Response to Comments, Findings of Fact, and Record of Decision

Riverstone Addition
Environmental Assessment Worksheet

June 2017

RGU

City of Ramsey
Tim Gladhill
Community Development Director
7550 Sunwood Drive NW
Ramsey, Minnesota 55303
Phone: (763) 433-9826
tgladhill@cityoframsey.com

PROPOSER

Riverstone Development, LLC
Stephen Bona
Development Manager
14015 Sunfish Lake Blvd.
Ramsey, MN 55303
Phone: (763) 427-3090
stephen@capstonehomes-mn.com

CITY OF RAMSEY

Response to Comments, Findings of Fact, and Record of Decision

Riverstone Addition Environmental Assessment Worksheet

June 2017

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INTRODUCTION

Riverstone Addition is proposed on 89.44 acres of land in the southwestern part of the City of Ramsey, Anoka County, Minnesota. The project will include up to 246 single-family homes and 98 townhome units, municipal sewer and water, mass grading, and stormwater features. The project will convert approximately 85.48 acres of annually-tilled cropland and small areas of trees to streets, homes, lawns, landscaping, and stormwater features.

An Environmental Assessment Worksheet (EAW) was prepared pursuant to Minnesota Rules 4410.4300, Subp. 19.c (Residential Development). The EAW and the respective comments have been reviewed in accordance with Minnesota Rules 4410.1700 to determine if the project has potential for significant environmental effects. This document includes responses to comments received by City of Ramsey (City), the Findings of Fact supporting the decision, and the Record of Decision indicating an Environmental Impact Statement (EIS) is not necessary for this project.

EAW Notification, Distribution, and Comment Period

In accordance with Minnesota Rules 4410.1500, the EAW was completed and distributed to persons and agencies on the official Environmental Quality Board (EQB) distribution list. The notification was published in the EQB Monitor on April 24, 2017, initiating the 30-day public comment period. A press release and public notice were submitted to Anoka County Union Herald. The comment period ended on May 24, 2017.

COMMENTS RECEIVED

The City received written comment letters from five agencies:

1. Minnesota Department of Natural Resources (MnDNR),
2. Minnesota Department of Transportation (MnDOT),
3. Minnesota Pollution Control Agency (MPCA),
4. Minnesota Historic Preservation Office (MHPO), and
5. Metropolitan Council (Met Council).

None of the comments recommended preparation of an EIS. The Metropolitan Council found the EAW to be complete and accurate with respect to regional concerns. The City of Ramsey did not receive comments from residents or individual members of the public.

RESPONSE TO COMMENTS

This document responds to comments on a letter-by-letter basis. It includes summaries of comments followed by responses. Complete comment letters are included in **Appendix A**. Responses to comments are generally confined to substantive issues that "address the accuracy and completeness of the material contained in the EAW, potential impacts that may warrant further investigation before the project is commenced, and the need for an EIS on the proposed project." (MN Rules 4410.1600). Some comments included general remarks, recommendations, or permit requirements. Such comments are noted for the record.

Minnesota Department of Natural Resources Comments

Shorelands

It is unlikely that a request for removal of the project area from the shoreland district would be approved by the MnDNR. Shoreland throughout the state contains roads that have created topographic divides and changed the drainage direction of overland sheet flow. Allowing land to be removed from a shoreland because of these human modifications to the landscape would defeat the purpose of the shoreland program. Shoreland is defined as a specific distance from a water body, not by topographic divide. Therefore, the portion of the development within the 1,000 foot shoreland district of Lake Itasca should be designed to comply with the standards in the City's Shoreland ordinance.

Response

The City intends to process Riverstone Addition as a shoreland PUD. Tier 3 of the shoreland district of Lake Itasca covers approximately 193,605 square feet (4.4 acres) in the northwestern part of the site. This shoreland area includes 478 square feet of delineated wetland, but does not include any bluffs. Based on the PUD methodology and standards described under MN Rules 6120.3800 and the Ramsey city code, subtracting the wetland from the total shoreland area leaves 193,127 square feet of Suitable Area. Dividing the Suitable Area by the 20,000-square-foot minimum size for sewered, nonriparian lots in a Natural Environment shoreland yields an allowable density of 9.65 lots.

The structural setback from the OHW of Lake Itasca will be roughly 750 feet, about five times the required 150-foot setback. Much of the shoreland lies within Lake Itasca Park, which will provide abundant open space. The City recently purchased 37 acres north of Alpine Drive to expand Lake Itasca Park from 23 to 60 acres. Based on the open space and the large setback from Lake Itasca, use of the 200% density multiplier in Tier 3 will increase the allowed density from 9.65 lots to19.3 lots. The Site Plan includes 12 lots in the shoreland, which is less than the 19 lots allowed.

The City of Ramsey recognizes that removal of areas from shoreland districts require MnDNR approval and that such approval is unlikely. However, the definition of shoreland under state rules and the Ramsey city code notes that:

> "The limits of shorelands may be reduced whenever the waters involved are bounded by topographic divides which extend landward from the waters for lesser distances and when approved by the commissioner."

Review of historical aerial photography suggests the project area drained southeast, and away from Lake Itasca, prior to construction of Alpine Drive in 1986. Drainage patterns showing drainage toward the southeast are apparent on aerial photographs back to 1937. An analysis completed for the Sommerset Station EAW in 2005 indicated the project area is located down gradient (i.e., "downstream") from Lake Itasca.

Floodplains

The EAW indicates a previous analysis showed Lake Itasca does not outlet during 100-year snowmelt and rainfall events, so the City of Ramsey proposed to install an outlet for the lake. It is not clear from the EAW discussion whether that outlet was previously installed or is being proposed now. Any change to the existing outlet characteristics of the lake will likely require a Public Waters Work Permit.

Response

The outlet was mentioned in the current EAW because it was discussed in an EAW prepared in 2005 for the Sommerset Station Subdivision. Sommerset Station would have covered 190 acres, including the Riverstone Addition property, but Sommerset Station did not advance to construction. The Sommerset Station EAW assumed that any outlet constructed would be above the OHW and the 100-year flood elevation of Itasca Lake.

The culvert under Alpine Drive acts an emergency overflow outlet from Itasca Lake. The control elevation in the culvert is 870.4 feet, which is higher than the 1% frequency flood elevation. Water from the emergency overflow would flow through Wetland 2, the Riverstone Addition ponding system, and continue draining southeast. The emergency overflow outlet will not affect Lake Itasca, nearby wetlands, or the proposed project design. Lowest floor elevations of homes on the project will be at least 3 feet above the highest anticipated groundwater table and 2 feet above the 100-year flood elevation, or 1 foot above the emergency overflow, whichever is greater.

Surface/Groundwater Appropriation

We recommend that ground water conservation measures, such as stormwater reuse for irrigation and use of drought tolerant native plants for landscaping, be incorporated into the development design.

Response

Comment noted.

Fish and Wildlife

The Blanding's turtle flyer and fact sheet should be provided to all contractors working in the area (see Appendix D of EAW). If Blanding's turtles are observed to be in danger, they should be moved out of harm's way by hand. State rules prohibit the destruction of threatened or endangered species, except under certain prescribed conditions.

Response

Comment noted.

Minnesota Department of Transportation Comments

Permits and Approvals

Work within or affecting MnDOT right of way requires a permit. Permit forms are available from MnDOT's utility website at www.dot.state.mn.us/metro/maintenance/permits.html and application submission options are listed in the comment letter.

Response

Comment noted. The project is not expected to involve construction on, direct access to, or effects on MnDOT right of way.

Minnesota Pollution Control Agency

Low Impact Design

The MPCA advocates the use of Low Impact Design (LID) practices to aid in the minimization of stormwater impacts. LID is a stormwater management approach and site-design technique that emphasizes water infiltration, values water as a resource, and promotes use of natural systems to treat water runoff. Several examples LID practices are listed in the comment letter. LID concepts may be found at www.pca.state.mn.us/water/stormwater/stormwater-manual.html. Links to other LID resources are located at www.pca.state.mn.us/water/stormwater-management-low-impact-development-and-green-infrastructure.

Response

Comment noted.

Minnesota Historic Preservation Office

Historic Properties

We conclude that there are no properties listed In the National or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by this project.

Response

Comment noted.

Metropolitan Council

Permits and Approvals

When the project proposer makes application to the MPCA for a permit to construct sanitary sewer, a copy of the plans, design data, and project location map will need to be submitted to the Metropolitan Council.

Table 3 of the EAW shows that a Comprehensive Plan Amendment has been submitted for the Riverstone project. This should be amended to state "to be applied for" because, as of May 22, 2017, no amendment for this development had been submitted to the Metropolitan Council.

Response

City of Ramsey staff have been in communication with Metropolitan Council staff and recently submitted an Administrative Comprehensive Plan Amendment to the Metropolitan Council.

Water Resources

Metropolitan Council staff encourages the City and Watershed to work with the project proposer to restore wetland habitat within degraded wetlands so the wetlands and their buffers become an amenity for the development.

Response

Comment noted.

Fish and Wildlife

Metropolitan Council staff recommends that the City specify use of surmountable curbs throughout the project site. The use of standard, near-vertical curbs can result in nearly full mortality of the area's turtle population by trapping them within roadways as they pass between wetlands for feeding and nesting. A more gently sloping curb, consistent with DNR's recommendation and guidance, will reduce mortality risks in the area without impacts to stormwater flow, safety, or maintenance. Use of MnDOT Curb and Gutter Design No. S524 or similar design is suggested.

Response

Comment noted.

Traffic and Transportation

The Riverstone site is within TAZ (transportation analysis zone) #61. The zone is currently forecasted to gain +86 households during 2014-40. Council staff recommend adding +260 households and +650 population to the TAZ #61 forecast to reflect the planned Riverstone development. Balancing adjustments can be made to TAZs elsewhere in the community. The City can update the TAZ forecast through correspondence to Metropolitan Council. Metropolitan Council's staff opinion is that the expected development fits within the community total forecast prepared by Metropolitan Council; no change is needed to the community total forecast.

Response

Comment noted.

FINDINGS OF FACT

Project Description

Proposed Project

Riverstone Addition is proposed on 89.44 acres of land in the southwestern part of the City of Ramsey, Anoka County, Minnesota. The project will include up to 246 single-family homes and 98 townhome units, municipal sewer and water, mass grading, and stormwater features.

Site Description and Existing Conditions

The project area is dominated by cropland and has a history of agricultural use. The project area is roughly 96% cropland, 2% tree rows, 1% wetland, and 1% grassland. The site includes sandy soils, 18 feet of topographic relief, and gradual slopes. Approximately 4.4 acres in the northwest part of the site is located within 1,000 feet of Lake Itasca, which is Minnesota DNR (MN DNR) pubic water 2-110P.

Decision Regarding the Potential for Significant Environmental Effects

Minnesota Rules 4410.1700, Subp. 7 lists four criteria that shall be considered in deciding whether a project has the potential for significant environmental effects. Those criteria and the City's findings are presented below.

A. Type, Extent, and Reversibility of Environmental Effects

Minnesota Rules 4410.1700 Subp. 7 (A) indicates the first factor that the City must consider is the "type, extent, and reversibility of environmental effects." The City's findings are set forth below.

1. **Cover Types**. The project will convert approximately 85.48 acres of annually-tilled cropland and small areas of trees to streets, homes, lawns, landscaping, and stormwater features. The project will include about 20.60 acres of open space, including 9.5 acres of stormwater basins.

2. **Shorelands**. The project area includes 4.4 acres of shoreland. The project design is consistent with residential densities allowed under Minnesota shoreland rules and PUD shoreland evaluation methods when the density increase multiplier is applied.

3. **Floodplains**. The proposed project will not affect the floodplains of Lake Itasca or the Mississippi River. Proposed homes will have lowest floor elevations at least 2 feet above the 100-year flood elevation, or 1 foot above the emergency overflow, whichever is greater.

4. **Land Use**. The proposed project is compatible with surrounding land uses and the proposed land use and zoning. The project will require a Comprehensive Plan Amendment to guide the site for LDR-Low Density Residential, which is intended for an average density of 4 units/acre.

5. **Geology and Soils**. Residential development grading is expected to affect about 87 acres of land and involve movement of about 475,000 cubic yards of soil to construct streets, residential building pads, and stormwater features.

6. **Water Quality**. Compliance with multiple stormwater requirements will minimize and mitigate potential adverse effects on receiving waters. Project construction will add about 14.5 acres of impervious surface to the site, consisting of streets, homes, and driveways. Stormwater rate and volume controls will limit increases in runoff volume and associated pollutant transport. Stormwater ponds and infiltration basins are expected to mitigate potential adverse effects on water quality.

7. **Wetlands and Surface Waters**. The project has been designed to avoid and minimize effects on wetlands to the extent practicable. Construction of a bituminous trail and an emergency overflow from Wetland 2 will require placement of fill in 2,039 square feet of Type 1 seasonally-flooded, farmed wetland. The proposed wetland impact is covered under the Minnesota Wetland Conservation Act 2,500-square-foot de minimis exemption threshold that applies to wetlands in the project area. Representatives from the U.S. Army Corps of Engineers reviewed the wetlands in the field on April 21, 2017, and stated that wetlands on the site are isolated from navigable waters and are not regulated under Section 404 of the Federal Clean Water Act.

8. **Wastewater**. The project is expected to produce normal domestic wastewater that will be typical of residential developments. The proposed project does not raise wastewater conveyance or treatment capacity concerns.

9. **Hazardous Materials**. The project area has been used as cropland since at least the 1930s. The site is not known to include environmental hazards. The agricultural land use history suggests low potential for environmental contamination.

10. **Ecological Resources**. Project development will convert about 85.5 acres of cropland and 0.9 acres of trees to residential land uses. The project may affect the number and type of wildlife species in the area, but changes in wildlife abundance are not expected to be regionally significant.

11. **Historic Resources**. A search of the Minnesota Archaeological Inventory and Historic Structures Inventory did not identify archaeological sites or historic structures known to exist in the project vicinity. The project is not expected to affect historic resources.

12. **Visual Resources**. There are no scenic views or vistas on or adjacent to the project area. Substantial effects on visual resources are not anticipated in conjunction with project development.

13. **Noise**. A Noise Study predicted noise levels at 19 receptor locations. The modeled noise level at one of the receptor locations exceeded Minnesota NAC-1 noise standards for daytime hours (**Appendix B**). The noise study lists potential remedies for this situation.

14. **Transportation**. The traffic to be generated by the proposed project does not raise capacity or safety concerns. Traffic generated by the project will have little effect on the regional transportation system. Intersections surrounding the site will continue to operate at acceptable levels of service with the addition of traffic generated by the proposed project. The Updated Traffic Study for the project is included in **Appendix C**.

B. Cumulative Potential Effects

Minnesota Rules 4410.1700 Subp. 7 (B) indicates the second factor the City must consider is "whether the cumulative potential effect is significant; whether the contribution from the project is significant when viewed in connection with other contributions to the cumulative potential effect; the degree to which the project complies with approved mitigation measures specifically designed to address the cumulative potential effect; and the efforts of the proposer to minimize the contributions from the project." The City's findings are set forth below.

Projects typically combine to produce cumulative effects on municipal resources like water and wastewater treatment. The City of Ramsey has planned for growth and increased capacity to address these cumulative effects. The proposed project will implement approved mitigation measures and be consistent with land use policies for areas served by municipal sewer and water.

Cumulative effects of suburban development on natural resources may include the loss of agricultural land and the loss and fragmentation of wildlife habitat. Surface water runoff from the project area will infiltrate into the soil or be treated in ponds prior to discharge to the Mississippi River. Stormwater regulations administered by multiple agencies and water quality BMPs are expected to minimize cumulative effects of post-development runoff on downstream waters.

C. Extent to Which the Environmental Effects are Subject to Mitigation

Minnesota Rules 4410.1700 Subp. 7 (C) indicates the third factor the City must consider is the "extent to which the environmental effects are subject to mitigation by ongoing public regulatory authority." The City's findings are set forth below.

Environmental effects on cover types, shorelands, floodplains, water quality, and traffic are subject to additional approvals and/or mitigation through requirements of local, state, and federal regulations, ordinances, management plans, and permitting processes. The following permits and approvals are required for the project addressed under the EAW. These permitting and approval processes will provide additional opportunity to require mitigation.

Potential environmental effects associated with this project will be mitigated in accordance with applicable rules and regulations. The City of Ramsey therefore finds that potential environmental effects of the project are less than significant and "subject to mitigation by ongoing public regulatory authority."

Table 1. Permits and Approvals

Unit of Government	Type of Application	Status
City of Ramsey	EAW Decision	Submitted
City of Ramsey	Comprehensive Plan Amendment	Submitted
City of Ramsey	Rezoning	Submitted
City of Ramsey	Concept Plan Approval	Submitted
City of Ramsey	Plat Approval	To be applied for
City of Ramsey	PUD Approval	To be applied for
City of Ramsey	Grading Permit	To be applied for
City of Ramsey	Building Permit	To be applied for
City of Ramsey	Stormwater Management and Erosion Control Approval	To be applied for
City of Ramsey	Municipal Water Connection Permit	To be applied for
City of Ramsey	Sanitary Sewer Connection Permit	To be applied for
Lower Rum River WMO	WCA Wetland Boundary/Type Determination	Approved
Lower Rum River WMO	WCA De minimis Exemption	Submitted
Lower Rum River WMO	Watershed Permit	Submitted
Metropolitan Council	Comprehensive Plan Amendment	Submitted
Minnesota Department of Health	Water Main Extension Approval	To be applied for
Minnesota Department of Natural Resources	Water Appropriation Permit	To be applied for
Minnesota Pollution Control Agency	NPDES/SDS General Permit	To be applied for
Minnesota Pollution Control Agency	Sanitary Sewer Extension Approval	To be applied for
U. S. Army Corps of Engineers	Wetland Delineation Concurrence / Jurisdictional Determination	Submitted

D. Extent to Which Environmental Effects can be Anticipated and Controlled

Minnesota Rules 4410.1700 Subp. 7 (D) indicates the final factor the City must consider is the "extent to which environmental effects can be anticipated and controlled as a result of other environmental studies undertaken by public agencies or the project proposer, including other EISs." The City's findings are set forth below.

1. The proposed project design, plans, EAW, related studies, and mitigation measures apply knowledge, approaches, standards, and best management practices gained from previous experience and projects that have, in general, successfully mitigated potential offsite environmental effects.

2. The EAW, in conjunction with this document, contains or references the known studies that provide information or guidance regarding environmental effects that can be anticipated and controlled.

3. Other projects studied under environmental reviews in Minnesota have included studies and mitigation measures comparable to those included in this EAW.

4. There are no elements of the project that pose the potential for significant environmental effects that cannot be addressed by the project design, assessment, permitting and development processes and by ensuring conformance with regional and local plans.

5. The environmental effects of this development can be anticipated and controlled by the City's PUD application process and other regulatory processes.

6. Considering the results of environmental review and permitting processes for similar projects, the City of Ramsey finds that the environmental effects of the project can be adequately anticipated and controlled.

Based on the EAW, comments received, responses to comments, and criteria above, the City of Ramsey finds that Riverstone Addition does not have the potential for significant environmental effects and does not require the preparation of an EIS.

RECORD OF DECISION

Based on the EAW, the response to comments, and the Findings of Fact, the City of Ramsey, the RGU for this environmental review, concludes the following:

1. The EAW was prepared in compliance with the procedures of the Minnesota Environmental Policy Act and Minnesota Rules, Parts 4410.1000 to 4410.1700 (2015),

2. The EAW satisfactorily addressed the issues for which existing information could have been reasonably obtained,

3. Based on the criteria established in Minnesota Rules 4410.1700, the project does not have the potential for significant environmental effects,

4. The City makes a "Negative Declaration," and

5. **An EIS is not required.**

CITY OF RAMSEY
COUNTY OF ANOKA
STATE OF MINNESOTA

RESOLUTION #17-06-113

RESOLUTION FINDING NO NEED FOR AN ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR THE RIVERSTONE ADDITION ENVIRONMENTAL ASSESSMENT WORKSHEET (EAW)

WHEREAS, Minnesota Rules 4410.4300, Subp. 19.C, requires that an EAW be prepared for a residential development of at least 100 unattached units or 150 attached units if the development is not consistent with the adopted comprehensive plan in a city within the seven-county Twin Cities metropolitan area; and

WHEREAS, on April 13, 2017, an EAW was completed for Riverstone Addition, which includes up to 246 detached single-family homes and 98 attached townhome units; and

WHEREAS, by April 24, 2017, copies of the EAW were distributed to all persons and agencies on the official Environmental Quality Board (EQB) distribution list and other interested parties; and

WHEREAS, on April 24, 2017, the EAW was publicly noticed in the EQB Monitor, commencing the 30-day public comment period; and

WHEREAS, a press release and public notice was submitted to the Anoka County Union Herald and published on April 21, 2017, announcing the completion of the EAW, its availability to interested parties, and the process for submitting comments on the EAW; and

WHEREAS, the 30-day comment period ended May 24, 2017 at 4:30 p.m., and the City of Ramsey accepted and responded to all written comments received; and

WHEREAS, none of the comments received recommended preparation of an EIS, and none suggested that the project had the potential to cause significant environmental effects.

NOW THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF RAMSEY, ANOKA COUNTY, STATE OF MINNESOTA, THAT:

1. The EAW was prepared in compliance with the procedures of the Minnesota Environmental Policy Act and Minnesota Rules, Parts 4410.1000 to 4410.1700 (2015),

2. The EAW satisfactorily addressed the environmental issues for which existing information could have been reasonably obtained,

3. Based on the criteria established in Minnesota Rules 4410.1700, the project does not have the potential for significant environmental effects,

4. The City makes a "Negative Declaration,"

5. **An EIS is not required,** and

6. The City adopts the Response to Comments, Findings of Fact, and Record of Decision for Riverstone Addition Environmental Assessment Worksheet (Record of Decision) and directs the Community Development Director to maintain the Record of Decision and to distribute it in accordance with the EQB rules.

The motion for the adoption of the foregoing resolution was duly seconded by Councilmember _____, and upon vote being taken thereon, the following voted in favor thereof:

Mayor Strommen
Councilmember Williams
Councilmember Kuzma
Councilmember LeTourneau
Councilmember Johns
Councilmember Riley
Councilmember Shryock

and the following voted against the same:

None

and the following abstained:

None

and the following were absent:

None

Whereupon said resolution was declared duly passed and adopted by the Ramsey City Council this the 13th day of June, 2017.

_____

Mayor

ATTEST:

_____

City Clerk

Appendix A
Written Comments Submitted to the City of Ramsey

Record of Decision
Riverstone Addition EAW

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DEPARTMENT OF NATURAL RESOURCES

Minnesota Department of Natural Resources
Ecological and Water Resource
1200 Warner Road
St. Paul, MN 55106

May 16, 2017 Transmitted Electronically

Tim Gladhill
Community Development Director
7550 Sunwood Drive NW
Ramsey, MN 5303

Re: Riverstone Addition EAW

Dear Tim Gladhill,

The Minnesota Department of Natural Resources (DNR) has reviewed the Environmental Assessment Worksheet (EAW) for the Riverstone Addition located in Ramsey, MN. We offer the following comments for your consideration.

Shorelands (page 7)

The EAW acknowledges that a portion of the site is in the Shoreland Overlay District of Lake Itasca, but suggests that the shoreland in the project area is eligible to be reduced because Alpine Drive NW functions as a drainage divide, such that the project area will not drain north to Lake Itasca. Please note that any removal of shoreland district area is subject to review and approval by DNR and it is unlikely that this request would be approved. Shoreland throughout the state contains roads (topographic divides) that have changed the drainage direction of overland sheet flow. Allowing land to be removed from a shoreland because of these human modifications to the landscape would defeat the purpose of the shoreland program. Shoreland is defined as a specific distance from a water body, not by topographic divide. Therefore, the portion of the development within the 1,000 foot shoreland district of Lake Itasca should be designed to comply with the standards in the City's Shoreland ordinance.

Floodplains (page 7)

The EAW indicates that in connection with a previous development, a water level analysis showed that Lake Itasca does not outlet during 100-year snowmelt and rainfall events, but modeled water levels came close to reaching the outlet on the south side of the lake, so the City of Ramsey proposed to install an outlet for the lake. It is not clear from the EAW discussion whether that outlet was previously installed or is being proposed in connection with this development proposal. Please note that any change to the existing outlet characteristics of the lake will likely require a Public Waters Work Permit.

Surface/Groundwater Appropriations (pages 15 - 16)

We recommend that ground water conservation measures, such as stormwater reuse for irrigation and use of drought tolerant native plants for landscaping, be incorporated into the development design.

Fish, Wildlife, Plant Communities and Sensitive Ecological Resources (Rare Features) (pages 20 -22)

As stated in DNR's NHIS letter, the Blanding's turtle flyer and fact sheet should be provided to all contractors working in the area (see Appendix D of EAW). If Blanding's turtles are in imminent danger they should be moved by hand out of harm's way, otherwise they should be left undisturbed. Please remember that state law and rules prohibit the destruction of threatened or endangered species, except under certain prescribed conditions.

Thank you for the consideration of our comments.

Sincerely,

/s/ Rebecca Horton

CC: Kate Drewry, Melissa Doperalski

DEPARTMENT OF TRANSPORTATION

Metropolitan District
1500 County Road B2 West
Roseville, MN 55113

May 18, 2017

Tim Gladhill
City of Ramsey
Community Development Director
7550 Sunwood Dr. NW
Ramsey, MN 55303

SUBJECT: Riverstone Addition
MnDOT Review #EAW17-008
NW quad US10 and Puma St
Ramsey, Anoka County

Dear Mr. Gladhill:

Thank you for the opportunity to review the Riverstone Addition EAW. Please note that MnDOT's review of this EAW does not constitute approval of a regional traffic analysis and is not a specific approval for access or new roadway improvements. As plans are refined, please keep MnDOT's staff informed of any major changes. MnDOT's has reviewed the document and has the following comments:

Permit Required
Any use of or work within or affecting MnDOT right of way requires a permit. Permit forms are available from MnDOT's utility website at http://www.dot.state.mn.us/metro/maintenance/permits.html

Please include one to one set of plans formatted to 11X17 with each permit application. : Please submit/send all permit applications and 11X17plan sets to: metropermitapps.dot@state.mn.us
Please direct any questions regarding permit requirements to Buck Craig (651-234-7911) of MnDOT's Metro Permits Section.

Review Submittal Options:
MnDOT's goal is to complete the review of plans within 30 days. Submittals sent in electronically can usually be turned around faster. There are four submittal options. Please submit either:

1. One (1) electronic pdf. version of the plans. MnDOT can accept the plans via e-mail at metrodevreviews.dot@state.mn.us provided that each separate e-mail is under 20 megabytes.
2. Three (3) sets of full size plans. Although submitting seven sets of full size plans will expedite the review process. Plans can be sent to:

   MnDOT – Metro District Planning Section
   Development Reviews Coordinator
   1500 West County Road B-2
   Roseville, MN 55113

3. One (1) compact disc.

4. Plans can also be submitted to MnDOT's External FTP Site. Please send files to: ftp://ftp2.dot.state.mn.us/pub/incoming/MetroWatersEdge/Planning Internet Explorer doesn't work using ftp so please use an FTP Client or your Windows Explorer (My Computer). Also, please send a note to metrodevreviews.dot@state.mn.us indicating that the plans have been submitted on the FTP site.

If you have any questions concerning this review please feel free to contact me at (651) 234-7784.

Sincerely,

Karen Scheffing
Principal Planner

Copy sent via E-Mail:
Brian Kelly, Water Resources
Buck Craig, Permits
Gayle Gedstad, Traffic
Ashley Roup, Right-of-Way
Paul Jung, Area Engineer
Nancy Jacobson, Design
Russell Owen, Metropolitan Council

Minnesota Pollution Control Agency

520 Lafayette Road North | St. Paul, Minnesota 55155-4194 | 651-296-6300

800-657-3864 | Use your preferred relay service | info.pca@state.mn.us | Equal Opportunity Employer

May 24, 2017

Mr. Tim Gladhill
Community Development Director
City of Ramsey
7550 Sunwood Drive NW
Ramsey, MN 55303

Re: Riverstone Addition Environmental Assessment Worksheet

Dear Mr. Gladhill:

Thank you for the opportunity to review and comment on the Environmental Assessment Worksheet (EAW) for the Riverstone Addition project (Project) located in the city of Ramsey, Anoka County, Minnesota. The Project consists of an 89-acre residential development. Regarding matters for which the Minnesota Pollution Control Agency (MPCA) has regulatory responsibility and other interests, the MPCA staff has the following comments for your consideration.

Low Impact Design

The MPCA advocates the use of Low Impact Design (LID) practices to aid in the minimization of stormwater impacts. LID is a stormwater management approach and site-design technique that emphasizes water infiltration, values water as a resource, and promotes the use of natural systems to treat water runoff. Examples include:

- Special ditches, arranged in a series, that soak up more water
- Vegetated filter strips at the edges of paved surfaces
- Trees or swales between rows of cars
- Residential or commercial rain gardens designed to capture and soak in stormwater
- Porous pavers, concrete, and asphalt for sidewalks and parking lots
- Narrower streets
- Rain barrels and cisterns
- Green roofs

LID concepts may be found in the *State of Minnesota Stormwater Manual* dated November 2005 located on the MPCA website at: http://www.pca.state.mn.us/water/stormwater/stormwater-manual.html.

In addition, the MPCA LID webpage provides a description and examples of LID features such as permeable pavement, rain gardens, and green roofs. Links to other resources on LID are available as well. The website is located at: https://www.pca.state.mn.us/water/stormwater-management-low-impact-development-and-green-infrastructure.

We appreciate the opportunity to review this Project. Please provide the notice of decision on the need for an Environmental Impact Statement. Please be aware that this letter does not constitute approval by the MPCA of any or all elements of the Project for the purpose of pending or future permit action(s) by the MPCA. Ultimately, it is the responsibility of the Project proposer to secure any required permits and to comply with any requisite permit conditions. If you have any questions concerning our review of this EAW, please contact me via email at Karen.kromar@state.mn.us or via telephone at 651-757-2508.

Sincerely,

Karen Kromar

Karen Kromar
Planner Principal
Environmental Review Unit
Resource Management and Assistance Division

KK:bt

cc: Dan Card, MPCA, St. Paul
Teresa McDill, MPCA, St. Paul

Minnesota
Historical Society

MINNESOTA HISTORIC PRESERVATION OFFICE

May 23, 2017

Mr. Tim Gladhill
Community Development Director
City of Ramsey
7550 Sunwood Dr NW
Ramsey, MN 55303

RE: EAW – Riverstone Addition
T32 R25 S20 and S29, Ramsey, Anoka County
MnHPO Number: 2017-1792

Dear Mr. Gladhill:

Thank you for providing this office with a copy of the Environmental Assessment Worksheet (EAW) for the above-referenced project.

Based on our review of the project information, we conclude that there are no properties listed in the National or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by this project.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36 CFR § 800. If this project is considered for federal financial assistance, or requires a federal permit or license, then review and consultation with our office will need to be initiated by the lead federal agency. Be advised that comments and recommendations provided by our office for this state-level review may differ from findings and determinations made by the federal agency as part of review and consultation under Section 106.

Please contact our Compliance Section at (651) 259-3455 if you have any questions regarding our review of this project.

Sincerely,

Sarah J. Beimers, Manager
Government Programs and Compliance

May 22, 2017

Tim Gladhill
Community Development Director
City of Ramsey
7550 Sunwood Drive NW
Ramsey, MN 55303

RE: City of Ramsey Environmental Assessment Worksheet (EAW) – Riverstone Development
Metropolitan Council Review No. 21716-1
Metropolitan Council District 9

Dear Mr. Gladhill:

The Metropolitan Council received an EAW for the Riverstone Development on April 21, 2017. This EAW reviews a project which will include up to 246 detached single-family homes and 98 attached townhome units on 89.44 acres of land in the City of Ramsey. Site development will include installation of municipal sewer and water, grading, and stormwater features. The project area is bordered on the north by Alpine Drive NW, on the east by Puma Street NW, on the south by the Burlington Northern Railroad and U.S. Highway 10/169, and the west by the Links at Northfork Golf Course.

Council staff has conducted a review of this EAW to determine its adequacy and accuracy in addressing regional concerns and the potential for significant environmental impact. The staff review finds that the EAW is complete and accurate with respect to regional concerns and does not raise issues of consistency with Council policies. The following sections offer comments regarding technical information that should be included in the EAW as well as advisory comments for the City's consideration.

Item 8 – Permits and Approvals Required *(Jim Larsen, 651-602-1159)*
In accordance with Minnesota Statute Section 473.513, at the time the project proposer makes application to the Minnesota Pollution Control Agency (MPCA) for a permit to construct each segment of sanitary sewer for the proposed project, a copy of the plans, design data, and a location map of the project will also need to be submitted to the Metropolitan Council. The Council's Environmental Service Engineering Programs staff will need to review, comment, and issue a nonobjection decision relative to issuance of the construction permit by the MPCA before connection can be made to the City's wastewater disposal system.

Item 11.b.iv.a. – Water Resources – Surface Waters – Wetlands *(Jim Larsen, 651-602-1159)*
The EAW states that the two wetlands to be retained within the project site, when delineated in October of 2016, had dominant vegetation consisting of soybeans, reed canary grass, and stunted corn. It also indicates that Lower Rum River Watershed Management Organization wetland protection standards will require native vegetation to be established within a 16.5-foot wide buffer strip around the wetlands. Council staff encourages the City and Watershed to work with the project proposer to restore wetland habitat within these two degraded wetlands as a part of the overall project, so that they can become an amenity for the proposed development once buffers have been reestablished around them.

Item 13 – Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features) *(Jim Larsen, 651-602-1159)*
The EAW states that Blanding's turtles (*Emydoidea blandingii*), a state threatened reptile species, has been observed in the vicinity of the proposed project. The prevalence of wetlands, stormwater treatment, and infiltration basins on and near this site raises the concern for wildlife impacts following completion of the proposed project. Indigenous fauna will likely attempt to remain in the area, in spite of its gradual conversion from a rural to an urban setting. Council staff recommends that the City specify the utilization of sloping, surmountable curbing throughout the project site. The use of standard, near-vertical B524 or similar curbing can be expected to result in nearly full mortality of the area's turtle population by entrapping them within roadways as they pass between and to nearby water basins for feeding and nesting. The simple change to a more gently sloping curb, consistent with DNR's recommendation and guidance contained in Appendix D will reduce fauna mortality risks in the area without impacts to stormwater flow, driver and pedestrian safety, or maintenance activities. Use of Minnesota Department of Transportation Curb and Gutter Design No. S524 or similar design profile is suggested.

Item 8 – Permits and Approvals Required *(Eric Wojchik, 651-602-1330)*
Table 3 shows that a Comprehensive Plan Amendment has been submitted for the Riverstone project. This detail should be amended to state 'To be applied for' because, as of the date of this letter, no amendment for this development has been submitted to the Metropolitan Council.

Forecasts *(Todd Graham, 651-602-1322)*
TAZ forecasts are not discussed in plan materials, but this would be helpful information. A draft set of TAZ forecasts for 2040 has been prepared by Met Council and is available for local governments to review.

