The City of Keizer is committed to providing equal access to all public meetings and information per the requirements of the ADA and Oregon Revised Statutes (ORS). The Keizer Civic Center is wheelchair accessible. If you require any service such as SPANISH translation or other interpretive services that furthers your inclusivity to participate, please contact the Office of the City Recorder at least 48 business hours prior to the meeting by email at davist@keizer.org or phone at (503)390-3700 or (503)856-3412. Most regular City Council meetings are streamed live through www.KeizerTV.com and cable-cast on Comcast Channel 23 within the Keizer City limits. Thank you for your interest in the City of Keizer.

AGENDA

KEIZER CITY COUNCIL
REGULAR SESSION

Monday, October 19, 2020
7:00 p.m.
Robert L. Simon Council Chambers
Keizer, Oregon

1. **CALL TO ORDER**

2. **ROLL CALL**

3. **FLAG SALUTE**

4. **SPECIAL ORDERS OF BUSINESS**

   a. **PROCLAMATION – Domestic Violence Prevention Month**

5. **COMMITTEE REPORTS**

6. **PUBLIC TESTIMONY**

   This time is provided for citizens to address the Council on any matters other than those on the agenda scheduled for public hearing.

7. **PUBLIC HEARINGS**

8. **ADMINISTRATIVE ACTION**

   a. **Keizer Growth Transportation Study**

   b. **Municipal Court Judge Evaluation Report**

9. **CONSENT CALENDAR**

   a. **RESOLUTION – Authorizing City Manager to Enter Into Professional Services Contract for Keizer Parks Master Plan Update with MIG**

   b. **RESOLUTION – Ratifying Finance Director's Signing of Agreement With Council of Mid-Willamette Society of St. Vincent DePaul For CARES Act Community Support Fund Grant**

c. **RESOLUTION – Authorizing the Finance Director to Enter Into Lease Agreement with Ricoh USA Inc. for City Hall Main Copier**

d. **RESOLUTION – Authorizing the City Manager to Purchase Two 2021 K8A AWD Police Interceptor Utility Vehicles for Police Department**

e. **Approval of September 28, 2020 City Council Work Session Minutes**

f. **Approval of October 5, 2020 City Council Regular Session Minutes**

10. COUNCIL LIAISON REPORTS

11. OTHER BUSINESS

This time is provided to allow the Mayor, City Council members, or staff an opportunity to bring new or old matters before the Council that are not on tonight's agenda.

12. WRITTEN COMMUNICATIONS

***To inform the Council of significant written communications*.**

13. AGENDA INPUT

October 26, 2020
6:00 p.m. - City Council Work Session

- **City Council Goal – Community Makeup – Demographics and Diversity**

November 2, 2020
7:00 p.m. - City Council Regular Session

November 9, 2020
6:00 p.m. – City Council Work Session

November 16, 2020
7:00 p.m. - City Council Regular Session

14. ADJOURNMENT

City of Keizer, Oregon

Proclamation

Whereas, the impact of domestic violence extends beyond individuals, reaching into families and communities; and

Whereas, in the last year Marion County has experienced three domestic violence homicide crimes resulting in the deaths of four victims; and

Whereas, the Marion County District Attorney's office received 1,126 law enforcement reports of domestic violence last year and filed 989 domestic violence cases; and

Whereas, the Marion County Courts received 1,128 requests for protective orders last year; and

Whereas, the Center for Hope and Safety received 33,189 contacts to their program last year and provided 4,866 nights of shelter; and

Whereas, the Marion County Victim Assistance Division provided 20,737 victim services and assisted 1,728 victims of domestic violence last year, walking alongside them and giving them a voice in the criminal justice process; and

Whereas, we know, as individuals, we can make a difference by speaking up and reaching out to help victims and survivors.

NOW, THEREFORE, I, CATHY CLARK, Mayor of the City of Keizer, together with the Keizer City Council assembled in Regular Session, do hereby proclaim the month of October 2020 as

DOMESTIC VIOLENCE AWARENESS MONTH

And resolve to honor those who have died and acknowledge those who have survived by supporting meaningful and accessible services that create safety and hope for survivors in our community.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the City of Keizer to be herein affixed this 19th day of October, 2020.

_____

MAYOR CATHY CLARK
City of Keizer, Oregon

COUNCIL MEETING: October 19, 2020
AGENDA ITEM NUMBER: _____

TO: **MAYOR CLARK AND CITY COUNCIL MEMBERS**

THROUGH: **CHRIS EPPLEY, CITY MANAGER**

FROM: **SHANE WITHAM**
INTERIM COMMUNITY DEVELOPMENT DIRECTOR

SUBJECT: Keizer Growth Transportation Impacts Study

ATTACHMENTS:
- Keizer Growth Transportation Impacts Study

ISSUE:
The Keizer Growth Transportation Impacts Study identifies transportation system improvements necessary for conceptual expansion of the Urban Growth Boundary (UGB). This project is a primarily technical analysis of the transportation system and the impacts that projected growth would have on the existing transportation system. The study does not advocate for, or against, expansion of the UGB. Rather, it outlines and identifies level of investments in the transportation system that would be needed to support future expansion.

Utilizing the 2019 Housing Needs Analysis as a basis for establishing Keizer's land needs, two separate growth scenarios were identified by staff and analyzed by the consultant (DKS) for possible expansion areas for this project. One scenario included only employment lands, while the other included both employment lands and land for housing. The resultant analysis identifies necessary transportations system upgrades, and quantifies the costs of those upgrades to support development.

This study is an important element to inform decision making on how the City can/should choose to address growth in the planning horizon. The study gives us a frame of reference regarding costs for transportation infrastructure necessitated by possible expansion to accommodate growth.

DKS representatives will explain the study and be available at tonight's meeting.

RECOMMENDATION:
Staff recommends that City Council direct staff to prepare a resolution approving the Keizer Growth Transportation Impacts Study for Council adoption at the next meeting.

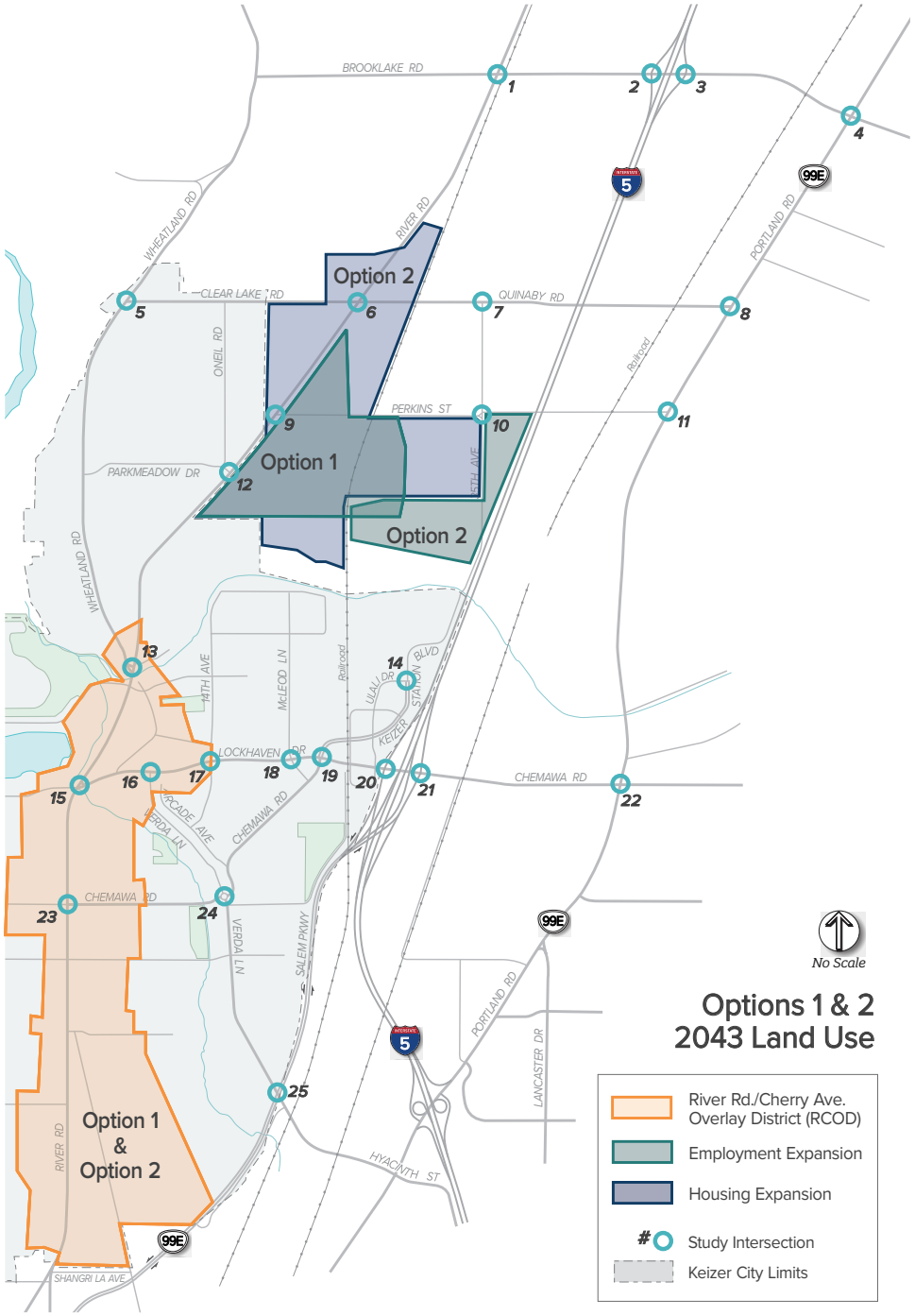
KEIZER GROWTH TRANSPORTATION IMPACTS STUDY

OCTOBER 2020

INTRODUCTION

The purpose of the Keizer Growth Transportation Study is to illustrate the level of investment in the transportation system needed to support conceptual planned expansion of the City's Urban Growth Boundary (UGB).

This study evaluated two candidate sites just north of the City limit that differed in size and mix of proposed land uses that will be referred as Option 1 and Option 2. The study findings estimated the expected magnitude of added vehicular traffic, and flagged portions of the street system that would be expected to require improvements or upgrades to provide safe and convenient access consistent with City standards. Necessary system improvements were tabulated and a rough preliminary cost estimate for each option was developed and compared. To be clear, this study does not recommend or provide the basis for any planned or proposed city growth expansions, it only presents illustrative examples of possible growth options for Keizer, and identifies the trade-offs involved in selected growth sites, and land use mixes for consideration.



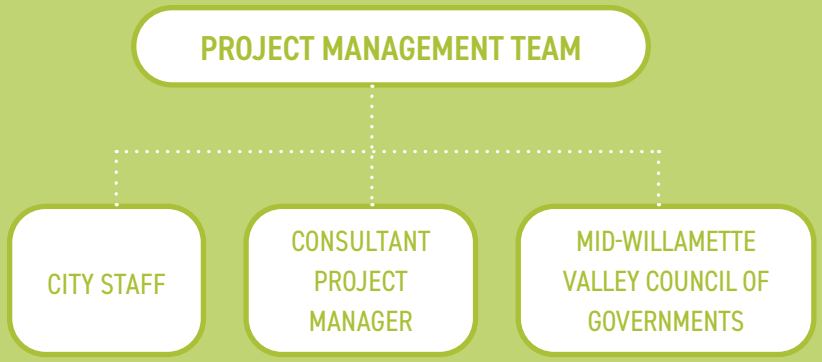
STUDY AREA

The study area for the Keizer Growth Transportation Study is shown in **Figure 1**. Performance assessments were conducted at 25 study intersections across multiple agency jurisdictions.

These locations were selected by the project management team, which included city staff, the consultant project manager, and senior staff from the Mid-Willamette Valley Council of Governments. The two illustrative UGB expansion areas are shown in the map.

The River Road/Cherry Avenue Overlay District (RCOD) includes housing infill that is included in both options.

FIGURE 1. STUDY AREA



STUDY PROCESS

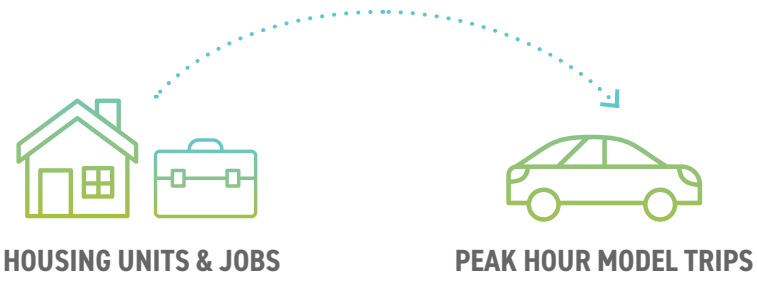
The following technical process was performed in this illustrative study.

1. Two conceptual growth areas on the northern end of the city's UGB were identified.
2. The scale and mix of land use types (housing and employment) for each growth option were defined, consistent with similar existing development in Keizer and Salem.
3. The regional travel forecasting model used by the Mid-Willamette Valley Council of Governments (MWVCOG) was used to estimate traffic growth.
4. The transportation system was assessed to see how it operates today and how that might change with full development trips for each of the two growth options.
5. Based on the performance assessment, a roster of expected added transportation system improvements was identified.
6. The additional investments needed to comply with agency performance standards were identified and evaluated for each option.

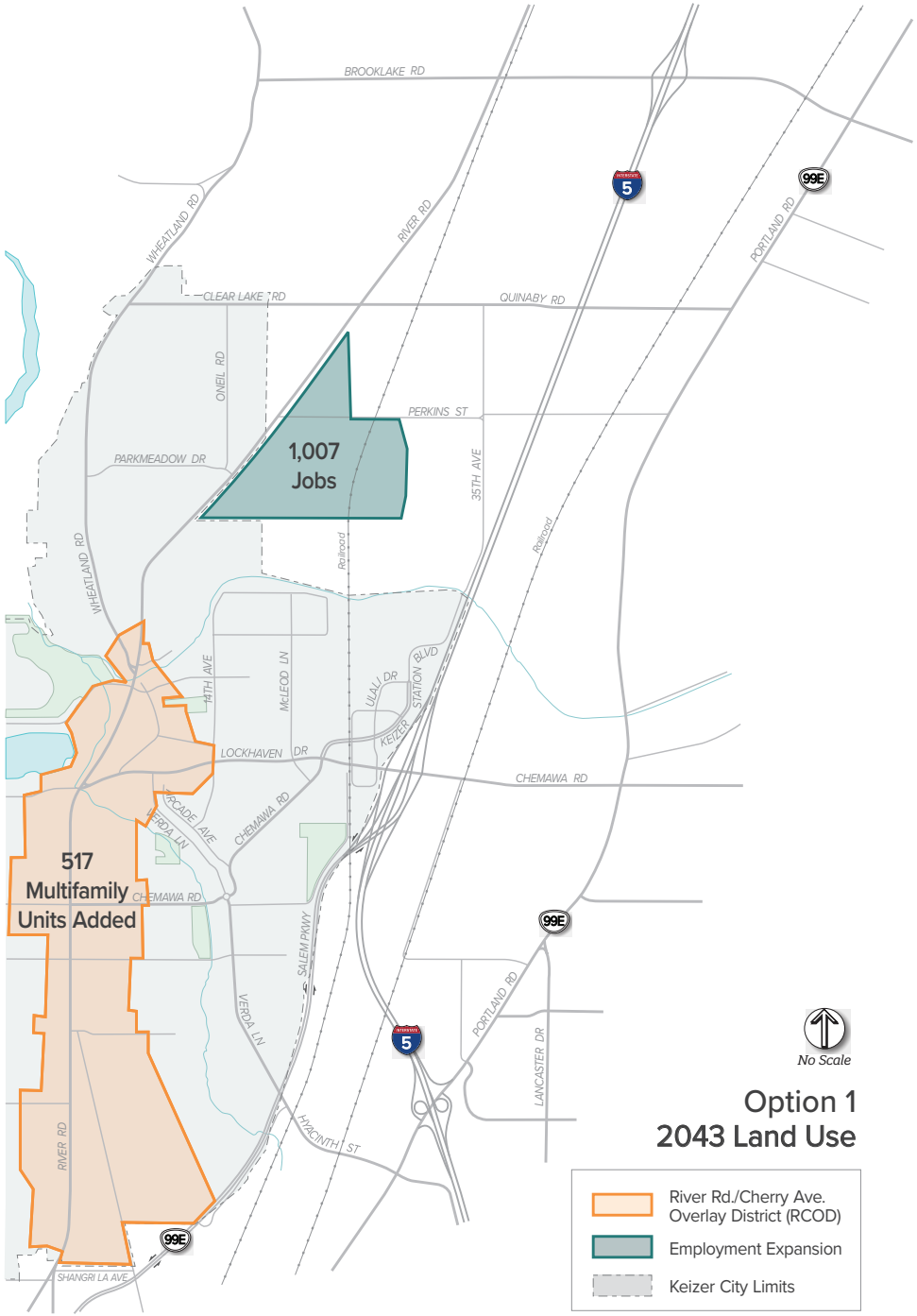
GROWTH OPTIONS

Two conceptual growth options were developed in coordination with the City of Keizer, MWVCOG, and the consultant team. The intent was to develop two options that address the housing needs and projected employment growth in Keizer.

For each option, the City provided a number of housing units and jobs, which was converted to peak hour model trips using trip generation assumptions and the future 2043 Salem-Keizer travel demand model (SKATS). The existing year (2017) and future year (2043) models were used to forecast the transportation impacts of the two options. In the SKATS model, vehicle and transit trips are assigned to the network, while bicycling and walking trips are forecast but not assigned to the network. For this analysis, only vehicle trips are reported.



A separate technical memorandum is provided in the appendix with more details regarding the travel forecasting methods and assumptions.

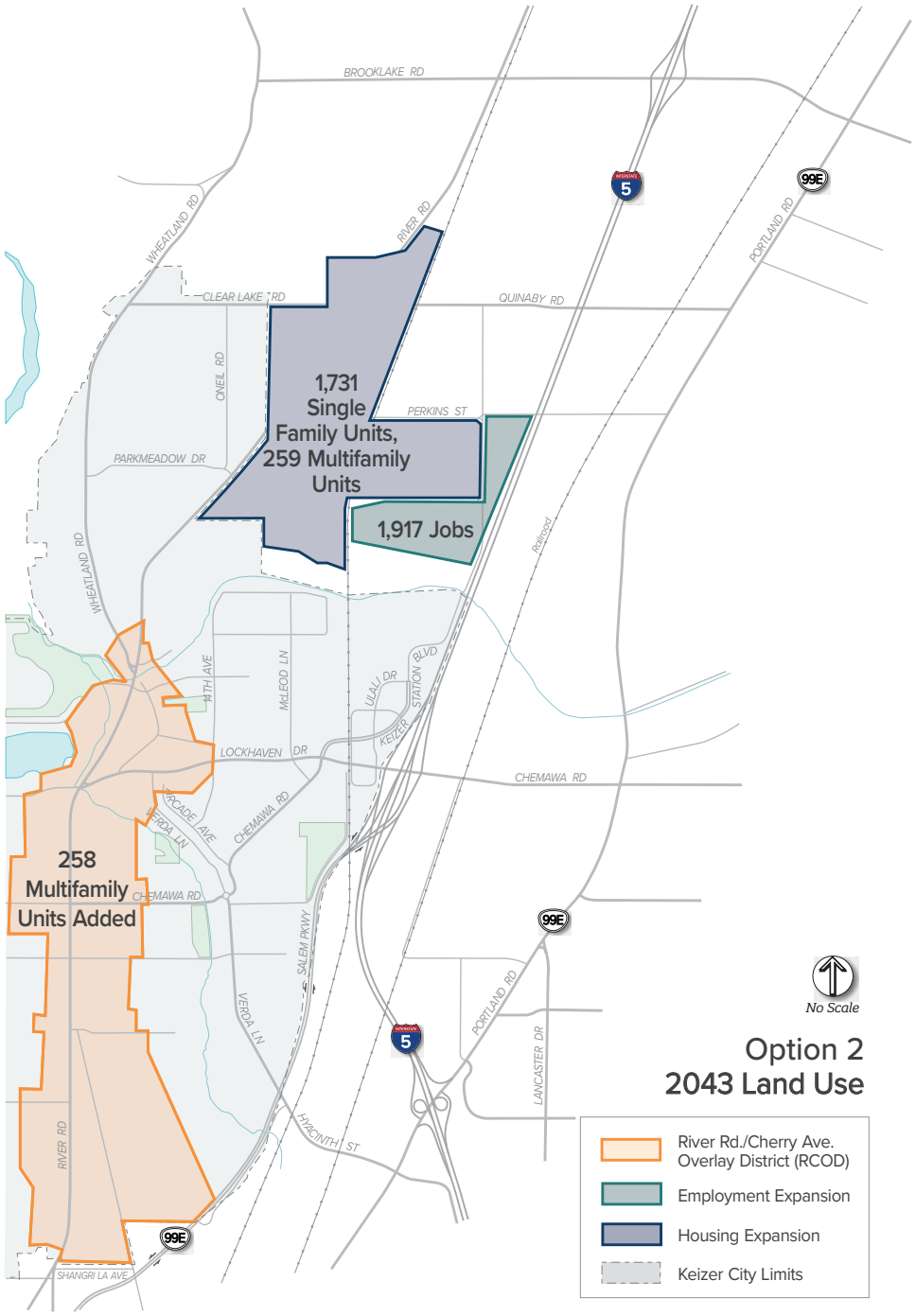


LAND USE OPTION 1

Option 1 includes an additional 517 multi-family housing units within the River Road/Cherry Avenue Overlay District (RCOD) and a small employment expansion outside of the Urban Growth Boundary (UGB) (**Figure 2**). The employment expansion is located outside the northeast corner of the UGB along River Road and covers about 63 acres, split into two thirds industrial and one third commercial land use. This employment growth in the expansion area results in an additional 350 PM peak hour trips added to the future roadway network. Note that the multi-family residential units in the RCOD are included in the baseline future scenario and thus don't add any further trips to the Option 1 expansion.

This development is assumed to be served mostly by existing roadways and new internal site roadways. The employment expansion area would have access to River Road via Perkins Street. The multi-family housing units would be dispersed across the RCOD, with accesses along River Road.

FIGURE 2. LAND USE OPTION 1



LAND USE OPTION 2

Option 2 is a larger expansion of the UGB. This option would expand the UGB in the northeast corner to include both sides of River Road up past Quinaby Road, expanding to I-5 to the east (**Figure 3**). The housing growth includes 258 multi-family units within the RCOD, plus an additional 259 multi-family units and 1,731 single family units in the expansion area. The employment growth includes roughly 120 acres split between industrial (two-thirds) and commercial (one-third). This growth in the expansion area results in an additional 1,660 PM peak hour trips added to the future roadway network - almost five times more than Option 1. Note that the multi-family residential units in the RCOD are included in the baseline future scenario and thus don't add any further trips to Option 2.

The second option will require more transportation infrastructure including roadway connections in the form of new collectors and internal site roadways. This analysis assumes trips access River Road at two new accesses besides Quinaby Road and Perkins Street. One new north-south collector roadway is assumed parallel to River Road in addition to internal site circulation. Trips may also access the site via the east or south on Quinaby Road, Perkins Street, and 35th Avenue.

FIGURE 3. LAND USE OPTION 2

LAND USE OPTION SUMMARY IN EXPANSION AREA*

OPTION 1

EMPLOYMENT EXPANSION

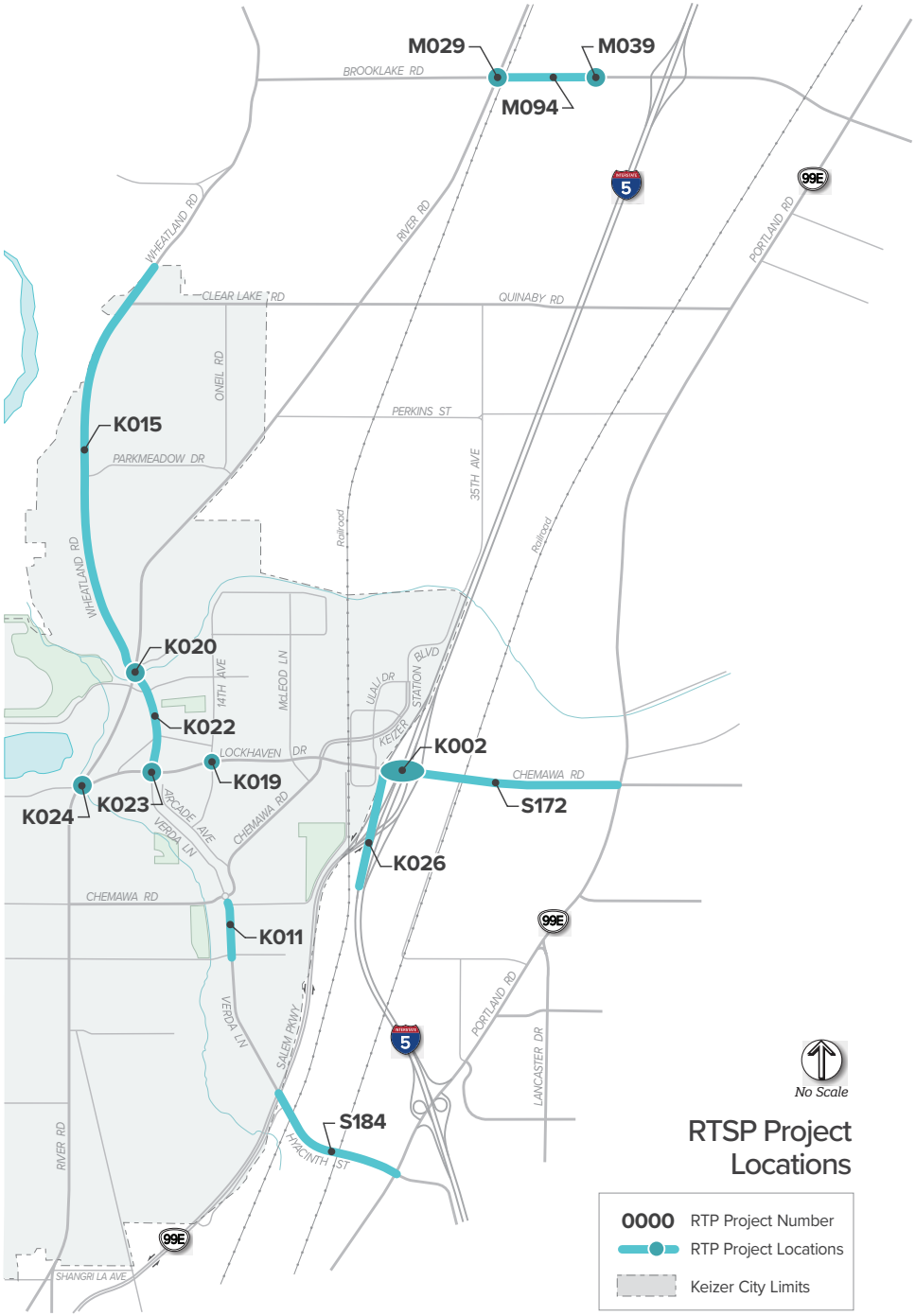
0	0	42	19	350
MULTI-FAMILY UNITS	SINGLE FAMILY UNITS	ACRES INDUSTRIAL	ACRES COMMERCIAL	VEHICLE TRIPS DURING PM PEAK HOUR

OPTION 2

MAJOR HOUSING AND EMPLOYMENT EXPANSION

259	1,731	80	40	1,660
MULTI-FAMILY UNITS	SINGLE FAMILY UNITS	ACRES INDUSTRIAL	ACRES COMMERCIAL	VEHICLE TRIPS DURING PM PEAK HOUR

** Note: This does not include the multi-family units assumed in the RCOD, as previously described.*



REGIONALLY IDENTIFIED SYSTEM IMPROVEMENTS

For the purposes of this study, it was assumed that the growth options would be fully developed by the horizon year of the plan forecast, year 2043. By that time, local agencies are expected to complete a series of transportation improvements to the study area roadway system independent of these growth options moving forward. They are identified in the Regional Transportation System Plan (RTSP), and have been identified as being likely to be funded, which is labeled as "Included" in that plan. The cost for the City of Keizer to complete these projects totaled just over $12 million in 2009. Accounting for inflation, this is about $16 million in 2019. Without these projects, the following intersections would experience severe congestion:

- *River Road / Brooklake Road*
- *River Road / Lockhaven Drive*
- *Verda Lane / Lockhaven Drive*
- *Kafir Drive / 14th Avenue / Lockhaven Drive*
- *Chemawa Road / I-5 SB Ramp*

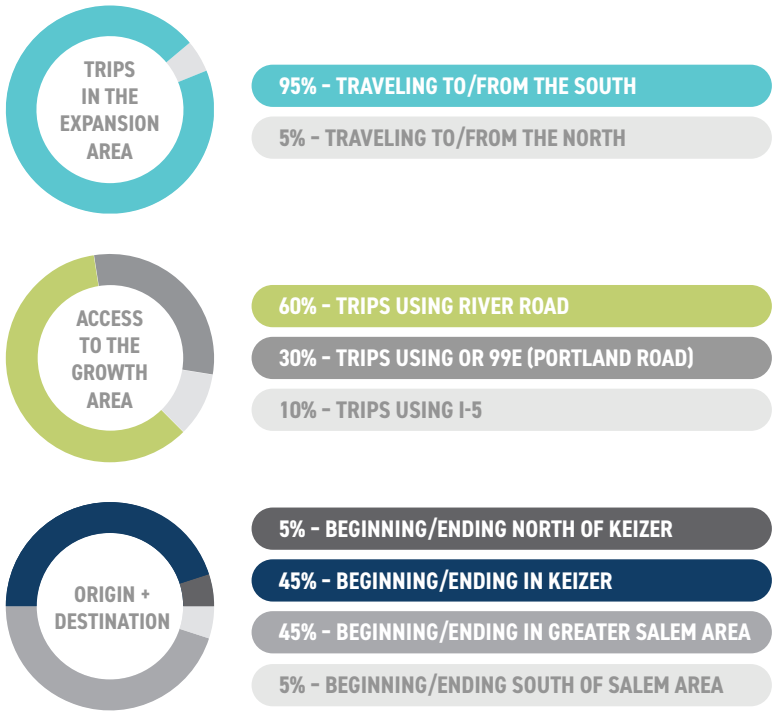
A complete list of the improvements applicable to the study area are included in the Appendix. These future improvements have been assumed to be in place for all future year scenarios.

Note that although existing funding for project K015 (multi-modal improvements) has been reallocated to another project, this project is still anticipated to be funded before the planning horizon year. In addition, this project has no impact on the vehicle capacity analysis.

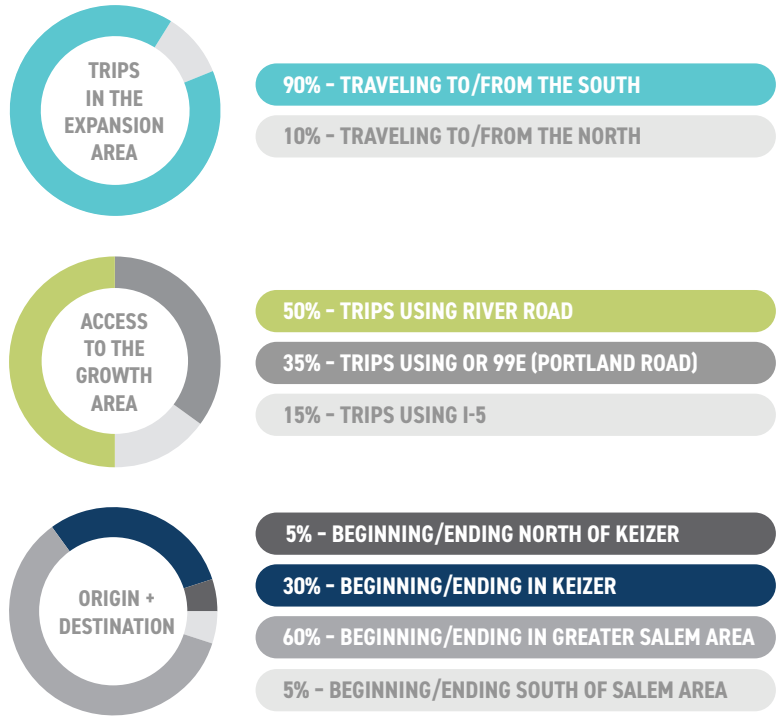
FIGURE 4. RTSP PROJECT LOCATIONS

TRIP DISTRIBUTION PATTERNS FOR THE GROWTH AREAS

LAND USE OPTION 1



LAND USE OPTION 2



Under current conditions, there is little existing land use north of Keizer in the expansion area. The 2043 SKATS regional travel demand model was used to determine future travel patterns for this analysis. Land use type, such as proportion of residential vs commercial and industrial uses, impact trip patterns. Residential areas have trips coming into the expansion area during the PM peak hour, while the majority of employment areas have trips leaving the expansion area during the PM peak hour.

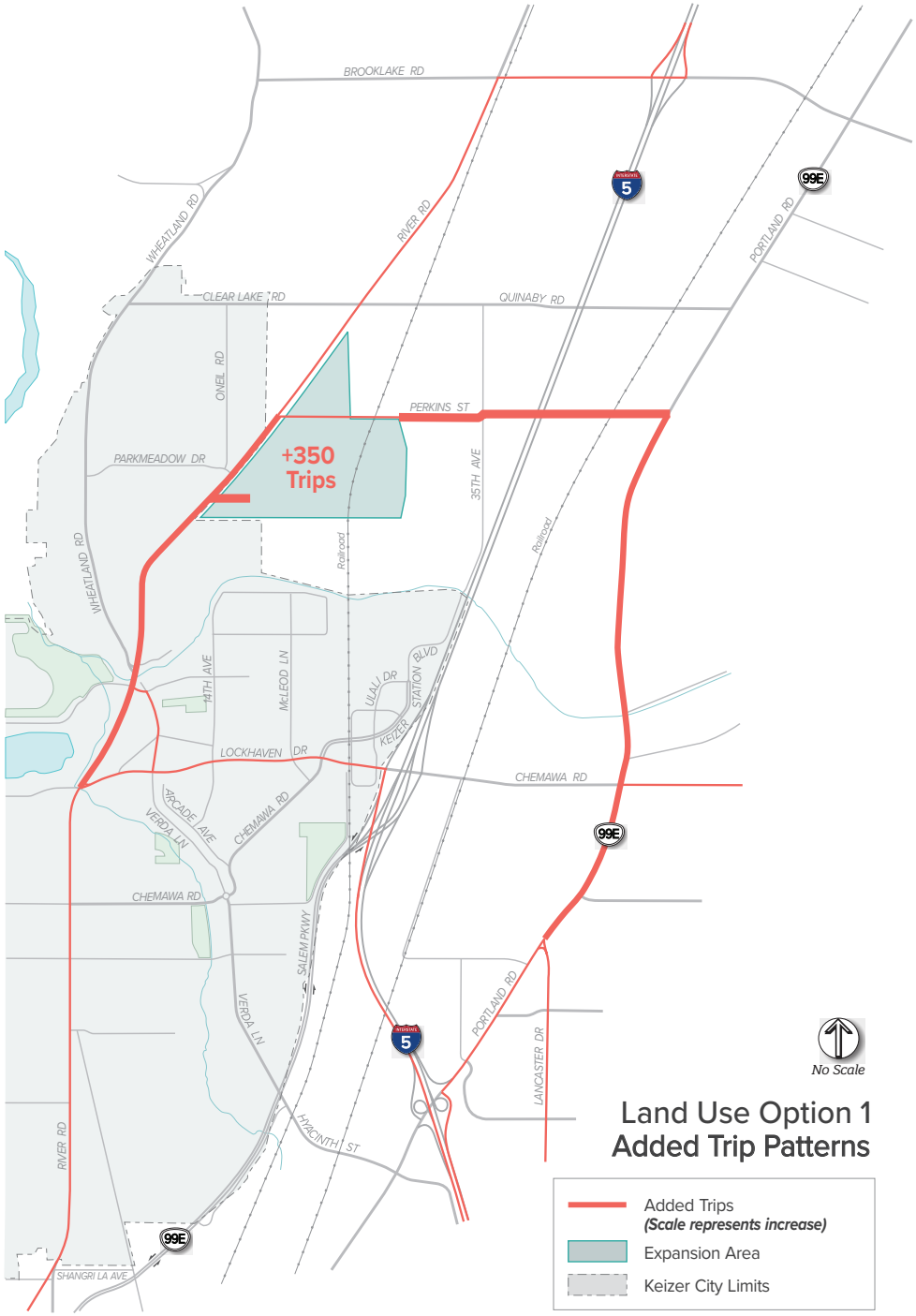
One reason the travel patterns are not the same between the two options is that Option 2 has a larger magnitude of additional trips, so once the Keizer housing or job demand has been filled, more trips are headed to and from the greater Salem area, as well as areas outside of Salem. Further details on trip distribution for the two growth options can be found in the Growth Impacts section.

