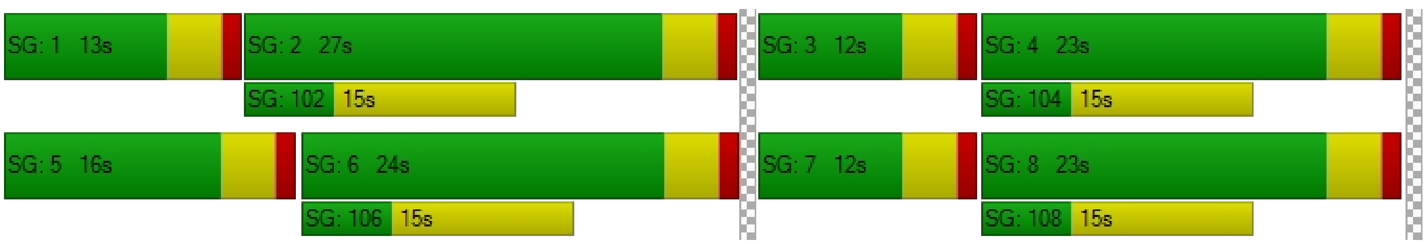
X, volume / capacity	0.95	0.67	0.24	0.78	0.93	0.31	0.93	0.92	0.62	0.90	0.94	0.28
d, Delay for Lane Group [s/veh]	64.71	24.00	18.67	41.89	42.80	23.77	67.55	32.01	27.11	60.99	33.00	22.95
Lane Group LOS	E	C	B	D	D	C	E	C	C	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	7.14	5.90	1.59	2.34	9.06	1.91	4.88	7.29	3.90	4.42	7.54	1.51
50th-Percentile Queue Length [ft]	178.52	147.39	39.86	58.38	226.42	47.85	121.93	182.27	97.59	110.48	188.39	37.86
95th-Percentile Queue Length [veh]	11.52	9.88	2.87	4.20	13.99	3.45	8.50	11.72	7.03	7.87	12.04	2.73
95th-Percentile Queue Length [ft]	288.08	246.94	71.74	105.08	349.80	86.13	212.48	292.97	175.66	196.67	300.94	68.15

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	64.71	24.00	18.67	41.89	42.80	23.77	67.55	32.01	27.11	60.99	33.00	22.95
Movement LOS	E	C	B	D	D	C	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	32.43			40.49			36.04			36.27		
Approach LOS	C			D			D			D		
d_I, Intersection Delay [s/veh]	36.23											
Intersection LOS	D											
Intersection V/C	0.824											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	28.0
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.054

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	6	1191	1367	14	9	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	1191	1367	14	9	13
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	313	360	4	2	3
Total Analysis Volume [veh/h]	6	1254	1439	15	9	14
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.05	0.04
d_M, Delay for Movement [s/veh]	12.73	0.00	0.00	0.00	28.01	16.02
Movement LOS	B	A	A	A	D	C
95th-Percentile Queue Length [veh]	0.04	0.00	0.00	0.00	0.30	0.30
95th-Percentile Queue Length [ft]	0.97	0.00	0.00	0.00	7.46	7.46
d_A, Approach Delay [s/veh]	0.06		0.00		20.72	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.20					
Intersection LOS	D					

Intersection Level Of Service Report

Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	24.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.057

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	960	2	10	1441	10	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	960	2	10	1441	10	70
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	253	1	3	379	3	18
Total Analysis Volume [veh/h]	1011	2	11	1517	11	74
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.02	0.02	0.06	0.14
d_M, Delay for Movement [s/veh]	0.00	0.00	10.28	0.00	24.68	13.12
Movement LOS	A	A	B	A	C	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.05	0.00	0.18	0.50
95th-Percentile Queue Length [ft]	0.00	0.00	1.21	0.00	4.48	12.41
d_A, Approach Delay [s/veh]	0.00		0.07		14.61	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.52					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	11.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.596

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	24	923	47	23	1328	26	1	0	11	204	0	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	923	47	23	1328	26	1	0	11	204	0	46
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	243	12	6	349	7	0	0	3	54	0	12
Total Analysis Volume [veh/h]	25	972	49	24	1398	27	1	0	12	215	0	48
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	0	0	7	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	0	0	5	0	0
Maximum Green [s]	30	30	0	30	30	0	30	0	0	30	0	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0
Split [s]	9	19	0	9	19	0	37	0	0	37	0	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	5	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	10	0	0	10	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall	No	No		No	No		No			No		
Maximum Recall	No	No		No	No		No			No		
Pedestrian Recall	No	No		No	No		No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	R	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	37	37	43	37	37	14	14	14	14
g / C, Green / Cycle	0.66	0.57	0.57	0.66	0.57	0.57	0.21	0.21	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.05	0.27	0.03	0.03	0.39	0.02	0.00	0.01	0.15	0.03
s, saturation flow rate [veh/h]	518	3618	1615	695	3618	1615	1440	1615	1440	1615
c, Capacity [veh/h]	407	2081	929	538	2077	927	369	344	369	344
d1, Uniform Delay [s]	6.15	8.03	6.05	4.51	9.61	6.00	21.90	20.30	25.73	20.77
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.29	0.76	0.11	0.03	1.76	0.06	0.00	0.04	1.46	0.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

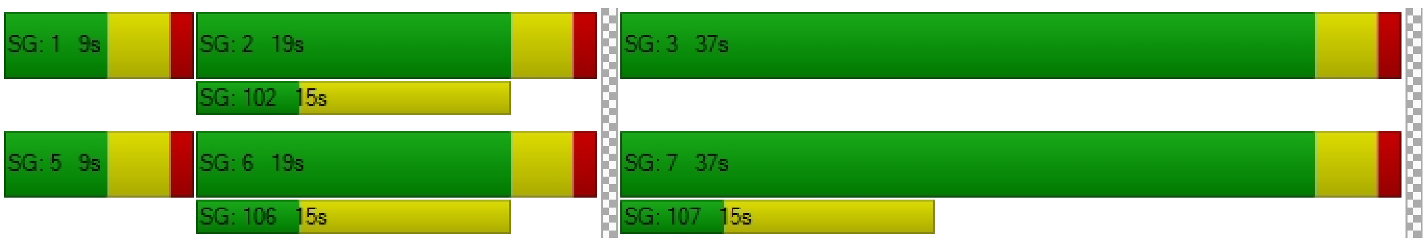
X, volume / capacity	0.06	0.47	0.05	0.04	0.67	0.03	0.00	0.03	0.58	0.14
d, Delay for Lane Group [s/veh]	6.44	8.78	6.16	4.55	11.37	6.05	21.90	20.34	27.18	20.95
Lane Group LOS	A	A	A	A	B	A	C	C	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.09	2.81	0.22	0.06	4.96	0.12	0.01	0.14	3.16	0.58
50th-Percentile Queue Length [ft]	2.27	70.13	5.61	1.52	124.03	3.06	0.31	3.52	79.03	14.44
95th-Percentile Queue Length [veh]	0.16	5.05	0.40	0.11	8.61	0.22	0.02	0.25	5.69	1.04
95th-Percentile Queue Length [ft]	4.08	126.24	10.10	2.73	215.35	5.50	0.55	6.33	142.26	25.98

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.44	8.78	6.16	4.55	11.37	6.05	21.90	0.00	20.34	27.18	0.00	20.95
Movement LOS	A	A	A	A	B	A	C		C	C		C
d_A, Approach Delay [s/veh]	8.60			11.16			20.46			26.05		
Approach LOS	A			B			C			C		
d_I, Intersection Delay [s/veh]	11.65											
Intersection LOS	B											
Intersection V/C	0.596											

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	34.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.077

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	52	685	242	253	1266	15	10	5	15	409	3	295
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	685	242	253	1266	15	10	5	15	409	3	295
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	180	64	67	333	4	3	1	4	108	1	78
Total Analysis Volume [veh/h]	55	721	255	266	1333	16	11	5	16	431	3	311
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	15	25	0	0	26	0	0	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	16	16	11	23	23	22	22	22	22
g / C, Green / Cycle	0.05	0.26	0.26	0.18	0.38	0.38	0.37	0.37	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.03	0.20	0.16	0.15	0.24	0.25	0.10	0.01	0.62	0.19
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1888	311	1413	676	1615
c, Capacity [veh/h]	94	940	420	318	1388	724	194	128	366	589
d1, Uniform Delay [s]	27.87	20.58	19.57	23.95	15.14	15.14	15.10	29.96	22.82	15.03
k, delay calibration	0.11	0.50	0.50	0.25	0.50	0.50	0.11	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.58	5.96	6.41	12.29	2.26	4.28	0.40	0.34	94.98	0.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

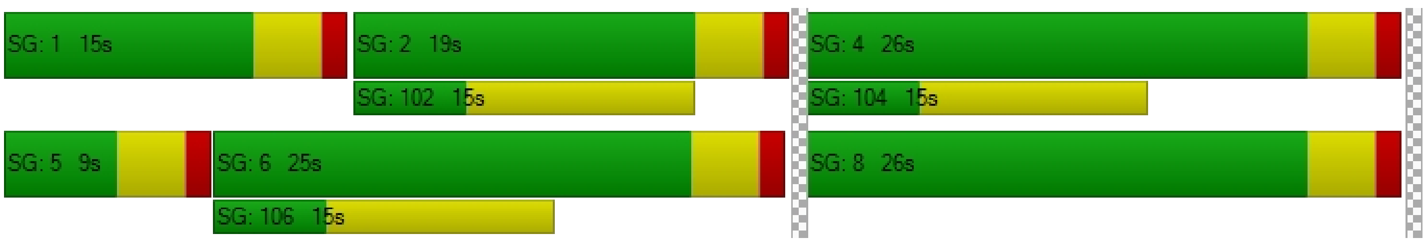
X, volume / capacity	0.58	0.77	0.61	0.84	0.64	0.64	0.17	0.10	1.15	0.53
d, Delay for Lane Group [s/veh]	33.45	26.54	25.98	36.24	17.40	19.42	15.50	30.30	117.80	15.77
Lane Group LOS	C	C	C	D	B	B	B	C	F	B
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.83	4.64	3.34	4.20	4.25	4.84	0.27	0.19	14.70	3.09
50th-Percentile Queue Length [ft]	20.74	115.88	83.53	104.93	106.24	121.09	6.81	4.76	367.43	77.17
95th-Percentile Queue Length [veh]	1.49	8.17	6.01	7.55	7.63	8.45	0.49	0.34	22.85	5.56
95th-Percentile Queue Length [ft]	37.33	204.15	150.35	188.87	190.76	211.32	12.26	8.57	571.15	138.91

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.45	26.54	25.98	36.24	18.08	19.42	15.50	15.50	15.50	115.16	117.80	15.77
Movement LOS	C	C	C	D	B	B	B	B	B	F	F	B
d_A, Approach Delay [s/veh]		26.77			21.08			15.50			73.69	
Approach LOS		C			C			B			E	
d_I, Intersection Delay [s/veh]	34.19											
Intersection LOS	C											
Intersection V/C	1.077											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Signalized	Delay (sec / veh):	4.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.512

Intersection Setup

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	215.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Park Center Circle N	
Base Volume Input [veh/h]	960	2	10	1441	10	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	960	2	10	1441	10	70
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	253	1	3	379	3	18
Total Analysis Volume [veh/h]	1011	2	11	1517	11	74
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal group	2	0	1	6	7	0
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	15	0	35	50	15	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	48	48	1	53	4	4
g / C, Green / Cycle	0.74	0.74	0.01	0.82	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.28	0.00	0.01	0.42	0.01	0.05
s, saturation flow rate [veh/h]	3618	1615	1810	3618	1810	1615
c, Capacity [veh/h]	2669	1191	29	2948	113	101
d1, Uniform Delay [s]	3.11	2.24	31.75	1.92	28.82	30.02
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.41	0.00	8.31	0.65	0.37	9.92
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.38	0.00	0.39	0.51	0.10	0.74
d, Delay for Lane Group [s/veh]	3.52	2.25	40.06	2.57	29.19	39.93
Lane Group LOS	A	A	D	A	C	D
Critical Lane Group	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	0.80	0.00	0.22	0.26	0.17	1.37
50th-Percentile Queue Length [ft]	19.90	0.07	5.52	6.61	4.19	34.23
95th-Percentile Queue Length [veh]	1.43	0.00	0.40	0.48	0.30	2.46
95th-Percentile Queue Length [ft]	35.83	0.12	9.94	11.89	7.54	61.62

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.52	2.25	40.06	2.57	29.19	39.93
Movement LOS	A	A	D	A	C	D
d_A, Approach Delay [s/veh]	3.52		2.84		38.54	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	4.26					
Intersection LOS	A					
Intersection V/C	0.512					

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Year 2035 With Project

Intersection Level Of Service Report
Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	23.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.511

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	110	92	54	78	186	74	238	1129	457	107	477	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	92	54	78	186	74	238	1129	457	107	477	30
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	24	14	21	49	19	63	297	120	28	126	8
Total Analysis Volume [veh/h]	116	97	57	82	196	78	251	1188	481	113	502	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	15	28	0	9	22	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	17	17	4	17	17	7	24	24	4	21	21
g / C, Green / Cycle	0.07	0.26	0.26	0.06	0.25	0.25	0.10	0.36	0.36	0.07	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.03	0.04	0.04	0.02	0.05	0.05	0.07	0.33	0.30	0.03	0.14	0.02
s, saturation flow rate [veh/h]	3514	1900	1674	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	239	500	440	211	923	412	364	1315	587	237	1184	529
d1, Uniform Delay [s]	29.23	18.44	18.49	29.44	19.09	18.97	28.15	19.62	18.76	29.24	17.09	15.01
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.29	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.53	0.68	0.83	1.17	0.53	1.02	2.33	2.60	7.32	1.49	0.24	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

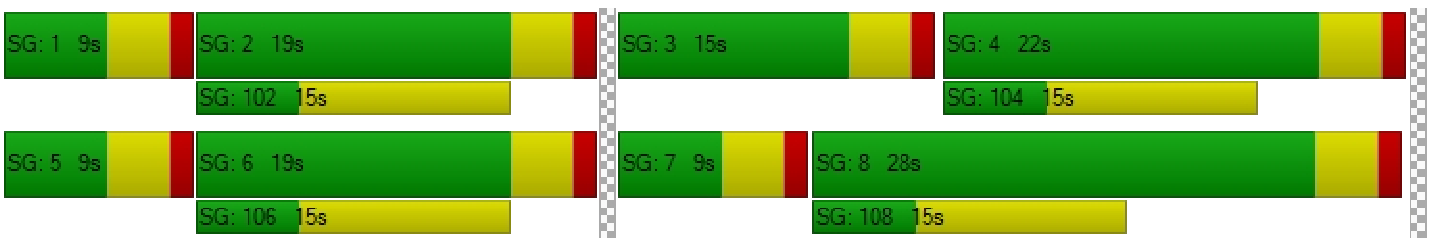
X, volume / capacity	0.49	0.16	0.17	0.39	0.21	0.19	0.69	0.90	0.82	0.48	0.42	0.06
d, Delay for Lane Group [s/veh]	30.76	19.12	19.32	30.61	19.61	19.98	30.48	22.22	26.09	30.72	17.33	15.06
Lane Group LOS	C	B	B	C	B	B	C	C	C	C	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.86	0.92	0.88	0.61	1.12	0.95	1.86	7.68	6.77	0.84	2.60	0.29
50th-Percentile Queue Length [ft]	21.52	23.04	22.03	15.18	27.91	23.66	46.40	191.96	169.34	20.95	65.09	7.35
95th-Percentile Queue Length [veh]	1.55	1.66	1.59	1.09	2.01	1.70	3.34	12.22	11.04	1.51	4.69	0.53
95th-Percentile Queue Length [ft]	38.73	41.46	39.65	27.32	50.24	42.59	83.52	305.57	276.05	37.70	117.17	13.24

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.76	19.15	19.32	30.61	19.61	19.98	30.48	22.22	26.09	30.72	17.33	15.06
Movement LOS	C	B	B	C	B	B	C	C	C	C	B	B
d_A, Approach Delay [s/veh]	24.18			22.22			24.27			19.56		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	23.08											
Intersection LOS	C											
Intersection V/C	0.511											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	19.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.359

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	14	6	4	8	2	11	38	986	82	20	415	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	6	4	8	2	11	38	986	82	20	415	12
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	2	1	2	1	3	10	259	22	5	109	3
Total Analysis Volume [veh/h]	15	6	4	8	2	12	40	1038	86	21	437	13
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	67
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	9	32	0	9	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	31	31	29	23	23	29	22	22
g / C, Green / Cycle	0.46	0.46	0.46	0.46	0.43	0.34	0.34	0.43	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.03	0.00	0.02	0.01	0.04	0.29	0.05	0.03	0.12	0.01
s, saturation flow rate [veh/h]	647	1615	611	1615	1107	3618	1615	717	3618	1615
c, Capacity [veh/h]	386	734	374	734	538	1232	550	317	1177	526
d1, Uniform Delay [s]	12.51	10.00	12.54	10.05	11.64	20.48	15.42	13.76	17.37	15.40
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.27	0.01	0.13	0.04	0.06	1.65	0.13	0.09	0.19	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

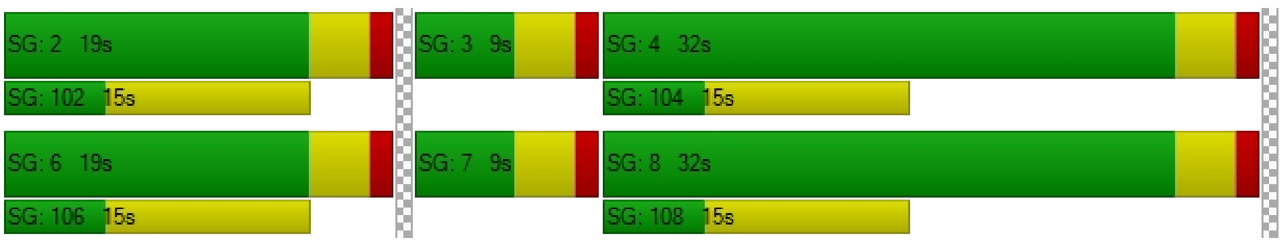
X, volume / capacity	0.05	0.01	0.03	0.02	0.07	0.84	0.16	0.07	0.37	0.02
d, Delay for Lane Group [s/veh]	12.78	10.02	12.67	10.09	11.70	22.13	15.55	13.85	17.57	15.42
Lane Group LOS	B	B	B	B	B	C	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.18	0.03	0.09	0.10	0.31	6.80	0.83	0.16	2.33	0.12
50th-Percentile Queue Length [ft]	4.57	0.80	2.17	2.40	7.75	169.93	20.83	4.11	58.15	3.09
95th-Percentile Queue Length [veh]	0.33	0.06	0.16	0.17	0.56	11.07	1.50	0.30	4.19	0.22
95th-Percentile Queue Length [ft]	8.23	1.43	3.90	4.32	13.96	276.83	37.49	7.39	104.66	5.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	12.78	12.78	10.02	12.67	12.67	10.09	11.70	22.13	15.55	13.85	17.57	15.42
Movement LOS	B	B	B	B	B	B	B	C	B	B	B	B
d_A, Approach Delay [s/veh]	12.34			11.26			21.29			17.34		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	19.92											
Intersection LOS	B											
Intersection V/C	0.359											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Project West Driveway (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	8.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Project West Driveway		Dumas St		Dumas Street	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Project West Driveway		Dumas St		Dumas Street	
Base Volume Input [veh/h]	4	1	20	14	8	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	1	20	14	8	14
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	5	4	2	4
Total Analysis Volume [veh/h]	4	1	21	15	8	15
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	8.82	8.44	0.00	0.00	7.28	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.02	0.02	0.00	0.00	0.04	0.04
95th-Percentile Queue Length [ft]	0.39	0.39	0.00	0.00	1.10	1.10
d_A, Approach Delay [s/veh]	8.74		0.00		2.53	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.59					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 4: Project East DriveWay (NS) at Dumas Street (EW)

Control Type:	Two-way stop	Delay (sec / veh):	8.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	Project East DriveWay		Dumas Street		Dumas St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Project East DriveWay		Dumas Street		Dumas St	
Base Volume Input [veh/h]	0	3	21	0	18	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	3	21	0	18	22
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	1	6	0	5	6
Total Analysis Volume [veh/h]	0	3	22	0	19	23
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	8.40	0.00	0.00	7.27	0.00
Movement LOS		A	A		A	A
95th-Percentile Queue Length [veh]	0.00	0.01	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	0.00	0.21	0.00	0.00	2.01	2.01
d_A, Approach Delay [s/veh]	8.40		0.00		3.29	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.44					
Intersection LOS	A					

Intersection Level Of Service Report

Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	22.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.643

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	77	640	57	71	797	111	196	435	338	104	290	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	77	640	57	71	797	111	196	435	338	104	290	87
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	168	15	19	210	29	52	114	89	27	76	23
Total Analysis Volume [veh/h]	81	674	60	75	839	117	206	458	356	109	305	92
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	0	13	22	0	10	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	20	20	4	20	20	8	16	16	5	12	12
g / C, Green / Cycle	0.06	0.33	0.33	0.06	0.33	0.33	0.14	0.26	0.26	0.08	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.04	0.04	0.23	0.07	0.11	0.13	0.22	0.06	0.08	0.06
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	116	1201	536	112	1193	533	257	941	420	146	718	321
d1, Uniform Delay [s]	27.64	16.53	13.97	27.68	17.63	14.60	25.03	18.89	21.16	27.12	21.15	20.54
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.21	0.11	0.21	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.34	1.90	0.42	6.75	3.49	0.95	10.33	0.39	8.94	7.44	0.40	0.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

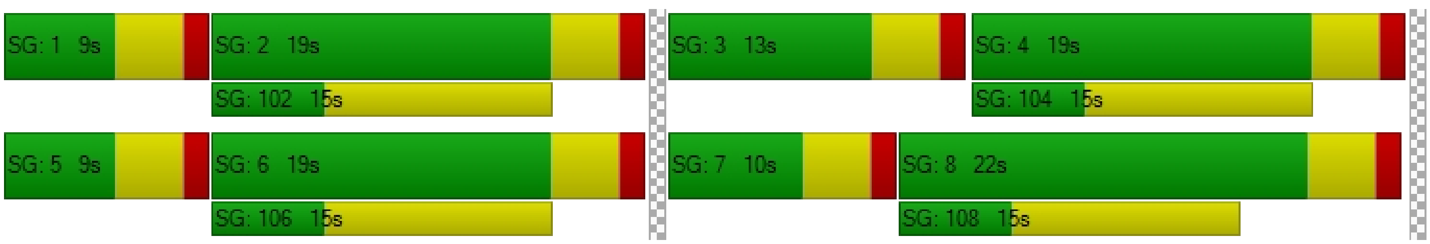
X, volume / capacity	0.70	0.56	0.11	0.67	0.70	0.22	0.80	0.49	0.85	0.75	0.42	0.29
d, Delay for Lane Group [s/veh]	34.98	18.43	14.39	34.43	21.12	15.55	35.36	19.28	30.10	34.56	21.55	21.02
Lane Group LOS	C	B	B	C	C	B	D	B	C	C	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.24	3.36	0.52	1.14	4.61	1.07	3.30	2.41	5.16	1.70	1.71	1.02
50th-Percentile Queue Length [ft]	31.06	83.97	13.02	28.52	115.26	26.79	82.47	60.36	128.99	42.46	42.83	25.59
95th-Percentile Queue Length [veh]	2.24	6.05	0.94	2.05	8.13	1.93	5.94	4.35	8.88	3.06	3.08	1.84
95th-Percentile Queue Length [ft]	55.92	151.15	23.43	51.34	203.29	48.23	148.44	108.65	222.12	76.43	77.09	46.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.98	18.43	14.39	34.43	21.12	15.55	35.36	19.28	30.10	34.56	21.55	21.02
Movement LOS	C	B	B	C	C	B	D	B	C	C	C	C
d_A, Approach Delay [s/veh]	19.78			21.46			26.31			24.26		
Approach LOS	B			C			C			C		
d_I, Intersection Delay [s/veh]	22.94											
Intersection LOS	C											
Intersection V/C	0.643											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	24.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.036

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	15	777	1123	23	7	15
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	777	1123	23	7	15
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	204	296	6	2	4
Total Analysis Volume [veh/h]	16	818	1182	24	7	16
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.01	0.00	0.04	0.04
d_M, Delay for Movement [s/veh]	11.32	0.00	0.00	0.00	24.33	13.76
Movement LOS	B	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.08	0.00	0.00	0.00	0.23	0.23
95th-Percentile Queue Length [ft]	2.10	0.00	0.00	0.00	5.70	5.70
d_A, Approach Delay [s/veh]	0.22		0.00		16.98	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.28					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	105.3
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.300

Intersection Setup

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	215.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			No		

volumes

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Base Volume Input [veh/h]	18	852	30	83	1023	24	14	0	6	1	0	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	852	30	83	1023	24	14	0	6	1	0	9
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	224	8	22	269	6	4	0	2	0	0	2
Total Analysis Volume [veh/h]	19	897	32	87	1077	25	15	0	6	1	0	9
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	1	1