The Riverstone site is within TAZ #61. The zone is currently forecasted to gain +86 households during 2014-40. Council staff recommend adding +260 households and +650 population to the TAZ #61 forecast, to reflect the planned Riverstone development. *Balancing adjustments* can be made to TAZs elsewhere in the community. The City can update the TAZ forecast through correspondence to Metropolitan Council.

Council staff opinion is that the expected development fits within the community total forecast prepared by Metropolitan Council; no change is needed to the community total forecast.

This concludes the Council's review of the EAW. The Council will take no formal action on the EAW. If you have any questions or need further information, please contact Eric Wojchik, Principal Reviewer, at 651-602-1330.

Sincerely,

LisaBeth Barajas, Manager
Local Planning Assistance

CC: Steve O'Brien, MHFA
Tod Sherman, Development Reviews Coordinator, MnDOT - Metro Division
Todd Haas, Board Chair, Lower Rum River WMO
Edward Reynoso, Metropolitan Council District 9
Eric Wojchik, Principal Reviewer/Sector Representative
Raya Esmaeili, Reviews Coordinator

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Appendix B
Noise Study

Record of Decision
Riverstone Addition EAW

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SBP ASSOCIATES, INC.

22502 Beach Road
Deerwood, MN 56444
Phone: 952-920-1500

Riverstone Addition
Ramsey, Minnesota
Noise Study
May, 2017

I. Project Description

Riverstone Development, LLC is proposing a residential development in Ramsey, Minnesota. The proposed project location is bordered on the south by Minnesota Highway 10 (TH 10) and a Burlington Northern railroad track. The proposed project location and layout is shown in Figure 1. Because of the potential noise impacts from TH 10 traffic, the City of Ramsey has requested a noise study to evaluate the proposed project relative to Minnesota Noise Standards.

The project is proposing a berm between the residential area and the highway and railroad.

II. Minnesota Noise Standards

Minnesota Rules Chapter 7030 provide the Minnesota standards for noise. These standards describe the limiting levels of sound established on the basis of present knowledge for the preservation of health and welfare. These standards are designed to be consistent with sleep, speech, annoyance, and hearing conservation requirements for receivers within areas grouped according to land use activities. The Minnesota standards are as follows:

	7:00 AM to 10:00 PM		10:00 PM to 7:00 AM	
	L_{10}	L_{50}	L_{10}	L_{50}
NAC-1 (Residential)	65	60	55	50
NAC-2 (Commercial)	70	65	70	65
NAC-3 (Industrial)	80	75	80	75

L_{10} means the sound level which is exceeded for 10 percent of the time for a one-hour period. L_{50} means the sound level which is exceeded 50 percent of the time for a one-hour period. Sound levels are expressed in dBA. A dBA is a unit of sound level expressed in decibels and weighted for the purpose of determining the human response to sound.

The nighttime NAC-1 standards are designed to prevent sleep interference for people sleeping in bedrooms with partially open windows. NAC-2 nighttime standards apply to NAC-1 locations if the building is constructed in such a way that the exterior to interior sound level attenuation is at least 30 dBA and the building has year-round climate control. Buildings meeting the State building code requirements typically meet the 30 dBA exterior to interior sound level attenuation requirement.

The NAC-1 daytime standards are designed to prevent speech interference in areas for outdoor activities. Areas for outdoor activities are not allowed if these noise levels are exceeded.

III. Noise Monitoring

SBP conducted monitoring on May 5, 2017 at locations representing the first and second rows of homes nearest the highway and railroad. Two of the locations (M1 and M2) are representative of the residential locations in the first row of housing away nearest the railroad and highway, and one location (M3) is representative of the second row of housing. The monitoring locations are shown in Figure 1.

Monitoring was conducted with two Type 1 sound analyzers, a Sinus Apollo, and CEL Model 593. Each analyzer was periodically field calibrated during the testing. Monitoring was conducted consistent with MPCA procedures. Monitoring was conducted for periods of 30 minutes to one hour in length.

The following table presents the results of the noise monitoring.

Table 1
Noise Monitoring Results – May 5, 2017
Riverstone Addition, Ramsey, MN

Location	Distance North of Railroad Track	Time	L_{10} (dBA)	L_{50} (dBA)	Notes
M1	165 feet	1126-1156	60.2	54.0	1 NB Train
M2	165 feet	1128-1158	60.5	54.5	1 NB Train
M1	165 feet	1221-1251	58.9	53.3	No Train
M1	165 feet	1251-1321	60.5	54.7	No Train
M1	165 feet	1332-1432	64.4	58.3	2 SB trains, 1 NB at the End
M3	400 feet	1209-1239	56.0	51.5	No Train
M3	400 feet	1322-1357	60.0	55.0	1 SB Train
M3	400 feet	1407-1447	61.5	57.5	2 NB Trains

In addition to this summary data, SBP also collected detailed time history data during selected monitoring periods. This data has been used to determine the impact of train noise relative to the State Standards. Complete monitoring data sets are available upon request.

The data shows the site noise levels to be well below the State daytime standards for the earlier monitoring periods, and within, but very near the Standards for the later period at location M1. This is likely due to increasing traffic volumes in the later afternoon.

IV. Highway 10 Noise Impacts - Noise Modeling Results

In order to determine the post-development noise impacts from Highway 10, SBP used the MINNOISEV31 traffic noise model to determine daytime and nighttime peak noise hour noise levels at selected residential locations in the proposed development. MINNOISEV31 is a modified version of the FHWA noise prediction model STAMINA 2.0.

Receptor Locations

Noise impacts were modeled at 19 receptors representing worst-case residential locations for noise impacts from Highway 10. The receptor locations are shown in Figure 1.

Traffic and High Noise Hour Determination

Generally, the highest hours for traffic noise impacts are when heavy truck volumes are high and there is free flowing traffic. Hourly breakdowns of existing traffic and heavy truck volumes for Highway 10 at this location were provided by Spack Consulting.

Based on this data, SBP conducted modeling of impacts at the project receptor locations using traffic volumes from likely high impact hours. It was determined that the 4:00 pm to 5:00 pm hour is the high impact daytime (7:00 am to 10:00 pm) hour for this location. The 6:00 am to 7:00 am hour is the highest impact nighttime (10:00 pm to 7:00 am) hour for this location.

Modeled Highway Noise Impacts

Table 2 and 3 present the modeled daytime and nighttime peak hour noise level impacts at each of the 22 receptor locations.

Table 2
Daytime Peak-Hour Highway Noise Modeling Noise Impact Results – May 5, 2017
Riverstone Addition, Ramsey, MN

Receptor	L_{10} (dBA)*	L_{50} (dBA)*
R1	63.2	59.6
R1A	64.0	**60.4**
R1B	63.2	59.7
R2	60.8	57.3
R3	58.7	55.5
R4	57.6	54.7
R5	57.5	54.3
R6	57.2	54.2
R7	57.8	54.9
R8	60.2	56.9
R9	59.1	55.9
R10	55.9	53.2
R11	60.6	57.6
R12	60.2	57.1
R13	58.1	55.2
R14	57.6	54.7
R15	55.9	53.2
R16	56.3	53.5
R17	53.5	51.0

*Bolded numbers exceed Minnesota NAC-1 standards for daytime hours.

Table 3
Nighttime Peak-Hour Highway Noise Modeling Noise Impact Results – May 5, 2017
Riverstone Addition, Ramsey, MN

Receptor	L_{10} (dBA)	L_{50} (dBA
R1	**61.9**	**57.8**
R1A	**62.7**	**58.7**
R1B	**61.9**	**58.1**
R2	**59.6**	**55.7**
R3	**57.4**	**53.8**
R4	**56.4**	**53.1**
R5	**56.3**	**52.7**
R6	**56.0**	**52.6**
R7	**56.5**	**53.2**
R8	**58.9**	**55.2**
R9	**57.9**	**54.4**
R10	54.8	**51.8**
R11	**59.4**	**56.0**
R12	**59.0**	**55.6**
R13	**56.9**	**53.7**
R14	**56.4**	**53.3**
R15	**54.8**	**51.8**
R16	**55.1**	**52.0**
R17	52.4	49.6

*Bolded numbers exceed Minnesota NAC-1 standards for nighttime hours.

The modeled noise level at one of the 19 receptor locations exceeds the Minnesota NAC-1 standards for daytime hours. The modeled noise level at all but one of the receptor locations exceeds the Minnesota NAC-1 standards for nighttime hours.

The NAC-1 daytime standards are designed to prevent speech interference in areas for outdoor activities. Areas for outdoor activities are not allowed if these noise levels are exceeded. The modeled L_{50} noise level at Receptor R1A exceeds the State standard by just 0.4 dBA. Remedies could include 1) having no areas for outdoor use in the portion of the property facing the roadway, 2)a barrier (solid fence) around all or a portion of the yard or patio at this home blocking the line of site between the vehicles on the road and an area designated for outdoor use or, 3) extending the proposed berm to provide additional mitigation at this location.

The nighttime NAC-1 standards are designed to prevent sleep interference for people sleeping in bedrooms with partially open windows. NAC-2 nighttime standards apply to NAC-1 locations if the building is constructed in such a way that the exterior to interior sound level attenuation is at least 30 dBA and the building has year-round climate control. Buildings meeting the State building code requirements typically meet the 30 dBA exterior to interior sound level attenuation requirement.

All modeled nighttime impacts are within the NAC-2 standards. Therefore, assuming the proposed residences will have year-round climate control, the modeled impacts at the proposed development are within the State noise standards and no additional mitigation is required.

V. Railroad Noise Impacts

Based on the noise monitoring data collected during train pass-bys, the trains are not generally expected to cause exceedances of the State Noise standards. Analysis of time history data for the train pass-bys show that the full length trains cause elevated noise levels (above 64.5 dBA) for about 90 to 110 seconds. Without, the proposed berm, it would take four or more full length trains passing by in an hour to approach the 6 minutes of impact required for the L_{10} exceedances. One to three full length trains passed by per hour during the monitoring. This is consistent with MnDOT rail traffic information for this track. Therefore, train noise is not likely to cause the Minnesota noise standards to be exceeded in a way that requires additional mitigation.

VI. Summary and Conclusions

Riverstone Development, LLC is proposing a residential development in Ramsey, Minnesota. The proposed project location is bordered on the south by Minnesota Highway 10 (TH 10) and a Burlington Northern railroad track. The proposed project location and layout is shown in Figure 1. Because of the potential noise impacts from TH 10 traffic , the City of Ramsey as requested a noise study to evaluate the proposed project relative to Minnesota Noise Standards.

The project is proposing a berm between the residential area and the highway and railroad.

Post-development noise levels were predicted for 19 receptor locations using monitoring data and computer modeling

The modeled noise level at one of the 19 receptor locations exceeds the Minnesota NAC-1 standards for daytime hours. The modeled noise level at all but one of the receptor locations exceeds the Minnesota NAC-1 standards for nighttime hours.

The NAC-1 daytime standards are designed to prevent speech interference in areas for outdoor activities. Areas for outdoor activities are not allowed if these noise levels are exceeded. The modeled L_{50} noise level at Receptor R1A exceeds the State standard by just 0.4 dBA. Remedies could include 1) having no areas for outdoor use in the portion of the property facing the roadway, 2)a barrier (solid fence) around all or a portion of the yard or patio at this home blocking the line of site between the vehicles on the road and an area designated for outdoor use or, 3) extending the proposed berm to provide additional mitigation at this location.

The nighttime NAC-1 standards are designed to prevent sleep interference for people sleeping in bedrooms with partially open windows. NAC-2 nighttime standards apply to NAC-1 locations if the building is constructed in such a way that the exterior to interior sound level attenuation is at least 30 dBA and the building has year-round climate control. Buildings meeting the State building code requirements typically meet the 30 dBA exterior to interior sound level attenuation requirement.

Based on the noise monitoring data collected during train pass-bys, the trains are not generally expected to cause exceedances of the State Noise standards. Analysis of time history Monitoring data collected train pass-bys at the project site show that the full length trains cause elevated noise levels (above 64.5 dBA) for about 90 to 110 seconds. Without the proposed berm, it would likely take four or more full length trains passing by in an hour to approach the 6 minutes of impact required for the L_{10} exceedances. One to three full length trains passed by per hour during the monitoring. This is consistent with MnDOT rail traffic information for this track. Therefore, train noise is not likely to cause the Minnesota noise standards to be exceeded in a way that requires additional mitigation.

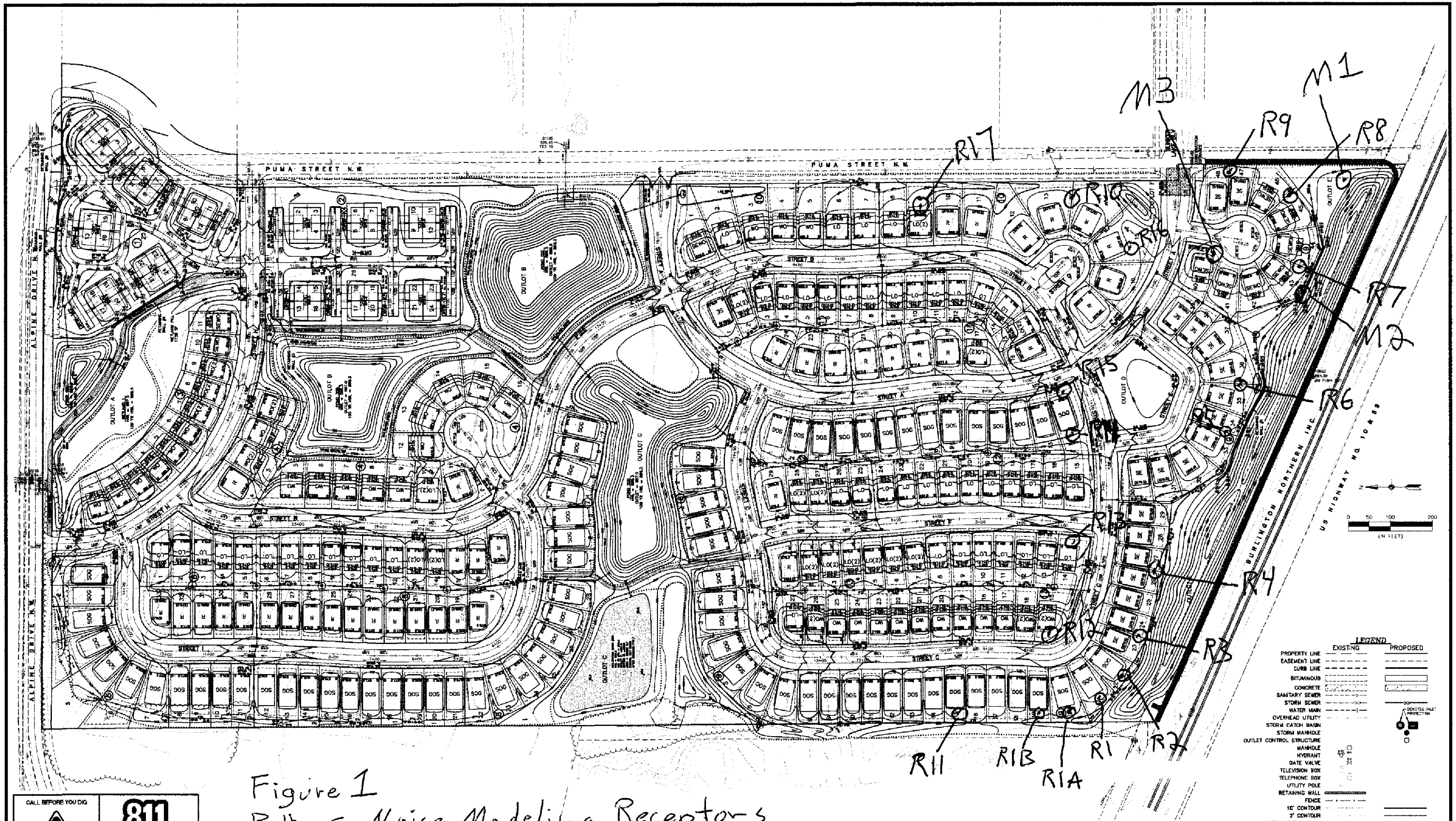

Figure 1
R# = Noise Modeling Receptors
M# = Noise Monitoring Locations

WETLAND SUMMARY

WETLAND FILL = 1738 SF

NOTE: WETLAND FILL TOTAL IS LESS THAN THE DEMINIMUS AMOUNT; NO WETLAND REPLACEMENT WILL BE REQUIRED

CALL BEFORE YOU DIG
811
Know what's below. Call before you dig.

The subsurface utility information shown on this plan is utility Quality Level D. This quality level was determined according to the guidelines of CI/ASCE 38-02, entitled "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data."

Carlson McCain
• environmental
• engineering
• surveying
3890 Pheasant Ridge Drive NE, Suite 100
Blaine, MN 55449
Phone: (763) 489-7900
Fax: (763) 489-7959
www.carlsonmccain.com

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

Print Name: Brian J. Krystofiak, P.E.
Signature:
Date: 3/08/17 License #: 25053

Drawn:
Designed: BJK
Date: 3/08/17

Revisions:
1.

RIVERSTONE DEVELOPMENT, LLC.
14015 Sunfish Lake B, Suite 400
Ramsey, MN 55303

RIVERSTONE
Ramsey, MN

GRADING PLAN

Save Date: 3/08/2017 P:\Jobs\0433 - 0480\0433 - Ramsey Use and Zoning\engineering\cad\Elements\0433_gp-1hr.dwg

Appendix C
Updated Traffic Study

Record of Decision
Riverstone Addition EAW

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Spack CONSULTING
ENGINEERING TRAFFIC FORWARD

Traffic Impact Study

Capstone Homes Residential Development
Ramsey, Minnesota

I hereby certify this report was prepared by me or under my direct supervision, and I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By: _____
Vern Swing, P.E.
License No. 41417

Date: May 2, 2017

Executive Summary

Background: The Capstone Homes Development is proposed for construction on the vacant land bounded by Puma Street, Alpine Drive, Trunk Highway (TH) 10, and Links at Northfork Golf Course in Ramsey, Minnesota. This development will include 344 total residential units (98 townhomes and 246 single family homes). The purpose of this study is to determine the traffic impacts associated with the build out of the proposed development on the study intersections.

Results: The principal findings of this traffic study are:

- The proposed expansion is expected to generate approximately 2,912 new trips during an average weekday (1,456 entering and 1,456 exiting), approximately 227 new trips during the a.m. peak hour (53 entering and 174 exiting) and approximately 297 new trips during the p.m. peak hour (189 entering and 108 exiting).
- The existing study intersections operate with acceptable delays and vehicle queues today with slightly increased queueing and delay at TH 10/Alpine Drive.
- The study intersections are expected to operate acceptably during the 2040 no-build and build scenarios with the exception of TH 10/Alpine Drive.
- TH 10/Alpine Drive experiences slightly higher than preferred queueing along Alpine Drive, however this is expected at side street stop controlled intersection with heavy mainline volume.
- Left turn lanes are not warranted based on the expected 2040 build year volumes and mainline speeds.
- Right turn lane warrants are not fulfilled due to the mainline speeds remaining below 45 MPH, which is consistent for neighborhood streets, however, the right turn lane volume thresholds were reached by the estimated 2040 Build volumes.
- There are no safety concerns with regards to turn lanes, due to the low queues, minimal delay, and good sight distance provided at all site accesses

Recommendations: The following items are recommended based on the analyses contained in this study:

- No additional intersection mitigation is required to help improve capacity. However, the TH 10/Alpine Drive intersection should be monitored to determine when volumes breach the Eight-Hour Traffic Signal Warrant as the projected volumes are heavily dependent on a number of anticipated developments that are not guaranteed to occur.
- Coordinate TH 10/Alpine Drive improvements with MnDOT once the Eight Hour Warrant is exceeded.
- If the speed limits along Puma Street or Alpine Drive are increased to 45 MPH or higher, re-evaluate the Turn-Lane warrants.
- Construct a new sidewalk/trail along the southern edge of Alpine Drive connecting the proposed access to the existing Alpine Drive/Puma Street intersection. The addition of a north/south crosswalk should also be considered at this intersection to help promote safe crossing to the existing northern sidewalk/trail.
- Ensure the proposed internal sidewalks connect to the external sidewalk/trail system.
- Work with Metro Transit or their affiliates to improve transit options within the project area as the closest existing transit is located roughly 1.5 miles away at Ramsey Station and Platform.

This study is based upon a concept plan from January 6, 2017. Assuming the general characteristics of the proposed development remain approximately the same as documented, minor changes in the final design are not expected to alter the results or recommendations of this study.

TABLE OF CONTENTS

LIST OF TABLES & CHARTS

1. Introduction

a. Proposed Development

The Capstone Homes Development is proposing to construct a new residential development located on the vacant land bounded by Puma Street, Alpine Drive, Trunk Highway (TH) 10, and Links at Northfork Golf Course in Ramsey, Minnesota. The development is currently proposed to include 98 townhomes and 246 single family homes for a total of 344 units.

For the purposes of this study, the development is expected to be fully built and occupied by the 2040 forecast year.

b. Purpose of Study

The purpose of this study is to:

i. Examine the existing operations of the surrounding study intersections.
ii. Forecast the amount of traffic expected to be generated by the proposed development.
iii. Determine the traffic impacts associated with the build out of the proposed development.

The traffic impacts are studied on the roads and intersections where significant impact is anticipated and improvements are recommended where mitigation is needed. For those not familiar with the general concepts and terms associated with traffic engineering, *The Language of Traffic Engineering* guide is included in the Appendix.

c. Study Objectives

The objectives of this study are:

i. Document how the study intersections and roadways currently operate.
ii. Forecast the amount of traffic expected to be generated by the proposed development.
iii. Determine how the study intersections and roadways will operate in the future AM and PM peak hours with the proposed development.
iv. Recommend appropriate mitigation and operation measures to improve operations if deficiencies are identified within the development or on the study intersections.

The study intersections closest to the proposed development were chosen for review as these will experience the greatest impact from traffic associated with the development. The study intersections include:

i. Alpine Drive/Puma Street
ii. Bunker Lake Boulevard/Puma Street
iii. Alpine Drive/Site Access
iv. Puma Street/Site Accesses
v. Alpine Drive/TH 10

2. Existing Conditions

a. Corridor Characteristics

As mentioned, the proposed site is located to the west of Puma Street, south of Alpine Drive, and north of Trunk Highway (TH) 10 in Ramsey, Minnesota. Table 1 shows the characteristics of the key roadway corridors around this site and within the study area.

Table 1 – Study Corridor Characteristics

Name[1]	Designation	Speed Limit	Lanes	Transit[2]	Peds/ Bicycles
Bunker Lake Boulevard (MSAS 12)	Minor Collector	30 mph	2 undivided	None	Sidewalk on north side
Puma Street (MSAS 109)	Local Street	30 mph	2 undivided	None	Sidewalk on west side
Alpine Drive (MSAS 112)	Minor Collector	40 mph	2 undivided	None	Sidewalk on north side
Trunk Highway 10	Principal Arterial	65 mph	4 divided	None	No sidewalks

[1] *MSAS = Municipal State Aid Street*
[2] *Transit routes are available roughly 1.5 miles away at Ramsey Station & Platform*

b. Traffic Volumes

48-hour intersection videos were collected at the existing study intersections under normal weekday conditions in February 2017. Using these videos, 24-hour turning movement counts were created by averaging the two days to smooth out any single day anomalies and create a typical day.

Based on these averages, the AM and PM peaks were determined to be 7:00 AM to 8:00AM and 4:45PM to 5:45 PM. The averaged turning movement counts from these two peak hours were used at the study intersections for analysis. The turning movement count data from the counts are contained in fifteen minute intervals in the Appendix.

Based on the Weekday turning movement volumes, the current daily traffic volumes on each study corridor are:

i. 38 vehicles per day on Bunker Lake Boulevard.
ii. 100 vehicles per day on Puma Street.
iii. 1,100 vehicles per day on Alpine Drive.

3. Forecasted Traffic

a. Site Traffic Forecasting

The *Institute of Transportation Engineers (ITE)* provides the *Trip Generation Manual, 9th Edition*, the standard document for determining expected traffic for proposed land uses. Using this ITE information, trip generation forecasts can be made for the development site.

The ITE manual compiles studies from across the country to provide a national average traffic for various land uses. For the proposed residential development, the designation of Single Family Homes and Townhomes were used. Based on information supplied in the site plan, the development is currently proposed to include 98 townhomes and 246 single family homes for a total of 344 units. With this information, the expected trip generation was completed based on the full build out of the development.

The resultant new trips generated by the proposed development are shown in Table 2. A detailed trip generation table showing the exact breakdowns is provided in the Appendix.

Table 2 – New Trip Generation

Land Use Code – Source	Description & Size	Daily		AM Peak Hour		PM Peak Hour	
		Total In	Total Out	Total In	Total Out	Total In	Total Out
210	Single Family Home	1,171	1,171	46	138	155	91
230	Townhomes	285	285	7	36	34	17
TOTAL		**1,456**	**1,456**	**53**	**174**	**189**	**108**

A trip distribution pattern was developed for the site generated traffic going to and from the proposed development. This pattern is based on the existing traffic volumes, access locations, location of major roadways leading to and from the site, and prior studies within the project area. The general trip distribution pattern for this study is:

i. 22 percent of the site generated traffic to/from the west on Alpine Drive.
ii. 19 percent of the site generated traffic to/from the east on Alpine Drive.
iii. 59 percent of the site generated traffic to/from the east on Bunker Lake Boulevard.

Traffic generated by the development of the site was assigned to the area roadways per this distribution pattern.

b. Non-site Traffic Forecasting

To forecast future traffic volumes for the year 2040 in the study area outside of the proposed development's traffic, additional trip generations were considered based on proposed developments within the project area. These trip generations

were based on a prior study completed by Bolton & Menk analyzing the future Business/Industrial Park developments, which included a preliminary look at the Capstone Homes Development. Using this study, the total acreage of the new proposed land uses were determined and their corresponding trip generations were completed. The developments included in this background growth can be seen, highlighted in yellow, in Figure 1, below.

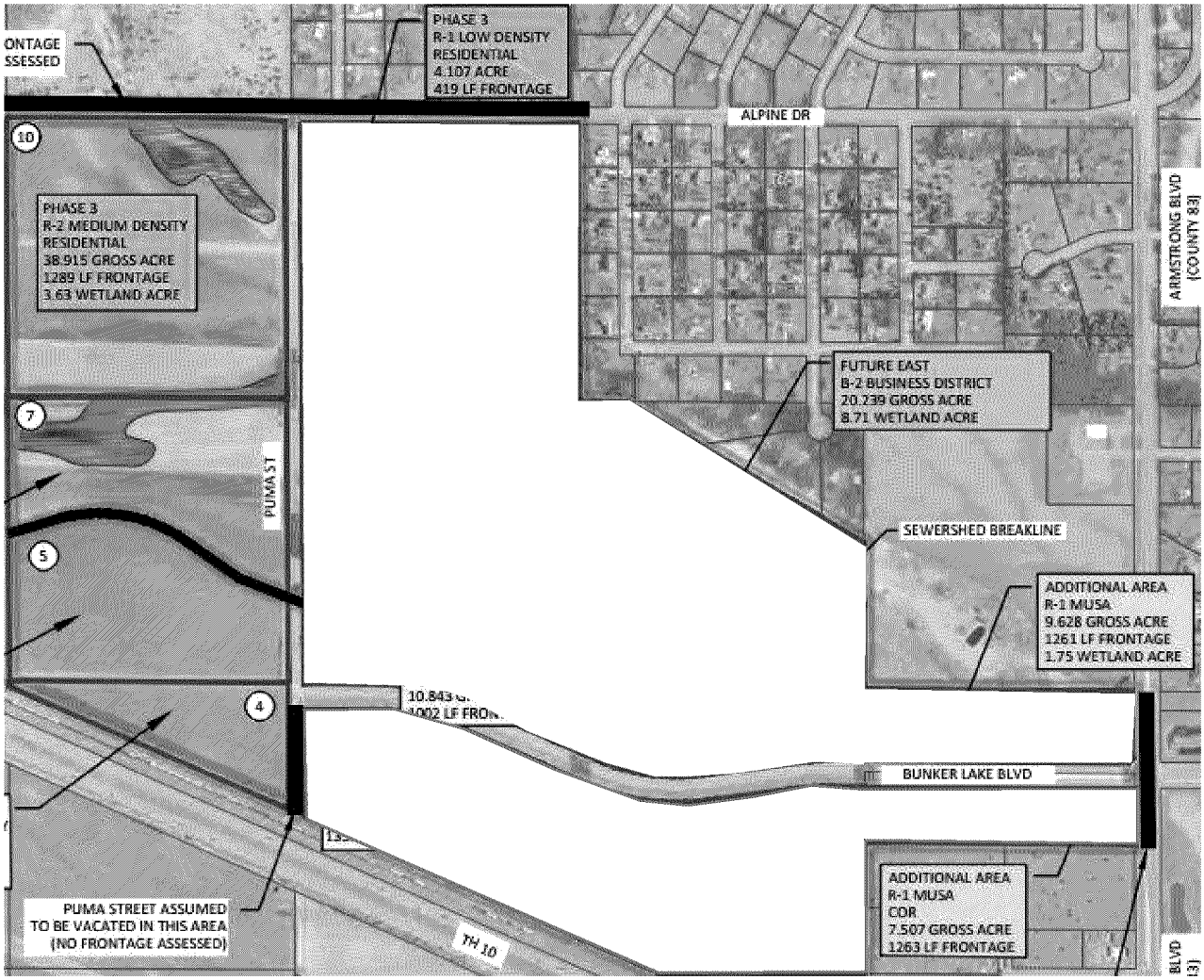


Figure 1 – Developments Included in Background Growth

To account for additional anticipated developments in the area not included in the above figure, an additional half percent per year growth rate were applied to through volumes in the roadway network. By combining the surrounding development trip generations and routes, the eleven and a half percent background growth rate, and the existing traffic volumes established the 2040 No-Build forecasts based on anticipated developments within and around the study area.

c. Total Traffic

Traffic forecasts were developed for the 2040 Build scenarios by adding the traffic generated by the proposed development to the non-site forecast volumes. Peak hour forecasts are shown in the Appendix.

4. Analyses

a. *Intersection Vehicular Analysis*

The scenarios analyzed in this study for both the a.m. and p.m. peak hours were the existing, 2040 No-Build, and 2040 Build scenarios. Capacity analyses are performed for the study intersections to determine if they need improvements such as turn lanes or an upgrade in traffic control. It should be noted that for the No-Build and Build scenarios it is assumed Puma Street will be realigned on the north end to line up with Okapai Street as shown in the site plan in the Appendix.

The existing and forecasted turning movement volumes along with the existing intersection configurations and traffic control were used to develop the average delay per intersection in each study scenario. The delay calculations were done in accordance with the *Highway Capacity Manual 6th Edition* using the Vistro software package. The full calculations for each study scenario, including Level of Service (LOS) grades and queue lengths, are included in the Appendix. Also, included in the Appendix is a guide explaining the Level of Service grade concept.

Chart 1 (a.m. peak hour) and Chart 2 (p.m. peak hour) show the 95th percentile queue lengths on the busiest stop sign controlled approach at intersections with side street stop sign control. Because the vast majority of vehicles going through the intersection are on the main roadway and have zero delay, which leads to low overall average delays, queueing is a good metric to determine the effectiveness of side-street stop controlled intersections. At side street stop sign controlled approaches to busy roadways, the average delay for all the vehicles on the approach often exceeds 60 seconds. This can be the case for a few vehicles waiting at the stop sign where improvements would not be justified for the low traffic volume. Based on our experience, in general, vehicle queuing of five to ten vehicles is considered unreasonable and could warrant mitigation.

Chart 1 – A.M. Peak Hour Queues: Side-Street Stop-Controlled Intersections

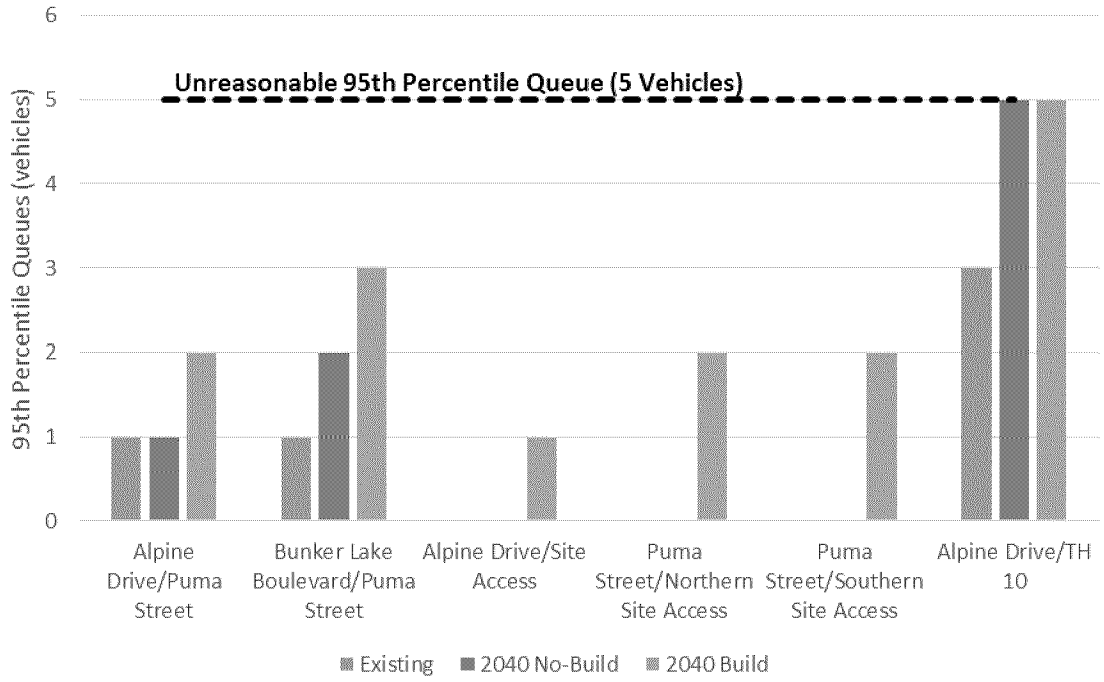
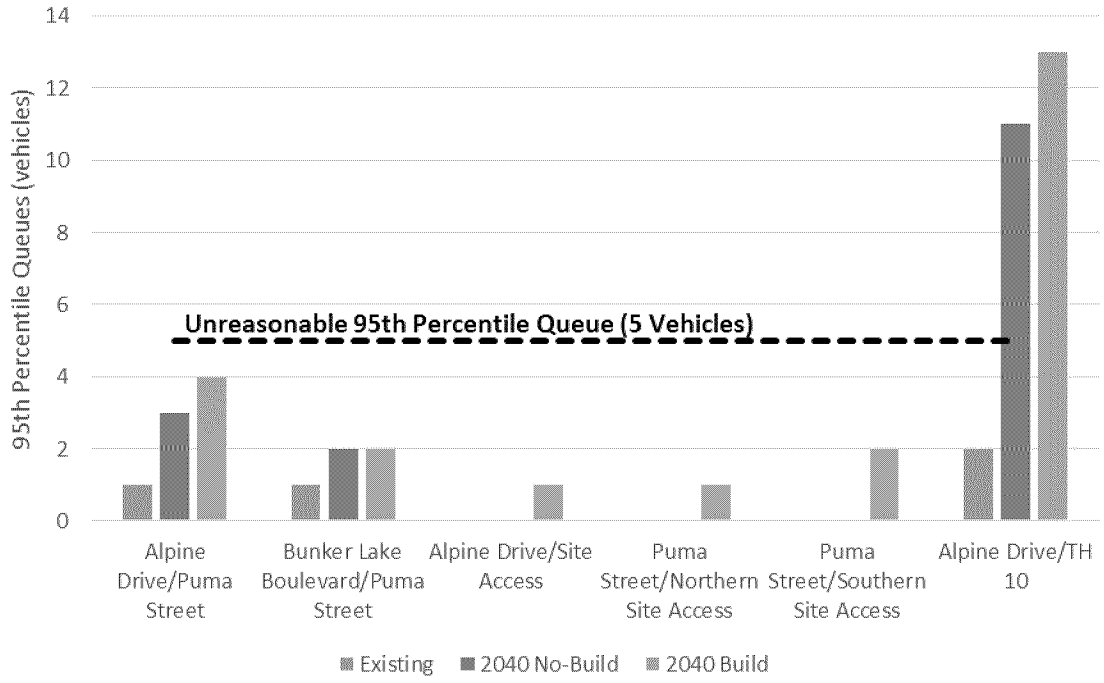


Chart 2 – P.M. Peak Hour Queues: Side-Street Stop-Controlled Intersections



An additional review of Level of Service (LOS) was completed for the existing, 2040 No-Build, and 2040 Build scenarios. Table 3 and Table 4, below, show the resulting intersection and worst movement LOS results.