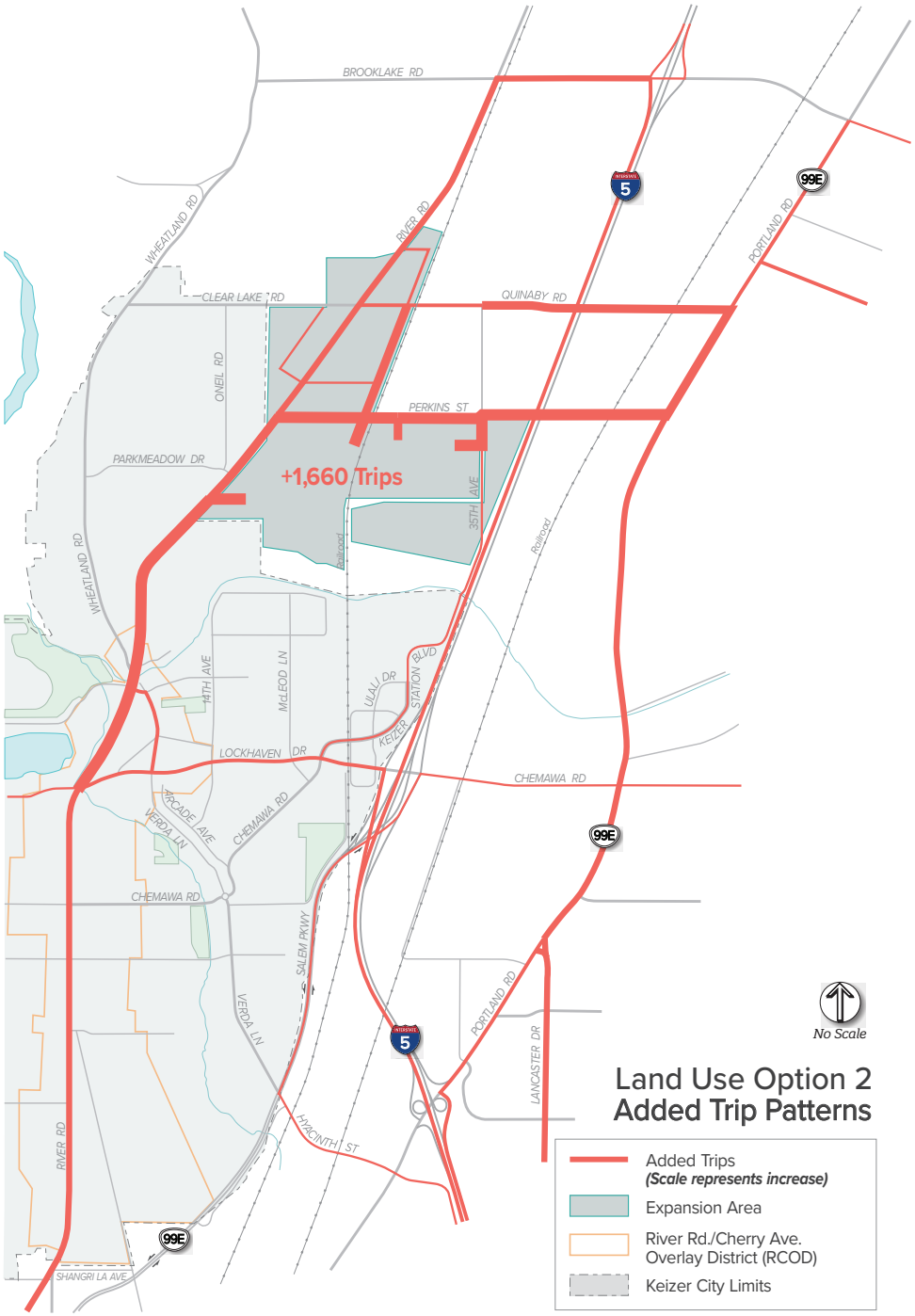
GROWTH IMPACTS

Based on the land use assumptions outlined in the previous section, trip patterns were developed for both of the growth options. These options were compared to a baseline scenario in 2043 that assumed no UGB expansion growth to determine the growth impacts. This modified baseline includes the 517 multi-family units in the River Road/Cherry Avenue Overlay District (RCOD) that are also assumed in Option 1. In Option 2, about half these units are assumed to be in the RCOD and half are located in the expansion area.

The trip patterns and magnitude of volume growth in the PM peak hour for the expansion areas of two options are shown in **Figures 5 and 6**. Generally, Option 1 has a much smaller impact than Option 2. Under Option 1, trips access the expansion area via River Road or Perkins Street, with some volume growth on OR 99E (Portland Road). There is a minor growth in trips on River Road in the RCOD.

FIGURE 5. LAND USE OPTION 1: ADDED TRIP PATTERNS





Land Use Option 2 shows significant growth in the expansion area, with increases in volume along River Road, Quinaby Road, Perkins Street, and OR 99E (Portland Road). There are some volume increases at the Brooklake Road, OR 99E (Portland Road), and Chemawa Road I-5 interchanges.

FIGURE 6. LAND USE OPTION 2: ADDED TRIP PATTERNS

GROWTH IMPACTS ON STUDY AREA ROADWAYS AND INTERSECTIONS

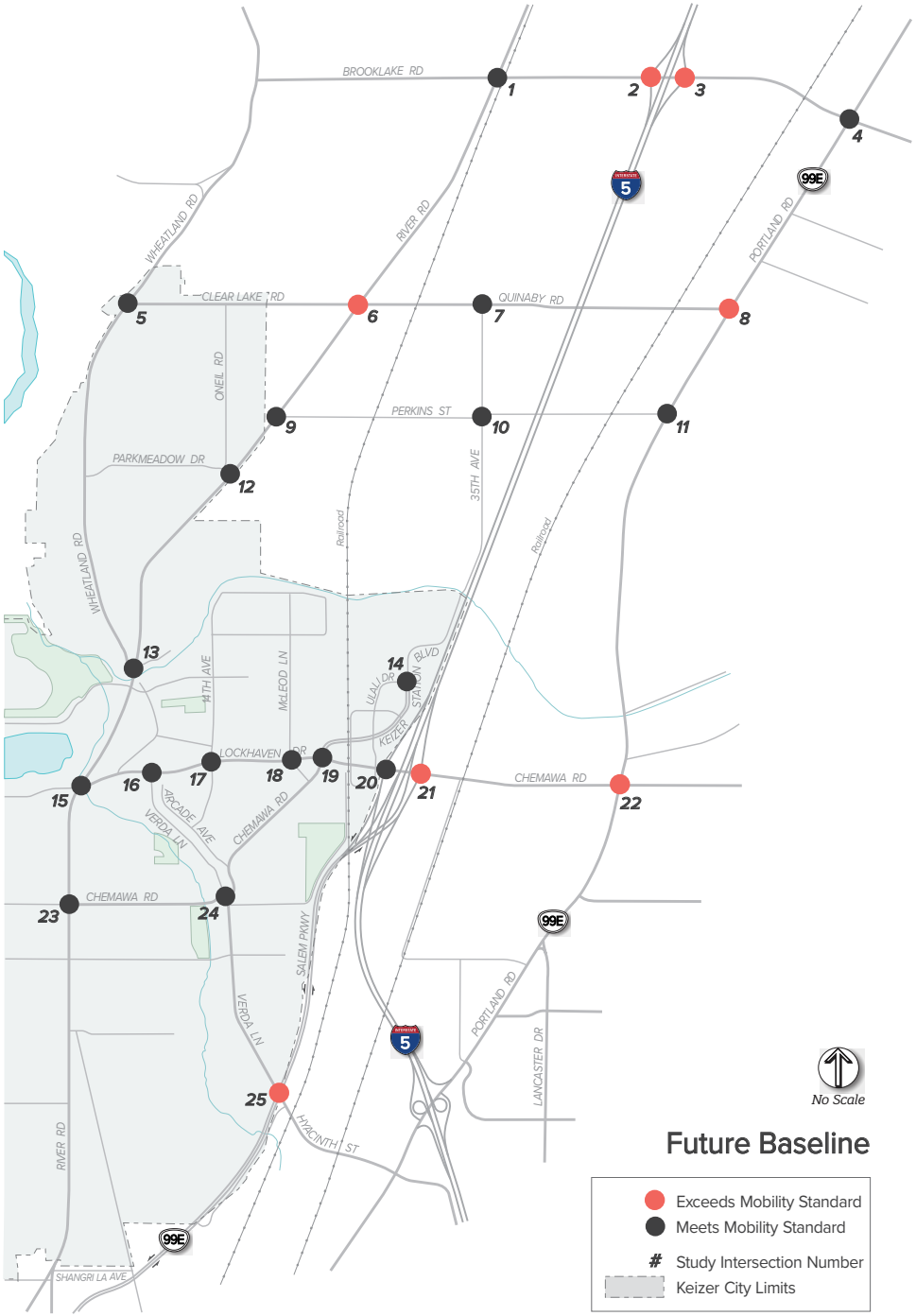
Several roadways adjacent to the location of the growth options will require upgrades to City of Keizer street design standards if and when growth occurs in the future year baseline conditions (meaning without land use options 1 and 2). The operations shown in Figure 7 were analyzed with the assumption that all RTSP projects identified on Page 8 are completed.[1] The roadways that would need improvement beyond the RTSP projects identified on Page 8 are shown in **Table 1**. The extent of the improvements would be limited to the Urban Growth Boundary.

Several study intersections will require upgrades to traffic controls or expanded turn lanes to serve these growth options, as shown in **Figure 7**. These intersections will continue to be severely congested during peak hours with both growth options.

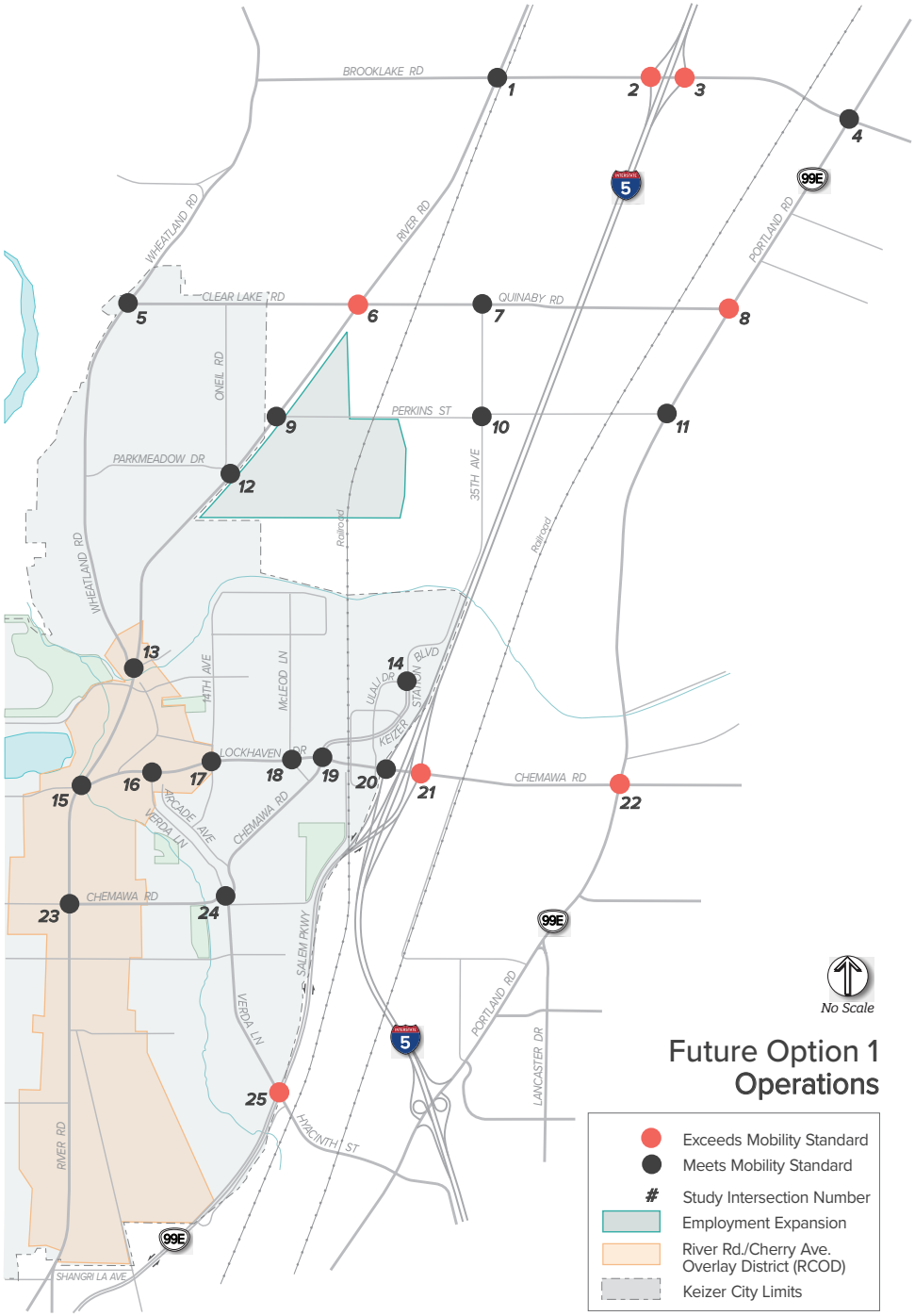
TABLE 1. ROADWAYS IN NEED OF IMPROVEMENT TO SERVE CONCEPTUAL GROWTH OPTIONS

LOCATION	FACILITY UPGRADE REQUIRED TO SERVE GROWTH
Perkins St	Upgrade to City of Keizer standards for minor arterials (3 lanes)
River Rd	Upgrade to City of Keizer standards for major arterials (5 lanes)
Quinaby Rd	Upgrade to City of Keizer standards for minor arterials (3 lanes)

FIGURE 7. FUTURE BASELINE



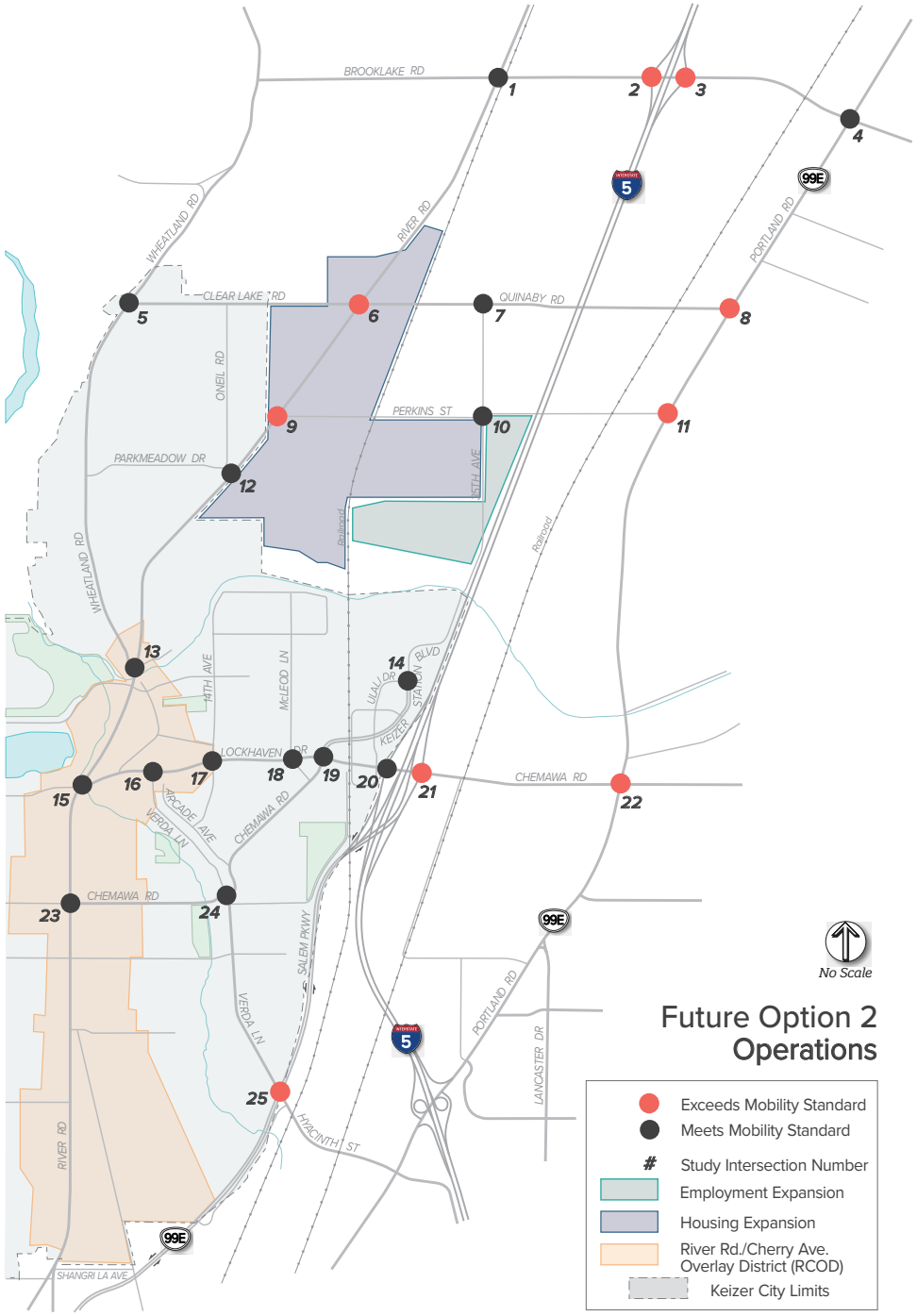
1 City of Keizer design standards - Streets. See page 5 https://evogov.s3.amazonaws.com/media/60/media/17105.pdf



LAND USE OPTION 1

Apart from the study intersections already experiencing significant congestion in the 2043 Baseline scenario, no additional study intersections exceed mobility standards with Option 1, as shown in **Figure 8**. The following section will provide system improvements for the intersections shown to be experiencing significant congestion.

FIGURE 8. LAND USE OPTION 1



LAND USE OPTION 2

Two study intersections experience significant congestion with the growth of Option 2, River Road/Perkins Street and OR 99 E (Portland Road)/Perkins Street, as shown in **Figure 9**. This is tied to the increased growth in trips along Perkins Street due to the adjacent expansion area.

FIGURE 9. LAND USE OPTION 2

SYSTEM INVESTMENTS TO SERVE GROWTH

2043 BASELINE SYSTEM RECOMMENDATIONS

Several study intersections need improvement to serve planned growth even without further UGB expansion. **Table 2** identifies several projects that are recommended for the street network without expansion of the UGB. Each recommended improvement shows an associated cost estimate, and the jurisdiction that would be primarily responsible for the improvement. When traffic signals are installed at intersections #6 and #8, they will operate adequately during peak hours, as shown in the Appendix. Several of the projects in Table 2 were identified by studies conducted after the RTSP project list was adopted. These projects are expected to mitigate growth that occurs by 2043 without expansion of the UGB (baseline conditions).

[1] As part of a previous study done by DKS Associates in 2019, intersection mitigations for the I-5 and Brooklake Road interchange were identified. These improvements include signalization of the two intersections.

[2] Two RTSP projects are identified in the general areas of study intersections 21 and 22, however specific improvements were not specified (see K002 and S172). Further study is recommended to expand the scope of the existing RTSP projects to include improvements at these study intersections as well as the Chemawa Road, OR 99E (Portland Road), and I-5 corridors in this area.

[3] Due to its location on a regionally significant route for motor vehicles and freight, Salem Parkway, additional study is recommended to mitigate intersection #25. Notably, the existing configuration and surrounding land use limits capacity expansion alternatives.

TABLE 2. BASELINE LIST OF INTERSECTION IMPROVEMENTS

INTERSECTION		RECOMMENDED IMPROVEMENT	COST ESTIMATE	JURISDICTION
2	**Brooklake Rd & I-5 SB Ramps**	Improvements from 2019 I-5/Brooklake Study (includes signalization)[1]	$5,400,000	ODOT
3	**Brooklake Rd & I-5 NB Ramps**	Improvements from 2019 I-5/Brooklake Study (includes signalization)[1]		
6	**River Rd & Clear Lake Rd/ Quinaby Rd**	Upgrade to signal control	$1,000,000	County/City
8	**OR 99E (Portland Rd) & Quinaby Rd**	Upgrade to signal control	$1,000,000	ODOT
21	**Chemawa Rd & I-5 NB Ramp**	Future study needed[2]	TBD	ODOT
22	**OR 99E (Portland Rd) & Chemawa Rd/ Hazelgreen Rd**	Future study needed[2]	TBD	ODOT
25	**Salem Pkwy & Verda Ln/ Hyacinth**	Future study needed[3]	TBD	ODOT

OPTION 1 SYSTEM RECOMMENDATIONS

No additional study intersections need improvement with the growth with Option 1 from the baseline scenario. However, several roadways adjacent to the proposed developments in this growth option would require upgrades to City of Keizer standards. Due to the location of Option 1's proposed development, only Perkins Street and River Road would require upgrades to City of Keizer standards. **Table 3** shows the proposed roadway upgrades and planning-level estimated costs.

By widening River Road as described in Table 3, study intersection #6 (River Road & Clear Lake Rd/Quinaby Road) would be mitigated to meet jurisdictional standard with the additional turn lanes on River Road, and therefore would not require an intersection control upgrade to a signal. A comparison of the intersection operations with additional turn lanes versus intersection control upgrades is provided in the Appendix.

Option 1 has a total of $17,000,000 for planning level transportation project costs associated with this expansion (not including future baseline needs identified above).

TABLE 3. OPTION 1 – LIST OF ROADWAY IMPROVEMENTS

ROADWAY	RECOMMENDED IMPROVEMENT[1]	COST ESTIMATE	JURISDICTION
Perkins St	Upgrade to 3 lanes	$5,000,000	County/City
River Rd	Upgrade to 5 lanes	$12,000,000	County/City

[1] Urban upgrades would be constructed to the new city limits (based on expansion area). Cost estimates reflect that distance.

OPTION 2 SYSTEM RECOMMENDATIONS

Two additional intersections need improvement with the growth of Option 2 as compared to the baseline scenario and Option 1. **Table 4** provides recommendations for improvements at these intersections, as well as the associated planning-level cost estimate and the jurisdiction responsible.

Several roadways adjacent to the proposed developments in this growth option would require upgrades to City of Keizer standards. **Table 5** shows the planning level cost estimates for these upgrades.

Study intersection #6 (River Road & Clear Lake Rd/Quinaby Road) would be mitigated to meet the jurisdictional standard with turn lanes constructed on both River Road and Quinaby Road. A comparison of this intersection from upgrading to signal control (recommended baseline improvements), to the construction of turn lanes on River Road only (recommended Option 1 improvements), to the construction of turn lanes on both River Road and Quinaby Road (recommended Option 2 improvements) is found in the Appendix.

Option 2 has a total of $36,500,000 for planning level transportation project costs associated with this expansion (not including future baseline needs identified above).

TABLE 4. OPTION 2 – LIST OF INTERSECTION IMPROVEMENTS

ROADWAY	RECOMMENDED IMPROVEMENT	COST ESTIMATE	JURISDICTION
River Rd & Perkins St	Construct turn lanes	$500,000 (for all three approaches)	Private developers, County, City
OR 99E (Portland Rd) & Perkins St	Upgrade to signal control	$1,000,000	ODOT

TABLE 5. OPTION 2 – LIST OF ROADWAY IMPROVEMENTS

ROADWAY	RECOMMENDED IMPROVEMENT[1]	COST ESTIMATE	JURISDICTION
Perkins St	Upgrade to 3 lanes	$10,000,000	County/City
River Rd	Upgrade to 5 lanes	$19,000,000	County/City
Quinaby Rd	Upgrade to 3 lanes	$6,000,000	County/City

[1] *Urban upgrades would be constructed to the new city limits (based on expansion area). Cost estimates reflect that distance.*

SUMMARY OF FINDINGS

In order to accommodate expected growth in 2043 regardless of the growth options proposed in this study, several study intersections will require upgrades. With the growth in Option 1, the City has the potential to work with developers to fund intersection and roadway improvements as identified in the Baseline scenario. The growth of Option 2 would cause two additional study intersections to experience significant congestion, one of which is likely to be funded by private development.

As shown in **Table 6**, planning level costs for the transportation projects identified total $17,000,000 for Option 1 and $36,500,000 for Option 2. These costs would be in addition to the City of Keizer's Included RTSP projects, which total $16 million in today's dollars, plus the 2043 recommended baseline improvements due to future deficiencies (about $1 million for City of Keizer).

TABLE 6. TOTAL ESTIMATED ROADWAY IMPROVEMENTS COSTS FOR GROWTH OPTIONS

GROWTH OPTION	RECOMMENDED IMPROVEMENTS	TOTAL ESTIMATED COST
Option 1	Widen Perkins Street Widen River Road	$17,000,000
Option 2	Widen Perkins Street Widen River Road Widen Quinaby Road Upgrade River Road & Perkins Street Upgrade Portland Road & Perkins Street	$36,500,000

HOUSEHOLD AND EMPLOYMENT GROWTH BY OPTION

If we continue our analysis to compare the scale of development that was supported by each growth option, we can derive a unit cost for each PM peak hour trip that would be served in the growth area. This provides a fair basis of comparison between these growth options.

For this analysis, both Option 1 and Option 2 were compared to the modified future baseline (includes 517 multi-family households in the RCOD). The following table summarizes the trips added to the growth area, the total cost of improvements, and the cost per additional trip for each option. Note that the Option 1 expansion only contains employment growth, while Option 2 has both single family households and employment growth.

While Option 1 is about half the cost of Option 2, Option 2 supports about five times the amount of trips. Because of this, the cost per trip are lower for Option 2 compared to Option 1. In fact, the cost per additional PM peak hour trip in Option 1 ($48,600) is approximately double the cost in Option 2 ($22,000). This outcome is due to the efficiencies of building out the expansion area in Option 2 and making use of the capacity improvements at the adjacent roadways and intersections that would be needed with any scale of development. Note that both options would also require an active transportation study to identify any needed bicycle and pedestrian facilities.

	GROWTH AREA TRIPS	COST OF IMPROVEMENTS	COST PER TRIP
OPTION 1	350	$17M	$48,600
OPTION 2	1,660	$36.5M	$22,000

These system improvements would likely be funded through a variety of sources, including System Development Charges, development exactions, and funds from local agencies (City of Keizer, Marion County, and ODOT). These trips were estimated from the travel demand model and are typically lower than the number of trips that would be produced from the ITE Trip Generation Manual in a Transportation Impact Analysis (TIA). Once specific developments are selected, a full TIA would need to be performed. Thus, the cost per trip reported here is for reference purposes, not the suggested development fee. For reference, the current Keizer System Development Charge (SDC) fee for a single family house is $1,405, or more generally $2,780 per trip[1]. The costs are intended to provide a scale of investment and to indicate how increased development density in the expansion area can lower costs per trip.

1 City of Keizer, Fees and Charges for Services, July 2019, https://www.keizer.org/media/Departments/Finance/2019-20-%20Fee%20Schedule%207-1-19%20update.pdf

KEIZER GROWTH TRANSPORTATION IMPACTS STUDY

APPENDIX

OCTOBER 2020

CONTENTS

SECTION 1. TECHNICAL MODELING MEMORANDUM

SECTION 2. REGIONAL TRANSPORTATION PLAN PROJECTS

SECTION 3: INTERSECTION OPERATIONS SUMMARY

SECTION 4: SYNCHRO OPERATIONS REPORTS

720 SW WASHINGTON STREET, SUITE 500, PORTLAND, OR 97205 • 503.243.3500 • DKSASSOCIATES.COM

SECTION 1. TECHNICAL MODELING MEMORANDUM

DKS 720 SW WASHINGTON STREET, SUITE 500, PORTLAND, OR 97205 • 503.243.3500 • DKSASSOCIATES.COM

TECHNICAL MEMORANDUM

DATE: September 1, 2020

TO: Shane Witham | City of Keizer

FROM: Carl Springer, PE and Amanda Deering, PE | DKS Associates

SUBJECT: Keizer UGB Growth Study – Technical Modeling Memorandum Project # 20018-000

INTRODUCTION

The purpose of this memorandum is to document the methods and assumptions used in the modeling process for the Keizer UGB Growth Study. Details will be provided on land use estimates, trip generation, modeling, and forecasting future volumes. Full analysis and results discussion are provided in the main report document.

LAND USE INPUTS

Two conceptual growth options were developed in coordination with the City of Keizer, the Mid-Willamette Valley Council of Governments (MWVCOG), and the consultant team. The intent was to develop two scenarios to address the housing needs and projected employment growth in Keizer beyond its current Urban Growth Boundary. For each growth scenario, the City provided an estimate of housing units and employment acreage, which was converted to land use inputs for the future 2043 Salem-Keizer travel demand model (SKATS). The existing year (2017) and future year (2043) models were used to forecast the transportation impacts of the two scenarios.

GROWTH OPTIONS

The following growth scenarios were modeled in this study to assess changes in travel demands:

- Modified baseline: 2043 SKATS base future model with the addition of multi-family housing units within the River Road/Cherry Road Overlay District (RCOD)
- Option 1: modified baseline plus a small employment expansion outside of the urban growth boundary (UGB)
- Option 2: housing expansion plus a large employment expansion and outside of the UGB

The expansion areas are depicted in Figure 1 and specific land use inputs from the City for these scenarios are presented in Table 1.

FIGURE 1: GROWTH EXPANSION AREAS

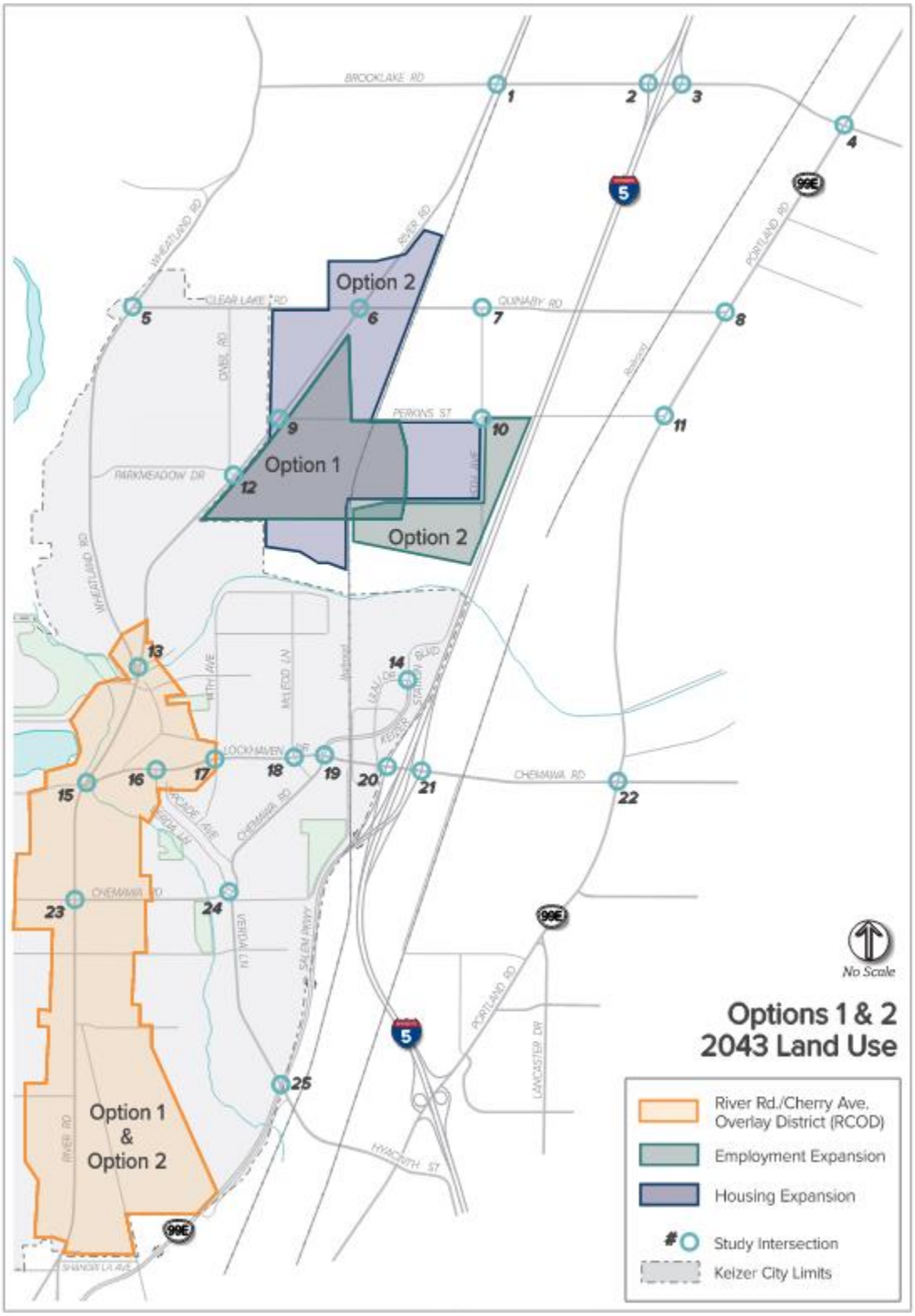


TABLE 1: LAND USE BY SCENARIO

SCENARIO	MULTI-FAMILY UNITS	SINGLE FAMILY UNITS	INDUSTRIAL EMPLOYMENT ACRES	COMMERCIAL EMPLOYMENT ACRES	TOTAL EMPLOYMENT ACRES
MODIFIED BASELINE	517	-	-	-	-
OPTION 1	517	-	42	21	63
OPTION 2	517 [a]	1731	80	40	120

[a] 258 multi-family units in the RCOD, and 259 units in the expansion area

This land use was checked to verify it matches the appropriate housing density and vacancy in the growth areas. It was also reviewed to check that it provides the level of housing specified in the housing needs analysis and that the projected employment matches the anticipated job growth.

MODEL INPUTS

These growth scenario land use quantities were then converted to inputs to the regional travel demand model in the form of households and jobs. These inputs are applied as edits to the land use for each applicable transportation analysis zone (TAZ). Options 1 and 2 involve TAZs that are outside of the UGB and are mostly vacant. The multifamily units in the River Road/Cherry Road Overlay District RCOD are filling in the vacant lots remaining in the otherwise developed TAZs surrounding River Road, within the city limits.

The following assumptions were used to convert commercial and industrial employment acreage to jobs by employment type for input into the model. The rates are in units of jobs per built 1,000 square feet (ksf) and are based off floor area ratios (FARs) and previous land use modeling assumptions.