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.00	0.12	0.01	0.00	0.30	0.00	0.01	0.02	0.00	0.02
d_M, Delay for Movement [s/veh]	10.79	0.00	0.00	10.47	0.00	0.00	105.30	0.00	12.40	67.47	0.00	11.50
Movement LOS	B	A	A	B	A	A	F		B	F		B
95th-Percentile Queue Length [veh]	0.09	0.00	0.00	0.40	0.00	0.00	1.04	0.00	0.04	0.05	0.00	0.05
95th-Percentile Queue Length [ft]	2.29	0.00	0.00	9.88	0.00	0.00	25.97	0.00	0.92	1.29	0.00	1.22
d_A, Approach Delay [s/veh]	0.22			0.77			78.76			17.09		
Approach LOS	A			A			F			C		
d_I, Intersection Delay [s/veh]	1.36											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	5.8
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.715

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	6	855	187	37	970	14	12	6	12	28	0	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	855	187	37	970	14	12	6	12	28	0	12
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	225	49	10	255	4	3	2	3	7	0	3
Total Analysis Volume [veh/h]	6	900	197	39	1021	15	13	6	13	29	0	13
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	10	10	0	10	10	0	0	10	0	0	10	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	41	0	13	45	0	0	21	0	0	21	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	C	R	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	47	38	38	47	42	42	5	5	5	5
g / C, Green / Cycle	0.78	0.63	0.63	0.78	0.70	0.70	0.09	0.09	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.01	0.25	0.12	0.05	0.28	0.01	0.05	0.01	0.36	0.01
s, saturation flow rate [veh/h]	643	3618	1615	803	3618	1615	387	1615	80	1615
c, Capacity [veh/h]	606	2286	1021	721	2518	1124	134	140	127	140
d1, Uniform Delay [s]	2.00	5.43	4.64	2.08	3.87	2.80	25.50	25.31	30.05	25.31
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.46	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	0.51	0.42	0.03	0.49	0.02	0.48	0.29	3.80	0.29
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.01	0.39	0.19	0.05	0.41	0.01	0.14	0.09	0.23	0.09
d, Delay for Lane Group [s/veh]	2.03	5.94	5.06	2.11	4.36	2.83	25.98	25.60	33.85	25.60
Lane Group LOS	A	A	A	A	A	A	C	C	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.00	1.55	0.64	0.01	1.06	0.03	0.26	0.17	0.54	0.17
50th-Percentile Queue Length [ft]	0.12	38.72	15.97	0.15	26.41	0.64	6.39	4.33	13.52	4.33
95th-Percentile Queue Length [veh]	0.01	2.79	1.15	0.01	1.90	0.05	0.46	0.31	0.97	0.31
95th-Percentile Queue Length [ft]	0.22	69.70	28.75	0.28	47.55	1.15	11.49	7.80	24.33	7.80

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	2.03	5.94	5.06	2.11	4.36	2.83	25.98	25.98	25.60	33.85	33.85	25.60
Movement LOS	A	A	A	A	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	5.76			4.25			25.82			31.30		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	5.80											
Intersection LOS	A											
Intersection V/C	0.715											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report

Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	20.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.720

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	27	749	404	343	746	5	5	3	3	82	1	285
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	749	404	343	746	5	5	3	3	82	1	285
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	197	106	90	196	1	1	1	1	22	0	75
Total Analysis Volume [veh/h]	28	788	425	361	785	5	5	3	3	86	1	300
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	22	32	0	0	19	0	0	19	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	2	21	21	14	33	33	13	13	13	13
g / C, Green / Cycle	0.03	0.35	0.35	0.23	0.55	0.55	0.22	0.22	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.02	0.22	0.26	0.20	0.14	0.14	0.01	0.02	0.04	0.19
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1894	1445	1432	1305	1615
c, Capacity [veh/h]	60	1264	564	421	1986	1040	402	307	403	352
d1, Uniform Delay [s]	28.56	16.27	17.27	22.12	7.14	7.14	18.52	23.27	19.29	22.58
k, delay calibration	0.11	0.50	0.50	0.19	0.50	0.50	0.11	0.11	0.11	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.49	2.32	8.99	8.44	0.32	0.61	0.03	0.16	0.14	11.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

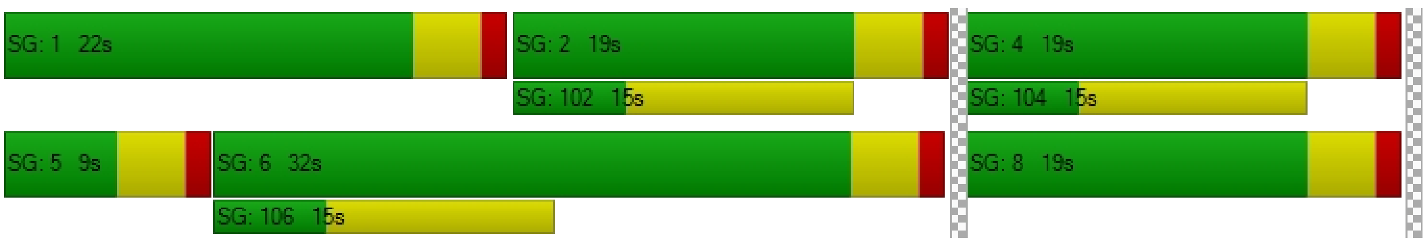
X, volume / capacity	0.47	0.62	0.75	0.86	0.26	0.26	0.03	0.11	0.13	0.85
d, Delay for Lane Group [s/veh]	34.05	18.60	26.26	30.56	7.46	7.75	18.55	23.43	19.43	34.12
Lane Group LOS	C	B	C	C	A	A	B	C	B	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	0.44	3.95	5.47	5.06	1.21	1.35	0.12	0.43	0.58	4.88
50th-Percentile Queue Length [ft]	11.08	98.84	136.74	126.45	30.24	33.77	2.89	10.64	14.40	121.99
95th-Percentile Queue Length [veh]	0.80	7.12	9.31	8.75	2.18	2.43	0.21	0.77	1.04	8.50
95th-Percentile Queue Length [ft]	19.95	177.91	232.63	218.66	54.44	60.78	5.21	19.16	25.93	212.56

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.05	18.60	26.26	30.56	7.56	7.75	18.55	18.55	18.55	23.43	19.43	34.12
Movement LOS	C	B	C	C	A	A	B	B	B	C	B	C
d_A, Approach Delay [s/veh]	21.57			14.77			18.55			31.18		
Approach LOS	C			B			B			C		
d_I, Intersection Delay [s/veh]	20.09											
Intersection LOS	C											
Intersection V/C	0.720											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Signalized	Delay (sec / veh):	5.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.432

Intersection Setup

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	215.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			No		

volumes

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Base Volume Input [veh/h]	18	852	30	83	1023	24	14	0	6	1	0	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	852	30	83	1023	24	14	0	6	1	0	9
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	224	8	22	269	6	4	0	2	0	0	2
Total Analysis Volume [veh/h]	19	897	32	87	1077	25	15	0	6	1	0	9
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	15	0	23	29	0	0	22	0	0	22	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	C	R	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	43	43	4	45	45	2	2	2	2
g / C, Green / Cycle	0.02	0.71	0.71	0.06	0.75	0.75	0.03	0.03	0.03	0.03
(v / s)_i Volume / Saturation Flow Rate	0.01	0.25	0.02	0.05	0.30	0.02	0.08	0.00	0.01	0.01
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	187	1615	168	1615
c, Capacity [veh/h]	45	2561	1143	119	2710	1210	125	43	124	43
d1, Uniform Delay [s]	28.91	3.41	2.62	27.57	2.70	1.93	30.05	28.60	29.91	28.65
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.23	0.38	0.05	8.24	0.44	0.03	0.43	1.44	0.03	2.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.42	0.35	0.03	0.73	0.40	0.02	0.12	0.14	0.01	0.21
d, Delay for Lane Group [s/veh]	35.14	3.79	2.66	35.82	3.14	1.96	30.47	30.04	29.94	31.00
Lane Group LOS	D	A	A	D	A	A	C	C	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh]	0.32	0.76	0.05	1.35	0.45	0.02	0.22	0.10	0.01	0.15
50th-Percentile Queue Length [ft]	7.94	19.06	1.22	33.82	11.13	0.50	5.59	2.45	0.37	3.73
95th-Percentile Queue Length [veh]	0.57	1.37	0.09	2.43	0.80	0.04	0.40	0.18	0.03	0.27
95th-Percentile Queue Length [ft]	14.29	34.31	2.19	60.87	20.03	0.89	10.05	4.41	0.66	6.72

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	35.14	3.79	2.66	35.82	3.14	1.96	30.47	30.47	30.04	29.94	29.94	31.00
Movement LOS	D	A	A	D	A	A	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	4.38			5.50			30.35			30.89		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	5.37											
Intersection LOS	A											
Intersection V/C	0.432											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 1: E Street (NS) at Orange Show Road (EW)

Control Type:	Signalized	Delay (sec / veh):	32.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.811

Intersection Setup

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	300.00	100.00	100.00	189.00	100.00	134.00	217.00	100.00	147.00	165.00	100.00	103.00
Speed [mph]	40.00			40.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	E Street			E Street			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	533	318	152	181	194	316	128	1031	338	197	1092	54
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	533	318	152	181	194	316	128	1031	338	197	1092	54
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	140	84	40	48	51	83	34	271	89	52	287	14
Total Analysis Volume [veh/h]	561	335	160	191	204	333	135	1085	356	207	1149	57
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	75
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	17	24	0	13	20	0	10	29	0	9	28	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	23	23	6	16	16	5	25	25	5	25	25
g / C, Green / Cycle	0.17	0.31	0.31	0.08	0.21	0.21	0.06	0.33	0.33	0.07	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.16	0.14	0.14	0.05	0.06	0.21	0.04	0.30	0.22	0.06	0.32	0.04
s, saturation flow rate [veh/h]	3514	1900	1695	3514	3618	1615	3514	3618	1615	3514	3618	1615
c, Capacity [veh/h]	609	588	524	282	782	349	221	1196	534	235	1210	540
d1, Uniform Delay [s]	30.50	20.75	20.75	33.57	24.43	29.04	34.26	24.02	21.57	34.72	24.35	17.23
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.20	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.31	2.43	2.73	2.86	0.81	37.87	2.73	2.98	2.61	10.35	4.98	0.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

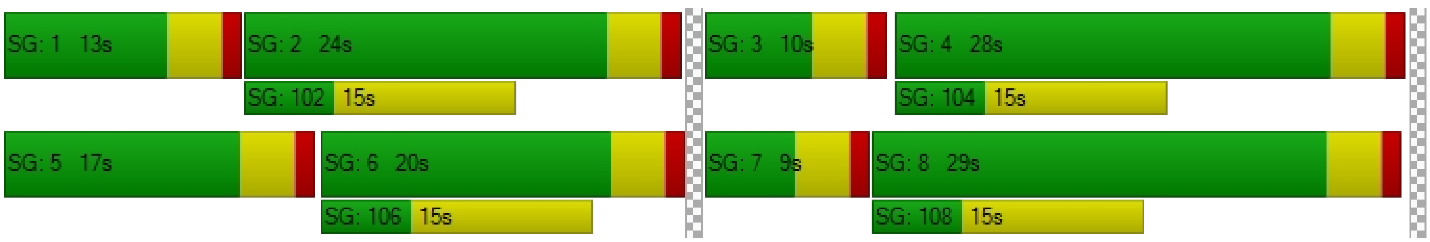
X, volume / capacity	0.92	0.44	0.45	0.68	0.26	0.95	0.61	0.91	0.67	0.88	0.95	0.11
d, Delay for Lane Group [s/veh]	36.81	23.18	23.48	36.42	25.24	66.91	36.99	27.00	24.18	45.06	29.33	17.31
Lane Group LOS	D	C	C	D	C	E	D	C	C	D	C	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	5.17	3.76	3.40	1.71	1.50	9.13	1.22	8.70	5.22	2.11	9.68	0.63
50th-Percentile Queue Length [ft]	129.23	93.89	84.91	42.77	37.39	228.34	30.51	217.49	130.56	52.72	242.02	15.84
95th-Percentile Queue Length [veh]	8.90	6.76	6.11	3.08	2.69	14.09	2.20	13.54	8.97	3.80	14.78	1.14
95th-Percentile Queue Length [ft]	222.44	169.01	152.83	76.98	67.30	352.25	54.91	338.42	224.26	94.90	369.59	28.51

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.81	23.25	23.48	36.42	25.24	66.91	36.99	27.00	24.18	45.06	29.33	17.31
Movement LOS	D	C	C	D	C	E	D	C	C	D	C	B
d_A, Approach Delay [s/veh]	30.49			47.24			27.22			31.15		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	32.16											
Intersection LOS	C											
Intersection V/C	0.811											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Washington Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	17.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.643

Intersection Setup

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	157.00	100.00	100.00	166.00	100.00	100.00
Speed [mph]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Washington Ave			Washington Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	52	23	19	5	1	15	32	1246	30	14	1194	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	23	19	5	1	15	32	1246	30	14	1194	17
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	6	5	1	0	4	8	328	8	4	314	4
Total Analysis Volume [veh/h]	55	24	20	5	1	16	34	1312	32	15	1257	18
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	5	0	0	5	0	5	5	0	5	5	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	19	0	9	32	0	9	32	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21	21	31	26	26	31	25	25
g / C, Green / Cycle	0.35	0.35	0.35	0.35	0.51	0.43	0.43	0.51	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.21	0.01	0.02	0.01	0.05	0.36	0.02	0.03	0.35	0.01
s, saturation flow rate [veh/h]	373	1615	255	1615	638	3618	1615	570	3618	1615
c, Capacity [veh/h]	233	569	199	569	362	1548	691	329	1484	662
d1, Uniform Delay [s]	20.91	12.78	15.26	12.75	10.68	15.46	10.05	10.71	16.04	10.59
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.92	0.12	0.28	0.09	0.11	1.37	0.03	0.06	1.43	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

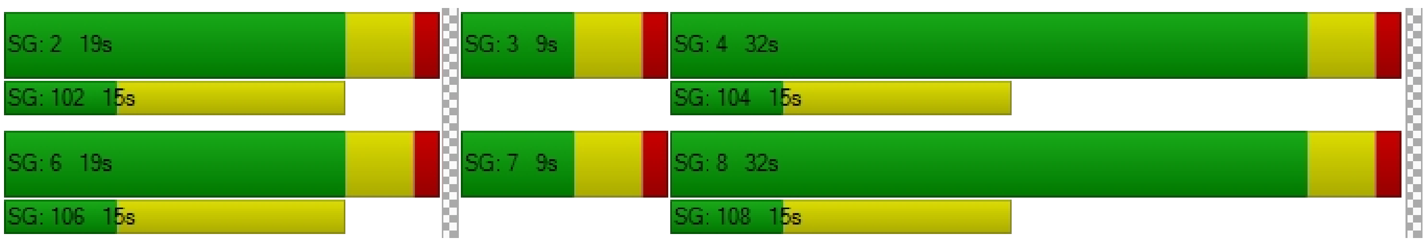
X, volume / capacity	0.34	0.04	0.03	0.03	0.09	0.85	0.05	0.05	0.85	0.03
d, Delay for Lane Group [s/veh]	24.82	12.90	15.54	12.84	10.79	16.83	10.08	10.77	17.47	10.60
Lane Group LOS	C	B	B	B	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	1.28	0.18	0.06	0.14	0.18	6.69	0.21	0.08	6.56	0.12
50th-Percentile Queue Length [ft]	32.12	4.46	1.58	3.56	4.41	167.13	5.20	1.93	163.94	3.03
95th-Percentile Queue Length [veh]	2.31	0.32	0.11	0.26	0.32	10.93	0.37	0.14	10.76	0.22
95th-Percentile Queue Length [ft]	57.81	8.04	2.84	6.41	7.94	273.14	9.36	3.48	268.93	5.46

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.82	24.82	12.90	15.54	15.54	12.84	10.79	16.83	10.08	10.77	17.47	10.60
Movement LOS	C	C	B	B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	22.41			13.58			16.52			17.29		
Approach LOS	C			B			B			B		
d_I, Intersection Delay [s/veh]	17.06											
Intersection LOS	B											
Intersection V/C	0.643											

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 3: Project West Driveway (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	8.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	Project West Driveway		Dumas St		Dumas Street	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Project West Driveway		Dumas St		Dumas Street	
Base Volume Input [veh/h]	14	4	20	4	4	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	4	20	4	4	30
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	1	5	1	1	8
Total Analysis Volume [veh/h]	15	4	21	4	4	32
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.88	8.47	0.00	0.00	7.25	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.06	0.06	0.00	0.00	0.07	0.07
95th-Percentile Queue Length [ft]	1.50	1.50	0.00	0.00	1.72	1.72
d_A, Approach Delay [s/veh]	8.80		0.00		0.81	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.45					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 4: Project East DriveWay (NS) at Dumas Street (EW)

Control Type:	Two-way stop	Delay (sec / veh):	8.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Project East DriveWay		Dumas Street		Dumas St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Project East DriveWay		Dumas Street		Dumas St	
Base Volume Input [veh/h]	0	7	24	0	9	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	7	24	0	9	34
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	2	6	0	2	9
Total Analysis Volume [veh/h]	0	7	25	0	9	36
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	8.43	0.00	0.00	7.26	0.00
Movement LOS		A	A		A	A
95th-Percentile Queue Length [veh]	0.00	0.02	0.00	0.00	0.09	0.09
95th-Percentile Queue Length [ft]	0.00	0.50	0.00	0.00	2.17	2.17
d_A, Approach Delay [s/veh]	8.43		0.00		1.45	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.61					
Intersection LOS	A					

Intersection Level Of Service Report
Intersection 5: Waterman Ave (NS) at Orange Show Rd (EW)

Control Type:	Signalized	Delay (sec / veh):	38.0
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.832

Intersection Setup

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	298.00	100.00	100.00	275.00	100.00	100.00	248.00	100.00	100.00	258.00	100.00	100.00
Speed [mph]	50.00			50.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Orange Show Rd			Orange Show Rd		
Base Volume Input [veh/h]	280	804	136	115	861	128	170	799	249	168	811	106
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	280	804	136	115	861	128	170	799	249	168	811	106
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	74	212	36	30	227	34	45	210	66	44	213	28
Total Analysis Volume [veh/h]	295	846	143	121	906	135	179	841	262	177	854	112
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	18	30	0	13	25	0	13	24	0	13	24	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	14	28	28	7	21	21	9	20	20	9	20	20
g / C, Green / Cycle	0.18	0.35	0.35	0.08	0.26	0.26	0.11	0.25	0.25	0.11	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.16	0.23	0.09	0.07	0.25	0.08	0.10	0.23	0.16	0.10	0.24	0.07
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	1810	3618	1615	1810	3618	1615
c, Capacity [veh/h]	317	1281	572	154	956	427	204	898	401	204	898	401
d1, Uniform Delay [s]	32.54	21.78	18.31	35.89	28.90	23.64	34.97	29.46	26.99	34.93	29.60	24.30
k, delay calibration	0.36	0.50	0.50	0.11	0.50	0.50	0.28	0.11	0.18	0.27	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	28.50	2.68	1.05	8.52	18.94	1.94	24.68	5.38	2.98	23.05	6.50	0.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

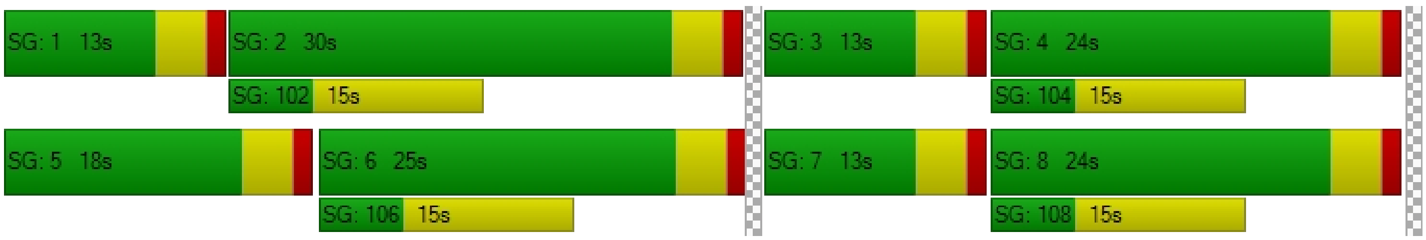
X, volume / capacity	0.93	0.66	0.25	0.79	0.95	0.32	0.88	0.94	0.65	0.87	0.95	0.28
d, Delay for Lane Group [s/veh]	61.04	24.47	19.36	44.41	47.84	25.58	59.65	34.85	29.97	57.98	36.10	24.68
Lane Group LOS	E	C	B	D	D	C	E	C	C	E	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	7.63	6.32	1.83	2.51	10.12	2.08	4.65	7.99	4.51	4.52	8.27	1.65
50th-Percentile Queue Length [ft]	190.84	157.93	45.64	62.74	252.90	52.07	116.31	199.67	112.69	112.99	206.86	41.22
95th-Percentile Queue Length [veh]	12.16	10.44	3.29	4.52	15.33	3.75	8.19	12.62	7.99	8.01	12.99	2.97
95th-Percentile Queue Length [ft]	304.12	260.98	82.15	112.94	383.30	93.73	204.74	315.54	199.74	200.15	324.79	74.20

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	61.04	24.47	19.36	44.41	47.84	25.58	59.65	34.85	29.97	57.98	36.10	24.68
Movement LOS	E	C	B	D	D	C	E	C	C	E	D	C
d_A, Approach Delay [s/veh]	32.30			44.89			37.31			38.37		
Approach LOS	C			D			D			D		
d_I, Intersection Delay [s/veh]	38.05											
Intersection LOS	D											
Intersection V/C	0.832											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Waterman Ave (NS) at Dumas St (EW)

Control Type:	Two-way stop	Delay (sec / veh):	29.1
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.056

Intersection Setup

Name	Waterman Ave		Waterman Ave		Dumas St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	111.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00		50.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Waterman Ave		Waterman Ave		Dumas St	
Base Volume Input [veh/h]	11	1229	1378	21	9	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1229	1378	21	9	24
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	323	363	6	2	6
Total Analysis Volume [veh/h]	12	1294	1451	22	9	25
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.01	0.00	0.06	0.07
d_M, Delay for Movement [s/veh]	12.97	0.00	0.00	0.00	29.15	16.50
Movement LOS	B	A	A	A	D	C
95th-Percentile Queue Length [veh]	0.08	0.00	0.00	0.00	0.42	0.42
95th-Percentile Queue Length [ft]	1.99	0.00	0.00	0.00	10.38	10.38
d_A, Approach Delay [s/veh]	0.12		0.00		19.85	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.30					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Two-way stop	Delay (sec / veh):	589.1
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	215.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			No		

volumes

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Base Volume Input [veh/h]	8	965	2	10	1452	11	38	0	18	10	0	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	965	2	10	1452	11	38	0	18	10	0	70
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	254	1	3	382	3	10	0	5	3	0	18
Total Analysis Volume [veh/h]	8	1016	2	11	1528	12	40	0	19	11	0	74
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.00	0.02	0.02	0.00	1.51	0.00	0.05	0.24	0.00	0.14
d_M, Delay for Movement [s/veh]	13.39	0.00	0.00	10.31	0.00	0.00	580.25	589.09	15.85	107.12	175.23	13.15
Movement LOS	B	A	A	B	A	A	F	F	C	F	F	B
95th-Percentile Queue Length [veh]	0.06	0.00	0.00	0.05	0.00	0.00	4.81	4.81	0.17	0.80	0.80	0.50
95th-Percentile Queue Length [ft]	1.40	0.00	0.00	1.22	0.00	0.00	120.20	120.20	4.28	20.06	20.06	12.46
d_A, Approach Delay [s/veh]	0.10			0.07			398.50			25.31		
Approach LOS	A			A			F			D		
d_I, Intersection Delay [s/veh]	9.51											
Intersection LOS	F											

Intersection Level Of Service Report

Intersection 8: Waterman Ave (NS) at Park Center Circle South (EW)

Control Type:	Signalized	Delay (sec / veh):	11.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.605

Intersection Setup

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Park Center Circle South			Park Center Circle South		
Base Volume Input [veh/h]	24	936	47	23	1357	26	1	0	11	204	0	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	936	47	23	1357	26	1	0	11	204	0	46
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	246	12	6	357	7	0	0	3	54	0	12
Total Analysis Volume [veh/h]	25	985	49	24	1428	27	1	0	12	215	0	48
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	3	0	0	7	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	0	0	5	0	0
Maximum Green [s]	30	30	0	30	30	0	30	0	0	30	0	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0
Split [s]	9	19	0	9	19	0	37	0	0	37	0	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	5	0	0	5	0	5	0	0	5	0	0
Pedestrian Clearance [s]	0	10	0	0	10	0	10	0	0	10	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
Minimum Recall	No	No		No	No		No			No		
Maximum Recall	No	No		No	No		No			No		
Pedestrian Recall	No	No		No	No		No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	R	L	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	43	37	37	43	37	37	14	14	14	14
g / C, Green / Cycle	0.66	0.57	0.57	0.66	0.57	0.57	0.21	0.21	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.05	0.27	0.03	0.03	0.39	0.02	0.00	0.01	0.15	0.03
s, saturation flow rate [veh/h]	508	3618	1615	688	3618	1615	1440	1615	1440	1615
c, Capacity [veh/h]	400	2081	929	533	2077	927	369	344	369	344
d1, Uniform Delay [s]	6.33	8.07	6.05	4.54	9.74	6.00	21.90	20.30	25.73	20.77
k, delay calibration	0.50	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.30	0.78	0.11	0.03	1.88	0.06	0.00	0.04	1.46	0.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