Table 3 – Existing Peak Hour Level of Service (LOS)[1]

Intersection	AM Peak Hour	PM Peak Hour
Alpine Drive/Puma Street	A (a)	A (a)
Bunker Lake Boulevard/Puma Street	A (a)	A (a)
Alpine Drive/Site Access	N/A	N/A
Puma Street/ Northern Site Access	N/A	N/A
Puma Street/Southern Site Access	N/A	N/A
Alpine Drive/TH 10	A (f)	A (f)

[1] The number is the intersection delay. The first letter is the Level of Service for the intersection. The second letter (in parentheses) is the Level of Service for the worst operating movement.

As Table 3 shows, all intersections operate at an overall intersection LOS A with worst movements at LOS A, with the exception of the southwest bound left from Alpine Drive onto TH 10. This movement operates at a LOS F, however, with a queue of less than two vehicles there is little concern of this movement.

Table 4 – 2040 Peak Hour Level of Service (LOS)[1]

Intersection	2040 AM No-Build	2040 PM No-Build	2040 AM Build	2040 PM Build
Alpine Drive/Puma Street	A (c)	A (b)	A (c)	A (c)
Bunker Lake Boulevard/Puma Street	A (b)	A (b)	A (b)	A (b)
Alpine Drive/Site Access	N/A	N/A	A (b)	A (b)
Puma Street/ Northern Site Access	N/A	N/A	A (b)	A (c)
Puma Street/Southern Site Access	N/A	N/A	A (c)	A (c)
Alpine Drive/TH 10	B (f)	F (f)	B (f)	F (f)

[1] The number is the intersection delay. The first letter is the Level of Service for the intersection. The second letter (in parentheses) is the Level of Service for the worst operating movement.

It should be noted that due to the high mainline volumes along TH 10 the HCM calculations begin to break down and the results do not accurately represent the expected conditions (specifically noted in the PM scenarios highlighted in red). However, even with that in mind, the TH 10/Alpine Drive intersection does begin to experience excessive delays that should be addressed.

b. Vehicular Mitigation Analysis

The above analyses indicate all study intersections are forecast to operate acceptably, with the exception of TH 10/Alpine Drive, under all scenarios, including with the addition of traffic generated by the proposed addition of the Capstone Homes Development. As Charts 1 and Chart 2 show, the existing, no-build, and build queues stay consistent and well below the standard thresholds.

All 95th percentile queues remain at or below four vehicles per approach while delays remain significantly below the LOS D/E boundary for all intersection except TH 10/Alpine Drive.

TH 10/Alpine Drive does experience PM queues and delays above the preferred threshold. Projecting the volumes to the 2040 No-Build scenario increase these concerns with the intersection breaking down in the 2040 PM No-Build scenario, operating with 95th percentile queues of 11 vehicles for southwest bound vehicles on Alpine Drive and LOS F for the approach. Also, the left turning vehicles begin to have issues completing their movements due to very heavy through movements along TH 10. Based on these results the Peak Hour Signal Warrants were checked to determine if signalized traffic control is warranted for the intersection.

With AM and PM mainline 2040 No-Build volumes above 3,000 vehicles per hour the cross-street volume threshold to warrant a traffic signal is only 100 vehicles per hour. Both the AM and PM No-Build and Build scenarios meet this threshold, with the projected volumes, which suggests the intersection would benefit from signalized traffic control.

By installing traffic signal control, gaps in mainline traffic would be produced providing additional time for left turning and U-turning vehicles to safely complete their movements on TH 10. Also, the signal would provide green time for Alpine Drive allowing the queues to clear and prevent excessive backups. It is important to note that the traffic signal would add delay to TH 10 mainline, which is not preferred along arterial roadways.

It is also important to note that due to the extended 2040 forecast year, and due to additional volumes based on anticipated, but not guaranteed, developments within the area, these upgrades are not needed immediately upon Capstone Homes construction. Because the volumes are heavily weighted by the additional developments within the area additional monitoring of the TH 10/Alpine Drive intersection should occur as the anticipated developments are added to the area to determine when intersection volumes rise above the Eight-Hour Traffic Warrant.

Turn-Lane Warrants were also checked at each of the site accesses to determine if any additional turn treatments are required. With the existing low speed along Alpine Drive and Puma Street, the Turn-Lane Warrants published by MnDOT will not be fulfilled, as a 45 MPH minimum speed limit is not present on either roadway. The 30 MPH speed limit is consistent for a neighborhood street. A preliminary Turn-Lane Warrant analysis was completed based on volumes alone, ignoring the 45 MPH minimum speed requirement as well as sight line/sight distance checks at each access.

The daily total traffic entering and exiting the site accesses based on the collected turning movement counts, surrounding development trip generations, and the site trip generation were estimated as follows:

i. Southern site access at Bunker Lake Boulevard – 970 Vehicles per day
ii. Center site access onto Puma Street – 920 Vehicles per day
iii. Northern site access onto Puma Street – 680 Vehicles per day
iv. Site access onto Alpine Drive – 350 Vehicles per day

Main Line ADTs are roughly:

i. Puma Street – 4,400 Vehicles per day
ii. Alpine Drive – 2,700 Vehicles per day

Based on these estimated volumes and the criteria published in Warrant 9 (Vehicular Volume Warrant) from the *MnDOT Access Management Manual's Turn-Lane Warrants for Undivided Highways*, Table 5, below, was created. This table shows the estimated mainline and access volumes and the corresponding MnDOT Warrant thresholds.

Table 5 – New Trip Generation

Intersection	Left Turn Lane		Right Turn Lane	
	Street ADT	Access ADT	Street ADT	Access ADT
Southern site access at Bunker Lake Boulevard	4,400	970	4,400	970
Center site access onto Puma Street	4,400	920	4,400	920
Northern site access onto Puma Street	4,400	680	4,400	680
Site access onto Alpine Drive	2,700	350	2,700	350
Criteria	**4,000 – 4,999 -or- 1,500 – 2,999**	**> 1,000 -or- > 1,500**	**> 1,500**	**> 100**

As Table 5 shows, left-turn lanes are not warranted based on the estimated 2040 Build volumes while the right-turn lane warrant is satisfied. Again, these values are based upon a 45 MPH speed limit, which is not present on either Alpine Drive or Puma Street. If the speed along these streets are raised to 45 MPH or higher the Turn-Lane Warrants should be re-assessed. However, under the existing circumstances, safety is not a concern due to the following factors:

i. All site accesses are connected to low speed 30 MPH roadways.
ii. Sufficient sight distance is provided at all site accesses.
iii. Delays for all turning movements into developments remain at LOS B or better.
iv. All queues remain below two vehicles for any turning movement into the development.

The sight distance/sight line analysis was completed at each intersection in April 2017. The Capstone Homes accesses along Puma Street provide significant sight distance with the intersections of Puma Street/Alpine Drive and Puma Street/Bunker Lake Boulevard being visible from each site access. The site

access off Alpine Drive also provides significant sight distance to the east (left-turning sight distance) with the Puma Street/Alpine Drive intersection being visible from the proposed access location (>850 feet of sight distance). Because it was evident sight distance was not an issue for these movements at the accesses time measurements were not required. However, the Right turning movement from Alpine Drive/Site Access field measurements were taken. This was achieved by standing at the proposed access location and recording time gaps for vehicles traveling eastbound along Alpine Drive.

As discussed in the American Association of State Highway and Transportation Officials' (AASHTO) *Geometric Design of Highways and Streets*, "studies have indicated that a constant value of time gap, independent of approach speed, can be used as a basis for intersection sight distance determinations." Using time gap instead of calculated distances based on the posted speed limit can be more accurate as it accounts for actual speed of the mainline. If drivers routinely travel faster or slower than the speed limit, using time gap captures those true speeds in terms of the impact on sight distance.

Measurements were collected and used to determine the average right turn sight distance times. Table 6 shows the required right turn sight distance times for each design vehicles with the average measured sight distance to the west (right-turning sight distance) for Alpine Drive/Site Access.

Table 6 – Right Turning Sight Distance

Design Vehicle Requirements	Right Turn Sight Distance (Seconds)
Passenger Car	6.5
Single Unit Truck	8.5
Combination Truck	10.5
Alpine Drive Access Field Measurement (Average)	**9.17**

As Table 6 shows, there is sufficient sight distance provided at the Alpine Drive/Site Access for right turning Passenger Cars and Single Unit Trucks. Combination Trucks, which require 10.5 seconds of sight distance time to complete a safe right turn movement, are not provided sufficient sight distance at this intersection. This does not raise any concerns however, as the other three access surpass sight distance thresholds.

It should be noted that this analysis did not consider modification to Armstrong Boulevard & Bunker Lake Boulevard as the prior Future Business Park Traffic Memorandum completed by Bolton & Menk already defined necessary upgrades for the intersection that would be required for proper traffic flow through the intersection.

c. *Concept Site Plan & Multi-Modal Review*

The concept site plan contained in the Appendix was reviewed to determine what changes are recommended, if any, to the proposed Capstone Homes Development. Following are key transportation elements of the concept site plan that should be implemented:

i. **Car Circulation**: The proposed site plan provides sufficient vehicle circulation with four accesses spaced evenly throughout the development. These accesses allow vehicles multiple options for entering and exiting the development which will help spread traffic more evenly throughout the site

ii. **Bicycle and pedestrian infrastructure:** An additional sidewalk/trail should be considered along the southern side of Alpine Drive from the proposed site access to the intersection of Alpine Drive and Puma Street. At this intersection, an additional crosswalk should be considered, connecting pedestrians north to the existing sidewalk/trail along the northern side of Alpine Drive. This new sidewalk/trail connection will provide a safe crossing and clear route for pedestrians and bicyclist to connect to the existing infrastructure. The existing trail along the western side of Puma Street will be lengthened to the southern edge of the development and an additional leg will be brought into the development at the Center Site Access location on Puma Street. This segment will stretch to the internal park to the north. Additional internal sidewalks will also be provided on one side of each street within the development and should connect to the existing sidewalk/trail along Puma Street, as well as the proposed additional sidewalk/trail along the southern side of Alpine Drive.

iii. **Adjacent Transit:** The addition of transit near the Capstone Homes Development should be considered. Having access to other modes of travel is often seen as an amenity and a general benefit to a site, while helping to reduce the overall number of vehicles throughout the study area.

5. Conclusions and Recommendations

The traffic impacts and operation of the proposed Capstone Homes Development were thoroughly studied and the principal findings are:

- The proposed expansion is expected to generate approximately 2,912 new trips during an average weekday (1,456 entering and 1,456 exiting), approximately 227 new trips during the a.m. peak hour (53 entering and 174 exiting) and approximately 297 new trips during the p.m. peak hour (189 entering and 108 exiting).
- The existing study intersections operate with acceptable delays and vehicle queues today with slightly increased queueing and delay at TH 10/Alpine Drive.
- The study intersections are expected to operate acceptably during the 2040 no-build and build scenarios with the exception of TH 10/Alpine Drive.
- TH 10/Alpine Drive experiences slightly higher than preferred queueing along Alpine Drive, however this is expected at side street stop controlled intersections with heavy mainline volume.
- Left turn lanes are not warranted based on the expected 2040 build year volumes and mainline speeds.
- Right turn lane warrants are not fulfilled due to the mainline speeds remaining below 45 MPH, which is consistent for neighborhood streets.
- There are no safety concerns with regards to turn lanes, due to the low queues, minimal delay, and good sight distance provided at all site accesses

The following recommendations are made based on the above findings:

- No additional intersection mitigation is required to help improve capacity. However, the TH 10/Alpine Drive intersection should be monitored to determine when volumes breach the Eight-Hour Traffic Signal Warrant as the projected volumes are heavily dependent on a number of anticipated developments that are not guaranteed to occur.
- Coordinate TH 10/Alpine Drive improvements with MnDOT once the Eight Hour Warrant is exceeded.
- If the speed limits along Puma Street or Alpine Drive are increased to 45 MPH or higher, re-evaluate the Turn-Lane warrants.
- Construct a new sidewalk/trail along the southern edge of Alpine Drive connecting the proposed access to the existing Alpine Drive/Puma Street intersection. The addition of a north/south crosswalk should also be considered at this intersection to help promote safe crossing to the existing northern sidewalk/trail.
- Ensure the proposed internal sidewalks connect to the external sidewalk/trail system.
- Work with Metro Transit or their affiliates to improve transit options within the project area as the closest existing transit is located roughly 1.5 miles away at Ramsey Station and Platform.

6. Appendix

A. Site Plan

B. The Language of Traffic Engineering

C. Traffic Counts

D. Trip Generation Tables

E. Peak Hour Volumes

F. Level of Service (LOS)

G. Capacity Analysis Backup

- AM Existing
- PM Existing
- AM 2040 No-Build
- PM 2040 No-Build
- AM 2040 Build
- PM 2040 Build

SITE DATA

TOTAL AREA	±88.44 AC.	SETBACK DATA:	
TOTAL NUMBER OF LOTS	344	50' S.F. – SIDE	5 FT.
50' S.F.	111	65' S.F. – SIDE	7.5 FT.
65' S.F.	48	50' VILLAS – SIDE	5 FT.
50' VILLAS	87	FRONT (ALL)	25 FT.
TOWNHOMES	98	REAR	20 FT. MIN.

SOUTH HALF DATA

TOTAL NUMBER OF LOTS	172	SETBACK DATA:	
50' S.F.	55	50' S.F. – SIDE	5 FT.
65' S.F.	24	65' S.F. – SIDE	7.5 FT.
50' VILLAS	35	50' VILLAS – SIDE	5 FT.
TOWNHOMES	58	FRONT (ALL)	25 FT.
		REAR	20 FT. MIN.

0 50 100 200
(IN FEET)

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Blaine, MN 55449
Phone: (763) 489-7900
Fax: (763) 489-7959
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CAPSTONE HOMES
14015 Sunfish Lake Blvd. - Suite 400
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PEARSON FARM
Ramsey, Minnesota

CONCEPT PLAN

1 of 1

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The Language of Traffic Engineering

Traffic Engineering, and Traffic Engineers, often use technical terms or jargon that may be confusing or tough to understand even within the context of a sentence. Key terms and acronyms that can generally be found in all types of traffic studies are defined in this document.

Types of Studies

Access Management – The practice of government agencies limiting the amount of intersections (both public roadway crossings and private driveways) along a roadway corridor based on the function of the roadway to improve safety and mobility while streamlining access.

Corridor Study – A transportation review and analysis of the existing and future traffic operations of a roadway segment. Varies in length from a couple blocks to a few miles and typically covers all modes of travel.

Intersection Control Evaluation (ICE) Report – A document that examines and determines the most appropriate type of control (stop sign, signal, roundabout, or other) at one or more intersections.

Safety Study – An examination of crash records to identify potential trends, issues, and problem intersections/ corridors. Usually includes potential mitigation options expected to decrease crash rates in the future.

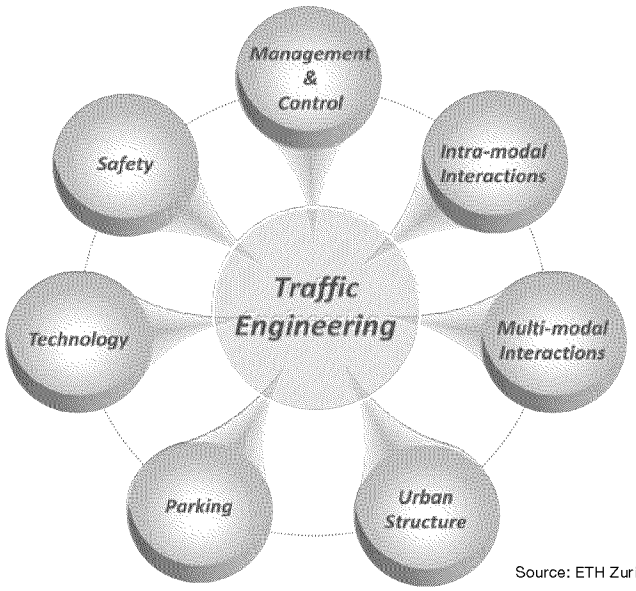
Speed Study – A review of existing travel speeds and the corridor characteristics to determine if speeding is an issue, the appropriate speed to post as the limit, and/or areas to provide reduced speed warnings.

Traffic Impact Study (TIS) – A document that addresses the expected traffic impacts of a development and, if necessary, mitigation options that will reduce or eliminate negative impacts. Also referred to as a Traffic Impact Analysis.

Transportation Plan – A document developed by a government agency to take inventory of their transportation network, identify concerns or issues and lay out the path for improvement of the system.

Travel Demand Management Plan (TDMP) – A plan that documents the existing infrastructure around a site, including transit and non-motorized vehicle options, and develops measures to be implemented to encourage those alternative modes of travel.

Warrant Evaluation – Review of traffic volumes and other characteristics at an intersection against thresholds to determine if a traffic signal or other traffic control option is needed/warranted.



Source: ETH Zurich

Traffic Engineering is a branch of civil engineering that focuses on the safe and efficient movement of people and vehicles. It is part science and part art, requiring not only technical skills for analysis but an understanding of motivations in choosing travel routes.

Key Organizations

AASHTO – American Association of State Highway and Transportation Officials. A nonprofit, nonpartisan association representing transportation departments with a primary goal of fostering the development, operation, and maintenance of an integrated national transportation system.

DOT – Department of Transportation. Government organizations within federal and state agencies dedicated to serving the transportation needs of the community and typically responsible for study, design, operation, and maintenance of all facets of transportation.

FHWA – Federal Highway Administration. An agency within the US Department of Transportation that supports State and local governments in the design, construction, and maintenance of the highway system.

ITE – Institute of Transportation Engineers. An international educational and scientific association of transportation professionals who are responsible for meeting mobility and safety needs.

Results

85th Percentile Speed – Speed at which 85 percent of drivers are traveling at or below. Speed limits are typically set at the 85th percentile speed.

95th Percentile Queue – The distance, generally measured in feet or number of vehicles, which will be exceeded in a lane, typically at an intersection, only five percent of the time. Usually used to help determine intersection turn lane lengths.

Control Delay – The total amount of time a motorist takes to get through a road segment or intersection minus the time it would take without stopping due to traffic controls (like stop signs or traffic signals). Control delay includes decelerating and accelerating back to full driving speed.

Functional Classification – the grouping of streets and highways into categories according to their characteristics and emphasis on mobility or access. Generally, categories include arterials (emphasizing mobility and fast travel), local roads (emphasizing access to adjoining properties), and collector roads (emphasizing a balance between the two and usually connecting arterials to local roads).

Intersection Delay – The average amount of time, usually expressed in seconds, experienced by any vehicle traveling through an intersection.

Level of Service (LOS) – Qualitative measure of traffic operations related to the amount of average delay experienced. Expressed in letter grades with LOS A representing the best operations with little to no delay and LOS F representing the worst operations with excessive delays and congestion.

Measures of Effectiveness – Performance measures that define how well traffic is moving along a corridor or thru an intersection. The common MOEs are travel time, corridor speed, delay, and queues.

Mitigation – Measures intended to reduce the impact of a development or improve an identified traffic issue by either improving capacity (like adding lanes) or reducing demand (like encouraging carpooling).

Queue – Length of line of cars waiting at an intersection or at a bottleneck in a corridor, typically measured for each individual lane of traffic in feet or number of vehicles.

Volume to Capacity (v/c) ratio – the number of vehicles through an intersection or roadway segment in a specific amount of time divided by the expected capacity of the road. Less than 1.0 indicates available capacity and above 1.0 indicates more vehicles than can be accommodated. Typically, a v/c ratio above 0.85 suggests operational issues.

Trip Generation – The amount of vehicle traffic generated by a land use. One trip is equal to one vehicle traveling from an origin to a destination (traveling to and from work equals two trips).

Warrants – Criteria based on volumes and other Measures of Effectiveness for determining when all way stop signs, roundabouts, traffic signals, or other type of control should be installed.

Important Manuals/Guides

HCM – Highway Capacity Manual (released by the Transportation Research Board, or TRB). The guide for engineers and planners to assess traffic and environmental effects of highway projects. This manual presents the foundation of traffic analysis procedures in the US.

MUTCD – Manual of Uniform Traffic Control Devices. A document that sets minimum standards and provides guidance to ensure uniformity of traffic control devices (such as messages, location, size, shapes, and colors) across the nation. All roads are subject to its jurisdiction.

HSM – Highway Safety Manual (released by AASHTO). A guide that presents a variety of methods for quantitatively estimating crash frequency or severity.

MUTCD, 2009 Edition, published by FHWA

Highway Capacity Manual, HCM2010

Highway Safety Manual, HSM

About This Brief

Spack Consulting prepared this brief as part of our company's vision to significantly improve the practice of traffic engineering and transportation planning. Transportation professionals from around the world have assisted us in developing this document. We are providing this brief under the Creative Commons Attribution License. Feel free to use-modify-share this guide, but please give us some credit in your document. To request our whole series of Design Briefs and to be included on our distribution list for new materials, please email mspack@spackconsulting.com. And please reach out if you have any comments or questions related to this Design Brief.

Traffic Data Inc
PO Box 16269
St. Louis Park, MN 55416

File Name : 1 - Alpine Dr & Puma St, 2-15-17
Site Code : 1
Start Date : 2/15/2017
Page No : 1

Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Southbound						Alpine Drive Westbound						Puma Street Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 AM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2	0	0	2	4
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2	0	0	2	4
01:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
01:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	1	2
Total	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	1	0	0	1	0	0	1	3
02:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
02:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
02:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
Total	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	3	0	0	3	4
03:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 AM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
04:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
04:30 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
04:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	1	0	3	4
Total	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	2	1	0	3	11
05:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
05:15 AM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	1	0	0	1	5
05:30 AM	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	8
05:45 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	1	0	0	1	4
Total	0	0	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	0	0	0	3	0	0	3	19
06:00 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	4	0	0	4	10
06:15 AM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	11	1	0	12	16
06:30 AM	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	6	0	0	6	14
06:45 AM	0	0	0	0	0	0	0	0	12	0	0	12	0	1	0	0	0	1	0	0	8	2	0	10	23
Total	0	0	0	0	0	0	0	0	30	0	0	30	0	1	0	0	0	1	0	0	29	3	0	32	63

Traffic Data Inc
PO Box 16269
St. Louis Park, MN 55416

File Name : 1 - Alpine Dr & Puma St, 2-15-17
Site Code : 1
Start Date : 2/15/2017
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Southbound						Alpine Drive Westbound						Puma Street Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	9	0	0	9	0	1	0	0	0	1	0	0	5	0	0	5	15
07:15 AM	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	0	0	23	2	0	25	35
07:30 AM	0	0	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	0	0	0	10	2	0	12	25
07:45 AM	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	0	0	12	2	0	14	24
Total	0	0	0	0	0	0	0	0	42	0	0	42	0	1	0	0	0	1	0	0	50	6	0	56	99
08:00 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	1	0	1	0	0	11	0	0	11	18
08:15 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	7	1	0	8	13
08:30 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	15	1	0	16	22
08:45 AM	0	0	0	0	0	0	0	0	9	0	0	9	0	1	0	1	0	2	0	0	11	0	0	11	22
Total	0	0	0	0	0	0	0	0	26	0	0	26	0	1	0	2	0	3	0	0	44	2	0	46	75
09:00 AM	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	0	0	8	0	0	8	18
09:15 AM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	7	0	0	7	14
09:30 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	2	1	0	3	6
09:45 AM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	4	0	0	4	8
Total	0	0	0	0	0	0	0	0	24	0	0	24	0	0	0	0	0	0	0	0	21	1	0	22	46
10:00 AM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	1	0	0	1	5
10:15 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	6	0	0	6	11
10:30 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	1	0	0	0	1	0	0	3	0	0	3	10
10:45 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	1	0	0	0	1	0	0	7	1	0	8	14
Total	0	0	0	0	0	0	0	0	20	0	0	20	0	2	0	0	0	2	0	0	17	1	0	18	40
11:00 AM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	4	1	0	5	9
11:15 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	5	1	0	6	11
11:30 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	9	0	0	9	15
11:45 AM	0	0	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	0	0	0	8	0	0	8	22
Total	0	0	0	0	0	0	0	0	29	0	0	29	0	0	0	0	0	0	0	0	26	2	0	28	57
12:00 PM	0	0	0	0	0	0	0	0	5	0	0	5	0	1	0	0	0	1	0	0	4	0	0	4	10
12:15 PM	0	0	0	0	0	0	0	0	5	0	0	5	0	1	0	0	0	1	0	0	8	0	0	8	14
12:30 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	2	0	0	0	2	0	0	9	1	0	10	15
12:45 PM	0	0	0	0	0	0	0	0	7	0	0	7	0	1	0	0	0	1	0	0	8	0	0	8	16
Total	0	0	0	0	0	0	0	0	20	0	0	20	0	5	0	0	0	5	0	0	29	1	0	30	55
01:00 PM	0	0	0	0	0	0	0	0	8	0	0	8	0	1	0	0	0	1	0	0	8	0	0	8	17
01:15 PM	0	0	0	0	0	0	0	0	8	0	0	8	0	1	0	0	0	1	0	0	7	0	0	7	16
01:30 PM	0	0	0	0	0	0	0	0	6	0	0	6	0	2	0	0	0	2	0	0	5	1	0	6	14
01:45 PM	0	0	0	0	0	0	0	1	6	0	0	7	0	1	0	1	0	2	0	0	6	0	0	6	15
Total	0	0	0	0	0	0	0	1	28	0	0	29	0	5	0	1	0	6	0	0	26	1	0	27	62

Traffic Data Inc
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St. Louis Park, MN 55416

File Name : 1 - Alpine Dr & Puma St, 2-15-17
Site Code : 1
Start Date : 2/15/2017
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Southbound						Alpine Drive Westbound						Puma Street Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
02:00 PM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	7	0	0	7	11
02:15 PM	0	0	0	0	0	0	0	0	8	0	0	8	0	2	0	1	0	3	0	0	3	0	0	3	14
02:30 PM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	1	0	1	0	0	7	0	0	7	15
02:45 PM	0	0	0	0	0	0	0	0	14	0	0	14	0	0	0	1	0	1	0	0	11	1	0	12	27
Total	0	0	0	0	0	0	0	0	33	0	0	33	0	2	0	3	0	5	0	0	28	1	0	29	67
03:00 PM	0	0	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	0	0	7	1	0	8	19
03:15 PM	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	9	1	0	10	18
03:30 PM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	8	1	0	9	16
03:45 PM	0	0	0	0	0	0	0	0	8	0	0	8	0	1	0	0	0	1	0	0	16	0	0	16	25
Total	0	0	0	0	0	0	0	0	34	0	0	34	0	1	0	0	0	1	0	0	40	3	0	43	78
04:00 PM	0	0	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	0	0	0	13	0	0	13	17
04:15 PM	0	0	0	0	0	0	0	0	16	0	0	16	0	1	0	0	0	1	0	0	11	0	0	11	28
04:30 PM	0	0	0	0	0	0	0	0	16	0	0	16	0	1	0	0	0	1	0	0	10	1	0	11	28
04:45 PM	0	0	0	0	0	0	0	1	11	0	0	12	0	0	0	0	0	0	0	0	15	1	0	16	28
Total	0	0	0	0	0	0	0	2	46	0	0	48	0	2	0	0	0	2	0	0	49	2	0	51	101
05:00 PM	0	0	0	0	0	0	0	0	10	0	0	10	0	2	0	1	0	3	0	0	17	0	1	18	31
05:15 PM	0	0	0	0	0	0	0	1	13	0	0	14	0	0	0	0	0	0	0	0	18	0	0	18	32
05:30 PM	0	0	0	0	0	0	0	0	15	0	0	15	0	2	0	0	0	2	0	0	14	0	0	14	31
05:45 PM	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	13	0	0	13	21
Total	0	0	0	0	0	0	0	1	46	0	0	47	0	4	0	1	0	5	0	0	62	0	1	63	115
06:00 PM	0	0	0	0	0	0	0	1	9	0	0	10	0	0	0	0	0	0	0	0	9	1	0	10	20
06:15 PM	0	0	0	0	0	0	0	0	13	0	0	13	0	2	0	0	0	2	0	0	13	1	0	14	29
06:30 PM	0	0	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	0	0	0	7	0	0	7	19
06:45 PM	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	0	0	7	0	0	7	17
Total	0	0	0	0	0	0	0	1	44	0	0	45	0	2	0	0	0	2	0	0	36	2	0	38	85
07:00 PM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	8	0	0	8	13
07:15 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	4	0	0	4	7
07:30 PM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	5	0	0	5	10
07:45 PM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	3	0	0	3	10
Total	0	0	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	0	0	0	20	0	0	20	40
08:00 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	5	0	0	5	8
08:15 PM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	1	0	0	1	8
08:30 PM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	8	0	0	8	12
08:45 PM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	5	0	0	5	11
Total	0	0	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	0	0	0	19	0	0	19	39

Traffic Data Inc
PO Box 16269
St. Louis Park, MN 55416

File Name : 1 - Alpine Dr & Puma St, 2-15-17
Site Code : 1
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Southbound						Alpine Drive Westbound						Puma Street Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
09:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	3	0	0	3	4
09:15 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	3	1	0	4	7
09:30 PM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	1	0	0	1	5
09:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	3	0	0	3	4
Total	0	0	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	0	0	10	1	0	11	20
10:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
10:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
10:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	3	0	0	3	4
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	7	0	0	7	10
11:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
11:15 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	2	0	0	2	5
11:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	5	0	0	5	10
Grand Total	0	0	0	0	0	0	0	5	510	0	0	515	0	27	0	7	0	34	0	0	529	27	1	557	1106
Apprch %	0	0	0	0	0		0	1	99	0	0		0	79.4	0	20.6	0		0	0	95	4.8	0.2		
Total %	0	0	0	0	0	0	0	0.5	46.1	0	0	46.6	0	2.4	0	0.6	0	3.1	0	0	47.8	2.4	0.1	50.4	
Cars +	0	0	0	0	0	0	0	5	500	0	0	505	0	21	0	6	0	27	0	0	519	27	1	547	1079
% Cars +	0	0	0	0	0	0	0	100	98	0	0	98.1	0	77.8	0	85.7	0	79.4	0	0	98.1	100	100	98.2	97.6
Trucks	0	0	0	0	0	0	0	0	10	0	0	10	0	6	0	1	0	7	0	0	10	0	0	10	27
% Trucks	0	0	0	0	0	0	0	0	2	0	0	1.9	0	22.2	0	14.3	0	20.6	0	0	1.9	0	0	1.8	2.4

Traffic Data Inc
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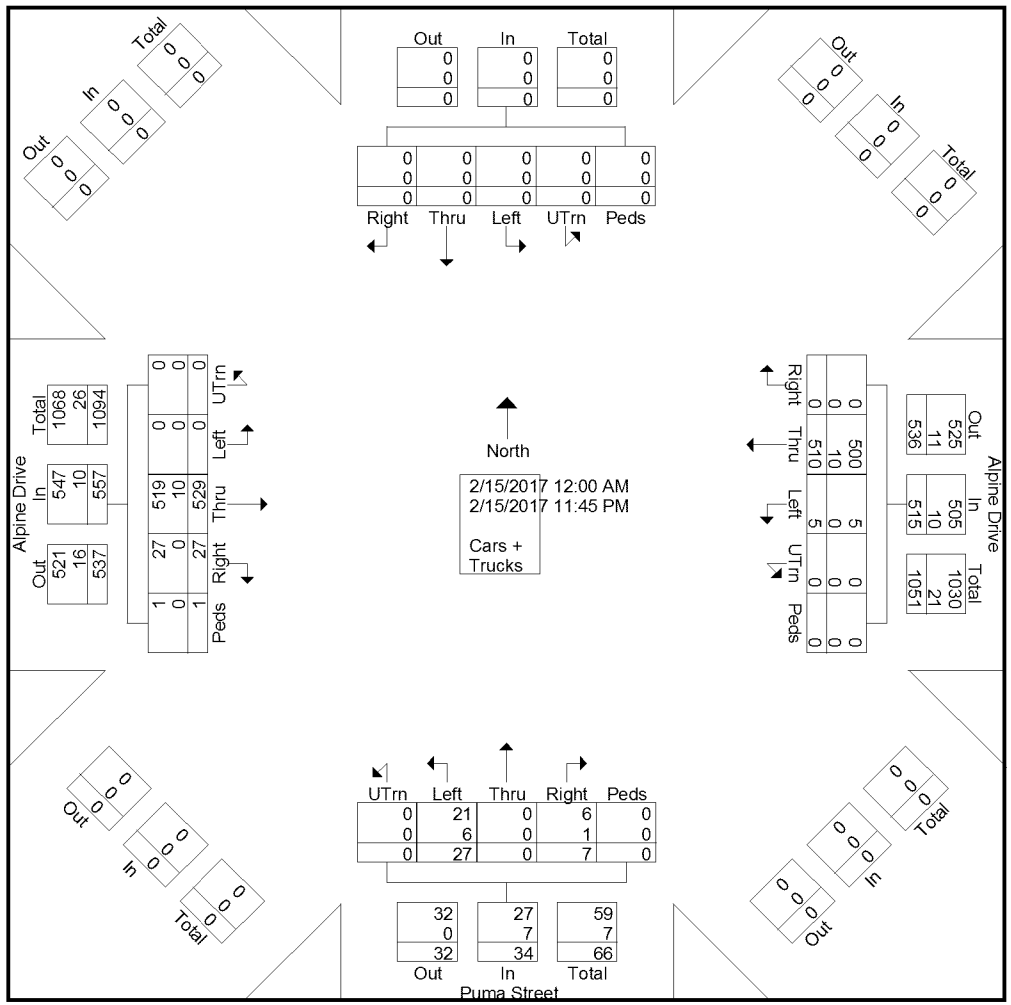
Oxford Street & Fairmount Avenue
Saint Paul, MN