TABLE 2: EMPLOYEE RATES BASED ON BUILT SQUARE FOOTAGE (JOB/KSF)

LAND USE TYPE	RETAIL	SERVICE	MANUFACTURING	WHOLESALE	TOTAL
COMMERCIAL	0.55	0.85	0.0	1.1	2.5
INDUSTRIAL	0.0	0.0	1.0	0.5	1.5

Using Table 2, the employment acreage was converted to total new jobs and, with new households, were allocated across the appropriate TAZs and were provided as model inputs to the COG. Tables 3 and 4 summarize the detailed model input assumptions. The inputs shown are only the additional households or jobs to be added to the 2043 future baseline SKATS model, and don't reflect total land use numbers for the TAZs. Note that the modified baseline is included in Table 3 to show the multi-family housing growth in the RCOD that was assumed beyond the original SKATS 2043

baseline. The selected zones in TAZs 95-128 represent the RCOD, while TAZs 83-91 represent the expansion areas.

TABLE 3: HOUSING ASSUMPTIONS FOR THE MODIFIED BASELINE AND TWO GROWTH SCENARIOS

ADDED HOUSEHOLDS	MODIFIED BASELINE	OPTION 1		OPTION 2	
TAZ	MULTI-FAMILY UNITS	SINGLE-FAMILY UNITS	MULTI-FAMILY UNITS	SINGLE-FAMILY UNITS	MULTI-FAMILY UNITS
EXPANSION AREA					
83	0	0	0	29	0
84	0	0	0	25	0
85	0	0	0	387	0
86	0	0	0	1174	259
87	0	0	0	45	0
89	0	0	0	1	0
91	0	0	0	70	0
RCOD AREA					
95	200	0	200	0	100
108	56	0	56	0	28
117	14	0	14	0	7
119	76	0	76	0	38
124	24	0	24	0	12
125	66	0	66	0	33
127	36	0	36	0	18
128	45	0	45	0	22
TOTAL	**517**	**0**	**517**	**1731**	**517**

TABLE 4: EMPLOYMENT ASSUMPTIONS FOR TWO GROWTH OPTIONS

ADDED JOBS	MODIFIED BASELINE	OPTION 1					OPTION 2				
TAZ	**TOTAL JOBS**	*RETAIL*	*SERVICE*	*MANUFAC-TURING*	*WHOLE-SALE*	**TOTAL**	*RETAIL*	*SERVICE*	*MANUFAC-TURING*	*WHOLE-SALE*	**TOTAL**
86	0	67	104	253	260	684	192	296	697	732	1917
91	0	34	52	113	124	323	0	0	0	0	0
TOTAL	**0**	**101**	**156**	**366**	**384**	**1007**	**192**	**296**	**697**	**732**	**1917**

UPDATED TRAVEL DEMAND MODELS

The COG used the land use inputs provided by DKS to create three 2043 future year scenario models: the modified baseline, Option 1, and Option 2. These are based off the latest regional travel demand models, with a base year of 2017 and horizon year of 2043. These models include committed transportation improvements from the current Regional Transportation Plan (RTP), and projects from the Cities of Keizer and Salem Transportation System Plans (TSPs). The land use inputs were converted to vehicle trips and assigned to the street network in the transportation model following the trip patterns and methods used in the SKATS models. In addition to the land use, DKS also provided some network edits to the transportation models in the expansion areas where new connections would be needed to support the development.

MODEL STREET NETWORK EDITS

Figures 2 and 3 show the model street network edits that were implemented for Options 1 and 2. The edits included adding new street connections as collectors in the expansion areas, adding new connectors to distribute the development trips, and modifying connector locations so they are not loading directly into study intersections. These edits are high level, with the intention of improving the modeling assignment and properly distributing trips. They do not represent proposed new street alignments or infrastructure.

FIGURE 2: OPTION 1 MODEL NETWORK EDITS

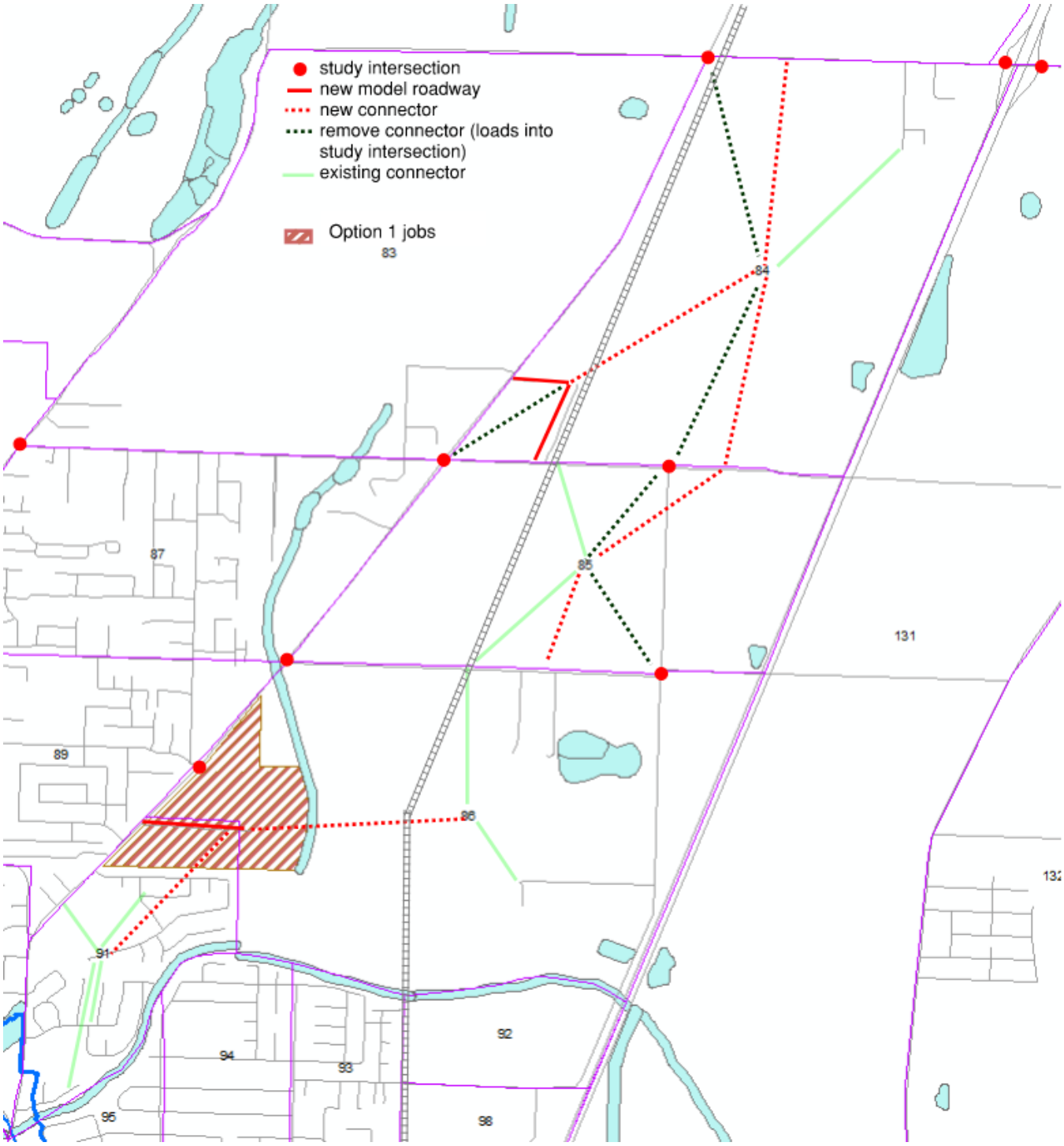
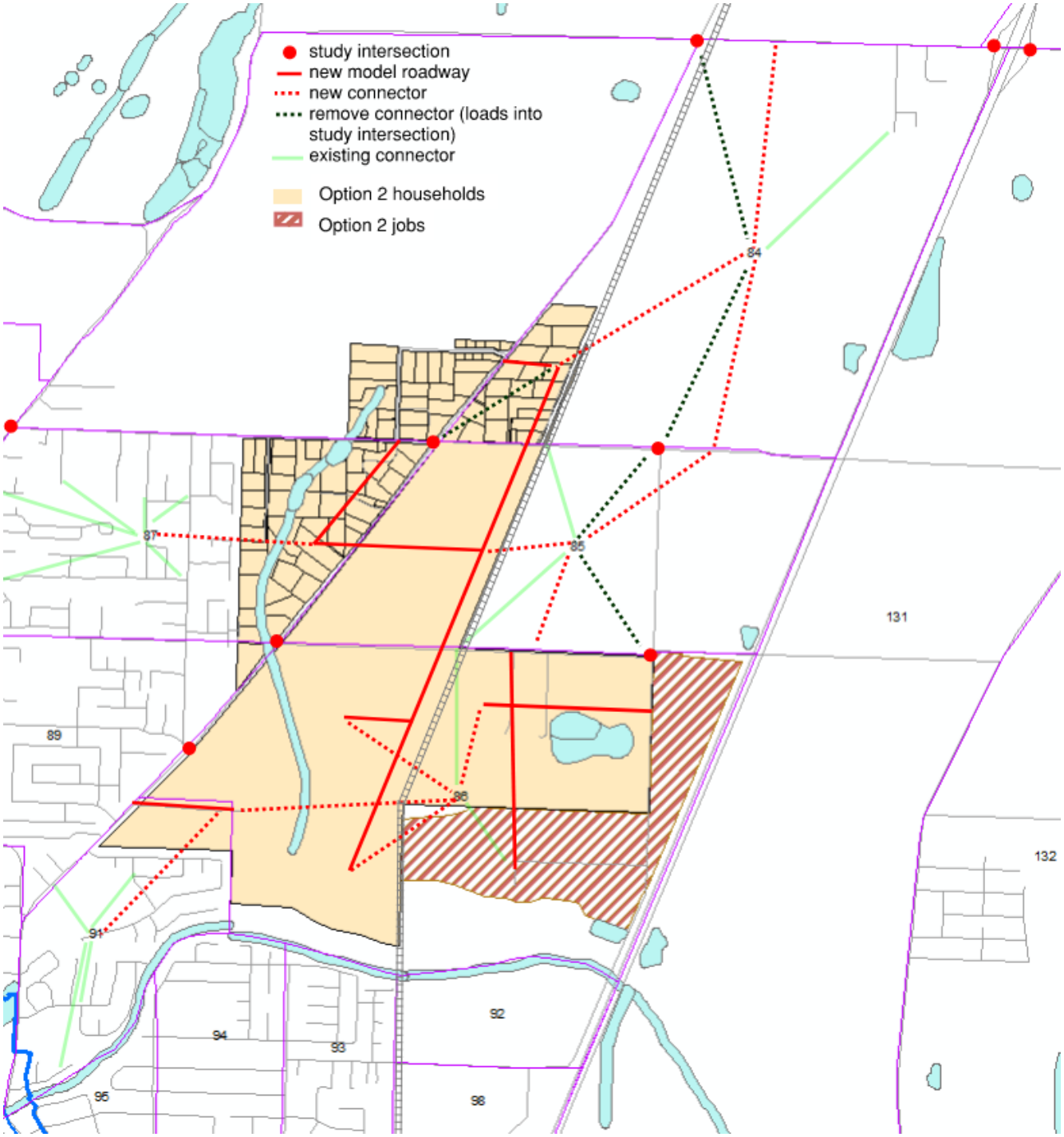


FIGURE 3: OPTION 2 MODEL NETWORK EDITS



MODEL TRAVEL FORECASTS

The three future scenario 2043 SKATS models and the base 2017 SKATS model were used to pull various outputs to support the transportation analysis documented in the main report. These included post-processed 2043 traffic volumes, Highway Capacity Manual (HCM) intersection operations, and growth area travel patterns.

Volume difference plots from the travel demand models were used to develop travel pattern and trip growth distribution figures shown in Figures 4 and 5. These figures show high level distribution of new trips in the expansion areas for Options 1 and 2. The multifamily growth in the RCOD is spread across the corridor and doesn't show significant growth in trips in the area.

Future 2043 traffic volumes at the study intersections were forecasted using the SKATS base and future year models, existing year count data, and post-processed using NCHRP 765 methods[1]. These volumes were used as inputs to the HCM intersection operation analysis performed in Synchro, which informed recommended transportation improvements.

[1] National Cooperative Highway Research Program (NCHRP) Report 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design, Transportation Research Board, 2014.

FIGURE 4: OPTION 1 GROWTH TRAVEL PATTERNS

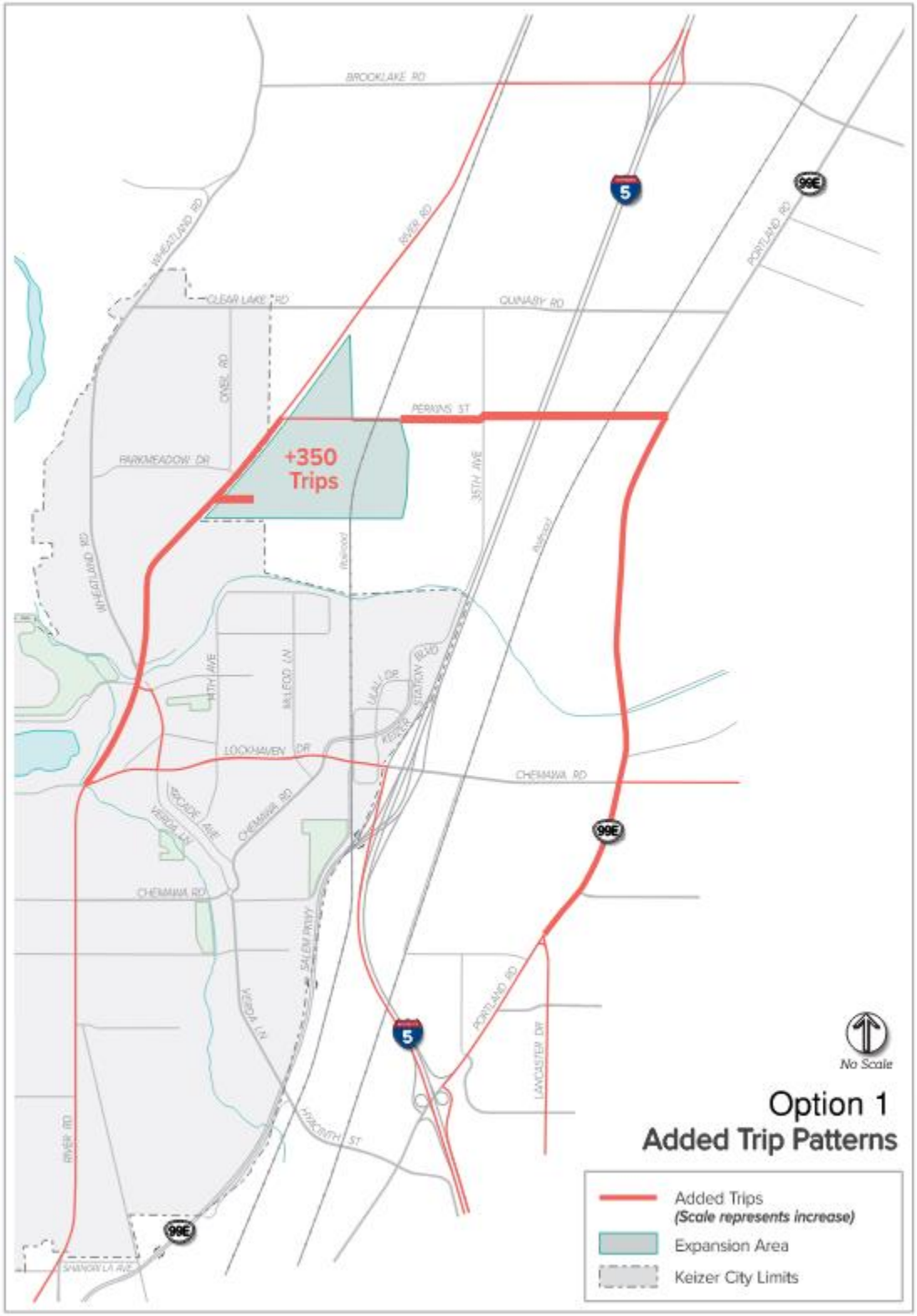
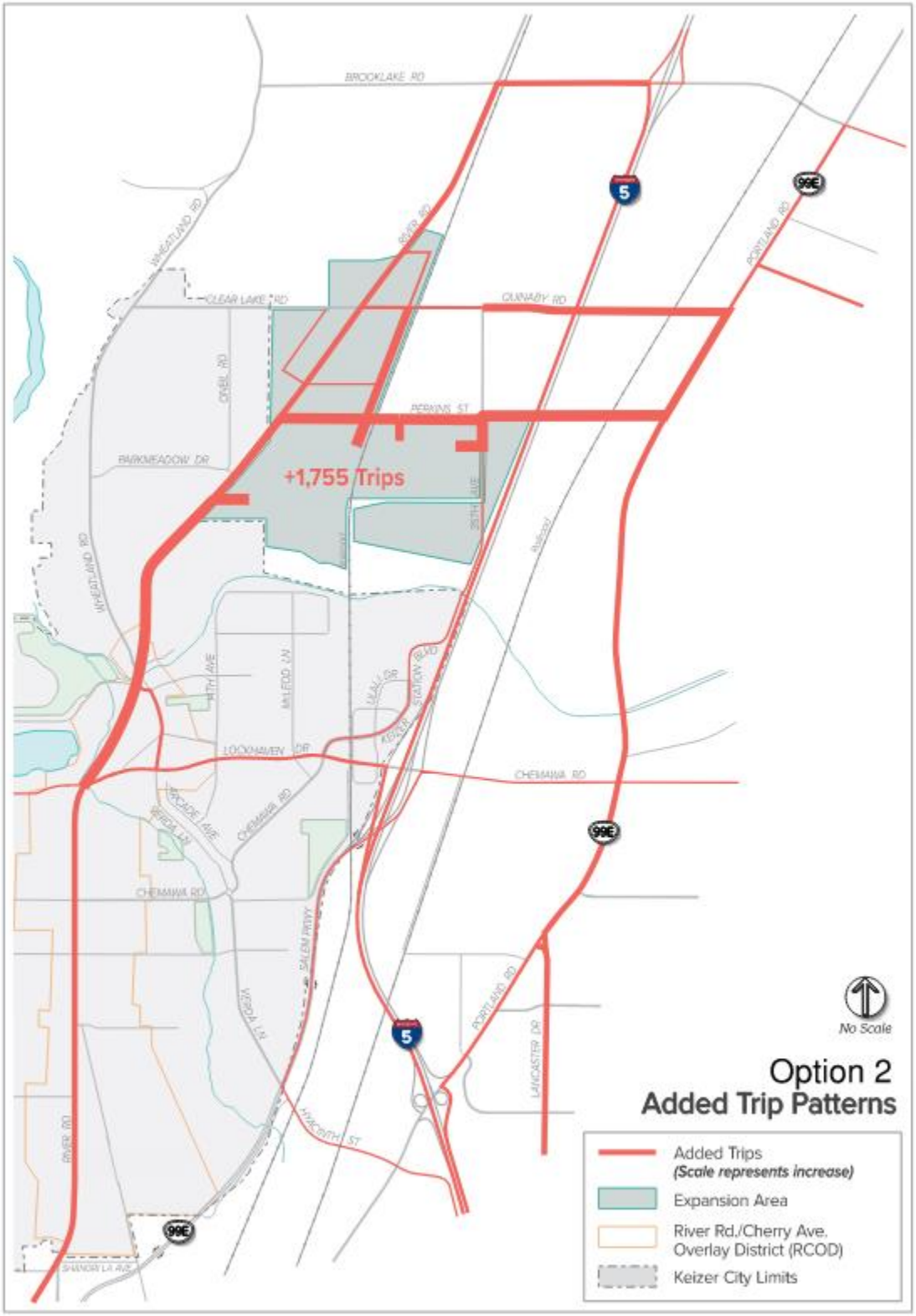


FIGURE 5: OPTION 2 GROWTH TRAVEL PATTERNS



SECTION 2. REGIONAL TRANSPORTATION PLAN PROJECTS

SEE PAGE 8 FOR MAP

REGIONAL TRANSPORTATION PLAN PROJECTS

(SEE PAGE 8 FOR MAP)

RTSP ID	PROJECT NAME	PROJECT DESCRIPTION	JURISDICTION	PLANNING LEVEL COST (2009)
K002	Chemawa Interchange	- Add EB dual right-turn lanes to SB ramp - Add WB dual left-turn lanes to SB ramp - Add SB receiving lane to ramp	City of Keizer ODOT	$550,000
K011	Verda Ln NE: Chemawa Rd NE to Dearborn Ave NE	Widen to 3 lanes, add bike lanes and sidewalks	City of Keizer	$2,200,000
K015	Wheatland Rd N: River Rd N to north City Limits	Widen for continuous bike lanes, separated sidewalks, rain gardens and landscaping	City of Keizer	$2,000,000
K019	Lockhaven Dr @ 14th Ave - Turn Lanes	- Construct a WB right-turn lane on Lockhaven Dr - Modify NB approach (Kafir Dr) and SB approach (14th Ave) to include separate left-turn lane and shared right turn/through lane	City of Keizer	$383,373
K020	Wheatland Rd/River Rd Intersection	Add second NB left-turn lane and protected left-turn signal phase. Lengthen outside southbound lane	City of Keizer	$1,100,000
K021	River Rd at Manzanita St Intersection Realignment	Move intersection approximately 250 feet to the south. Reconstruct McNary Estates Dr and Manzanita St approaches.	City of Keizer	$2,700,000
K022	Verda Ln Extension	Extend Verda Ln from Lockhaven Dr to River Rd	City of Keizer	$2,075,000
K023	Lockhaven Dr/Verda Ln Intersection	Signalize the intersection	City of Keizer	$400,000

K024	River Rd at Lockhaven Dr Intersection Modifications	- Convert WB approach to dual left-turn lanes, a single through lane, and a separate right-turn lane - Convert east/west split phasing to a more conventional protected left-turn phasing	City of Keizer	$500,000
K026	On-ramp to I-5 and Salem Parkway	Widen the existing on-ramp from Chemawa Road to I-5 (SB) from one lane to two lanes.	City of Keizer ODOT	$360,000
S172	Chemawa Rd NE: I-5 to Portland Rd NE	Widen to 4 lanes plus center turn lanes, bike lanes, curbs, gutters, and sidewalks.	City of Salem	$2,511,000
S184	Hyacinth St NE: Salem Parkway NE to Portland Rd NE	Widen to major arterial standards, including 4 travel lanes and a center turn lane with curbs, gutters, sidewalks, bike lanes and intersection modifications	City of Salem	$3,448,000
M029	River Rd NE & Brooklake Rd NE	Signalize and realign intersection	Marion County	$2,500,000
M039	Brooklake Rd N & Huff Ave	Add traffic signal and turn lanes	Marion County	$2,500,000
M094	Brooklake Road: River Road to Huff Avenue	Widen to two lanes in each direction with turn lanes	Marion County	$4,000,000

SECTION 3: INTERSECTION OPERATIONS SUMMARY

Existing

#	Intersection	Jurisdiction	Mobility Standard	Control Type	LOS	Delay	V/C Ratio
1	River Rd & Brooklake Rd	Marion Co	LOS D V/C <= 0.85	AWSC	D	28.1	0.76
2	Brooklake Rd & I-5 SB Ramps	ODOT (OHP)	V/C <= 0.85	TWSC	B/F	12/123	0.46/0.65
3	Brooklake Rd & I-5 NB Ramps	ODOT (OHP)	V/C <= 0.85	TWSC	A/F	10/148	0.31/1.13
4	Portland Rd & Brooklake Rd	ODOT (OHP)	V/C <= 0.95	Signal	B	13.2	0.68
5	Wheatland Rd & Clear Lake Rd	City of Keizer	LOS E V/C <= 0.95	TWSC	A/B	8/11	0.11/0.1
6	River Rd & Clear Lake Rd/Quinaby Rd	Marion Co	LOS E V/C <= 0.85	TWSC	A/C	8/22	0.26/0.36
7	35th Ave & Quinaby Rd	Marion Co	LOS E V/C <= 0.85	TWSC	A/B	7/10	0.07/0.13
8	Portland Rd & Quinaby Rd	ODOT (OHP)	V/C <= 0.95	TWSC	A/C	9/20	0.39/0.25
9	River Rd & Perkins St	Marion Co	LOS E V/C <= 0.85	TWSC	A/C	8/19	0.27/0.39
10	35th Ave & Perkins St	Marion Co	LOS E V/C <= 0.85	TWSC	A/B	7/11	0.06/0.16
11	Portland Rd & Perkins St	ODOT (OHP)	V/C <= 0.95	TWSC	A/C	9/18	0.38/0.19
12	River Rd & Parkmeadow Dr	City of Keizer	LOS E V/C <= 0.95	TWSC	A/C	10/17	0.32/0.31
13	River Rd & Wheatland Rd/Springwood Dr	City of Keizer	LOS D V/C <= 0.95	Signal	C	20.4	0.79
14	Keizer Station Blvd & Ulali Dr	City of Keizer	LOS D	Signal	A	6.1	0.28
15	River Rd & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	D	43.4	0.77
16	Verda Ln & Lockhaven Dr	City of Keizer	LOS E	TWSC	A/C	10/19	0.48/0.26
17	Kafir Dr/14th Ave & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	C	24.2	0.99
18	McLeod Ln & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	C	22	0.59
19	Chemawa Rd & Lockhaven Dr & Keizer Station Blvd	City of Keizer	V/C < 1.00	Signal	D	45.8	0.68
20	Chemawa Rd & I-5 SB Ramp	ODOT (OHP)	V/C <= 0.85	Signal	D	45.1	0.83
21	Chemawa Rd & I-5 NB Ramp	ODOT (OHP)	V/C <= 0.85	Signal	D	35.7	0.89
22	Portland Rd & Chemawa Rd/Hazelgreen Rd	ODOT (OHP)	V/C <= 0.95	Signal	D	52.9	0.84
23	River Rd & Chemawa Rd	City of Keizer	LOS D V/C <= 0.95	Signal	D	44.4	0.82

24	Verda Ln & Chemawa Rd	City of Keizer	V/C < 1.00	RAB	A	9.2	0.54
25	Salem Pkwy & Verda Ln/Hyacinth St	ODOT (OHP)	V/C <= 0.95	Signal	D	54.5	0.78

Future Baseline (no RTP)

#	Intersection	Jurisdiction	Mobility Standard	Control Type	LOS	Delay	V/C Ratio
1	River Rd & Brooklake Rd	Marion Co	LOS D V/C <= 0.85	AWSC	F	62.7	0.97
2	Brooklake Rd & I-5 SB Ramps	ODOT (OHP)	V/C <= 0.85	TWSC	B/F	13/1517	0.49/4
3	Brooklake Rd & I-5 NB Ramps	ODOT (OHP)	V/C <= 0.85	TWSC	B/F	15/1452	0.51/3.82
4	Portland Rd & Brooklake Rd	ODOT (OHP)	V/C <= 0.95	Signal	B	12.1	0.72
5	Wheatland Rd & Clear Lake Rd	City of Keizer	LOS EV/C <= 0.95	TWSC	A/B	8/11	0.13/0.15
6	River Rd & Clear Lake Rd/Quinaby Rd	Marion Co	LOS E V/C <= 0.85	TWSC	A/F	8/151	0.33/1.14
7	35th Ave & Quinaby Rd	Marion Co	LOS EV/C <= 0.85	TWSC	A/B	8/13	0.16/0.24
8	Portland Rd & Quinaby Rd	ODOT (OHP)	V/C <= 0.95	TWSC	B/F	10/140	0.46/1.09
9	River Rd & Perkins St	Marion Co	LOS E V/C <= 0.85	TWSC	A/E	8/41	0.36/0.69
10	35th Ave & Perkins St	Marion Co	LOS EV/C <= 0.85	TWSC	A/C	8/18	0.18/0.36
11	Portland Rd & Perkins St	ODOT (OHP)	V/C <= 0.95	TWSC	A/D	10/31	0.49/0.48
12	River Rd & Parkmeadow Dr	City of Keizer	LOS EV/C <= 0.95	TWSC	B/C	11/24	0.43/0.44
13	River Rd & Wheatland Rd/Springwood Dr	City of Keizer	LOS DV/C <= 0.95	Signal	C	31.7	0.93
14	Keizer Station Blvd & Ulali Dr	City of Keizer	LOS D	Signal	A	6.4	0.30
15	River Rd & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	D	46.8	0.83
16	Verda Ln & Lockhaven Dr	City of Keizer	V/C < 1.00	TWSC	A/C	9/17	0.46/0.25
17	Kafir Dr/14th Ave & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	B	13.6	0.81
18	McLeod Ln & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	C	23.2	0.60
19	Chemawa Rd & Lockhaven Dr & Keizer Station Blvd	City of Keizer	V/C < 1.00	Signal	E	55.5	0.74
20	Chemawa Rd & I-5 SB Ramp	ODOT (OHP)	V/C <= 0.85	Signal	F	91.3	0.95
21	Chemawa Rd & I-5 NB Ramp	ODOT (OHP)	V/C <= 0.85	Signal	F	94.9	1.08
22	Portland Rd & Chemawa Rd/Hazelgreen Rd	ODOT (OHP)	V/C <= 0.95	Signal	F	130.9	1.08
23	River Rd & Chemawa Rd	City of Keizer	LOS DV/C <= 0.95	Signal	D	53.5	0.88
24	Verda Ln & Chemawa Rd	City of Keizer	V/C < 1.00	RAB	a	9.9	0.54
25	Salem Pkwy & Verda Ln/Hyacinth St	ODOT (OHP)	V/C <= 0.95	Signal	F	162	1.21

Future Baseline

#	Intersection	Jurisdiction	Mobility Standard	Control Type	LOS	Delay	V/C Ratio
1	River Rd & Brooklake Rd	Marion Co	LOS D V/C <= 0.85	Signal	B	14.5	0.67
2	Brooklake Rd & I-5 SB Ramps	ODOT (OHP)	V/C <= 0.85	TWSC	B/F	13/1443	0.49/3.85
3	Brooklake Rd & I-5 NB Ramps	ODOT (OHP)	V/C <= 0.85	TWSC	B/F	14/1476	0.5/3.89
4	Portland Rd & Brooklake Rd	ODOT (OHP)	V/C <= 0.95	Signal	B	18.2	0.78
5	Wheatland Rd & Clear Lake Rd	City of Keizer	LOS E V/C <= 0.95	TWSC	A/B	8/11	0.13/0.15
6	River Rd & Clear Lake Rd/Quinaby Rd	Marion Co	LOS EV/C <= 0.85	TWSC	A/F	8/151	0.33/1.14
7	35th Ave & Quinaby Rd	Marion Co	LOS E V/C <= 0.85	TWSC	A/B	8/13	0.16/0.23
8	Portland Rd & Quinaby Rd	ODOT (OHP)	V/C <= 0.95	TWSC	B/F	10/140	0.46/1.09
9	River Rd & Perkins St	Marion Co	LOS E V/C <= 0.85	TWSC	A/E	8/41	0.36/0.69
10	35th Ave & Perkins St	Marion Co	LOS E V/C <= 0.85	TWSC	A/C	8/18	0.18/0.36
11	Portland Rd & Perkins St	ODOT (OHP)	V/C <= 0.95	TWSC	A/D	10/32	0.49/0.49
12	River Rd & Parkmeadow Dr	City of Keizer	LOS E V/C <= 0.95	TWSC	B/C	11/25	0.43/0.46
13	River Rd & Wheatland Rd/Springwood Dr	City of Keizer	LOS D V/C <= 0.95	Signal	C	21	0.56
14	Keizer Station Blvd & Ulali Dr	City of Keizer	LOS D	Signal	A	6	0.30
15	River Rd & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	D	43	0.67
16	Verda Ln & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	B	12	0.78
17	Kafir Dr/14th Ave & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	B	12	0.64
18	McLeod Ln & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	C	23	0.60
19	Chemawa Rd & Lockhaven Dr & Keizer Station Blvd	City of Keizer	V/C < 1.00	Signal	D	54	0.74
20	Chemawa Rd & I-5 SB Ramp	ODOT (OHP)	V/C <= 0.85	Signal	B	20	0.63
21	Chemawa Rd & I-5 NB Ramp	ODOT (OHP)	V/C <= 0.85	Signal	F	89	1.07
22	Portland Rd & Chemawa Rd/Hazelgreen Rd	ODOT (OHP)	V/C <= 0.95	Signal	F	131	1.08
23	River Rd & Chemawa Rd	City of Keizer	LOS D V/C <= 0.95	Signal	D	54	0.88
24	Verda Ln & Chemawa Rd	City of Keizer	V/C < 1.00	RAB	A	10	0.53
25	Salem Pkwy & Verda Ln/Hyacinth St	ODOT (OHP)	V/C <= 0.95	Signal	F	162	1.21

Land Use Option 1

#	Intersection	Jurisdiction	Mobility Standard	Control Type	LOS	Delay	V/C Ratio
1	River Rd & Brooklake Rd	Marion Co	LOS D V/C <= 0.85	Signal	B	14.4	0.66
2	Brooklake Rd & I-5 SB Ramps	ODOT (OHP)	V/C <= 0.85	TWSC	B/F	14/1591	0.51/4.14
3	Brooklake Rd & I-5 NB Ramps	ODOT (OHP)	V/C <= 0.85	TWSC	B/F	15/1439	0.51/3.79
4	Portland Rd & Brooklake Rd	ODOT (OHP)	V/C <= 0.95	Signal	B	13.0	0.84
5	Wheatland Rd & Clear Lake Rd	City of Keizer	LOS E V/C <= 0.95	TWSC	A/B	8/12	0.13/0.15
6	River Rd & Clear Lake Rd/Quinaby Rd	Marion Co	LOS EV/C <= 0.85	TWSC	A/F	8/92	0.35/0.92
7	35th Ave & Quinaby Rd	Marion Co	LOS E V/C <= 0.85	TWSC	A/B	8/13	0.16/0.25
8	Portland Rd & Quinaby Rd	ODOT (OHP)	V/C <= 0.95	TWSC	A/F	10/129	0.44/1.06
9	River Rd & Perkins St	Marion Co	LOS E V/C <= 0.85	TWSC	A/E	8/39	0.35/0.67
10	35th Ave & Perkins St	Marion Co	LOS E V/C <= 0.85	TWSC	A/C	8/18	0.18/0.39
11	Portland Rd & Perkins St	ODOT (OHP)	V/C <= 0.95	TWSC	A/E	10/43	0.48/0.68
12	River Rd & Parkmeadow Dr	City of Keizer	LOS E V/C <= 0.95	TWSC	B/C	11/23	0.42/0.43
13	River Rd & Wheatland Rd/Springwood Dr	City of Keizer	LOS D V/C <= 0.95	Signal	C	21	0.58
14	Keizer Station Blvd & Ulali Dr	City of Keizer	LOS D	Signal	A	6	0.30
15	River Rd & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	D	42	0.66
16	Verda Ln & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	B	11	0.77
17	Kafir Dr/14th Ave & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	B	12	0.65
18	McLeod Ln & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	C	23	0.60
19	Chemawa Rd & Lockhaven Dr & Keizer Station Blvd	City of Keizer	V/C < 1.00	Signal	D	54	0.74
20	Chemawa Rd & I-5 SB Ramp	ODOT (OHP)	V/C <= 0.85	Signal	C	21	0.65
21	Chemawa Rd & I-5 NB Ramp	ODOT (OHP)	V/C <= 0.85	Signal	F	96	1.08
22	Portland Rd & Chemawa Rd/Hazelgreen Rd	ODOT (OHP)	V/C <= 0.95	Signal	F	130	1.08
23	River Rd & Chemawa Rd	City of Keizer	LOS D V/C <= 0.95	Signal	D	51	0.87
24	Verda Ln & Chemawa Rd	City of Keizer	V/C < 1.00	RAB	B	10	0.60
25	Salem Pkwy & Verda Ln/Hyacinth St	ODOT (OHP)	V/C <= 0.95	Signal	F	161	1.22