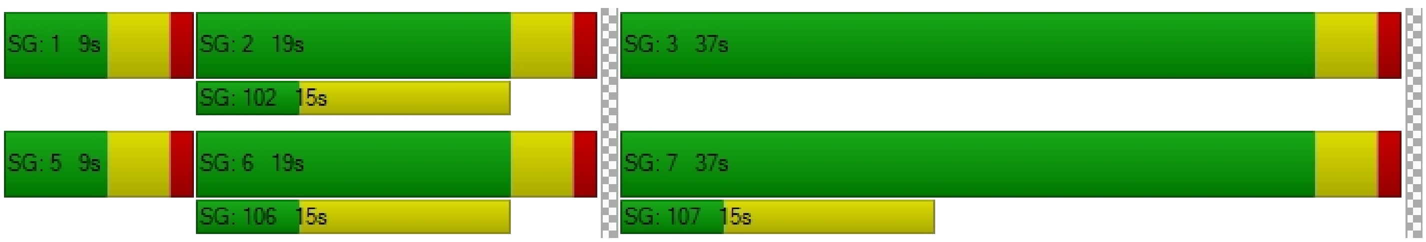
X, volume / capacity	0.06	0.47	0.05	0.05	0.69	0.03	0.00	0.03	0.58	0.14
d, Delay for Lane Group [s/veh]	6.63	8.84	6.16	4.58	11.62	6.05	21.90	20.34	27.18	20.95
Lane Group LOS	A	A	A	A	B	A	C	C	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.09	2.86	0.22	0.06	5.15	0.12	0.01	0.14	3.16	0.58
50th-Percentile Queue Length [ft]	2.28	71.46	5.61	1.52	128.83	3.06	0.31	3.52	79.03	14.44
95th-Percentile Queue Length [veh]	0.16	5.14	0.40	0.11	8.88	0.22	0.02	0.25	5.69	1.04
95th-Percentile Queue Length [ft]	4.11	128.62	10.10	2.73	221.91	5.50	0.55	6.33	142.26	25.98

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.63	8.84	6.16	4.58	11.62	6.05	21.90	0.00	20.34	27.18	0.00	20.95
Movement LOS	A	A	A	A	B	A	C		C	C		C
d_A, Approach Delay [s/veh]	8.67			11.40			20.46			26.05		
Approach LOS	A			B			C			C		
d_I, Intersection Delay [s/veh]	11.78											
Intersection LOS	B											
Intersection V/C	0.605											

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 9: Waterman Ave (NS) at Vanderbilt Way (EW)

Control Type:	Signalized	Delay (sec / veh):	34.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.081

Intersection Setup

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

volumes

Name	Waterman Ave			Waterman Ave			Vanderbilt Way			Vanderbilt Way		
Base Volume Input [veh/h]	52	698	242	253	1295	15	10	5	15	409	3	295
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	698	242	253	1295	15	10	5	15	409	3	295
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	184	64	67	341	4	3	1	4	108	1	78
Total Analysis Volume [veh/h]	55	735	255	266	1363	16	11	5	16	431	3	311
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	9	19	0	15	25	0	0	26	0	0	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	3	16	16	11	23	23	22	22	22	22
g / C, Green / Cycle	0.05	0.26	0.26	0.18	0.38	0.38	0.37	0.37	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.03	0.20	0.16	0.15	0.25	0.25	0.10	0.01	0.62	0.19
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1889	311	1413	676	1615
c, Capacity [veh/h]	94	940	420	318	1388	725	194	128	366	589
d1, Uniform Delay [s]	27.87	20.68	19.57	23.95	15.25	15.25	15.10	29.96	22.82	15.03
k, delay calibration	0.11	0.50	0.50	0.25	0.50	0.50	0.11	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.58	6.44	6.41	12.29	2.40	4.54	0.40	0.34	94.98	0.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

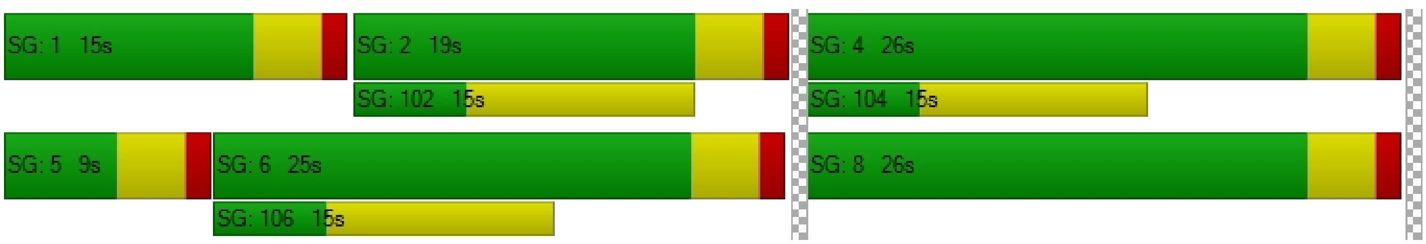
X, volume / capacity	0.58	0.78	0.61	0.84	0.65	0.65	0.17	0.10	1.15	0.53
d, Delay for Lane Group [s/veh]	33.45	27.12	25.98	36.24	17.65	19.79	15.50	30.30	117.80	15.77
Lane Group LOS	C	C	C	D	B	B	B	C	F	B
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	0.83	4.79	3.34	4.20	4.39	5.01	0.27	0.19	14.70	3.09
50th-Percentile Queue Length [ft]	20.74	119.79	83.53	104.93	109.74	125.37	6.81	4.76	367.43	77.17
95th-Percentile Queue Length [veh]	1.49	8.38	6.01	7.55	7.83	8.69	0.49	0.34	22.85	5.56
95th-Percentile Queue Length [ft]	37.33	209.54	150.35	188.87	195.64	217.18	12.26	8.57	571.15	138.91

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.45	27.12	25.98	36.24	18.37	19.79	15.50	15.50	15.50	115.16	117.80	15.77
Movement LOS	C	C	C	D	B	B	B	B	B	F	F	B
d_A, Approach Delay [s/veh]		27.18			21.27			15.50			73.69	
Approach LOS		C			C			B			E	
d_I, Intersection Delay [s/veh]	34.26											
Intersection LOS	C											
Intersection V/C	1.081											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 7: Waterman Ave (NS) at Park Center Circle North (EW)

Control Type:	Signalized	Delay (sec / veh):	8.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.653

Intersection Setup

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	215.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	50.00			50.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			No		

volumes

Name	Waterman Ave			Waterman Ave			Project Driveway			Park Center Circle N		
Base Volume Input [veh/h]	8	965	2	10	1452	11	38	0	18	10	0	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	965	2	10	1452	11	38	0	18	10	0	70
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	254	1	3	382	3	10	0	5	3	0	18
Total Analysis Volume [veh/h]	8	1016	2	11	1528	12	40	0	19	11	0	74
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	26	36	0	9	19	0	0	15	0	0	15	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	C	R	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	1	39	39	1	40	40	8	8	8	8
g / C, Green / Cycle	0.01	0.66	0.66	0.02	0.66	0.66	0.13	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.00	0.28	0.00	0.01	0.42	0.01	1.96	0.01	0.66	0.05
s, saturation flow rate [veh/h]	1810	3618	1615	1810	3618	1615	20	1615	17	1615
c, Capacity [veh/h]	23	2366	1056	29	2379	1062	122	211	122	211
d1, Uniform Delay [s]	29.47	5.01	3.61	29.30	6.11	3.55	30.08	23.01	30.07	23.83
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.50	0.11	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.18	0.57	0.00	7.93	1.35	0.02	6.99	0.18	1.46	0.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

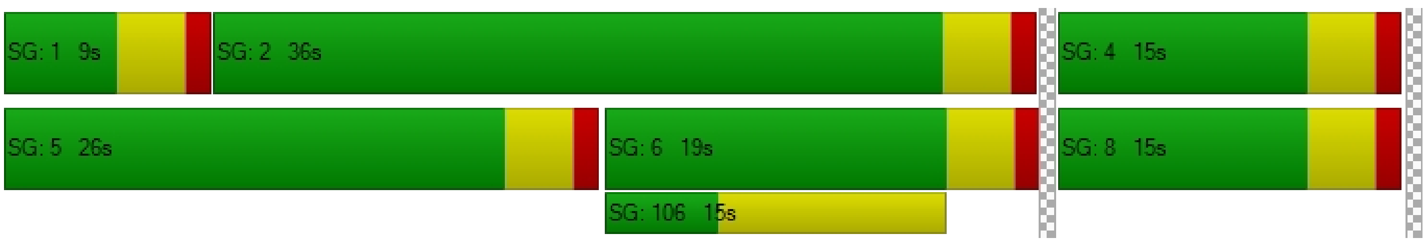
X, volume / capacity	0.35	0.43	0.00	0.38	0.64	0.01	0.33	0.09	0.09	0.35
d, Delay for Lane Group [s/veh]	38.65	5.58	3.61	37.23	7.46	3.57	37.07	23.19	31.53	24.83
Lane Group LOS	D	A	A	D	A	A	D	C	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh]	0.16	1.58	0.00	0.20	2.96	0.03	0.80	0.23	0.20	0.96
50th-Percentile Queue Length [ft]	3.99	39.38	0.12	5.10	74.10	0.72	20.11	5.86	5.06	24.01
95th-Percentile Queue Length [veh]	0.29	2.84	0.01	0.37	5.34	0.05	1.45	0.42	0.36	1.73
95th-Percentile Queue Length [ft]	7.18	70.88	0.22	9.18	133.38	1.29	36.20	10.55	9.10	43.22

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	38.65	5.58	3.61	37.23	7.46	3.57	37.07	37.07	23.19	31.53	31.53	24.83
Movement LOS	D	A	A	D	A	A	D	D	C	C	C	C
d_A, Approach Delay [s/veh]	5.83			7.64			32.60			25.69		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	8.06											
Intersection LOS	A											
Intersection V/C	2.653											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



March 28, 2016

Mr. Jackson Smith
NEWCASTLE PARTNERS, INC.
4740 Green River Road, Suite 118
Corona, CA 92880

Dear Mr. Smith:

INTRODUCTION

The firm of Kunzman Associates, Inc. is pleased to provide responses to comments regarding the Waterman Industrial Center project in the City of San Bernardino. Comments were received via email Memo dated March 23, 2015 (see Appendix A).

The Waterman Industrial Center Traffic Impact Analysis was prepared by Kunzman Associates, Inc. (September 9, 2015). The traffic impact analysis will be revised to incorporate text revisions as per the comments. The Waterman Industrial Center Traffic Impact Analysis (Revised) was prepared by Kunzman Associates, Inc. (March 22, 2016). See Appendix B for key revised pages.

RESPONSE TO COMMENT 1 (SA2-1)

Comment so noted. Based upon previous discussions with the City of San Bernardino staff, no improvements are currently planned or funded for the railroad crossing on Waterman Avenue (north of Dumas Street).

RESPONSE TO COMMENT 2 (OR1-2)

While the project will add truck trips to Waterman Avenue, the Waterman Avenue study area intersections are projected to operate within acceptable Levels of Service during the peak hours for Year 2035 With Project traffic conditions (as shown in Table 12 of the traffic study).

RESPONSE TO COMMENT 3 (OR3-19)

The Waterman Industrial Center Traffic Impact Analysis (Revised) was prepared by Kunzman Associates, Inc. (March 22, 2016). The trip generation was revised to reflect the South Coast Air Quality Management District guidelines for high-cube warehouse distribution center projects. The car - truck ratios were altered to reflect the higher truck splits. As shown in Table 3, the **61.9% car (1.04/1.68) and 38.1% truck (0.64/1.68**) values are from ITE and approved alternative documented by SCAQMD.

Consequently, the truck mix was obtained from SCAQMD document specifying the use of **(LHD2 = 0.0645, MHD = 0.0645, HHD = 0.2300)** when using the ITE 0.64 truck trip rate.

No change in mitigation measures from the previous traffic study to the revised traffic study were recommended at the study area intersections with the revised trip generation rates.

RESPONSE TO COMMENT 4 (OR3-20)

See Response to Comment 3 (OR3-19).

RESPONSE TO COMMENT 5 (OR3-21)

See Response to Comment 3 (OR3-19).

RESPONSE TO COMMENT 6 (GP1-3)

The applicant will be adding an additional lane to Dumas Road with this project. This will create a two-way left-turn median from approximately the west property boundary to Waterman Avenue. This lane will allow for pass through traffic without blocking the travel lane with trucks desiring to turn left into the project site.

It has been a pleasure to service your needs on the Waterman Industrial Center project. Should you have any questions or if we can be of further assistance, please do not hesitate to call at (714) 973-8383.

Sincerely,

KUNZMAN ASSOCIATES, INC.

Perrie Ilercil, P.E.
Senior Associate

REGISTERED PROFESSIONAL ENGINEER WILLIAM A. KUNZMAN No. TR0056 TRAFFIC STATE OF CALIFORNIA

KUNZMAN ASSOCIATES, INC.

William Kunzman, P.E.
Principal

Jn5629e

APPENDIX A

COMMENT MEMO

STATE OF CALIFORNIA EDMUND G. BROWN JR., *Governor*

PUBLIC UTILITIES COMMISSION
320 WEST 4TH STREET, SUITE 500
LOS ANGELES, CA 90013
(213) 576-7083

March 1, 2016

Travis Martin
City of San Bernardino
300 North D Street, 3rd Floor
San Bernardino, CA 92418

Dear Travis:

Re: SCH 2016021002 San Bernardino (SBC) Waterman Industrial Center Project - DMND

The California Public Utilities Commission (Commission) has jurisdiction over the safety of highway-rail crossings (crossings) in California. The California Public Utilities Code requires Commission approval for the construction or alteration of crossings and grants the Commission exclusive power on the design, alteration, and closure of crossings in California. The Commission Rail Crossings and Engineering Branch (RCEB) has received the *Mitigated Negative Declaration* for the proposed Waterman Industrial Center Project. The City of San Bernardino (City) is the lead agency.

The project area is located southwest of the intersection of Dumas Street and Waterman Avenue. The Waterman Avenue crossing (CPUC 002U-3.00 and DOT 027220Y) is located approximately 20 feet north of the intersection. Construction traffic is anticipated throughout the duration of the project. Traffic volume is anticipated to increase at the crossing during the project construction and in the future.

RCEB recommends that the City add language to the project so that any development adjacent to or near the railroad/light rail right-of-way (ROW) is planned with the safety of the rail corridor in mind. Construction and future business activities may increase traffic volumes not only on streets and at intersections, but also at railroad crossings. Mitigation measures to consider include, but are not limited to, improvements to existing railroad crossings due to increase in traffic volumes, and continuous vandal resistant fencing or other appropriate barriers to limit the access of trespassers onto the railroad ROW. SA2-1

If you have any questions in this matter, please contact Sergio Licon at (213) 576-7085, Sergio.licon@cpuc.ca.gov.

Sincerely,

Ken Chiang

Ken Chiang, P.E.
Utilities Engineer
Rail Crossings and Engineering Branch
Safety and Enforcement Division

C: State Clearinghouse

OR1

From: Steve von Rajcs <svonrajcs@chfcares.com>
Sent: Thursday, February 11, 2016 12:05 PM
To: Travis Martin
Cc: Desiree Lavin Glover
Subject: Comments re: Waterman Industrial Center (proposed)

Follow Up Flag: Follow up
Flag Status: Flagged

Hi, Travis,

I just received the Notice of Intent for the Waterman Industrial Center proposed to be located at W. Dumas and S. Waterman Avenue.

As owners of the Inland Regional Center buildings (across the street from the project), I have only two concerns:

1.When the SCE towers are relocated, the overhead wires ***cannot*** be moved any closer to our buildings. OR1-1
2. Large volumes of truck traffic at the site will undoubtedly cause severe congestion on S. Waterman. OR1-2

Thank you for hearing our concerns.

Steve von Rajcs
President/CEO
California Housing Foundation
1200 California Street, Suite 104
Redlands, CA , 92374
(909) 793-9800
svonrajcs@CHFcares.com

LOZEAU DRURY LLP

T 510.836.4200
F 510.836.4205

410 12th Street, Suite 250
Oakland, Ca 94607

www.lozeaudrury.com
doug@lozeaudrury.com

BY EMAIL and OVERNIGHT MAIL

March 1, 2016

Travis Martin, Assistant Planner
City of San Bernardino
9093845313
300 North D Street, 3rd Floor
San Bernardino, CA 92418
martin_tr@sbcity.org

Re: Mitigated Negative Declaration for Waterman Industrial Center (Development Permit Type D – 15-11) – SCH No. 2016021002

Dear Mr. Martin:

This letter is submitted on behalf of Laborers International Union of North America, Local Union 783, and its hundreds of members living in San Bernardino County (collectively, "LIUNA" or "Commenters") concerning the City of San Bernardino's (the "City") Initial Study and Mitigated Negative Declaration ("IS/MND") prepared for the Waterman Industrial Center, Development Permit Type D – 15-11) (SCH No. 2016021002) (the "Project").

The Project is a 564,652 square foot industrial building that includes office space, parking, a pump house, and landscaping. The Project is located at the intersection of East Dumas Street and South Waterman Avenue in the City of San Bernardino.

These comments have been prepared with the assistance of Matt Hagemann, P.G., C.Hg., QSD, QSP, an expert hydrogeologist; and Jessie Jaeger, air quality specialist from SWAPE. Their comments and curriculum vitae are attached as Exhibit A hereto ("Hagemann") and are incorporated by reference in their entirety. The City should respond to Mr. Hagemann's comments separately. See OR4

Commenters request that the City withdraw the IS/MND and instead prepare an environmental impact report ("EIR") for the Project, as there is substantial evidence that the Project will have significant unmitigated impacts on the environment as discussed OR3-1

OR3-1 Cont. below. There is a fair argument that the Project may have significant unmitigated impacts, including:

OR3-2
1. Significant and unmitigated air quality impacts associated with the operation of the Project.

OR3-3
2. Significant and unmitigated human health risks from diesel particulate matter emissions associated with Project construction.

OR3-4 An EIR is required to analyze these and other impacts and to adopt feasible mitigation measures to reduce the impacts to the extent feasible.

PROJECT DESCRIPTION

OR3-5 The Project is a proposed 564,652-square-foot (SF) industrial center building on the southwest corner of the intersection of East Dumas Street and South Waterman Avenue in the City of San Bernardino. It also includes office space, parking, a pump house, and landscaping on an approximately 26-acre property. The future tenant of the building is not currently known, so associated operational details are not known. Additionally, there are 8 Southern California Edison (SCE) power poles that contain 6 wires of high voltage 66kv Edison transmission lines, a 3 wire 12kv system and a 3 wire 4kv system. The City concluded that the Project, with proposed mitigation measures identified in the IS/MND, will not have a significant effect on the environment and that an EIR is therefore not required.

STANDING

OR3-6 Members of LIUNA, Local Union No. 783 live, work, and recreate in the immediate vicinity of the Project site. These members will suffer the impacts of a poorly executed or inadequately mitigated Project, just as would the members of any nearby homeowners association, community group or environmental group. Hundreds of LIUNA Local Union No. 783 members live and work in areas that will be affected by air pollution generated by the project. Therefore, LIUNA Local Union No. 883 and its members have a direct interest in ensuring that the Project is adequately analyzed and that its environmental and public health impacts are mitigated to the fullest extent feasible.

OR3-7 Pursuant to CEQA, LIUNA Local Union No. 783 submits these comments in response to the City's proposed IS/MND. Under the circumstances presented here, CEQA clearly requires the preparation of an EIR and accordingly, the City should decline to adopt the proposed IS/MND.

LEGAL STANDARD

OR3-8 As the California Supreme Court recently held, "[i]f no EIR has been prepared for a nonexempt project, but substantial evidence in the record supports a fair argument that the project may result in significant adverse impacts, the proper remedy is to order preparation of an EIR." (*Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 319-320 ["*CBE v. SCAQMD*"], citing, *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 75, 88; *Brentwood Assn. for No Drilling, Inc. v. City of Los Angeles* (1982) 134 Cal.App.3d 491, 504–505.) "The 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." (*Communities for a Better Environment v. Calif. Resources Agency* (2002) 103 Cal.App.4th 98, 109 ["*CBE v. CRA*"].) OR3-8 Cont.

The EIR is the very heart of CEQA. (*Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1214; *Pocket Protectors v. City of Sacramento* (2004) 124 Cal.App.4th 903, 927.) The EIR is an "environmental 'alarm bell' whose purpose is to alert the public and its responsible officials to environmental changes before they have reached the ecological points of no return." (*Bakersfield Citizens*, *supra,* 124 Cal.App.4th at 1220.) The EIR also functions as a "document of accountability," intended to "demonstrate to an apprehensive citizenry that the agency has, in fact, analyzed and considered the ecological implications of its action." (*Laurel Heights Improvements Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 392.) The EIR process "protects not only the environment but also informed self-government." (*Pocket Protectors*, *supra,* 124 Cal.App.4th at 927.) OR3-9

An EIR is required if "there is substantial evidence, in light of the whole record before the lead agency, that the project may have a significant effect on the environment." (Pub. Resources Code, § 21080(d); see also *Pocket Protectors*, *supra,* 124 Cal.App.4th at 927.) In very limited circumstances, an agency may avoid preparing an EIR by issuing a negative declaration, a written statement briefly indicating that a project will have no significant impact thus requiring no EIR (14 Cal. Code Regs., § 15371 ["CEQA Guidelines"]), only if there is not even a "fair argument" that the project will have a significant environmental effect. (Pub. Resources Code, §§ 21100, 21064.) Since "[t]he adoption of a negative declaration . . . has a terminal effect on the environmental review process," by allowing the agency "to dispense with the duty [to prepare an EIR]," negative declarations are allowed only in cases where "the proposed project will not affect the environment at all." (*Citizens of Lake Murray v. San Diego* (1989) 129 Cal.App.3d 436, 440.) OR3-10

Where an initial study shows that the project may have a significant effect on the environment, a mitigated negative declaration may be appropriate. However, a mitigated negative declaration is proper *only* if the project revisions would avoid or mitigate the potentially significant effects identified in the initial study "to a point where clearly no significant effect on the environment would occur, and…there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment." (Public OR3-11

OR3-11 Cont. Resources Code §§ 21064.5 and 21080(c)(2); *Mejia v. City of Los Angeles* (2005) 130 Cal.App.4th 322, 331.) In that context, "may" means a *reasonable possibility* of a significant effect on the environment. (Pub. Resources Code, §§ 21082.2(a), 21100, 21151(a); *Pocket Protectors*, *supra,* 124 Cal.App.4th at 927; *League for Protection of Oakland's etc. Historic Resources v. City of Oakland* (1997) 52 Cal.App.4th 896, 904–905.)

OR3-12 Under the "fair argument" standard, an EIR is required if any substantial evidence in the record indicates that a project may have an adverse environmental effect—even if contrary evidence exists to support the agency's decision. (CEQA Guidelines, § 15064(f)(1); *Pocket Protectors*, *supra*, 124 Cal.App.4th at 931; *Stanislaus Audubon Society v. County of Stanislaus* (1995) 33 Cal.App.4th 144, 150-15; *Quail Botanical Gardens Found., Inc. v. City of Encinitas* (1994) 29 Cal.App.4th 1597, 1602.) The "fair argument" standard creates a "low threshold" favoring environmental review through an EIR rather than through issuance of negative declarations or notices of exemption from CEQA. (*Pocket Protectors*, *supra*, 124 Cal.App.4th at 928.)

OR3-13 The "fair argument" standard is virtually the opposite of the typical deferential standard accorded to agencies. As a leading CEQA treatise explains:

> This 'fair argument' standard is very different from the standard normally followed by public agencies in making administrative determinations. Ordinarily, public agencies weigh the evidence in the record before them and reach a decision based on a preponderance of the evidence. [Citations]. The fair argument standard, by contrast, prevents the lead agency from weighing competing evidence to determine who has a better argument concerning the likelihood or extent of a potential environmental impact. The lead agency's decision is thus largely legal rather than factual; it does not resolve conflicts in the evidence but determines only whether substantial evidence exists in the record to support the prescribed fair argument.

OR3-14 (Kostka & Zishcke, *Practice Under CEQA*, §6.29, pp. 273-274.) The Courts have explained that "it is a question of law, not fact, whether a fair argument exists, and the courts owe no deference to the lead agency's determination. Review is de novo, with a ***preference for resolving doubts in favor of environmental review***." (*Pocket Protectors*, *supra*, 124 Cal.App.4th at 928 [emphasis in original].)

OR3-15 As a matter of law, "substantial evidence includes . . . expert opinion." (Pub. Resources Code, § 21080(e)(1); CEQA Guidelines, § 15064(f)(5).) CEQA Guidelines demand that where experts have presented conflicting evidence on the extent of the environmental effects of a project, the agency must consider the environmental effects to be significant and prepare an EIR. (CEQA Guidelines § 15064(f)(5); Pub. Res. Code § 21080(e)(1); *Pocket Protectors*, *supra*,124 Cal.App.4th at 935.) "Significant environmental effect" is defined very broadly as "a substantial or potentially substantial adverse change in the environment." (Pub. Resources Code, § 21068; see also CEQA Guidelines, § 15382.) An effect on the environment need not be "momentous" to meet the CEQA test for significance; it is enough that the impacts are "not trivial." (*No Oil, Inc., supra,* 13 Cal.3d at 83.) In *Pocket Protectors*, the court explained how expert opinion is considered. The Court limited agencies and courts to weighing the admissibility of the evidence. (*Pocket Protectors*, *supra,* 124 Cal.App.4th at 935.) In the context of reviewing a negative declaration, "neither the lead agency nor a court may 'weigh' conflicting substantial evidence to determine whether an EIR must be prepared in the first instance." (*Id*.) Where a disagreement arises regarding the validity of a negative declaration, the courts require an EIR. As the Court explained, "[i]t is the function of an EIR, not a negative declaration, to resolve conflicting claims, based on substantial evidence, as to the environmental effects of a project." (*Id*.) OR3-15 Cont.