Traffic Data Inc
PO Box 16269
St. Louis Park, MN 55416

File Name : 1 - Alpine Dr & Puma St, 2-15-17
Site Code : 1
Start Date : 2/15/2017
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Oxford Street & Fairmount Avenue
Saint Paul, MN

	Southbound						Alpine Drive Westbound						Puma Street Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 AM to 09:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:15 AM																									
07:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	23	2	0	25	35
07:30 AM	0	0	0	0	0	0	0	0	**13**	0	0	**13**	0	0	0	0	0	0	0	0	10	2	0	12	25
07:45 AM	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	0	0	12	2	0	14	24
08:00 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	**1**	0	**1**	0	0	11	0	0	11	18
Total Volume	0	0	0	0	0	0	0	0	39	0	0	39	0	0	0	1	0	1	0	0	56	6	0	62	102
% App. Total	0	0	0	0	0		0	0	100	0	0		0	0	0	100	0		0	0	90.3	9.7	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.750	.000	.000	.750	.000	.000	.000	.250	.000	.250	.000	.000	.609	.750	.000	.620	.729
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 12:30 PM																									
12:30 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	**2**	0	0	0	**2**	0	0	**9**	**1**	0	**10**	15
12:45 PM	0	0	0	0	0	0	0	0	7	0	0	7	0	1	0	0	0	1	0	0	8	0	0	8	16
01:00 PM	0	0	0	0	0	0	0	0	**8**	0	0	**8**	0	1	0	0	0	1	0	0	8	0	0	8	**17**
01:15 PM	0	0	0	0	0	0	0	0	8	0	0	8	0	1	0	0	0	1	0	0	7	0	0	7	16
Total Volume	0	0	0	0	0	0	0	0	26	0	0	26	0	5	0	0	0	5	0	0	32	1	0	33	64
% App. Total	0	0	0	0	0		0	0	100	0	0		0	100	0	0	0		0	0	97	3	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.813	.000	.000	.813	.000	.625	.000	.000	.000	.625	.000	.000	.889	.250	.000	.825	.941
Peak Hour Analysis From 02:00 PM to 11:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:45 PM																									
04:45 PM	0	0	0	0	0	0	0	**1**	11	0	0	12	0	0	0	0	0	0	0	0	15	**1**	0	16	28
05:00 PM	0	0	0	0	0	0	0	0	10	0	0	10	0	**2**	0	**1**	0	**3**	0	0	17	0	**1**	**18**	31
05:15 PM	0	0	0	0	0	0	0	1	13	0	0	14	0	0	0	0	0	0	0	0	**18**	0	0	18	**32**
05:30 PM	0	0	0	0	0	0	0	0	**15**	0	0	**15**	0	2	0	0	0	2	0	0	14	0	0	14	31
Total Volume	0	0	0	0	0	0	0	2	49	0	0	51	0	4	0	1	0	5	0	0	64	1	1	66	122
% App. Total	0	0	0	0	0		0	3.9	96.1	0	0		0	80	0	20	0		0	0	97	1.5	1.5		
PHF	.000	.000	.000	.000	.000	.000	.000	.500	.817	.000	.000	.850	.000	.500	.000	.250	.000	.417	.000	.000	.889	.250	.250	.917	.953

Traffic Data Inc
PO Box 16269
St. Louis Park, MN 55416

File Name : 1 - Alpine Dr & Puma St, 2-16-17
Site Code : 1
Start Date : 2/16/2017
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Southbound						Alpine Drive Westbound						Puma Street Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
01:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
01:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
01:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
02:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
02:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
02:30 AM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
02:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
Total	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	3	0	0	3	7
03:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
03:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:45 AM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	2	0	0	2	7
04:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
05:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
05:15 AM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	1	0	0	1	5
05:30 AM	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	8
05:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	4
Total	0	0	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	0	0	0	6	0	0	6	18
06:00 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	5	0	0	5	11
06:15 AM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	1	1	0	2	9
06:30 AM	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	0	0	8	0	0	8	18
06:45 AM	0	0	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	0	0	6	1	0	7	16
Total	0	0	0	0	0	0	0	0	32	0	0	32	0	0	0	0	0	0	0	0	20	2	0	22	54

Traffic Data Inc
PO Box 16269
St. Louis Park, MN 55416

File Name : 1 - Alpine Dr & Puma St, 2-16-17
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Southbound						Alpine Drive Westbound						Puma Street Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	12	0	0	12	0	1	0	0	0	1	0	0	11	0	0	11	24
07:15 AM	0	0	0	0	0	0	0	0	11	0	0	11	0	1	0	0	0	1	0	0	14	0	0	14	26
07:30 AM	0	0	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	0	0	0	17	1	0	18	31
07:45 AM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	13	4	0	17	24
Total	0	0	0	0	0	0	0	0	43	0	0	43	0	2	0	0	0	2	0	0	55	5	0	60	105
08:00 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	12	0	0	12	15
08:15 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	7	1	0	8	14
08:30 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	11	2	0	13	19
08:45 AM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	8	0	0	8	15
Total	0	0	0	0	0	0	0	0	22	0	0	22	0	0	0	0	0	0	0	0	38	3	0	41	63
09:00 AM	0	0	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	0	0	8	0	0	8	17
09:15 AM	0	0	0	0	0	0	0	1	6	0	0	7	0	0	0	0	0	0	0	0	5	0	0	5	12
09:30 AM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	3	1	0	4	8
09:45 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	1	0	1	0	0	5	0	0	5	9
Total	0	0	0	0	0	0	0	1	22	0	0	23	0	0	0	1	0	1	0	0	21	1	0	22	46
10:00 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	1	0	0	0	1	0	0	8	1	0	9	15
10:15 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	8	0	0	8	13
10:30 AM	0	0	0	0	0	0	0	1	4	0	0	5	0	1	0	0	0	1	0	0	2	0	0	2	8
10:45 AM	0	0	0	0	0	0	1	0	3	0	0	4	0	1	0	0	0	1	0	0	9	0	0	9	14
Total	0	0	0	0	0	0	1	1	17	0	0	19	0	3	0	0	0	3	0	0	27	1	0	28	50
11:00 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	6	1	0	7	13
11:15 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	1	1	0	0	5	0	0	5	11
11:30 AM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	1	0	0	1	5
11:45 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	1	0	0	0	1	0	0	6	0	0	6	13
Total	0	0	0	0	0	0	0	0	21	0	0	21	0	1	0	0	1	2	0	0	18	1	0	19	42
12:00 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	8	1	0	9	11
12:15 PM	0	0	0	0	0	0	0	0	5	0	1	6	0	1	0	0	1	2	0	0	2	0	0	2	10
12:30 PM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	7	0	0	7	13
12:45 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	4	0	0	4	7
Total	0	0	0	0	0	0	0	0	16	0	1	17	0	1	0	0	1	2	0	0	21	1	0	22	41
01:00 PM	0	0	0	0	0	0	0	0	6	0	0	6	0	2	0	0	0	2	0	0	10	0	0	10	18
01:15 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	1	0	0	0	1	0	0	8	1	0	9	13
01:30 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	1	0	0	0	1	0	0	6	0	0	6	9
01:45 PM	0	0	0	0	0	0	0	1	5	0	0	6	0	1	0	1	0	2	0	0	9	0	0	9	17
Total	0	0	0	0	0	0	0	1	16	0	0	17	0	5	0	1	0	6	0	0	33	1	0	34	57

Traffic Data Inc
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St. Louis Park, MN 55416

File Name : 1 - Alpine Dr & Puma St, 2-16-17
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Southbound						Alpine Drive Westbound						Puma Street Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
02:00 PM	0	0	0	0	0	0	0	0	10	0	0	10	0	2	0	0	0	2	0	0	6	0	0	6	18
02:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	1	0	0	7	1	0	8	10
02:30 PM	0	0	0	0	0	0	0	1	8	0	0	9	0	1	0	1	0	2	0	0	6	0	0	6	17
02:45 PM	0	0	0	0	0	0	0	0	7	0	0	7	0	1	0	1	0	2	0	0	9	2	0	11	20
Total	0	0	0	0	0	0	0	1	26	0	0	27	0	5	0	2	0	7	0	0	28	3	0	31	65
03:00 PM	0	0	0	0	0	0	0	0	11	0	0	11	0	1	0	0	0	1	0	0	6	2	0	8	20
03:15 PM	0	0	0	0	0	0	0	0	7	0	0	7	0	2	0	0	0	2	0	0	10	1	0	11	20
03:30 PM	0	0	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	0	0	15	0	0	15	26
03:45 PM	0	0	0	0	0	0	0	0	8	0	0	8	0	1	0	0	0	1	0	0	10	0	0	10	19
Total	0	0	0	0	0	0	0	0	37	0	0	37	0	4	0	0	0	4	0	0	41	3	0	44	85
04:00 PM	0	0	0	0	0	0	0	1	18	0	0	19	0	2	0	0	0	2	0	0	14	1	0	15	36
04:15 PM	0	0	0	0	0	0	0	0	13	0	0	13	0	3	0	0	0	3	0	0	13	0	0	13	29
04:30 PM	0	0	0	0	0	0	0	0	21	0	0	21	0	1	0	0	0	1	0	0	8	0	0	8	30
04:45 PM	0	0	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	0	0	0	14	2	0	16	28
Total	0	0	0	0	0	0	0	1	64	0	0	65	0	6	0	0	0	6	0	0	49	3	0	52	123
05:00 PM	0	0	0	0	0	0	0	0	9	0	0	9	0	0	0	0	2	2	0	0	15	1	0	16	27
05:15 PM	0	0	0	0	0	0	0	0	12	0	0	12	0	1	0	0	0	1	0	0	13	1	0	14	27
05:30 PM	0	0	0	0	0	0	0	0	18	0	0	18	0	2	0	0	0	2	0	0	14	1	0	15	35
05:45 PM	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	0	0	20	1	0	21	31
Total	0	0	0	0	0	0	0	0	49	0	0	49	0	3	0	0	2	5	0	0	62	4	0	66	120
06:00 PM	0	0	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	0	0	16	1	0	17	26
06:15 PM	0	0	0	0	0	0	1	0	7	0	0	8	0	0	0	0	0	0	0	0	11	0	0	11	19
06:30 PM	0	0	0	0	0	0	0	0	6	0	0	6	0	3	0	0	0	3	0	0	6	1	0	7	16
06:45 PM	0	0	0	0	0	0	0	0	5	0	0	5	0	1	0	0	0	1	0	0	6	0	0	6	12
Total	0	0	0	0	0	0	1	0	27	0	0	28	0	4	0	0	0	4	0	0	39	2	0	41	73
07:00 PM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	3	0	0	3	7
07:15 PM	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	8	0	0	8	16
07:30 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	6	0	0	6	8
07:45 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	7	0	0	7	10
Total	0	0	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	0	0	0	24	0	0	24	41
08:00 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	3	0	0	3	6
08:15 PM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	6	0	0	6	12
08:30 PM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	3	0	0	3	7
08:45 PM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
Total	0	0	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	0	0	0	12	0	0	12	31

Traffic Data Inc
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St. Louis Park, MN 55416

File Name : 1 - Alpine Dr & Puma St, 2-16-17
Site Code : 1
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Southbound						Alpine Drive Westbound						Puma Street Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
09:00 PM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	5	0	0	5	9
09:15 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	1	0	0	0	1	0	0	5	0	0	5	8
09:30 PM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	5	0	0	5	11
09:45 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	4	0	0	4	6
Total	0	0	0	0	0	0	0	0	14	0	0	14	0	1	0	0	0	1	0	0	19	0	0	19	34
10:00 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	1	0	0	1	4
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	4
10:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
10:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	5	0	0	5	6
Total	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	11	0	0	11	16
11:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
11:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
Total	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	7	0	0	7	9
Grand Total	0	0	0	0	0	0	2	5	478	0	1	486	0	35	0	4	4	43	0	0	539	30	0	569	1098
Apprch %	0	0	0	0	0		0.4	1	98.4	0	0.2		0	81.4	0	9.3	9.3		0	0	94.7	5.3	0		
Total %	0	0	0	0	0	0	0.2	0.5	43.5	0	0.1	44.3	0	3.2	0	0.4	0.4	3.9	0	0	49.1	2.7	0	51.8	
Cars +	0	0	0	0	0	0	1	5	468	0	1	475	0	33	0	4	1	38	0	0	526	30	0	556	1069
% Cars +	0	0	0	0	0	0	50	100	97.9	0	100	97.7	0	94.3	0	100	25	88.4	0	0	97.6	100	0	97.7	97.4
Trucks	0	0	0	0	0	0	1	0	10	0	0	11	0	2	0	0	3	5	0	0	13	0	0	13	29
% Trucks	0	0	0	0	0	0	50	0	2.1	0	0	2.3	0	5.7	0	0	75	11.6	0	0	2.4	0	0	2.3	2.6

Traffic Data Inc
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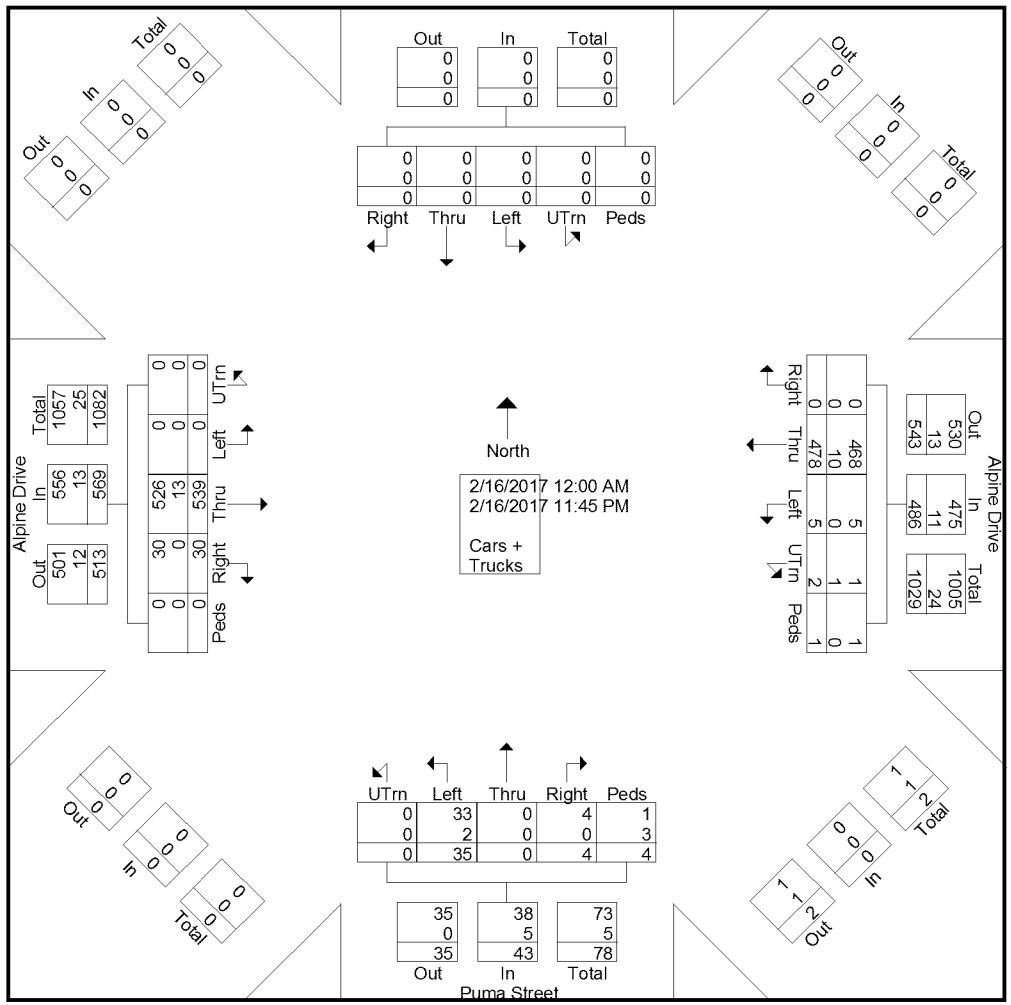
Oxford Street & Fairmount Avenue
Saint Paul, MN



Traffic Data Inc
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St. Louis Park, MN 55416

File Name : 1 - Alpine Dr & Puma St, 2-16-17
Site Code : 1
Start Date : 2/16/2017
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Oxford Street & Fairmount Avenue
Saint Paul, MN

	Southbound						Alpine Drive Westbound						Puma Street Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 AM to 09:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:00 AM																									
07:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**12**	**0**	1	0	0	0	1	0	0	11	0	0	11	24
07:15 AM	0	0	0	0	0	0	0	0	11	0	0	11	0	1	0	0	0	1	0	0	14	0	0	14	26
07:30 AM	0	0	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	0	0	0	**17**	1	0	**18**	**31**
07:45 AM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	13	**4**	0	17	24
Total Volume	0	0	0	0	0	0	0	0	43	0	0	43	0	2	0	0	0	2	0	0	55	5	0	60	105
% App. Total	0	0	0	0	0		0	0	100	0	0		0	100	0	0	0		0	0	91.7	8.3	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.827	.000	.000	.827	.000	.500	.000	.000	.000	.500	.000	.000	.809	.313	.000	.833	.847
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 01:00 PM																									
01:00 PM	0	0	0	0	0	0	0	0	**6**	0	0	**6**	0	**2**	0	0	0	**2**	0	0	**10**	0	0	**10**	**18**
01:15 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	1	0	0	0	1	0	0	8	**1**	0	9	13
01:30 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	1	0	0	0	1	0	0	6	0	0	6	9
01:45 PM	0	0	0	0	0	0	0	**1**	5	0	0	6	0	1	0	**1**	0	2	0	0	9	0	0	9	17
Total Volume	0	0	0	0	0	0	0	1	16	0	0	17	0	5	0	1	0	6	0	0	33	1	0	34	57
% App. Total	0	0	0	0	0		0	5.9	94.1	0	0		0	83.3	0	16.7	0		0	0	97.1	2.9	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.250	.667	.000	.000	.708	.000	.625	.000	.250	.000	.750	.000	.000	.825	.250	.000	.850	.792
Peak Hour Analysis From 02:00 PM to 11:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:00 PM																									
04:00 PM	0	0	0	0	0	0	0	**1**	18	0	0	19	0	2	0	0	0	2	0	0	**14**	1	0	15	**36**
04:15 PM	0	0	0	0	0	0	0	0	13	0	0	13	0	**3**	0	0	0	**3**	0	0	13	0	0	13	29
04:30 PM	0	0	0	0	0	0	0	0	**21**	0	0	**21**	0	1	0	0	0	1	0	0	8	0	0	8	30
04:45 PM	0	0	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	0	0	0	14	**2**	0	**16**	28
Total Volume	0	0	0	0	0	0	0	1	64	0	0	65	0	6	0	0	0	6	0	0	49	3	0	52	123
% App. Total	0	0	0	0	0		0	1.5	98.5	0	0		0	100	0	0	0		0	0	94.2	5.8	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.250	.762	.000	.000	.774	.000	.500	.000	.000	.000	.500	.000	.000	.875	.375	.000	.813	.854

Traffic Data Inc
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Puma Street Southbound						Bunker Lake Boulevard Westbound						Puma Street Northbound						Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	2	0	0	0	2	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	3	0	0	0	3	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4

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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Puma Street Southbound						Bunker Lake Boulevard Westbound						Puma Street Northbound						Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
07:15 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:30 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	7	0	0	0	7	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	8
08:00 AM	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
08:15 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	3	0	0	0	3	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	6
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Puma Street Southbound						Bunker Lake Boulevard Westbound						Puma Street Northbound						Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	2	0	0	0	2	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
04:00 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
04:45 PM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	4	0	0	0	4	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	6
05:00 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
05:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	1	0	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	7
06:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Puma Street Southbound						Bunker Lake Boulevard Westbound						Puma Street Northbound						Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
09:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	20	0	0	0	20	0	0	0	15	0	15	0	0	0	0	0	0	0	0	0	0	0	0	35
Apprch %	0	100	0	0	0		0	0	0	100	0		0	0	0	0	0		0	0	0	0	0		
Total %	0	57.1	0	0	0	57.1	0	0	0	42.9	0	42.9	0	0	0	0	0	0	0	0	0	0	0	0	
Cars +	0	20	0	0	0	20	0	0	0	12	0	12	0	0	0	0	0	0	0	0	0	0	0	0	32
% Cars +	0	100	0	0	0	100	0	0	0	80	0	80	0	0	0	0	0	0	0	0	0	0	0	0	91.4
Trucks	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
% Trucks	0	0	0	0	0	0	0	0	0	20	0	20	0	0	0	0	0	0	0	0	0	0	0	0	8.6

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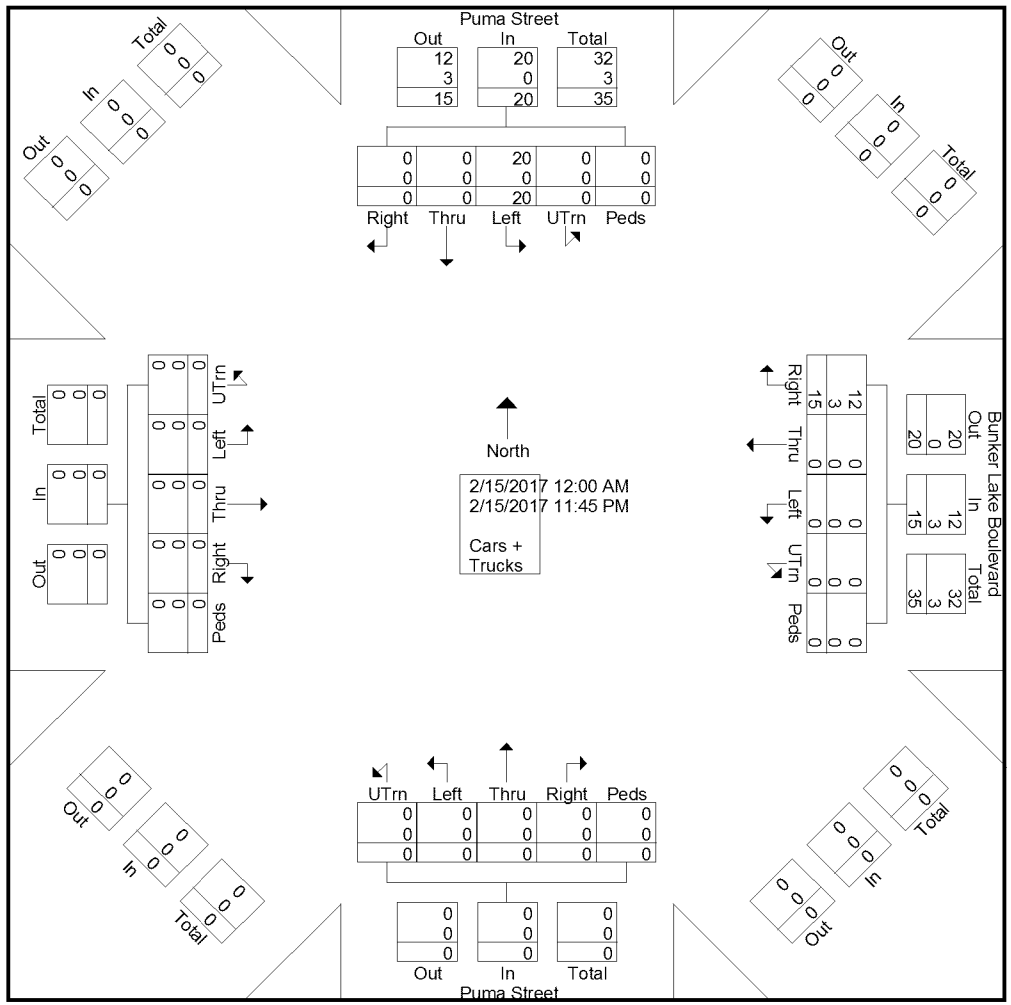
Oxford Street & Fairmount Avenue
Saint Paul, MN



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Oxford Street & Fairmount Avenue
Saint Paul, MN

	Puma Street Southbound						Bunker Lake Boulevard Westbound						Puma Street Northbound						Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 AM to 09:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 06:45 AM																									
06:45 AM	**0**	2	0	0	0	2	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**3**
07:00 AM	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
07:15 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:30 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	6	0	0	0	6	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	8
% App. Total	0	100	0	0	0		0	0	0	100	0		0	0	0	0	0		0	0	0	0	0		
PHF	.000	.750	.000	.000	.000	.750	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.667
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 10:00 AM																									
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Peak Hour Analysis From 02:00 PM to 11:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:45 PM																									
04:45 PM	0	**2**	0	0	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	**3**	0	**3**	0	0	0	0	0	0	0	0	0	0	0	0	**3**
05:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	0	3	0	0	0	3	0	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	9
% App. Total	0	100	0	0	0		0	0	0	100	0		0	0	0	0	0		0	0	0	0	0		
PHF	.000	.375	.000	.000	.000	.375	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.750

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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Puma Street Southbound						Bunker Lake Boulevard Westbound						Puma Street Northbound						Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

Traffic Data Inc
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Puma Street Southbound						Bunker Lake Boulevard Westbound						Puma Street Northbound						Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Total	0	5	0	0	0	5	1	0	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	8
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
08:30 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Puma Street Southbound						Bunker Lake Boulevard Westbound						Puma Street Northbound						Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
03:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	1	1	0	2	0	0	0	0	0	0	3
03:30 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03:45 PM	0	0	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	2	0	0	0	2	0	1	0	3	0	4	0	0	1	1	0	2	0	0	0	0	0	0	8
04:00 PM	0	2	0	0	0	2	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4
04:15 PM	0	1	0	0	0	1	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	4
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	5	0	0	0	5	0	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	11
05:00 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	1	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
05:30 PM	0	2	0	0	0	2	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	5
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	4	0	0	0	4	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	8
06:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Data Inc
PO Box 16269
St. Louis Park, MN 55416

File Name : 2 - Bunker Lake Blvd & Puma St, 2-16-17
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Puma Street Southbound						Bunker Lake Boulevard Westbound						Puma Street Northbound						Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
09:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	22	0	0	0	22	1	1	0	15	0	17	0	0	1	1	0	2	0	0	0	0	0	0	41
Apprch %	0	100	0	0	0		5.9	5.9	0	88.2	0		0	0	50	50	0		0	0	0	0	0		
Total %	0	53.7	0	0	0	53.7	2.4	2.4	0	36.6	0	41.5	0	0	2.4	2.4	0	4.9	0	0	0	0	0	0	
Cars +	0	22	0	0	0	22	1	1	0	13	0	15	0	0	1	1	0	2	0	0	0	0	0	0	39
% Cars +	0	100	0	0	0	100	100	100	0	86.7	0	88.2	0	0	100	100	0	100	0	0	0	0	0	0	95.1
Trucks	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% Trucks	0	0	0	0	0	0	0	0	0	13.3	0	11.8	0	0	0	0	0	0	0	0	0	0	0	0	4.9

Traffic Data Inc
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St. Louis Park, MN 55416

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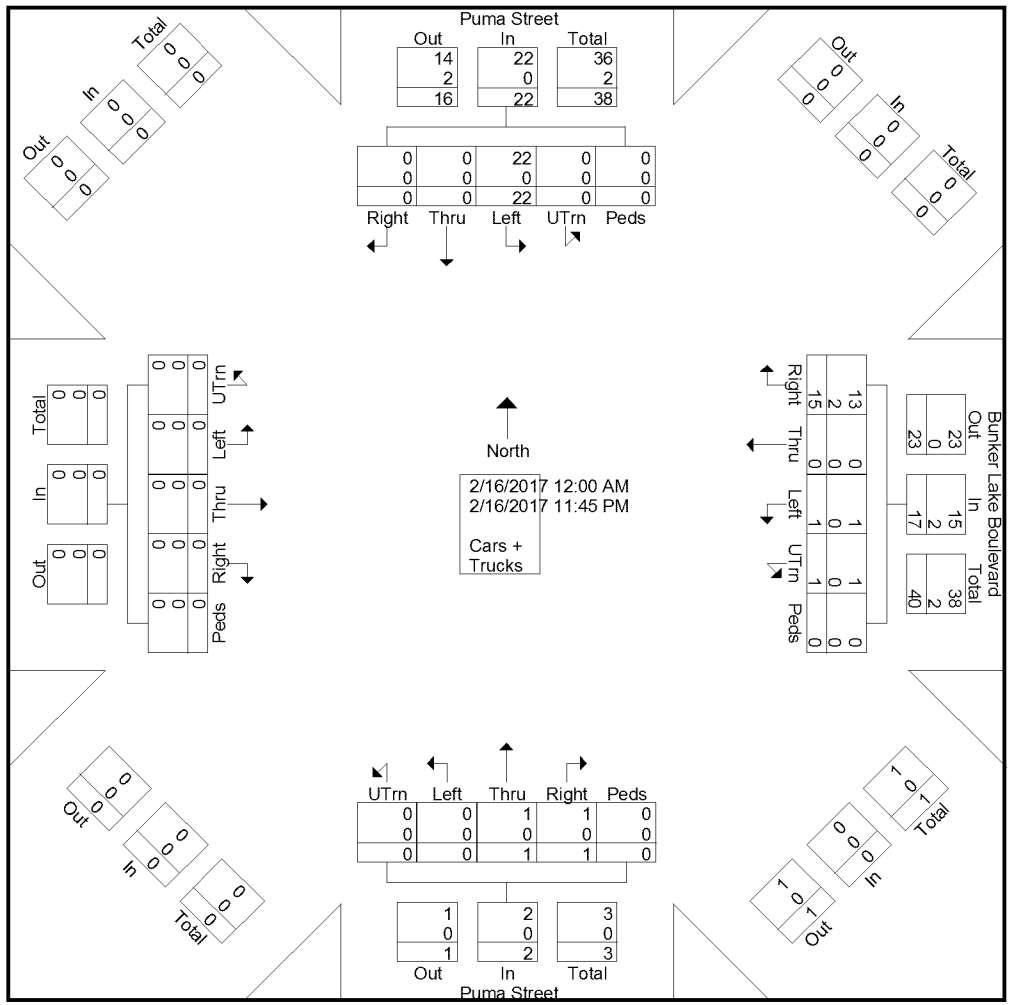
Oxford Street & Fairmount Avenue
Saint Paul, MN



Traffic Data Inc
PO Box 16269
St. Louis Park, MN 55416

File Name : 2 - Bunker Lake Blvd & Puma St, 2-16-17
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Oxford Street & Fairmount Avenue
Saint Paul, MN

	Puma Street Southbound						Bunker Lake Boulevard Westbound						Puma Street Northbound						Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 AM to 09:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:00 AM																									
07:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	5	0	0	0	**5**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**5**
Total Volume	0	5	0	0	0	5	1	0	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	8
% App. Total	0	100	0	0	0		33.3	0	0	66.7	0		0	0	0	0	0		0	0	0	0	0		
PHF	.000	.250	.000	.000	.000	.250	.250	.000	.000	.500	.000	.750	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.400
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 10:00 AM																									
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Peak Hour Analysis From 02:00 PM to 11:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 03:30 PM																									
03:30 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03:45 PM	0	0	0	0	0	0	0	**1**	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
04:00 PM	0	**2**	0	0	0	**2**	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**4**
04:15 PM	0	1	0	0	0	1	0	0	0	**3**	0	**3**	0	0	0	0	0	0	0	0	0	0	0	0	4
Total Volume	0	4	0	0	0	4	0	1	0	6	0	7	0	0	0	0	0	0	0	0	0	0	0	0	11
% App. Total	0	100	0	0	0		0	14.3	0	85.7	0		0	0	0	0	0		0	0	0	0	0		
PHF	.000	.500	.000	.000	.000	.500	.000	.250	.000	.500	.000	.583	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.688

Traffic Data Inc
PO Box 16269
St. Louis Park, MN 55416

File Name : 3 - Alpine Dr & Okapi, 2-15-17
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Okapi Street Southbound						Alpine Drive Westbound						Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
01:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
01:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
02:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
02:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
02:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
02:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
Total	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	4	0	0	4	5
03:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 AM	0	0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	3
Total	0	0	0	1	0	1	0	0	2	0	0	2	0	0	0	0	0	0	0	0	1	0	0	1	4
04:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
04:15 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
04:30 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
04:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	2	0	0	2	10
05:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 AM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
05:30 AM	0	1	0	0	0	1	0	0	8	0	0	8	0	0	0	0	0	0	0	0	1	0	0	1	10
05:45 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	1	0	0	1	4
Total	0	1	0	0	0	1	0	0	16	0	0	16	0	0	0	0	0	0	0	0	2	0	0	2	19
06:00 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	4	0	0	4	10
06:15 AM	0	3	0	0	0	3	0	0	4	0	0	4	0	0	0	0	0	0	0	0	8	0	0	8	15
06:30 AM	0	1	0	0	1	2	0	0	8	0	0	8	0	0	0	0	0	0	0	0	9	0	0	9	19
06:45 AM	0	2	0	0	0	2	0	0	10	0	0	10	0	0	0	0	0	0	0	0	10	0	0	10	22
Total	0	6	0	0	1	7	0	0	28	0	0	28	0	0	0	0	0	0	0	0	31	0	0	31	66

Traffic Data Inc
PO Box 16269
St. Louis Park, MN 55416

File Name : 3 - Alpine Dr & Okapi, 2-15-17
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Okapi Street Southbound						Alpine Drive Westbound						Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	0	0	5	0	0	5	14
07:15 AM	0	0	0	2	0	2	0	0	8	0	0	8	0	0	0	0	0	0	0	0	21	0	0	21	31
07:30 AM	0	2	0	0	0	2	0	0	13	1	0	14	0	0	0	0	0	0	0	0	12	0	0	12	28
07:45 AM	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	0	0	12	0	0	12	22
Total	0	2	0	2	0	4	0	0	40	1	0	41	0	0	0	0	0	0	0	0	50	0	0	50	95
08:00 AM	0	1	0	0	0	1	0	0	5	0	0	5	0	0	0	0	0	0	0	0	11	0	0	11	17
08:15 AM	0	2	0	0	0	2	0	0	6	0	0	6	0	0	0	0	0	0	0	0	7	0	0	7	15
08:30 AM	0	0	0	0	0	0	0	0	6	1	0	7	0	0	0	0	0	0	0	0	15	0	0	15	22
08:45 AM	0	0	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	0	0	12	0	0	12	21
Total	0	3	0	0	0	3	0	0	26	1	0	27	0	0	0	0	0	0	0	0	45	0	0	45	75
09:00 AM	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	0	0	8	0	0	8	18
09:15 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	7	0	0	7	13
09:30 AM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	2	0	0	2	6
09:45 AM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	3	0	0	3	7
Total	0	0	0	0	0	0	0	0	24	0	0	24	0	0	0	0	0	0	0	0	20	0	0	20	44
10:00 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	2	0	0	2	5
10:15 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	3	0	0	3	8
10:30 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	6	0	0	6	11
10:45 AM	0	1	0	0	0	1	0	0	6	0	0	6	0	0	0	0	0	0	0	1	7	0	0	8	15
Total	0	1	0	0	0	1	0	0	19	0	0	19	0	0	0	0	0	0	0	1	18	0	0	19	39
11:00 AM	0	1	0	0	1	2	0	0	4	0	0	4	0	0	0	0	0	0	0	0	4	0	0	4	10
11:15 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	6	0	0	6	11
11:30 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	8	0	0	8	14
11:45 AM	0	0	0	1	0	1	0	0	13	0	0	13	0	0	0	0	0	0	0	1	8	0	0	9	23
Total	0	1	0	1	1	3	0	0	28	0	0	28	0	0	0	0	0	0	0	1	26	0	0	27	58
12:00 PM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	4	0	0	4	8
12:15 PM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	8	0	0	8	15
12:30 PM	0	0	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	0	0	9	0	0	9	12
12:45 PM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	8	0	0	8	14
Total	0	0	0	0	0	0	0	0	19	1	0	20	0	0	0	0	0	0	0	0	29	0	0	29	49
01:00 PM	0	3	0	0	0	3	0	0	10	0	0	10	0	0	0	0	0	0	0	0	8	0	0	8	21
01:15 PM	0	0	0	0	1	1	0	0	7	0	0	7	0	0	0	0	0	0	0	0	6	0	0	6	14
01:30 PM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	4	0	0	4	11
01:45 PM	0	0	0	0	0	0	0	0	5	1	0	6	0	0	0	0	0	0	0	1	9	0	0	10	16
Total	0	3	0	0	1	4	0	0	29	1	0	30	0	0	0	0	0	0	0	1	27	0	0	28	62