Land Use Option 2

#	Intersection	Jurisdiction	Mobility Standard	Control Type	LOS	Delay	V/C Ratio
1	River Rd & Brooklake Rd	Marion Co	LOS D V/C <= 0.85	Signal	B	16.3	0.75
2	Brooklake Rd & I-5 SB Ramps	ODOT (OHP)	V/C <= 0.85	TWSC	B/F	14/863	0.51/2.53
3	Brooklake Rd & I-5 NB Ramps	ODOT (OHP)	V/C <= 0.85	TWSC	B/F	13/1272	0.44/3.51
4	Portland Rd & Brooklake Rd	ODOT (OHP)	V/C <= 0.95	Signal	B	15.6	0.94
5	Wheatland Rd & Clear Lake Rd	City of Keizer	LOS E V/C <= 0.95	TWSC	A/B	8/12	0.14/0.19
6	River Rd & Clear Lake Rd/Quinaby Rd	Marion Co	LOS EV/C <= 0.85	TWSC	A/F	8/100	0.35/0.97
7	35th Ave & Quinaby Rd	Marion Co	LOS E V/C <= 0.85	TWSC	A/C	8/16	0.25/0.3
8	Portland Rd & Quinaby Rd	ODOT (OHP)	V/C <= 0.95	TWSC	B/F	11/234	0.48/1.33
9	River Rd & Perkins St	Marion Co	LOS EV/C <= 0.85	TWSC	A/F	9/76	0.36/0.92
10	35th Ave & Perkins St	Marion Co	LOS E V/C <= 0.85	TWSC	A/D	8/31	0.23/0.67
11	Portland Rd & Perkins St	ODOT (OHP)	V/C <= 0.95	TWSC	B/F	10/104	0.56/1.01
12	River Rd & Parkmeadow Dr	City of Keizer	LOS E V/C <= 0.95	TWSC	B/D	11/27	0.43/0.5
13	River Rd & Wheatland Rd/Springwood Dr	City of Keizer	LOS D V/C <= 0.95	Signal	C	21	0.61
14	Keizer Station Blvd & Ulali Dr	City of Keizer	LOS D	Signal	A	6	0.30
15	River Rd & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	D	42	0.66
16	Verda Ln & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	B	12	0.79
17	Kafir Dr/14th Ave & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	B	12	0.65
18	McLeod Ln & Lockhaven Dr	City of Keizer	V/C < 1.00	Signal	C	20	0.59
19	Chemawa Rd & Lockhaven Dr & Keizer Station Blvd	City of Keizer	V/C < 1.00	Signal	E	55	0.75
20	Chemawa Rd & I-5 SB Ramp	ODOT (OHP)	V/C <= 0.85	Signal	C	22	0.66
21	Chemawa Rd & I-5 NB Ramp	ODOT (OHP)	V/C <= 0.85	Signal	F	110	1.12
22	Portland Rd & Chemawa Rd/Hazelgreen Rd	ODOT (OHP)	V/C <= 0.95	Signal	F	137	1.08
23	River Rd & Chemawa Rd	City of Keizer	LOS D V/C <= 0.95	Signal	D	54	0.90
24	Verda Ln & Chemawa Rd	City of Keizer	V/C < 1.00	RAB	B	11	0.61
25	Salem Pkwy & Verda Ln/Hyacinth St	ODOT (OHP)	V/C <= 0.95	Signal	F	167	1.23

Mitigations

#	Intersection	Jurisdiction	Mobility Standard	Control Type	LOS	Delay	V/C Ratio	
6	River Rd & Clear Lake Rd/Quinaby Rd	Marion Co	LOS E V/C <= 0.85	TWSC	A/E	8.4/39.7	0.06/0.48	Widened River Road to 3 lanes (added NB and SB Left Turn Lanes), Widened Quinaby Rd to 3 lanes (added WB and EB Left Turn Lanes)
8	Portland Rd & Quinaby Rd	ODOT (OHP)	V/C <= 0.95	TWSC	B/E	10.5/45.0	0.19/0.75	Restripe Portland Rd to allow for two-stage left turn lane
9	River Rd & Perkins St	Marion Co	LOS E V/C <= 0.85	TWSC	A/D	8.5/26.2	0.04/0.56	Widened Perkins to 3 lanes (added WB Left Turn Lane), Widened River Rd to 3 lanes (added SB Left Turn Lane
10	35th Ave & Perkins St	Marion Co	LOS E V/C <= 0.85	TWSC	A/C	7.9/24.2	0.05/0.47	Widened Perkins to 3 lanes (added WB and EB Left Turn Lanes) and realigned to T-intersection
11	Portland Rd & Perkins St	ODOT (OHP)	V/C <= 0.95	TWSC	C	26.0	0.85	Signalized intersection

SECTION 4: SYNCHRO OPERATIONS REPORTS

Intersection	
Intersection Delay, s/veh	21.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	87	24	233	109	167	17	99	103	238	149	18
Future Vol, veh/h	5	87	24	233	109	167	17	99	103	238	149	18
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	20	2	0	2	4	4	0	3	3	3	2	0
Mvmt Flow	5	91	25	243	114	174	18	103	107	248	155	19
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	12.7	22.3	14.5	28.1
HCM LOS	B	C	B	D

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	8%	5%	0%	68%	0%	59%
Vol Thru, %	45%	95%	0%	32%	0%	37%
Vol Right, %	47%	0%	100%	0%	100%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	219	92	24	342	167	405
LT Vol	17	5	0	233	0	238
Through Vol	99	87	0	109	0	149
RT Vol	103	0	24	0	167	18
Lane Flow Rate	228	96	25	356	174	422
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.421	0.218	0.049	0.727	0.305	0.768
Departure Headway (Hd)	6.648	8.197	7.128	7.346	6.313	6.55
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	541	437	501	492	569	553
Service Time	4.709	5.969	4.899	5.1	4.066	4.598
HCM Lane V/C Ratio	0.421	0.22	0.05	0.724	0.306	0.763
HCM Control Delay	14.5	13.3	10.3	27.4	11.8	28.1
HCM Lane LOS	B	B	B	D	B	D
HCM 95th-tile Q	2.1	0.8	0.2	5.9	1.3	6.9

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	288	453	321	360	0	0	0	0	43	0	293
Future Vol, veh/h	0	288	453	321	360	0	0	0	0	43	0	293
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	180	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	12	9	3	12	0	0	0	0	0	0	10
Mvmt Flow	0	303	477	338	379	0	0	0	0	45	0	308

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	780	0	0	1597	1835	379
Stage 1	-	-	-	-	-	-	1055	1055	-
Stage 2	-	-	-	-	-	-	542	780	-
Critical Hdwy	-	-	-	4.13	-	-	6.4	6.5	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	-	-	-	2.227	-	-	3.5	4	3.39
Pot Cap-1 Maneuver	0	-	-	833	-	0	118	77	651
Stage 1	0	-	-	-	-	0	338	305	-
Stage 2	0	-	-	-	-	0	587	409	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	833	-	-	70	0	651
Mov Cap-2 Maneuver	-	-	-	-	-	-	70	0	-
Stage 1	-	-	-	-	-	-	338	0	-
Stage 2	-	-	-	-	-	-	349	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	5.8	29.1
HCM LOS			D

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	833	-	70	651
HCM Lane V/C Ratio	-	-	0.406	-	0.647	0.474
HCM Control Delay (s)	-	-	12.2	-	122.8	15.4
HCM Lane LOS	-	-	B	-	F	C
HCM 95th %tile Q(veh)	-	-	2	-	2.9	2.5

Intersection	
Int Delay, s/veh	27.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	140	188	0	0	435	51	214	0	276	0	0	0
Future Vol, veh/h	140	188	0	0	435	51	214	0	276	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	18	4	0	0	4	0	14	0	4	0	0	0
Mvmt Flow	154	207	0	0	478	56	235	0	303	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	534	0	-	-	-	0	1021	1049	207
Stage 1	-	-	-	-	-	-	515	515	-
Stage 2	-	-	-	-	-	-	506	534	-
Critical Hdwy	4.28	-	-	-	-	-	6.54	6.5	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	5.54	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.54	5.5	-
Follow-up Hdwy	2.362	-	-	-	-	-	3.626	4	3.336
Pot Cap-1 Maneuver	958	-	0	0	-	-	249	229	828
Stage 1	-	-	0	0	-	-	576	538	-
Stage 2	-	-	0	0	-	-	582	528	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	958	-	-	-	-	-	~ 209	0	828
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 209	0	-
Stage 1	-	-	-	-	-	-	483	0	-
Stage 2	-	-	-	-	-	-	582	0	-

Approach	EB	WB	NB
HCM Control Delay, s	4	0	71.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	209	828	958	-	-	-
HCM Lane V/C Ratio	1.125	0.366	0.161	-	-	-
HCM Control Delay (s)	147.9	11.8	9.5	-	-	-
HCM Lane LOS	F	B	A	-	-	-
HCM 95th %tile Q(veh)	11.2	1.7	0.6	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
4: Portland Rd & Brooklake Rd

Existing PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	60	150	28	63	17	84	403	17	16	547	253
Future Volume (veh/h)	245	60	150	28	63	17	84	403	17	16	547	253
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1856	1870	1870	1870	1811	1856	1856	1900	1870	1826
Adj Flow Rate, veh/h	258	63	0	29	66	18	88	424	18	17	576	266
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	3	2	2	2	6	3	3	0	2	5
Cap, veh/h	444	79		168	343	81	323	845	36	432	827	684
Arrive On Green	0.28	0.29	0.00	0.28	0.29	0.28	0.05	0.48	0.45	0.01	0.44	0.44
Sat Flow, veh/h	1127	275	1572	294	1190	281	1725	1767	75	1810	1870	1547
Grp Volume(v), veh/h	321	0	0	113	0	0	88	0	442	17	576	266
Grp Sat Flow(s),veh/h/ln	1402	0	1572	1766	0	0	1725	0	1842	1810	1870	1547
Q Serve(g_s), s	8.8	0.0	0.0	0.0	0.0	0.0	1.6	0.0	9.0	0.3	13.5	6.3
Cycle Q Clear(g_c), s	11.4	0.0	0.0	2.6	0.0	0.0	1.6	0.0	9.0	0.3	13.5	6.3
Prop In Lane	0.80		1.00	0.26		0.16	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	511	0		576	0	0	323	0	881	432	827	684
V/C Ratio(X)	0.63	0.00		0.20	0.00	0.00	0.27	0.00	0.50	0.04	0.70	0.39
Avail Cap(c_a), veh/h	1035	0		1224	0	0	493	0	1457	676	1479	1224
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	0.0	0.0	14.8	0.0	0.0	10.1	0.0	9.8	9.4	12.2	10.2
Incr Delay (d2), s/veh	0.9	0.0	0.0	0.1	0.0	0.0	0.3	0.0	0.6	0.0	1.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.0	0.0	1.0	0.0	0.0	0.5	0.0	2.8	0.1	4.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.7	0.0	0.0	14.9	0.0	0.0	10.5	0.0	10.4	9.4	13.7	10.7
LnGrp LOS	B	A		B	A	A	B	A	B	A	B	B
Approach Vol, veh/h		321	A		113			530			859	
Approach Delay, s/veh		18.7			14.9			10.4			12.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.7	30.0		19.7	6.7	28.0		19.7
Change Period (Y+Rc), s	4.0	* 5.4		4.5	4.0	* 5.4		4.5
Max Green Setting (Gmax), s	8.0	* 42		36.5	8.0	* 42		36.5
Max Q Clear Time (g_c+I1), s	2.3	11.0		13.4	3.6	15.5		4.6
Green Ext Time (p_c), s	0.0	4.0		1.6	0.0	7.1		0.5

Intersection Summary	
HCM 6th Ctrl Delay	13.2
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1	1	48	1	15	1	65	45	13	146	2
Future Vol, veh/h	2	1	1	48	1	15	1	65	45	13	146	2
Conflicting Peds, #/hr	0	0	2	0	0	0	0	0	2	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	50	100	0	0	0	0	0	2	2	8	0	0
Mvmt Flow	2	1	1	54	1	17	1	73	51	15	164	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	307	325	169	301	301	101	168	0	0	126	0	0
Stage 1	197	197	-	103	103	-	-	-	-	-	-	-
Stage 2	110	128	-	198	198	-	-	-	-	-	-	-
Critical Hdwy	7.6	7.5	6.2	7.1	6.5	6.2	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.6	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.95	4.9	3.3	3.5	4	3.3	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	561	462	880	655	615	960	1422	-	-	1424	-	-
Stage 1	706	587	-	908	814	-	-	-	-	-	-	-
Stage 2	791	635	-	808	741	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	544	454	877	644	605	958	1419	-	-	1421	-	-
Mov Cap-2 Maneuver	544	454	-	644	605	-	-	-	-	-	-	-
Stage 1	704	579	-	905	812	-	-	-	-	-	-	-
Stage 2	775	633	-	794	731	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	10.8	0.1	0.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1419	-	-	570	697	1421	-	-
HCM Lane V/C Ratio	0.001	-	-	0.008	0.103	0.01	-	-
HCM Control Delay (s)	7.5	0	-	11.4	10.8	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	36	16	37	78	60	29	141	22	39	339	42
Future Vol, veh/h	22	36	16	37	78	60	29	141	22	39	339	42
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	30	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	6	6	0	0	7	0	2	0	8	1	0
Mvmt Flow	23	37	16	38	80	62	30	145	23	40	349	43

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	708	679	372	695	689	157	392	0	0	168	0	0
Stage 1	451	451	-	217	217	-	-	-	-	-	-	-
Stage 2	257	228	-	478	472	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.56	6.26	7.1	6.5	6.27	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.1	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.054	3.354	3.5	4	3.363	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	352	369	665	359	371	876	1178	-	-	1374	-	-
Stage 1	592	564	-	790	727	-	-	-	-	-	-	-
Stage 2	752	708	-	572	562	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	256	345	664	306	347	876	1178	-	-	1374	-	-
Mov Cap-2 Maneuver	256	345	-	306	347	-	-	-	-	-	-	-
Stage 1	575	543	-	768	707	-	-	-	-	-	-	-
Stage 2	602	688	-	500	541	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.7	17.5	1.2	0.7
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1178	-	-	305	664	333	876	1374	-	-
HCM Lane V/C Ratio	0.025	-	-	0.196	0.025	0.356	0.071	0.029	-	-
HCM Control Delay (s)	8.1	0	-	19.7	10.6	21.7	9.4	7.7	0	-
HCM Lane LOS	A	A	-	C	B	C	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.1	1.6	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	55	40	11	91	71	16
Future Vol, veh/h	55	40	11	91	71	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	7	0	0	3	0	0
Mvmt Flow	67	49	13	111	87	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	116	0	229	92
Stage 1	-	-	-	-	92	-
Stage 2	-	-	-	-	137	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1485	-	764	971
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	895	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1485	-	757	971
Mov Cap-2 Maneuver	-	-	-	-	757	-
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	887	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	789	-	-	1485	-
HCM Lane V/C Ratio	0.134	-	-	0.009	-
HCM Control Delay (s)	10.3	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	47	50	370	581	43
Future Vol, veh/h	30	47	50	370	581	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	240	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	4	4	5	1	2
Mvmt Flow	32	49	53	389	612	45

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1130	635	657	0	-	0
Stage 1	635	-	-	-	-	-
Stage 2	495	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	227	475	921	-	-	-
Stage 1	532	-	-	-	-	-
Stage 2	617	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	214	475	921	-	-	-
Mov Cap-2 Maneuver	214	-	-	-	-	-
Stage 1	501	-	-	-	-	-
Stage 2	617	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.9	1.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	921	-	322	-	-
HCM Lane V/C Ratio	0.057	-	0.252	-	-
HCM Control Delay (s)	9.1	-	19.9	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	120	22	193	62	13	380
Future Vol, veh/h	120	22	193	62	13	380
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	1	0	2	2	0	1
Mvmt Flow	138	25	222	71	15	437

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	725	258	0	0	293	0
Stage 1	258	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	393	786	-	-	1280	-
Stage 1	787	-	-	-	-	-
Stage 2	633	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	387	786	-	-	1280	-
Mov Cap-2 Maneuver	387	-	-	-	-	-
Stage 1	787	-	-	-	-	-
Stage 2	624	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.9	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	420	1280	-
HCM Lane V/C Ratio	-	-	0.389	0.012	-
HCM Control Delay (s)	-	-	18.9	7.8	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.8	0	-

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	22	0	25	74	6	0	77	18	6	39	1
Future Vol, veh/h	5	22	0	25	74	6	0	77	18	6	39	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	5	0	0	1	0	0	0	0	0	5	0
Mvmt Flow	6	25	0	28	84	7	0	88	20	7	44	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	203	167	-	169	157	98	-	0	0	108	0	0
Stage 1	59	59	-	98	98	-	-	-	-	-	-	-
Stage 2	144	108	-	71	59	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.55	-	7.1	6.51	6.2	-	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.55	-	6.1	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.55	-	6.1	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.045	-	3.5	4.009	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	759	720	0	799	737	963	0	-	-	1495	-	-
Stage 1	958	840	0	913	816	-	0	-	-	-	-	-
Stage 2	864	800	0	944	848	-	0	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	685	716	-	775	733	963	-	-	-	1495	-	-
Mov Cap-2 Maneuver	685	716	-	775	733	-	-	-	-	-	-	-
Stage 1	958	836	-	913	816	-	-	-	-	-	-	-
Stage 2	769	800	-	911	844	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	10.7	0	1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	710	753	1495	-	-
HCM Lane V/C Ratio	-	-	0.043	0.158	0.005	-	-
HCM Control Delay (s)	-	-	10.3	10.7	7.4	0	-
HCM Lane LOS	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.6	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	50	67	432	581	24
Future Vol, veh/h	12	50	67	432	581	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	6	0	4	2	0
Mvmt Flow	13	54	72	465	625	26

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1247	638	651	0	-	0
Stage 1	638	-	-	-	-	-
Stage 2	609	-	-	-	-	-
Critical Hdwy	6.4	6.26	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.354	2.2	-	-	-
Pot Cap-1 Maneuver	193	469	945	-	-	-
Stage 1	530	-	-	-	-	-
Stage 2	547	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	173	469	945	-	-	-
Mov Cap-2 Maneuver	173	-	-	-	-	-
Stage 1	475	-	-	-	-	-
Stage 2	547	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.6	1.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	945	-	352	-	-
HCM Lane V/C Ratio	0.076	-	0.189	-	-
HCM Control Delay (s)	9.1	0	17.6	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.7	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	96	224	223	403	89
Future Vol, veh/h	32	96	224	223	403	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	1	1	1	1	0
Mvmt Flow	36	107	249	248	448	99

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1244	498	547	0	-	0
Stage 1	498	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Critical Hdwy	6.43	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	191	574	1027	-	-	-
Stage 1	609	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	145	574	1027	-	-	-
Mov Cap-2 Maneuver	278	-	-	-	-	-
Stage 1	462	-	-	-	-	-
Stage 2	467	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.5	4.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1027	-	453	-	-
HCM Lane V/C Ratio	0.242	-	0.314	-	-
HCM Control Delay (s)	9.6	-	16.5	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.9	-	1.3	-	-

HCM 6th Signalized Intersection Summary
13: River Rd & Wheatland Rd/Springwood Dr

Existing PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	2	336	13	1	4	528	735	13	10	577	13
Future Volume (veh/h)	7	2	336	13	1	4	528	735	13	10	577	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1900	1900	1900	1900	1885	1885	1900	1885	1885
Adj Flow Rate, veh/h	8	2	365	14	1	4	574	799	14	11	627	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	0	0	0	0	1	1	0	1	1
Cap, veh/h	258	65	472	34	2	10	656	2201	39	353	1480	33
Arrive On Green	0.15	0.18	0.18	0.02	0.03	0.02	0.21	0.61	0.58	0.01	0.41	0.38
Sat Flow, veh/h	1462	365	2674	1291	92	369	1810	3601	63	1810	3581	80
Grp Volume(v), veh/h	10	0	365	19	0	0	574	397	416	11	313	328
Grp Sat Flow(s),veh/h/ln	1827	0	1337	1752	0	0	1810	1791	1873	1810	1791	1870
Q Serve(g_s), s	0.4	0.0	11.7	1.0	0.0	0.0	16.4	10.0	10.0	0.3	11.2	11.2
Cycle Q Clear(g_c), s	0.4	0.0	11.7	1.0	0.0	0.0	16.4	10.0	10.0	0.3	11.2	11.2
Prop In Lane	0.80		1.00	0.74		0.21	1.00		0.03	1.00		0.04
Lane Grp Cap(c), veh/h	323	0	472	47	0	0	656	1094	1145	353	740	773
V/C Ratio(X)	0.03	0.00	0.77	0.41	0.00	0.00	0.87	0.36	0.36	0.03	0.42	0.42
Avail Cap(c_a), veh/h	345	0	505	117	0	0	807	1094	1145	449	740	773
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	0.0	35.3	43.3	0.0	0.0	13.3	8.7	8.8	17.0	18.8	18.8
Incr Delay (d2), s/veh	0.0	0.0	6.0	2.1	0.0	0.0	7.9	0.9	0.9	0.0	1.8	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	4.2	0.4	0.0	0.0	6.8	3.5	3.7	0.1	4.8	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.4	0.0	41.3	45.5	0.0	0.0	21.2	9.7	9.7	17.0	20.5	20.5
LnGrp LOS	C	A	D	D	A	A	C	A	A	B	C	C
Approach Vol, veh/h		375			19			1387			652	
Approach Delay, s/veh		41.1			45.5			14.4			20.5	
Approach LOS		D			D			B			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	59.0		19.9	22.5	41.2		6.4				
Change Period (Y+Rc), s	4.0	7.0		6.0	4.0	7.0		4.5				
Max Green Setting (Gmax), s	5.5	42.5		15.0	26.0	22.0		5.5				
Max Q Clear Time (g_c+I1), s	2.3	12.0		13.7	18.4	13.2		3.0				
Green Ext Time (p_c), s	0.0	0.9		0.1	0.1	0.7		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	20.4
HCM 6th LOS	C

Notes

User approved changes to right turn type.

HCM 6th Signalized Intersection Summary
14: Keizer Station Blvd & Ulali Dr

Existing PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	90	53	122	104	21	33	105	90	10	145	76
Future Volume (veh/h)	111	90	53	122	104	21	33	105	90	10	145	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1870	1870	1900	1885	1900
Adj Flow Rate, veh/h	126	102	60	139	118	24	38	119	102	11	165	86
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	2	2	0	1	0
Cap, veh/h	591	298	175	571	410	83	679	340	292	651	690	589
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1266	1112	654	1243	1532	312	1147	930	797	1178	1885	1610
Grp Volume(v), veh/h	126	0	162	139	0	142	38	0	221	11	165	86
Grp Sat Flow(s),veh/h/ln	1266	0	1765	1243	0	1844	1147	0	1727	1178	1885	1610
Q Serve(g_s), s	1.9	0.0	1.6	2.2	0.0	1.3	0.5	0.0	2.0	0.1	1.3	0.8
Cycle Q Clear(g_c), s	3.3	0.0	1.6	3.8	0.0	1.3	1.8	0.0	2.0	2.2	1.3	0.8
Prop In Lane	1.00		0.37	1.00		0.17	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	591	0	473	571	0	494	679	0	632	651	690	589
V/C Ratio(X)	0.21	0.00	0.34	0.24	0.00	0.29	0.06	0.00	0.35	0.02	0.24	0.15
Avail Cap(c_a), veh/h	1469	0	1697	1432	0	1772	1886	0	2450	1891	2674	2284
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.6	0.0	6.4	8.0	0.0	6.3	5.5	0.0	5.0	5.8	4.8	4.6
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.3	0.4	0.0	0.3	0.0	0.0	0.2	0.0	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.7	0.0	6.6	8.1	0.0	6.5	5.5	0.0	5.2	5.8	4.9	4.7
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		288			281			259			262	
Approach Delay, s/veh		7.1			7.3			5.2			4.9	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	12.0	9.9	12.0	9.9
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	31.0	21.0	31.0	21.0
Max Q Clear Time (g_c+I1), s	4.2	5.8	4.0	5.3
Green Ext Time (p_c), s	0.2	0.2	0.3	0.2

Intersection Summary	
HCM 6th Ctrl Delay	6.1
HCM 6th LOS	A

HCM Signalized Intersection Capacity Analysis
15: River Rd & Lockhaven Dr

Existing PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	222	100	243	243	204	119	831	257	196	634	151
Future Volume (vph)	147	222	100	243	243	204	119	831	257	196	634	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1863	1556	1648	1753	1577	1805	3574	1524	1787	3435	
Flt Permitted	0.95	1.00	1.00	0.62	0.93	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1863	1556	1068	1638	1577	1805	3574	1524	1787	3435	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	152	229	103	251	251	210	123	857	265	202	654	156
RTOR Reduction (vph)	0	0	88	0	0	135	0	0	168	0	15	0
Lane Group Flow (vph)	152	229	15	213	289	75	123	857	97	202	795	0
Confl. Peds. (#/hr)	1		7	7		1	5		3	3		5
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	1%	3%	2%	1%	0%	1%	3%	1%	1%	3%
Turn Type	Split	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	7			8		5	2		1	6	
Permitted Phases			7	8		8			2			
Actuated Green, G (s)	18.5	18.5	18.5	28.0	28.0	28.0	11.5	45.5	45.5	17.5	51.5	
Effective Green, g (s)	19.5	19.5	19.5	29.0	29.0	29.0	12.0	47.5	47.5	18.0	53.5	
Actuated g/C Ratio	0.15	0.15	0.15	0.22	0.22	0.22	0.09	0.37	0.37	0.14	0.41	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	0.5	0.5	0.5	0.5	
Lane Grp Cap (vph)	268	279	233	238	365	351	166	1305	556	247	1413	
v/s Ratio Prot	0.09	c0.12					0.07	c0.24		c0.11	0.23	
v/s Ratio Perm			0.01	c0.20	0.18	0.05			0.06			
v/c Ratio	0.57	0.82	0.07	0.89	0.79	0.21	0.74	0.66	0.17	0.82	0.56	
Uniform Delay, d1	51.3	53.6	47.4	49.0	47.7	41.2	57.5	34.4	28.0	54.4	29.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.82	0.51	1.00	1.00	
Incremental Delay, d2	1.6	16.6	0.0	31.2	10.5	0.1	14.3	2.6	0.7	17.7	1.6	
Delay (s)	53.0	70.1	47.5	80.2	58.1	41.3	69.1	30.8	14.9	72.1	30.9	
Level of Service	D	E	D	F	E	D	E	C	B	E	C	
Approach Delay (s)		59.9			59.8			31.2			39.1	
Approach LOS		E			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	43.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	649	81	20	768	61	22
Future Vol, veh/h	649	81	20	768	61	22
Conflicting Peds, #/hr	0	4	4	0	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	2	5	2	0	5
Mvmt Flow	683	85	21	808	64	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	772	0	1580	732
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	850	-
Critical Hdwy	-	-	4.15	-	6.4	6.25
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.245	-	3.5	3.345
Pot Cap-1 Maneuver	-	-	830	-	121	416
Stage 1	-	-	-	-	481	-
Stage 2	-	-	-	-	422	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	827	-	117	414
Mov Cap-2 Maneuver	-	-	-	-	316	-
Stage 1	-	-	-	-	479	-
Stage 2	-	-	-	-	411	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	19.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	337	-	-	827	-
HCM Lane V/C Ratio	0.259	-	-	0.025	-
HCM Control Delay (s)	19.4	-	-	9.5	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1	-	-	0.1	-

HCM 6th Signalized Intersection Summary
17: Kafir Dr/14th Ave & Lockhaven Dr

Existing PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	610	4	7	767	203	5	24	8	115	20	36
Future Volume (veh/h)	27	610	4	7	767	203	5	24	8	115	20	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1841	1841	1900	1870	1870	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	28	629	4	7	791	209	5	25	8	119	21	37
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	0	2	2	0	0	0	0	0	0
Cap, veh/h	181	1160	7	431	885	234	41	166	44	159	23	364
Arrive On Green	0.02	0.63	0.62	0.01	0.62	0.61	0.23	0.25	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1810	1827	12	1810	1418	375	0	663	177	403	100	1582
Grp Volume(v), veh/h	28	0	633	7	0	1000	38	0	0	140	0	37
Grp Sat Flow(s),veh/h/ln	1810	0	1839	1810	0	1793	840	0	0	503	0	1582
Q Serve(g_s), s	0.6	0.0	19.2	0.1	0.0	47.5	0.0	0.0	0.0	0.0	0.0	1.8
Cycle Q Clear(g_c), s	0.6	0.0	19.2	0.1	0.0	47.5	23.0	0.0	0.0	23.0	0.0	1.8
Prop In Lane	1.00		0.01	1.00		0.21	0.13		0.21	0.85		1.00
Lane Grp Cap(c), veh/h	181	0	1167	431	0	1118	234	0	0	182	0	364
V/C Ratio(X)	0.15	0.00	0.54	0.02	0.00	0.89	0.16	0.00	0.00	0.77	0.00	0.10
Avail Cap(c_a), veh/h	296	0	1167	566	0	1118	234	0	0	182	0	364
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.8	0.0	10.2	8.9	0.0	16.1	29.8	0.0	0.0	40.1	0.0	30.4
Incr Delay (d2), s/veh	0.1	0.0	1.8	0.0	0.0	11.0	0.1	0.0	0.0	16.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	7.4	0.1	0.0	20.1	0.7	0.0	0.0	4.3	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.0	0.0	12.0	8.9	0.0	27.1	29.9	0.0	0.0	56.3	0.0	30.4
LnGrp LOS	B	A	B	A	A	C	C	A	A	E	A	C
Approach Vol, veh/h		661			1007			38			177	
Approach Delay, s/veh		12.3			27.0			29.9			50.9	
Approach LOS		B			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.5	67.5		28.0	5.6	66.4		28.0
Change Period (Y+Rc), s	4.0	5.0		* 5	4.0	5.0		5.0
Max Green Setting (Gmax), s	8.0	56.0		* 23	8.0	56.0		22.0
Max Q Clear Time (g_c+I1), s	2.1	21.2		25.0	2.6	49.5		25.0
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	1.3		0.0

Intersection Summary	
HCM 6th Ctrl Delay	24.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
18: McLeod Ln & Lockhaven Dr

Existing PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	662	14	30	930	297	10	50	3	131	28	25
Future Volume (veh/h)	45	662	14	30	930	297	10	50	3	131	28	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1841	1841	1900	1885	1885	1900	1870	1900	1900	1900	1900
Adj Flow Rate, veh/h	49	720	15	33	1011	323	11	54	3	142	30	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	4	4	0	1	1	0	2	0	0	0	0
Cap, veh/h	63	2599	54	42	1943	615	14	94	80	111	96	86
Arrive On Green	0.04	0.74	0.73	0.05	1.00	1.00	0.01	0.05	0.05	0.06	0.10	0.10
Sat Flow, veh/h	1810	3503	73	1810	2660	843	1810	1870	1601	1810	920	828
Grp Volume(v), veh/h	49	359	376	33	678	656	11	54	3	142	0	57
Grp Sat Flow(s),veh/h/ln	1810	1749	1828	1810	1791	1712	1810	1870	1601	1810	0	1748
Q Serve(g_s), s	3.5	8.7	8.7	2.3	0.0	0.0	0.8	3.7	0.2	8.0	0.0	3.9
Cycle Q Clear(g_c), s	3.5	8.7	8.7	2.3	0.0	0.0	0.8	3.7	0.2	8.0	0.0	3.9
Prop In Lane	1.00		0.04	1.00		0.49	1.00		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	63	1297	1356	42	1308	1250	14	94	80	111	0	182
V/C Ratio(X)	0.77	0.28	0.28	0.78	0.52	0.52	0.80	0.58	0.04	1.28	0.00	0.31
Avail Cap(c_a), veh/h	167	1297	1356	111	1308	1250	111	317	271	111	0	296
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.83	0.83	0.83	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	62.2	5.4	5.5	61.6	0.0	0.0	64.4	60.4	58.8	61.0	0.0	53.9
Incr Delay (d2), s/veh	7.2	0.5	0.5	9.4	1.2	1.3	31.7	2.1	0.1	176.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	3.0	3.1	1.2	0.4	0.5	0.5	1.8	0.1	9.2	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.4	6.0	6.0	71.0	1.2	1.3	96.1	62.5	58.8	237.4	0.0	54.3
LnGrp LOS	E	A	A	E	A	A	F	E	E	F	A	D
Approach Vol, veh/h		784			1367			68			199	
Approach Delay, s/veh		9.9			3.0			67.7			185.0	
Approach LOS		A			A			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	100.5	5.0	17.5	8.6	98.9	12.0	10.5
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	75.0	8.0	22.0	12.0	71.0	8.0	22.0
Max Q Clear Time (g_c+I1), s	4.3	10.7	2.8	5.9	5.5	2.0	10.0	5.7
Green Ext Time (p_c), s	0.0	0.9	0.0	0.1	0.0	2.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	22.0
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
19: Chemawa Rd & Lockhaven Dr & Keizer Station Blvd

Existing PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	676	3	466	1154	35	6	104	339	152	73	89
Future Volume (veh/h)	121	676	3	466	1154	35	6	104	339	152	73	89
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1885	1885	1900	1811	1811	1900	1826	1826
Adj Flow Rate, veh/h	126	704	3	485	1202	36	6	108	353	158	76	93
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	0	1	1	0	6	6	0	5	5
Cap, veh/h	174	1824	8	432	2056	62	8	265	386	183	443	370
Arrive On Green	0.10	1.00	1.00	0.12	0.58	0.57	0.00	0.15	0.15	0.10	0.24	0.24
Sat Flow, veh/h	3428	3600	15	3510	3551	106	1810	1811	2640	1810	1826	1526
Grp Volume(v), veh/h	126	345	362	485	606	632	6	108	353	158	76	93
Grp Sat Flow(s),veh/h/ln	1714	1763	1853	1755	1791	1866	1810	1811	1320	1810	1826	1526
Q Serve(g_s), s	4.6	0.0	0.0	16.0	28.0	28.1	0.4	7.0	17.1	11.2	4.3	6.4
Cycle Q Clear(g_c), s	4.6	0.0	0.0	16.0	28.0	28.1	0.4	7.0	17.1	11.2	4.3	6.4
Prop In Lane	1.00		0.01	1.00		0.06	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	174	893	939	432	1037	1080	8	265	386	183	443	370
V/C Ratio(X)	0.72	0.39	0.39	1.12	0.58	0.58	0.74	0.41	0.91	0.86	0.17	0.25
Avail Cap(c_a), veh/h	527	893	939	432	1037	1080	139	265	386	223	443	370
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.5	0.0	0.0	57.0	17.4	17.4	64.6	50.4	54.7	57.5	38.9	39.7
Incr Delay (d2), s/veh	2.0	1.2	1.1	81.1	2.4	2.3	37.7	0.4	25.4	21.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.3	0.3	11.9	11.8	12.3	0.3	3.2	7.0	6.2	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.5	1.2	1.1	138.1	19.8	19.8	102.3	50.8	80.1	79.0	39.0	39.8
LnGrp LOS	E	A	A	F	B	B	F	D	F	E	D	D
Approach Vol, veh/h		833			1723			467			327	
Approach Delay, s/veh		10.0			53.1			73.6			58.5	
Approach LOS		A			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	69.9	4.6	35.6	10.6	79.3	17.1	23.0
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	62.0	10.0	25.0	20.0	58.0	16.0	19.0
Max Q Clear Time (g_c+I1), s	18.0	2.0	2.4	8.4	6.6	30.1	13.2	19.1
Green Ext Time (p_c), s	0.0	0.9	0.0	0.1	0.0	1.7	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	45.8
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
20: Chemawa Rd & SB Ramp