DISCUSSION

A. AN EIR IS REQUIRED BECAUSE THE PROJECT WILL MAY HAVE SIGNIFICANT UNMITIGATED ENVIRONMENTAL IMPACTS.

An EIR is required whenever substantial evidence in the entire record before the agency supports a fair argument that a project may have a significant effect on the environment. (*CBE v. SCAQMD, supra,* 48 Cal.4th at 319-20; Public Resources Code § 21080(d); *see also, Pocket Protectors, supra,* 124 Cal.App.4th at 927.) As set forth below, there is a fair argument supported by substantial evidence that the Project may result in significant environmental impacts from the operation of the Project. Therefore, the City is required to prepare an EIR to evaluate the Project's impacts and analyze mitigation measures needed to reduce such impacts to a less than significant level. OR3-16

1. Substantial Evidence Supports a Fair Argument that the Project Will Result in Significant Unmitigated Impacts to Air Quality By Failing to Input Correct Parameters into the IS/MND's Emissions Calculations.

The IS/MND used the California Emissions Estimator Model Version CalEEMod.2013.2.2 ("CalEEMod") to calculate emissions from the Project. However, Mr. Hagemann observes that several of the assumptions used and values input into CalEEMod were inconsistent with both information disclosed in the IS/MND as well as recommended procedures and values set forth by the South Coast Air Quality Management District ("SCAQMD") for a high-cube warehouse (the type of Project at issue). Had the Project's emissions been calculated using the correct parameters, the Project would have a potentially significant impact on air quality. As such, the Project's air quality impacts have not been properly analyzed and mitigated. Accordingly, the following points constitute substantial evidence that support a fair argument that the IS/MND failed to properly calculate the Project's emissions and that the Project will thus have significant unmitigated impacts. OR3-17

a. The IS/MND Improperly Assumes That the Project Will Not Involve Refrigeration.

OR3-18 The IS/MND significantly underestimated the Project's operational emissions by assuming that all warehouses at the Project will be unrefrigerated. The CalEEMod calculations were premised entirely on the notion that the proposed industrial building was modeled as an unrefrigerated warehouse. (IS/MND, Appendix A, pp. 52, 182.) However, the IS/MND is clear that the future tenant of the industrial building is not currently known. SCAQMD requires the use of a conservative air quality impact analysis to afford the fullest possible protection of the environment. In this case, a conservative analysis would dictate modeling the proposed warehouse as either entirely or partially refrigerated. Mr. Hagemann's letter explains that refrigerated warehouses release more air pollutants and greenhouse gas ("GHG") emissions when compared to unrefrigerated warehouses. Thus, by failing to include refrigerated warehouses a potential land use in the CalEEMod calculations, the Project's operational emissions may be substantially underestimated, and would thus likely result in a significant impact on regional air quality. This constitutes substantial evidence that an EIR should be prepared to evaluate the impacts of the Project's operational emissions and to mitigate those impacts.

b. The IS/MND Incorrectly Relies on the Fontana Truck Trip Study to for the Truck Trip Rate and for the Fleet Mix.

OR3-19 The IS/MND also significantly underestimated the Project's operational mobile-source emissions by relying on an improper truck trip rate and fleet mix percentage. Specifically, the IS/MND's Traffic Impact Assessment (Appendix F, p. 3) and its Air Quality/GHG Assessment (Appendix A, p. 60) improperly rely on the August 2003 City of Fontana *Truck Trip Generation Study* ("Fontana Study") to determine the number of vehicle and truck trips the Project will generate during operation. As Mr. Hagemann's letter details, SCAQMD has found numerous problems with the Fontana Study and has thus recommended specific figures to use for the truck trip rate for a high-cube warehouse distribution center.

OR3-20 Mr. Hagemann used SCAQMD's recommended rate to calculate the Project's number of truck trips and found the number of truck trips associated with the Project increased by approximately 87% from the number contained in the IS/MND's model, which is based on the Fontana Study's truck trip rate. Thus, the IS/MND's improper reliance on the Fontana Study likely misrepresented the actual air quality impacts of the Project.

OR3-21 Similarly, the IS/MND relied on the Fontana Study's total truck fleet mix of 20%, which sets forth the operational mix of cars, 2-axle trucks, 3-axle trucks, and 4-axle trucks to input into CalEEMod. As Mr. Hagemann notes, this approach "is not consistent with recommendations set forth by SCAQMD, and does not accurately represent the percentage of trucks that access a high-cube warehouse on a daily basis." (Hagemann, p. 6.) To avoid underestimating the number of trucks visiting warehouse facilities, SCAQMD recommends a truck fleet mix of 40%. This number is double that used by the IS/MND, and is a conservative value especially given that the future tenant of the warehouse is unknown. Based on this recommendation, Mr. Hagemann's letter sets forth a fleet mix percentage that the City should have input into CalEEMod that more accurately represents the number of trips that would likely occur during Project operation. As such, the IS/MND uses an inaccurate rate for the fleet mix percentage that does not adequately asses and mitigates the Project's air quality and GHG impacts. As EIR should be prepared that adequately assesses and mitigates these impacts. OR3-21 Cont.

c. The IS/MND Incorrectly Input Fleet Mix Percentage into CalEEMod.

Mr. Hagemann's letter explains how the IS/MND input the aforementioned artificially low fleet mix percentage in the CalEEMod model incorrectly. Instead of inputting the fleet mix values into the model as fleet mix percentages, the values were used to adjust the trip type percentages for the Project. This approach is plainly inconsistent with Appendix A of the CalEEMod User's Guide instructions on how to calculate the trip type. The IS/MND incorrectly assumed that commercial-work ("C-W") trip are made exclusively by trucks and commercial-nonwork ("C-NW") trips are made exclusively by passenger cars. In fact, both C-W and C-NW trips include trips made by a mix of vehicle types. Mr. Hagemann notes that "[a]s a result, the Project's operational mobile-source emissions are both greatly underestimated and extremely inaccurate." (Hagemann, p. 6.) An EIR should be prepared that inputs the proper data into the CalEEMod model and accurately analyzes the Project's mobile-source emissions and provides mitigation measures for those impacts. OR3-22

2. Substantial Evidence Supports a Fair Argument that the Project Will Result in Significant Unmitigated Impacts to Human Health from Diesel Particulate Emissions Associated with Project Construction.

The IS/MND conclusion that the health risk posed to nearby sensitive receptors from exposure to diesel particulate matter ("DPM") emissions released during Project construction would be less than significant fails to quantify this risk and compare it to applicable thresholds. The IS/MND fails to include a health risk assessment ("HRA"). OR3-23

The IS/MND concludes that health risk from construction activities would be less than significant because construction would occur over a period of time shorter than 70 years. However, this conclusion directly contrasts with guidance published by the Office of Environmental Heal Hazard Assessment ("OEHHA"), which recommends that all OR3-24

OR3-24 Cont. short-term projects lasting at least two months be evaluated for cancer risks to nearby sensitive receptors. The IS/MND is devoid of this analysis.

OR-25 Mr. Hagemann prepared a simple screening-level health risk assessment which demonstrates that construction related DPM emissions from the Project may result in a potentially significant health risk impact. (Hagemann, pp. 8-9.) Using annual estimates from the Project's CalEEMod model, Mr. Hagemann used the EPA's recommended AERSCREEN air dispersion model to generate the maximum reasonable estimates of single hour downwind DPM concentrations from the Project Site. Mr. Hagemann then calculated the excess cancer risk for each sensitive receptor location using applicable HRA methodologies prescribed by OEHHA. (*Id.*, pp. 9-10.) He found that "[t]he infantile exposure for the sensitive receptors exceeds the SCAQMD threshold of 10 in one million." (*Id.*, p. 10.) Further, it is likely that this impact would be even greater since the estimates from the Project's CalEEMod model were artificially low, as demonstrated above. Thus, Mr. Hagemann states that "a refined health risk assessment must be prepared to examine air quality impacts generated by Project construction using site-specific meteorology and specific equipment usage schedules." (*Id.*, p. 10.)

OR3-26 Mr. Hagemann's analysis clearly provides substantial evidence supporting a fair argument that construction emissions from the Project may have significant impacts on human health and the environment. Accordingly, the City must prepare an EIR to analyze these impacts and evaluate potential mitigation measures to address the impacts.

OR3-27

CONCLUSION

For the foregoing reasons, the IS/MND for the Project should be withdrawn, an EIR should be prepared and the draft EIR should be circulated for public review and comment in accordance with CEQA. Thank you for considering our comments.

Sincerely,

Douglas Chermak
Lozeau Drury LLP

EXHIBIT A

See OR4

OR4

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

2656 29th Street, Suite 201
Santa Monica, California 90405

Matt Hagemann
Tel: (949) 887-9013
Email: mhagemann@swape.com

February 29, 2016

Douglas Chermak
Lozeau | Drury LLP
410 12th Street, Suite 250
Oakland, CA 94607

Subject: Comments on the Waterman Industrial Center Project

Dear Mr. Chermak:

We have reviewed the February 1, 2016 Initial Study/Mitigated Negative Declaration (IS/MND) for the Waterman Industrial Center Project ("Project"). The Project includes construction of a 564,652-square foot (SF) speculative warehouse building on a 26-acre property located on the southwest corner of the intersection of East Dumas Street and South Waterman Avenue in the City of San Bernardino. The building would be a cross dock warehouse facility with 10,000 SF of dedicated office/mezzanine space. The site will also include a 427-SF pump house. The building would have 49 dock doors on its northern frontage and 49 on its southern frontage. Total on-site parking would be 452 stalls, with 286 dedicated to warehouse parking (including office) and 166 trailer parking spaces. Landscaping in the amount of 103,585 SF is anticipated for the site and the southwest corner of the site would be used as a storm water/water quality control basin. Roadway frontage improvements would be provided on South Waterman Avenue and East Dumas Street.

Our review concludes that the IS/MND fails to adequately evaluate the Project's Hazards and Hazardous Waste, Air Quality and Greenhouse Gas impacts. Specifically, we find the following issues with the analyses conducted in the IS/MND: OR4-1

- The IS/MND models the Project's construction and operational criteria air pollutant and greenhouse gas emissions using incorrect input parameters. As a result, the Project's pollutant emissions are greatly underestimated. OR4-2
- Furthermore, the IS/MND concludes that the health risk posed to nearby sensitive receptors exposed to diesel exhaust emitted during Project construction will be less-than-significant, yet fails to provide substantial evidence to support this claim. When a health risk assessment is actually prepared to quantify the impacts from Project construction, we find that the health risk posed to these nearby sensitive receptors will be potentially significant. OR4-3

OR4-3 Cont.

A Draft Environmental Impact Report (DEIR) should be prepared to address these issues, and should identify and incorporate additional mitigation measures where necessary.

Air Quality

Unsubstantiated Input Parameters Used to Estimate Project Emissions

OR4-4

The IS/MND relies on emissions calculated from the California Emissions Estimator Model Version CalEEMod.2013.2.2 ("CalEEMod").[1] CalEEMod provides recommended default values based on site specific information, such as land use type, meteorological data, total lot acreage, project type and typical equipment associated with project type. If more specific project information is known, the user can change the default values and input project-specific values, but CEQA requires that such changes be justified by substantial evidence.[2] Once all the values are inputted into the model, the Project's construction and operational emissions are calculated, and "output files" are generated. These output files, which are part of the Project's Air Quality Technical Report (Appendix A), disclose to the reader what parameters were utilized in calculating the Project's air pollutant emissions, and make known which default values were changed as well as provide justification for the values selected.[3]

OR4-5

According to the IS/MND, the Project is subject to significance criteria, guidance, and regulations set forth by the South Coast Air Quality Management District (SCAQMD) (IS/MND, p. 26). When reviewing the Project's CalEEMod output files, however, we found that several of the assumptions used and values inputted into the model were not consistent with recommended procedures and values set forth by the SCAQMD for high-cube warehouses, and were not consistent with information disclosed in the IS/MND. When the Project's emissions are modeled using correct input parameters, we find that the Project will have a potentially significant impact on regional air quality. As a result, a DEIR should be prepared to include an updated air pollution model that uses correct input values, consistent with the IS/MND and recommendations set forth by the SCAQMD.

Assumes Unrefrigerated Land Use

OR4-6

Because the IS/MND assumes that all warehouses will be unrefrigerated, the Project's operational emissions may be grossly underestimated. According to the CalEEMod output files provided in Appendix A of the IS/MND, the proposed industrial building was modeled as an "Unrefrigerated Warehouse-No Rail" (see excerpt below) (Appendix A, p. 52, pp. 182).

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	564.65	1000sqft	12.96	564,652.00	0
Other Asphalt Surfaces	5.84	Acre	5.84	254,390.40	0
Other Non-Asphalt Surfaces	103.59	1000sqft	2.38	103,585.00	0
Parking Lot	452.00	Space	4.07	180,800.00	0

[1] CalEEMod website, *available at*: http://www.caleemod.com/

[2] CalEEMod User Guide, pp. 2, 9, *available at:* http://www.caleemod.com/

[3] CalEEMod User Guide, pp. 7, 13, *available at:* http://www.caleemod.com/ (A key feature of the CalEEMod program is the "remarks" feature, where the user explains why a default setting was replaced by a "user defined" value. These remarks are included in the report.)

Assuming that the proposed building will be composed of unrefrigerated warehouses, exclusively, however, is inconsistent with information disclosed in the IS/MND, and may result in an underestimation of the Project's operational emissions. According to the IS/MND, future tenants of the proposed warehouses are currently unknown. The IS/MND states, "The industrial building is currently planned as a 'spec building.' Thus, <u>the future tenant of the building is not currently known</u>" (IS/MND, p. 3). Therefore, by assuming that the proposed Project buildings will be composed solely of unrefrigerated warehouses is unsubstantiated, as the Project's future tenants remain unknown. OR4-6 Cont.

As discussed by SCAQMD, "CEQA requires the use of 'conservative analysis' to afford 'fullest possible protection of the environment.'"[4] As a result, the most conservative analysis should be conducted. With this in mind, the proposed building should be modeled as "Refrigerated Warehouse-No Rail," or at the very least, a portion of the building should be modeled as "Refrigerated Warehouse-No Rail," with the remaining portion of the building modeled as "Unrefrigerated Warehouse-No Rail," so as to take into consideration the possibility that future tenants may require both cold storage and non-cold storage. OR4-7

Refrigerated warehouses release more air pollutants and greenhouse gas (GHG) emissions when compared to unrefrigerated warehouses for several reasons. First, warehouses equipped with cold storage (refrigerators and freezers, for example) are known to consume more energy when compared to warehouses without cold storage.[5] Second, warehouses equipped with cold storage typically require refrigerated trucks, which are known to idle for much longer, even up to an hour, when compared to unrefrigerated hauling trucks.[6] Lastly, according to a July 2014 *Warehouse Truck Trip Study Data Results and Usage* presentation prepared by the SCAQMD, it was found that hauling trucks that require refrigeration result in greater truck trip rates when compared to non-refrigerated hauling trucks.[7] OR4-8

By not including refrigerated warehouses as a potential land use in the air quality model, the Project's operational emissions may be grossly underestimated, as the future tenants are currently unknown. Unless the Project Applicant can demonstrate that the future tenants of these proposed buildings will be limited to unrefrigerated warehouse uses, exclusively, it should be assumed that a mix of cold and non-cold storage will be provided on-site. A DEIR should be prepared to account for the possibility of refrigerated warehouse needs by future tenants. OR4-9

Incorrect Usage of Fontana Truck Trip Study for Fleet Mix and Truck Trip Rate

Because the IS/MND relies upon an artificially low truck trip rate and truck fleet mix percentage, the Project's operational mobile-source emissions are greatly underestimated. The IS/MND's Traffic Impact OR4-10

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[4] "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Inland Empire Logistics Council, June 2014, *available at*: http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/final-ielc_6-19-2014.pdf?sfvrsn=2

[5] Managing Energy Costs in Warehouses, Business Energy Advisor, *available at*: http://bizenergyadvisor.com/warehouses

[6] "Estimation of Fuel Use by Idling Commercial Trucks," p. 8, *available at:* http://www.transportation.anl.gov/pdfs/TA/373.pdf

[7] "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile Source Committee, July 2014, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/finaltrucktripstudymsc072514.pdf?sfvrsn=2, p. 7, 9

OR4-10 Cont.

Assessment (Appendix F) and Air Quality/GHG Assessment (Appendix A) rely on the August 2003 City of Fontana *Truck Trip Generation Study* ("Fontana Study"),[8] and the 2012 Institute of Transportation Engineers 9th Edition *Trip Generation Manual* ("Trip Generation Manual") to determine the number of vehicle and truck trips the Project will generate during operation (Appendix A, p. 60; Appendix F, p. 3). While the Trip Generation Manual is a widely accepted resource, the Fontana Study is not, and according to SCAQMD Staff, has limited applicability.

OR4-11

As is disclosed in the IS/MND and associated appendices, the proposed industrial building will consist of high-cube distribution warehouses (IS/MND, p. 64; Appendix F, p. 3). According to SCAQMD staff, the "Fontana Study, by itself, is not characteristic of high cube warehouses."[9] Furthermore, SCAQMD staff finds the following additional issues with the Fontana Study: [10]

OR4-12

- The overall trip rate is based on only four warehouses total, which includes two warehouses with zeros. In other words, the results of the Fontana Study were based on only two data points. As is disclosed in the Fontana Study, the daily trip rate was only based on data from a Target warehouse and a TAB warehouse.[11]

OR4-13

- The Fontana Study does not report any 24-hour daily truck trip rates. According to the Fontana Study, "Trip generation statistics for daily truck trips were not calculated because vehicle classifications counts could not be obtained from the driveway 24-hour counts."[12]

OR4-14

- The trip rates using the Fontana study are calculated based on a 20 percent truck fleet mix, which is inconsistent with SCAQMD's recommendation that agencies use a truck fleet mix of 40%.

OR4-15

Due to these reasons, SCAQMD recommends that Project Applicants either "use ITE default values until Governing Board action" (Option 1) or refer to the flow chart below (Option 2). [13]

[8] "Truck Trip Generation Study." City of Fontana, County of San Bernardino, State of California, August 2003, *available at*: http://www.fontana.org/DocumentCenter/Home/View/622

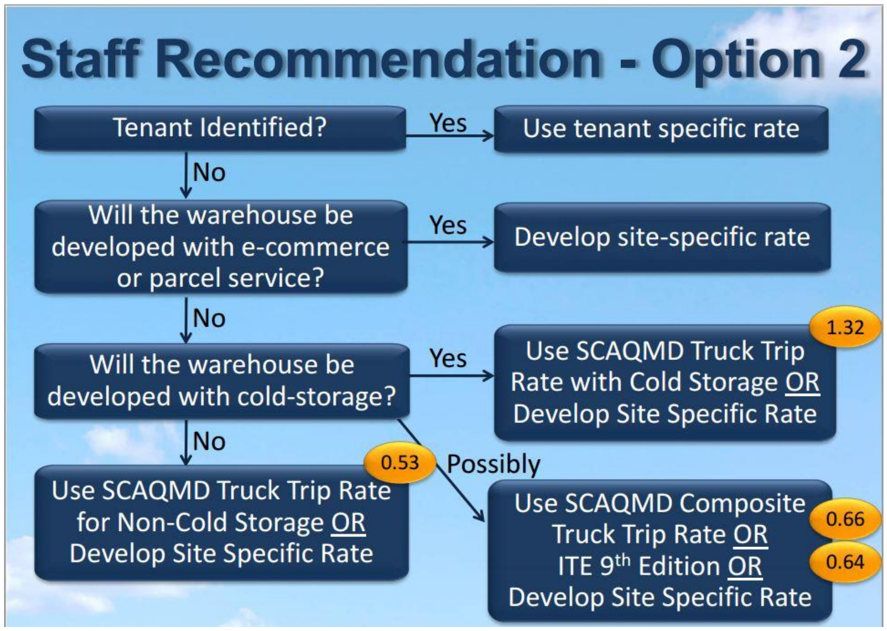
[9] "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile Source Committee, July 2014, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/finaltrucktripstudymsc072514.pdf?sfvrsn=2, p. 10

[10] "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile Source Committee, July 2014, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/finaltrucktripstudymsc072514.pdf?sfvrsn=2, p. 10

[11] "Truck Trip Generation Study." City of Fontana, County of San Bernardino, State of California, August 2003, *available at*: http://www.fontana.org/DocumentCenter/Home/View/622, p. 35

[12] "Truck Trip Generation Study." City of Fontana, County of San Bernardino, State of California, August 2003, *available at*: http://www.fontana.org/DocumentCenter/Home/View/622, p. 6

[13] "Warehouse Truck Trip Study Data Results and Usage" Presentation. SCAQMD Mobile Source Committee, July 2014, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/finaltrucktripstudymsc072514.pdf?sfvrsn=2, p. 11



OR4-15 Cont.

Following Option 1, a truck trip rate of 0.64[14] should be used for *high-cube warehouse/distribution center* land uses (ITE Code 152), rather than the 0.34 truck trip rate used in the IS/MND (p. 64). Following Option 2, a truck trip rate of 0.66 or 0.64 should be used (assuming that the warehouse could be developed with cold-storage). Therefore, regardless of the option implemented, a minimum daily truck trip rate of 0.64 should be used, according to the SCAQMD. OR4-16

As previously discussed, the proposed building is anticipated to be a high-cube warehouse distribution center. When the recommended truck trip rate of 0.64 is used in place of the 0.34 truck trip rate used in the IS/MND, we find that the number of truck trips increase by approximately 87%, with an increase of approximately 168 trips per day, and an increase of approximately 61,000 truck trips per year (see table below). OR4-17

		IS/MND Model		**SWAPE Model**	
Building	**Size (square feet)**	**Truck Trip Rate[1]**	**# of Daily Truck Trips**	**Truck Trip Rate[1]**	**# of Daily Truck Trips**
High-Cube Warehouse	564,652	0.34	194	0.64	361
Total Daily Truck Trips		**-**	**194**	**-**	**361**
Total Annual Truck Trips		**-**	**70,692**	**-**	**131,903**
[1] Truck Trip Rate Per 1,000 Square Feet			**Increase in Daily Truck Trips**		**168**
[2] Increase in Trips = SWAPE Model - IS/MND Model			**Increase in Annual Truck Trips[3]**		**61,211**
[3] Annual Trips = Daily Trips x 365 Days			**Percent Increase[2]**		**87%**

The IS/MND and associated appendices also rely on a total truck fleet mix of approximately 20%, which is taken from the Fontana Study. Appendix A of the IS/MND states, "The vehicle mix followed the OR4-18

[14] 0.64 truck trips per 1,000 square feet.

4-18 Cont.

recommendations of the Fontana Truck Trip Generation Study with a mix of 79.57 percent cars, 3.46 percent 2-axle trucks, 4.64 percent 3-axle trucks and 12.33 percent 4-axle trucks" (p. 60). This fleet mix used in the IS/MND and associated appendices, however, is not consistent with recommendations set forth by SCAQMD, and does not accurately represent the percentage of trucks that access a high-cube warehouse on a daily basis. Rather, SCAQMD recommends that lead agencies assume a truck fleet mix of 40%. According to *Appendix E: Technical Source Documentation* of the CalEEMod User's Guide, "in order to avoid underestimating the number of trucks visiting warehouse facilities," SCAQMD staff "recommends that lead agencies conservatively assume that an average of 40% of total trips are truck trips [(0.48*10 + 0.2*4)/(10+4)=0.4)]."[15] If Project-specific data is not available, such as detailed trip rates based on a known tenant schedule, this average of 40% provides a reasonably conservative value based on currently available data. As is stated in the IS/MND, since the future tenant is unknown, "an exact number of future employees or hours of operation cannot be determined," which means that the tenant schedule is not known; therefore, a 40% truck fleet mix should be assumed (IS/MND, p. 3).

OR4-19

Specifically, the following fleet mix percentage should have been used within the CalEEMod model.

CalEEMod Parameter		IS/MND Model Input	SWAPE Model Input
Operational Mobile Fleet Mix	Passenger Cars (LDA)	79.57%	59.14%
	2 Axle Trucks (LHDT1)	3.46%	6.92%
	3 Axle Trucks (MHD)	4.64%	9.28%
	4+ Axle Trucks (HHDT)	12.33%	24.66%

The "Operational Mobile Fleet Mix" percentages for trucks (LHDT1, MHD, and HHDT) in the table above were adjusted to reflect a truck trip percentage of approximately 40%, which is consistent with recommended procedures set forth by SCAQMD staff. This fleet mix more accurately represents the number of trips that are likely to occur during Project operation. As such, an updated air quality analysis should be prepared in a DEIR that adequately assesses the Project's air quality and greenhouse gas impacts.

Incorrectly Applied Percent Fleet Mix to Trip Type Percentage

Not only did the IS/MND rely upon an artificially low truck fleet mix percentage to estimate the Project's mobile-source emissions, but it also inputted this fleet mix percentage into the CalEEMod model incorrectly. As a result, the Project's operational mobile-source emissions are both greatly underestimated and extremely inaccurate.