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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Okapi Street Southbound						Alpine Drive Westbound						Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
02:00 PM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	6	0	0	6	10
02:15 PM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	5	0	0	5	12
02:30 PM	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	8	0	0	8	16
02:45 PM	0	0	0	1	0	1	0	0	13	1	0	14	0	0	0	0	0	0	0	0	12	0	0	12	27
Total	0	0	0	1	0	1	0	0	32	1	0	33	0	0	0	0	0	0	0	0	31	0	0	31	65
03:00 PM	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	0	0	7	0	0	7	17
03:15 PM	0	1	0	0	0	1	0	0	9	1	0	10	0	0	0	0	0	0	0	0	9	0	0	9	20
03:30 PM	0	0	0	0	0	0	0	0	6	2	0	8	0	0	0	0	0	0	0	0	9	0	0	9	17
03:45 PM	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	15	0	0	15	23
Total	0	1	0	0	0	1	0	0	33	3	0	36	0	0	0	0	0	0	0	0	40	0	0	40	77
04:00 PM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	13	0	0	13	18
04:15 PM	0	1	0	1	0	2	0	0	15	0	0	15	0	0	0	0	0	0	0	0	12	0	0	12	29
04:30 PM	0	0	0	0	0	0	0	0	15	2	0	17	0	0	0	0	0	0	0	0	10	0	0	10	27
04:45 PM	0	0	0	1	0	1	0	0	11	0	0	11	0	0	0	0	0	0	0	0	13	0	0	13	25
Total	0	1	0	2	0	3	0	0	46	2	0	48	0	0	0	0	0	0	0	0	48	0	0	48	99
05:00 PM	0	0	0	1	0	1	0	0	10	1	0	11	0	0	0	0	0	0	0	1	18	0	0	19	31
05:15 PM	0	0	0	0	0	0	0	0	13	2	0	15	0	0	0	0	0	0	0	1	18	0	0	19	34
05:30 PM	0	0	0	1	1	2	0	0	15	0	0	15	0	0	0	0	0	0	0	0	14	0	0	14	31
05:45 PM	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	13	0	0	13	21
Total	0	0	0	2	1	3	0	0	46	3	0	49	0	0	0	0	0	0	0	2	63	0	0	65	117
06:00 PM	0	0	0	1	0	1	0	0	8	0	0	8	0	0	0	0	0	0	0	1	8	0	0	9	18
06:15 PM	0	0	0	0	0	0	0	0	14	1	0	15	0	0	0	0	0	0	0	0	14	0	0	14	29
06:30 PM	0	0	0	1	0	1	0	0	9	1	0	10	0	0	0	0	0	0	0	0	7	0	0	7	18
06:45 PM	0	0	0	1	0	1	0	0	10	0	0	10	0	0	0	0	0	0	0	0	7	0	0	7	18
Total	0	0	0	3	0	3	0	0	41	2	0	43	0	0	0	0	0	0	0	1	36	0	0	37	83
07:00 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	7	0	0	7	9
07:15 PM	0	1	0	0	0	1	0	0	3	0	0	3	0	0	0	0	0	0	0	0	4	0	0	4	8
07:30 PM	0	0	0	0	0	0	0	0	5	1	0	6	0	0	0	0	0	0	0	0	5	0	0	5	11
07:45 PM	0	0	0	0	0	0	0	0	7	1	0	8	0	0	0	0	0	0	0	0	3	0	0	3	11
Total	0	1	0	0	0	1	0	0	17	2	0	19	0	0	0	0	0	0	0	0	19	0	0	19	39
08:00 PM	0	1	0	0	0	1	0	0	3	2	0	5	0	0	0	0	0	0	0	0	5	0	0	5	11
08:15 PM	0	1	0	0	0	1	0	0	7	0	0	7	0	0	0	0	0	0	0	0	1	0	0	1	9
08:30 PM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	7	0	0	7	11
08:45 PM	0	1	0	0	0	1	0	0	6	0	0	6	0	0	0	0	0	0	0	0	6	0	0	6	13
Total	0	3	0	0	0	3	0	0	20	2	0	22	0	0	0	0	0	0	0	0	19	0	0	19	44

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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Okapi Street Southbound						Alpine Drive Westbound						Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
09:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	3	0	0	3	4
09:15 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	1	5	0	0	6	9
09:30 PM	0	0	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	0	0	0	1	0	0	1	6
09:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	3	0	0	3	4
Total	0	0	0	0	0	0	0	0	9	1	0	10	0	0	0	0	0	0	0	1	12	0	0	13	23
10:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
10:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
10:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	3	0	0	3	4
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	7	0	0	7	10
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:15 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	2	0	0	2	5
11:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	5	0	0	5	9
Grand Total	0	23	0	13	4	40	0	0	493	20	0	513	0	0	0	0	0	0	0	7	535	0	0	542	1095
Apprch %	0	57.5	0	32.5	10		0	0	96.1	3.9	0		0	0	0	0	0		0	1.3	98.7	0	0		
Total %	0	2.1	0	1.2	0.4	3.7	0	0	45	1.8	0	46.8	0	0	0	0	0	0	0	0.6	48.9	0	0	49.5	
Cars +	0	22	0	13	4	39	0	0	479	20	0	499	0	0	0	0	0	0	0	7	525	0	0	532	1070
% Cars +	0	95.7	0	100	100	97.5	0	0	97.2	100	0	97.3	0	0	0	0	0	0	0	100	98.1	0	0	98.2	97.7
Trucks	0	1	0	0	0	1	0	0	14	0	0	14	0	0	0	0	0	0	0	0	10	0	0	10	25
% Trucks	0	4.3	0	0	0	2.5	0	0	2.8	0	0	2.7	0	0	0	0	0	0	0	0	1.9	0	0	1.8	2.3

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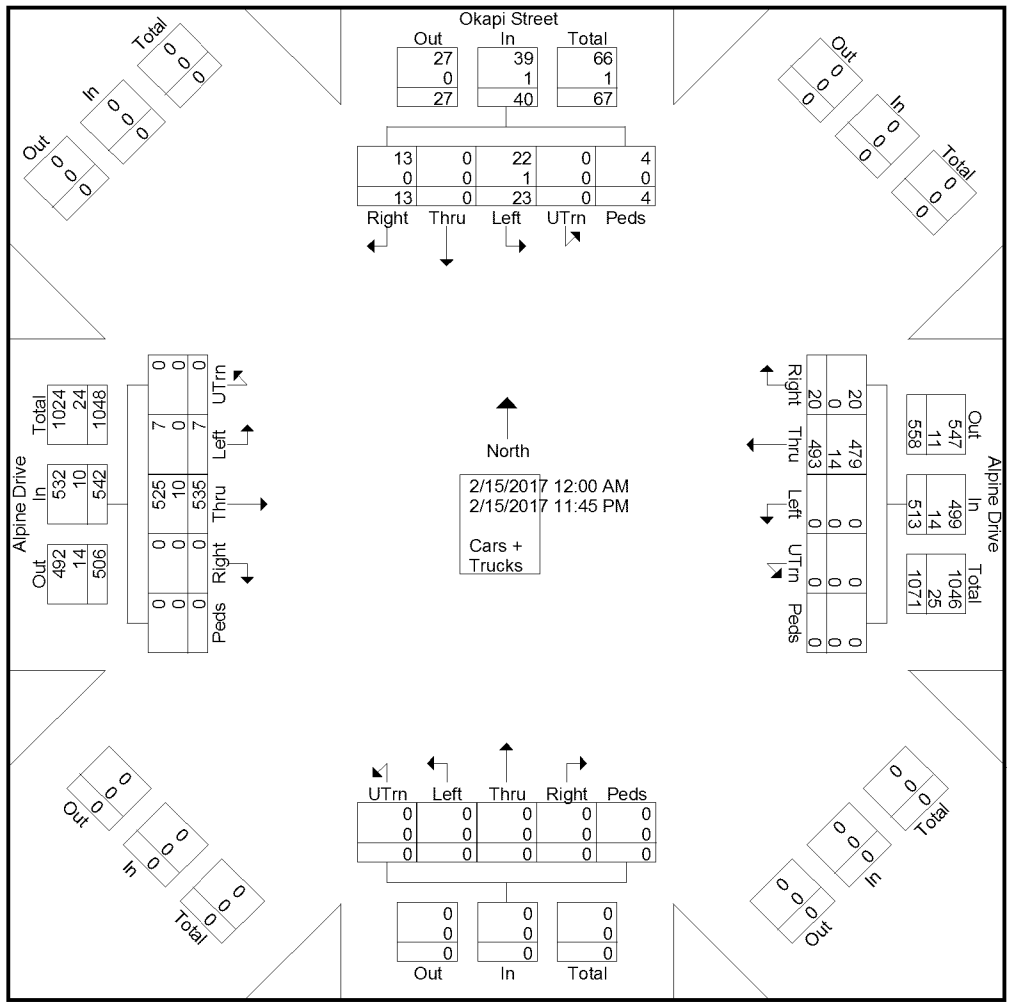
Oxford Street & Fairmount Avenue
Saint Paul, MN



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Oxford Street & Fairmount Avenue
Saint Paul, MN

	Okapi Street Southbound						Alpine Drive Westbound						Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 AM to 09:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:15 AM																									
07:15 AM	**0**	**0**	**0**	2	0	2	0	0	8	0	0	8	0	0	0	0	0	0	0	0	21	0	0	21	**31**
07:30 AM	0	**2**	0	0	0	2	0	0	**13**	**1**	0	**14**	0	0	0	0	0	0	0	0	12	0	0	12	28
07:45 AM	0	0	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	0	0	12	0	0	12	22
08:00 AM	0	1	0	0	0	1	0	0	5	0	0	5	0	0	0	0	0	0	0	0	11	0	0	11	17
Total Volume	0	3	0	2	0	5	0	0	36	1	0	37	0	0	0	0	0	0	0	0	56	0	0	56	98
% App. Total	0	60	0	40	0		0	0	97.3	2.7	0		0	0	0	0	0		0	0	100	0	0		
PHF	.000	.375	.000	.250	.000	.625	.000	.000	.692	.250	.000	.661	.000	.000	.000	.000	.000	.000	.000	.000	.667	.000	.000	.667	.790
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 12:15 PM																									
12:15 PM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	8	0	0	8	15
12:30 PM	0	0	0	0	0	0	0	0	2	**1**	0	3	0	0	0	0	0	0	0	0	**9**	0	0	**9**	12
12:45 PM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	8	0	0	8	14
01:00 PM	0	**3**	0	0	0	**3**	0	0	**10**	0	0	**10**	0	0	0	0	0	0	0	0	8	0	0	8	**21**
Total Volume	0	3	0	0	0	3	0	0	25	1	0	26	0	0	0	0	0	0	0	0	33	0	0	33	62
% App. Total	0	100	0	0	0		0	0	96.2	3.8	0		0	0	0	0	0		0	0	100	0	0		
PHF	.000	.250	.000	.000	.000	.250	.000	.000	.625	.250	.000	.650	.000	.000	.000	.000	.000	.000	.000	.000	.917	.000	.000	.917	.738
Peak Hour Analysis From 02:00 PM to 11:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:45 PM																									
04:45 PM	0	0	0	**1**	0	1	0	0	11	0	0	11	0	0	0	0	0	0	0	0	13	0	0	13	25
05:00 PM	0	0	0	1	0	1	0	0	10	1	0	11	0	0	0	0	0	0	0	**1**	**18**	0	0	**19**	31
05:15 PM	0	0	0	0	0	0	0	0	13	**2**	0	**15**	0	0	0	0	0	0	0	1	18	0	0	19	**34**
05:30 PM	0	0	0	1	**1**	**2**	0	0	**15**	0	0	15	0	0	0	0	0	0	0	0	14	0	0	14	31
Total Volume	0	0	0	3	1	4	0	0	49	3	0	52	0	0	0	0	0	0	0	2	63	0	0	65	121
% App. Total	0	0	0	75	25		0	0	94.2	5.8	0		0	0	0	0	0		0	3.1	96.9	0	0		
PHF	.000	.000	.000	.750	.250	.500	.000	.000	.817	.375	.000	.867	.000	.000	.000	.000	.000	.000	.000	.500	.875	.000	.000	.855	.890

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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Okapi Street Southbound						Alpine Drive Westbound						Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
01:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
01:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
01:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
02:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
02:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
02:30 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
02:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
Total	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	3	0	0	3	8
03:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
03:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:45 AM	0	0	0	1	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	1	0	1	0	0	4	0	0	4	0	0	0	0	0	0	0	0	2	0	0	2	7
04:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
05:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
05:15 AM	0	1	0	0	0	1	0	0	4	0	0	4	0	0	0	0	0	0	0	0	1	0	0	1	6
05:30 AM	0	0	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9
05:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	4	0	0	4	5
Total	0	1	0	0	0	1	0	0	14	0	0	14	0	0	0	0	0	0	0	0	6	0	0	6	21
06:00 AM	0	1	0	0	0	1	0	0	6	0	0	6	0	0	0	0	0	0	0	0	5	0	0	5	12
06:15 AM	0	2	0	0	0	2	0	0	6	0	0	6	0	0	0	0	0	0	0	0	9	0	0	9	17
06:30 AM	0	2	0	0	0	2	0	0	10	0	0	10	0	0	0	0	0	0	0	0	10	0	0	10	22
06:45 AM	0	1	0	0	0	1	0	0	10	0	0	10	0	0	0	0	0	0	0	0	5	0	0	5	16
Total	0	6	0	0	0	6	0	0	32	0	0	32	0	0	0	0	0	0	0	0	29	0	0	29	67

Traffic Data Inc
PO Box 16269
St. Louis Park, MN 55416

File Name : 3 - Alpine Dr & Okapi, 2-16-17
Site Code : 1
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Okapi Street Southbound						Alpine Drive Westbound						Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	0	0	0	12	0	0	12	24
07:15 AM	0	1	0	1	0	2	0	0	10	0	0	10	0	0	0	0	0	0	0	0	15	0	0	15	27
07:30 AM	0	2	0	0	0	2	0	0	13	1	0	14	0	0	0	0	0	0	0	0	14	0	0	14	30
07:45 AM	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	14	0	0	14	22
Total	0	3	0	1	0	4	0	0	43	1	0	44	0	0	0	0	0	0	0	0	55	0	0	55	103
08:00 AM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	12	0	0	12	15
08:15 AM	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	7	0	0	7	13
08:30 AM	0	0	0	0	0	0	0	0	6	1	0	7	0	0	0	0	0	0	0	0	11	0	0	11	18
08:45 AM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	8	0	0	8	15
Total	0	0	0	0	0	0	0	0	22	1	0	23	0	0	0	0	0	0	0	0	38	0	0	38	61
09:00 AM	0	0	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	0	0	8	0	0	8	17
09:15 AM	0	0	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	0	0	5	0	0	5	12
09:30 AM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	3	0	0	3	7
09:45 AM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	6	0	0	6	8
Total	0	0	0	0	0	0	0	0	22	0	0	22	0	0	0	0	0	0	0	0	22	0	0	22	44
10:00 AM	0	0	0	0	0	0	0	0	7	1	0	8	0	0	0	0	0	0	0	0	7	0	0	7	15
10:15 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	8	0	0	8	13
10:30 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	1	0	0	1	6
10:45 AM	0	0	0	0	1	1	0	0	5	0	0	5	0	0	0	0	0	0	0	0	7	0	0	7	13
Total	0	0	0	0	1	1	0	0	22	1	0	23	0	0	0	0	0	0	0	0	23	0	0	23	47
11:00 AM	0	1	0	0	0	1	0	0	6	0	0	6	0	0	0	0	0	0	0	0	6	0	0	6	13
11:15 AM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	5	0	0	5	10
11:30 AM	0	0	0	0	1	1	0	0	4	0	0	4	0	0	0	0	0	0	0	0	1	0	0	1	6
11:45 AM	0	0	0	1	0	1	0	0	6	2	0	8	0	0	0	0	0	0	0	0	5	0	0	5	14
Total	0	1	0	1	1	3	0	0	21	2	0	23	0	0	0	0	0	0	0	0	17	0	0	17	43
12:00 PM	0	0	0	0	1	1	0	0	2	0	0	2	0	0	0	0	0	0	0	0	8	0	0	8	11
12:15 PM	0	0	0	0	1	1	0	0	5	0	0	5	0	0	0	0	0	0	0	0	2	0	0	2	8
12:30 PM	0	0	0	0	1	1	0	0	6	0	0	6	0	0	0	0	0	0	0	0	6	0	0	6	13
12:45 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	5	0	0	5	7
Total	0	0	0	0	3	3	0	0	15	0	0	15	0	0	0	0	0	0	0	0	21	0	0	21	39
01:00 PM	0	0	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	0	0	5	0	0	5	16
01:15 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	7	0	0	7	10
01:30 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	1	6	0	0	7	9
01:45 PM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	1	9	0	0	10	15
Total	0	0	0	0	0	0	0	0	21	0	0	21	0	0	0	0	0	0	0	2	27	0	0	29	50

Traffic Data Inc
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St. Louis Park, MN 55416

File Name : 3 - Alpine Dr & Okapi, 2-16-17
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Okapi Street Southbound						Alpine Drive Westbound						Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
02:00 PM	0	0	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	0	0	5	0	0	5	16
02:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	7	0	0	7	8
02:30 PM	0	1	0	0	0	1	0	0	9	0	0	9	0	0	0	0	0	0	0	0	6	0	0	6	16
02:45 PM	0	0	0	0	1	1	0	0	6	0	0	6	0	0	0	0	0	0	0	0	11	0	0	11	18
Total	0	1	0	0	1	2	0	0	27	0	0	27	0	0	0	0	0	0	0	0	29	0	0	29	58
03:00 PM	0	0	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	0	0	1	6	0	0	7	18
03:15 PM	0	1	0	1	0	2	0	0	6	0	0	6	0	0	0	0	0	0	0	0	10	0	0	10	18
03:30 PM	0	0	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	0	0	0	12	0	0	12	24
03:45 PM	0	1	0	0	0	1	0	0	8	1	0	9	0	0	0	0	0	0	0	0	12	0	0	12	22
Total	0	2	0	1	0	3	0	0	37	1	0	38	0	0	0	0	0	0	0	1	40	0	0	41	82
04:00 PM	0	1	0	0	0	1	0	0	19	0	0	19	0	0	0	0	0	0	0	1	13	0	0	14	34
04:15 PM	0	1	0	0	0	1	0	0	14	1	0	15	0	0	0	0	0	0	0	0	13	0	0	13	29
04:30 PM	0	0	0	0	0	0	0	0	19	1	0	20	0	0	0	0	0	0	0	0	7	0	0	7	27
04:45 PM	0	0	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	0	0	1	14	0	0	15	27
Total	0	2	0	0	0	2	0	0	64	2	0	66	0	0	0	0	0	0	0	2	47	0	0	49	117
05:00 PM	0	0	0	0	0	0	0	0	10	3	0	13	0	0	0	0	2	2	0	0	9	0	0	9	24
05:15 PM	0	0	0	2	0	2	0	0	11	1	0	12	0	0	0	0	0	0	0	0	16	0	0	16	30
05:30 PM	0	0	0	0	0	0	0	0	18	0	0	18	0	0	0	0	0	0	0	0	14	0	0	14	32
05:45 PM	0	0	0	0	0	0	0	0	10	1	0	11	0	0	0	0	0	0	0	0	19	0	0	19	30
Total	0	0	0	2	0	2	0	0	49	5	0	54	0	0	0	0	2	2	0	0	58	0	0	58	116
06:00 PM	0	0	0	0	0	0	0	0	9	3	0	12	0	0	0	0	0	0	0	0	16	0	0	16	28
06:15 PM	0	1	0	1	0	2	0	0	9	0	0	9	0	0	0	0	0	0	0	1	12	0	0	13	24
06:30 PM	0	0	0	0	0	0	0	0	6	1	0	7	0	0	0	0	0	0	0	0	6	0	0	6	13
06:45 PM	0	1	0	0	0	1	0	0	5	0	0	5	0	0	0	0	0	0	0	0	6	0	0	6	12
Total	0	2	0	1	0	3	0	0	29	4	0	33	0	0	0	0	0	0	0	1	40	0	0	41	77
07:00 PM	0	0	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	0	0	0	3	0	0	3	8
07:15 PM	0	0	0	0	0	0	0	0	8	2	0	10	0	0	0	0	0	0	0	0	8	0	0	8	18
07:30 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	6	0	0	6	8
07:45 PM	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	7	0	0	7	11
Total	0	0	0	0	0	0	0	0	18	3	0	21	0	0	0	0	0	0	0	0	24	0	0	24	45
08:00 PM	0	0	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	0	0	3	0	0	3	7
08:15 PM	0	0	0	0	0	0	0	0	7	1	0	8	0	0	0	0	0	0	0	0	6	0	0	6	14
08:30 PM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	0	4	0	0	4	9
08:45 PM	0	0	0	0	0	0	0	0	6	1	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
Total	0	0	0	0	0	0	0	0	21	3	0	24	0	0	0	0	0	0	0	0	13	0	0	13	37

Traffic Data Inc
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Oxford Street & Fairmount Avenue
Saint Paul, MN

Groups Printed- Cars + - Trucks

	Okapi Street Southbound						Alpine Drive Westbound						Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
09:00 PM	0	0	0	1	0	1	0	0	3	0	0	3	0	0	0	0	0	0	0	1	3	0	0	4	8
09:15 PM	0	1	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	7	0	0	7	9
09:30 PM	0	0	0	0	0	0	0	0	7	1	0	8	0	0	0	0	0	0	0	0	3	0	0	3	11
09:45 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	5	0	0	5	7
Total	0	1	0	1	0	2	0	0	13	1	0	14	0	0	0	0	0	0	0	1	18	0	0	19	35
10:00 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	1	0	0	1	4
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	4
10:30 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	1	0	0	1	3
10:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	4	0	0	4	5
Total	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0	10	0	0	10	16
11:00 PM	0	2	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	2	5
11:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	3	0	0	3	4
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
Total	0	2	0	0	0	2	0	0	2	0	0	2	0	0	0	0	0	0	0	0	9	0	0	9	13
Grand Total	0	21	0	8	6	35	0	0	495	24	0	519	0	0	0	0	2	2	0	7	534	0	0	541	1097
Apprch %	0	60	0	22.9	17.1		0	0	95.4	4.6	0		0	0	0	0	100		0	1.3	98.7	0	0		
Total %	0	1.9	0	0.7	0.5	3.2	0	0	45.1	2.2	0	47.3	0	0	0	0	0.2	0.2	0	0.6	48.7	0	0	49.3	
Cars +	0	20	0	7	6	33	0	0	481	22	0	503	0	0	0	0	0	0	0	7	520	0	0	527	1063
% Cars +	0	95.2	0	87.5	100	94.3	0	0	97.2	91.7	0	96.9	0	0	0	0	0	0	0	100	97.4	0	0	97.4	96.9
Trucks	0	1	0	1	0	2	0	0	14	2	0	16	0	0	0	0	2	2	0	0	14	0	0	14	34
% Trucks	0	4.8	0	12.5	0	5.7	0	0	2.8	8.3	0	3.1	0	0	0	0	100	100	0	0	2.6	0	0	2.6	3.1

Traffic Data Inc
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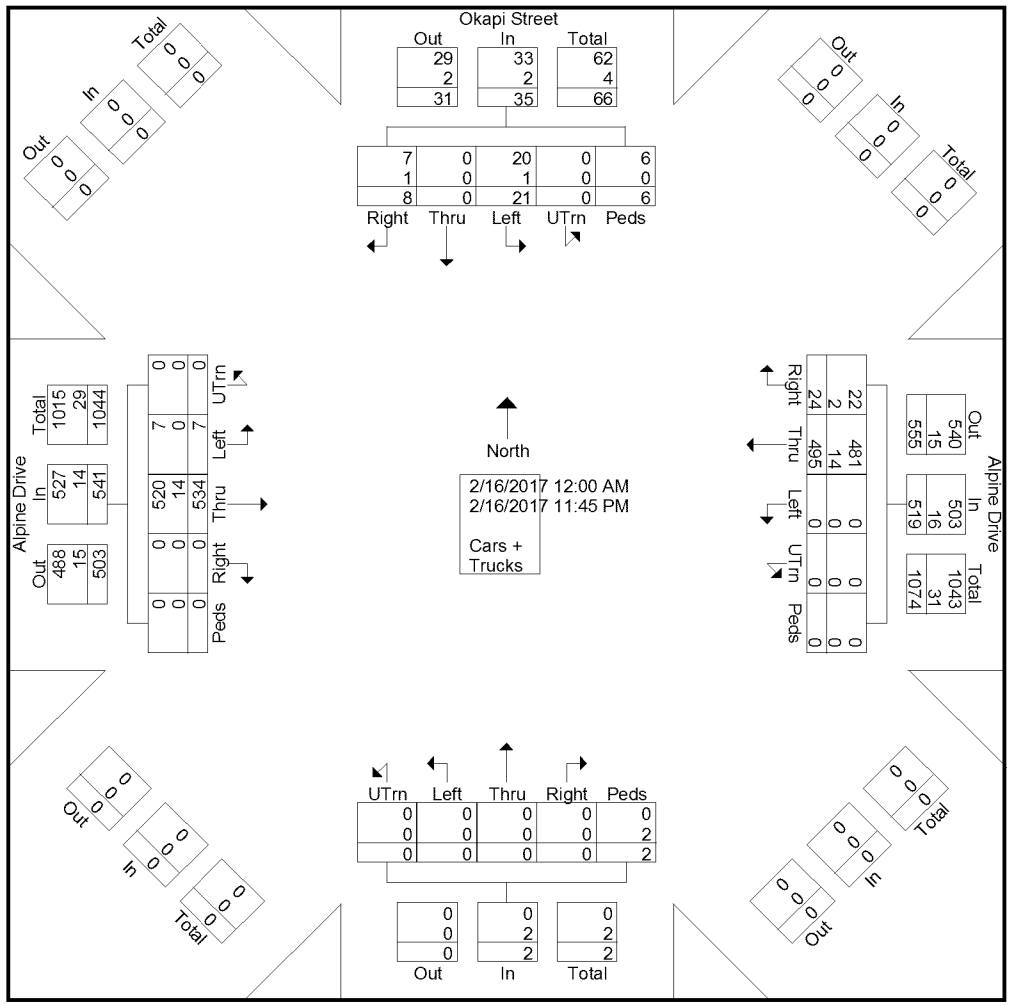
Oxford Street & Fairmount Avenue
Saint Paul, MN



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St. Louis Park, MN 55416

File Name : 3 - Alpine Dr & Okapi, 2-16-17
Site Code : 1
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Oxford Street & Fairmount Avenue
Saint Paul, MN

	Okapi Street Southbound						Alpine Drive Westbound						Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 AM to 09:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:00 AM																									
07:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**12**	**24**
07:15 AM	**0**	**1**	**0**	1	0	2	0	0	10	0	0	10	0	0	0	0	0	0	0	0	15	0	0	15	27
07:30 AM	0	**2**	0	0	0	2	0	0	**13**	**1**	0	**14**	0	0	0	0	0	0	0	0	14	0	0	14	**30**
07:45 AM	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	14	0	0	14	22
Total Volume	0	3	0	1	0	4	0	0	43	1	0	44	0	0	0	0	0	0	0	0	55	0	0	55	103
% App. Total	0	75	0	25	0		0	0	97.7	2.3	0		0	0	0	0	0		0	0	100	0	0		
PHF	.000	.375	.000	.250	.000	.500	.000	.000	.827	.250	.000	.786	.000	.000	.000	.000	.000	.000	.000	.000	.917	.000	.000	.917	.858
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 01:00 PM																									
01:00 PM	0	0	0	0	0	0	0	0	**11**	0	0	**11**	0	0	0	0	0	0	0	0	5	0	0	5	**16**
01:15 PM	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	7	0	0	7	10
01:30 PM	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	**1**	6	0	0	7	9
01:45 PM	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	0	1	**9**	0	0	**10**	15
Total Volume	0	0	0	0	0	0	0	0	21	0	0	21	0	0	0	0	0	0	0	2	27	0	0	29	50
% App. Total	0	0	0	0	0		0	0	100	0	0		0	0	0	0	0		0	6.9	93.1	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.477	.000	.000	.477	.000	.000	.000	.000	.000	.000	.000	.500	.750	.000	.000	.725	.781
Peak Hour Analysis From 02:00 PM to 11:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 05:15 PM																									
05:15 PM	0	0	0	**2**	0	**2**	0	0	11	1	0	12	0	0	0	0	0	0	0	0	16	0	0	16	30
05:30 PM	0	0	0	0	0	0	0	0	**18**	0	0	**18**	0	0	0	0	0	0	0	0	14	0	0	14	**32**
05:45 PM	0	0	0	0	0	0	0	0	10	1	0	11	0	0	0	0	0	0	0	0	**19**	0	0	**19**	30
06:00 PM	0	0	0	0	0	0	0	0	9	**3**	0	12	0	0	0	0	0	0	0	0	16	0	0	16	28
Total Volume	0	0	0	2	0	2	0	0	48	5	0	53	0	0	0	0	0	0	0	0	65	0	0	65	120
% App. Total	0	0	0	100	0		0	0	90.6	9.4	0		0	0	0	0	0		0	0	100	0	0		
PHF	.000	.000	.000	.250	.000	.250	.000	.000	.667	.417	.000	.736	.000	.000	.000	.000	.000	.000	.000	.000	.855	.000	.000	.855	.938

Traffic Data Inc
PO Box 16269
St. Louis Park, MN 55416

File Name : 4 - TH 10 & Alpine Drive
Site Code : 1
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TH 10 & Alpine Drive
Saint Paul, MN

Groups Printed- Cars + - Trucks

	TH 10 Southbound						Alpine Drive Westbound						TH 10 Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
12:00 AM	0	0	9	0	0	9	0	1	0	1	0	2	0	0	21	0	0	21	0	0	0	0	0	0	32
12:15 AM	0	0	19	0	0	19	0	0	0	0	0	0	0	0	22	2	0	24	0	0	0	0	0	0	43
12:30 AM	0	0	11	0	0	11	0	0	0	0	0	0	0	0	17	1	0	18	0	0	0	0	0	0	29
12:45 AM	0	0	12	0	0	12	0	0	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	0	27
Total	0	0	51	0	0	51	0	1	0	1	0	2	0	0	75	3	0	78	0	0	0	0	0	0	131
01:00 AM	0	0	14	0	0	14	0	0	0	1	0	1	0	0	25	0	0	25	0	0	0	0	0	0	40
01:15 AM	0	0	16	0	0	16	0	0	0	0	0	0	0	0	21	0	0	21	0	0	0	0	0	0	37
01:30 AM	0	0	7	0	0	7	0	0	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	0	26
01:45 AM	0	0	8	0	0	8	0	0	0	0	0	0	0	0	22	0	0	22	0	0	0	0	0	0	30
Total	0	0	45	0	0	45	0	0	0	1	0	1	0	0	87	0	0	87	0	0	0	0	0	0	133
02:00 AM	0	0	9	0	0	9	0	0	0	0	0	0	0	0	23	0	0	23	0	0	0	0	0	0	32
02:15 AM	0	0	15	0	0	15	0	0	0	1	0	1	0	0	14	1	0	15	0	0	0	0	0	0	31
02:30 AM	0	1	16	0	0	17	0	1	0	1	0	2	0	0	12	0	0	12	0	0	0	0	0	0	31
02:45 AM	0	1	28	0	0	29	0	0	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	0	48
Total	0	2	68	0	0	70	0	1	0	2	0	3	0	0	68	1	0	69	0	0	0	0	0	0	142
03:00 AM	0	0	16	0	0	16	0	0	0	1	0	1	0	0	15	0	0	15	0	0	0	0	0	0	32
03:15 AM	0	0	31	0	0	31	0	0	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	0	48
03:30 AM	0	0	40	0	0	40	0	0	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	0	54
03:45 AM	0	0	37	0	0	37	0	0	0	2	0	2	0	0	18	0	0	18	0	0	0	0	0	0	57
Total	0	0	124	0	0	124	0	0	0	3	0	3	0	0	64	0	0	64	0	0	0	0	0	0	191
04:00 AM	0	0	60	0	0	60	0	1	0	1	0	2	0	0	19	0	0	19	0	0	0	0	0	0	81
04:15 AM	0	0	102	0	0	102	0	0	0	4	0	4	0	0	30	0	0	30	0	0	0	0	0	0	136
04:30 AM	0	0	150	0	0	150	0	1	0	3	0	4	0	0	27	0	0	27	0	0	0	0	0	0	181
04:45 AM	0	0	137	0	0	137	0	2	0	0	0	2	0	0	54	0	0	54	0	0	0	0	0	0	193
Total	0	0	449	0	0	449	0	4	0	8	0	12	0	0	130	0	0	130	0	0	0	0	0	0	591
05:00 AM	0	0	180	0	0	180	0	3	0	2	0	5	0	0	41	0	0	41	0	0	0	0	0	0	226
05:15 AM	0	0	295	0	0	295	0	5	0	4	0	9	0	0	53	0	0	53	0	0	0	0	0	0	357
05:30 AM	0	0	396	0	0	396	0	1	0	10	0	11	0	0	88	0	0	88	0	0	0	0	0	0	495
05:45 AM	0	1	388	0	0	389	0	3	0	3	0	6	0	0	111	0	0	111	0	0	0	0	0	0	506
Total	0	1	1259	0	0	1260	0	12	0	19	0	31	0	0	293	0	0	293	0	0	0	0	0	0	1584
06:00 AM	0	3	406	0	0	409	0	3	0	9	0	12	0	0	139	1	0	140	0	0	0	0	0	0	561
06:15 AM	0	4	527	0	0	531	0	8	0	8	0	16	2	0	155	1	0	158	0	0	0	0	0	0	705
06:30 AM	0	5	477	0	0	482	0	4	0	6	0	10	0	0	201	7	0	208	0	0	0	0	0	0	700
06:45 AM	0	2	440	0	0	442	0	6	0	8	0	14	0	0	183	4	0	187	0	0	0	0	0	0	643
Total	0	14	1850	0	0	1864	0	21	0	31	0	52	2	0	678	13	0	693	0	0	0	0	0	0	2609