Existing PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	685	923	275	1760	0	0	0	0	166	6	371
Future Volume (veh/h)	0	685	923	275	1760	0	0	0	0	166	6	371
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1885	1885	1885	0				1870	1648	1870
Adj Flow Rate, veh/h	0	714	961	286	1833	0				173	6	386
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	3	1	1	1	0				2	17	2
Cap, veh/h	0	1689	765	357	2595	0				277	10	508
Arrive On Green	0.00	0.48	0.48	0.20	0.72	0.00				0.16	0.18	0.18
Sat Flow, veh/h	0	3618	1598	1795	3676	0				1519	53	2790
Grp Volume(v), veh/h	0	714	961	286	1833	0				179	0	386
Grp Sat Flow(s),veh/h/ln	0	1763	1598	1795	1791	0				1572	0	1395
Q Serve(g_s), s	0.0	11.3	41.0	13.0	24.7	0.0				9.1	0.0	11.2
Cycle Q Clear(g_c), s	0.0	11.3	41.0	13.0	24.7	0.0				9.1	0.0	11.2
Prop In Lane	0.00		1.00	1.00		0.00				0.97		1.00
Lane Grp Cap(c), veh/h	0	1689	765	357	2595	0				286	0	508
V/C Ratio(X)	0.00	0.42	1.26	0.80	0.71	0.00				0.63	0.00	0.76
Avail Cap(c_a), veh/h	0	1689	765	440	2595	0				753	0	1336
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	14.6	22.3	32.7	6.7	0.0				33.3	0.0	33.2
Incr Delay (d2), s/veh	0.0	0.1	125.7	6.7	0.8	0.0				0.8	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.2	40.3	6.2	7.1	0.0				3.4	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	14.6	148.0	39.4	7.4	0.0				34.1	0.0	34.1
LnGrp LOS	A	B	F	D	A	A				C	A	C
Approach Vol, veh/h		1675			2119						565	
Approach Delay, s/veh		91.1			11.7						34.1	
Approach LOS		F			B						C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	31.0	45.0		19.6		66.0
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	19.0	39.0		39.0		39.0
Max Q Clear Time (g_c+I1), s	15.0	43.0		13.2		26.7
Green Ext Time (p_c), s	0.0	0.0		0.3		4.1

Intersection Summary	
HCM 6th Ctrl Delay	45.1
HCM 6th LOS	D

HCM Signalized Intersection Capacity Analysis
21: NB Ramp & Chemawa Rd

Existing PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	657	0	0	777	67	1258	0	238	0	0	0
Future Volume (vph)	194	657	0	0	777	67	1258	0	238	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00			
Frt	1.00	1.00			0.99		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (prot)	1770	3505			3524		1698	1698	1568			
Flt Permitted	0.95	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (perm)	1770	3505			3524		1698	1698	1568			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	206	699	0	0	827	71	1338	0	253	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	102	0	0	0
Lane Group Flow (vph)	206	699	0	0	892	0	669	669	151	0	0	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	3%	0%	0%	1%	4%	1%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA		Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases							4		4			
Actuated Green, G (s)	14.3	47.1			26.8		41.3	41.3	41.3			
Effective Green, g (s)	16.3	49.1			28.8		43.3	43.3	43.3			
Actuated g/C Ratio	0.16	0.49			0.29		0.43	0.43	0.43			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	0.5	0.5			0.5		0.5	0.5	0.5			
Lane Grp Cap (vph)	287	1714			1010		732	732	676			
v/s Ratio Prot	c0.12	0.20			c0.25							
v/s Ratio Perm							c0.39	0.39	0.10			
v/c Ratio	0.72	0.41			0.88		0.91	0.91	0.22			
Uniform Delay, d1	39.9	16.4			34.2		26.8	26.8	18.0			
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2	7.0	0.1			9.0		15.6	15.6	0.1			
Delay (s)	46.8	16.4			43.2		42.4	42.4	18.0			
Level of Service	D	B			D		D	D	B			
Approach Delay (s)		23.3			43.2			38.5			0.0	
Approach LOS		C			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	14.0
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary
22: Portland Rd & Chemawa Rd/Hazelgreen Rd

Existing PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	347	406	56	271	24	365	354	79	60	530	78
Future Volume (veh/h)	99	347	406	56	271	24	365	354	79	60	530	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1870	1841	1885	1885	1900	1826	1826	1781	1870	1856
Adj Flow Rate, veh/h	106	373	437	60	291	26	392	381	85	65	570	84
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	2	4	1	1	0	5	5	8	2	3
Cap, veh/h	147	605	521	88	503	45	281	911	201	123	853	377
Arrive On Green	0.08	0.33	0.33	0.05	0.29	0.27	0.16	0.32	0.29	0.07	0.24	0.24
Sat Flow, veh/h	1753	1841	1585	1753	1705	152	1810	2825	624	1697	3554	1572
Grp Volume(v), veh/h	106	373	437	60	0	317	392	232	234	65	570	84
Grp Sat Flow(s),veh/h/ln	1753	1841	1585	1753	0	1858	1810	1735	1714	1697	1777	1572
Q Serve(g_s), s	4.2	12.1	18.1	2.4	0.0	10.3	11.0	7.4	7.7	2.6	10.3	3.0
Cycle Q Clear(g_c), s	4.2	12.1	18.1	2.4	0.0	10.3	11.0	7.4	7.7	2.6	10.3	3.0
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	147	605	521	88	0	548	281	559	553	123	853	377
V/C Ratio(X)	0.72	0.62	0.84	0.68	0.00	0.58	1.40	0.42	0.42	0.53	0.67	0.22
Avail Cap(c_a), veh/h	272	675	581	272	0	681	281	636	629	263	1304	577
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	20.0	22.0	33.1	0.0	21.3	29.9	18.8	19.1	31.7	24.4	21.6
Incr Delay (d2), s/veh	4.8	1.2	9.3	6.7	0.0	0.7	198.4	0.4	0.4	2.6	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	4.7	7.2	1.1	0.0	4.0	19.8	2.7	2.8	1.1	4.2	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.5	21.2	31.3	39.8	0.0	22.0	228.4	19.2	19.5	34.3	25.1	21.8
LnGrp LOS	D	C	C	D	A	C	F	B	B	C	C	C
Approach Vol, veh/h		916			377			858			719	
Approach Delay, s/veh		27.8			24.9			114.8			25.5	
Approach LOS		C			C			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	21.0	10.0	24.9	9.2	26.9	7.6	27.3
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	10.5	24.0	10.5	24.0	10.5	24.0	10.5	24.0
Max Q Clear Time (g_c+I1), s	13.0	12.3	6.2	12.3	4.6	9.7	4.4	20.1
Green Ext Time (p_c), s	0.0	2.7	0.1	1.0	0.0	1.7	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	52.9
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
23: River Rd & Chemawa Rd

Existing PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	217	180	162	268	121	202	1066	108	126	692	81
Future Volume (veh/h)	137	217	180	162	268	121	202	1066	108	126	692	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1710	1697	1683	1697	1710	1697	1697	1697	1697	1697	1683	1683
Adj Flow Rate, veh/h	144	228	189	171	282	127	213	1122	114	133	728	85
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	2	1	0	1	1	1	1	1	2	2
Cap, veh/h	166	271	218	193	303	245	235	1474	150	153	1303	152
Arrive On Green	0.10	0.16	0.16	0.12	0.18	0.18	0.15	0.50	0.50	0.19	0.91	0.90
Sat Flow, veh/h	1629	1697	1370	1616	1710	1387	1616	2950	299	1616	2880	336
Grp Volume(v), veh/h	144	228	189	171	282	127	213	612	624	133	404	409
Grp Sat Flow(s),veh/h/ln	1629	1697	1370	1616	1710	1387	1616	1612	1638	1616	1599	1617
Q Serve(g_s), s	11.3	17.0	17.5	13.5	21.1	10.8	16.9	39.8	40.0	10.4	6.3	6.4
Cycle Q Clear(g_c), s	11.3	17.0	17.5	13.5	21.1	10.8	16.9	39.8	40.0	10.4	6.3	6.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		0.21
Lane Grp Cap(c), veh/h	166	271	218	193	303	245	235	805	818	153	724	732
V/C Ratio(X)	0.87	0.84	0.87	0.89	0.93	0.52	0.91	0.76	0.76	0.87	0.56	0.56
Avail Cap(c_a), veh/h	194	271	218	242	303	245	360	805	818	186	724	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.89	0.89
Uniform Delay (d), s/veh	57.5	53.1	53.3	56.4	52.7	48.5	54.7	26.2	26.3	51.9	3.7	3.7
Incr Delay (d2), s/veh	22.6	17.2	23.9	22.9	33.9	0.9	13.8	6.7	6.6	23.7	2.8	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	8.5	7.5	6.8	11.9	3.8	7.7	16.3	16.6	4.8	1.8	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.1	70.2	77.2	79.3	86.6	49.4	68.5	32.9	32.9	75.6	6.4	6.5
LnGrp LOS	F	E	E	E	F	D	E	C	C	E	A	A
Approach Vol, veh/h		561			580			1449			946	
Approach Delay, s/veh		75.1			76.3			38.2			16.2	
Approach LOS		E			E			D			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	69.4	19.5	24.7	22.9	62.8	17.3	27.0
Change Period (Y+Rc), s	4.0	4.5	4.0	4.0	4.0	4.5	4.0	4.0
Max Green Setting (Gmax), s	15.0	60.0	19.5	19.0	29.0	46.0	15.5	23.0
Max Q Clear Time (g_c+I1), s	12.4	42.0	15.5	19.5	18.9	8.4	13.3	23.1
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.0	1.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	44.4
HCM 6th LOS	D

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	482	542	460	133
Demand Flow Rate, veh/h	488	548	465	134
Vehicles Circulating, veh/h	242	299	327	685
Vehicles Exiting, veh/h	577	493	403	162
Ped Vol Crossing Leg, #/h	0	0	2	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.4	10.4	9.3	7.5
Approach LOS	A	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	488	548	465	134
Cap Entry Lane, veh/h	1078	1017	989	686
Entry HV Adj Factor	0.988	0.989	0.989	0.994
Flow Entry, veh/h	482	542	460	133
Cap Entry, veh/h	1065	1006	977	682
V/C Ratio	0.453	0.539	0.471	0.195
Control Delay, s/veh	8.4	10.4	9.3	7.5
LOS	A	B	A	A
95th %tile Queue, veh	2	3	3	1

HCM 6th Signalized Intersection Summary
25: Salem Pkwy & Verda Ln/Hyacinth St

Existing PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	318	93	253	473	78	184	1090	321	41	898	114
Future Volume (veh/h)	38	318	93	253	473	78	184	1090	321	41	898	114
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1856	1885	1885	1870	1826	1885	1856	1885	1870	1856	1900
Adj Flow Rate, veh/h	39	324	95	258	483	80	188	1112	0	42	916	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	3	1	1	2	5	1	3	1	2	3	0
Cap, veh/h	127	343	289	294	520	423	227	1191		326	1417	
Arrive On Green	0.07	0.18	0.18	0.16	0.28	0.28	0.13	0.34	0.00	0.18	0.40	0.00
Sat Flow, veh/h	1810	1856	1566	1795	1870	1521	1795	3526	1598	1781	3526	1610
Grp Volume(v), veh/h	39	324	95	258	483	80	188	1112	0	42	916	0
Grp Sat Flow(s),veh/h/ln	1810	1856	1566	1795	1870	1521	1795	1763	1598	1781	1763	1610
Q Serve(g_s), s	2.7	22.4	5.1	18.2	32.7	5.2	13.3	39.7	0.0	2.6	27.3	0.0
Cycle Q Clear(g_c), s	2.7	22.4	5.1	18.2	32.7	5.2	13.3	39.7	0.0	2.6	27.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	343	289	294	520	423	227	1191		326	1417	
V/C Ratio(X)	0.31	0.95	0.33	0.88	0.93	0.19	0.83	0.93		0.13	0.65	
Avail Cap(c_a), veh/h	127	343	289	359	604	491	290	1193		326	1417	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	57.4	52.4	25.9	53.1	45.7	35.8	55.4	41.6	0.0	44.4	31.4	0.0
Incr Delay (d2), s/veh	1.3	34.7	0.7	16.4	18.2	0.1	14.4	14.4	0.0	0.2	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	13.6	2.7	9.5	17.6	1.9	6.7	18.5	0.0	1.1	11.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.8	87.0	26.6	69.5	63.9	35.9	69.8	56.0	0.0	44.6	33.7	0.0
LnGrp LOS	E	F	C	E	E	D	E	E		D	C	
Approach Vol, veh/h		458			821			1300	A		958	A
Approach Delay, s/veh		72.1			62.9			58.0			34.2	
Approach LOS		E			E			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.5	56.3	13.2	40.1	28.8	47.9	25.3	28.0
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	6.0	* 6	5.0	5.0
Max Green Setting (Gmax), s	20.0	41.0	7.0	41.0	19.0	* 42	25.0	23.0
Max Q Clear Time (g_c+I1), s	15.3	29.3	4.7	34.7	4.6	41.7	20.2	24.4
Green Ext Time (p_c), s	0.2	5.0	0.0	0.4	0.0	0.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	54.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	41.8
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	90	30	265	125	180	25	135	115	240	200	25
Future Vol, veh/h	10	90	30	265	125	180	25	135	115	240	200	25
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	20	2	0	2	4	4	0	3	3	3	2	0
Mvmt Flow	10	94	31	276	130	188	26	141	120	250	208	26
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	14.6	41	21.2	62.7
HCM LOS	B	E	C	F

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	9%	10%	0%	68%	0%	52%
Vol Thru, %	49%	90%	0%	32%	0%	43%
Vol Right, %	42%	0%	100%	0%	100%	5%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	275	100	30	390	180	465
LT Vol	25	10	0	265	0	240
Through Vol	135	90	0	125	0	200
RT Vol	115	0	30	0	180	25
Lane Flow Rate	286	104	31	406	188	484
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.598	0.269	0.071	0.918	0.369	0.98
Departure Headway (Hd)	7.512	9.302	8.197	8.134	7.093	7.287
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	478	385	436	447	506	499
Service Time	5.574	7.078	5.972	5.891	4.85	5.287
HCM Lane V/C Ratio	0.598	0.27	0.071	0.908	0.372	0.97
HCM Control Delay	21.2	15.5	11.6	53.5	14	62.7
HCM Lane LOS	C	C	B	F	B	F
HCM 95th-tile Q	3.8	1.1	0.2	10.3	1.7	12.9

Intersection	
Int Delay, s/veh	148

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	390	330	395	295	0	0	0	0	190	0	440
Future Vol, veh/h	0	390	330	395	295	0	0	0	0	190	0	440
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	180	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	12	9	3	12	0	0	0	0	0	0	10
Mvmt Flow	0	411	347	416	311	0	0	0	0	200	0	463

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	758	0	0	1728	1901	311
Stage 1	-	-	-	-	-	-	1143	1143	-
Stage 2	-	-	-	-	-	-	585	758	-
Critical Hdwy	-	-	-	4.13	-	-	6.4	6.5	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	-	-	-	2.227	-	-	3.5	4	3.39
Pot Cap-1 Maneuver	0	-	-	849	-	0	~ 98	70	711
Stage 1	0	-	-	-	-	0	307	277	-
Stage 2	0	-	-	-	-	0	561	418	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	849	-	-	~ 50	0	711
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 50	0	-
Stage 1	-	-	-	-	-	-	307	0	-
Stage 2	-	-	-	-	-	-	286	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	7.6	$ 470.8
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	849	-	50	711
HCM Lane V/C Ratio	-	-	0.49	-	4	0.651
HCM Control Delay (s)	-	-	13.2	-	$ 1517	19
HCM Lane LOS	-	-	B	-	F	C
HCM 95th %tile Q(veh)	-	-	2.7	-	22.1	4.8

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	137

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	350	230	0	0	530	200	160	0	290	0	0	0
Future Vol, veh/h	350	230	0	0	530	200	160	0	290	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	18	4	0	0	4	0	14	0	4	0	0	0
Mvmt Flow	385	253	0	0	582	220	176	0	319	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	802	0	-	-	-	0	1715	1825	253
Stage 1	-	-	-	-	-	-	1023	1023	-
Stage 2	-	-	-	-	-	-	692	802	-
Critical Hdwy	4.28	-	-	-	-	-	6.54	6.5	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	5.54	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.54	5.5	-
Follow-up Hdwy	2.362	-	-	-	-	-	3.626	4	3.336
Pot Cap-1 Maneuver	755	-	0	0	-	-	~ 93	78	781
Stage 1	-	-	0	0	-	-	330	316	-
Stage 2	-	-	0	0	-	-	475	399	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	755	-	-	-	-	-	~ 46	0	781
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 46	0	-
Stage 1	-	-	-	-	-	-	~ 162	0	-
Stage 2	-	-	-	-	-	-	475	0	-

Approach	EB	WB	NB
HCM Control Delay, s	8.8	0	$ 524.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	46	781	755	-	-	-
HCM Lane V/C Ratio	3.822	0.408	0.509	-	-	-
HCM Control Delay (s)	$ 1451.7	12.8	14.6	-	-	-
HCM Lane LOS	F	B	B	-	-	-
HCM 95th %tile Q(veh)	19.6	2	2.9	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
Future Baseline PM Peak Hour (without RTP projects)

4: Portland Rd & Brooklake Rd

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	60	295	40	150	55	95	595	40	50	480	390
Future Volume (veh/h)	140	60	295	40	150	55	95	595	40	50	480	390
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1856	1870	1870	1870	1811	1856	1856	1900	1870	1826
Adj Flow Rate, veh/h	147	63	0	42	158	58	100	626	42	53	505	411
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	3	2	2	2	6	3	3	0	2	5
Cap, veh/h	320	102		128	270	91	389	852	57	344	885	732
Arrive On Green	0.22	0.23	0.00	0.22	0.23	0.22	0.05	0.50	0.47	0.03	0.47	0.47
Sat Flow, veh/h	860	451	1572	185	1195	400	1725	1719	115	1810	1870	1547
Grp Volume(v), veh/h	210	0	0	258	0	0	100	0	668	53	505	411
Grp Sat Flow(s),veh/h/ln	1311	0	1572	1780	0	0	1725	0	1835	1810	1870	1547
Q Serve(g_s), s	0.8	0.0	0.0	0.0	0.0	0.0	1.5	0.0	14.1	0.8	9.5	9.3
Cycle Q Clear(g_c), s	7.1	0.0	0.0	6.3	0.0	0.0	1.5	0.0	14.1	0.8	9.5	9.3
Prop In Lane	0.70		1.00	0.16		0.22	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	409	0		471	0	0	389	0	910	344	885	732
V/C Ratio(X)	0.51	0.00		0.55	0.00	0.00	0.26	0.00	0.73	0.15	0.57	0.56
Avail Cap(c_a), veh/h	1081	0		1372	0	0	579	0	1620	584	1652	1366
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	0.0	0.0	17.1	0.0	0.0	7.6	0.0	9.8	8.7	9.3	9.2
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.7	0.0	0.0	0.3	0.0	1.7	0.2	0.8	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.0	2.4	0.0	0.0	0.4	0.0	4.1	0.2	2.8	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	0.0	0.0	17.9	0.0	0.0	7.9	0.0	11.4	8.9	10.1	10.2
LnGrp LOS	B	A		B	A	A	A	A	B	A	B	B
Approach Vol, veh/h		210	A		258			768			969	
Approach Delay, s/veh		18.1			17.9			11.0			10.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	28.1		15.0	6.6	27.0		15.0
Change Period (Y+Rc), s	4.0	* 5.4		4.5	4.0	* 5.4		4.5
Max Green Setting (Gmax), s	8.0	* 42		36.5	8.0	* 42		36.5
Max Q Clear Time (g_c+I1), s	2.8	16.1		9.1	3.5	11.5		8.3
Green Ext Time (p_c), s	0.0	6.7		1.1	0.1	7.7		1.2

Intersection Summary	
HCM 6th Ctrl Delay	12.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	65	0	20	0	70	55	15	180	0
Future Vol, veh/h	0	0	0	65	0	20	0	70	55	15	180	0
Conflicting Peds, #/hr	0	0	2	0	0	0	0	0	2	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	50	100	0	0	0	0	0	2	2	8	0	0
Mvmt Flow	0	0	0	73	0	22	0	79	62	17	202	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	359	381	206	350	350	112	204	0	0	143	0	0
Stage 1	238	238	-	112	112	-	-	-	-	-	-	-
Stage 2	121	143	-	238	238	-	-	-	-	-	-	-
Critical Hdwy	7.6	7.5	6.2	7.1	6.5	6.2	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.6	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.95	4.9	3.3	3.5	4	3.3	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	517	426	840	608	577	947	1380	-	-	1404	-	-
Stage 1	669	560	-	898	807	-	-	-	-	-	-	-
Stage 2	780	625	-	770	712	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	498	418	837	599	567	945	1377	-	-	1401	-	-
Mov Cap-2 Maneuver	498	418	-	599	567	-	-	-	-	-	-	-
Stage 1	668	551	-	896	805	-	-	-	-	-	-	-
Stage 2	761	624	-	758	701	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	11.4	0	0.6
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1377	-	-	-	655	1401	-	-
HCM Lane V/C Ratio	-	-	-	-	0.146	0.012	-	-
HCM Control Delay (s)	0	-	-	0	11.4	7.6	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0	-	-

Intersection	
Int Delay, s/veh	32.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	55	20	110	120	100	35	170	80	80	405	30
Future Vol, veh/h	25	55	20	110	120	100	35	170	80	80	405	30
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	30	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	6	6	0	0	7	0	2	0	8	1	0
Mvmt Flow	26	57	21	113	124	103	36	175	82	82	418	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	948	927	435	926	901	216	449	0	0	257	0	0
Stage 1	598	598	-	288	288	-	-	-	-	-	-	-
Stage 2	350	329	-	638	613	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.56	6.26	7.1	6.5	6.27	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.1	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.054	3.354	3.5	4	3.363	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	243	264	613	251	280	811	1122	-	-	1274	-	-
Stage 1	492	485	-	724	677	-	-	-	-	-	-	-
Stage 2	671	639	-	468	486	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	117	232	612	179	246	811	1122	-	-	1274	-	-
Mov Cap-2 Maneuver	117	232	-	179	246	-	-	-	-	-	-	-
Stage 1	473	443	-	696	651	-	-	-	-	-	-	-
Stage 2	456	615	-	360	444	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	35.7	108.3	1	1.2
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1122	-	-	177	612	209	811	1274	-	-
HCM Lane V/C Ratio	0.032	-	-	0.466	0.034	1.135	0.127	0.065	-	-
HCM Control Delay (s)	8.3	0	-	41.9	11.1	151	10.1	8	0	-
HCM Lane LOS	A	A	-	E	B	F	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.2	0.1	11.3	0.4	0.2	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	155	60	15	210	85	25
Future Vol, veh/h	155	60	15	210	85	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	7	0	0	3	0	0
Mvmt Flow	189	73	18	256	104	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	262	0	518	226
Stage 1	-	-	-	-	226	-
Stage 2	-	-	-	-	292	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1314	-	521	818
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	762	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1314	-	513	818
Mov Cap-2 Maneuver	-	-	-	-	513	-
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	750	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	560	-	-	1314	-
HCM Lane V/C Ratio	0.24	-	-	0.014	-
HCM Control Delay (s)	13.4	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0	-

Intersection	
Int Delay, s/veh	19.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	95	115	105	485	645	95
Future Vol, veh/h	95	115	105	485	645	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	240	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	4	4	5	1	2
Mvmt Flow	100	121	111	511	679	100

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1462	729	779	0	-	0
Stage 1	729	-	-	-	-	-
Stage 2	733	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	143	420	829	-	-	-
Stage 1	481	-	-	-	-	-
Stage 2	479	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	124	420	829	-	-	-
Mov Cap-2 Maneuver	124	-	-	-	-	-
Stage 1	417	-	-	-	-	-
Stage 2	479	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	140.1	1.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	829	-	202	-	-
HCM Lane V/C Ratio	0.133	-	1.094	-	-
HCM Control Delay (s)	10	-	140.1	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0.5	-	10.4	-	-

Intersection	
Int Delay, s/veh	6.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	150	25	285	75	15	515
Future Vol, veh/h	150	25	285	75	15	515
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	1	0	2	2	0	1
Mvmt Flow	172	29	328	86	17	592

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	997	371	0	0	414	0
Stage 1	371	-	-	-	-	-
Stage 2	626	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	272	679	-	-	1156	-
Stage 1	700	-	-	-	-	-
Stage 2	535	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	266	679	-	-	1156	-
Mov Cap-2 Maneuver	266	-	-	-	-	-
Stage 1	700	-	-	-	-	-
Stage 2	523	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	41	0	0.2
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	291	1156	-
HCM Lane V/C Ratio	-	-	0.691	0.015	-
HCM Control Delay (s)	-	-	41	8.2	0
HCM Lane LOS	-	-	E	A	A
HCM 95th %tile Q(veh)	-	-	4.7	0	-

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	25	60	50	75	10	100	95	65	25	45	5
Future Vol, veh/h	5	25	60	50	75	10	100	95	65	25	45	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	5	0	0	1	0	0	0	0	0	5	0
Mvmt Flow	6	28	68	57	85	11	114	108	74	28	51	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	531	520	54	531	486	145	57	0	0	182	0	0
Stage 1	110	110	-	373	373	-	-	-	-	-	-	-
Stage 2	421	410	-	158	113	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.55	6.2	7.1	6.51	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.55	-	6.1	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.55	-	6.1	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.045	3.3	3.5	4.009	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	462	456	1019	462	483	908	1560	-	-	1405	-	-
Stage 1	900	799	-	652	620	-	-	-	-	-	-	-
Stage 2	614	590	-	849	804	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	358	410	1019	377	434	908	1560	-	-	1405	-	-
Mov Cap-2 Maneuver	358	410	-	377	434	-	-	-	-	-	-	-
Stage 1	826	782	-	599	569	-	-	-	-	-	-	-
Stage 2	473	542	-	747	787	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.3	18.1	2.9	2.5
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1560	-	-	673	427	1405	-	-
HCM Lane V/C Ratio	0.073	-	-	0.152	0.359	0.02	-	-
HCM Control Delay (s)	7.5	-	-	11.3	18.1	7.6	0	-
HCM Lane LOS	A	-	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	1.6	0.1	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	95	90	585	705	25
Future Vol, veh/h	20	95	90	585	705	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	6	0	4	2	0
Mvmt Flow	22	102	97	629	758	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1595	772	785	0	-	0
Stage 1	772	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Critical Hdwy	6.4	6.26	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.354	2.2	-	-	-
Pot Cap-1 Maneuver	119	393	843	-	-	-
Stage 1	459	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	98	393	843	-	-	-
Mov Cap-2 Maneuver	98	-	-	-	-	-
Stage 1	378	-	-	-	-	-
Stage 2	435	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31.2	1.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	843	-	258	-	-
HCM Lane V/C Ratio	0.115	-	0.479	-	-
HCM Control Delay (s)	9.8	0	31.2	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0.4	-	2.4	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	100	250	325	570	95
Future Vol, veh/h	35	100	250	325	570	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	1	1	1	1	0
Mvmt Flow	39	111	278	361	633	106

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1603	686	739	0	-	0
Stage 1	686	-	-	-	-	-
Stage 2	917	-	-	-	-	-
Critical Hdwy	6.43	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	116	449	872	-	-	-
Stage 1	498	-	-	-	-	-
Stage 2	388	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	79	449	872	-	-	-
Mov Cap-2 Maneuver	201	-	-	-	-	-
Stage 1	339	-	-	-	-	-
Stage 2	388	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.7	4.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	872	-	340	-	-
HCM Lane V/C Ratio	0.319	-	0.441	-	-
HCM Control Delay (s)	11	-	23.7	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	1.4	-	2.2	-	-

HCM 6th Signalized Intersection Summary Future Baseline PM Peak Hour (without RTP projects)
13: River Rd & Wheatland Rd/Springwood Dr

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	5	405	15	5	5	565	900	15	15	775	15
Future Volume (veh/h)	10	5	405	15	5	5	565	900	15	15	775	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1900	1900	1900	1900	1885	1885	1900	1885	1885
Adj Flow Rate, veh/h	11	5	440	16	5	5	614	978	16	16	842	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	0	0	0	0	1	1	0	1	1
Cap, veh/h	239	108	506	35	11	11	641	2128	35	264	1148	22
Arrive On Green	0.17	0.19	0.19	0.03	0.03	0.03	0.28	0.59	0.56	0.01	0.32	0.29
Sat Flow, veh/h	1263	574	2678	1088	340	340	1810	3606	59	1810	3595	68
Grp Volume(v), veh/h	16	0	440	26	0	0	614	486	508	16	419	439
Grp Sat Flow(s),veh/h/ln	1837	0	1339	1769	0	0	1810	1791	1874	1810	1791	1872
Q Serve(g_s), s	0.7	0.0	14.4	1.3	0.0	0.0	23.3	13.7	13.7	0.6	18.7	18.8
Cycle Q Clear(g_c), s	0.7	0.0	14.4	1.3	0.0	0.0	23.3	13.7	13.7	0.6	18.7	18.8
Prop In Lane	0.69		1.00	0.62		0.19	1.00		0.03	1.00		0.04
Lane Grp Cap(c), veh/h	347	0	506	57	0	0	641	1057	1106	264	572	598
V/C Ratio(X)	0.05	0.00	0.87	0.46	0.00	0.00	0.96	0.46	0.46	0.06	0.73	0.73
Avail Cap(c_a), veh/h	347	0	506	118	0	0	653	1057	1106	355	572	598
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	35.4	43.0	0.0	0.0	21.0	10.4	10.4	22.4	27.2	27.3
Incr Delay (d2), s/veh	0.0	0.0	14.5	2.1	0.0	0.0	24.7	1.4	1.4	0.0	8.1	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	5.7	0.6	0.0	0.0	13.0	5.0	5.2	0.2	9.0	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.5	0.0	49.9	45.1	0.0	0.0	45.6	11.8	11.8	22.5	35.3	35.1
LnGrp LOS	C	A	D	D	A	A	D	B	B	C	D	D
Approach Vol, veh/h		456			26			1608			874	
Approach Delay, s/veh		49.2			45.1			24.7			35.0	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.0	57.1		21.0	29.4	32.7		6.9
Change Period (Y+Rc), s	4.0	7.0		6.0	4.0	7.0		4.5
Max Green Setting (Gmax), s	5.5	42.5		15.0	26.0	22.0		5.5
Max Q Clear Time (g_c+I1), s	2.6	15.7		16.4	25.3	20.8		3.3
Green Ext Time (p_c), s	0.0	1.2		0.0	0.0	0.3		0.0

Intersection Summary	
HCM 6th Ctrl Delay	31.7
HCM 6th LOS	C

Notes

User approved changes to right turn type.