OR4-20

As is discussed in the section above, Appendix A of the IS/MND states that "the vehicle mix followed the recommendations of the Fontana Truck Trip Generation Study with a mix of 79.57 percent cars, 3.46 percent 2-axle trucks, 4.64 percent 3-axle trucks and 12.33 percent 4-axle trucks" (p. 60). According to the SCAQMD, "in order to convert the axle based fleet mix to the vehicle classes utilized by EMFAC" (which is what CalEEMod relies upon to estimate mobile-source emissions), 2-axle trucks can be

[15] "Appendix E Technical Source Documentation." CalEEMod User's Guide, July 2013, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/high-cube-resource-caleemod-appendix-e.pdf?sfvrsn=2, pp. 15

represented by the LHDT1 vehicle class, 3-axle trucks can be represented by the MHDT vehicle class, 4-axle trucks can be represented by the HHDT vehicle class, and all others can be represented by the LDA vehicle class.[16] Therefore, assuming that the fleet mix percentage provided in the Fontana Study is correct, the following percentages should have been inputted for each vehicle class, with all others vehicle classes set to zero (see table below). OR4-21

Truck Type Number of Axles	Truck Type EMFAC Vehicle Class	Fleet Mix (%)
4-axle	HHDT	12.33
3-axle	MHDT	4.64
2-axle	LHDT1	3.46
Passenger Cars	LDA	79.57

Review of the IS/MND's CalEEMod output files, however, indicate that these values were not inputted into the model as the fleet mix percentages. Rather, these values were used to adjust the trip type percentages for the Project. According to the CalEEMod output files, a truck trip percentage of 20.43% was applied to commercial-work (C-W) trip types to represent the number of truck trips that would occur, and a car trip percentage of 79.57% was applied to commercial-nonwork (C-NW) trips to represent the number of passenger car trips that would occur during Project operation (Appendix A, pp. 183). OR4-22

The application of these percentages to the trip types within CalEEMod, however, is entirely incorrect. According to Appendix A of the CalEEMod User's Guide, "the trip type breakdown describes the purpose of the trip generated at each land use," and "multiplying the total trips for a land use by trip type breakdown percentage yields trips for a given trip type."[17] This trip type, however, does not specifically apply to vehicle classes, as is assumed by the IS/MND. Commercial-work (C-W) trips are not made by trucks, exclusively, and commercial-nonwork (C-NW) trips are not made by passenger cars, exclusively. OR4-23
Rather, "the commercial-work trip represents a trip made by someone who is employed by the commercial land use sector," which can include trips made by employees in light-duty trucks and passenger cars as well as trips made by vendors in light-duty and heavy-duty trucks.[18] Similarly, "the commercial-nonwork trip represents a trip associated with the commercial land use other than by customers or workers," such as "trips made by delivery vehicles of goods associated with the land use."[19] Therefore, applying a trip percentage of 20.43% to C-W trips to represent the number of truck trips that will occur during Project operation is incorrect, as C-W trips include trips made by a mix of

[16] "Appendix E Technical Source Documentation." CalEEMod User's Guide, July 2013, *available at:* http://www.aqmd.gov/docs/default-source/ceqa/handbook/high-cube-warehouse-trip-rate-study-for-air-quality-analysis/high-cube-resource-caleemod-appendix-e.pdf?sfvrsn=2, pp. 15
[17] "CalEEMod User's Guide, Appendix A: Calculation Details for CalEEMod." SCAQMD, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/caleemod-appendixa.pdf?sfvrsn=2, p. 20
[18] "CalEEMod User's Guide, Appendix A: Calculation Details for CalEEMod." SCAQMD, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/caleemod-appendixa.pdf?sfvrsn=2, p. 20
[19] "CalEEMod User's Guide, Appendix A: Calculation Details for CalEEMod." SCAQMD, *available at:* http://www.aqmd.gov/docs/default-source/caleemod/caleemod-appendixa.pdf?sfvrsn=2, p. 20

OR4-23 Cont. vehicle types, including passenger cars. Similarly, applying a trip percentage of 79.57% to C-NW trips to represent the number of passenger car trips that will occur during Project operation is incorrect, as C-NW trips include trips made by a mix of vehicle types, including trucks. Due to these reasons, we require that an updated air quality analysis be prepared in a DEIR in order to adequately assess the Project's air quality and greenhouse gas impacts.

Diesel Particulate Matter Health Risk Emissions Inadequately Evaluated

The IS/MND concludes that the health risk posed to nearby sensitive receptors from exposure to diesel particulate matter ("DPM") emissions released during Project construction would be less than significant, yet fails to quantify the risk and compare it to applicable thresholds (IS/MND, p. 20). The IS/MND attempts to justify the omission of an actual health risk assessment ("HRA"), stating, "Given the relatively limited number of heavy duty construction equipment and the short-term construction schedule, the proposed project would not result in a long-term (i.e., 70 years) substantial source of toxic air contaminant emissions and corresponding individual cancer risk. Therefore, no significant short-term toxic air contaminant impacts would occur during construction of the proposed project" (IS/MND, p. 20). This justification, however, is incorrect.

OR4-24 The IS/MND assumes that because construction would occur over a period of time shorter than 70 years, health risk from construction activities would be less than significant. This determination, however, is in contrast to the most recent guidance published by the Office of Environmental Health Hazard Assessment (OEHHA), the organization responsible for providing recommendations for health risk assessments in California. In February of 2015, OEHHA released its most recent *Risk Assessment Guidelines: Guidance Manual for Preparation of Health Risk Assessments*, which was formally adopted in March of 2015.[20] This guidance document describes the types of projects that warrant the preparation of a health risk assessment. Construction of the Project will produce emissions of DPM, a human carcinogen, through the exhaust stacks of construction equipment over a construction period of 10 months, from June 2016 to March 2017 (IS/MND, p. 17). The OEHHA document recommends that all short-term projects lasting at least two months be evaluated for cancer risks to nearby sensitive receptors.[21] This recommendation reflects the most recent health risk assessment policy, and as such, an assessment of health risks to nearby sensitive receptors from construction should be included in a revised CEQA evaluation for the Project.

OR4-25 Furthermore, simply because there is a "relatively limited number of heavy duty construction equipment" (IS/MND, p. 20) does not mean that the emissions from the construction equipment would not pose a significant risk to nearby receptors. In an effort to demonstrate this, we prepared a simple screening-level health risk assessment. The results of our assessment, as described below, demonstrate that construction-related DPM emissions may result in a potentially significant health risk impact.

[20] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/hotspots2015.html

[21] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf, p. 8-18

As of 2011, the EPA recommends AERSCREEN as the leading air dispersion model, due to improvements in simulating local meteorological conditions based on simple input parameters.[22] The model replaced SCREEN3, which is included in OEHHA[23] and CAPCOA[24] guidance as the appropriate air dispersion model for Level 2 health risk screening assessments ("HRSAs"). A Level 2 HRSA utilizes a limited amount of site-specific information to generate maximum reasonable downwind concentrations of air contaminants to which nearby sensitive receptors may be exposed. If an unacceptable air quality hazard is determined to be possible using AERSCREEN, a more refined modeling approach is required prior to approval of the Project. OR4-26

We prepared a preliminary health risk screening assessment of the Project's construction emissions using the annual estimates from the Project's CalEEMod model, which can be found within Appendix D of the IS/MND's Air Quality, Global Climate Change, and Health Risk Assessment Impact Analysis. The CalEEMod annual emissions indicate that construction activities will generate approximately 450.2 pounds of DPM over a 303 day construction period. The AERSCREEN model relies on a continuous average emissions rate to simulate maximum downwind concentrations from point, area, and volume emission sources. To account for the variability in construction equipment usage over the seven phases of Project construction, we calculated an average DPM emission rate by the following equation.

$$Emission\ Rate\ \left(\frac{grams}{second}\right) = \frac{450.2\ lbs}{303\ days} \times \frac{453.6\ grams}{lb} \times \frac{1\ day}{24\ hours} \times \frac{1\ hour}{3{,}600\ seconds} \approx \mathbf{0.0078}\ {}^{\boldsymbol{g}}\!/\!_{\boldsymbol{s}}$$

OR4-27

Construction activity was simulated as a 25.6 acre rectangular area source in AERSCREEN, with dimensions of 377 meters by 275 meters. A release height of three meters was selected to represent the height of exhaust stacks on construction equipment, and an initial vertical dimension of one and a half meters was used to simulate instantaneous plume dispersion upon release. An urban meteorological setting was selected with model-default inputs for wind speed and direction distribution.

The AERSCREEN model generated maximum reasonable estimates of single hour downwind DPM concentrations from the Project site. EPA guidance suggests that in screening procedures, the annualized average concentration of an air pollutant may be estimated by multiplying the single-hour concentration by 10%.[25] The maximum single-hour downwind concentration in the AERSCREEN output was approximately 2.742 $\mu g/m^3$ DPM 25 meters downwind, a distance that is most representative of the sensitive receptor location at 20 meters (65 feet). The annualized average concentration for the sensitive receptor was estimated to be 0.2742 $\mu g/m^3$.

We calculated the excess cancer risk for each sensitive receptor location, for adults, children, and/or infant receptors using applicable HRA methodologies prescribed by OEHHA. OEHHA recommends the OR4-28

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[22] "AERSCREEN Released as the EPA Recommended Screening Model," USEPA, April 11, 2011, *available at:* http://www.epa.gov/ttn/scram/guidance/clarification/20110411_AERSCREEN_Release_Memo.pdf

[23] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf

[24] "Health Risk Assessments for Proposed Land Use Projects," CAPCOA, July 2009, *available at:* http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf

[25] http://www.epa.gov/ttn/scram/guidance/guide/EPA-454R-92-019_OCR.pdf

use of Age Sensitivity Factors ("ASFs") to account for the heightened susceptibility of young children to the carcinogenic toxicity of air pollution.[26] According to the revised guidance, quantified cancer risk should be multiplied by a factor of ten during the first two years of life (infant), and by a factor of three for the subsequent fourteen years of life (child aged two until sixteen). Furthermore, in accordance with guidance set forth by the SCAQMD and OEHHA, we used 95th percentile breathing rates for infants and 80th percentile breathing rates for children and adults.[27] We used a cancer potency factor of 1.1 (mg/kg-day)$^{-1}$ and an averaging time of 25,550 days. The results of our calculations are shown below.

OR4-28 Cont.

Parameter	Description	Units	Adult	Child	Infant
C_{air}	Concentration	µg/m³	0.2742	0.2742	0.2742
DBR	Daily breathing rate	L/kg-day	230	640	1090
EF	Exposure Frequency	days/year	350	350	350
ED	Exposure Duration	years	0.8	0.8	0.8
AT	Averaging Time	days	25550	25550	25550
	Inhaled Dose	(mg/kg-day)	9.1E-07	1.7E-06	1.7E-06
CPF	Cancer Potency Factor	1/(mg/kg-day)	1.1	1.1	1.1
ASF	Age Sensitivity Factor	-	1	3	10
	Cancer Risk		**7.60E-07**	**6.35E-06**	**3.60E-05**

OR4-29

The excess cancer risk to adults, children, and infants during Project construction for the sensitive receptors 25 meters away are 0.76, 6.35, and 36 in one million, respectively. Consistent with OEHHA guidance, exposure was assumed to begin in the infantile stage of life to provide the most conservative estimates of air quality hazards. The infantile exposure for the sensitive receptors exceeds the SCAQMD threshold of 10 in one million. As a result, a refined health risk assessment must be prepared to examine air quality impacts generated by Project construction using site-specific meteorology and specific equipment usage schedules. It should be noted that the Project's health risk impact may be greater than what is estimated in our independent screening-level assessment, as the DPM emission value relied upon to conduct this analysis was taken from the IS/MND's CalEEMod model. As was discussed in the previous sections, the IS/MND's CalEEMod model relies upon incorrect input parameters that artificially reduce the Project's construction and operational emissions. Therefore, the health risk posed to nearby sensitive receptors as a result of the Project may be greater. Even though our assessment may still underestimate the Project's health risk impact, our analysis still demonstrates that the Project poses a significant health risk as a result of DPM emissions. Therefore, a DEIR must be prepared to adequately evaluate the Project's health risk impact, and should include additional mitigation measures to reduce this impact to a less-than-significant level.

[26] "Risk Assessment Guidelines Guidance Manual for Preparation of Health Risk Assessments." OEHHA, February 2015, *available at:* http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf

[27] "Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics 'Hot Spots' Information and Assessment Act," SCAQMD, June 5, 2015, *available at:* http://www.aqmd.gov/docs/default-source/planning/risk-assessment/ab2588-risk-assessment-guidelines.pdf?sfvrsn=6, p. 19

Sincerely,

Matt Hagemann, P.G., C.Hg.

Jessie Jaeger

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

1640 5th St.., Suite 204 Santa
Santa Monica, California 90401
Tel: (949) 887-9013
Email: mhagemann@swape.com

Matthew F. Hagemann, P.G., C.Hg., QSD, QSP

Geologic and Hydrogeologic Characterization
Industrial Stormwater Compliance
Investigation and Remediation Strategies
Litigation Support and Testifying Expert
CEQA Review

Education:

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.
B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

Professional Certifications:

California Professional Geologist
California Certified Hydrogeologist
Qualified SWPPP Developer and Practitioner

Professional Experience:

Matt has 25 years of experience in environmental policy, assessment and remediation. He spent nine years with the U.S. EPA in the RCRA and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) while also working with permit holders to improve hydrogeologic characterization and water quality monitoring.

Matt has worked closely with U.S. EPA legal counsel and the technical staff of several states in the application and enforcement of RCRA, Safe Drinking Water Act and Clean Water Act regulations. Matt has trained the technical staff in the States of California, Hawaii, Nevada, Arizona and the Territory of Guam in the conduct of investigations, groundwater fundamentals, and sampling techniques.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Geology Instructor, Golden West College, 2010 – 2104;
- Senior Environmental Analyst, Komex H2O Science, Inc. (2000 -- 2003);

- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, Matt's responsibilities have included:

- Lead analyst and testifying expert in the review of over 100 environmental impact reports since 2003 under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, Valley Fever, greenhouse gas emissions, and geologic hazards. Make recommendations for additional mitigation measures to lead agencies at the local and county level to include additional characterization of health risks and implementation of protective measures to reduce worker exposure to hazards from toxins and Valley Fever.
- Stormwater analysis, sampling and best management practice evaluation at industrial facilities.
- Manager of a project to provide technical assistance to a community adjacent to a former Naval shipyard under a grant from the U.S. EPA.
- Technical assistance and litigation support for vapor intrusion concerns.
- Lead analyst and testifying expert in the review of environmental issues in license applications for large solar power plants before the California Energy Commission.
- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.
- Expert witness on two cases involving MTBE litigation.
- Expert witness and litigation support on the impact of air toxins and hazards at a school.
- Expert witness in litigation at a former plywood plant.

With Komex H2O Science Inc., Matt's duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.

- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.

- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Executive Director:

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the discharge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, Matt worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for his contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. He prepared geologic reports, conducted public hearings, and responded to public comments from residents who were very concerned about the impact of designation.

- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.
- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation-wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

<u>Policy:</u>

Served senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advised the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaped EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific principles into the policy-making process.
- Established national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, Matt led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities were as follows:

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, Matt taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.

Matt taught physical geology (lecture and lab and introductory geology at Golden West College in Huntington Beach, California from 2010 to 2014.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S. EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Coloradao.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal repesentatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

Hagemann, M.F., 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invited presentation to the California Assembly Natural Resources Committee.

Hagemann, M.F., 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. From Tank to Tap: A Chronology of MTBE in Groundwater. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to Address Impacts to Groundwater. Presentation to the annual meeting of the Society of Environmental Journalists.

Hagemann, M.F., 2002. An Estimate of the Cost to Address MTBE Contamination in Groundwater (and Who Will Pay). Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to a meeting of the U.S. EPA and State Underground Storage Tank Program managers.

Hagemann, M.F., 2001. From Tank to Tap: A Chronology of MTBE in Groundwater. Unpublished report.

Hagemann, M.F., 2001. Estimated Cleanup Cost for MTBE in Groundwater Used as Drinking Water. Unpublished report.

Hagemann, M.F., 2001. Estimated Costs to Address MTBE Releases from Leaking Underground Storage Tanks. Unpublished report.

Hagemann, M.F., and VanMouwerik, M., 1999. Potential Water Quality Concerns Related to Snowmobile Usage. Water Resources Division, National Park Service, Technical Report.

VanMouwerik, M. and **Hagemann, M.F**. 1999, Water Quality Concerns Related to Personal Watercraft Usage. Water Resources Division, National Park Service, Technical Report.

Hagemann, M.F., 1999, Is Dilution the Solution to Pollution in National Parks? The George Wright Society Biannual Meeting, Asheville, North Carolina.

Hagemann, M.F., 1997, The Potential for MTBE to Contaminate Groundwater. U.S. EPA Superfund Groundwater Technical Forum Annual Meeting, Las Vegas, Nevada.

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval Air Station, Conference on Intrinsic Remediation of Chlorinated Hydrocarbons, Salt Lake City.

Hagemann, M.F., Fukunaga, G.L., 1996, The Vulnerability of Groundwater to Anthropogenic Contaminants on the Island of Maui, Hawaii. Hawaii Water Works Association Annual Meeting, Maui, October 1996.

Hagemann, M. F., Fukanaga, G. L., 1996, Ranking Groundwater Vulnerability in Central Oahu, Hawaii. Proceedings, Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Characterization and Cleanup at Closing Military Bases in California. Proceedings, California Groundwater Resources Association Meeting.

Hagemann, M.F. and Sabol, M.A., 1993. Role of the U.S. EPA in the High Plains States Groundwater Recharge Demonstration Program. Proceedings, Sixth Biennial Symposium on the Artificial Recharge of Groundwater.

Hagemann, M.F., 1993. U.S. EPA Policy on the Technical Impracticability of the Cleanup of DNAPL-contaminated Groundwater. California Groundwater Resources Association Meeting.

Hagemann, M.F., 1992. Dense Nonaqueous Phase Liquid Contamination of Groundwater: An Ounce of Prevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.

<u>Other Experience:</u>

Selected as subject matter expert for the California Professional Geologist licensing examination, 2009-2011.

JESSIE MARIE JAEGER

SOIL WATER AIR PROTECTION ENTERPRISE
2656 29th Street, Suite 201
Santa Monica, California 90405
Mobile: (530) 867-6202
Office: (310) 452-5555
Fax: (310) 452-5550
Email: jessie@swape.com

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

EDUCATION

UNIVERSITY OF CALIFORNIA, LOS ANGELES **B.S. CONSERVATION BIOLOGY & ENVIRONMENTAL SCIENCES** *JUNE 2014*

PROJECT EXPERIENCE

SOIL WATER AIR PROTECTION ENTERPRISE ***SANTA MONICA, CA***

AIR QUALITY SPECIALIST

SENIOR ANALYST: CEQA ANALYSIS & MODELING

- Calculated roadway, stationary source, and cumulative impacts for risk and hazard analyses at proposed land use projects.
- Quantified criteria air pollutant and greenhouse gas emissions released during construction and operational activities of proposed land use projects using CalEEMod and EMFAC2011 emission factors.
- Utilized AERSCREEN, a screening dispersion model, to determine the ambient air concentrations at sensitive receptor locations.
- Organized presentations containing figures and tables comparing results of particulate matter analyses to CEQA thresholds.
- Prepared reports that discuss results of the health risk analyses conducted for several land use redevelopment projects.

SENIOR ANALYST: GREENHOUSE GAS MODELING AND DETERMINATION OF SIGNIFICANCE

- Quantified greenhouse gas (GHG) emissions of a "business as usual" scenario for proposed land use projects using CalEEMod.
- Determined compliance of proposed projects with AB 32 GHG reduction targets, with measures described in CARB's Scoping Plan for each land use sector, and with GHG significance thresholds recommended by various Air Quality Management Districts in California.
- Produced tables and figures that compare the results of the GHG analyses to applicable CEQA thresholds and reduction targets.

PROJECT MANAGER: OFF-GASSING OF FORMALDEHYDE FROM FLOORING PRODUCTS

- Determined the appropriate standard test methods to effectively measure formaldehyde emissions from flooring products.
- Compiled and analyzed laboratory testing data. Produced tables, charts, and graphs to exhibit emission levels.
- Compared finalized testing data to Proposition 65 No Significant Risk Level (NSRL) and to CARB's Phase 2 Standard.
- Prepared a final analytical report and organized supporting data for use as Expert testimony in environmental litigation.
- Participated in meetings with clients to discuss project strategy and identify solutions to achieve short and long term goals.

PROJECT ANALYST: EXPOSURE ASSESSMENT OF CONTAMINANTS EMITTED BY INCINERATOR

- Reviewed and organized sampling data, and determined the maximum levels of arsenic, dioxin, and lead in soil samples.
- Determined cumulative and hourly particulate deposition of incinerator and modeled particle dispersion locations using GIS and AERMOD.
- Conducted risk assessment using guidance set forth by the Office of Environmental Health Hazard Assessment (OEHHA).
- Utilized LeadSpread8 to evaluate exposure, and the potential adverse health effects from exposure, to lead in the environment.
- Compared final results of assessment to the Environmental Protection Agency's (EPA) Regional Screening Levels (RSLs).

ACCOMPLISHMENTS

- **Recipient**, Bruins Advantage Scholarship, University of California, Los Angeles ***SEPT 2010 – JUNE 2014***
- **Academic Honoree,** Dean's List, University of California, Los Angeles ***SEPT 2013 – JUNE 2014***
- **Academic Wellness Director**, UCLA Undergraduate Students Associated Council ***SEPT 2013 – JUNE 2014***
- **Student Groups Support Committee Member**, UCLA Undergraduate Students Associated Council ***SEPT 2012 – JUNE 2013***

GP1

Nedra A. Myricks
170 E. Dumas Street
San Bernardino CA 92408
(909) 884-3967
namyricks@aol.com

February 29, 2016

Travis Martin, Assistant Planner
City of San Bernardino
Planning Department
300 North D Street, 3rd Floor
San Bernardino CA 92418

RE: Proposed Waterman Industrial Center – Waterman Ave. and Dumas Street

Dear Mr. Martin:

I am not in support of the project referenced above. I do not believe this is a viable project for this area at this time, and see it as frivolous and unnecessary, primarily based on the number of vacant warehouse spaces currently available in typically the same area as Newcastle Partners wants to build this new facility; and the number of residents who will have to be displaced to accommodate it's completion. GP1-1

I am well aware of the air cargo business expected to "boom" at San Bernardino International Airport some time in the future; and the displacement that will cause for some long time residents in this area, but that is not happening NOW! There are newly built, empty warehouse spaces all along Central Ave., Orange Show Road, Tippecanoe Ave. and Arrowhead Ave. at Central. Wouldn't it be prudent to find occupants for these warehouse spaces first before building new ones? Especially a new "spec building" with no known tenant confirmed for occupation. GP1-2

Dumas Street is currently wide enough to accommodate one lane of traffic in each direction and is easily congested, as evidenced during the weekend of February 13-14 when Waterman Ave. was closed in both directions at Dumas and Orange Show Road; the same weekend as the High Times Cannabis Festival was held at the National Orange Show. The traffic on Dumas that weekend was horrific! I witnessed several "near misses". The street would definitely have to be widened to accommodate large trucks; and the "Draft Mitigated Negative Declaration and Initial GP1-3

GP1-3 Cont. Study" regarding this project stated that the completion of this project would "require the removal and displacement of five existing single family residences on the project site".

GP1-4 Having indicated my opposition to this project, but fully aware that construction will probably proceed as planned, I have two questions for your department:

1) Which five (5) homes on Dumas are being addressed for "removal and displacement"?

GP1-5 2) Would property owners be better off selling their properties on the open market as opposed to waiting for Imminent Domain to displace them?

Thank you in advance for responding to my inquiries.

Yours truly,

Nedra A. Myricks

cc: Senator Barbara Boxer
Assemblywoman Cheryl R. Brown
Supervisor Josie Gonzalez
Councilman John Valdivia

APPENDIX B

KEY REVISED TABLES AND FIGURES

Table 3

Proposed Project Trip Generation Comparison of Fontana versus SCAQMD Vehicle Mix[1]

Land Use	Quantity	Units[2]	PCE Factor[3]	Vehicle Percent[4]	Peak Hour Morning Inbound	Peak Hour Morning Outbound	Peak Hour Morning Total	Peak Hour Evening Inbound	Peak Hour Evening Outbound	Peak Hour Evening Total	Daily
Trip Generation Rates											
High Cube Warehouse		TSF			0.08	0.03	0.11	0.04	0.08	0.12	1.68
Car Trip Generation				61.90%	0.06	0.02	0.08	0.02	0.06	0.08	1.04
Truck Trip Generation				38.10%	0.02	0.01	0.03	0.01	0.03	0.04	0.64
Trips Generated											
High Cube Warehouse Trucks 2 Axle			2.0	6.45%	6	2	8	3	6	9	122
High Cube Warehouse Trucks 3 Axle			2.5	8.65%	10	4	14	5	10	15	205
High Cube Warehouse Trucks 4+ Axle			3.0	23.00%	31	12	43	16	31	47	655
High Cube Warehouse Truck Subtotal		PCE		38.10%	47	18	65	24	47	71	982
High Cube Warehouse Car Subtotal		PCE	1.0	61.90%	34	11	45	11	34	45	587
Total	564.652	TSF			81	29	110	35	81	116	1,569
Previous Trip Generation	564.652	TSF			63	24	87	32	63	95	1,282
Difference					18	5	23	3	18	21	287

[1] Source: Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012, Land Use Category 150.

[2] TSF = Thousand Square Feet; PCE = Passenger Car Equivalent.