Traffic Data Inc
PO Box 16269
St. Louis Park, MN 55416

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TH 10 & Alpine Drive
Saint Paul, MN

Groups Printed- Cars + - Trucks

	TH 10 Southbound						Alpine Drive Westbound						TH 10 Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	6	482	0	0	488	0	7	0	10	0	17	1	0	180	1	0	182	0	0	0	0	0	0	687
07:15 AM	0	9	477	0	0	486	0	7	0	13	0	20	0	0	189	1	0	190	0	0	0	0	0	0	696
07:30 AM	0	10	483	0	0	493	0	7	0	7	0	14	1	0	245	1	0	247	0	0	0	0	0	0	754
07:45 AM	0	5	455	0	0	460	0	6	0	15	0	21	0	0	241	3	0	244	0	0	0	0	0	0	725
Total	0	30	1897	0	0	1927	0	27	0	45	0	72	2	0	855	6	0	863	0	0	0	0	0	0	2862
08:00 AM	0	7	354	0	0	361	0	8	0	8	0	16	0	0	192	3	0	195	0	0	0	0	0	0	572
08:15 AM	0	4	355	0	0	359	0	11	0	10	0	21	0	0	189	1	0	190	0	0	0	0	0	0	570
08:30 AM	1	1	304	0	0	306	0	3	0	5	0	8	0	0	183	3	0	186	0	0	0	0	0	0	500
08:45 AM	2	1	287	0	0	290	0	6	0	7	0	13	0	0	155	2	0	157	0	0	0	0	0	0	460
Total	3	13	1300	0	0	1316	0	28	0	30	0	58	0	0	719	9	0	728	0	0	0	0	0	0	2102
09:00 AM	0	1	296	0	0	297	0	7	0	8	0	15	0	0	163	3	0	166	0	0	0	0	0	0	478
09:15 AM	0	1	262	0	0	263	0	3	0	5	0	8	0	0	169	2	0	171	0	0	0	0	0	0	442
09:30 AM	0	2	231	0	0	233	0	3	0	7	0	10	0	0	188	3	0	191	0	0	0	0	0	0	434
09:45 AM	0	4	240	0	0	244	0	4	0	3	0	7	1	0	161	6	0	168	0	0	0	0	0	0	419
Total	0	8	1029	0	0	1037	0	17	0	23	0	40	1	0	681	14	0	696	0	0	0	0	0	0	1773
10:00 AM	1	6	240	0	0	247	0	6	0	7	0	13	0	0	186	2	0	188	0	0	0	0	0	0	448
10:15 AM	1	10	206	0	0	217	0	8	0	5	0	13	0	0	179	3	0	182	0	0	0	0	0	0	412
10:30 AM	2	5	220	0	0	227	0	2	0	4	0	6	0	0	182	2	0	184	0	0	0	0	0	0	417
10:45 AM	1	3	205	0	0	209	0	0	0	4	0	4	0	0	204	2	0	206	0	0	0	0	0	0	419
Total	5	24	871	0	0	900	0	16	0	20	0	36	0	0	751	9	0	760	0	0	0	0	0	0	1696
11:00 AM	0	8	199	0	0	207	0	5	0	3	0	8	1	0	193	1	0	195	0	0	0	0	0	0	410
11:15 AM	1	5	201	0	0	207	0	1	0	4	0	5	2	0	179	1	0	182	0	0	0	0	0	0	394
11:30 AM	1	6	212	0	0	219	0	1	0	4	0	5	1	0	204	3	0	208	0	0	0	0	0	0	432
11:45 AM	1	5	231	0	0	237	0	3	0	10	0	13	2	0	189	5	0	196	0	0	0	0	0	0	446
Total	3	24	843	0	0	870	0	10	0	21	0	31	6	0	765	10	0	781	0	0	0	0	0	0	1682
12:00 PM	1	8	223	0	0	232	0	2	0	6	0	8	1	0	191	2	0	194	0	0	0	0	0	0	434
12:15 PM	0	6	196	0	0	202	0	2	0	8	0	10	2	0	185	6	0	193	0	0	0	0	0	0	405
12:30 PM	0	3	224	0	0	227	0	4	0	6	0	10	1	0	179	3	0	183	0	0	0	0	0	0	420
12:45 PM	2	4	215	0	0	221	0	4	0	3	0	7	1	0	225	2	0	228	0	0	0	0	0	0	456
Total	3	21	858	0	0	882	0	12	0	23	0	35	5	0	780	13	0	798	0	0	0	0	0	0	1715
01:00 PM	0	10	198	0	0	208	0	1	0	7	0	8	1	0	185	8	0	194	0	0	0	0	0	0	410
01:15 PM	1	4	195	0	0	200	0	1	0	3	0	4	2	0	210	5	0	217	0	0	0	0	0	0	421
01:30 PM	0	6	243	0	0	249	0	3	0	5	0	8	1	0	226	6	0	233	0	0	0	0	0	0	490
01:45 PM	1	6	214	0	0	221	0	3	0	10	0	13	2	0	235	6	0	243	0	0	0	0	0	0	477
Total	2	26	850	0	0	878	0	8	0	25	0	33	6	0	856	25	0	887	0	0	0	0	0	0	1798

Traffic Data Inc
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TH 10 & Alpine Drive
Saint Paul, MN

Groups Printed- Cars + - Trucks

	TH 10 Southbound						Alpine Drive Westbound						TH 10 Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
02:00 PM	0	12	249	0	0	261	0	3	0	4	0	7	0	0	290	7	0	297	0	0	0	0	0	0	565
02:15 PM	2	11	226	0	0	239	0	2	0	5	0	7	1	0	315	8	0	324	0	0	0	0	0	0	570
02:30 PM	0	2	249	0	0	251	0	5	0	7	0	12	0	0	359	20	0	379	0	0	0	0	0	0	642
02:45 PM	0	7	238	0	0	245	0	3	0	8	0	11	0	0	343	15	0	358	0	0	0	0	0	0	614
Total	2	32	962	0	0	996	0	13	0	24	0	37	1	0	1307	50	0	1358	0	0	0	0	0	0	2391
03:00 PM	3	7	275	0	0	285	0	7	0	3	0	10	1	0	375	10	0	386	0	0	0	0	0	0	681
03:15 PM	4	16	265	0	0	285	0	5	0	7	0	12	0	0	433	8	0	441	0	0	0	0	0	0	738
03:30 PM	0	6	288	0	0	294	0	2	0	11	0	13	1	0	466	9	0	476	0	0	0	0	0	0	783
03:45 PM	5	9	290	0	0	304	0	11	0	8	0	19	1	0	467	2	0	470	0	0	0	0	0	0	793
Total	12	38	1118	0	0	1168	0	25	0	29	0	54	3	0	1741	29	0	1773	0	0	0	0	0	0	2995
04:00 PM	2	12	290	0	0	304	0	8	0	5	0	13	0	0	467	5	0	472	0	0	0	0	0	0	789
04:15 PM	2	11	295	0	0	308	0	6	0	9	0	15	0	0	457	4	0	461	0	0	0	0	0	0	784
04:30 PM	0	5	312	0	0	317	0	2	0	7	0	9	0	0	468	8	0	476	0	0	0	0	0	0	802
04:45 PM	0	14	325	0	0	339	0	2	0	12	0	14	0	0	464	12	0	476	0	0	0	0	0	0	829
Total	4	42	1222	0	0	1268	0	18	0	33	0	51	0	0	1856	29	0	1885	0	0	0	0	0	0	3204
05:00 PM	0	14	337	0	0	351	0	4	0	12	0	16	1	0	479	3	0	483	0	0	0	0	0	0	850
05:15 PM	4	16	276	0	0	296	0	2	0	9	0	11	1	0	472	9	0	482	0	0	0	0	0	0	789
05:30 PM	2	20	303	0	0	325	0	2	0	7	0	9	0	0	425	9	0	434	0	0	0	0	0	0	768
05:45 PM	0	15	242	0	0	257	0	6	0	7	0	13	0	0	399	19	0	418	0	0	0	0	0	0	688
Total	6	65	1158	0	0	1229	0	14	0	35	0	49	2	0	1775	40	0	1817	0	0	0	0	0	0	3095
06:00 PM	1	6	237	0	0	244	0	3	0	11	0	14	1	0	360	8	0	369	0	0	0	0	0	0	627
06:15 PM	1	9	200	0	0	210	0	1	0	9	0	10	0	0	309	6	0	315	0	0	0	0	0	0	535
06:30 PM	0	7	189	0	0	196	0	4	0	8	0	12	1	0	280	7	0	288	0	0	0	0	0	0	496
06:45 PM	0	7	169	0	0	176	0	3	0	9	0	12	2	0	227	5	0	234	0	0	0	0	0	0	422
Total	2	29	795	0	0	826	0	11	0	37	0	48	4	0	1176	26	0	1206	0	0	0	0	0	0	2080
07:00 PM	2	4	117	0	0	123	0	1	0	5	0	6	1	0	204	7	0	212	0	0	0	0	0	0	341
07:15 PM	0	7	127	0	0	134	0	6	0	4	0	10	0	0	217	6	0	223	0	0	0	0	0	0	367
07:30 PM	0	3	115	0	0	118	0	2	0	1	0	3	0	0	168	5	0	173	0	0	0	0	0	0	294
07:45 PM	0	6	110	0	0	116	0	3	0	1	0	4	0	0	171	3	0	174	0	0	0	0	0	0	294
Total	2	20	469	0	0	491	0	12	0	11	0	23	1	0	760	21	0	782	0	0	0	0	0	0	1296
08:00 PM	0	7	114	0	0	121	0	4	0	10	0	14	0	0	153	4	0	157	0	0	0	0	0	0	292
08:15 PM	0	6	128	0	0	134	0	3	0	3	0	6	1	0	158	3	0	162	0	0	0	0	0	0	302
08:30 PM	0	3	106	0	0	109	0	1	0	2	0	3	0	0	158	2	0	160	0	0	0	0	0	0	272
08:45 PM	0	12	75	0	0	87	0	12	0	5	0	17	0	0	145	4	0	149	0	0	0	0	0	0	253
Total	0	28	423	0	0	451	0	20	0	20	0	40	1	0	614	13	0	628	0	0	0	0	0	0	1119

Traffic Data Inc
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TH 10 & Alpine Drive
Saint Paul, MN

Groups Printed- Cars + - Trucks

	TH 10 Southbound						Alpine Drive Westbound						TH 10 Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
09:00 PM	0	6	87	0	0	93	0	3	0	2	0	5	0	0	131	2	0	133	0	0	0	0	0	0	231
09:15 PM	0	3	75	0	0	78	0	1	0	2	0	3	0	0	102	0	0	102	0	0	0	0	0	0	183
09:30 PM	0	2	70	0	0	72	0	0	0	0	0	0	0	0	101	2	0	103	0	0	0	0	0	0	175
09:45 PM	0	6	61	0	0	67	0	0	0	0	0	0	1	0	80	2	0	83	0	0	0	0	0	0	150
Total	0	17	293	0	0	310	0	4	0	4	0	8	1	0	414	6	0	421	0	0	0	0	0	0	739
10:00 PM	0	2	62	0	0	64	0	1	0	1	0	2	0	0	80	0	0	80	0	0	0	0	0	0	146
10:15 PM	0	1	54	0	0	55	0	0	0	0	0	0	0	0	70	1	0	71	0	0	0	0	0	0	126
10:30 PM	1	0	58	0	0	59	0	0	0	1	0	1	0	0	60	3	0	63	0	0	0	0	0	0	123
10:45 PM	0	2	42	0	0	44	0	1	0	4	0	5	0	0	52	0	0	52	0	0	0	0	0	0	101
Total	1	5	216	0	0	222	0	2	0	6	0	8	0	0	262	4	0	266	0	0	0	0	0	0	496
11:00 PM	0	1	40	0	0	41	0	0	0	0	0	0	1	0	56	0	0	57	0	0	0	0	0	0	98
11:15 PM	0	1	26	0	0	27	0	1	0	1	0	2	0	0	43	1	0	44	0	0	0	0	0	0	73
11:30 PM	0	1	22	0	0	23	0	0	0	0	0	0	0	0	57	1	0	58	0	0	0	0	0	0	81
11:45 PM	0	1	14	0	0	15	0	0	0	1	0	1	0	0	44	0	0	44	0	0	0	0	0	0	60
Total	0	4	102	0	0	106	0	1	0	2	0	3	1	0	200	2	0	203	0	0	0	0	0	0	312
Grand Total	45	443	18252												16907										
Cars +	42	409	17337	0	0	17788	0	272	0	409	0	681	31	0	16150	314	0	16495	0	0	0	0	0	0	34964
% Cars +	93.3	92.3	95	0	0	94.9	0	98.2	0	90.3	0	93.3	86.1	0	95.5	97.2	0	95.5	0	0	0	0	0	0	95.2
Trucks	3	34	915	0	0	952	0	5	0	44	0	49	5	0	757	9	0	771	0	0	0	0	0	0	1772
% Trucks	6.7	7.7	5	0	0	5.1	0	1.8	0	9.7	0	6.7	13.9	0	4.5	2.8	0	4.5	0	0	0	0	0	0	4.8

Traffic Data Inc
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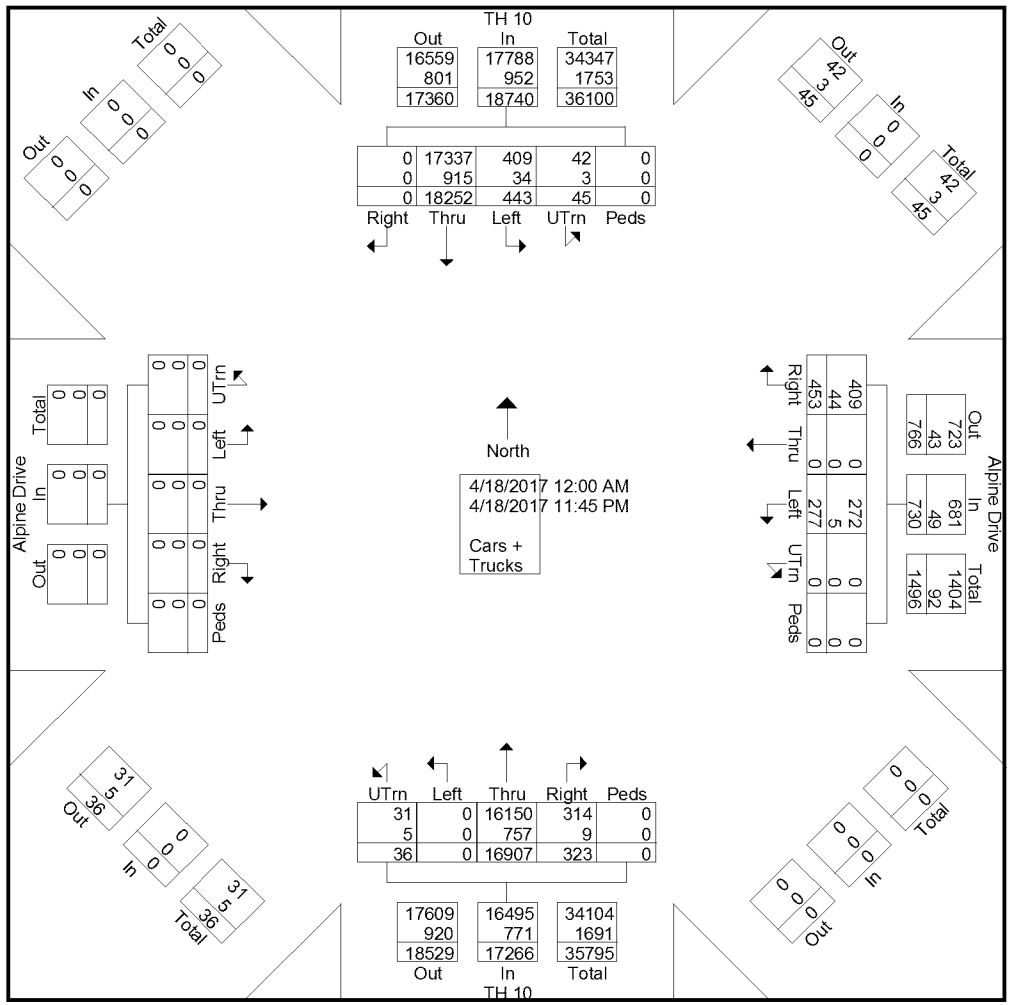
TH 10 & Alpine Drive
Saint Paul, MN



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File Name : 4 - TH 10 & Alpine Drive
Site Code : 1
Start Date : 4/18/2017
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TH 10 & Alpine Drive
Saint Paul, MN

	TH 10 Southbound						Alpine Drive Westbound						TH 10 Northbound						Alpine Drive Eastbound						
Start Time	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	UTrn	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 AM to 09:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:00 AM																									
07:00 AM	**0**	**6**	**482**	**0**	**0**	**488**	**0**	7	0	10	0	17	1	0	180	1	0	182	0	0	0	0	0	0	687
07:15 AM	0	9	477	0	0	486	0	7	0	13	0	20	0	0	189	1	0	190	0	0	0	0	0	0	696
07:30 AM	0	10	483	0	0	**493**	0	7	0	7	0	14	1	0	**245**	1	0	**247**	0	0	0	0	0	0	**754**
07:45 AM	0	5	455	0	0	460	0	6	0	**15**	0	**21**	0	0	241	**3**	0	244	0	0	0	0	0	0	725
Total Volume	0	30	1897	0	0	1927	0	27	0	45	0	72	2	0	855	6	0	863	0	0	0	0	0	0	2862
% App. Total	0	1.6	98.4	0	0		0	37.5	0	62.5	0		0.2	0	99.1	0.7	0		0	0	0	0	0		
PHF	.000	.750	.982	.000	.000	.977	.000	.964	.000	.750	.000	.857	.500	.000	.872	.500	.000	.873	.000	.000	.000	.000	.000	.000	.949
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 01:00 PM																									
01:00 PM	0	**10**	198	0	0	208	0	1	0	7	0	8	1	0	185	**8**	0	194	0	0	0	0	0	0	410
01:15 PM	**1**	4	195	0	0	200	0	1	0	3	0	4	**2**	0	210	5	0	217	0	0	0	0	0	0	421
01:30 PM	0	6	**243**	0	0	**249**	0	**3**	0	5	0	8	1	0	226	6	0	233	0	0	0	0	0	0	**490**
01:45 PM	1	6	214	0	0	221	0	3	0	**10**	0	**13**	2	0	**235**	6	0	**243**	0	0	0	0	0	0	477
Total Volume	2	26	850	0	0	878	0	8	0	25	0	33	6	0	856	25	0	887	0	0	0	0	0	0	1798
% App. Total	0.2	3	96.8	0	0		0	24.2	0	75.8	0		0.7	0	96.5	2.8	0		0	0	0	0	0		
PHF	.500	.650	.874	.000	.000	.882	.000	.667	.000	.625	.000	.635	.750	.000	.911	.781	.000	.913	.000	.000	.000	.000	.000	.000	.917
Peak Hour Analysis From 02:00 PM to 11:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:30 PM																									
04:30 PM	0	5	312	0	0	317	0	2	0	7	0	9	0	0	468	8	0	476	0	0	0	0	0	0	802
04:45 PM	0	14	325	0	0	339	0	2	0	**12**	0	14	0	0	464	**12**	0	476	0	0	0	0	0	0	829
05:00 PM	0	14	**337**	0	0	**351**	0	**4**	0	12	0	**16**	**1**	0	**479**	3	0	**483**	0	0	0	0	0	0	**850**
05:15 PM	**4**	**16**	276	0	0	296	0	2	0	9	0	11	1	0	472	9	0	482	0	0	0	0	0	0	789
Total Volume	4	49	1250	0	0	1303	0	10	0	40	0	50	2	0	1883	32	0	1917	0	0	0	0	0	0	3270
% App. Total	0.3	3.8	95.9	0	0		0	20	0	80	0		0.1	0	98.2	1.7	0		0	0	0	0	0		
PHF	.250	.766	.927	.000	.000	.928	.000	.625	.000	.833	.000	.781	.500	.000	.983	.667	.000	.992	.000	.000	.000	.000	.000	.000	.962

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Table D1
Forecasted Trip Generation

Weekday Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family Home	210	Units	246.0	9.52	50%	50%	1,171	1,171
Townhomes	230	Units	98.0	5.81	50%	50%	285	285
Total							**1,456**	**1,456**

AM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family Home	210	Units	246.0	0.75	25%	75%	46	138
Townhomes	230	Units	98.0	0.44	17%	83%	7	36
Total							**53**	**174**

PM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS	
							ENTER	EXIT
Single Family Home	210	Units	246.0	1.00	63%	37%	155	91
Townhomes	230	Units	98.0	0.52	67%	33%	34	17
Total							**189**	**108**

NOTES:

1. **All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 9th Edition unless otherwise noted.**
2. **A.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 7 and 9 a.m.).**
3. **P.M. Trip Generation is for the peak hour of adjacent street traffic (one hour between 4 and 6 p.m.).**

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Table D2
Forecasted Trip Generation
South of Bunker

Weekday Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS ENTER	NEW TRIPS EXIT
Industrial Park	130	Acres	45.1	61.17	50%	50%	1,380	1,380
Total								

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS ENTER	NEW TRIPS EXIT
Industrial Park	130	Acres	45.1	8.20	83%	17%	307	63
Total							**307**	**63**

PM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS ENTER	NEW TRIPS EXIT
Industrial Park	130	Acres	45.1	8.53	21%	79%	81	304
Total							**81**	**304**

NOTES:
1. **All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 9th Edition unless otherwise noted.**
2. **AM Peak Trip Generation is for the AM Peak Hour.**
3. **PM Peak Trip Generation is for the Peak Hour of Generator**

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Table D3
Forecasted Trip Generation
North of Bunker

Weekday Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS ENTER	NEW TRIPS EXIT
Industrial Park	130	Acres	37.2	61.17	50%	50%	1,137	1,137
Total							**1,137**	**1,137**

AM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS ENTER	NEW TRIPS EXIT
Industrial Park	130	Acres	37.2	8.20	83%	17%	253	52
Total							**253**	**52**

PM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS ENTER	NEW TRIPS EXIT
Industrial Park	130	Acres	37.2	8.53	21%	79%	67	250
Total							**67**	**250**

NOTES:
1. **All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 9th Edition unless otherwise noted.**
2. **AM Peak Trip Generation is for the AM Peak Hour.**
3. **PM Peak Trip Generation is for the Peak Hour of Generator**

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Table D4
Forecasted Trip Generation
East of Puma

Weekday Daily Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	DAILY RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS ENTER	NEW TRIPS EXIT
Industrial Park	130	Acres	32.0	61.17	50%	50%	979	979
Single Family Detached Housing	210	Acres	34.6	26.04	50%	50%	451	451
Total								

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS ENTER	NEW TRIPS EXIT
Industrial Park	130	Acres	32.0	8.20	83%	17%	218	45
Single Family Detached Housing	210	Acres	34.6	2.06	31%	69%	22	49
Total							**240**	**94**

PM Peak Volumes

LAND USE	ITE CODE #	DEVELOPMENT UNITS	QUANTITY	PEAK RATE	ENTER PERCENT	EXIT PERCENT	NEW TRIPS ENTER	NEW TRIPS EXIT
Industrial Park	130	Acres	32.0	8.53	21%	79%	57	216
Single Family Detached Housing	210	Acres	34.6	2.74	66%	34%	63	32
Total							**120**	**248**

1. **All trip generation rates based on "Trip Generation", Institute of Transportation Engineers, 9th Edition unless otherwise noted.**
2. **AM Peak Trip Generation is for the AM Peak Hour.**
3. **PM Peak Trip Generation is for the Peak Hour of Generator**

AM Peak Volumes

Figure 1: Existing Peak Volumes

- **AM Peak Hour on top, PM Peak Hour on bottom**

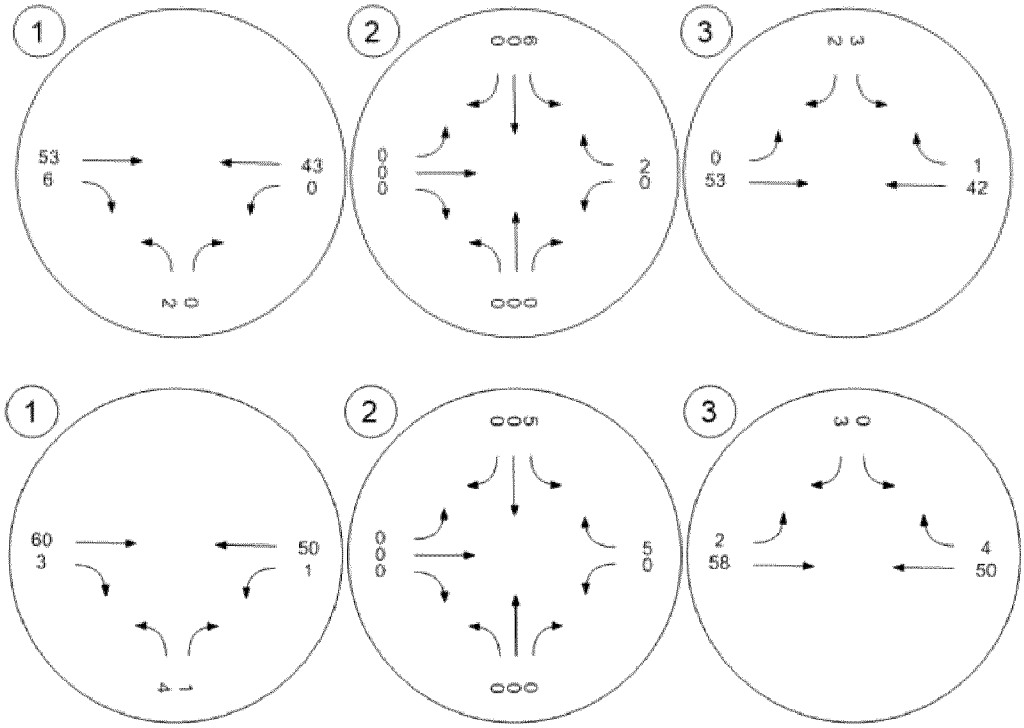


Figure 2: 2040 No-Build Peak Volumes

- **AM Peak Hour on top, PM Peak Hour on bottom**

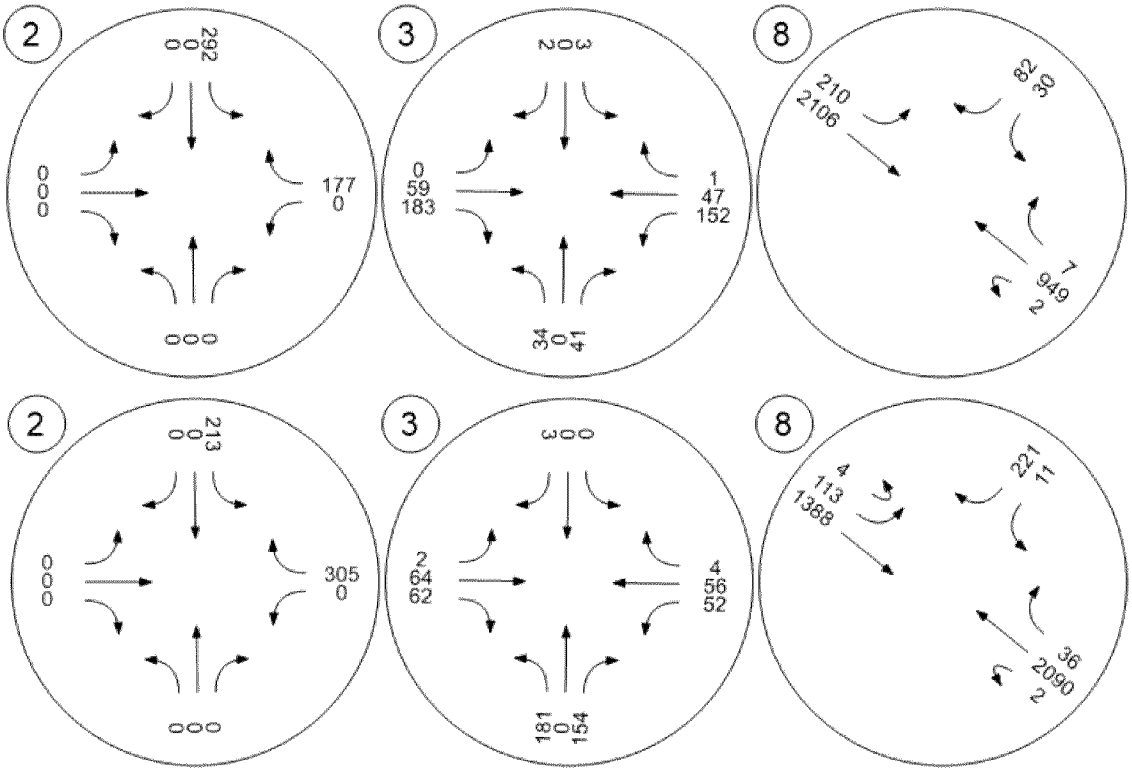
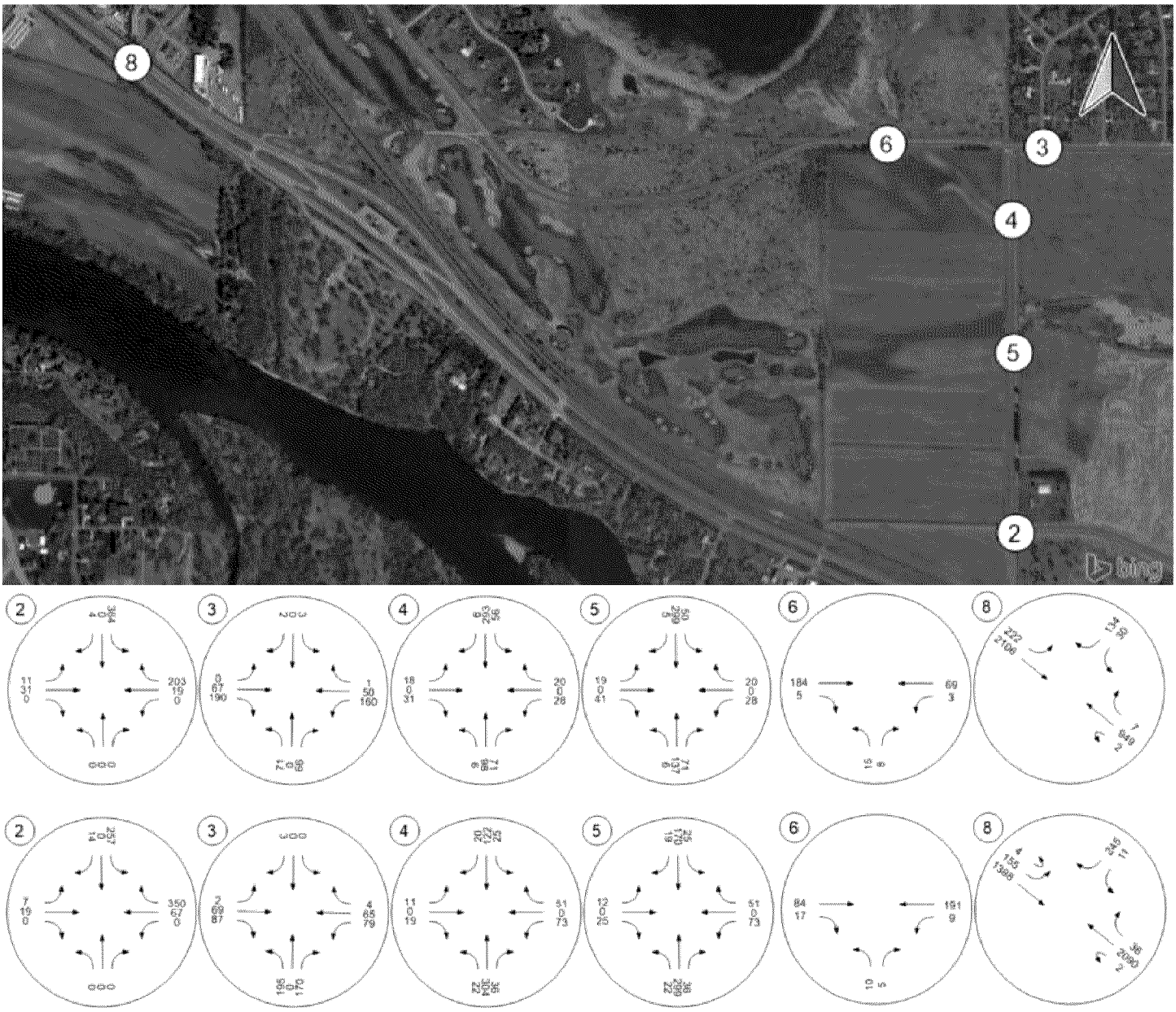


Figure 3: 2040 Build Peak Volumes

- **AM Peak Hour on top, PM Peak Hour on bottom**



Level of Service (LOS)

Level of Service (LOS) is a qualitative description, similar to typical school grades, that traffic engineers use to communicate how good or bad traffic operations are on a corridor, intersection, or interchange.

Common Factors

Traffic can be a hard thing to quantify as everyone has a different tolerance for congestion. What seems excessively long to one person may seem good enough for another. These differences are readily apparent when comparing small towns or rural areas, where five cars an hour can be the norm, to big cities or downtowns, where less than hundred cars an hour, even in the middle of night, is rare.

To combat this issue and provide a consistent measuring tool for traffic studies, a "Level of Service" rating was developed. Level of Service ratings are based on the roadway or intersection characteristics and the amount of traffic. Just like grade school, LOS A represents the best traffic operations, where traffic flows freely. LOS F, on the other hand, represents failing operations, where the road or intersection is congested and running beyond maximum capacity. LOS E is typically considered "at capacity" which means the amount of traffic is right at the level the roadway or intersection can adequately accommodate. Using Level of Service letter grades provides an easy way to convey road operations to the general public and has been adopted across the United States.