HCM 6th Signalized Intersection Summary Future Baseline PM Peak Hour (without RTP projects)
14: Keizer Station Blvd & Ulali Dr

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	90	105	125	105	25	45	105	90	10	155	80
Future Volume (veh/h)	125	90	105	125	105	25	45	105	90	10	155	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1870	1870	1900	1885	1900
Adj Flow Rate, veh/h	142	102	119	142	119	28	51	119	102	11	176	91
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	2	2	0	1	0
Cap, veh/h	621	241	281	550	453	107	630	323	277	610	655	560
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1260	790	921	1178	1487	350	1130	930	797	1178	1885	1610
Grp Volume(v), veh/h	142	0	221	142	0	147	51	0	221	11	176	91
Grp Sat Flow(s),veh/h/ln	1260	0	1711	1178	0	1837	1130	0	1727	1178	1885	1610
Q Serve(g_s), s	2.2	0.0	2.4	2.5	0.0	1.4	0.8	0.0	2.2	0.2	1.5	0.9
Cycle Q Clear(g_c), s	3.6	0.0	2.4	4.9	0.0	1.4	2.3	0.0	2.2	2.4	1.5	0.9
Prop In Lane	1.00		0.54	1.00		0.19	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	621	0	521	550	0	560	630	0	600	610	655	560
V/C Ratio(X)	0.23	0.00	0.42	0.26	0.00	0.26	0.08	0.00	0.37	0.02	0.27	0.16
Avail Cap(c_a), veh/h	1387	0	1561	1266	0	1676	1759	0	2326	1787	2539	2169
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.4	0.0	6.4	8.3	0.0	6.0	6.2	0.0	5.6	6.5	5.4	5.2
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.5	0.4	0.0	0.3	0.1	0.0	0.3	0.0	0.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.5	0.0	6.6	8.4	0.0	6.1	6.3	0.0	5.8	6.5	5.5	5.2
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		363			289			272			278	
Approach Delay, s/veh		6.9			7.3			5.9			5.4	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	12.0	11.0	12.0	11.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	31.0	21.0	31.0	21.0
Max Q Clear Time (g_c+I1), s	4.4	6.9	4.3	5.6
Green Ext Time (p_c), s	0.2	0.2	0.3	0.4

Intersection Summary	
HCM 6th Ctrl Delay	6.4
HCM 6th LOS	A

HCM Signalized Intersection Capacity Analysis
15: River Rd & Lockhaven Dr

Future Baseline PM Peak Hour (without RTP projects)

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	260	165	315	225	205	130	835	275	165	725	125
Future Volume (vph)	160	260	165	315	225	205	130	835	275	165	725	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1863	1556	1649	1737	1577	1805	3574	1524	1787	3467	
Flt Permitted	0.95	1.00	1.00	0.59	0.83	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1863	1556	1031	1461	1577	1805	3574	1524	1787	3467	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	165	268	170	325	232	211	134	861	284	170	747	129
RTOR Reduction (vph)	0	0	141	0	0	117	0	0	198	0	11	0
Lane Group Flow (vph)	165	268	29	240	317	94	134	861	86	170	865	0
Confl. Peds. (#/hr)	1		7	7		1	5		3	3		5
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	1%	3%	2%	1%	0%	1%	3%	1%	1%	3%
Turn Type	Split	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	7			8		5	2		1	6	
Permitted Phases			7	8		8			2			
Actuated Green, G (s)	21.5	21.5	21.5	34.2	34.2	34.2	12.1	37.2	37.2	16.6	41.7	
Effective Green, g (s)	22.5	22.5	22.5	35.2	35.2	35.2	12.6	39.2	39.2	17.1	43.7	
Actuated g/C Ratio	0.17	0.17	0.17	0.27	0.27	0.27	0.10	0.30	0.30	0.13	0.34	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	0.5	0.5	0.5	0.5	
Lane Grp Cap (vph)	309	322	269	279	395	427	174	1077	459	235	1165	
v/s Ratio Prot	0.09	c0.14					0.07	c0.24		0.10	c0.25	
v/s Ratio Perm			0.02	c0.23	0.22	0.06			0.06			
v/c Ratio	0.53	0.83	0.11	0.86	0.80	0.22	0.77	0.80	0.19	0.72	0.74	
Uniform Delay, d1	49.0	51.9	45.3	45.1	44.2	36.8	57.3	41.8	33.6	54.2	38.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.82	0.51	1.00	1.00	
Incremental Delay, d2	0.9	15.9	0.1	22.0	10.6	0.1	17.2	6.2	0.9	9.0	4.3	
Delay (s)	49.9	67.8	45.4	67.1	54.8	36.9	71.7	40.5	17.9	63.1	42.5	
Level of Service	D	E	D	E	D	D	E	D	B	E	D	
Approach Delay (s)		56.6			53.7			38.7			45.8	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	46.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	595	30	60	735	25	70
Future Vol, veh/h	595	30	60	735	25	70
Conflicting Peds, #/hr	0	4	4	0	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	4	2	5	2	0	5
Mvmt Flow	626	32	63	774	26	74

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	662	0	1546	648
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	900	-
Critical Hdwy	-	-	4.15	-	6.4	6.25
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.245	-	3.5	3.345
Pot Cap-1 Maneuver	-	-	912	-	127	465
Stage 1	-	-	-	-	526	-
Stage 2	-	-	-	-	400	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	909	-	118	462
Mov Cap-2 Maneuver	-	-	-	-	306	-
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	372	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	16.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	407	-	-	909	-
HCM Lane V/C Ratio	0.246	-	-	0.069	-
HCM Control Delay (s)	16.7	-	-	9.3	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1	-	-	0.2	-

HCM 6th Signalized Intersection Summary — Future Baseline PM Peak Hour (without RTP projects)

17: Kafir Dr/14th Ave & Lockhaven Dr

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	795	10	10	905	145	20	55	15	50	20	40
Future Volume (veh/h)	50	795	10	10	905	145	20	55	15	50	20	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.97		0.96	0.97		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1841	1841	1900	1870	1870	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	52	820	10	10	933	149	21	57	15	52	21	41
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	0	2	2	0	0	0	0	0	0
Cap, veh/h	301	1377	17	454	1165	186	72	144	33	165	57	161
Arrive On Green	0.02	0.76	0.75	0.01	0.74	0.73	0.10	0.12	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1810	1815	22	1810	1568	250	228	1157	266	997	550	1548
Grp Volume(v), veh/h	52	0	830	10	0	1082	93	0	0	73	0	41
Grp Sat Flow(s),veh/h/ln	1810	0	1837	1810	0	1819	1652	0	0	1548	0	1548
Q Serve(g_s), s	0.7	0.0	19.9	0.1	0.0	37.8	1.3	0.0	0.0	0.0	0.0	2.4
Cycle Q Clear(g_c), s	0.7	0.0	19.9	0.1	0.0	37.8	5.4	0.0	0.0	4.1	0.0	2.4
Prop In Lane	1.00		0.01	1.00		0.14	0.23		0.16	0.71		1.00
Lane Grp Cap(c), veh/h	301	0	1393	454	0	1351	216	0	0	223	0	161
V/C Ratio(X)	0.17	0.00	0.60	0.02	0.00	0.80	0.43	0.00	0.00	0.33	0.00	0.25
Avail Cap(c_a), veh/h	405	0	1393	586	0	1351	410	0	0	404	0	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.0	0.0	5.3	5.1	0.0	8.2	40.9	0.0	0.0	41.9	0.0	41.2
Incr Delay (d2), s/veh	0.1	0.0	1.9	0.0	0.0	5.1	0.5	0.0	0.0	0.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	6.2	0.0	0.0	12.7	2.2	0.0	0.0	1.7	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.1	0.0	7.2	5.1	0.0	13.3	41.4	0.0	0.0	42.2	0.0	41.5
LnGrp LOS	B	A	A	A	A	B	D	A	A	D	A	D
Approach Vol, veh/h		882			1092			93			114	
Approach Delay, s/veh		7.4			13.2			41.4			42.0	
Approach LOS		A			B			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.7	79.9		15.4	6.3	78.3		15.4
Change Period (Y+Rc), s	4.0	5.0		* 5	4.0	5.0		5.0
Max Green Setting (Gmax), s	8.0	56.0		* 23	8.0	56.0		22.0
Max Q Clear Time (g_c+I1), s	2.1	21.9		6.1	2.7	39.8		7.4
Green Ext Time (p_c), s	0.0	1.2		0.1	0.0	1.9		0.1

Intersection Summary	
HCM 6th Ctrl Delay	13.6
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary Future Baseline PM Peak Hour (without RTP projects)
18: McLeod Ln & Lockhaven Dr

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	760	15	30	940	290	15	60	10	135	30	25
Future Volume (veh/h)	45	760	15	30	940	290	15	60	10	135	30	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1841	1841	1900	1885	1885	1900	1870	1900	1900	1900	1900
Adj Flow Rate, veh/h	49	826	16	33	1022	315	16	65	11	147	33	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	4	4	0	1	1	0	2	0	0	0	0
Cap, veh/h	63	2590	50	42	1951	596	19	101	86	111	101	83
Arrive On Green	0.04	0.74	0.73	0.05	1.00	1.00	0.01	0.05	0.05	0.06	0.10	0.10
Sat Flow, veh/h	1810	3509	68	1810	2686	821	1810	1870	1601	1810	965	790
Grp Volume(v), veh/h	49	412	430	33	678	659	16	65	11	147	0	60
Grp Sat Flow(s),veh/h/ln	1810	1749	1828	1810	1791	1716	1810	1870	1601	1810	0	1755
Q Serve(g_s), s	3.5	10.5	10.5	2.3	0.0	0.0	1.1	4.4	0.9	8.0	0.0	4.1
Cycle Q Clear(g_c), s	3.5	10.5	10.5	2.3	0.0	0.0	1.1	4.4	0.9	8.0	0.0	4.1
Prop In Lane	1.00		0.04	1.00		0.48	1.00		1.00	1.00		0.45
Lane Grp Cap(c), veh/h	63	1291	1350	42	1301	1247	19	101	86	111	0	184
V/C Ratio(X)	0.77	0.32	0.32	0.78	0.52	0.53	0.83	0.64	0.13	1.32	0.00	0.33
Avail Cap(c_a), veh/h	167	1291	1350	111	1301	1247	111	317	271	111	0	297
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	62.2	5.8	5.8	61.6	0.0	0.0	64.2	60.3	58.6	61.0	0.0	53.9
Incr Delay (d2), s/veh	7.2	0.7	0.6	7.6	1.0	1.1	27.3	2.5	0.2	193.6	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	3.7	3.8	1.1	0.4	0.4	0.7	2.2	0.3	9.7	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.4	6.5	6.5	69.2	1.0	1.1	91.5	62.8	58.8	254.6	0.0	54.3
LnGrp LOS	E	A	A	E	A	A	F	E	E	F	A	D
Approach Vol, veh/h		891			1370			92			207	
Approach Delay, s/veh		9.9			2.7			67.3			196.6	
Approach LOS		A			A			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	100.0	5.4	17.6	8.6	98.4	12.0	11.0
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	75.0	8.0	22.0	12.0	71.0	8.0	22.0
Max Q Clear Time (g_c+I1), s	4.3	12.5	3.1	6.1	5.5	2.0	10.0	6.4
Green Ext Time (p_c), s	0.0	1.1	0.0	0.1	0.0	2.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary Future Baseline PM Peak Hour (without RTP projects)
19: Chemawa Rd & Lockhaven Dr & Keizer Station Blvd

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	730	10	455	1130	65	10	105	245	280	90	120
Future Volume (veh/h)	165	730	10	455	1130	65	10	105	245	280	90	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1885	1885	1900	1811	1811	1900	1826	1826
Adj Flow Rate, veh/h	172	760	10	474	1177	68	10	109	255	292	94	125
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	0	1	1	0	6	6	0	5	5
Cap, veh/h	220	1850	24	432	1990	115	13	202	294	223	416	347
Arrive On Green	0.13	1.00	1.00	0.12	0.58	0.57	0.01	0.11	0.11	0.12	0.23	0.23
Sat Flow, veh/h	3428	3563	47	3510	3442	199	1810	1811	2638	1810	1826	1526
Grp Volume(v), veh/h	172	376	394	474	612	633	10	109	255	292	94	125
Grp Sat Flow(s),veh/h/ln	1714	1763	1847	1755	1791	1849	1810	1811	1319	1810	1826	1526
Q Serve(g_s), s	6.3	0.0	0.0	16.0	28.5	28.6	0.7	7.4	12.4	16.0	5.4	9.0
Cycle Q Clear(g_c), s	6.3	0.0	0.0	16.0	28.5	28.6	0.7	7.4	12.4	16.0	5.4	9.0
Prop In Lane	1.00		0.03	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	220	915	959	432	1035	1069	13	202	294	223	416	347
V/C Ratio(X)	0.78	0.41	0.41	1.10	0.59	0.59	0.79	0.54	0.87	1.31	0.23	0.36
Avail Cap(c_a), veh/h	527	915	959	432	1035	1069	139	265	386	223	416	347
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.8	0.0	0.0	57.0	17.6	17.6	64.5	54.6	56.8	57.0	40.9	42.2
Incr Delay (d2), s/veh	2.1	1.3	1.2	72.2	2.5	2.4	32.0	0.8	12.4	168.3	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.3	0.3	11.4	12.0	12.4	0.4	3.4	4.6	17.7	2.5	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.9	1.3	1.2	129.2	20.1	20.0	96.4	55.4	69.2	225.3	41.0	42.5
LnGrp LOS	E	A	A	F	C	C	F	E	E	F	D	D
Approach Vol, veh/h		942			1719			374			511	
Approach Delay, s/veh		11.6			50.1			65.9			146.7	
Approach LOS		B			D			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	71.5	4.9	33.6	12.3	79.2	20.0	18.5
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	62.0	10.0	25.0	20.0	58.0	16.0	19.0
Max Q Clear Time (g_c+I1), s	18.3	2.0	2.7	11.0	8.3	30.6	18.0	14.4
Green Ext Time (p_c), s	0.0	1.0	0.0	0.1	0.0	1.8	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	55.5
HCM 6th LOS	E

HCM 6th Signalized Intersection Summary Future Baseline PM Peak Hour (without RTP projects)
20: Chemawa Rd & SB Ramp

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	695	1015	480	1820	0	0	0	0	270	15	385
Future Volume (veh/h)	0	695	1015	480	1820	0	0	0	0	270	15	385
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1885	1885	1885	0				1870	1648	1870
Adj Flow Rate, veh/h	0	724	1057	500	1896	0				281	16	401
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	3	1	1	1	0				2	17	2
Cap, veh/h	0	1509	684	394	2468	0				339	19	634
Arrive On Green	0.00	0.43	0.43	0.22	0.69	0.00				0.21	0.23	0.23
Sat Flow, veh/h	0	3618	1598	1795	3676	0				1489	85	2790
Grp Volume(v), veh/h	0	724	1057	500	1896	0				297	0	401
Grp Sat Flow(s),veh/h/ln	0	1763	1598	1795	1791	0				1574	0	1395
Q Serve(g_s), s	0.0	14.2	41.0	21.0	33.5	0.0				17.3	0.0	12.4
Cycle Q Clear(g_c), s	0.0	14.2	41.0	21.0	33.5	0.0				17.3	0.0	12.4
Prop In Lane	0.00		1.00	1.00		0.00				0.95		1.00
Lane Grp Cap(c), veh/h	0	1509	684	394	2468	0				358	0	634
V/C Ratio(X)	0.00	0.48	1.55	1.27	0.77	0.00				0.83	0.00	0.63
Avail Cap(c_a), veh/h	0	1509	684	394	2468	0				674	0	1194
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.7	27.4	37.4	9.8	0.0				36.2	0.0	33.4
Incr Delay (d2), s/veh	0.0	0.1	252.7	140.2	1.4	0.0				1.9	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.5	62.5	24.3	11.3	0.0				6.6	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.8	280.1	177.6	11.2	0.0				38.1	0.0	33.8
LnGrp LOS	A	B	F	F	B	A				D	A	C
Approach Vol, veh/h		1781			2396						698	
Approach Delay, s/veh		174.3			45.9						35.6	
Approach LOS		F			D						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	25.0	45.0		25.8		70.0
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	19.0	39.0		39.0		39.0
Max Q Clear Time (g_c+I1), s	23.0	43.0		19.3		35.5
Green Ext Time (p_c), s	0.0	0.0		0.5		2.0

Intersection Summary	
HCM 6th Ctrl Delay	91.3
HCM 6th LOS	F

HCM Signalized Intersection Capacity Analysis
Future Baseline PM Peak Hour (without RTP projects)
21: NB Ramp & Chemawa Rd

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	720	0	0	1110	250	1190	0	505	0	0	0
Future Volume (vph)	245	720	0	0	1110	250	1190	0	505	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00			
Frt	1.00	1.00			0.97		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (prot)	1770	3505			3457		1698	1698	1568			
Flt Permitted	0.95	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (perm)	1770	3505			3457		1698	1698	1568			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	261	766	0	0	1181	266	1266	0	537	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	0	0	0	89	0	0	0
Lane Group Flow (vph)	261	766	0	0	1430	0	633	633	448	0	0	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	3%	0%	0%	1%	4%	1%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA		Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases							4		4			
Actuated Green, G (s)	16.6	51.9			29.3		39.9	39.9	39.9			
Effective Green, g (s)	18.6	53.9			31.3		41.9	41.9	41.9			
Actuated g/C Ratio	0.18	0.52			0.30		0.40	0.40	0.40			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	0.5	0.5			0.5		0.5	0.5	0.5			
Lane Grp Cap (vph)	317	1820			1042		685	685	632			
v/s Ratio Prot	c0.15	0.22			c0.41							
v/s Ratio Perm							c0.37	0.37	0.29			
v/c Ratio	0.82	0.42			1.37		0.92	0.92	0.71			
Uniform Delay, d1	41.0	15.3			36.2		29.4	29.4	25.8			
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2	15.0	0.1			173.8		17.9	17.9	3.0			
Delay (s)	56.1	15.4			210.1		47.4	47.4	28.8			
Level of Service	E	B			F		D	D	C			
Approach Delay (s)		25.7			210.1			41.9			0.0	
Approach LOS		C			F			D			A	

Intersection Summary			
HCM 2000 Control Delay	94.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	103.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	115.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary Future Baseline PM Peak Hour (without RTP projects)
22: Portland Rd & Chemawa Rd/Hazelgreen Rd

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	555	415	65	410	35	555	500	140	115	630	125
Future Volume (veh/h)	125	555	415	65	410	35	555	500	140	115	630	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1870	1841	1885	1885	1900	1826	1826	1781	1870	1856
Adj Flow Rate, veh/h	134	597	446	70	441	38	597	538	151	124	677	134
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	2	4	1	1	0	5	5	8	2	3
Cap, veh/h	178	634	546	100	514	44	250	788	220	174	920	407
Arrive On Green	0.10	0.34	0.34	0.06	0.30	0.28	0.14	0.29	0.27	0.10	0.26	0.26
Sat Flow, veh/h	1753	1841	1585	1753	1711	147	1810	2677	748	1697	3554	1572
Grp Volume(v), veh/h	134	597	446	70	0	479	597	348	341	124	677	134
Grp Sat Flow(s),veh/h/ln	1753	1841	1585	1753	0	1859	1810	1735	1691	1697	1777	1572
Q Serve(g_s), s	5.9	25.0	20.4	3.1	0.0	19.3	11.0	14.1	14.3	5.6	13.9	5.5
Cycle Q Clear(g_c), s	5.9	25.0	20.4	3.1	0.0	19.3	11.0	14.1	14.3	5.6	13.9	5.5
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.44	1.00		1.00
Lane Grp Cap(c), veh/h	178	634	546	100	0	559	250	510	498	174	920	407
V/C Ratio(X)	0.75	0.94	0.82	0.70	0.00	0.86	2.39	0.68	0.69	0.71	0.74	0.33
Avail Cap(c_a), veh/h	242	634	546	242	0	607	250	566	552	234	1161	514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.8	25.3	23.8	36.8	0.0	26.3	34.3	24.8	25.3	34.6	27.0	23.9
Incr Delay (d2), s/veh	7.3	22.2	9.1	6.3	0.0	10.7	636.7	2.6	2.8	5.1	1.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	13.6	8.2	1.4	0.0	9.2	48.7	5.6	5.6	2.5	5.8	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	47.5	32.9	43.2	0.0	37.0	671.0	27.4	28.0	39.7	28.6	24.2
LnGrp LOS	D	D	C	D	A	D	F	C	C	D	C	C
Approach Vol, veh/h		1177			549			1286			935	
Approach Delay, s/veh		41.4			37.8			326.4			29.5	
Approach LOS		D			D			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	24.6	12.1	27.9	12.2	27.4	8.6	31.4
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	10.5	24.0	10.5	24.0	10.5	24.0	10.5	24.0
Max Q Clear Time (g_c+I1), s	13.3	15.9	7.9	21.3	7.6	16.3	5.1	27.0
Green Ext Time (p_c), s	0.0	2.7	0.1	0.6	0.1	2.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	130.9
HCM 6th LOS	F

HCM 6th Signalized Intersection Summary Future Baseline PM Peak Hour (without RTP projects)
23: River Rd & Chemawa Rd

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	220	205	190	300	130	215	1085	110	145	880	100
Future Volume (veh/h)	145	220	205	190	300	130	215	1085	110	145	880	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1710	1697	1683	1697	1710	1697	1697	1697	1697	1697	1683	1683
Adj Flow Rate, veh/h	153	232	216	200	316	137	226	1142	116	153	926	105
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	2	1	0	1	1	1	1	1	2	2
Cap, veh/h	175	250	201	222	303	245	248	1421	144	173	1269	144
Arrive On Green	0.11	0.15	0.15	0.14	0.18	0.18	0.15	0.48	0.48	0.21	0.88	0.87
Sat Flow, veh/h	1629	1697	1365	1616	1710	1387	1616	2950	299	1616	2890	328
Grp Volume(v), veh/h	153	232	216	200	316	137	226	623	635	153	512	519
Grp Sat Flow(s),veh/h/ln	1629	1697	1365	1616	1710	1387	1616	1612	1638	1616	1599	1618
Q Serve(g_s), s	12.0	17.6	19.1	15.8	23.0	11.7	17.9	42.5	42.7	11.9	14.1	14.3
Cycle Q Clear(g_c), s	12.0	17.6	19.1	15.8	23.0	11.7	17.9	42.5	42.7	11.9	14.1	14.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		0.20
Lane Grp Cap(c), veh/h	175	250	201	222	303	245	248	777	789	173	702	711
V/C Ratio(X)	0.87	0.93	1.07	0.90	1.04	0.56	0.91	0.80	0.80	0.89	0.73	0.73
Avail Cap(c_a), veh/h	194	250	201	242	303	245	360	777	789	186	702	711
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.89	0.89
Uniform Delay (d), s/veh	57.1	54.8	55.4	55.2	53.5	48.9	54.2	28.5	28.5	50.3	5.3	5.4
Incr Delay (d2), s/veh	25.2	33.5	79.3	30.1	63.8	1.7	16.6	8.6	8.6	30.4	5.9	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	9.8	11.0	8.3	15.2	4.2	8.4	17.7	18.1	5.7	3.2	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.4	88.3	134.8	85.3	117.3	50.6	70.8	37.0	37.1	80.7	11.2	11.2
LnGrp LOS	F	F	F	F	F	D	E	D	D	F	B	B
Approach Vol, veh/h		601			653			1484			1184	
Approach Delay, s/veh		103.5			93.5			42.2			20.2	
Approach LOS		F			F			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.9	67.1	21.8	23.1	23.9	61.1	18.0	27.0
Change Period (Y+Rc), s	4.0	4.5	4.0	4.0	4.0	4.5	4.0	4.0
Max Green Setting (Gmax), s	15.0	60.0	19.5	19.0	29.0	46.0	15.5	23.0
Max Q Clear Time (g_c+I1), s	13.9	44.7	17.8	21.1	19.9	16.3	14.0	25.0
Green Ext Time (p_c), s	0.0	1.8	0.0	0.0	0.0	1.4	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	53.5
HCM 6th LOS	D

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	489	505	525	206
Demand Flow Rate, veh/h	494	511	530	207
Vehicles Circulating, veh/h	306	367	286	681
Vehicles Exiting, veh/h	582	449	514	197
Ped Vol Crossing Leg, #/h	0	0	2	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.4	10.9	9.8	9.0
Approach LOS	A	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	494	511	530	207
Cap Entry Lane, veh/h	1010	949	1031	689
Entry HV Adj Factor	0.989	0.988	0.990	0.994
Flow Entry, veh/h	489	505	525	206
Cap Entry, veh/h	999	938	1020	685
V/C Ratio	0.489	0.538	0.514	0.300
Control Delay, s/veh	9.4	10.9	9.8	9.0
LOS	A	B	A	A
95th %tile Queue, veh	3	3	3	1

HCM 6th Signalized Intersection Summary Future Baseline PM Peak Hour (without RTP projects)
25: Salem Pkwy & Verda Ln/Hyacinth St

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	635	40	450	870	310	95	1195	630	195	905	175
Future Volume (veh/h)	40	635	40	450	870	310	95	1195	630	195	905	175
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1856	1885	1885	1870	1826	1885	1856	1885	1870	1856	1900
Adj Flow Rate, veh/h	41	648	41	459	888	316	97	1219	0	199	923	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	3	1	1	2	5	1	3	1	2	3	0
Cap, veh/h	111	343	289	359	604	492	134	1193		260	1472	
Arrive On Green	0.06	0.18	0.18	0.20	0.32	0.32	0.07	0.34	0.00	0.15	0.42	0.00
Sat Flow, veh/h	1810	1856	1566	1795	1870	1522	1795	3526	1598	1781	3526	1610
Grp Volume(v), veh/h	41	648	41	459	888	316	97	1219	0	199	923	0
Grp Sat Flow(s),veh/h/ln	1810	1856	1566	1795	1870	1522	1795	1763	1598	1781	1763	1610
Q Serve(g_s), s	2.8	24.0	2.3	26.0	42.0	23.1	6.9	44.0	0.0	14.0	26.9	0.0
Cycle Q Clear(g_c), s	2.8	24.0	2.3	26.0	42.0	23.1	6.9	44.0	0.0	14.0	26.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	111	343	289	359	604	492	134	1193		260	1472	
V/C Ratio(X)	0.37	1.89	0.14	1.28	1.47	0.64	0.72	1.02		0.76	0.63	
Avail Cap(c_a), veh/h	111	343	289	359	604	492	290	1193		274	1472	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.6	53.0	29.4	52.0	44.0	37.6	58.8	43.0	0.0	53.3	29.9	0.0
Incr Delay (d2), s/veh	2.0	412.1	0.2	145.1	220.2	2.2	7.1	31.6	0.0	11.5	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	50.3	1.1	26.0	56.0	8.8	3.3	23.2	0.0	6.8	11.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.6	465.1	29.6	197.1	264.2	39.8	65.9	74.6	0.0	64.9	31.9	0.0
LnGrp LOS	E	F	C	F	F	D	E	F		E	C	
Approach Vol, veh/h		730			1663			1316	A		1122	A
Approach Delay, s/veh		417.9			203.1			74.0			37.8	
Approach LOS		F			F			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	58.3	12.0	46.0	24.0	48.0	30.0	28.0
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	6.0	* 6	5.0	5.0
Max Green Setting (Gmax), s	20.0	41.0	7.0	41.0	19.0	* 42	25.0	23.0
Max Q Clear Time (g_c+I1), s	7.8	28.9	4.8	44.0	16.0	46.0	28.0	26.0
Green Ext Time (p_c), s	0.1	5.1	0.0	0.0	0.1	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	162.0
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
1: River Rd & Brooklake Rd

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	90	30	265	125	180	25	135	115	240	200	25
Future Volume (veh/h)	10	90	30	265	125	180	25	135	115	240	200	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1870	1870	1870	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	10	94	31	276	130	188	26	141	120	250	208	26
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	20	2	2	2	4	4	3	3	3	2	2	2
Cap, veh/h	258	422	139	455	210	304	109	496	386	475	375	43
Arrive On Green	0.31	0.31	0.30	0.31	0.31	0.30	0.54	0.55	0.54	0.54	0.55	0.54
Sat Flow, veh/h	910	1346	444	1266	671	970	75	903	703	695	682	78
Grp Volume(v), veh/h	10	0	125	276	0	318	287	0	0	484	0	0
Grp Sat Flow(s),veh/h/ln	910	0	1790	1266	0	1641	1682	0	0	1455	0	0
Q Serve(g_s), s	0.6	0.0	3.0	12.0	0.0	9.6	0.0	0.0	0.0	6.4	0.0	0.0
Cycle Q Clear(g_c), s	10.2	0.0	3.0	15.0	0.0	9.6	5.3	0.0	0.0	11.7	0.0	0.0
Prop In Lane	1.00		0.25	1.00		0.59	0.09		0.42	0.52		0.05
Lane Grp Cap(c), veh/h	258	0	561	455	0	514	977	0	0	881	0	0
V/C Ratio(X)	0.04	0.00	0.22	0.61	0.00	0.62	0.29	0.00	0.00	0.55	0.00	0.00
Avail Cap(c_a), veh/h	285	0	615	493	0	564	977	0	0	881	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.4	0.0	14.8	20.3	0.0	17.2	7.2	0.0	0.0	8.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	1.9	0.0	1.8	0.8	0.0	0.0	2.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	1.0	3.2	0.0	3.2	1.4	0.0	0.0	2.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	0.0	15.0	22.2	0.0	19.0	7.9	0.0	0.0	10.8	0.0	0.0
LnGrp LOS	C	A	B	C	A	B	A	A	A	B	A	A
Approach Vol, veh/h		135			594			287			484	
Approach Delay, s/veh		15.5			20.5			7.9			10.8	
Approach LOS		B			C			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.0		22.2		36.0		22.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		19.5		31.5		19.5				
Max Q Clear Time (g_c+I1), s		7.3		12.2		13.7		17.0				
Green Ext Time (p_c), s		1.5		0.3		2.7		0.7				

Intersection Summary			
HCM 6th Ctrl Delay			14.5
HCM 6th LOS			B

Intersection	
Int Delay, s/veh	141.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	390	330	395	280	0	0	0	0	190	0	440
Future Vol, veh/h	0	390	330	395	280	0	0	0	0	190	0	440
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	180	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	12	9	3	12	0	0	0	0	0	0	10
Mvmt Flow	0	411	347	416	295	0	0	0	0	200	0	463

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	758	0	0	1712	1885	295
Stage 1	-	-	-	-	-	-	1127	1127	-
Stage 2	-	-	-	-	-	-	585	758	-
Critical Hdwy	-	-	-	4.13	-	-	6.4	6.5	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	-	-	-	2.227	-	-	3.5	4	3.39
Pot Cap-1 Maneuver	0	-	-	849	-	0	~ 101	71	726
Stage 1	0	-	-	-	-	0	312	282	-
Stage 2	0	-	-	-	-	0	561	418	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	849	-	-	~ 52	0	726
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 52	0	-
Stage 1	-	-	-	-	-	-	312	0	-
Stage 2	-	-	-	-	-	-	286	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	7.7	$ 447.9
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	849	-	52	726
HCM Lane V/C Ratio	-	-	0.49	-	3.846	0.638
HCM Control Delay (s)	-	-	13.2	$	1442.6	18.3
HCM Lane LOS	-	-	B	-	F	C
HCM 95th %tile Q(veh)	-	-	2.7	-	21.9	4.6

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	148.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	350	230	0	0	505	200	170	0	290	0	0	0
Future Vol, veh/h	350	230	0	0	505	200	170	0	290	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	18	4	0	0	4	0	14	0	4	0	0	0
Mvmt Flow	385	253	0	0	555	220	187	0	319	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	775	0	-	-	-	0	1688	1798	253
Stage 1	-	-	-	-	-	-	1023	1023	-
Stage 2	-	-	-	-	-	-	665	775	-
Critical Hdwy	4.28	-	-	-	-	-	6.54	6.5	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	5.54	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.54	5.5	-
Follow-up Hdwy	2.362	-	-	-	-	-	3.626	4	3.336
Pot Cap-1 Maneuver	774	-	0	0	-	-	~ 96	81	781
Stage 1	-	-	0	0	-	-	330	316	-
Stage 2	-	-	0	0	-	-	490	411	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	774	-	-	-	-	-	~ 48	0	781
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 48	0	-
Stage 1	-	-	-	-	-	-	~ 166	0	-
Stage 2	-	-	-	-	-	-	490	0	-

Approach	EB	WB	NB
HCM Control Delay, s	8.5	0	$ 553.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	48	781	774	-	-	-
HCM Lane V/C Ratio	3.892	0.408	0.497	-	-	-
HCM Control Delay (s)	$ 1475.5	12.8	14.2	-	-	-
HCM Lane LOS	F	B	B	-	-	-
HCM 95th %tile Q(veh)	20.7	2	2.8	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
4: Portland Rd & Brooklake Rd

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	255	90	295	40	150	55	95	595	40	50	480	390
Future Volume (veh/h)	255	90	295	40	150	55	95	595	40	50	480	390
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1856	1870	1870	1870	1811	1856	1856	1900	1870	1826
Adj Flow Rate, veh/h	268	95	0	42	158	58	100	626	42	53	505	411
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	3	2	2	2	6	3	3	0	2	5
Cap, veh/h	397	110		122	427	143	313	758	51	248	780	646
Arrive On Green	0.35	0.36	0.00	0.35	0.36	0.35	0.06	0.44	0.42	0.04	0.42	0.42
Sat Flow, veh/h	867	307	1572	181	1189	397	1725	1719	115	1810	1870	1547
Grp Volume(v), veh/h	363	0	0	258	0	0	100	0	668	53	505	411
Grp Sat Flow(s),veh/h/ln	1175	0	1572	1768	0	0	1725	0	1835	1810	1870	1547
Q Serve(g_s), s	13.7	0.0	0.0	0.0	0.0	0.0	2.4	0.0	23.5	1.2	15.8	15.4
Cycle Q Clear(g_c), s	21.7	0.0	0.0	8.0	0.0	0.0	2.4	0.0	23.5	1.2	15.8	15.4
Prop In Lane	0.74		1.00	0.16		0.22	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	491	0		668	0	0	313	0	809	248	780	646
V/C Ratio(X)	0.74	0.00		0.39	0.00	0.00	0.32	0.00	0.83	0.21	0.65	0.64
Avail Cap(c_a), veh/h	672	0		914	0	0	399	0	1077	381	1098	909
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.8	0.0	0.0	17.7	0.0	0.0	13.2	0.0	18.0	15.2	17.0	16.9
Incr Delay (d2), s/veh	2.3	0.0	0.0	0.3	0.0	0.0	0.4	0.0	4.7	0.3	1.3	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	0.0	0.0	3.2	0.0	0.0	0.8	0.0	9.5	0.5	6.2	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.1	0.0	0.0	18.0	0.0	0.0	13.6	0.0	22.8	15.6	18.3	18.4
LnGrp LOS	C	A		B	A	A	B	A	C	B	B	B
Approach Vol, veh/h		363	A		258			768			969	
Approach Delay, s/veh		25.1			18.0			21.6			18.2	
Approach LOS		C			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.6	36.3		30.3	8.4	34.6		30.3
Change Period (Y+Rc), s	4.5	* 5.4		5.0	4.5	* 5.4		5.0
Max Green Setting (Gmax), s	7.5	* 42		36.0	7.5	* 42		36.0
Max Q Clear Time (g_c+I1), s	3.2	25.5		23.7	4.4	17.8		10.0
Green Ext Time (p_c), s	0.0	5.4		1.6	0.0	7.1		1.2

Intersection Summary	
HCM 6th Ctrl Delay	20.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	65	0	20	0	70	55	15	180	0
Future Vol, veh/h	0	0	0	65	0	20	0	70	55	15	180	0
Conflicting Peds, #/hr	0	0	0	2	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	89	92	89	92	89	89	89	89	92
Heavy Vehicles, %	2	2	2	0	2	0	2	2	2	8	0	2
Mvmt Flow	0	0	0	73	0	22	0	79	62	17	202	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	357	379	204	350	348	112	202	0	0	143	0	0
Stage 1	236	236	-	112	112	-	-	-	-	-	-	-
Stage 2	121	143	-	238	236	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.2	4.12	-	-	4.18	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.3	2.218	-	-	2.272	-	-
Pot Cap-1 Maneuver	598	553	837	608	576	947	1370	-	-	1404	-	-
Stage 1	767	710	-	898	803	-	-	-	-	-	-	-
Stage 2	883	779	-	770	710	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	578	544	835	599	567	945	1370	-	-	1401	-	-
Mov Cap-2 Maneuver	578	544	-	599	567	-	-	-	-	-	-	-
Stage 1	767	700	-	896	801	-	-	-	-	-	-	-
Stage 2	862	777	-	758	700	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	11.4	0	0.6
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1370	-	-	-	655	1401	-	-
HCM Lane V/C Ratio	-	-	-	-	0.146	0.012	-	-
HCM Control Delay (s)	0	-	-	0	11.4	7.6	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0	-	-

Intersection	
Int Delay, s/veh	32.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	55	20	110	120	100	35	170	80	80	405	30
Future Vol, veh/h	25	55	20	110	120	100	35	170	80	80	405	30
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	30	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	6	6	0	0	7	0	2	0	8	1	0
Mvmt Flow	26	57	21	113	124	103	36	175	82	82	418	31

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	948	927	435	926	901	216	449	0	0	257	0	0
Stage 1	598	598	-	288	288	-	-	-	-	-	-	-
Stage 2	350	329	-	638	613	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.56	6.26	7.1	6.5	6.27	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.1	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.054	3.354	3.5	4	3.363	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	243	264	613	251	280	811	1122	-	-	1274	-	-
Stage 1	492	485	-	724	677	-	-	-	-	-	-	-
Stage 2	671	639	-	468	486	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	117	232	612	179	246	811	1122	-	-	1274	-	-
Mov Cap-2 Maneuver	117	232	-	179	246	-	-	-	-	-	-	-
Stage 1	473	443	-	696	651	-	-	-	-	-	-	-
Stage 2	456	615	-	360	444	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	35.7	108.3	1	1.2
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1122	-	-	177	612	209	811	1274	-	-
HCM Lane V/C Ratio	0.032	-	-	0.466	0.034	1.135	0.127	0.065	-	-
HCM Control Delay (s)	8.3	0	-	41.9	11.1	151	10.1	8	0	-
HCM Lane LOS	A	A	-	E	B	F	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.2	0.1	11.3	0.4	0.2	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	155	50	15	210	80	25
Future Vol, veh/h	155	50	15	210	80	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	7	0	0	3	0	0
Mvmt Flow	189	61	18	256	98	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	250	0	512	220
Stage 1	-	-	-	-	220	-
Stage 2	-	-	-	-	292	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1327	-	525	825
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	762	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1327	-	517	825
Mov Cap-2 Maneuver	-	-	-	-	517	-
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	750	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	567	-	-	1327	-
HCM Lane V/C Ratio	0.226	-	-	0.014	-
HCM Control Delay (s)	13.2	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0	-

Intersection	
Int Delay, s/veh	19.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	95	115	105	485	645	95
Future Vol, veh/h	95	115	105	485	645	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	240	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	4	4	5	1	2
Mvmt Flow	100	121	111	511	679	100

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1462	729	779	0	-	0
Stage 1	729	-	-	-	-	-
Stage 2	733	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	143	420	829	-	-	-
Stage 1	481	-	-	-	-	-
Stage 2	479	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	124	420	829	-	-	-
Mov Cap-2 Maneuver	124	-	-	-	-	-
Stage 1	417	-	-	-	-	-
Stage 2	479	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	140.1	1.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	829	-	202	-	-
HCM Lane V/C Ratio	0.133	-	1.094	-	-
HCM Control Delay (s)	10	-	140.1	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0.5	-	10.4	-	-

Intersection	
Int Delay, s/veh	6.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	150	25	285	70	15	515
Future Vol, veh/h	150	25	285	70	15	515
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	1	0	2	2	0	1
Mvmt Flow	172	29	328	80	17	592

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	994	368	0	0	408	0
Stage 1	368	-	-	-	-	-
Stage 2	626	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	273	682	-	-	1162	-
Stage 1	702	-	-	-	-	-
Stage 2	535	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	267	682	-	-	1162	-
Mov Cap-2 Maneuver	267	-	-	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	523	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	40.7	0	0.2
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	292	1162	-
HCM Lane V/C Ratio	-	-	0.689	0.015	-
HCM Control Delay (s)	-	-	40.7	8.1	0
HCM Lane LOS	-	-	E	A	A
HCM 95th %tile Q(veh)	-	-	4.7	0	-