[3] Passenger Car Equivalent factors are per City of San Bernardino recommended values.

[4] Source: South Coast Air Quality Management District Letter, dated January 2, 2015.

Table 12

Year 2035 With Project Intersection Delay and Level of Service

			Intersection Approach Lanes[1]												Peak Hour					
		Traffic	Northbound			Southbound			Eastbound			Westbound			Morning			Evening		
Intersection	Jurisdiction	Control[2]	L	T	R	L	T	R	L	T	R	L	T	R	Delay[3]	LOS[4]	V/C[4]	Delay[3]	LOS[4]	V/C[4]
E Street (NS) at:																				
Orange Show Road (EW) - #1	City of SB	TS	2	1.5	0.5	2	2	1>	2	2	1	2	2	1>	32.5	C	0.469	41.5	D	0.610
Washington Avenue (NS) at:																				
Orange Show Road (EW) - #2	City of SB	TS	0.5	0.5	d	0.5	0.5	d	1	2	d	1	2	d	8.3	A	0.952	10.7	B	0.965
Project West Access (NS) at:																				
Dumas Street (EW) - #3	City of SB	**CSS**	**0.5**	0	**0.5**	0	0	0	0	0.5	0.5	0.5	0.5	0	8.7	A	N/A	8.8	A	N/A
Project East Access (NS) at:																				
Dumas Street (EW) - #4	City of SB	**CSS**	**0.5**	0	**0.5**	0	0	0	0	0.5	0.5	0.5	0.5	0	8.4	A	N/A	8.4	A	N/A
Waterman Avenue (NS) at:																				
Orange Show Road (EW) - #5	City of SB	TS	1	2	d	1	2	d	1	2	d	1	2	d	29.7	C	0.501	38.4	D	0.784
Dumas Street (EW) - #6	City of SB	CSS	1	2	0	0	2	d	1	0	**1**	0	0	0	16.6	C	N/A	20.3	C	N/A
Park Center Circle N (EW) - #7	City of SB																			
Without Improvements		CSS	**1**	2	d	1	2	**1**	**0.5**	**0.5**	**1**	0.5	0.5	d	77.1	F	N/A	99.9[5]	F	N/A
With Improvements		**TS**	**1**	2	d	1	2	**1**	**0.5**	**0.5**	**1**	0.5	0.5	d	12.8	B	0.332	15.0	B	0.487
Park Center Circle S (EW) - #8	City of SB	TS	1	2	1	1	2	d	0.5	0.5	d	0.5	0.5	d	8.4	A	0.926	11.3	B	0.974
Vanderbilt Way (EW) - #9	City of SB	TS	1	2	1	1	2.5	0.5	0	1	0	1.5	0.5	1	23.4	C	0.624	19.8	B	0.543

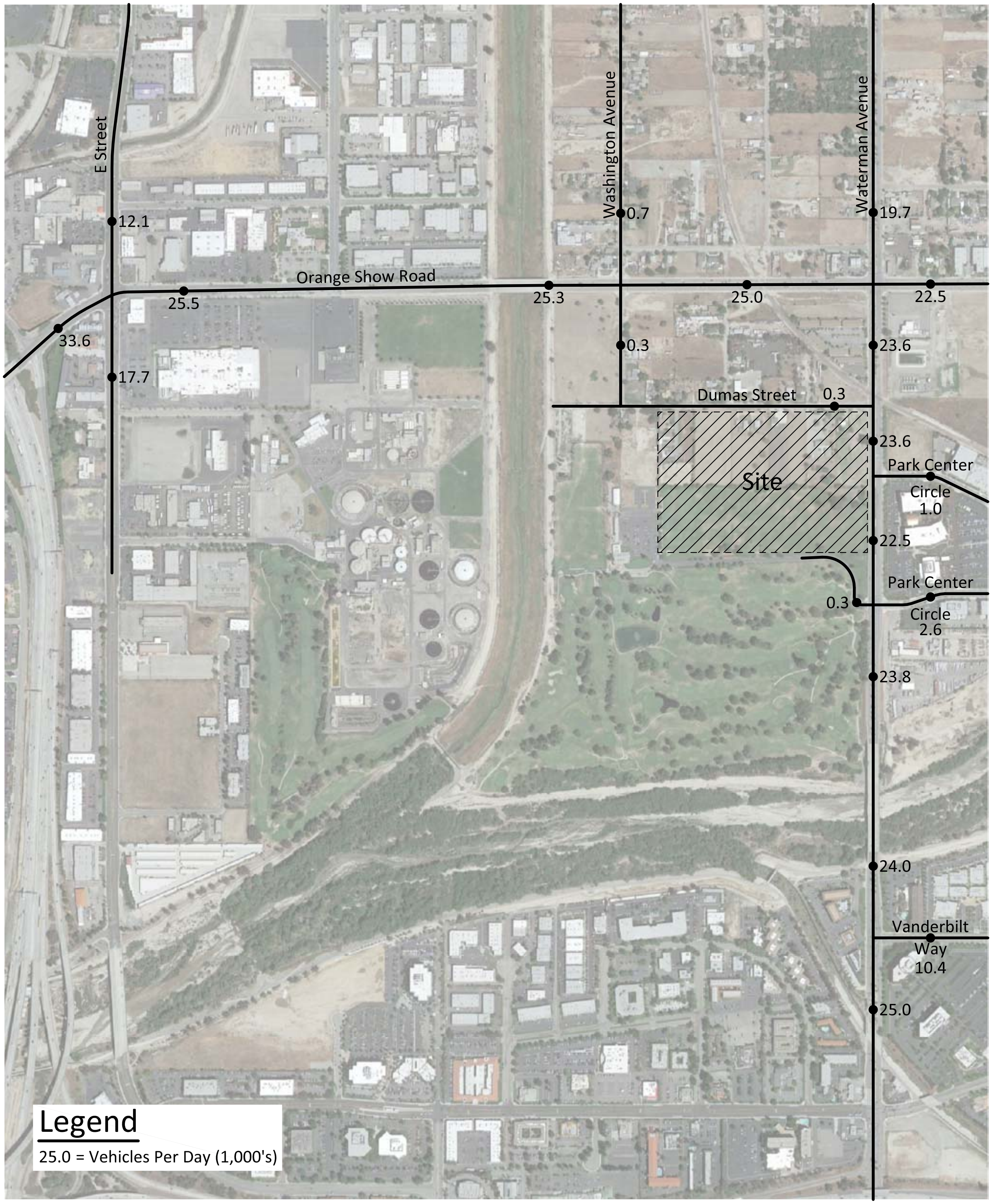
[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes. L = Left; T = Through; R = Right; d = defacto Right Turn; **TS** = Improvements.

[2] TS = Traffic Signal; CSS = Cross Street Stop

[3] Delay, level of service (LOS) and volume to capacity ratio (V/C) has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the 2000 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[4] LOS = Level of Service; V/C = Volume to Capacity.

Figure 4
Existing Average Daily Traffic Volumes



Kunzman Associates, Inc.

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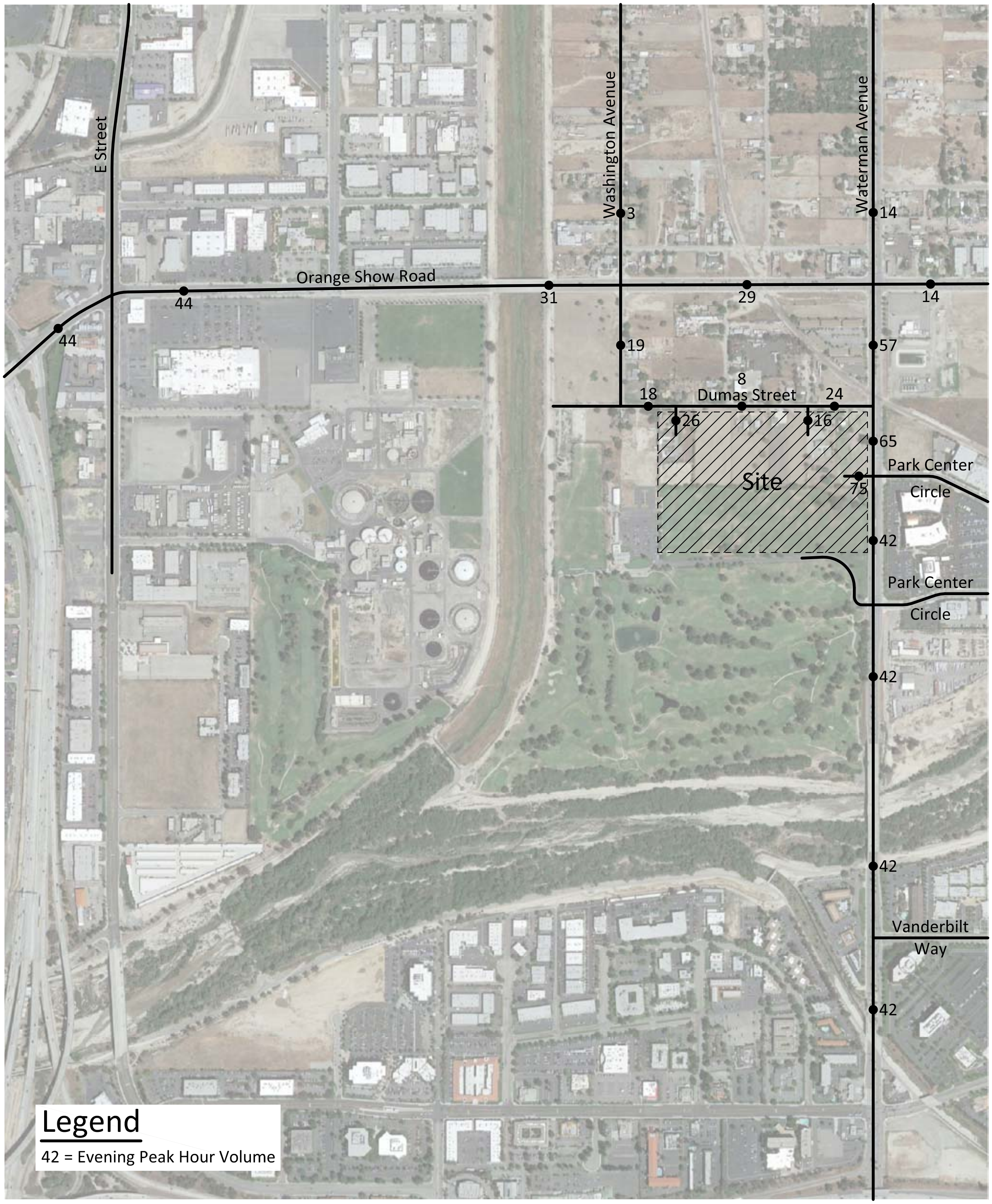
JN 5629e

Figure 17
Project Trip Contribution Test Volumes



APPENDIX C

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT DOCUMENTATION

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

SENT VIA E-MAIL AND USPS: February 12, 2015
ohernandez@fontana.org

Mr. Orlando Hernandez, Senior Planner
City of Fontana
Community Development Department, Planning Division
8353 Sierra Avenue
Fontana, CA 92335

**Draft Environmental Impact Report (DEIR) for the
West Valley Logistics Center Specific Plan (WVLCSP)**

The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the above-mentioned document. The following comments are meant as guidance for the Lead Agency and should be incorporated into the Final CEQA document.

In the project description, the Lead Agency proposes the construction of seven buildings for warehouse distribution and office space uses totaling approximately 3.48 million square feet on a 291-acre site. The Lead Agency has projected 6,384 total daily vehicle trips including at least 1,302 daily truck trips operating at the site. In the Air Quality Section, the Lead Agency quantified the project's construction and operation air quality impacts and has compared those impacts with the SCAQMD's recommended regional and localized daily significance thresholds. Based on its analyses, the Lead Agency has determined that construction air quality impacts will exceed the recommended regional daily significance threshold for NOx and operational daily air quality impacts for VOC, NOx, CO and PM10.

The SCAQMD staff has concerns regarding the air quality assumptions used in the operational portion of the CalEEMod land use model and that the proposed project should include all feasible mitigation measures in the Final CEQA document to further reduce the projected significant project construction and operational impacts. Details are included in the attachment.

Pursuant to Public Resources Code Section 21092.5, SCAQMD staff requests that the Lead Agency provide the SCAQMD with written responses to all comments contained herein prior to the adoption of the Final EIR. Further, staff is available to work with the Lead Agency to address these issues and any other questions that may arise. Please contact Jack Cheng, Air Quality Specialist, at (909) 396-2448, if you have any questions regarding the enclosed comments.

Sincerely,

Jillian Wong

Jillian Wong, Ph.D.
Program Supervisor
Planning, Rule Development & Area Sources

Attachment
JW:JC
SBC141223-01
Control Number

Siting of an Incompatible Land Use

1. The SCAQMD staff is concerned that the existing sensitive receptors will be exposed to significant regional and localized operational impacts, mostly from the daily truck activities that will likely operate using diesel fuel. Based on information in the DEIR (air quality analyses, the project truck distribution, or by aerial map inspection), the Lead Agency shows a minimum distance of 150 feet meters to the nearest sensitive receptor; a residence located east of the project site. [1]

   As a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land-use decision making process, the California Air Resources Board (CARB) has provided the CARB Air Quality and Land Use Handbook (CARB Land Use Handbook). Based on guidance from the CARB Land Use Handbook, CARB recommends a buffer of at least 1,000 feet between land uses that will have 100 or more trucks per day. [2]

   In accordance with the state CEQA Guidelines §15126.4 (a)(1)(D), the Lead Agency should discuss the proposed siting of this land use and any potential impacts resulting from any proposed mitigation related to the CARB Land Use Handbook guidance in the Final EIR.

Air Quality Analysis

Daily Truck Trip Rate

2. In the Air Quality Impact Analysis, the Lead Agency uses the Institute of Transportation Engineers Trip Generation Manual, 9th Edition, 2012 (ITE Manual) 1.68 overall trip generation rate (for cars and trucks totaling approximately 6,384 daily vehicles) for the proposed Project, but does not use the 0.64 (38.1%) daily truck trip rate from this same reference. Rather, the air quality analysis used a 0.343 daily truck trip rate (ITE 1.68 total daily trip rate minus 1.337 passenger vehicle trip rate = 0.343 (20.43%) daily truck trip rate) and truck vehicle fleet mixture percentages from the City of Fontana Truck Trip Generation Study (Fontana Study) to estimate project air quality operational impacts in the CalEEMod modeling. By using the 0.343 Fontana Study daily truck trip rate, trucks are estimated at 1,302 daily truck trips in the DEIR instead of approximately 2,225 daily truck trips using the ITE 0.64 daily truck trip rate.

   Specifically, the Fontana Study fleet mixture percentages include: 3.46 percent of the total fleet for 2-axle Trucks; 4.64 percent for 3-axle trucks; and 12.33 percent for 4-axle and larger trucks with truck categories totaling 20.43 percent of the total vehicle fleet. Passenger Vehicles would therefore comprise 79.57 percent of total vehicles during operations. However, the 0.343 daily truck trip rate resulted in fleet percentages for the CalEEMod truck subcategories that were not proportionally adjusted consistent with the percentage of trucks

[1] Table 4.2.2.2-1. Sensitive Land Uses in the Project Vicinity

[2] CARB Air Quality and Land Use Handbook: http://www.arb.ca.gov/ch/handbook.pdf . Guidance is for siting new sensitive land uses within 1,000 feet of a distribution center, Page 4. The buffer is a neutral mitigation measure provided to minimizes truck activity emission impacts to sensitive receptors. Besides truck activity of more than 1,000 trucks per day, this guidance applies to distribution centers that accommodate more than 40 transport refrigeration units per day or where TRU operations will exceed 300 hours per week truck activities and sensitive receptors, Page 4.

estimated using the ITE 0.64 daily truck trip rate. In order to avoid underestimating project operational and related air quality and health effect impacts, the Air Quality Analysis, HRA and FEIR should be revised using the following truck percentages: LHD2 = 0.0645, MHD = 0.0865, HHD = 0.2300.

Absent from a specific traffic study of known tenants, the Final EIR should be consistent using the associated ITE truck trip rate to estimate project daily truck trips so that project trips and associated emission and health effect impacts are not underestimated.

Vehicle Fleet Mixture Percentages

3. In the Air Quality Analysis, the Lead Agency has included the input parameters for the California Emissions Estimator Model (CalEEMod) land use model. Under fleet mixture percentages, the Lead Agency assigned 3.5 percent to Light-Duty Trucks 1(LDT1) instead of Light Heavy Duty 1 (LHD1) and 2.3 percent respectively to Medium Duty Vehicle and Light Heavy Duty 1. Based on the CalEEMod user guidance, these vehicles are likely heavier vehicles and the 3.5 percent should be assigned to the Light Heavy Duty category and the two 2.3 percentages assigned to MDV and LHD1 should rather be assigned to the Light Heavy Duty 2 category (4.6 percent total). These changes in the fleet mixture parameters follow the CalEEMod guidance and would also avoid underestimating the model's operational air quality impacts.

Health Risk Assessment (HRA)

4. SCAQMD staff did not receive the electronic modeling files for this project during the public comment period and were unable to verify the accuracy of the modeled impacts described in the DEIR. Specifically, SCAQMD staff was not able to verify the emission rates used in the HRA, the appropriateness of the meteorological station, the flag pole receptor height used, the location of sources modeled, and the selection of the points of maximum impact. Furthermore, Figures 4 and 5 are missing in the HRA.

5. The American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee (AERMIC) was formed to introduce state-of-the-art modeling concepts into the EPA's air quality models. Through AERMIC, a modeling system, AERMOD, was introduced that incorporated air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. As of December 9, 2006, AERMOD is fully promulgated as a replacement to ISC3, in accordance with Appendix W (http://www.epa.gov/ttn/scram/dispersion_prefrec.htm). AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. AERMOD-ready meteorological data for various meteorological stations within the South Coast Air Basin (SCAB) are available for download free of charge at http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/data-for-aermod. The Lead Agency used AERMOD (version 09292) to prepare the dispersion modeling for the Health Risk Assessment (HRA), which is outdated. The current version is AERMOD (version 14134). The improvements to AERMOD affect volume sources as well

as building downwash treatment. Therefore, SCAQMD staff recommends the Lead Agency revise the HRA with the current version of AERMOD.

6. The Lead Agency used the rural option in the dispersion modeling. SCAQMD modeling methodology requires the use of the urban option. Please provide an explanation of why the rural option is appropriate or revise the HRA using the urban option.

Warehouse Land Use Model Input

7. The Lead Agency states that the Project will include both refrigerated and unrefrigerated warehouse space. On page 4.2.2-29 of the DEIR, the Lead Agency estimates that a "worst-case analysis, it was assumed that 5% of trucks serving the project site and up to 5% of the warehouse area within the site would be climate controlled." However, in Appendix A – CalEEMod Model Printouts, refrigerated warehouse space accounts for approximately 8% of the entire warehouse space. The square footage used throughout the Draft EIR is inconsistent and the Lead Agency should update the total square footage analyzed in the Air Quality Analysis in the Final EIR.

Construction

8. Since the Project is considered a large operation (50 acre sites or more of disturbed surface area; or daily earth-moving operations of 5000 cubic yards or more on three days in any year) in the South Coast Air Basin, the Lead Agency is required to comply with all SCAQMD Rule 403 – Large Operation requirements. This may include but not limited to Large Operation Notification, appropriate signage, and employment of a dust control supervisor that has successfully completed the Dust Control in the South Coast Air Basin training class. Therefore, the Final EIR should contain a description of how the Project will comply with Rule 403.

Mitigation Measures for Operational Air Quality Impacts (Mobile Sources)

9. Because the California Air Resources Board has classified the particulate portion of diesel exhaust emissions as carcinogenic and during project operations, the Lead Agency has determined that project operation emissions are significant for Volatile Organic Compounds (VOC) and Oxides of Nitrogen (NOx), primarily from truck activity emissions, the SCAQMD staff therefore recommends the following changes and additional measures that should be incorporated in the Final EIR to reduce exposure to sensitive receptors and reduce potential significant project air quality impacts:

Electric Vehicle (EV) Charging Stations

- Trucks that can operate at least partially on electricity have the ability to substantially reduce the significant NOx impacts from this project. Further, trucks that run at least partially on electricity are projected to become available during the life of the project as discussed in the 2012 Regional Transportation Plan. It is important to make this electrical infrastructure available when the project is built so that it is ready when this technology becomes commercially available. The cost of installing electrical charging equipment onsite is significantly cheaper if completed when the project is built compared to retrofitting an existing building. Therefore, the SCAQMD staff recommends the Lead Agency require the proposed warehouse and other plan areas that allow truck parking to be constructed with the appropriate infrastructure to facilitate sufficient electric charging for trucks to plug-in. Similar to the City of Los Angeles requirements for all new projects, the SCAQMD staff recommends that the Lead Agency require at least 5% of all vehicle parking spaces (including for trucks) include EV charging stations.[3] Further, electrical hookups should be provided at the onsite truck stop for truckers to plug in any onboard auxiliary equipment. At a minimum, electrical panels should appropriately sized to allow for future expanded use.

CNG Fueling Station and Convenience Site

- Because the proposed project will generate significant regional NOx operational impacts, the SCAQMD staff recommends that the project pro-actively take measures that could reduce emissions sooner rather than later. The SCAQMD staff therefore recommends that the Lead Agency ensure the availability of alternative fueling facility (e.g., natural gas) to serve the project site prior to operation of any logistics warehousing within the project area.

Recommended Changes

Mitigation AQ-13

- The Applicant shall specify a minimum of amount of electric vehicle charging stations <u>that are accessible for trucks and vehicles.</u>

Additional Mitigation Measures

- Provide minimum buffer zone of 300 meters (approximately 1,000 feet) between truck traffic and sensitive receptors.
- Limit the daily number of trucks allowed at each facility to levels analyzed in the Final EIR. If higher daily truck volumes are anticipated to visit the site, the Lead Agency should commit to re-evaluating the project through CEQA prior to allowing this higher activity level.
- Design the site such that any check-in point for trucks is well inside the facility to ensure that there are no trucks queuing outside of the facility.
- On-site equipment should be alternative fueled.
- Provide food options, fueling, truck repair and or convenience stores on-site to minimize the need for trucks to traverse through residential neighborhoods.
- Improve traffic flow by signal synchronization.

[3] http://ladbs.org/LADBSWeb/LADBS_Forms/Publications/LAGreenBuildingCodeOrdinance.pdf , page 95.

- Have truck routes clearly marked with trailblazer signs, so that trucks will not enter residential areas.
- Should the proposed Project generate significant regional emissions, the Lead Agency should require mitigation that requires accelerated phase-in for non-diesel powered trucks. For example, natural gas trucks, including Class 8 HHD trucks, are commercially available today. Natural gas trucks can provide a substantial reduction in health risks, and may be more financially feasible today due to reduced fuel costs compared to diesel. In the Final CEQA document, the Lead Agency should require a phase-in schedule for these cleaner operating trucks to reduce project impacts. SCAQMD staff is available to discuss the availability of current and upcoming truck technologies and incentive programs with the Lead Agency and project applicant.

Mitigation Measures for Operational Air Quality Impacts (Other)

10. In addition to the mobile source mitigation measures identified above the Lead Agency should incorporate the following on-site area source mitigation measures below to reduce the project's regional air quality impacts from NOx emissions during operation. These mitigation measure should be incorporated pursuant to CEQA Guidelines §15126.4, §15369.5.

    - Maximize use of solar energy including solar panels; installing the maximum possible number of solar energy arrays on the building roofs and/or on the Project site to generate solar energy for the facility.
    - Utilize only Energy Star heating, cooling, and lighting devices, and appliances.
    - Install light colored "cool" roofs and cool pavements.
    - Limit the use of outdoor lighting to only that needed for safety and security purposes.
    - Require use of electric or alternatively fueled sweepers with HEPA filters.
    - Use of water-based or low VOC cleaning products.