Common Factors Impacting Level of Service

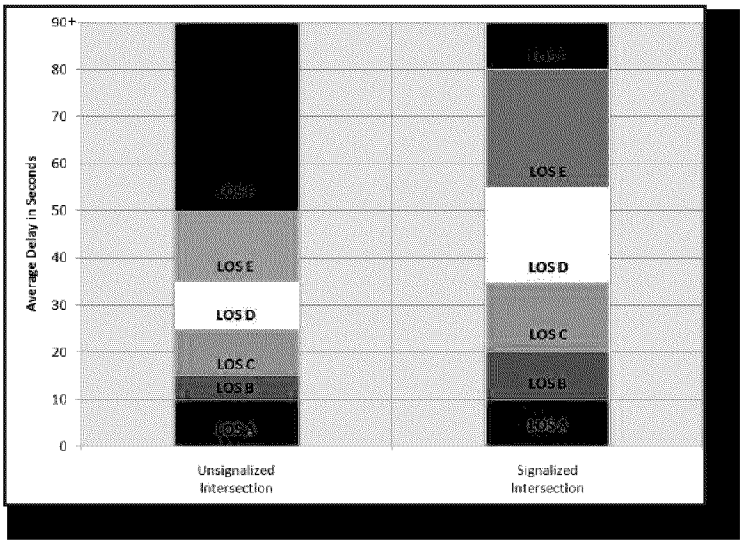
- **Number of Lanes.**
- **Traffic Volumes.**
- **Intersection Control (stop sign, signal, roundabout, interchange.)**
- **Amount of access on a corridor.**
- **Percentage of turning traffic.**
- **Traffic signal cycle length (green time devoted to each approach) and phasing (one green for all approach movements or separate green arrows.)**
- **Percentage of heavy trucks.**
- **Roadway Grades.**
- **Distribution of traffic within a peak hour as well as over the course of a day.**
- **Pedestrian activity.**
- **Bicycle activity.**

Level of Service criteria have been developed for multiple types of traffic operations including:

- Intersections
- Urban Corridors
- Freeways
- Transit Service
- Bicycle Operations
- Pedestrian Operations

The most common LOS criteria used is for car operations at intersections; both signalized and unsignalized. For an intersection Level of Service analysis, average delay for cars travelling through the intersection is used to determine the appropriate grade. A high delay results in a poor LOS rating and equates to poor operations. Similarly, low delay results in a good LOS rating and equates to good or great operations.

LOS can be determined for the intersection as a whole, or for individual movements. It is common during peak periods in major population areas for an intersection to have an acceptable overall LOS rating, but fail to achieve a good grade for individual movements.



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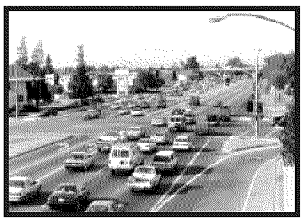
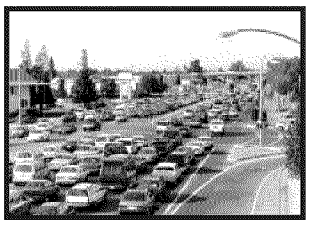
LOS A



LOS C

LOS D = Acceptable



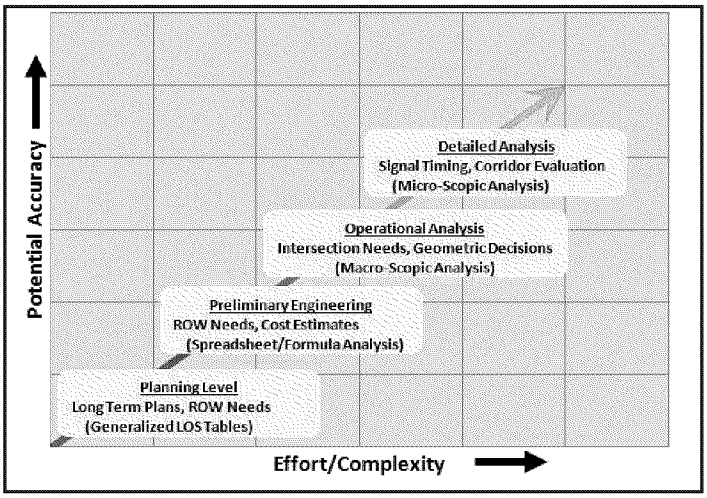
LOS F = Unacceptable

Source: City of San Jose, CA.

Although a Level of Service rating of A represents the best traffic operations, it is not always the most desirable. Providing LOS A for all corridors and all operations at all times would require a significant amount of land to be devoted to the road infrastructure, which makes it extremely costly to build and maintain. During non-peak times, like overnight, much of that infrastructure would sit unused.

On the opposite side of the spectrum, a Level of Service rating of E and F represent traffic operations close to breaking down, or that already have. These ratings mean high delays, long queues, and slow speeds, not to mention driver frustration. Instead of trying to achieve one or the other, government agencies try to strike a balance between providing acceptable operations, neither falling nor flowing too freely. Because of this, **LOS D is typically considered the lowest LOS acceptable by government agencies** and is reflective of a balanced approach between cost and benefit.

There are many tools and guidelines used to determine a roads Level of Service rating. Simple tools like generalized roadway capacities allow for planning-level efforts. While inexpensive and quick to complete, they are not as accurate as other options. More complicated tools, such as micro-simulations, provide more accurate results, but cost more and take more time. It is important to understand the trade-offs between the analysis types as well as the purpose of the study.



Source: Florida Deptarment of Transportation

- Highway Capacity Manual, fifth edition
- Nation Cooperative Highway Research Program Report 616: Multimodal Level of Service Analysis for Urban Streets
- http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_616.pdf
- Florida Department of Transportation Quality/Level of Service Handbook
- http://www.dot.state.fl.us/planning/systems/programs/sm/los/pdfs/2009FDOTQLOS_Handbook.pdf

About This Brief

Spack Consulting prepared this brief as part of our company's vision to significantly improve the practice of traffic engineering and transportation planning. Transportation professionals from around the world have assisted us in developing this document. We are providing this brief under the Creative Commons Attribution License. Feel free to use-modify-share this guide, but please give us some credit in your document. To request our whole series of Design Briefs and to be included on our distribution list for new materials, please email mspack@spackconsulting.com. And please reach out if you have any comments or questions related to this Design Brief.

Vistro File: C:\...\Pearson Farm Model_updated.vistro
Report File: C:\...\Existing AM.pdf

Scenario 1 Existing AM Peak
5/1/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alpine Drive & Puma Street	Two-way stop	HCM 2010	NB Left	0.002	9.0	A
2	Puma Street & Bunker Lake Boulevard	Two-way stop	HCM 2010	SB Thru	0.000	9.0	A
3	Alpine Drive & Okapi Street	Two-way stop	HCM 2010	SB Left	0.005	9.1	A
8	TH 10 & Alpine Drive	Two-way stop	HCM 2010	SWB Left	0.556	143.5	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report
Intersection 1: Alpine Drive & Puma Street

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name						
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		40.00		40.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	2	0	53	6	0	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
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	0	53	6	0	43
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	13	2	0	11
Total Analysis Volume [veh/h]	2	0	53	6	0	43
Pedestrian Volume [ped/h]	0		0		0	

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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	0.00	0.00
d_M, Delay for Movement [s/veh]	9.01	8.57	0.00	0.00	7.33	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.01	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.17	0.17	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.01		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.17					
Intersection LOS	A					

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Intersection Level Of Service Report
Intersection 2: Puma Street & Bunker Lake Boulevard

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name											
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]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name											
Base Volume Input [veh/h]	0	0	0	6	0	0	0	0	0	0	0	2
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
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]	0	0	0	6	0	0	0	0	0	0	0	2
Peak Hour 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
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]	0	0	0	2	0	0	0	0	0	0	0	1
Total Analysis Volume [veh/h]	0	0	0	6	0	0	0	0	0	0	0	2
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
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	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.52	9.03	8.32	8.54	9.04	8.34	7.22	0.00	0.00	7.22	0.00	0.00
Movement LOS	A	A	A	A	A	A	A	A	A	A		A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.44	0.44	0.44	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.62			8.54			2.41			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	6.41											
Intersection LOS	A											

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Intersection Level Of Service Report
Intersection 3: Alpine Drive & Okapi Street

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name						
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
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		40.00		40.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	3	2	0	53	42	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
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	2	0	53	42	1
Peak Hour Factor	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	1	0	16	12	0
Total Analysis Volume [veh/h]	4	2	0	62	49	1
Pedestrian Volume [ped/h]	0		0		0	

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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	0.00	0.00
d_M, Delay for Movement [s/veh]	9.09	8.56	7.31	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.02	0.02	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.49	0.49	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.91		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.45					
Intersection LOS	A					

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Intersection Level Of Service Report
Intersection 8: TH 10 & Alpine Drive

Control Type:	Two-way stop	Delay (sec / veh):	143.5
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.556

Intersection Setup

Name							
Approach	Southwestbound		Northwestbound			Southeastbound	
Lane Configuration							
Turning Movement	Left	Right	U-turn	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0	0
Pocket Length [ft]	100.00	325.00	340.00	100.00	340.00	100.00	100.00
Speed [mph]	30.00		65.00			65.00	
Grade [%]	0.00		0.00			0.00	
Crosswalk	Yes		Yes			Yes	

Volumes

Name							
Base Volume Input [veh/h]	27	45	2	855	6	30	1897
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	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
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	45	2	855	6	30	1897
Peak Hour Factor	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	12	1	225	2	8	500
Total Analysis Volume [veh/h]	28	47	2	901	6	32	1999
Pedestrian Volume [ped/h]	0		0			0	

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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	0.56	0.08	0.04	0.01	0.00	0.04	0.02
d_M, Delay for Movement [s/veh]	143.53	12.07	77.72	0.00	0.00	10.04	0.00
Movement LOS	F	B	F	A	A	B	A
95th-Percentile Queue Length [veh]	2.13	0.28	0.12	0.00	0.00	0.13	0.00
95th-Percentile Queue Length [ft]	53.29	6.90	2.97	0.00	0.00	3.36	0.00
d_A, Approach Delay [s/veh]	61.15		0.17			0.16	
Approach LOS	F		A			A	
d_I, Intersection Delay [s/veh]	1.68						
Intersection LOS	F						

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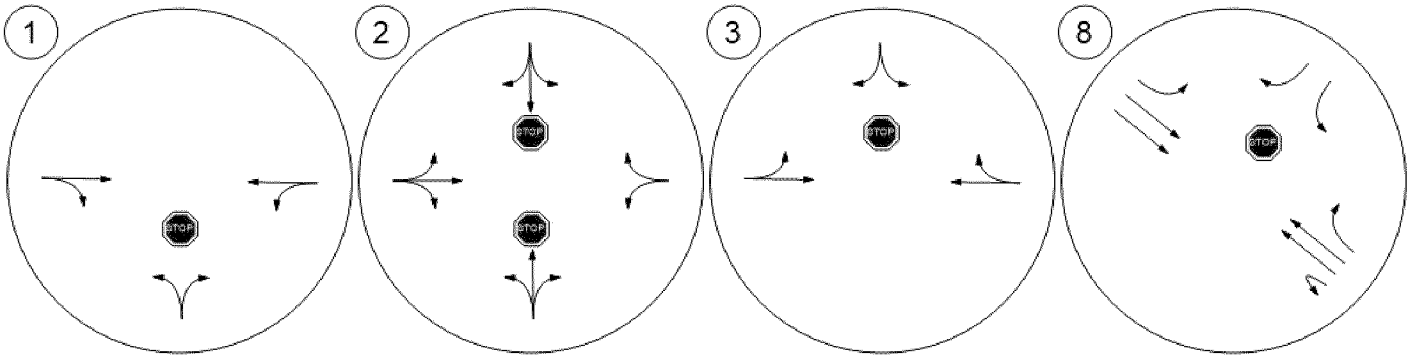
Lane Configuration and Traffic Control



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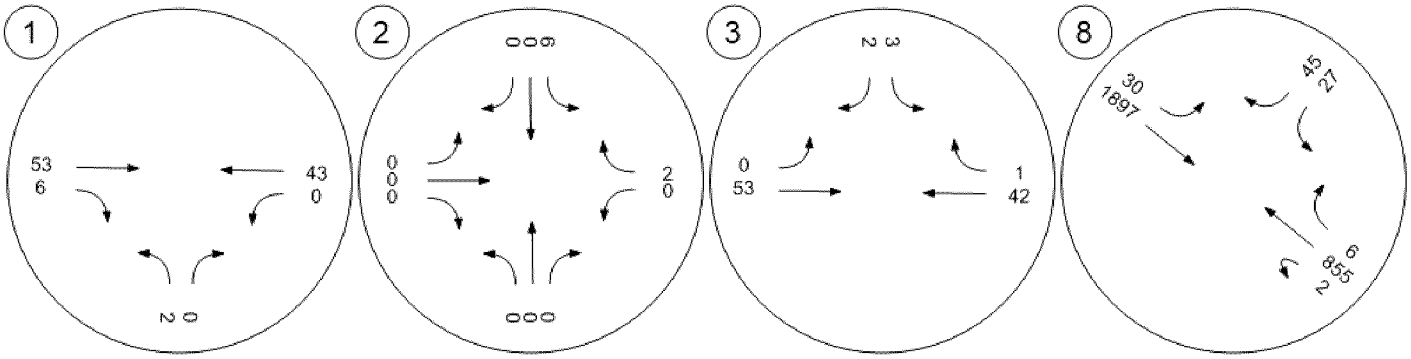
Traffic Volume - Base Volume



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Vistro File: C:\...\Pearson Farm Model_updated.vistro
Report File: C:\...\Existing PM.pdf

Scenario 2 Existing PM Peak
5/1/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alpine Drive & Puma Street	Two-way stop	HCM 2010	NB Left	0.005	9.1	A
2	Puma Street & Bunker Lake Boulevard	Two-way stop	HCM 2010	SB Thru	0.000	9.0	A
3	Alpine Drive & Okapi Street	Two-way stop	HCM 2010	SB Left	0.000	9.2	A
8	TH 10 & Alpine Drive	Two-way stop	HCM 2010	SWB Left	0.814	586.4	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report
Intersection 1: Alpine Drive & Puma Street

Control Type:	Two-way stop	Delay (sec / veh):	9.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name						
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		40.00		40.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	4	1	60	3	1	50
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
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	60	3	1	50
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	15	1	0	13
Total Analysis Volume [veh/h]	4	1	60	3	1	50
Pedestrian Volume [ped/h]	0		0		0	

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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	0.00	0.00
d_M, Delay for Movement [s/veh]	9.10	8.61	0.00	0.00	7.34	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.02	0.02	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft]	0.42	0.42	0.00	0.00	2.57	2.57
d_A, Approach Delay [s/veh]	9.00		0.00		0.14	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.44					
Intersection LOS	A					

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Intersection Level Of Service Report
Intersection 2: Puma Street & Bunker Lake Boulevard

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name											
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]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name											
Base Volume Input [veh/h]	0	0	0	5	0	0	0	0	0	0	0	5
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
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]	0	0	0	5	0	0	0	0	0	0	0	5
Peak Hour 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
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]	0	0	0	1	0	0	0	0	0	0	0	1
Total Analysis Volume [veh/h]	0	0	0	5	0	0	0	0	0	0	0	5
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.53	9.04	8.32	8.55	9.05	8.35	7.23	0.00	0.00	7.22	0.00	0.00
Movement LOS	A	A	A	A	A	A	A	A	A	A		A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.37	0.37	0.37	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.63			8.55			2.41			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	4.27											
Intersection LOS	A											

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Intersection Level Of Service Report
Intersection 3: Alpine Drive & Okapi Street

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name						
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
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		40.00		40.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	3	2	58	50	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
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	2	58	50	4
Peak Hour Factor	0.9023	0.9023	0.9023	0.9023	0.9023	0.9023
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	1	1	16	14	1
Total Analysis Volume [veh/h]	0	3	2	64	55	4
Pedestrian Volume [ped/h]	0		0		0	

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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	0.00	0.00
d_M, Delay for Movement [s/veh]	9.15	8.58	7.33	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.01	0.13	0.13	0.00	0.00
95th-Percentile Queue Length [ft]	0.22	0.22	3.34	3.34	0.00	0.00
d_A, Approach Delay [s/veh]	8.58		0.22		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.32					
Intersection LOS	A					

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Intersection Level Of Service Report
Intersection 8: TH 10 & Alpine Drive

Control Type:	Two-way stop	Delay (sec / veh):	586.4
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.814

Intersection Setup

Name								
Approach	Southwestbound		Northwestbound			Southeastbound		
Lane Configuration								
Turning Movement	Left	Right	U-turn	Thru	Right	U-turn	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0	0	0
Pocket Length [ft]	100.00	325.00	340.00	100.00	340.00	100.00	100.00	100.00
Speed [mph]	30.00		65.00			65.00		
Grade [%]	0.00		0.00			0.00		
Crosswalk	Yes		Yes			Yes		

Volumes

Name								
Base Volume Input [veh/h]	10	40	2	1883	32	4	49	1250
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	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
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	40	2	1883	32	4	49	1250
Peak Hour Factor	0.9618	0.9618	0.9618	0.9618	0.9618	0.9618	0.9618	0.9618
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	10	1	489	8	1	13	325
Total Analysis Volume [veh/h]	10	42	2	1958	33	4	51	1300
Pedestrian Volume [ped/h]	0		0			0		

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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	0.81	0.17	0.01	0.02	0.00	0.09	0.18	0.01
d_M, Delay for Movement [s/veh]	586.45	22.33	28.24	0.00	0.00	89.90	23.83	0.00
Movement LOS	F	C	D	A	A	F	C	A
95th-Percentile Queue Length [veh]	1.80	0.59	0.04	0.00	0.00	1.03	1.03	0.00
95th-Percentile Queue Length [ft]	44.97	14.85	0.97	0.00	0.00	25.81	25.81	0.00
d_A, Approach Delay [s/veh]	130.82		0.03			1.16		
Approach LOS	F		A			A		
d_I, Intersection Delay [s/veh]	2.48							
Intersection LOS	F							

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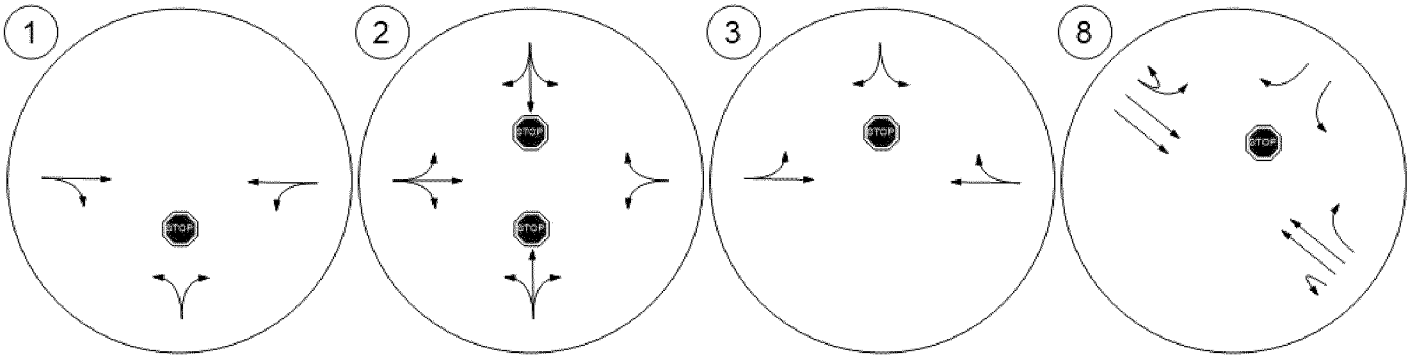
Lane Configuration and Traffic Control



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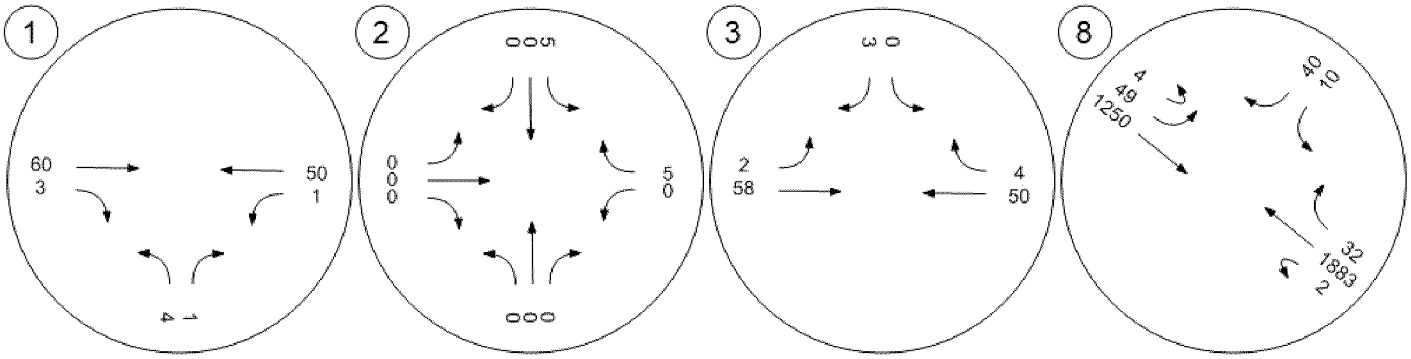
Traffic Volume - Base Volume



Vistro File: C:\...\Pearson Farm Model_updated.vistro
Report File: C:\...\No-Build AM.pdf

Scenario 4 2040 No-Build_ AM Peak
5/1/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Puma Street & Bunker Lake Boulevard	Two-way stop	HCM 2010	SB Thru	0.000	11.4	B
3	Alpine Drive & Okapi/Puma Street	Two-way stop	HCM 2010	SB Thru	0.000	16.6	C
8	TH 10 & Alpine Drive	Two-way stop	HCM 2010	SWB Left	2.309	1,156.6	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report
Intersection 2: Puma Street & Bunker Lake Boulevard

Control Type:	Two-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name											
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]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name											
Base Volume Input [veh/h]	0	0	0	6	0	0	0	0	0	0	0	2
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.11	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.11
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	285	0	0	0	0	0	0	0	175
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]	0	0	0	292	0	0	0	0	0	0	0	177
Peak Hour 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
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]	0	0	0	73	0	0	0	0	0	0	0	44
Total Analysis Volume [veh/h]	0	0	0	292	0	0	0	0	0	0	0	177
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
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	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.01	10.02	8.32	10.94	11.42	10.64	7.57	0.00	0.00	7.22	0.00	0.00
Movement LOS	A	B	A	B	B	B	A	A	A	A		A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	1.42	1.42	1.42	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	35.55	35.55	35.55	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.12			10.94			2.52			0.00		
Approach LOS	A			B			A			A		
d_I, Intersection Delay [s/veh]	6.81											
Intersection LOS	B											

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Intersection Level Of Service Report
Intersection 3: Alpine Drive & Okapi/Puma Street

Control Type:	Two-way stop	Delay (sec / veh):	16.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name											
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]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	0	1	3	0	2	0	53	6	0	42	1
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.11	1.00	1.11	1.11	1.11	1.11	1.00	1.11	1.00	1.00	1.11	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	32	0	40	0	0	0	0	0	177	152	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]	34	0	41	3	0	2	0	59	183	152	47	1
Peak Hour Factor	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534
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]	10	0	12	1	0	1	0	17	54	45	14	0
Total Analysis Volume [veh/h]	40	0	48	4	0	2	0	69	214	178	55	1
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
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	0.11	0.00	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00
d_M, Delay for Movement [s/veh]	15.93	16.27	10.44	15.67	16.60	8.67	7.32	0.00	0.00	8.27	0.00	0.00
Movement LOS	C	C	B	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.58	0.58	0.58	0.04	0.04	0.04	0.00	0.00	0.00	0.67	0.67	0.67
95th-Percentile Queue Length [ft]	14.41	14.41	14.41	1.04	1.04	1.04	0.00	0.00	0.00	16.70	16.70	16.70
d_A, Approach Delay [s/veh]	12.94			13.34			0.00			6.29		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	4.40											
Intersection LOS	C											

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Intersection Level Of Service Report
Intersection 8: TH 10 & Alpine Drive

Control Type:	Two-way stop	Delay (sec / veh):	1,156.6
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.309

Intersection Setup

Name							
Approach	Southwestbound		Northwestbound			Southeastbound	
Lane Configuration							
Turning Movement	Left	Right	U-turn	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0	0
Pocket Length [ft]	100.00	325.00	340.00	100.00	340.00	100.00	100.00
Speed [mph]	30.00		65.00			65.00	
Grade [%]	0.00		0.00			0.00	
Crosswalk	Yes		Yes			Yes	

Volumes

Name							
Base Volume Input [veh/h]	27	45	2	855	6	30	1897
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.11	1.11	1.11	1.11	1.11	1.11	1.11
In-Process Volume [veh/h]	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	32	0	0	0	177	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	82	2	949	7	210	2106
Peak Hour Factor	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	22	1	250	2	55	555
Total Analysis Volume [veh/h]	32	86	2	1000	7	221	2219
Pedestrian Volume [ped/h]	0		0			0	

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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	2.31	0.17	0.06	0.01	0.00	0.32	0.02
d_M, Delay for Movement [s/veh]	1156.59	13.36	110.63	0.00	0.00	12.76	0.00
Movement LOS	F	B	F	A	A	B	A
95th-Percentile Queue Length [veh]	4.78	0.59	0.17	0.00	0.00	1.40	0.00
95th-Percentile Queue Length [ft]	119.47	14.83	4.24	0.00	0.00	34.97	0.00
d_A, Approach Delay [s/veh]	323.39		0.22			1.16	
Approach LOS	F		A			A	
d_I, Intersection Delay [s/veh]	11.55						
Intersection LOS	F						

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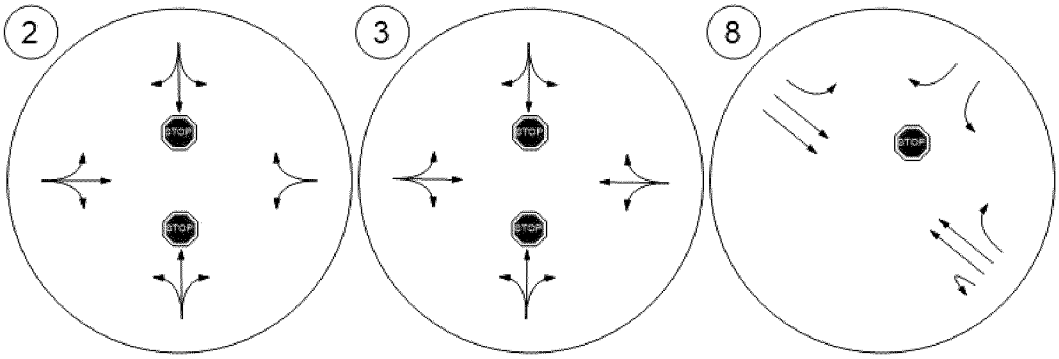
Lane Configuration and Traffic Control



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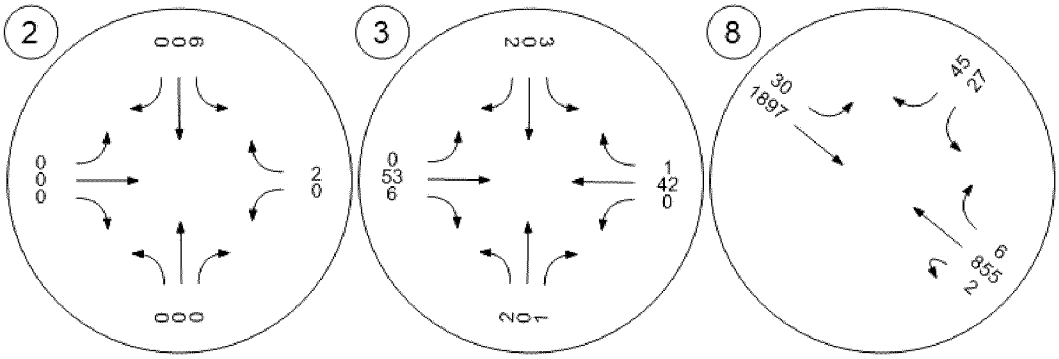
Traffic Volume - Base Volume



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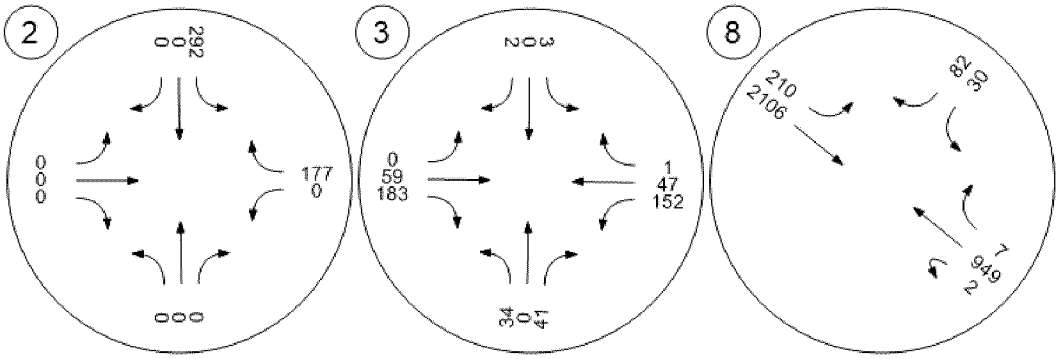
Traffic Volume - Future Total Volume



Vistro File: C:\...\Pearson Farm Model_updated.vistro
Report File: C:\...\No-Build PM.pdf

Scenario 5 2040 No-Build_ PM Peak
5/1/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Puma Street & Bunker Lake Boulevard	Two-way stop	HCM 2010	SB Thru	0.000	11.4	B
3	Alpine Drive & Okapi/Puma Street	Two-way stop	HCM 2010	NB Thru	0.000	14.5	B
8	TH 10 & Alpine Drive	Two-way stop	HCM 6th Edition	SEB Left	0.500	10,000.0	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report
Intersection 2: Puma Street & Bunker Lake Boulevard

Control Type:	Two-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name											
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]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name											
Base Volume Input [veh/h]	0	0	0	5	0	0	0	0	0	0	0	5
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.11	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.11
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	207	0	0	0	0	0	0	0	299
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]	0	0	0	213	0	0	0	0	0	0	0	305
Peak Hour 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
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]	0	0	0	53	0	0	0	0	0	0	0	76
Total Analysis Volume [veh/h]	0	0	0	213	0	0	0	0	0	0	0	305
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
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	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.42	10.92	8.32	10.98	11.43	10.59	7.87	0.00	0.00	7.22	0.00	0.00
Movement LOS	A	B	A	B	B	B	A	A	A	A		A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	1.05	1.05	1.05	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	26.19	26.19	26.19	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.55			10.98			2.62			0.00		
Approach LOS	A			B			A			A		
d_I, Intersection Delay [s/veh]	4.51											
Intersection LOS	B											

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Intersection Level Of Service Report
Intersection 3: Alpine Drive & Okapi/Puma Street

Control Type:	Two-way stop	Delay (sec / veh):	14.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name											
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]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	4	0	1	0	0	3	2	58	3	1	50	4
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.11	1.11	1.11	1.11	1.11	1.11	1.00	1.11	1.00	1.00	1.11	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	177	0	153	0	0	0	0	0	59	51	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]	181	0	154	0	0	3	2	64	62	52	56	4
Peak Hour Factor	1.0000	1.0000	1.0000	0.9023	1.0000	0.9023	0.9023	0.9023	1.0000	1.0000	0.9023	0.9023
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]	45	0	39	0	0	1	1	18	16	13	16	1
Total Analysis Volume [veh/h]	181	0	154	0	0	3	2	71	62	52	62	4
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
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	0.28	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00
d_M, Delay for Movement [s/veh]	14.11	14.54	12.39	12.34	11.16	8.61	7.35	0.00	0.00	7.57	0.00	0.00
Movement LOS	B	B	B	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	2.24	2.24	2.24	0.01	0.01	0.01	0.29	0.29	0.29	0.26	0.26	0.26
95th-Percentile Queue Length [ft]	56.09	56.09	56.09	0.23	0.23	0.23	7.22	7.22	7.22	6.62	6.62	6.62
d_A, Approach Delay [s/veh]	13.32			8.61			0.11			3.34		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	8.29											
Intersection LOS	B											

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Intersection Level Of Service Report
Intersection 8: TH 10 & Alpine Drive

Control Type:	Two-way stop	Delay (sec / veh):	10,000.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.500

Intersection Setup

Name								
Approach	Southwestbound		Northwestbound			Southeastbound		
Lane Configuration								
Turning Movement	Left	Right	U-turn	Thru	Right	U-turn	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0	0	0
Pocket Length [ft]	100.00	325.00	340.00	100.00	340.00	100.00	100.00	100.00
Speed [mph]	30.00		65.00			65.00		
Grade [%]	0.00		0.00			0.00		
Crosswalk	Yes		Yes			Yes		

Volumes

Name								
Base Volume Input [veh/h]	10	40	2	1883	32	4	49	1250
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	177	0	0	0	0	59	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	221	2	2090	36	4	113	1388
Peak Hour Factor	0.9618	0.9618	0.9618	0.9618	0.9618	0.9618	0.9618	0.9618
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	57	1	543	9	1	29	361
Total Analysis Volume [veh/h]	11	230	2	2173	37	4	117	1443
Pedestrian Volume [ped/h]	0		0			0		

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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	2.65	1.09	0.02	0.02	0.00	0.00	0.50	0.01
d_M, Delay for Movement [s/veh]	2327.04	135.28	34.22	0.00	0.00	10000.00	10000.00	0.00
Movement LOS	F	F	D	A	A	F	F	A
95th-Percentile Queue Length [veh]	2.50	10.52	0.05	0.00	0.00	17.69	17.69	0.00
95th-Percentile Queue Length [ft]	62.60	263.07	1.21	0.00	0.00	442.25	442.25	0.00
d_A, Approach Delay [s/veh]	235.32		0.03			773.66		
Approach LOS	F		A			F		
d_I, Intersection Delay [s/veh]	315.35							
Intersection LOS	F							

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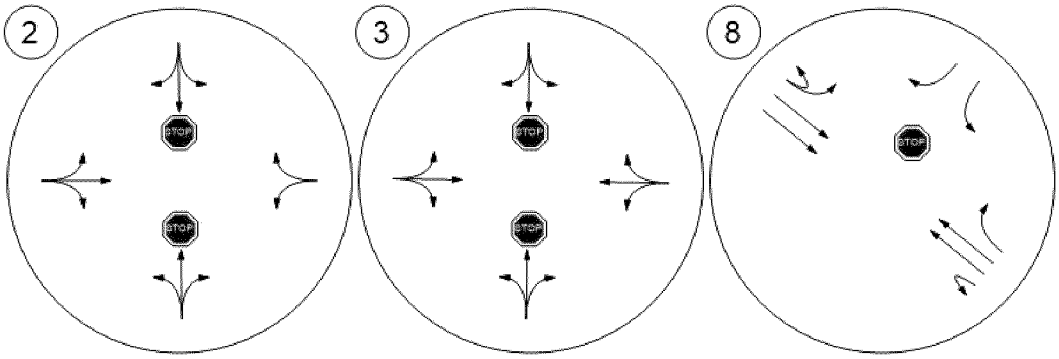
Lane Configuration and Traffic Control



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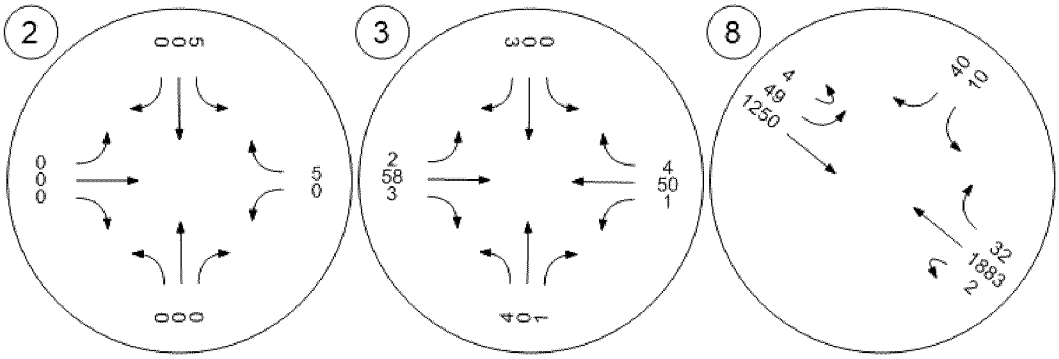
Traffic Volume - Base Volume