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	25	60	50	75	10	100	95	70	20	45	5
Future Vol, veh/h	5	25	60	50	75	10	100	95	70	20	45	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	5	0	0	1	0	0	0	0	0	5	0
Mvmt Flow	6	28	68	57	85	11	114	108	80	23	51	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	524	516	54	524	479	148	57	0	0	188	0	0
Stage 1	100	100	-	376	376	-	-	-	-	-	-	-
Stage 2	424	416	-	148	103	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.55	6.2	7.1	6.51	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.55	-	6.1	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.55	-	6.1	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.045	3.3	3.5	4.009	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	467	459	1019	467	487	904	1560	-	-	1398	-	-
Stage 1	911	806	-	649	618	-	-	-	-	-	-	-
Stage 2	612	587	-	859	812	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	364	414	1019	382	439	904	1560	-	-	1398	-	-
Mov Cap-2 Maneuver	364	414	-	382	439	-	-	-	-	-	-	-
Stage 1	836	792	-	596	567	-	-	-	-	-	-	-
Stage 2	471	539	-	760	798	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.3	17.9	2.8	2.2
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1560	-	-	677	432	1398	-	-
HCM Lane V/C Ratio	0.073	-	-	0.151	0.355	0.016	-	-
HCM Control Delay (s)	7.5	-	-	11.3	17.9	7.6	0	-
HCM Lane LOS	A	-	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	1.6	0.1	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	95	90	585	705	40
Future Vol, veh/h	20	95	90	585	705	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	6	0	4	2	0
Mvmt Flow	22	102	97	629	758	43

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1603	780	801	0	-	0
Stage 1	780	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Critical Hdwy	6.4	6.26	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.354	2.2	-	-	-
Pot Cap-1 Maneuver	117	389	831	-	-	-
Stage 1	455	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	96	389	831	-	-	-
Mov Cap-2 Maneuver	96	-	-	-	-	-
Stage 1	374	-	-	-	-	-
Stage 2	435	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31.9	1.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	831	-	254	-	-
HCM Lane V/C Ratio	0.116	-	0.487	-	-
HCM Control Delay (s)	9.9	0	31.9	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0.4	-	2.5	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	100	250	325	555	100
Future Vol, veh/h	40	100	250	325	555	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	1	1	1	1	0
Mvmt Flow	44	111	278	361	617	111

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1590	673	728	0	-	0
Stage 1	673	-	-	-	-	-
Stage 2	917	-	-	-	-	-
Critical Hdwy	6.43	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	118	457	880	-	-	-
Stage 1	505	-	-	-	-	-
Stage 2	388	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	81	457	880	-	-	-
Mov Cap-2 Maneuver	203	-	-	-	-	-
Stage 1	345	-	-	-	-	-
Stage 2	388	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.5	4.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	880	-	337	-	-
HCM Lane V/C Ratio	0.316	-	0.462	-	-
HCM Control Delay (s)	11	-	24.5	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	1.4	-	2.3	-	-

HCM Signalized Intersection Capacity Analysis
13: River Rd & Wheatland Rd/Springwood Dr

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	5	405	15	5	5	565	905	10	15	775	15
Future Volume (vph)	10	5	405	15	5	5	565	905	10	15	775	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	0.88		1.00		0.97	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.96		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1837	2663		1711		3502	3564		1805	3564	
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1837	2663		1711		3502	3564		1805	3564	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	5	440	16	5	5	614	984	11	16	842	16
RTOR Reduction (vph)	0	0	399	0	5	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	16	41	0	21	0	614	995	0	16	857	0
Confl. Peds. (#/hr)			7	7			5		4	4		5
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	0%	2%	8%	0%	0%	0%	1%	8%	0%	1%	0%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		6.3	6.3		2.2		20.6	58.1		1.9	39.4	
Effective Green, g (s)		8.3	8.3		2.7		20.6	61.1		2.9	42.4	
Actuated g/C Ratio		0.09	0.09		0.03		0.23	0.68		0.03	0.47	
Clearance Time (s)		6.0	6.0		4.5		4.0	7.0		4.0	7.0	
Vehicle Extension (s)		1.0	1.0		0.5		0.5	0.5		0.5	0.5	
Lane Grp Cap (vph)		169	245		51		801	2419		58	1679	
v/s Ratio Prot		0.01			c0.01		c0.18	0.28		0.01	c0.24	
v/s Ratio Perm			c0.02									
v/c Ratio		0.09	0.17		0.41		0.77	0.41		0.28	0.51	
Uniform Delay, d1		37.4	37.7		42.9		32.5	6.4		42.5	16.6	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.1		2.0		4.0	0.5		0.9	1.1	
Delay (s)		37.5	37.8		44.9		36.4	7.0		43.5	17.7	
Level of Service		D	D		D		D	A		D	B	
Approach Delay (s)		37.8			44.9			18.2			18.2	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
14: Keizer Station Blvd & Ulali Dr

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	90	105	125	105	25	45	105	90	10	155	80
Future Volume (veh/h)	125	90	105	125	105	25	45	105	90	10	155	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1870	1870	1900	1885	1900
Adj Flow Rate, veh/h	142	102	119	142	119	28	51	119	102	11	176	91
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	2	2	0	1	0
Cap, veh/h	621	241	281	550	453	107	630	323	277	610	655	560
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1260	790	921	1178	1487	350	1130	930	797	1178	1885	1610
Grp Volume(v), veh/h	142	0	221	142	0	147	51	0	221	11	176	91
Grp Sat Flow(s),veh/h/ln	1260	0	1711	1178	0	1837	1130	0	1727	1178	1885	1610
Q Serve(g_s), s	2.2	0.0	2.4	2.5	0.0	1.4	0.8	0.0	2.2	0.2	1.5	0.9
Cycle Q Clear(g_c), s	3.6	0.0	2.4	4.9	0.0	1.4	2.3	0.0	2.2	2.4	1.5	0.9
Prop In Lane	1.00		0.54	1.00		0.19	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	621	0	521	550	0	560	630	0	600	610	655	560
V/C Ratio(X)	0.23	0.00	0.42	0.26	0.00	0.26	0.08	0.00	0.37	0.02	0.27	0.16
Avail Cap(c_a), veh/h	1387	0	1561	1266	0	1676	1759	0	2326	1787	2539	2169
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.4	0.0	6.4	8.3	0.0	6.0	6.2	0.0	5.6	6.5	5.4	5.2
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.4	0.4	0.0	0.3	0.1	0.0	0.3	0.0	0.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.5	0.0	6.6	8.4	0.0	6.1	6.3	0.0	5.8	6.5	5.5	5.2
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		363			289			272			278	
Approach Delay, s/veh		6.9			7.3			5.9			5.4	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	12.0	11.0	12.0	11.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	31.0	21.0	31.0	21.0
Max Q Clear Time (g_c+I1), s	4.4	6.9	4.3	5.6
Green Ext Time (p_c), s	0.2	0.2	0.3	0.3

Intersection Summary	
HCM 6th Ctrl Delay	6.4
HCM 6th LOS	A

HCM Signalized Intersection Capacity Analysis
15: River Rd & Lockhaven Dr

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	260	165	315	225	205	130	835	275	165	725	125
Future Volume (vph)	160	260	165	315	225	205	130	835	275	165	725	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.97	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1863	1557	3400	1863	1577	1805	3574	1523	1787	3467	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1863	1557	3400	1863	1577	1805	3574	1523	1787	3467	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	165	268	170	325	232	211	134	861	284	170	747	129
RTOR Reduction (vph)	0	0	140	0	0	172	0	0	158	0	8	0
Lane Group Flow (vph)	165	268	30	325	232	39	134	861	126	170	868	0
Confl. Peds. (#/hr)	1		7	7		1	5		3	3		5
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	1%	3%	2%	1%	0%	1%	3%	1%	1%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4			2			
Actuated Green, G (s)	15.8	23.0	23.0	16.5	23.7	23.7	13.0	59.0	59.0	18.0	64.0	
Effective Green, g (s)	16.8	24.0	24.0	17.5	24.7	24.7	13.5	61.0	61.0	18.5	66.0	
Actuated g/C Ratio	0.12	0.18	0.18	0.13	0.18	0.18	0.10	0.45	0.45	0.14	0.48	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	0.5	0.5	0.5	0.5	
Lane Grp Cap (vph)	219	326	272	434	335	284	177	1591	678	241	1670	
v/s Ratio Prot	0.09	c0.14		c0.10	0.12		c0.07	c0.24		c0.10	0.25	
v/s Ratio Perm			0.02			0.02			0.08			
v/c Ratio	0.75	0.82	0.11	0.75	0.69	0.14	0.76	0.54	0.19	0.71	0.52	
Uniform Delay, d1	58.1	54.4	47.5	57.6	52.6	47.2	60.2	27.8	23.0	56.6	24.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.2	14.6	0.1	6.1	4.9	0.1	15.0	1.3	0.6	7.4	1.2	
Delay (s)	70.3	69.0	47.6	63.7	57.5	47.3	75.2	29.1	23.6	64.1	25.7	
Level of Service	E	E	D	E	E	D	E	C	C	E	C	
Approach Delay (s)		63.3			57.3			32.7			31.9	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	42.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	137.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
16: Verda Ln & Lockhaven Dr

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	595	30	60	745	145	25	60	70	165	65	25
Future Volume (veh/h)	20	595	30	60	745	145	25	60	70	165	65	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1841	1826	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	626	32	63	784	158	26	65	74	179	71	27
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Percent Heavy Veh, %	2	4	4	5	2	2	2	2	2	2	2	2
Cap, veh/h	252	1075	55	434	935	188	109	191	184	328	104	35
Arrive On Green	0.62	0.62	0.62	0.62	0.62	0.62	0.23	0.24	0.24	0.23	0.24	0.24
Sat Flow, veh/h	595	1736	89	757	1510	304	147	800	770	934	435	148
Grp Volume(v), veh/h	22	0	658	63	0	942	165	0	0	277	0	0
Grp Sat Flow(s),veh/h/ln	595	0	1824	757	0	1814	1717	0	0	1516	0	0
Q Serve(g_s), s	1.7	0.0	12.1	3.0	0.0	23.1	0.0	0.0	0.0	4.7	0.0	0.0
Cycle Q Clear(g_c), s	24.9	0.0	12.1	15.1	0.0	23.1	4.6	0.0	0.0	9.3	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.17	0.16		0.45	0.65		0.10
Lane Grp Cap(c), veh/h	252	0	1130	434	0	1124	468	0	0	454	0	0
V/C Ratio(X)	0.09	0.00	0.58	0.15	0.00	0.84	0.35	0.00	0.00	0.61	0.00	0.00
Avail Cap(c_a), veh/h	456	0	1756	694	0	1747	878	0	0	809	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.3	0.0	6.4	10.9	0.0	8.5	18.1	0.0	0.0	19.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.5	0.2	0.0	2.2	0.5	0.0	0.0	1.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	3.1	0.4	0.0	6.3	1.8	0.0	0.0	3.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.5	0.0	6.9	11.0	0.0	10.7	18.6	0.0	0.0	21.1	0.0	0.0
LnGrp LOS	B	A	A	B	A	B	B	A	A	C	A	A
Approach Vol, veh/h		680			1005			165			277	
Approach Delay, s/veh		7.2			10.7			18.6			21.1	
Approach LOS		A			B			B			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	17.4	38.9	17.4	38.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	27.3	53.7	27.3	53.7
Max Q Clear Time (g_c+I1), s	6.6	26.9	11.3	25.1
Green Ext Time (p_c), s	0.9	5.0	1.5	9.2

Intersection Summary	
HCM 6th Ctrl Delay	11.6
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
17: Kafir Dr/14th Ave & Lockhaven Dr

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	795	10	10	905	145	20	55	15	50	20	40
Future Volume (veh/h)	50	795	10	10	905	145	20	55	15	50	20	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.98		0.97	0.97		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1841	1841	1900	1870	1900	1900	1900	1900	1885	1900	1900
Adj Flow Rate, veh/h	52	820	10	10	933	149	21	57	15	52	21	41
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	0	2	0	0	0	0	1	0	0
Cap, veh/h	350	1348	16	435	1360	1145	199	187	49	182	67	131
Arrive On Green	0.02	0.74	0.74	0.01	0.73	0.73	0.13	0.13	0.13	0.12	0.12	0.12
Sat Flow, veh/h	1810	1815	22	1810	1870	1575	1328	1439	379	1304	562	1096
Grp Volume(v), veh/h	52	0	830	10	933	149	21	0	72	52	0	62
Grp Sat Flow(s),veh/h/ln	1810	0	1837	1810	1870	1575	1328	0	1818	1304	0	1658
Q Serve(g_s), s	0.8	0.0	21.2	0.2	27.2	2.9	1.5	0.0	3.6	3.8	0.0	3.4
Cycle Q Clear(g_c), s	0.8	0.0	21.2	0.2	27.2	2.9	4.9	0.0	3.6	7.4	0.0	3.4
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.21	1.00		0.66
Lane Grp Cap(c), veh/h	350	0	1364	435	1360	1145	199	0	236	182	0	199
V/C Ratio(X)	0.15	0.00	0.61	0.02	0.69	0.13	0.11	0.00	0.31	0.29	0.00	0.31
Avail Cap(c_a), veh/h	453	0	1364	566	1360	1145	332	0	418	325	0	381
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.6	0.0	6.0	5.8	7.4	4.1	41.5	0.0	39.4	43.7	0.0	40.2
Incr Delay (d2), s/veh	0.1	0.0	2.0	0.0	2.8	0.2	0.1	0.0	0.3	0.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	6.9	0.0	9.4	0.8	0.5	0.0	1.6	1.3	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.6	0.0	8.1	5.8	10.3	4.3	41.6	0.0	39.7	44.0	0.0	40.6
LnGrp LOS	A	A	A	A	B	A	D	A	D	D	A	D
Approach Vol, veh/h		882			1092			93			114	
Approach Delay, s/veh		8.0			9.4			40.1			42.1	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.7	78.3		17.0	6.3	76.7		17.0
Change Period (Y+Rc), s	4.0	5.0		* 5	4.0	5.0		5.0
Max Green Setting (Gmax), s	8.0	56.0		* 23	8.0	56.0		22.0
Max Q Clear Time (g_c+I1), s	2.8	23.2		9.4	2.8	29.2		6.9
Green Ext Time (p_c), s	0.0	1.2		0.1	0.0	1.4		0.1

Intersection Summary	
HCM 6th Ctrl Delay	11.9
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
18: McLeod Ln & Lockhaven Dr

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	760	15	30	940	280	15	60	5	135	30	25
Future Volume (veh/h)	45	760	15	30	940	280	15	60	5	135	30	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1841	1841	1900	1885	1885	1900	1870	1900	1900	1900	1900
Adj Flow Rate, veh/h	49	826	16	33	1022	304	16	65	5	147	33	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	4	4	0	1	1	0	2	0	0	0	0
Cap, veh/h	63	2591	50	42	1970	581	19	101	86	111	101	83
Arrive On Green	0.04	0.74	0.73	0.05	1.00	1.00	0.01	0.05	0.05	0.06	0.10	0.10
Sat Flow, veh/h	1810	3509	68	1810	2711	800	1810	1870	1601	1810	965	790
Grp Volume(v), veh/h	49	412	430	33	672	654	16	65	5	147	0	60
Grp Sat Flow(s),veh/h/ln	1810	1749	1828	1810	1791	1721	1810	1870	1601	1810	0	1755
Q Serve(g_s), s	3.5	10.5	10.5	2.3	0.0	0.0	1.1	4.4	0.4	8.0	0.0	4.1
Cycle Q Clear(g_c), s	3.5	10.5	10.5	2.3	0.0	0.0	1.1	4.4	0.4	8.0	0.0	4.1
Prop In Lane	1.00		0.04	1.00		0.47	1.00		1.00	1.00		0.45
Lane Grp Cap(c), veh/h	63	1291	1350	42	1301	1250	19	101	86	111	0	184
V/C Ratio(X)	0.77	0.32	0.32	0.78	0.52	0.52	0.83	0.65	0.06	1.32	0.00	0.33
Avail Cap(c_a), veh/h	167	1291	1350	111	1301	1250	111	317	271	111	0	297
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	62.2	5.8	5.8	61.6	0.0	0.0	64.2	60.3	58.4	61.0	0.0	53.9
Incr Delay (d2), s/veh	7.2	0.7	0.6	7.6	1.0	1.0	27.3	2.6	0.1	193.6	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	3.7	3.8	1.1	0.4	0.4	0.7	2.2	0.2	9.7	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.4	6.5	6.5	69.2	1.0	1.0	91.5	62.8	58.5	254.6	0.0	54.3
LnGrp LOS	E	A	A	E	A	A	F	E	E	F	A	D
Approach Vol, veh/h		891			1359			86			207	
Approach Delay, s/veh		9.9			2.7			67.9			196.6	
Approach LOS		A			A			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	100.0	5.4	17.6	8.6	98.4	12.0	11.0
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	75.0	8.0	22.0	12.0	71.0	8.0	22.0
Max Q Clear Time (g_c+I1), s	4.3	12.5	3.1	6.1	5.5	2.0	10.0	6.4
Green Ext Time (p_c), s	0.0	1.1	0.0	0.1	0.0	2.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
19: Chemawa Rd & Lockhaven Dr & Keizer Station Blvd

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	730	5	455	1130	65	10	105	245	275	90	110
Future Volume (veh/h)	165	730	5	455	1130	65	10	105	245	275	90	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1885	1885	1900	1811	1811	1900	1826	1826
Adj Flow Rate, veh/h	172	760	5	474	1177	68	10	109	255	286	94	115
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	0	1	1	0	6	6	0	5	5
Cap, veh/h	220	1864	12	432	1990	115	13	202	294	223	416	347
Arrive On Green	0.13	1.00	1.00	0.12	0.58	0.57	0.01	0.11	0.11	0.12	0.23	0.23
Sat Flow, veh/h	3428	3590	24	3510	3442	199	1810	1811	2638	1810	1826	1526
Grp Volume(v), veh/h	172	373	392	474	612	633	10	109	255	286	94	115
Grp Sat Flow(s),veh/h/ln	1714	1763	1851	1755	1791	1849	1810	1811	1319	1810	1826	1526
Q Serve(g_s), s	6.3	0.0	0.0	16.0	28.5	28.6	0.7	7.4	12.4	16.0	5.4	8.2
Cycle Q Clear(g_c), s	6.3	0.0	0.0	16.0	28.5	28.6	0.7	7.4	12.4	16.0	5.4	8.2
Prop In Lane	1.00		0.01	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	220	915	961	432	1035	1069	13	202	294	223	416	347
V/C Ratio(X)	0.78	0.41	0.41	1.10	0.59	0.59	0.79	0.54	0.87	1.28	0.23	0.33
Avail Cap(c_a), veh/h	527	915	961	432	1035	1069	139	265	386	223	416	347
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.8	0.0	0.0	57.0	17.6	17.6	64.5	54.6	56.8	57.0	40.9	41.9
Incr Delay (d2), s/veh	2.1	1.3	1.2	72.2	2.5	2.4	32.0	0.8	12.4	157.5	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.3	0.3	11.4	12.0	12.4	0.4	3.4	4.6	17.0	2.5	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.9	1.3	1.2	129.2	20.1	20.0	96.4	55.4	69.2	214.5	41.0	42.1
LnGrp LOS	E	A	A	F	C	C	F	E	E	F	D	D
Approach Vol, veh/h		937			1719			374			495	
Approach Delay, s/veh		11.6			50.1			65.9			141.5	
Approach LOS		B			D			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	71.5	4.9	33.6	12.3	79.2	20.0	18.5
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	62.0	10.0	25.0	20.0	58.0	16.0	19.0
Max Q Clear Time (g_c+I1), s	18.3	2.0	2.7	10.2	8.3	30.6	18.0	14.4
Green Ext Time (p_c), s	0.0	1.0	0.0	0.1	0.0	1.8	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	54.4
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
20: Chemawa Rd & SB Ramp

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	690	1015	480	1805	0	0	0	0	270	15	385
Future Volume (veh/h)	0	690	1015	480	1805	0	0	0	0	270	15	385
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1885	1885	1885	0				1870	1648	1870
Adj Flow Rate, veh/h	0	719	1057	500	1880	0				281	16	401
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	3	1	1	1	0				2	17	2
Cap, veh/h	0	1483	1183	658	2368	0				352	20	659
Arrive On Green	0.00	0.42	0.42	0.19	0.66	0.00				0.21	0.24	0.24
Sat Flow, veh/h	0	3618	2812	3483	3676	0				1489	85	2790
Grp Volume(v), veh/h	0	719	1057	500	1880	0				297	0	401
Grp Sat Flow(s),veh/h/ln	0	1763	1406	1742	1791	0				1574	0	1395
Q Serve(g_s), s	0.0	11.6	27.2	10.6	29.2	0.0				14.0	0.0	10.0
Cycle Q Clear(g_c), s	0.0	11.6	27.2	10.6	29.2	0.0				14.0	0.0	10.0
Prop In Lane	0.00		1.00	1.00		0.00				0.95		1.00
Lane Grp Cap(c), veh/h	0	1483	1183	658	2368	0				372	0	659
V/C Ratio(X)	0.00	0.48	0.89	0.76	0.79	0.00				0.80	0.00	0.61
Avail Cap(c_a), veh/h	0	1854	1479	938	2368	0				827	0	1467
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.4	21.0	29.9	9.4	0.0				29.0	0.0	26.5
Incr Delay (d2), s/veh	0.0	0.1	5.4	1.2	1.8	0.0				1.5	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.3	8.9	4.4	9.4	0.0				5.1	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	16.5	26.4	31.1	11.2	0.0				30.5	0.0	26.9
LnGrp LOS	A	B	C	C	B	A				C	A	C
Approach Vol, veh/h		1776			2380						698	
Approach Delay, s/veh		22.4			15.4						28.4	
Approach LOS		C			B						C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	18.7	36.8		22.4		55.5
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	19.0	39.0		39.0		39.0
Max Q Clear Time (g_c+I1), s	12.6	29.2		16.0		31.2
Green Ext Time (p_c), s	0.1	1.6		0.5		3.4

Intersection Summary	
HCM 6th Ctrl Delay	19.8
HCM 6th LOS	B

HCM Signalized Intersection Capacity Analysis
21: NB Ramp & Chemawa Rd

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	715	0	0	1060	250	1225	0	500	0	0	0
Future Volume (vph)	245	715	0	0	1060	250	1225	0	500	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00			
Frt	1.00	1.00			0.97		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (prot)	1770	3505			3452		1698	1698	1568			
Flt Permitted	0.95	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (perm)	1770	3505			3452		1698	1698	1568			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	261	761	0	0	1128	266	1303	0	532	0	0	0
RTOR Reduction (vph)	0	0	0	0	18	0	0	0	90	0	0	0
Lane Group Flow (vph)	261	761	0	0	1376	0	651	652	442	0	0	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	3%	0%	0%	1%	4%	1%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA		Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases							4		4			
Actuated Green, G (s)	16.7	52.0			29.3		41.1	41.1	41.1			
Effective Green, g (s)	18.7	54.0			31.3		43.1	43.1	43.1			
Actuated g/C Ratio	0.18	0.51			0.30		0.41	0.41	0.41			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	0.5	0.5			0.5		0.5	0.5	0.5			
Lane Grp Cap (vph)	314	1800			1028		696	696	643			
v/s Ratio Prot	c0.15	0.22			c0.40							
v/s Ratio Perm							0.38	0.38	0.28			
v/c Ratio	0.83	0.42			1.34		0.94	0.94	0.69			
Uniform Delay, d1	41.7	15.9			36.9		29.7	29.7	25.5			
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2	16.2	0.1			158.9		19.6	19.8	2.5			
Delay (s)	57.8	15.9			195.8		49.2	49.5	27.9			
Level of Service	E	B			F		D	D	C			
Approach Delay (s)		26.6			195.8			43.1			0.0	
Approach LOS		C			F			D			A	

Intersection Summary			
HCM 2000 Control Delay	89.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	105.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary
22: Portland Rd & Chemawa Rd/Hazelgreen Rd

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	555	415	65	410	35	555	500	140	115	630	125
Future Volume (veh/h)	125	555	415	65	410	35	555	500	140	115	630	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1870	1841	1885	1885	1900	1826	1826	1781	1870	1856
Adj Flow Rate, veh/h	134	597	446	70	441	38	597	538	151	124	677	134
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	2	4	1	1	0	5	5	8	2	3
Cap, veh/h	178	634	546	100	514	44	250	788	220	174	920	407
Arrive On Green	0.10	0.34	0.34	0.06	0.30	0.28	0.14	0.29	0.27	0.10	0.26	0.26
Sat Flow, veh/h	1753	1841	1585	1753	1711	147	1810	2677	748	1697	3554	1572
Grp Volume(v), veh/h	134	597	446	70	0	479	597	348	341	124	677	134
Grp Sat Flow(s),veh/h/ln	1753	1841	1585	1753	0	1859	1810	1735	1691	1697	1777	1572
Q Serve(g_s), s	5.9	25.0	20.4	3.1	0.0	19.3	11.0	14.1	14.3	5.6	13.9	5.5
Cycle Q Clear(g_c), s	5.9	25.0	20.4	3.1	0.0	19.3	11.0	14.1	14.3	5.6	13.9	5.5
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.44	1.00		1.00
Lane Grp Cap(c), veh/h	178	634	546	100	0	559	250	510	498	174	920	407
V/C Ratio(X)	0.75	0.94	0.82	0.70	0.00	0.86	2.39	0.68	0.69	0.71	0.74	0.33
Avail Cap(c_a), veh/h	242	634	546	242	0	607	250	566	552	234	1161	514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.8	25.3	23.8	36.8	0.0	26.3	34.3	24.8	25.3	34.6	27.0	23.9
Incr Delay (d2), s/veh	7.3	22.2	9.1	6.3	0.0	10.7	636.7	2.6	2.8	5.1	1.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	13.6	8.2	1.4	0.0	9.2	48.7	5.6	5.6	2.5	5.8	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	47.5	32.9	43.2	0.0	37.0	671.0	27.4	28.0	39.7	28.6	24.2
LnGrp LOS	D	D	C	D	A	D	F	C	C	D	C	C
Approach Vol, veh/h		1177			549			1286			935	
Approach Delay, s/veh		41.4			37.8			326.4			29.5	
Approach LOS		D			D			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	24.6	12.1	27.9	12.2	27.4	8.6	31.4
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	10.5	24.0	10.5	24.0	10.5	24.0	10.5	24.0
Max Q Clear Time (g_c+I1), s	13.3	15.9	7.9	21.3	7.6	16.3	5.1	27.0
Green Ext Time (p_c), s	0.0	2.7	0.1	0.6	0.1	2.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	130.9
HCM 6th LOS	F

HCM 6th Signalized Intersection Summary
23: River Rd & Chemawa Rd

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	220	205	190	300	130	215	1085	110	145	880	100
Future Volume (veh/h)	145	220	205	190	300	130	215	1085	110	145	880	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1710	1697	1683	1697	1710	1697	1697	1697	1697	1697	1683	1683
Adj Flow Rate, veh/h	153	232	216	200	316	137	226	1142	116	153	926	105
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	2	1	0	1	1	1	1	1	2	2
Cap, veh/h	175	250	201	222	303	245	248	1421	144	173	1269	144
Arrive On Green	0.11	0.15	0.15	0.14	0.18	0.18	0.15	0.48	0.48	0.21	0.88	0.87
Sat Flow, veh/h	1629	1697	1365	1616	1710	1387	1616	2950	299	1616	2890	328
Grp Volume(v), veh/h	153	232	216	200	316	137	226	623	635	153	512	519
Grp Sat Flow(s),veh/h/ln	1629	1697	1365	1616	1710	1387	1616	1612	1638	1616	1599	1618
Q Serve(g_s), s	12.0	17.6	19.1	15.8	23.0	11.7	17.9	42.5	42.7	11.9	14.1	14.3
Cycle Q Clear(g_c), s	12.0	17.6	19.1	15.8	23.0	11.7	17.9	42.5	42.7	11.9	14.1	14.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		0.20
Lane Grp Cap(c), veh/h	175	250	201	222	303	245	248	777	789	173	702	711
V/C Ratio(X)	0.87	0.93	1.07	0.90	1.04	0.56	0.91	0.80	0.80	0.89	0.73	0.73
Avail Cap(c_a), veh/h	194	250	201	242	303	245	360	777	789	186	702	711
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.89	0.89
Uniform Delay (d), s/veh	57.1	54.8	55.4	55.2	53.5	48.9	54.2	28.5	28.5	50.3	5.3	5.4
Incr Delay (d2), s/veh	25.2	33.5	79.3	30.1	63.8	1.7	16.6	8.6	8.6	30.4	5.9	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	9.8	11.0	8.3	15.2	4.2	8.4	17.7	18.1	5.7	3.2	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.4	88.3	134.8	85.3	117.3	50.6	70.8	37.0	37.1	80.7	11.2	11.2
LnGrp LOS	F	F	F	F	F	D	E	D	D	F	B	B
Approach Vol, veh/h		601			653			1484			1184	
Approach Delay, s/veh		103.5			93.5			42.2			20.2	
Approach LOS		F			F			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.9	67.1	21.8	23.1	23.9	61.1	18.0	27.0
Change Period (Y+Rc), s	4.0	4.5	4.0	4.0	4.0	4.5	4.0	4.0
Max Green Setting (Gmax), s	15.0	60.0	19.5	19.0	29.0	46.0	15.5	23.0
Max Q Clear Time (g_c+I1), s	13.9	44.7	17.8	21.1	19.9	16.3	14.0	25.0
Green Ext Time (p_c), s	0.0	1.8	0.0	0.0	0.0	1.4	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	53.5
HCM 6th LOS	D

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	474	500	525	206
Demand Flow Rate, veh/h	479	506	530	207
Vehicles Circulating, veh/h	306	367	271	676
Vehicles Exiting, veh/h	577	434	514	197
Ped Vol Crossing Leg, #/h	0	0	2	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.2	10.8	9.5	8.9
Approach LOS	A	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	479	506	530	207
Cap Entry Lane, veh/h	1010	949	1047	692
Entry HV Adj Factor	0.989	0.988	0.990	0.994
Flow Entry, veh/h	474	500	525	206
Cap Entry, veh/h	999	938	1036	688
V/C Ratio	0.474	0.533	0.507	0.299
Control Delay, s/veh	9.2	10.8	9.5	8.9
LOS	A	B	A	A
95th %tile Queue, veh	3	3	3	1

HCM 6th Signalized Intersection Summary
25: Salem Pkwy & Verda Ln/Hyacinth St

2043 Future Baseline PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	635	40	450	870	310	95	1195	630	195	905	175
Future Volume (veh/h)	40	635	40	450	870	310	95	1195	630	195	905	175
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1856	1885	1885	1870	1826	1885	1856	1885	1870	1856	1900
Adj Flow Rate, veh/h	41	648	41	459	888	316	97	1219	0	199	923	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	3	1	1	2	5	1	3	1	2	3	0
Cap, veh/h	111	343	289	359	604	492	134	1193		260	1472	
Arrive On Green	0.06	0.18	0.18	0.20	0.32	0.32	0.07	0.34	0.00	0.15	0.42	0.00
Sat Flow, veh/h	1810	1856	1566	1795	1870	1522	1795	3526	1598	1781	3526	1610
Grp Volume(v), veh/h	41	648	41	459	888	316	97	1219	0	199	923	0
Grp Sat Flow(s),veh/h/ln	1810	1856	1566	1795	1870	1522	1795	1763	1598	1781	1763	1610
Q Serve(g_s), s	2.8	24.0	2.3	26.0	42.0	23.1	6.9	44.0	0.0	14.0	26.9	0.0
Cycle Q Clear(g_c), s	2.8	24.0	2.3	26.0	42.0	23.1	6.9	44.0	0.0	14.0	26.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	111	343	289	359	604	492	134	1193		260	1472	
V/C Ratio(X)	0.37	1.89	0.14	1.28	1.47	0.64	0.72	1.02		0.76	0.63	
Avail Cap(c_a), veh/h	111	343	289	359	604	492	290	1193		274	1472	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.6	53.0	29.4	52.0	44.0	37.6	58.8	43.0	0.0	53.3	29.9	0.0
Incr Delay (d2), s/veh	2.0	412.1	0.2	145.1	220.2	2.2	7.1	31.6	0.0	11.5	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	50.3	1.1	26.0	56.0	8.8	3.3	23.2	0.0	6.8	11.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.6	465.1	29.6	197.1	264.2	39.8	65.9	74.6	0.0	64.9	31.9	0.0
LnGrp LOS	E	F	C	F	F	D	E	F		E	C	
Approach Vol, veh/h		730			1663			1316	A		1122	A
Approach Delay, s/veh		417.9			203.1			74.0			37.8	
Approach LOS		F			F			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	58.3	12.0	46.0	24.0	48.0	30.0	28.0
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	6.0	* 6	5.0	5.0
Max Green Setting (Gmax), s	20.0	41.0	7.0	41.0	19.0	* 42	25.0	23.0
Max Q Clear Time (g_c+I1), s	8.9	28.9	4.8	44.0	16.0	46.0	28.0	26.0
Green Ext Time (p_c), s	0.1	5.1	0.0	0.0	0.1	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	162.0
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
1: River Rd & Brooklake Rd

2043 Land Use Option 1 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	90	30	255	125	185	25	130	115	255	185	25
Future Volume (veh/h)	10	90	30	255	125	185	25	130	115	255	185	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1870	1870	1870	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	10	94	31	266	130	193	26	135	120	266	193	26
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	20	2	2	2	4	4	3	3	3	2	2	2
Cap, veh/h	250	415	137	449	203	302	111	489	397	503	346	43
Arrive On Green	0.31	0.31	0.30	0.31	0.31	0.30	0.54	0.55	0.54	0.54	0.55	0.54
Sat Flow, veh/h	906	1346	444	1266	660	980	78	884	717	735	625	77
Grp Volume(v), veh/h	10	0	125	266	0	323	281	0	0	485	0	0
Grp Sat Flow(s),veh/h/ln	906	0	1790	1266	0	1639	1679	0	0	1438	0	0
Q Serve(g_s), s	0.6	0.0	3.0	11.4	0.0	9.8	0.0	0.0	0.0	6.7	0.0	0.0
Cycle Q Clear(g_c), s	10.4	0.0	3.0	14.5	0.0	9.8	5.1	0.0	0.0	11.8	0.0	0.0
Prop In Lane	1.00		0.25	1.00		0.60	0.09		0.43	0.55		0.05
Lane Grp Cap(c), veh/h	250	0	552	449	0	506	983	0	0	879	0	0
V/C Ratio(X)	0.04	0.00	0.23	0.59	0.00	0.64	0.29	0.00	0.00	0.55	0.00	0.00
Avail Cap(c_a), veh/h	284	0	619	496	0	567	983	0	0	879	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.7	0.0	14.9	20.2	0.0	17.4	7.0	0.0	0.0	8.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.2	1.6	0.0	2.0	0.7	0.0	0.0	2.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	1.0	3.0	0.0	3.3	1.3	0.0	0.0	2.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.8	0.0	15.1	21.8	0.0	19.4	7.7	0.0	0.0	10.7	0.0	0.0
LnGrp LOS	C	A	B	C	A	B	A	A	A	B	A	A
Approach Vol, veh/h		135			589			281			485	
Approach Delay, s/veh		15.6			20.5			7.7			10.7	
Approach LOS		B			C			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.0		21.8		36.0		21.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		19.5		31.5		19.5				
Max Q Clear Time (g_c+I1), s		7.1		12.4		13.8		16.5				
Green Ext Time (p_c), s		1.5		0.3		2.8		0.9				

Intersection Summary												
HCM 6th Ctrl Delay			14.4									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	148.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	400	355	395	295	0	0	0	0	185	0	440
Future Vol, veh/h	0	400	355	395	295	0	0	0	0	185	0	440
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	180	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	12	9	3	12	0	0	0	0	0	0	10
Mvmt Flow	0	421	374	416	311	0	0	0	0	195	0	463