Warehouse Truck Trip Study Data Results and Usage

Mobile Source Committee
July 25, 2014

South Coast AQMD

Cleaning the Air That We Breathe…

Background

- Purpose: To provide guidance on how to quantify warehouse truck emissions for CEQA air quality analyses
  - Technical guidance
  - Establish “substantial evidence” for assumptions
  - Consistency for SCAQMD staff comments
- Truck emissions >90% of air impact
- Tenant often unknown when CEQA document certified

Existing Trip Rates

Grouping	Overall Rate (trips/tsf)		Truck Rate (trips/tsf)	
	Average Rate	Rate with Peaking Factor*	Average Rate	Rate with Peaking Factor*
Current ITE	1.68		0.64	
*Majority of CEQA docs**	1.68		0.34	
CalEEMod Guidance		2.59		1.04

Calculated truck trip rate based on Fontana Truck Trip Study (4 warehouses)

** 11 out of 18 CEQA docs in past year use 0.34 truck rate*

Truck Trip Study Process Overview

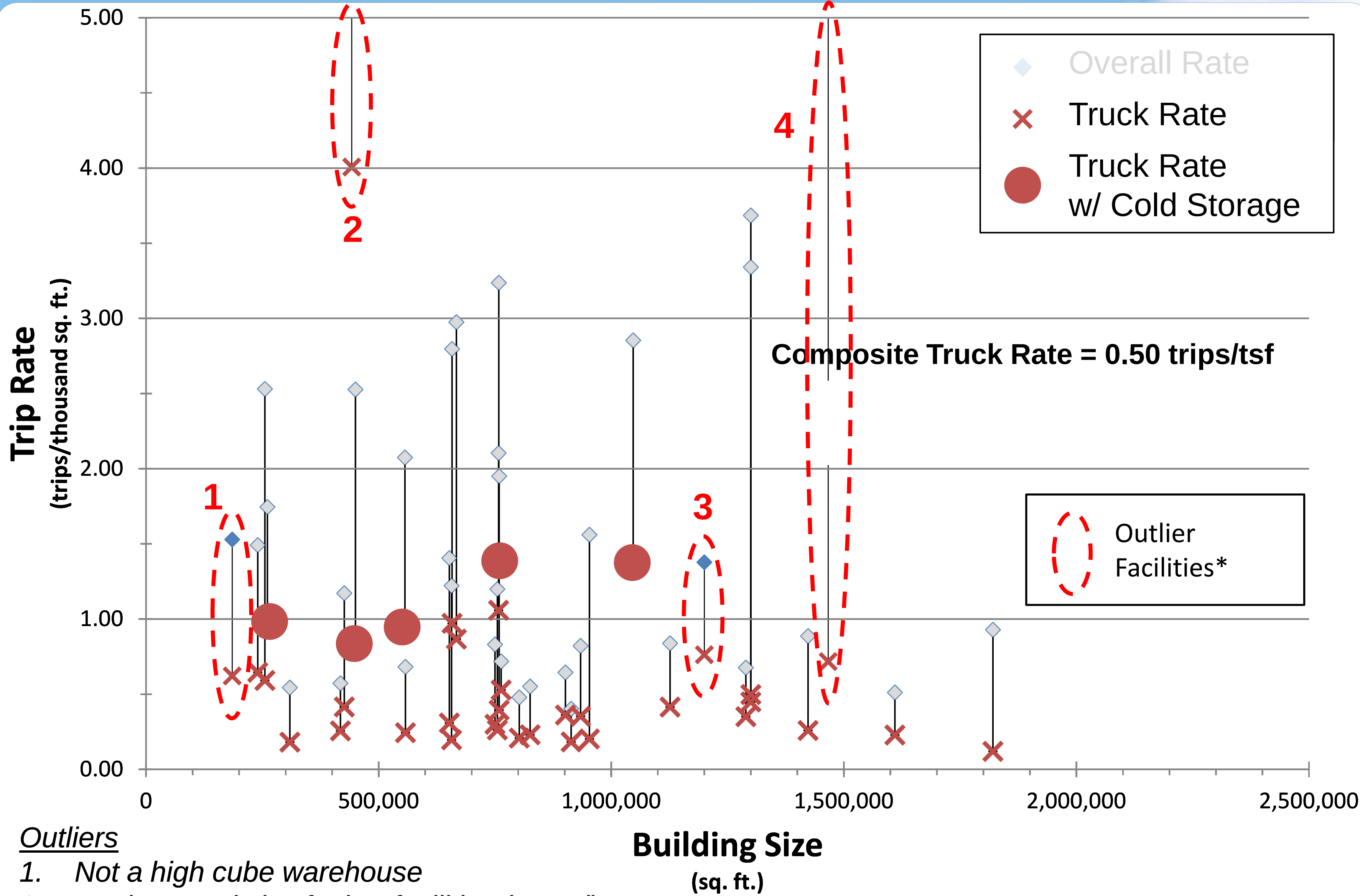
- Study began in January 2012
- 12 Stakeholder Working Group meetings
- 2 Technical Working Group meetings
- 34 responses to Business Survey*
- Video truck counts using traffic engineer at 33 warehouses**
- UCR traffic engineer and statistician analyzed results

* 400 Business Surveys sent out. 63 warehouses responded. 34 of the 63 warehouses met definition of "high cube warehouse"

** 37 total video counts. 4 excluded because either an outlier or did not meet definition of "high cube warehouse"

Analysis of Data

- Removed outlier data
  - E-commerce and parcel warehouses substantially higher overall trip rate
- Verified only “high cube warehouses” > 200,000 square feet
- Averaged data
  - Overall trip rate per 1,000 sq feet
  - Truck trip rate per 1,000 sq feet
- Three categories:
  - Non-cold storage warehouses
  - Cold storage warehouses
  - Composite for warehouses



Outliers

1. *Not a high cube warehouse*
2. *Uncharacteristic of other facilities (parcel)*
3. *Trucks use local street for internal circulation*
4. *Uncharacteristic of other facilities (e-commerce)*

SCAQMD Warehouse Truck Trip Study Findings[1,2]

Grouping	Overall Rate (trips/tsf)		Truck Rate (trips/tsf)	
	Average Rate	Rate with Peaking Factor[3]	Average Rate	Rate with Peaking Factor[3]
With Cold Storage	2.49	2.99	1.10	1.32
Non-Cold Storage	1.34	1.78	0.40	0.53
Composite	1.51	1.98	0.50	0.66

[1] *Peaking Factor applied only to averaging periods ≤ one day*

[2] *Outlier data removed*

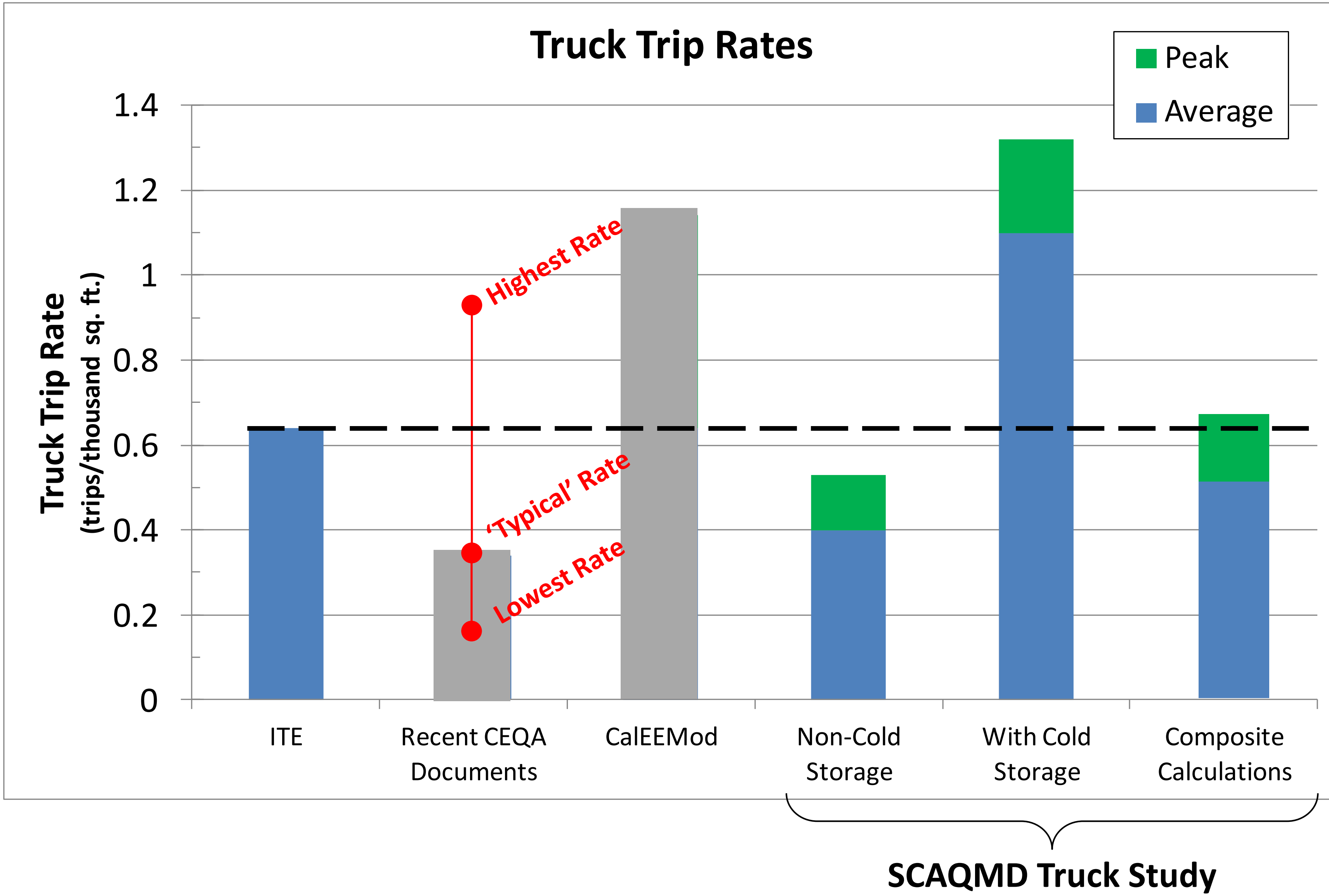
[3] *Peaking Factor from Business Survey*

Cold Storage (14)	Non-Cold Storage (16)
20%	33%

Business Position/ Recommendation

- Use current edition ITE truck trip rate as default
  - ITE higher than SCAQMD non-cold storage truck rate w/peak: 0.64 vs 0.53 trips/tsf
  - ITE similar to SCAQMD composite truck rate w/peak: 0.64 vs 0.66 trips/tsf
  - ITE captures “peak” daily
  - ITE has established procedures to update trip rates
  - Lead agencies can use site specific data

Truck Trip Rate Comparison



Staff Response

- Can support use of ITE truck trip rate as current default
- SCAQMD Study results with peaking factor are not inconsistent with ITE
- Fontana Truck Trip Study limited applicability
    - Overall trip rate based on 4 warehouses – includes 2 warehouses with zeros
    - No 24-hour truck trip rates reported
    - Truck trip rates using Fontana study are calculated based on 20% truck fleet mix
    - Fontana Study, by itself, is not characteristic of high cube warehouses

Staff Recommendations

- Implement staff interim recommendation
  - Use ITE default values until Governing Board action
  - Reflected in monthly IGR Board letter, NOP comment letter, and CalEEMod users noticed
- Option 1:
  - Continue staff interim recommendation
  - Supplement study by collecting more information on cold storage and peaking rates
- Option 2: See flow chart

Staff Recommendation - Option 2

Tenant Identified?

Yes → Use tenant specific rate

No ↓

Will the warehouse be developed with e-commerce or parcel service?

Yes → Develop site-specific rate

No ↓

Will the warehouse be developed with cold-storage?

Yes → Use SCAQMD Truck Trip Rate with Cold Storage <u>OR</u> Develop Site Specific Rate (1.32)

No ↓ Use SCAQMD Truck Trip Rate for Non-Cold Storage <u>OR</u> Develop Site Specific Rate (0.53)

Possibly → Use SCAQMD Composite Truck Trip Rate <u>OR</u> (0.66) ITE 9th Edition <u>OR</u> (0.64) Develop Site Specific Rate

Consistent with CEQA Guidelines, substantial evidence needed to justify choice of trip rate



Staff Recommendations *(Continued)*

- Submit SCAQMD Truck Trip Study results to ITE
- Recommend ITE separate “Cold Storage High Cube Warehouse”
- Recommend ITE evaluate e-commerce type warehouses
- Biannually collect additional trip count data from warehouses
- Develop updated emission mitigation menu e.g., WRCOG “Good Neighbor” Guidelines

Waterman - Annual Average Emissions

Estimate of Annual Construction DPM Emissions (as PM10 exhaust)

Total Annual PM10 Exhaust Emissions During Construction as estmated in the CalEEMod model.	0.0948	tons/year
Average Emissions	0.002729528	grams/sec
Total size of the emission source (25.25 acres)	102212	meters squared
Average area source emission	2.67046E-08	grams/m2-sec

Cancer Risk from DPM

DPM Concentration at boundary of closest receptor	0.20133	ug/m3 from Aermod dispersion model
Cancer Potency Factor (CPF)	1.1	(mg/kg/day)^-1
Daily Breathing Rate *DBR)	302	(l/kg of body weight-day)
Exposure Duration (ED)	0.4	years
Exposure Frequency (EF)	151	days
Age Sensitivity Factor (ASF)	1	

Adult 2003 OEHHA Cancer Risk = DPM Concentration x CPF x DBR x ED x EF x ASF / 25550

CR 0.158108113 in one million

Chronic Non-cancer Hazard Index from DPM

Reference Exposure Level (REL) for DPM: 5 ug/m3

Chronic Non-cancer HI = Annual DPM/REL = 0.040266

Waterman - Annual Average Emissions

Estimate of Annual Construction DPM Emissions (as PM10 exhaust)

Total Annual PM10 Exhaust Emissions During Construction as estmated in the CalEEMod model.	0.0948	tons/year
Average Emissions	0.002729528	grams/sec
Total size of the emission source (25.25 acres)	102212	meters squared
Average area source emission	2.67046E-08	grams/m2-sec

Cancer Risk from DPM

DPM Concentration at boundary of closest receptor	0.20133	ug/m3 from Aermod dispersion model
Cancer Potency Factor (CPF)	1.1	(mg/kg/day)^-1
Daily Breathing Rate *DBR)	230	(l/kg of body weight-day)
Exposure Duration (ED)	0.4	years
Exposure Frequency (EF)	151	days
Age Sensitivity Factor (ASF)	1	

Adult 2015 OEHHA Cancer Risk = DPM Concentration x CPF x DBR x ED x EF x ASF / 25550

CR 0.120413464 in one million

Chronic Non-cancer Hazard Index from DPM

Reference Exposure Level (REL) for DPM: 5 ug/m3

Chronic Non-cancer HI = Annual DPM/REL = 0.040266

Waterman - Annual Average Emissions

Estimate of Annual Construction DPM Emissions (as PM10 exhaust)

Total Annual PM10 Exhaust Emissions During Construction as estmated in the CalEEMod model.	0.0948	tons/year
Average Emissions	0.002729528	grams/sec
Total size of the emission source (25.25 acres)	102212	meters squared
Average area source emission	2.67046E-08	grams/m2-sec

Cancer Risk from DPM

DPM Concentration at boundary of closest receptor	0.20133	ug/m3 from Aermod dispersion model
Cancer Potency Factor (CPF)	1.1	(mg/kg/day)^-1
Daily Breathing Rate *DBR)	640	(l/kg of body weight-day)
Exposure Duration (ED)	0.4	years
Exposure Frequency (EF)	151	days
Age Sensitivity Factor (ASF)	3	

Child 2015 OEHHA Cancer Risk = DPM Concentration x CPF x DBR x ED x EF x ASF / 25550

CR 1.005190653 in one million

Chronic Non-cancer Hazard Index from DPM

Reference Exposure Level (REL) for DPM: 5 ug/m3

Chronic Non-cancer HI = Annual DPM/REL = 0.040266

Waterman - Annual Average Emissions

Estimate of Annual Construction DPM Emissions (as PM10 exhaust)

Total Annual PM10 Exhaust Emissions During Construction as estmated in the CalEEMod model.	0.0948	tons/year
Average Emissions	0.002729528	grams/sec
Total size of the emission source (25.25 acres)	102212	meters squared
Average area source emission	2.67046E-08	grams/m2-sec

Cancer Risk from DPM

DPM Concentration at boundary of closest receptor	0.20133	ug/m3 from Aermod dispersion model
Cancer Potency Factor (CPF)	1.1	(mg/kg/day)^-1
Daily Breathing Rate *DBR)	1090	(l/kg of body weight-day)
Exposure Duration (ED)	0.4	years
Exposure Frequency (EF)	151	days
Age Sensitivity Factor (ASF)	10	

Cancer Risk = DPM Concentration x CPF x DBR x ED x EF x ASF / 25550

Infant 2015 OEHHA CR 5.706551103 in one million

Chronic Non-cancer Hazard Index from DPM

Reference Exposure Level (REL) for DPM: 5 ug/m3

Chronic Non-cancer HI = Annual DPM/REL = 0.040266

```
** Lakes Environmental AERMOD MPI
**
****************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 9.1.0
** Lakes Environmental Software Inc.
** Date: 3/15/2016
** File: C:\Lakes\AERMOD View\Waterman Construction\Waterman Construction.ADI
**
****************************************
**
**
****************************************
** AERMOD Control Pathway
****************************************
**
**
CO STARTING
   TITLEONE C:\Lakes\AERMOD View\Waterman Construction\Waterman Construction.isc
   TITLETWO Maximum DPM concentrations onsite
   MODELOPT DFAULT CONC
   AVERTIME ANNUAL
   URBANOPT 219288 2015_Pop_of_City_of_San_Bernardino
   POLLUTID DPM
   RUNORNOT RUN
   ERRORFIL "Waterman Construction.err"
CO FINISHED
**
****************************************
** AERMOD Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION AREA1        AREA       473879.650  3770535.220      305.000
** DESCRSRC Construction Area Boundary
** Source Parameters **
   SRCPARAM AREA1        2.6705E-08     5.000   392.090   260.560     0.000
**
** No Building Downwash **
**
   URBANSRC ALL
   SRCGROUP ALL
SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
```

```
**
**
RE STARTING
   INCLUDED "Waterman Construction.rou"
RE FINISHED
**
****************************************
** AERMOD Meteorology Pathway
****************************************
**
**
ME STARTING
   SURFFILE "C:\Users\Kate Wilson\Desktop\Met data\snbo8.sfc"
   PROFFILE "C:\Users\Kate Wilson\Desktop\Met data\snbo8.PFL"
   SURFDATA 0 2007
   UAIRDATA 3190 2007
   SITEDATA 99999 2007
   PROFBASE 305.0 METERS
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
** Auto-Generated Plotfiles
   PLOTFILE ANNUAL ALL "WATERMAN CONSTRUCTION.AD\AN00GALL.PLT" 31
   SUMMFILE "Waterman Construction.sum"
OU FINISHED

 ***********************************
 *** SETUP Finishes Successfully ***
 ***********************************


 *** AERMOD - VERSION  15181 ***   *** C:\Lakes\AERMOD View\Waterman Construction\Waterman Construction.isc ***        03/15/16
 *** AERMET - VERSION  14134 ***   *** Maximum DPM concentrations onsite                                    ***        10:25:12
                                                                                                                       PAGE   1
 **MODELOPTs:   RegDFAULT CONC      ELEV      URBAN

                                           ***     MODEL SETUP OPTIONS SUMMARY       ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 **Model Is Setup For Calculation of Average CONCentration Values.

   --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F
```

```
**Model Uses URBAN Dispersion Algorithm for the SBL for     1 Source(s),
  for Total of    1 Urban Area(s):
  Urban Population =    219288.0 ;  Urban Roughness Length =  1.000 m

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Urban Roughness Length of 1.0 Meter Assumed.

**Other Options Specified:
        TEMP_Sub - Meteorological data includes TEMP substitutions

**Model Assumes No FLAGPOLE Receptor Heights.

**The User Specified a Pollutant Type of:  DPM

**Model Calculates ANNUAL Averages Only

**This Run Includes:      1 Source(s);       1 Source Group(s); and     457 Receptor(s)

               with:      0 POINT(s), including
                          0 POINTCAP(s) and      0 POINTHOR(s)
                and:      0 VOLUME source(s)
                and:      1 AREA type source(s)
                and:      0 LINE source(s)
                and:      0 OPENPIT source(s)


**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date:  14134

**Output Options Selected:
         Model Outputs Tables of ANNUAL Averages by Receptor
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =   305.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =      3.5 MB of RAM.
```

```
**Detailed Error/Message File:   Waterman Construction.err
**File for Summary of Results:   Waterman Construction.sum

*** AERMOD - VERSION  15181 ***   *** C:\Lakes\AERMOD View\Waterman Construction\Waterman Construction.isc ***        03/15/16
*** AERMET - VERSION  14134 ***   *** Maximum DPM concentrations onsite                                    ***        10:25:12
                                                                                                                      PAGE   2
**MODELOPTs:   RegDFAULT CONC      ELEV      URBAN


                                                 *** AREA SOURCE DATA ***

              NUMBER EMISSION RATE  COORD (SW CORNER)  BASE     RELEASE  X-DIM     Y-DIM    ORIENT.    INIT.   URBAN  EMISSION RATE
  SOURCE       PART.  (GRAMS/SEC       X         Y     ELEV.    HEIGHT  OF AREA   OF AREA   OF AREA     SZ     SOURCE  SCALAR VARY
    ID         CATS.   /METER**2)   (METERS) (METERS) (METERS) (METERS) (METERS)  (METERS)   (DEG.)  (METERS)           BY
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

AREA1            0   0.26705E-07  473879.6 3770535.2   305.0     5.00    392.09    260.56      0.00     0.00     YES

*** AERMOD - VERSION  15181 ***   *** C:\Lakes\AERMOD View\Waterman Construction\Waterman Construction.isc ***        03/15/16
*** AERMET - VERSION  14134 ***   *** Maximum DPM concentrations onsite                                    ***        10:25:12
                                                                                                                      PAGE   3
**MODELOPTs:   RegDFAULT CONC      ELEV      URBAN


                                          *** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID                                             SOURCE IDs
-----------                                             ----------


 ALL        AREA1       ,

*** AERMOD - VERSION  15181 ***   *** C:\Lakes\AERMOD View\Waterman Construction\Waterman Construction.isc ***        03/15/16
*** AERMET - VERSION  14134 ***   *** Maximum DPM concentrations onsite                                    ***        10:25:12
                                                                                                                      PAGE   4
**MODELOPTs:   RegDFAULT CONC      ELEV      URBAN


                                         *** SOURCE IDs DEFINED AS URBAN SOURCES ***

 URBAN ID   URBAN POP                                   SOURCE IDs
 --------   ---------                                   ----------


              219288.   AREA1       ,

*** AERMOD - VERSION  15181 ***   *** C:\Lakes\AERMOD View\Waterman Construction\Waterman Construction.isc ***        03/15/16
*** AERMET - VERSION  14134 ***   *** Maximum DPM concentrations onsite                                    ***        10:25:12
                                                                                                                      PAGE   5
**MODELOPTs:   RegDFAULT CONC      ELEV      URBAN
```

*** GRIDDED RECEPTOR NETWORK SUMMARY ***

*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

*** X-COORDINATES OF GRID ***
(METERS)

473592.7, 473642.7, 473692.7, 473742.7, 473792.7, 473842.7, 473892.7, 473942.7, 473992.7, 474042.7,
474092.7, 474142.7, 474192.7, 474242.7, 474292.7, 474342.7, 474392.7, 474442.7, 474492.7, 474542.7,
474592.7,

*** Y-COORDINATES OF GRID ***
(METERS)

3770290.4, 3770340.4, 3770390.4, 3770440.4, 3770490.4, 3770540.4, 3770590.4, 3770640.4, 3770690.4, 3770740.4,
3770790.4, 3770840.4, 3770890.4, 3770940.4, 3770990.4, 3771040.4, 3771090.4, 3771140.4, 3771190.4, 3771240.4,
3771290.4,

*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

* ELEVATION HEIGHTS IN METERS *

Y-COORD (METERS)	X-COORD (METERS) 473592.69	473642.69	473692.69	473742.69	473792.69	473842.69	473892.69	473942.69	473992.69
3771290.45	304.00	304.00	304.40	305.00	305.00	305.00	306.00	306.00	306.40
3771240.45	304.00	304.00	305.00	305.00	305.00	305.70	306.00	306.00	306.40
3771190.45	304.00	304.00	305.00	305.00	305.20	306.00	306.00	306.20	307.00
3771140.45	304.00	304.70	305.00	305.00	305.80	306.00	306.00	306.80	307.00
3771090.45	304.00	304.80	305.00	305.10	305.90	306.00	306.10	307.00	307.20
3771040.45	304.00	304.80	305.00	305.10	306.00	306.10	307.00	307.00	307.40
3770990.45	303.20	304.80	305.00	305.90	306.00	306.10	307.00	307.00	307.10
3770940.45	303.10	304.40	305.00	305.10	306.00	306.00	306.10	307.00	307.00
3770890.45	304.00	304.80	305.00	305.10	306.00	306.00	306.00	306.60	307.00
3770840.45	304.00	304.80	305.00	305.00	305.80	306.00	306.00	306.00	307.00
3770790.45	304.00	304.80	305.00	305.00	305.40	306.00	306.00	306.00	306.70
3770740.45	303.10	304.00	305.00	305.00	305.00	305.40	306.00	306.00	306.00
3770690.45	302.10	302.90	304.50	305.00	305.00	305.10	306.00	306.00	306.00
3770640.45	302.00	302.00	302.20	303.50	304.80	305.00	305.50	306.00	306.00
3770590.45	302.00	302.00	302.00	302.90	304.60	305.00	305.10	306.00	306.00
3770540.45	302.00	302.00	302.00	302.10	303.80	305.00	305.00	305.80	306.00
3770490.45	302.00	302.00	302.00	302.10	303.80	305.00	305.00	305.40	306.00
3770440.45	302.00	302.00	302.00	302.30	303.80	305.00	305.00	305.00	305.30
3770390.45	302.00	302.70	302.40	303.00	303.80	304.50	305.00	305.00	305.00
3770340.45	302.60	303.00	303.00	303.00	303.90	304.40	305.00	305.00	304.80