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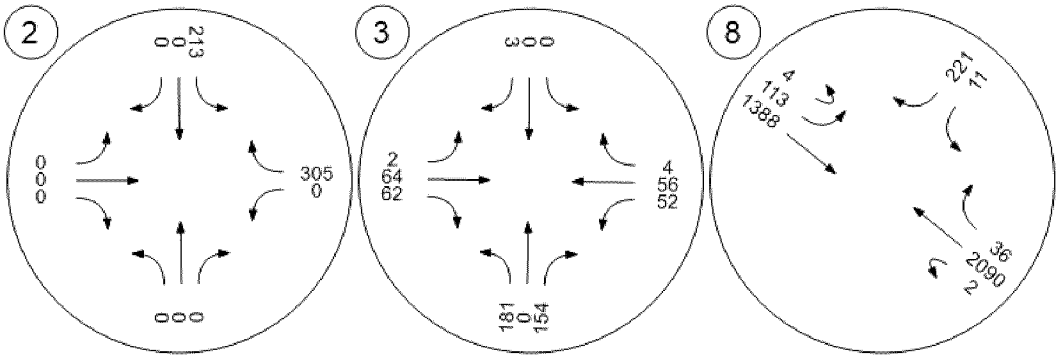
Traffic Volume - Future Total Volume



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Vistro File: C:\...\Pearson Farm Model_updated.vistro
Report File: C:\Users\Jonah\Desktop\Build AM.pdf

Scenario 6 2040 Build_ AM Peak
5/1/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Puma Street & Bunker Lake Boulevard	Two-way stop	HCM 2010	SB Thru	0.000	14.0	B
3	Alpine Drive & Okapi Street	Two-way stop	HCM 2010	NB Thru	0.000	19.1	C
4	Puma Street & Northern Site Access	Two-way stop	HCM 2010	WB Left	0.070	14.7	B
5	Puma Street & Southern Site Access	Two-way stop	HCM 2010	WB Left	0.075	15.5	C
6	Alpine Drive & Site Access	Two-way stop	HCM 2010	NB Left	0.021	10.1	B
8	TH 10 & Alpine Drive	Two-way stop	HCM 2010	SWB Left	2.477	1,264.6	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report
Intersection 2: Puma Street & Bunker Lake Boulevard

Control Type:	Two-way stop	Delay (sec / veh):	14.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name											
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]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	6	0	0	0	0	0	0	0	2
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.11	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.11
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	357	0	4	11	31	0	0	19	201
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]	0	0	0	364	0	4	11	31	0	0	19	203
Peak Hour 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
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]	0	0	0	91	0	1	3	8	0	0	5	51
Total Analysis Volume [veh/h]	0	0	0	364	0	4	11	31	0	0	19	203
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
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	0.00	0.00	0.00	0.46	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.62	10.74	8.45	13.56	14.01	12.84	7.69	0.00	0.00	7.28	0.00	0.00
Movement LOS	A	B	A	B	B	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	2.52	2.52	2.52	0.10	0.10	0.10	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	63.03	63.03	63.03	2.41	2.41	2.41	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.61			13.55			2.02			0.00		
Approach LOS	A			B			A			A		
d_I, Intersection Delay [s/veh]	8.03											
Intersection LOS	B											

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Intersection Level Of Service Report
Intersection 3: Alpine Drive & Okapi Street

Control Type:	Two-way stop	Delay (sec / veh):	19.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name											
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]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	2	0	1	3	0	2	0	53	6	0	42	1
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.11	1.11	1.11	1.11	1.11	1.11	1.00	1.11	1.00	1.00	1.11	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	69	0	65	0	0	0	0	8	184	160	3	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]	71	0	66	3	0	2	0	67	190	160	50	1
Peak Hour Factor	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534	0.8534
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]	21	0	19	1	0	1	0	20	56	47	15	0
Total Analysis Volume [veh/h]	83	0	77	4	0	2	0	79	223	187	59	1
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
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	0.24	0.00	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00
d_M, Delay for Movement [s/veh]	18.85	19.15	12.78	17.11	17.41	8.72	7.33	0.00	0.00	8.36	0.00	0.00
Movement LOS	C	C	B	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	1.41	1.41	1.41	0.05	0.05	0.05	0.00	0.00	0.00	0.73	0.73	0.73
95th-Percentile Queue Length [ft]	35.36	35.36	35.36	1.16	1.16	1.16	0.00	0.00	0.00	18.20	18.20	18.20
d_A, Approach Delay [s/veh]	15.93			14.31			0.00			6.33		
Approach LOS	C			B			A			A		
d_I, Intersection Delay [s/veh]	5.87											
Intersection LOS	C											

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Intersection Level Of Service Report
Intersection 4: Puma Street & Northern Site Access

Control Type:	Two-way stop	Delay (sec / veh):	14.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.070

Intersection Setup

Name												
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]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	2	0	6	4	0	0	0	0	0	0	0
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.11	1.00	1.00	1.11	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]	6	96	71	50	289	6	18	0	31	28	0	20
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]	6	98	71	56	293	6	18	0	31	28	0	20
Peak Hour 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
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	25	18	14	73	2	5	0	8	7	0	5
Total Analysis Volume [veh/h]	6	98	71	56	293	6	18	0	31	28	0	20
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
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	0.00	0.00	0.00	0.04	0.00	0.00	0.04	0.00	0.04	0.07	0.00	0.02
d_M, Delay for Movement [s/veh]	7.87	0.00	0.00	7.66	0.00	0.00	14.37	14.62	10.43	14.74	14.36	9.63
Movement LOS	A	A	A	A	A	A	B	B	B	B	B	A
95th-Percentile Queue Length [veh]	0.48	0.48	0.48	1.00	1.00	1.00	0.28	0.28	0.28	0.30	0.30	0.30
95th-Percentile Queue Length [ft]	12.03	12.03	12.03	25.08	25.08	25.08	6.99	6.99	6.99	7.58	7.58	7.58
d_A, Approach Delay [s/veh]	0.27			1.21			11.88			12.61		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	2.65											
Intersection LOS	B											

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Intersection Level Of Service Report
Intersection 5: Puma Street & Southern Site Access

Control Type:	Two-way stop	Delay (sec / veh):	15.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.075

Intersection Setup

Name											
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]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	2	0	0	6	0	0	0	0	0	0	0
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.11	1.00	1.00	1.11	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]	6	135	71	50	292	5	19	0	41	28	0	20
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]	6	137	71	50	299	5	19	0	41	28	0	20
Peak Hour 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
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	34	18	13	75	1	5	0	10	7	0	5
Total Analysis Volume [veh/h]	6	137	71	50	299	5	19	0	41	28	0	20
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
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	0.00	0.00	0.00	0.04	0.00	0.00	0.05	0.00	0.06	0.08	0.00	0.02
d_M, Delay for Movement [s/veh]	7.88	0.00	0.00	7.74	0.00	0.00	14.94	15.12	10.60	15.49	14.80	9.94
Movement LOS	A	A	A	A	A	A	B	C	B	C	B	A
95th-Percentile Queue Length [veh]	0.61	0.61	0.61	1.04	1.04	1.04	0.35	0.35	0.35	0.33	0.33	0.33
95th-Percentile Queue Length [ft]	15.32	15.32	15.32	26.10	26.10	26.10	8.68	8.68	8.68	8.13	8.13	8.13
d_A, Approach Delay [s/veh]	0.22			1.09			11.98			13.18		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	2.64											
Intersection LOS	C											

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Intersection Level Of Service Report
Intersection 6: Alpine Drive & Site Access

Control Type:	Two-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.021

Intersection Setup

Name						
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		40.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.11	1.00	1.00	1.11
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	15	8	184	5	3	69
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	8	184	5	3	69
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	2	46	1	1	17
Total Analysis Volume [veh/h]	15	8	184	5	3	69
Pedestrian Volume [ped/h]	0		0		0	

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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	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.11	9.35	0.00	0.00	7.60	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.09	0.09	0.00	0.00	0.16	0.16
95th-Percentile Queue Length [ft]	2.32	2.32	0.00	0.00	4.11	4.11
d_A, Approach Delay [s/veh]	9.84		0.00		0.32	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.88					
Intersection LOS	B					

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Intersection Level Of Service Report
Intersection 8: TH 10 & Alpine Drive

Control Type:	Two-way stop	Delay (sec / veh):	1,264.6
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.477

Intersection Setup

Name							
Approach	Southwestbound		Northwestbound			Southeastbound	
Lane Configuration							
Turning Movement	Left	Right	U-turn	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0	0
Pocket Length [ft]	100.00	325.00	340.00	100.00	340.00	100.00	100.00
Speed [mph]	30.00		65.00			65.00	
Grade [%]	0.00		0.00			0.00	
Crosswalk	Yes		Yes			Yes	

Volumes

Name							
Base Volume Input [veh/h]	27	45	2	855	6	30	1897
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.11	1.11	1.11	1.11	1.11	1.11	1.11
In-Process Volume [veh/h]	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	84	0	0	0	189	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	134	2	949	7	222	2106
Peak Hour Factor	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489	0.9489
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	35	1	250	2	58	555
Total Analysis Volume [veh/h]	32	141	2	1000	7	234	2219
Pedestrian Volume [ped/h]	0		0			0	

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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	2.48	0.27	0.06	0.01	0.00	0.34	0.02
d_M, Delay for Movement [s/veh]	1264.63	14.57	110.63	0.00	0.00	12.98	0.00
Movement LOS	F	B	F	A	A	B	A
95th-Percentile Queue Length [veh]	4.86	1.10	0.17	0.00	0.00	1.52	0.00
95th-Percentile Queue Length [ft]	121.40	27.54	4.24	0.00	0.00	37.99	0.00
d_A, Approach Delay [s/veh]	245.80		0.22			1.24	
Approach LOS	F		A			A	
d_I, Intersection Delay [s/veh]	12.59						
Intersection LOS	F						

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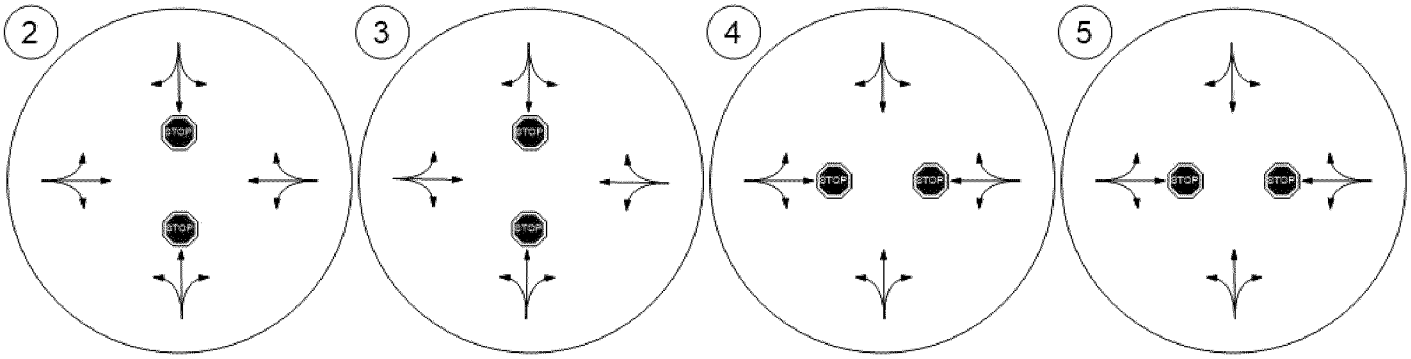
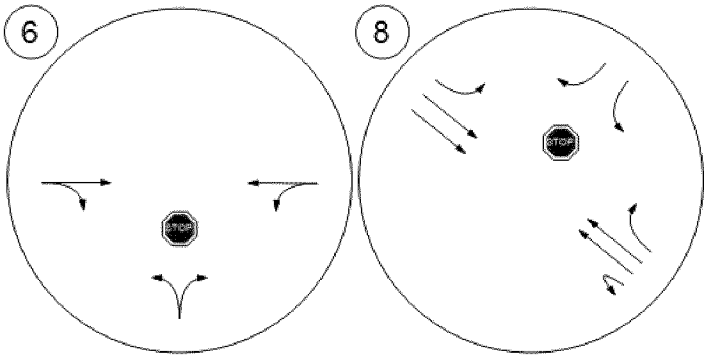
Lane Configuration and Traffic Control





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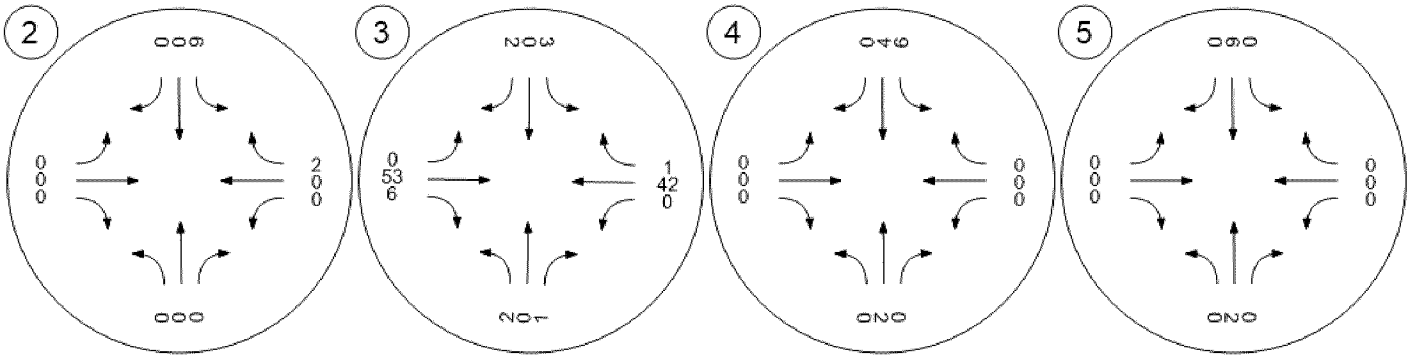
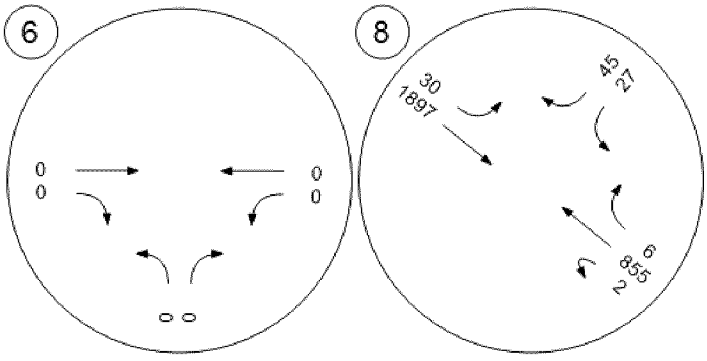
Traffic Volume - Base Volume





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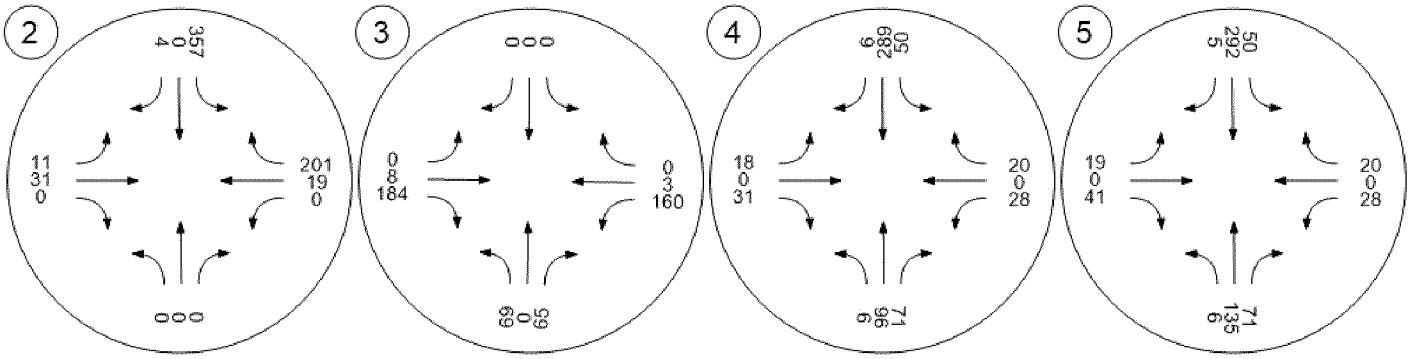
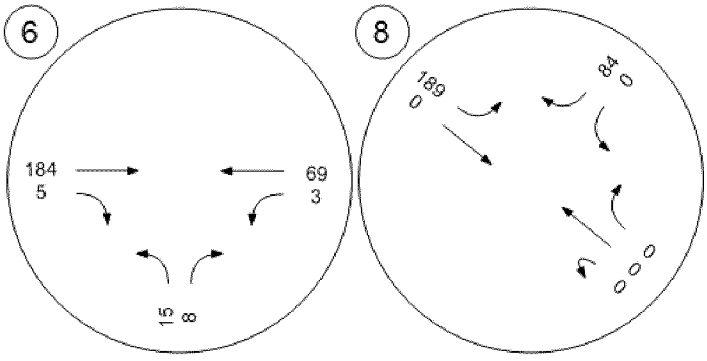
Traffic Volume - Net New Site Trips





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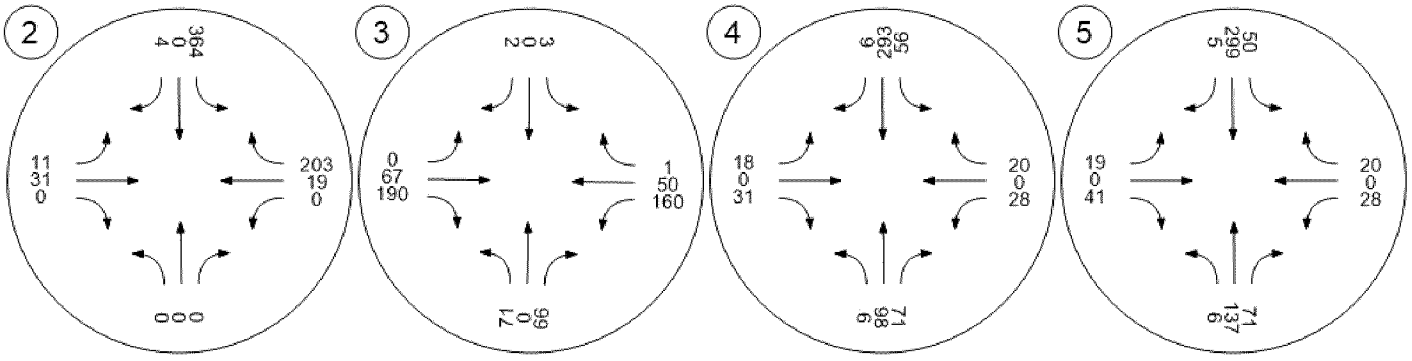
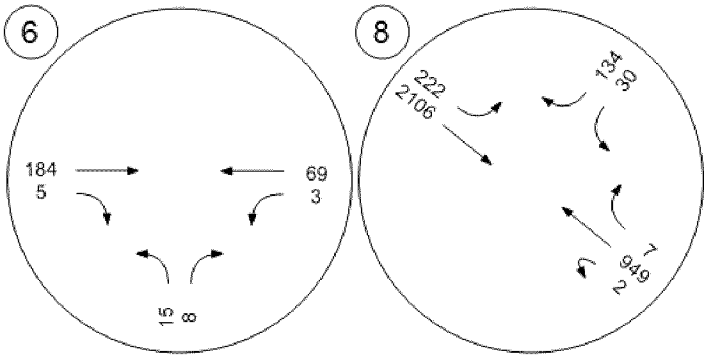
Traffic Volume - Future Total Volume





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Vistro File: C:\...\Pearson Farm Model_updated.vistro
Report File: C:\Users\Jonah\Desktop\Build PM.pdf

Scenario 7 2040 Build_ PM Peak
5/1/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
2	Puma Street & Bunker Lake Boulevard	Two-way stop	HCM 2010	SB Thru	0.000	14.2	B
3	Alpine Drive & Okapi Street	Two-way stop	HCM 2010	NB Thru	0.000	17.3	C
4	Puma Street & Northern Site Access	Two-way stop	HCM 2010	WB Left	0.175	15.9	C
5	Puma Street & Southern Site Access	Two-way stop	HCM 2010	WB Left	0.189	16.9	C
6	Alpine Drive & Site Access	Two-way stop	HCM 2010	NB Left	0.015	10.3	B
8	TH 10 & Alpine Drive	Two-way stop	HCM 2010	SEB Left	0.688	10,000.0	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

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Intersection Level Of Service Report
Intersection 2: Puma Street & Bunker Lake Boulevard

Control Type:	Two-way stop	Delay (sec / veh):	14.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name												
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]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	0	0	5	0	0	0	0	0	0	0	5
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.11	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.11
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	251	0	14	7	19	0	0	67	344
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]	0	0	0	257	0	14	7	19	0	0	67	350
Peak Hour 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
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]	0	0	0	64	0	4	2	5	0	0	17	88
Total Analysis Volume [veh/h]	0	0	0	257	0	14	7	19	0	0	67	350
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
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	0.00	0.00	0.00	0.38	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.49	12.18	8.40	13.81	14.20	12.99	8.17	0.00	0.00	7.25	0.00	0.00
Movement LOS	B	B	A	B	B	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	1.92	1.92	1.92	0.07	0.07	0.07	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	47.94	47.94	47.94	1.75	1.75	1.75	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.36			13.77			2.20			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	5.31											
Intersection LOS	B											

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Intersection Level Of Service Report
Intersection 3: Alpine Drive & Okapi Street

Control Type:	Two-way stop	Delay (sec / veh):	17.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name												
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]	30.00			30.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	4	0	1	0	0	3	2	58	3	1	50	4
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.11	1.11	1.11	1.11	1.11	1.11	1.00	1.11	1.00	1.00	1.11	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	191	0	169	0	0	0	0	5	84	78	9	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]	195	0	170	0	0	3	2	69	87	79	65	4
Peak Hour Factor	1.0000	1.0000	1.0000	0.9023	1.0000	0.9023	0.9023	0.9023	1.0000	1.0000	0.9023	0.9023
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]	49	0	43	0	0	1	1	19	22	20	18	1
Total Analysis Volume [veh/h]	195	0	170	0	0	3	2	76	87	79	72	4
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
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	0.34	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00
d_M, Delay for Movement [s/veh]	16.90	17.31	14.44	13.77	12.11	8.66	7.37	0.00	0.00	7.69	0.00	0.00
Movement LOS	C	C	B	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	3.08	3.08	3.08	0.01	0.01	0.01	0.36	0.36	0.36	0.37	0.37	0.37
95th-Percentile Queue Length [ft]	77.11	77.11	77.11	0.23	0.23	0.23	9.09	9.09	9.09	9.20	9.20	9.20
d_A, Approach Delay [s/veh]	15.75			8.66			0.09			3.92		
Approach LOS	C			A			A			A		
d_I, Intersection Delay [s/veh]	9.30											
Intersection LOS	C											

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Intersection Level Of Service Report
Intersection 4: Puma Street & Northern Site Access

Control Type:	Two-way stop	Delay (sec / veh):	15.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.175

Intersection Setup

Name												
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]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	5	0	0	4	0	0	0	0	0	0	0
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.11	1.00	1.00	1.11	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]	22	298	36	25	118	20	11	0	19	73	0	51
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]	22	304	36	25	122	20	11	0	19	73	0	51
Peak Hour 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
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	76	9	6	31	5	3	0	5	18	0	13
Total Analysis Volume [veh/h]	22	304	36	25	122	20	11	0	19	73	0	51
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
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	0.00	0.00	0.02	0.00	0.00	0.03	0.00	0.02	0.17	0.00	0.07
d_M, Delay for Movement [s/veh]	7.54	0.00	0.00	8.01	0.00	0.00	14.61	13.96	9.23	15.92	15.87	12.31
Movement LOS	A	A	A	A	A	A	B	B	A	C	C	B
95th-Percentile Queue Length [veh]	1.00	1.00	1.00	0.47	0.47	0.47	0.15	0.15	0.15	0.96	0.96	0.96
95th-Percentile Queue Length [ft]	24.98	24.98	24.98	11.86	11.86	11.86	3.87	3.87	3.87	23.93	23.93	23.93
d_A, Approach Delay [s/veh]	0.46			1.20			11.20			14.43		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	3.65											
Intersection LOS	C											

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Intersection Level Of Service Report
Intersection 5: Puma Street & Southern Site Access

Control Type:	Two-way stop	Delay (sec / veh):	16.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.189

Intersection Setup

Name												
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]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	0	5	0	0	4	0	0	0	0	0	0	0
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 [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.11	1.00	1.00	1.11	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]	22	293	36	25	166	19	12	0	25	73	0	51
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]	22	299	36	25	170	19	12	0	25	73	0	51
Peak Hour 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
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	75	9	6	43	5	3	0	6	18	0	13
Total Analysis Volume [veh/h]	22	299	36	25	170	19	12	0	25	73	0	51
Pedestrian Volume [ped/h]	0			0			0			0		

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Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
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	0.00	0.00	0.02	0.00	0.00	0.03	0.00	0.03	0.19	0.00	0.07
d_M, Delay for Movement [s/veh]	7.64	0.00	0.00	8.00	0.00	0.00	15.33	14.56	9.57	16.94	16.68	12.60
Movement LOS	A	A	A	A	A	A	C	B	A	C	C	B
95th-Percentile Queue Length [veh]	1.03	1.03	1.03	0.63	0.63	0.63	0.20	0.20	0.20	1.03	1.03	1.03
95th-Percentile Queue Length [ft]	25.84	25.84	25.84	15.81	15.81	15.81	4.95	4.95	4.95	25.69	25.69	25.69
d_A, Approach Delay [s/veh]	0.47			0.93			11.44			15.15		
Approach LOS	A			A			B			C		
d_I, Intersection Delay [s/veh]	3.65											
Intersection LOS	C											

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Intersection Level Of Service Report
Intersection 6: Alpine Drive & Site Access

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name						
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		40.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.11	1.00	1.00	1.11
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	5	84	17	9	191
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]	10	5	84	17	9	191
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	1	21	4	2	48
Total Analysis Volume [veh/h]	10	5	84	17	9	191
Pedestrian Volume [ped/h]	0		0		0	

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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	0.01	0.01	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	10.35	8.83	0.00	0.00	7.43	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.06	0.06	0.00	0.00	0.46	0.46
95th-Percentile Queue Length [ft]	1.51	1.51	0.00	0.00	11.58	11.58
d_A, Approach Delay [s/veh]	9.84		0.00		0.33	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.68					
Intersection LOS	B					

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Intersection Level Of Service Report
Intersection 8: TH 10 & Alpine Drive

Control Type:	Two-way stop	Delay (sec / veh):	10,000.0
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.688

Intersection Setup

Name								
Approach	Southwestbound		Northwestbound			Southeastbound		
Lane Configuration								
Turning Movement	Left	Right	U-turn	Thru	Right	U-turn	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0	0	0
Pocket Length [ft]	100.00	325.00	340.00	100.00	340.00	100.00	100.00	100.00
Speed [mph]	30.00		65.00			65.00		
Grade [%]	0.00		0.00			0.00		
Crosswalk	Yes		Yes			Yes		

Volumes

Name								
Base Volume Input [veh/h]	10	40	2	1883	32	4	49	1250
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	201	0	0	0	0	101	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	245	2	2090	36	4	155	1388
Peak Hour Factor	0.9618	0.9618	0.9618	0.9618	0.9618	0.9618	0.9618	0.9618
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	64	1	543	9	1	40	361
Total Analysis Volume [veh/h]	11	255	2	2173	37	4	161	1443
Pedestrian Volume [ped/h]	0		0			0		

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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	4.91	1.21	0.02	0.02	0.00	0.00	0.69	0.01
d_M, Delay for Movement [s/veh]	4568.51	175.22	34.22	0.00	0.00	10000.00	10000.00	0.00
Movement LOS	F	F	D	A	A	F	F	A
95th-Percentile Queue Length [veh]	2.65	12.88	0.05	0.00	0.00	23.28	23.28	0.00
95th-Percentile Queue Length [ft]	66.27	321.93	1.21	0.00	0.00	582.06	582.06	0.00
d_A, Approach Delay [s/veh]	356.89		0.03			1026.12		
Approach LOS	F		A			F		
d_I, Intersection Delay [s/veh]	427.07							
Intersection LOS	F							

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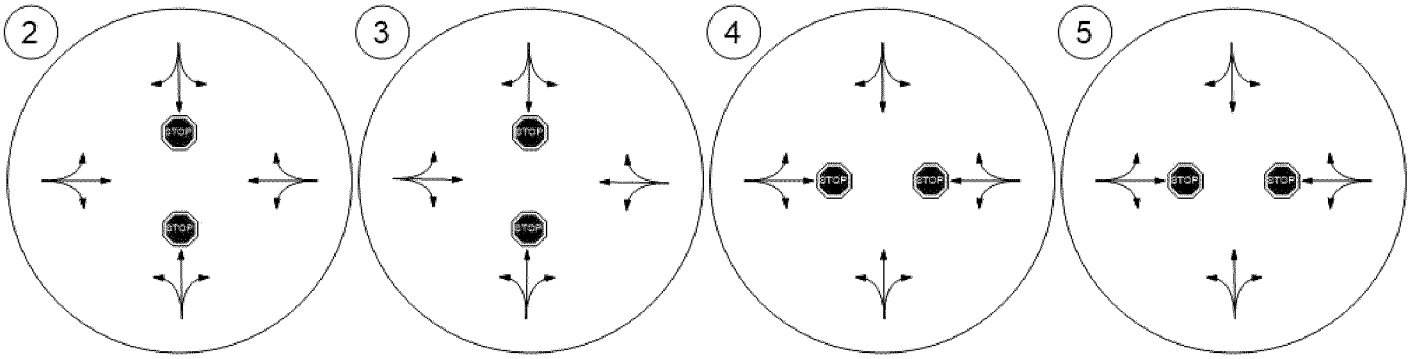
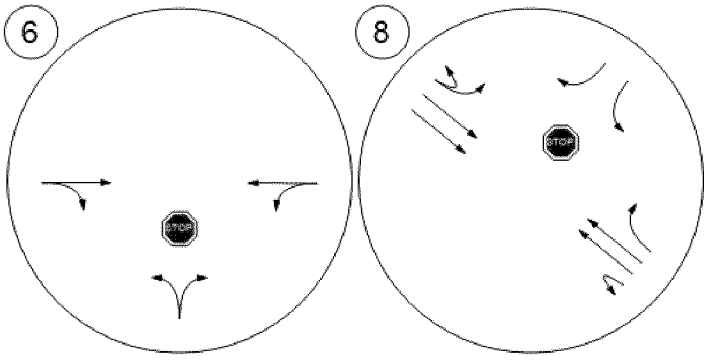
Lane Configuration and Traffic Control





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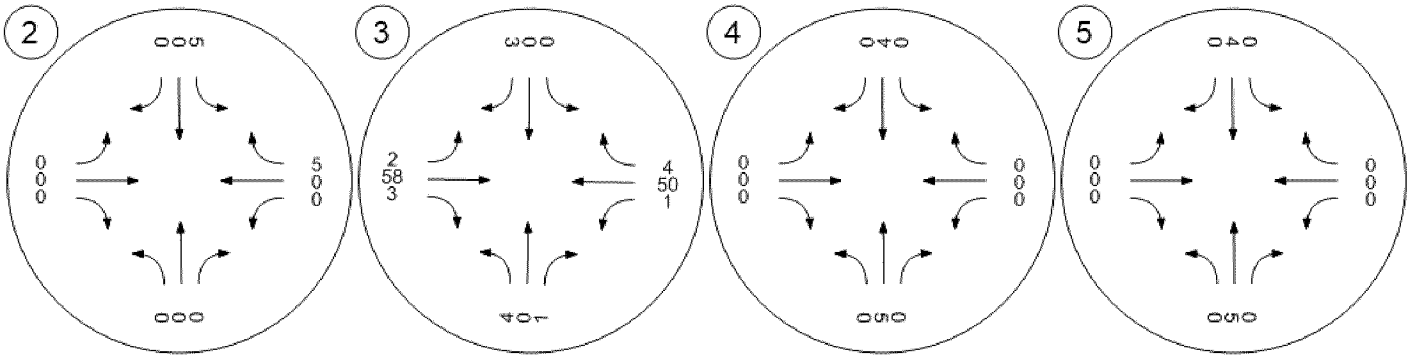
Traffic Volume - Base Volume



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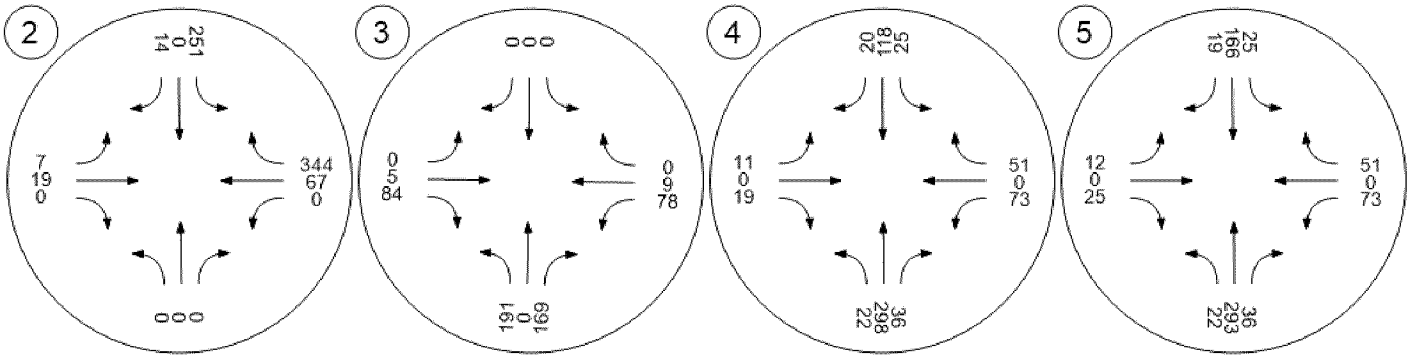
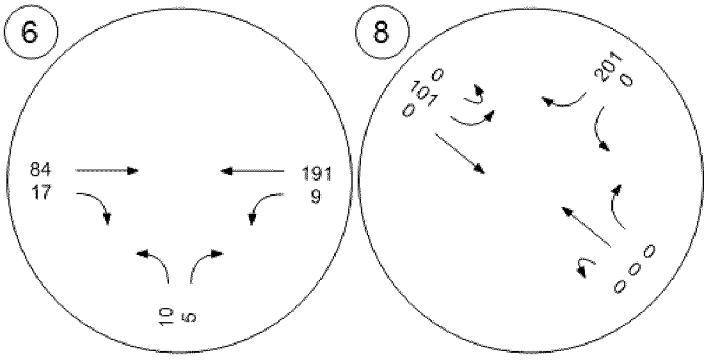
Traffic Volume - Net New Site Trips





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Traffic Volume - Future Total Volume