3770290.45 |	302.10	302.80	302.80	303.00	303.00	304.10	304.60	304.80	304.00

**MODELOPTs: RegDFAULT CONC   ELEV   URBAN

*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

* ELEVATION HEIGHTS IN METERS *

Y-COORD (METERS)	X-COORD (METERS) 474042.69	474092.69	474142.69	474192.69	474242.69	474292.69	474342.69	474392.69	474442.69
3771290.45	307.00	307.00	308.00	308.00	308.00	309.00	309.00	309.00	310.00
3771240.45	307.00	307.00	308.00	308.00	308.00	309.00	309.00	309.00	310.00
3771190.45	307.00	307.80	308.00	308.00	308.00	309.00	309.00	309.00	310.00
3771140.45	307.10	308.00	308.00	308.00	308.70	309.00	309.00	309.00	310.00
3771090.45	308.00	308.00	308.00	308.00	308.80	309.00	309.00	309.00	310.00
3771040.45	308.00	308.00	308.00	308.00	308.80	309.00	309.00	309.00	310.00
3770990.45	308.00	308.00	308.00	308.00	308.10	309.00	309.00	309.00	309.50
3770940.45	307.50	308.00	308.00	308.00	308.00	308.50	309.00	309.00	309.00
3770890.45	307.00	307.80	308.00	308.00	308.00	308.00	308.10	309.00	309.00
3770840.45	307.00	307.10	308.00	308.00	308.00	308.00	308.00	308.80	309.00
3770790.45	307.00	307.00	307.00	307.50	308.00	308.00	308.00	308.40	309.00
3770740.45	307.00	307.00	307.00	307.00	307.60	307.90	308.00	308.80	309.00
3770690.45	307.00	307.00	307.00	307.00	307.00	307.40	308.00	308.80	309.00
3770640.45	306.50	306.50	306.50	307.00	307.00	307.20	308.00	308.80	309.00
3770590.45	306.00	306.00	306.00	306.00	306.00	306.80	307.80	308.60	309.00
3770540.45	306.00	306.00	306.00	306.00	306.00	306.00	306.20	307.80	308.50
3770490.45	306.00	306.00	306.00	306.00	306.00	306.00	306.00	306.00	307.40
3770440.45	305.80	305.80	305.80	305.80	306.00	306.00	306.00	306.00	307.00
3770390.45	305.00	305.00	305.00	305.00	305.80	306.00	306.00	306.00	307.00
3770340.45	305.00	305.00	305.00	305.00	305.40	306.00	306.00	306.00	307.40
3770290.45	305.00	305.00	305.00	305.00	305.00	305.30	306.00	306.00	307.10

**MODELOPTs: RegDFAULT CONC   ELEV   URBAN

*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

* ELEVATION HEIGHTS IN METERS *

Y-COORD (METERS)	X-COORD (METERS) 474492.69	474542.69	474592.69
3771290.45	310.00	310.00	310.40

3771240.45 |	310.00	310.00	310.20
3771190.45 |	310.00	310.00	310.00
3771140.45 |	310.00	310.00	310.00
3771090.45 |	310.00	310.00	310.00
3771040.45 |	310.00	310.00	310.00
3770990.45 |	310.00	310.00	310.00
3770940.45 |	309.50	310.00	310.00
3770890.45 |	309.00	309.60	310.00
3770840.45 |	309.00	309.00	310.00
3770790.45 |	309.00	309.00	309.70
3770740.45 |	309.20	309.80	310.00
3770690.45 |	309.20	310.00	310.40
3770640.45 |	310.00	310.00	311.00
3770590.45 |	310.00	310.00	310.30
3770540.45 |	310.00	310.00	310.00
3770490.45 |	308.50	309.40	309.70
3770440.45 |	307.80	308.60	309.00
3770390.45 |	307.10	308.00	308.50
3770340.45 |	307.50	307.40	308.00
3770290.45 |	307.10	307.20	307.30

**MODELOPTs: RegDFAULT CONC ELEV URBAN

*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

* HILL HEIGHT SCALES IN METERS *

Y-COORD (METERS)	X-COORD (METERS) 473592.69	473642.69	473692.69	473742.69	473792.69	473842.69	473892.69	473942.69	473992.69
3771290.45	304.00	304.00	304.40	305.00	305.00	305.00	306.00	306.00	306.40
3771240.45	304.00	304.00	305.00	305.00	305.00	305.70	306.00	306.00	306.40
3771190.45	304.00	304.00	305.00	305.00	305.20	306.00	306.00	306.20	307.00
3771140.45	304.00	304.70	305.00	305.00	305.80	306.00	306.00	306.80	307.00
3771090.45	304.00	304.80	305.00	305.10	305.90	306.00	306.10	307.00	307.20
3771040.45	304.00	304.80	305.00	305.10	306.00	306.10	307.00	307.00	307.40
3770990.45	303.20	304.80	305.00	305.90	306.00	306.10	307.00	307.00	307.10
3770940.45	303.10	304.40	305.00	305.10	306.00	306.00	306.10	307.00	307.00
3770890.45	304.00	304.80	305.00	305.10	306.00	306.00	306.00	306.60	307.00
3770840.45	304.00	304.80	305.00	305.00	305.80	306.00	306.00	306.00	307.00
3770790.45	304.00	304.80	305.00	305.00	305.40	306.00	306.00	306.00	306.70
3770740.45	303.10	304.00	305.00	305.00	305.00	305.40	306.00	306.00	306.00
3770690.45	302.10	302.90	304.50	305.00	305.00	305.10	306.00	306.00	306.00
3770640.45	302.00	302.00	302.20	303.50	304.80	305.00	305.50	306.00	306.00
3770590.45	302.00	302.00	302.00	302.90	304.60	305.00	305.10	306.00	306.00
3770540.45	302.00	302.00	302.00	302.10	303.80	305.00	305.00	305.80	306.00
3770490.45	302.00	302.00	302.00	302.10	303.80	305.00	305.00	305.40	306.00

3770440.45 |	302.00	302.00	302.00	302.30	303.80	305.00	305.00	305.00	305.30
3770390.45 |	302.00	302.70	302.40	303.00	303.80	304.50	305.00	305.00	305.00
3770340.45 |	302.60	303.00	303.00	303.00	303.90	304.40	305.00	305.00	304.80
3770290.45 |	302.10	302.80	302.80	303.00	303.00	304.10	304.60	304.80	304.00

**MODELOPTs: RegDFAULT CONC ELEV URBAN

*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

* HILL HEIGHT SCALES IN METERS *

Y-COORD (METERS)	X-COORD (METERS) 474042.69	474092.69	474142.69	474192.69	474242.69	474292.69	474342.69	474392.69	474442.69
3771290.45	307.00	307.00	308.00	308.00	308.00	309.00	309.00	309.00	310.00
3771240.45	307.00	307.00	308.00	308.00	308.00	309.00	309.00	309.00	310.00
3771190.45	307.00	307.80	308.00	308.00	308.00	309.00	309.00	309.00	310.00
3771140.45	307.10	308.00	308.00	308.00	308.70	309.00	309.00	309.00	310.00
3771090.45	308.00	308.00	308.00	308.00	308.80	309.00	309.00	309.00	310.00
3771040.45	308.00	308.00	308.00	308.00	308.80	309.00	309.00	309.00	310.00
3770990.45	308.00	308.00	308.00	308.00	308.10	309.00	309.00	309.00	309.50
3770940.45	307.50	308.00	308.00	308.00	308.00	308.50	309.00	309.00	309.00
3770890.45	307.00	307.80	308.00	308.00	308.00	308.00	308.10	309.00	309.00
3770840.45	307.00	307.10	308.00	308.00	308.00	308.00	308.00	308.80	309.00
3770790.45	307.00	307.00	307.00	307.50	308.00	308.00	308.00	308.40	309.00
3770740.45	307.00	307.00	307.00	307.00	307.60	307.90	308.00	308.80	309.00
3770690.45	307.00	307.00	307.00	307.00	307.00	307.40	308.00	308.80	309.00
3770640.45	306.50	306.50	306.50	307.00	307.00	307.20	308.00	308.80	309.00
3770590.45	306.00	306.00	306.00	306.00	306.00	306.80	307.80	308.60	309.00
3770540.45	306.00	306.00	306.00	306.00	306.00	306.00	306.20	307.80	308.50
3770490.45	306.00	306.00	306.00	306.00	306.00	306.00	306.00	306.00	307.40
3770440.45	305.80	305.80	305.80	305.80	306.00	306.00	306.00	306.00	307.00
3770390.45	305.00	305.00	305.00	305.00	305.80	306.00	306.00	306.00	307.00
3770340.45	305.00	305.00	305.00	305.00	305.40	306.00	306.00	306.00	307.40
3770290.45	305.00	305.00	305.00	305.00	305.00	305.30	306.00	306.00	307.10

**MODELOPTs: RegDFAULT CONC ELEV URBAN

*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

* HILL HEIGHT SCALES IN METERS *

Y-COORD (METERS)	X-COORD (METERS) 474492.69	474542.69	474592.69

- -

3771290.45 |	310.00	310.00	310.40
3771240.45 |	310.00	310.00	310.20
3771190.45 |	310.00	310.00	310.00
3771140.45 |	310.00	310.00	310.00
3771090.45 |	310.00	310.00	310.00
3771040.45 |	310.00	310.00	310.00
3770990.45 |	310.00	310.00	310.00
3770940.45 |	309.50	310.00	310.00
3770890.45 |	309.00	309.60	310.00
3770840.45 |	309.00	309.00	310.00
3770790.45 |	309.00	309.00	309.70
3770740.45 |	309.20	309.80	310.00
3770690.45 |	309.20	310.00	310.40
3770640.45 |	310.00	310.00	311.00
3770590.45 |	310.00	310.00	310.30
3770540.45 |	310.00	310.00	310.00
3770490.45 |	308.50	309.40	309.70
3770440.45 |	307.80	308.60	309.00
3770390.45 |	307.10	308.00	308.50
3770340.45 |	307.50	307.40	308.00
3770290.45 |	307.10	307.20	307.30

**MODELOPTs: RegDFAULT CONC ELEV URBAN

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

```
( 473821.8, 3770780.8,     305.8,     305.8,       0.0);        ( 473841.7, 3770856.2,     306.0,     306.0,       0.0);
( 473872.5, 3770817.8,     306.0,     306.0,       0.0);        ( 473896.4, 3770814.3,     306.0,     306.0,       0.0);
( 473922.1, 3770812.4,     306.0,     306.0,       0.0);        ( 473944.0, 3770812.4,     306.0,     306.0,       0.0);
( 473955.6, 3770813.7,     306.2,     306.2,       0.0);        ( 473986.3, 3770813.1,     307.0,     307.0,       0.0);
( 474041.7, 3770827.9,     307.0,     307.0,       0.0);        ( 474132.2, 3770814.7,     307.3,     307.3,       0.0);
( 474153.7, 3770815.4,     307.3,     307.3,       0.0);        ( 474183.2, 3770813.5,     307.8,     307.8,       0.0);
( 473860.2, 3770519.7,     305.0,     305.0,       0.0);        ( 474265.1, 3770413.6,     306.0,     306.0,       0.0);
( 474184.5, 3771047.5,     308.0,     308.0,       0.0);        ( 474265.5, 3771209.5,     308.5,     308.5,       0.0);
```


**MODELOPTs: RegDFAULT CONC ELEV URBAN

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54,   3.09,   5.14,   8.23, 10.80,

**MODELOPTs: RegDFAULT CONC   ELEV   URBAN

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\Kate Wilson\Desktop\Met data\snbo8.sfc   Met Version: 14134
Profile file: C:\Users\Kate Wilson\Desktop\Met data\snbo8.PFL
Surface format: FREE
Profile format: FREE
Surface station no.:   0   Upper air station no.:   3190
Name: UNKNOWN   Name: UNKNOWN
Year: 2007   Year: 2007

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
07	01	01	1	01	-0.5	0.030	-9.000	-9.000	-999.	12.	4.4	0.32	1.00	1.00	0.50	27.	9.1	279.9	5.5
07	01	01	1	02	-0.5	0.030	-9.000	-9.000	-999.	12.	4.3	0.32	1.00	1.00	0.50	7.	9.1	279.2	5.5
07	01	01	1	03	-0.5	0.030	-9.000	-9.000	-999.	12.	4.3	0.32	1.00	1.00	0.50	97.	9.1	278.8	5.5
07	01	01	1	04	-0.7	0.030	-9.000	-9.000	-999.	12.	3.1	0.32	1.00	1.00	0.50	148.	9.1	278.1	5.5
07	01	01	1	05	-2.4	0.054	-9.000	-9.000	-999.	30.	5.5	0.32	1.00	1.00	0.90	87.	9.1	278.1	5.5
07	01	01	1	06	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	1.00	1.00	0.90	208.	9.1	277.0	5.5
07	01	01	1	07	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	1.00	1.00	0.90	156.	9.1	277.5	5.5
07	01	01	1	08	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	1.00	0.52	0.90	60.	9.1	277.5	5.5
07	01	01	1	09	34.6	0.390	0.621	0.005	241.	585.	-149.6	0.32	1.00	0.31	3.10	264.	9.1	282.5	5.5
07	01	01	1	10	78.0	0.267	1.066	0.005	541.	341.	-21.3	0.32	1.00	0.24	1.80	242.	9.1	289.2	5.5
07	01	01	1	11	112.9	0.612	1.395	0.019	839.	1149.	-176.9	0.32	1.00	0.21	4.90	82.	9.1	290.4	5.5
07	01	01	1	12	130.3	0.615	1.611	0.020	1120.	1158.	-155.8	0.32	1.00	0.20	4.90	74.	9.1	290.9	5.5
07	01	01	1	13	128.2	0.671	1.662	0.015	1250.	1315.	-204.9	0.32	1.00	0.20	5.40	59.	9.1	290.9	5.5
07	01	01	1	14	107.5	0.712	1.575	0.007	1267.	1439.	-292.1	0.32	1.00	0.22	5.80	58.	9.1	291.4	5.5
07	01	01	1	15	68.1	0.602	1.356	0.021	1277.	1137.	-279.3	0.32	1.00	0.25	4.90	40.	9.1	291.4	5.5
07	01	01	1	16	18.1	0.438	0.872	0.021	1278.	724.	-405.7	0.32	1.00	0.34	3.60	312.	9.1	292.0	5.5

```
07 01 01   1 17  -25.8  0.263 -9.000 -9.000 -999.  353.     61.6  0.32   1.00   0.63    2.70  342.    9.1  290.9    5.5
07 01 01   1 18   -4.9  0.077 -9.000 -9.000 -999.  114.      8.1  0.32   1.00   1.00    1.30  256.    9.1  289.2    5.5
07 01 01   1 19   -4.9  0.077 -9.000 -9.000 -999.   52.      8.1  0.32   1.00   1.00    1.30  191.    9.1  289.9    5.5
07 01 01   1 20   -4.9  0.077 -9.000 -9.000 -999.   52.      8.1  0.32   1.00   1.00    1.30  197.    9.1  289.9    5.5
07 01 01   1 21   -4.9  0.077 -9.000 -9.000 -999.   52.      8.1  0.32   1.00   1.00    1.30  190.    9.1  289.9    5.5
07 01 01   1 22   -2.4  0.054 -9.000 -9.000 -999.   30.      5.6  0.32   1.00   1.00    0.90  188.    9.1  289.2    5.5
07 01 01   1 23   -9.5  0.107 -9.000 -9.000 -999.   84.     11.3  0.32   1.00   1.00    1.80  162.    9.1  289.9    5.5
07 01 01   1 24   -9.5  0.107 -9.000 -9.000 -999.   84.     11.3  0.32   1.00   1.00    1.80   42.    9.1  289.2    5.5
```

First hour of profile data

```
YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
07 01 01 01    5.5 0 -999.  -99.00   279.9   99.0  -99.00  -99.00
07 01 01 01    9.1 1   27.    0.50  -999.0   99.0  -99.00  -99.00
```

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC   ELEV   URBAN

*** THE ANNUAL AVERAGE CONCENTRATION   VALUES AVERAGED OVER   5 YEARS FOR SOURCE GROUP: ALL   ***
INCLUDING SOURCE(S):   AREA1   ,

*** NETWORK ID: UCART1   ; NETWORK TYPE: GRIDCART ***

** CONC OF DPM   IN MICROGRAMS/M**3   **

Y-COORD (METERS)	X-COORD (METERS) 473592.69	473642.69	473692.69	473742.69	473792.69	473842.69	473892.69	473942.69	473992.69
3771290.45	0.00458	0.00483	0.00515	0.00554	0.00608	0.00683	0.00786	0.00923	0.01093
3771240.45	0.00507	0.00537	0.00573	0.00619	0.00680	0.00768	0.00891	0.01056	0.01262
3771190.45	0.00566	0.00602	0.00645	0.00697	0.00769	0.00872	0.01021	0.01225	0.01479
3771140.45	0.00637	0.00681	0.00732	0.00794	0.00879	0.01004	0.01188	0.01444	0.01767
3771090.45	0.00722	0.00777	0.00840	0.00916	0.01019	0.01173	0.01408	0.01740	0.02160
3771040.45	0.00824	0.00894	0.00975	0.01073	0.01201	0.01396	0.01704	0.02156	0.02719
3770990.45	0.00944	0.01039	0.01147	0.01276	0.01445	0.01703	0.02129	0.02776	0.03566
3770940.45	0.01086	0.01215	0.01365	0.01547	0.01782	0.02142	0.02782	0.03779	0.04933
3770890.45	0.01246	0.01421	0.01636	0.01905	0.02260	0.02808	0.03885	0.05626	0.07366
3770840.45	0.01413	0.01649	0.01955	0.02366	0.02955	0.03924	0.06231	0.09884	0.12395
3770790.45	0.01577	0.01883	0.02300	0.02907	0.03897	0.05995	0.13298	0.20705	0.23971
3770740.45	0.01728	0.02104	0.02643	0.03472	0.04948	0.08567	0.20599	0.29031	0.32198
3770690.45	0.01859	0.02298	0.02950	0.03984	0.05867	0.10299	0.23196	0.31704	0.34603
3770640.45	0.01967	0.02448	0.03167	0.04339	0.06461	0.11183	0.24040	0.32104	0.34432
3770590.45	0.02045	0.02551	0.03298	0.04497	0.06635	0.11236	0.23290	0.29909	0.31364
3770540.45	0.02092	0.02596	0.03325	0.04438	0.06333	0.10112	0.17970	0.20659	0.21263
3770490.45	0.02104	0.02584	0.03253	0.04218	0.05696	0.07939	0.10352	0.11352	0.11558
3770440.45	0.02080	0.02518	0.03100	0.03882	0.04927	0.06156	0.07153	0.07605	0.07649

3770390.45 |	0.02024	0.02411	0.02894	0.03499	0.04208	0.04916	0.05428	0.05635	0.05586
3770340.45 |	0.01943	0.02271	0.02662	0.03114	0.03597	0.04026	0.04306	0.04387	0.04292
3770290.45 |	0.01840	0.02114	0.02424	0.02760	0.03086	0.03356	0.03509	0.03524	0.03408

**MODELOPTs: RegDFAULT CONC ELEV URBAN

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): AREA1 ,

*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

** CONC OF DPM IN MICROGRAMS/M**3 **

Y-COORD (METERS)	X-COORD (METERS) 474042.69	474092.69	474142.69	474192.69	474242.69	474292.69	474342.69	474392.69	474442.69
3771290.45	0.01288	0.01500	0.01711	0.01908	0.02074	0.02191	0.02256	0.02263	0.02216
3771240.45	0.01499	0.01753	0.02002	0.02229	0.02411	0.02529	0.02578	0.02554	0.02465
3771190.45	0.01772	0.02078	0.02374	0.02634	0.02831	0.02941	0.02960	0.02889	0.02739
3771140.45	0.02133	0.02505	0.02856	0.03150	0.03354	0.03446	0.03414	0.03269	0.03034
3771090.45	0.02622	0.03083	0.03495	0.03822	0.04021	0.04069	0.03954	0.03697	0.03342
3771040.45	0.03319	0.03885	0.04361	0.04709	0.04881	0.04848	0.04594	0.04168	0.03647
3770990.45	0.04350	0.05036	0.05565	0.05910	0.06025	0.05836	0.05351	0.04665	0.03924
3770940.45	0.05967	0.06762	0.07310	0.07602	0.07592	0.07137	0.06232	0.05144	0.04120
3770890.45	0.08692	0.09542	0.10026	0.10177	0.09921	0.08932	0.07225	0.05512	0.04166
3770840.45	0.13939	0.14772	0.15011	0.14857	0.14076	0.11597	0.08087	0.05611	0.04005
3770790.45	0.25627	0.26275	0.26301	0.25883	0.24037	0.14565	0.08277	0.05322	0.03632
3770740.45	0.33826	0.34240	0.33872	0.32512	0.28693	0.14772	0.07711	0.04699	0.03116
3770690.45	0.35912	0.36010	0.35258	0.33345	0.28173	0.13893	0.06710	0.03911	0.02551
3770640.45	0.35163	0.34956	0.33918	0.31857	0.26342	0.12098	0.05372	0.03064	0.02023
3770590.45	0.31590	0.31141	0.29972	0.27632	0.22178	0.09194	0.03872	0.02315	0.01605
3770540.45	0.21167	0.20648	0.19516	0.17430	0.12986	0.05103	0.02719	0.01812	0.01331
3770490.45	0.11358	0.10791	0.09790	0.08175	0.05697	0.03251	0.02111	0.01525	0.01163
3770440.45	0.07398	0.06880	0.06063	0.04920	0.03558	0.02421	0.01737	0.01320	0.01040
3770390.45	0.05330	0.04880	0.04239	0.03440	0.02604	0.01923	0.01465	0.01158	0.00938
3770340.45	0.04049	0.03670	0.03172	0.02601	0.02042	0.01585	0.01256	0.01022	0.00848
3770290.45	0.03190	0.02874	0.02485	0.02064	0.01667	0.01339	0.01092	0.00909	0.00768

**MODELOPTs: RegDFAULT CONC ELEV URBAN

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): AREA1 ,

*** NETWORK ID: UCART1 ; NETWORK TYPE: GRIDCART ***

** CONC OF DPM IN MICROGRAMS/M**3 **

Y-COORD (METERS)	X-COORD (METERS) 474492.69	474542.69	474592.69
3771290.45	0.02126	0.02005	0.01929
3771240.45	0.02329	0.02160	0.02044
3771190.45	0.02540	0.02312	0.02075
3771140.45	0.02752	0.02451	0.02155
3771090.45	0.02953	0.02565	0.02204
3771040.45	0.03124	0.02638	0.02212
3770990.45	0.03237	0.02650	0.02168
3770940.45	0.03263	0.02586	0.02066
3770890.45	0.03169	0.02438	0.01908
3770840.45	0.02938	0.02212	0.01704
3770790.45	0.02596	0.01928	0.01478
3770740.45	0.02196	0.01624	0.01251
3770690.45	0.01800	0.01343	0.00948
3770640.45	0.01454	0.01112	0.00797
3770590.45	0.01198	0.00942	0.00705
3770540.45	0.01028	0.00827	0.00683
3770490.45	0.00922	0.00752	0.00628
3770440.45	0.00843	0.00698	0.00588
3770390.45	0.00777	0.00652	0.00556
3770340.45	0.00715	0.00610	0.00526
3770290.45	0.00658	0.00570	0.00497

**MODELOPTs: RegDFAULT CONC ELEV URBAN

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): AREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF DPM IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
473821.79	3770780.83	0.05190	473841.73	3770856.25	0.03478
473872.55	3770817.80	0.06428	473896.38	3770814.31	0.09752
473922.12	3770812.40	0.13502	473944.04	3770812.40	0.15544
473955.65	3770813.70	0.16019	473986.29	3770813.11	0.17790
474041.70	3770827.94	0.16105	474132.24	3770814.67	0.20133
474153.71	3770815.45	0.19889	474183.17	3770813.50	0.20064
473860.23	3770519.70	0.11022	474265.12	3770413.61	0.02556
474184.49	3771047.50	0.04521	474265.49	3771209.49	0.02722

**MODELOPTs: RegDFAULT CONC   ELEV   URBAN

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER   5 YEARS ***

** CONC OF DPM   IN MICROGRAMS/M**3   **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	0.36010 AT (	474092.69, 3770690.45, 307.00, 307.00, 0.00)	GC	UCART1
	2ND HIGHEST VALUE IS	0.35912 AT (	474042.69, 3770690.45, 307.00, 307.00, 0.00)	GC	UCART1
	3RD HIGHEST VALUE IS	0.35258 AT (	474142.69, 3770690.45, 307.00, 307.00, 0.00)	GC	UCART1
	4TH HIGHEST VALUE IS	0.35163 AT (	474042.69, 3770640.45, 306.50, 306.50, 0.00)	GC	UCART1
	5TH HIGHEST VALUE IS	0.34956 AT (	474092.69, 3770640.45, 306.50, 306.50, 0.00)	GC	UCART1
	6TH HIGHEST VALUE IS	0.34603 AT (	473992.69, 3770690.45, 306.00, 306.00, 0.00)	GC	UCART1
	7TH HIGHEST VALUE IS	0.34432 AT (	473992.69, 3770640.45, 306.00, 306.00, 0.00)	GC	UCART1
	8TH HIGHEST VALUE IS	0.34240 AT (	474092.69, 3770740.45, 307.00, 307.00, 0.00)	GC	UCART1
	9TH HIGHEST VALUE IS	0.33918 AT (	474142.69, 3770640.45, 306.50, 306.50, 0.00)	GC	UCART1
	10TH HIGHEST VALUE IS	0.33872 AT (	474142.69, 3770740.45, 307.00, 307.00, 0.00)	GC	UCART1

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC   ELEV   URBAN

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of   0 Fatal Error Message(s)
A Total of   0 Warning Message(s)
A Total of   1086 Informational Message(s)

A Total of   43824 Hours Were Processed

A Total of   37 Calm Hours Identified

A Total of   1049 Missing Hours Identified (2.39 Percent)

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******** FATAL ERROR MESSAGES ********
           ***  NONE  ***

********   WARNING MESSAGES   ********
           ***  NONE  ***

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*** AERMOD Finishes Successfully ***
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