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	795	0	0	1751	1938	311
Stage 1	-	-	-	-	-	-	1143	1143	-
Stage 2	-	-	-	-	-	-	608	795	-
Critical Hdwy	-	-	-	4.13	-	-	6.4	6.5	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	-	-	-	2.227	-	-	3.5	4	3.39
Pot Cap-1 Maneuver	0	-	-	822	-	0	~ 95	66	711
Stage 1	0	-	-	-	-	0	307	277	-
Stage 2	0	-	-	-	-	0	547	402	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	822	-	-	~ 47	0	711
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 47	0	-
Stage 1	-	-	-	-	-	-	307	0	-
Stage 2	-	-	-	-	-	-	270	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	7.9	$ 484.2
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	822	-	47	711
HCM Lane V/C Ratio	-	-	0.506	-	4.143	0.651
HCM Control Delay (s)	-	-	13.8	$	1590.7	19
HCM Lane LOS	-	-	B	-	F	C
HCM 95th %tile Q(veh)	-	-	2.9	-	21.8	4.8

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	132

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	350	235	0	0	535	195	155	0	285	0	0	0
Future Vol, veh/h	350	235	0	0	535	195	155	0	285	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	18	4	0	0	4	0	14	0	4	0	0	0
Mvmt Flow	385	258	0	0	588	214	170	0	313	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	802	0	-	-	-	0	1723	1830	258
Stage 1	-	-	-	-	-	-	1028	1028	-
Stage 2	-	-	-	-	-	-	695	802	-
Critical Hdwy	4.28	-	-	-	-	-	6.54	6.5	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	5.54	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.54	5.5	-
Follow-up Hdwy	2.362	-	-	-	-	-	3.626	4	3.336
Pot Cap-1 Maneuver	755	-	0	0	-	-	~ 91	77	776
Stage 1	-	-	0	0	-	-	328	314	-
Stage 2	-	-	0	0	-	-	474	399	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	755	-	-	-	-	-	~ 45	0	776
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 45	0	-
Stage 1	-	-	-	-	-	-	~ 161	0	-
Stage 2	-	-	-	-	-	-	474	0	-

Approach	EB	WB	NB
HCM Control Delay, s	8.7	0	$ 515.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	45	776	755	-	-	-
HCM Lane V/C Ratio	3.785	0.404	0.509	-	-	-
HCM Control Delay (s)	$ 1438.9	12.7	14.6	-	-	-
HCM Lane LOS	F	B	B	-	-	-
HCM 95th %tile Q(veh)	19	2	2.9	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
4: Portland Rd & Brooklake Rd

2043 Land Use Option 1 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	60	290	40	150	60	90	595	45	60	475	390
Future Volume (veh/h)	140	60	290	40	150	60	90	595	45	60	475	390
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1856	1870	1870	1870	1811	1856	1856	1900	1870	1826
Adj Flow Rate, veh/h	147	63	0	42	158	63	95	626	47	63	500	411
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	3	2	2	2	6	3	3	0	2	5
Cap, veh/h	315	104		123	280	102	397	832	62	352	883	731
Arrive On Green	0.22	0.24	0.00	0.22	0.24	0.22	0.06	0.49	0.46	0.04	0.47	0.47
Sat Flow, veh/h	829	435	1572	182	1173	427	1725	1705	128	1810	1870	1547
Grp Volume(v), veh/h	210	0	0	263	0	0	95	0	673	63	500	411
Grp Sat Flow(s),veh/h/ln	1264	0	1572	1782	0	0	1725	0	1833	1810	1870	1547
Q Serve(g_s), s	1.2	0.0	0.0	0.0	0.0	0.0	1.5	0.0	15.6	0.9	10.1	10.0
Cycle Q Clear(g_c), s	8.1	0.0	0.0	6.9	0.0	0.0	1.5	0.0	15.6	0.9	10.1	10.0
Prop In Lane	0.70		1.00	0.16		0.24	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	394	0		471	0	0	397	0	895	352	883	731
V/C Ratio(X)	0.53	0.00		0.56	0.00	0.00	0.24	0.00	0.75	0.18	0.57	0.56
Avail Cap(c_a), veh/h	982	0		1261	0	0	557	0	1505	549	1536	1271
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.5	0.0	0.0	18.0	0.0	0.0	7.7	0.0	10.9	9.1	10.0	9.9
Incr Delay (d2), s/veh	0.8	0.0	0.0	0.8	0.0	0.0	0.2	0.0	1.8	0.2	0.8	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	0.0	2.7	0.0	0.0	0.4	0.0	4.8	0.3	3.2	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.3	0.0	0.0	18.8	0.0	0.0	7.9	0.0	12.7	9.2	10.8	10.9
LnGrp LOS	B	A		B	A	A	A	A	B	A	B	B
Approach Vol, veh/h		210	A		263			768			974	
Approach Delay, s/veh		19.3			18.8			12.1			10.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.3	29.6		16.5	7.1	28.7		16.5
Change Period (Y+Rc), s	4.5	* 5.4		5.0	4.5	* 5.4		5.0
Max Green Setting (Gmax), s	7.5	* 42		36.0	7.5	* 42		36.0
Max Q Clear Time (g_c+I1), s	2.9	17.6		10.1	3.5	12.1		8.9
Green Ext Time (p_c), s	0.0	6.6		1.1	0.0	7.6		1.3

Intersection Summary	
HCM 6th Ctrl Delay	13.0
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	65	0	20	0	80	60	15	180	0
Future Vol, veh/h	0	0	0	65	0	20	0	80	60	15	180	0
Conflicting Peds, #/hr	0	0	0	2	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	89	92	89	92	89	89	89	89	92
Heavy Vehicles, %	2	2	2	0	2	0	2	2	2	8	0	2
Mvmt Flow	0	0	0	73	0	22	0	90	67	17	202	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	371	395	204	364	362	126	202	0	0	159	0	0
Stage 1	236	236	-	126	126	-	-	-	-	-	-	-
Stage 2	135	159	-	238	236	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.2	4.12	-	-	4.18	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.3	2.218	-	-	2.272	-	-
Pot Cap-1 Maneuver	586	542	837	596	565	930	1370	-	-	1385	-	-
Stage 1	767	710	-	883	792	-	-	-	-	-	-	-
Stage 2	868	766	-	770	710	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	565	533	835	588	556	928	1370	-	-	1382	-	-
Mov Cap-2 Maneuver	565	533	-	588	556	-	-	-	-	-	-	-
Stage 1	767	700	-	881	790	-	-	-	-	-	-	-
Stage 2	847	764	-	758	700	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	11.6	0	0.6
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1370	-	-	-	643	1382	-	-
HCM Lane V/C Ratio	-	-	-	-	0.149	0.012	-	-
HCM Control Delay (s)	0	-	-	0	11.6	7.6	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0	-	-

Intersection	
Int Delay, s/veh	18.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	50	20	75	105	90	35	190	65	80	420	45
Future Vol, veh/h	25	50	20	75	105	90	35	190	65	80	420	45
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	30	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	6	6	0	0	7	0	2	0	8	1	0
Mvmt Flow	26	52	21	77	108	93	36	196	67	82	433	46

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	976	955	457	960	945	230	479	0	0	263	0	0
Stage 1	620	620	-	302	302	-	-	-	-	-	-	-
Stage 2	356	335	-	658	643	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.56	6.26	7.1	6.5	6.27	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.1	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.054	3.354	3.5	4	3.363	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	232	254	595	238	264	797	1094	-	-	1267	-	-
Stage 1	479	474	-	712	668	-	-	-	-	-	-	-
Stage 2	666	635	-	457	472	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	118	222	594	171	231	797	1094	-	-	1267	-	-
Mov Cap-2 Maneuver	118	222	-	171	231	-	-	-	-	-	-	-
Stage 1	460	432	-	684	642	-	-	-	-	-	-	-
Stage 2	470	610	-	354	430	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	35.5	64.9	1	1.2
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1094	-	-	172	594	202	797	1267	-	-
HCM Lane V/C Ratio	0.033	-	-	0.45	0.035	0.919	0.116	0.065	-	-
HCM Control Delay (s)	8.4	0	-	42	11.3	92.3	10.1	8	0	-
HCM Lane LOS	A	A	-	E	B	F	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.1	0.1	7.4	0.4	0.2	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	160	50	15	210	85	30
Future Vol, veh/h	160	50	15	210	85	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	7	0	0	3	0	0
Mvmt Flow	195	61	18	256	104	37

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	256	0	518	226
Stage 1	-	-	-	-	226	-
Stage 2	-	-	-	-	292	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1321	-	521	818
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	762	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1321	-	513	818
Mov Cap-2 Maneuver	-	-	-	-	513	-
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	750	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	568	-	-	1321	-
HCM Lane V/C Ratio	0.247	-	-	0.014	-
HCM Control Delay (s)	13.4	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1	-	-	0	-

Intersection	
Int Delay, s/veh	18.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	100	110	105	480	610	100
Future Vol, veh/h	100	110	105	480	610	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	240	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	4	4	5	1	2
Mvmt Flow	105	116	111	505	642	105

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1422	695	747	0	-	0
Stage 1	695	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	152	439	852	-	-	-
Stage 1	499	-	-	-	-	-
Stage 2	482	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	132	439	852	-	-	-
Mov Cap-2 Maneuver	132	-	-	-	-	-
Stage 1	434	-	-	-	-	-
Stage 2	482	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	128.5	1.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	852	-	208	-	-
HCM Lane V/C Ratio	0.13	-	1.063	-	-
HCM Control Delay (s)	9.9	-	128.5	-	-
HCM Lane LOS	A	-	F	-	-
HCM 95th %tile Q(veh)	0.4	-	10	-	-

Intersection	
Int Delay, s/veh	6.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	145	30	290	75	20	490
Future Vol, veh/h	145	30	290	75	20	490
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	1	0	2	2	0	1
Mvmt Flow	167	34	333	86	23	563

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	985	376	0	0	419	0
Stage 1	376	-	-	-	-	-
Stage 2	609	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	276	675	-	-	1151	-
Stage 1	696	-	-	-	-	-
Stage 2	545	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	268	675	-	-	1151	-
Mov Cap-2 Maneuver	268	-	-	-	-	-
Stage 1	696	-	-	-	-	-
Stage 2	529	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	38.6	0	0.3
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	299	1151	-
HCM Lane V/C Ratio	-	-	0.673	0.02	-
HCM Control Delay (s)	-	-	38.6	8.2	0
HCM Lane LOS	-	-	E	A	A
HCM 95th %tile Q(veh)	-	-	4.5	0.1	-

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	60	75	40	100	10	90	100	75	15	45	5
Future Vol, veh/h	5	60	75	40	100	10	90	100	75	15	45	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	5	0	0	1	0	0	0	0	0	5	0
Mvmt Flow	6	68	85	45	114	11	102	114	85	17	51	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	511	491	54	526	452	157	57	0	0	199	0	0
Stage 1	88	88	-	361	361	-	-	-	-	-	-	-
Stage 2	423	403	-	165	91	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.55	6.2	7.1	6.51	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.55	-	6.1	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.55	-	6.1	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.045	3.3	3.5	4.009	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	476	474	1019	466	505	894	1560	-	-	1385	-	-
Stage 1	925	816	-	662	628	-	-	-	-	-	-	-
Stage 2	613	595	-	842	821	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	357	433	1019	351	462	894	1560	-	-	1385	-	-
Mov Cap-2 Maneuver	357	433	-	351	462	-	-	-	-	-	-	-
Stage 1	857	805	-	613	582	-	-	-	-	-	-	-
Stage 2	451	551	-	697	810	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.8	18.3	2.5	1.8
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1560	-	-	619	439	1385	-	-
HCM Lane V/C Ratio	0.066	-	-	0.257	0.388	0.012	-	-
HCM Control Delay (s)	7.5	-	-	12.8	18.3	7.6	0	-
HCM Lane LOS	A	-	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1	1.8	0	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	140	100	570	670	25
Future Vol, veh/h	30	140	100	570	670	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	6	0	4	2	0
Mvmt Flow	32	151	108	613	720	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1563	734	747	0	-	0
Stage 1	734	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Critical Hdwy	6.4	6.26	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.354	2.2	-	-	-
Pot Cap-1 Maneuver	124	414	870	-	-	-
Stage 1	478	-	-	-	-	-
Stage 2	432	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	101	414	870	-	-	-
Mov Cap-2 Maneuver	101	-	-	-	-	-
Stage 1	388	-	-	-	-	-
Stage 2	432	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	43	1.5	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	870	-	268	-	-
HCM Lane V/C Ratio	0.124	-	0.682	-	-
HCM Control Delay (s)	9.7	0	43	-	-
HCM Lane LOS	A	A	E	-	-
HCM 95th %tile Q(veh)	0.4	-	4.5	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	100	250	330	545	90
Future Vol, veh/h	35	100	250	330	545	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	1	1	1	1	0
Mvmt Flow	39	111	278	367	606	100

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1579	656	706	0	-	0
Stage 1	656	-	-	-	-	-
Stage 2	923	-	-	-	-	-
Critical Hdwy	6.43	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	120	467	897	-	-	-
Stage 1	514	-	-	-	-	-
Stage 2	385	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	83	467	897	-	-	-
Mov Cap-2 Maneuver	206	-	-	-	-	-
Stage 1	355	-	-	-	-	-
Stage 2	385	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.6	4.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	897	-	352	-	-
HCM Lane V/C Ratio	0.31	-	0.426	-	-
HCM Control Delay (s)	10.8	-	22.6	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	1.3	-	2.1	-	-

HCM Signalized Intersection Capacity Analysis — 2043 Land Use Option 1 - PM Peak Hour

13: River Rd & Wheatland Rd/Springwood Dr

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	5	405	15	5	5	560	905	15	10	845	15
Future Volume (vph)	10	5	405	15	5	5	560	905	15	10	845	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	0.88		1.00		0.97	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.96		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	1.00	
Flt Protected		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1837	2663		1711		3502	3560		1805	3564	
Flt Permitted		0.97	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1837	2663		1711		3502	3560		1805	3564	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	5	440	16	5	5	609	984	16	11	918	16
RTOR Reduction (vph)	0	0	399	0	5	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	16	41	0	21	0	609	999	0	11	933	0
Confl. Peds. (#/hr)			7	7			5		4	4		5
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	0%	2%	8%	0%	0%	0%	1%	8%	0%	1%	0%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		6.3	6.3		2.2		20.3	59.0		1.0	39.7	
Effective Green, g (s)		8.3	8.3		2.7		20.3	62.0		2.0	42.7	
Actuated g/C Ratio		0.09	0.09		0.03		0.23	0.69		0.02	0.47	
Clearance Time (s)		6.0	6.0		4.5		4.0	7.0		4.0	7.0	
Vehicle Extension (s)		1.0	1.0		0.5		0.5	0.5		0.5	0.5	
Lane Grp Cap (vph)		169	245		51		789	2452		40	1690	
v/s Ratio Prot		0.01			c0.01		c0.17	0.28		0.01	c0.26	
v/s Ratio Perm			c0.02									
v/c Ratio		0.09	0.17		0.41		0.77	0.41		0.28	0.55	
Uniform Delay, d1		37.4	37.7		42.9		32.7	6.1		43.3	16.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.1		2.0		4.3	0.5		1.4	1.3	
Delay (s)		37.5	37.8		44.9		37.0	6.6		44.6	18.1	
Level of Service		D	D		D		D	A		D	B	
Approach Delay (s)		37.8			44.9			18.1			18.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
14: Keizer Station Blvd & Ulali Dr

2043 Land Use Option 1 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	90	105	125	105	25	45	105	90	10	155	80
Future Volume (veh/h)	125	90	105	125	105	25	45	105	90	10	155	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1870	1870	1900	1885	1900
Adj Flow Rate, veh/h	142	102	119	142	119	28	51	119	102	11	176	91
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	2	2	0	1	0
Cap, veh/h	621	241	281	550	453	107	630	323	277	610	655	560
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1260	790	921	1178	1487	350	1130	930	797	1178	1885	1610
Grp Volume(v), veh/h	142	0	221	142	0	147	51	0	221	11	176	91
Grp Sat Flow(s),veh/h/ln	1260	0	1711	1178	0	1837	1130	0	1727	1178	1885	1610
Q Serve(g_s), s	2.2	0.0	2.4	2.5	0.0	1.4	0.8	0.0	2.2	0.2	1.5	0.9
Cycle Q Clear(g_c), s	3.6	0.0	2.4	4.9	0.0	1.4	2.3	0.0	2.2	2.4	1.5	0.9
Prop In Lane	1.00		0.54	1.00		0.19	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	621	0	521	550	0	560	630	0	600	610	655	560
V/C Ratio(X)	0.23	0.00	0.42	0.26	0.00	0.26	0.08	0.00	0.37	0.02	0.27	0.16
Avail Cap(c_a), veh/h	1387	0	1561	1266	0	1676	1759	0	2326	1787	2539	2169
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.4	0.0	6.4	8.3	0.0	6.0	6.2	0.0	5.6	6.5	5.4	5.2
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.4	0.4	0.0	0.3	0.1	0.0	0.3	0.0	0.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.5	0.0	6.6	8.4	0.0	6.1	6.3	0.0	5.8	6.5	5.5	5.2
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		363			289			272			278	
Approach Delay, s/veh		6.9			7.3			5.9			5.4	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	12.0	11.0	12.0	11.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	31.0	21.0	31.0	21.0
Max Q Clear Time (g_c+I1), s	4.4	6.9	4.3	5.6
Green Ext Time (p_c), s	0.2	0.2	0.3	0.3

Intersection Summary	
HCM 6th Ctrl Delay	6.4
HCM 6th LOS	A

HCM Signalized Intersection Capacity Analysis — 2043 Land Use Option 1 - PM Peak Hour

15: River Rd & Lockhaven Dr

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	260	175	325	210	190	125	835	275	155	750	120
Future Volume (vph)	160	260	175	325	210	190	125	835	275	155	750	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1863	1557	3400	1863	1577	1805	3574	1523	1787	3474	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1863	1557	3400	1863	1577	1805	3574	1523	1787	3474	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	165	268	180	335	216	196	129	861	284	160	773	124
RTOR Reduction (vph)	0	0	149	0	0	160	0	0	158	0	8	0
Lane Group Flow (vph)	165	268	31	335	216	36	129	861	126	160	889	0
Confl. Peds. (#/hr)	1		7	7		1	5		3	3		5
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	1%	3%	2%	1%	0%	1%	3%	1%	1%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4			2			
Actuated Green, G (s)	15.8	22.9	22.9	16.9	24.0	24.0	12.7	58.6	58.6	18.1	64.0	
Effective Green, g (s)	16.8	23.9	23.9	17.9	25.0	25.0	13.2	60.6	60.6	18.6	66.0	
Actuated g/C Ratio	0.12	0.17	0.17	0.13	0.18	0.18	0.10	0.44	0.44	0.14	0.48	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	0.5	0.5	0.5	0.5	
Lane Grp Cap (vph)	219	325	271	444	339	287	173	1580	673	242	1673	
v/s Ratio Prot	0.09	c0.14		c0.10	0.12		c0.07	c0.24		c0.09	0.26	
v/s Ratio Perm			0.02			0.02			0.08			
v/c Ratio	0.75	0.82	0.12	0.75	0.64	0.12	0.75	0.54	0.19	0.66	0.53	
Uniform Delay, d1	58.1	54.5	47.6	57.4	51.8	46.8	60.3	28.1	23.2	56.2	24.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.2	14.8	0.1	6.4	2.9	0.1	14.1	1.4	0.6	5.2	1.2	
Delay (s)	70.3	69.3	47.7	63.8	54.7	46.9	74.4	29.4	23.8	61.4	25.9	
Level of Service	E	E	D	E	D	D	E	C	C	E	C	
Approach Delay (s)		63.3			56.7			32.7			31.3	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	137.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
16: Verda Ln & Lockhaven Dr

2043 Land Use Option 1 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	600	20	45	740	145	25	50	65	185	45	25
Future Volume (veh/h)	20	600	20	45	740	145	25	50	65	185	45	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1841	1826	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	632	21	47	779	158	26	54	68	201	49	27
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Percent Heavy Veh, %	2	4	4	5	2	2	2	2	2	2	2	2
Cap, veh/h	253	1092	36	436	930	189	115	183	189	368	69	35
Arrive On Green	0.62	0.62	0.62	0.62	0.62	0.62	0.23	0.24	0.24	0.23	0.24	0.24
Sat Flow, veh/h	598	1771	59	761	1508	306	163	762	787	1068	289	147
Grp Volume(v), veh/h	22	0	653	47	0	937	148	0	0	277	0	0
Grp Sat Flow(s),veh/h/ln	598	0	1830	761	0	1814	1712	0	0	1504	0	0
Q Serve(g_s), s	1.7	0.0	11.9	2.2	0.0	22.8	0.0	0.0	0.0	5.2	0.0	0.0
Cycle Q Clear(g_c), s	24.5	0.0	11.9	14.1	0.0	22.8	4.1	0.0	0.0	9.3	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.17	0.18		0.46	0.73		0.10
Lane Grp Cap(c), veh/h	253	0	1128	436	0	1118	472	0	0	459	0	0
V/C Ratio(X)	0.09	0.00	0.58	0.11	0.00	0.84	0.31	0.00	0.00	0.60	0.00	0.00
Avail Cap(c_a), veh/h	465	0	1779	707	0	1764	885	0	0	814	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.2	0.0	6.4	10.6	0.0	8.5	17.7	0.0	0.0	19.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.5	0.1	0.0	2.1	0.4	0.0	0.0	1.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	3.0	0.3	0.0	6.1	1.5	0.0	0.0	3.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.4	0.0	6.9	10.7	0.0	10.6	18.0	0.0	0.0	20.8	0.0	0.0
LnGrp LOS	B	A	A	B	A	B	B	A	A	C	A	A
Approach Vol, veh/h		675			984			148			277	
Approach Delay, s/veh		7.2			10.6			18.0			20.8	
Approach LOS		A			B			B			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	17.4	38.4	17.4	38.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	27.3	53.7	27.3	53.7
Max Q Clear Time (g_c+I1), s	6.1	26.5	11.3	24.8
Green Ext Time (p_c), s	0.8	5.0	1.5	9.0

Intersection Summary	
HCM 6th Ctrl Delay	11.4
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
17: Kafir Dr/14th Ave & Lockhaven Dr

2043 Land Use Option 1 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	815	20	10	905	140	20	55	15	45	25	40
Future Volume (veh/h)	55	815	20	10	905	140	20	55	15	45	25	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.98		0.97	0.97		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1841	1841	1900	1870	1900	1900	1900	1900	1885	1900	1900
Adj Flow Rate, veh/h	57	840	21	10	933	144	21	57	15	46	26	41
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	0	2	0	0	0	0	1	0	0
Cap, veh/h	355	1334	33	419	1365	1149	191	182	48	177	76	119
Arrive On Green	0.02	0.75	0.75	0.01	0.73	0.73	0.13	0.13	0.13	0.12	0.12	0.12
Sat Flow, veh/h	1810	1788	45	1810	1870	1575	1322	1439	379	1304	649	1024
Grp Volume(v), veh/h	57	0	861	10	933	144	21	0	72	46	0	67
Grp Sat Flow(s),veh/h/ln	1810	0	1833	1810	1870	1575	1322	0	1817	1304	0	1673
Q Serve(g_s), s	0.8	0.0	22.5	0.2	26.9	2.7	1.5	0.0	3.6	3.4	0.0	3.7
Cycle Q Clear(g_c), s	0.8	0.0	22.5	0.2	26.9	2.7	5.2	0.0	3.6	7.0	0.0	3.7
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.21	1.00		0.61
Lane Grp Cap(c), veh/h	355	0	1368	419	1365	1149	191	0	230	177	0	195
V/C Ratio(X)	0.16	0.00	0.63	0.02	0.68	0.13	0.11	0.00	0.31	0.26	0.00	0.34
Avail Cap(c_a), veh/h	457	0	1368	550	1365	1149	327	0	418	325	0	385
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.5	0.0	6.1	6.0	7.3	4.0	42.1	0.0	39.7	43.8	0.0	40.7
Incr Delay (d2), s/veh	0.1	0.0	2.2	0.0	2.8	0.2	0.1	0.0	0.3	0.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	7.2	0.0	9.3	0.8	0.5	0.0	1.6	1.1	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.5	0.0	8.3	6.0	10.1	4.2	42.2	0.0	40.0	44.1	0.0	41.0
LnGrp LOS	A	A	A	A	B	A	D	A	D	D	A	D
Approach Vol, veh/h		918			1087			93			113	
Approach Delay, s/veh		8.2			9.3			40.5			42.3	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.7	78.6		16.7	6.4	77.0		16.7
Change Period (Y+Rc), s	4.0	5.0		* 5	4.0	5.0		5.0
Max Green Setting (Gmax), s	8.0	56.0		* 23	8.0	56.0		22.0
Max Q Clear Time (g_c+I1), s	2.8	24.5		9.0	2.8	28.9		7.2
Green Ext Time (p_c), s	0.0	1.3		0.1	0.0	1.4		0.1

Intersection Summary	
HCM 6th Ctrl Delay	11.8
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
18: McLeod Ln & Lockhaven Dr

2043 Land Use Option 1 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	775	15	30	935	290	15	60	10	135	30	25
Future Volume (veh/h)	45	775	15	30	935	290	15	60	10	135	30	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1841	1841	1900	1885	1885	1900	1870	1900	1900	1900	1900
Adj Flow Rate, veh/h	49	842	16	33	1016	315	16	65	11	147	33	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	4	4	0	1	1	0	2	0	0	0	0
Cap, veh/h	63	2591	49	42	1948	599	19	101	86	111	101	83
Arrive On Green	0.04	0.74	0.73	0.05	1.00	1.00	0.01	0.05	0.05	0.06	0.10	0.10
Sat Flow, veh/h	1810	3511	67	1810	2682	825	1810	1870	1601	1810	965	790
Grp Volume(v), veh/h	49	419	439	33	676	655	16	65	11	147	0	60
Grp Sat Flow(s),veh/h/ln	1810	1749	1829	1810	1791	1716	1810	1870	1601	1810	0	1755
Q Serve(g_s), s	3.5	10.7	10.8	2.3	0.0	0.0	1.1	4.4	0.9	8.0	0.0	4.1
Cycle Q Clear(g_c), s	3.5	10.7	10.8	2.3	0.0	0.0	1.1	4.4	0.9	8.0	0.0	4.1
Prop In Lane	1.00		0.04	1.00		0.48	1.00		1.00	1.00		0.45
Lane Grp Cap(c), veh/h	63	1291	1350	42	1301	1246	19	101	86	111	0	184
V/C Ratio(X)	0.77	0.32	0.32	0.78	0.52	0.53	0.83	0.64	0.13	1.32	0.00	0.33
Avail Cap(c_a), veh/h	167	1291	1350	111	1301	1246	111	317	271	111	0	297
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	62.2	5.9	5.9	61.6	0.0	0.0	64.2	60.3	58.6	61.0	0.0	53.9
Incr Delay (d2), s/veh	7.2	0.7	0.6	7.7	1.0	1.1	27.3	2.5	0.2	193.6	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	3.7	3.9	1.1	0.4	0.4	0.7	2.2	0.3	9.7	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.4	6.5	6.5	69.3	1.0	1.1	91.5	62.8	58.8	254.6	0.0	54.3
LnGrp LOS	E	A	A	E	A	A	F	E	E	F	A	D
Approach Vol, veh/h		907			1364			92			207	
Approach Delay, s/veh		9.9			2.7			67.3			196.6	
Approach LOS		A			A			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	100.0	5.4	17.6	8.6	98.4	12.0	11.0
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	75.0	8.0	22.0	12.0	71.0	8.0	22.0
Max Q Clear Time (g_c+I1), s	4.3	12.8	3.1	6.1	5.5	2.0	10.0	6.4
Green Ext Time (p_c), s	0.0	1.1	0.0	0.1	0.0	2.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary — 2043 Land Use Option 1 - PM Peak Hour

19: Chemawa Rd & Lockhaven Dr & Keizer Station Blvd

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	740	15	455	1125	65	10	105	245	275	90	120
Future Volume (veh/h)	165	740	15	455	1125	65	10	105	245	275	90	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1885	1885	1900	1811	1811	1900	1826	1826
Adj Flow Rate, veh/h	172	771	16	474	1172	68	10	109	255	286	94	125
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	0	1	1	0	6	6	0	5	5
Cap, veh/h	220	1834	38	432	1989	115	13	202	294	223	416	347
Arrive On Green	0.13	1.00	1.00	0.12	0.58	0.57	0.01	0.11	0.11	0.12	0.23	0.23
Sat Flow, veh/h	3428	3532	73	3510	3441	199	1810	1811	2638	1810	1826	1526
Grp Volume(v), veh/h	172	385	402	474	610	630	10	109	255	286	94	125
Grp Sat Flow(s),veh/h/ln	1714	1763	1842	1755	1791	1849	1810	1811	1319	1810	1826	1526
Q Serve(g_s), s	6.3	0.0	0.0	16.0	28.3	28.4	0.7	7.4	12.4	16.0	5.4	9.0
Cycle Q Clear(g_c), s	6.3	0.0	0.0	16.0	28.3	28.4	0.7	7.4	12.4	16.0	5.4	9.0
Prop In Lane	1.00		0.04	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	220	915	957	432	1035	1069	13	202	294	223	416	347
V/C Ratio(X)	0.78	0.42	0.42	1.10	0.59	0.59	0.79	0.54	0.87	1.28	0.23	0.36
Avail Cap(c_a), veh/h	527	915	957	432	1035	1069	139	265	386	223	416	347
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.8	0.0	0.0	57.0	17.5	17.6	64.5	54.6	56.8	57.0	40.9	42.2
Incr Delay (d2), s/veh	2.1	1.3	1.3	72.2	2.5	2.4	32.0	0.8	12.4	157.5	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.3	0.3	11.4	11.9	12.3	0.4	3.4	4.6	17.0	2.5	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.9	1.3	1.3	129.2	20.0	20.0	96.4	55.4	69.2	214.5	41.0	42.5
LnGrp LOS	E	A	A	F	B	B	F	E	E	F	D	D
Approach Vol, veh/h		959			1714			374			505	
Approach Delay, s/veh		11.4			50.2			65.9			139.6	
Approach LOS		B			D			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	71.5	4.9	33.6	12.3	79.2	20.0	18.5
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	62.0	10.0	25.0	20.0	58.0	16.0	19.0
Max Q Clear Time (g_c+I1), s	18.3	2.0	2.7	11.0	8.3	30.4	18.0	14.4
Green Ext Time (p_c), s	0.0	1.0	0.0	0.1	0.0	1.8	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	54.1
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
20: Chemawa Rd & SB Ramp

2043 Land Use Option 1 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	690	1040	500	1805	0	0	0	0	275	15	390
Future Volume (veh/h)	0	690	1040	500	1805	0	0	0	0	275	15	390
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1885	1885	1885	0				1870	1648	1870
Adj Flow Rate, veh/h	0	719	1083	521	1880	0				286	16	406
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	3	1	1	1	0				2	17	2
Cap, veh/h	0	1502	1198	669	2387	0				353	20	660
Arrive On Green	0.00	0.43	0.43	0.19	0.67	0.00				0.21	0.24	0.24
Sat Flow, veh/h	0	3618	2812	3483	3676	0				1490	83	2790
Grp Volume(v), veh/h	0	719	1083	521	1880	0				302	0	406
Grp Sat Flow(s),veh/h/ln	0	1763	1406	1742	1791	0				1574	0	1395
Q Serve(g_s), s	0.0	12.2	29.7	11.7	30.5	0.0				15.1	0.0	10.7
Cycle Q Clear(g_c), s	0.0	12.2	29.7	11.7	30.5	0.0				15.1	0.0	10.7
Prop In Lane	0.00		1.00	1.00		0.00				0.95		1.00
Lane Grp Cap(c), veh/h	0	1502	1198	669	2387	0				373	0	660
V/C Ratio(X)	0.00	0.48	0.90	0.78	0.79	0.00				0.81	0.00	0.61
Avail Cap(c_a), veh/h	0	1749	1395	885	2387	0				781	0	1384
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.1	22.1	31.7	9.7	0.0				30.7	0.0	28.2
Incr Delay (d2), s/veh	0.0	0.1	7.2	2.3	1.7	0.0				1.6	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.6	10.1	5.0	10.0	0.0				5.6	0.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.2	29.3	34.0	11.3	0.0				32.4	0.0	28.5
LnGrp LOS	A	B	C	C	B	A				C	A	C
Approach Vol, veh/h		1802			2401						708	
Approach Delay, s/veh		24.5			16.3						30.2	
Approach LOS		C			B						C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	19.9	39.2		23.6		59.1
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	19.0	39.0		39.0		39.0
Max Q Clear Time (g_c+I1), s	13.7	31.7		17.1		32.5
Green Ext Time (p_c), s	0.1	1.5		0.5		3.0

Intersection Summary	
HCM 6th Ctrl Delay	21.3
HCM 6th LOS	C

HCM Signalized Intersection Capacity Analysis 2043 Land Use Option 1 - PM Peak Hour

21: NB Ramp & Chemawa Rd

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	715	0	0	1115	250	1190	0	505	0	0	0
Future Volume (vph)	250	715	0	0	1115	250	1190	0	505	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00			
Frt	1.00	1.00			0.97		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (prot)	1770	3505			3457		1698	1698	1568			
Flt Permitted	0.95	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (perm)	1770	3505			3457		1698	1698	1568			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	266	761	0	0	1186	266	1266	0	537	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	0	0	0	91	0	0	0
Lane Group Flow (vph)	266	761	0	0	1435	0	633	633	446	0	0	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	3%	0%	0%	1%	4%	1%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA		Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases							4		4			
Actuated Green, G (s)	16.7	52.0			29.3		40.0	40.0	40.0			
Effective Green, g (s)	18.7	54.0			31.3		42.0	42.0	42.0			
Actuated g/C Ratio	0.18	0.52			0.30		0.40	0.40	0.40			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	0.5	0.5			0.5		0.5	0.5	0.5			
Lane Grp Cap (vph)	318	1819			1040		685	685	633			
v/s Ratio Prot	c0.15	0.22			c0.42							
v/s Ratio Perm							c0.37	0.37	0.28			
v/c Ratio	0.84	0.42			1.38		0.92	0.92	0.71			
Uniform Delay, d1	41.2	15.4			36.4		29.5	29.5	25.8			
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2	16.4	0.1			177.1		17.9	17.9	2.9			
Delay (s)	57.6	15.4			213.4		47.4	47.4	28.8			
Level of Service	E	B			F		D	D	C			
Approach Delay (s)		26.3			213.4			41.9			0.0	
Approach LOS		C			F			D			A	

Intersection Summary			
HCM 2000 Control Delay	96.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary
22: Portland Rd & Chemawa Rd/Hazelgreen Rd

2043 Land Use Option 1 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	560	410	65	415	35	550	495	145	120	635	125
Future Volume (veh/h)	125	560	410	65	415	35	550	495	145	120	635	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1870	1841	1885	1885	1900	1826	1826	1781	1870	1856
Adj Flow Rate, veh/h	134	602	441	70	446	38	591	532	156	129	683	134
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	2	4	1	1	0	5	5	8	2	3
Cap, veh/h	177	637	549	100	518	44	248	772	225	179	923	408
Arrive On Green	0.10	0.35	0.35	0.06	0.30	0.28	0.14	0.29	0.27	0.11	0.26	0.26
Sat Flow, veh/h	1753	1841	1585	1753	1713	146	1810	2648	773	1697	3554	1572
Grp Volume(v), veh/h	134	602	441	70	0	484	591	348	340	129	683	134
Grp Sat Flow(s),veh/h/ln	1753	1841	1585	1753	0	1859	1810	1735	1687	1697	1777	1572
Q Serve(g_s), s	6.0	25.5	20.2	3.1	0.0	19.7	11.0	14.2	14.4	5.9	14.1	5.5
Cycle Q Clear(g_c), s	6.0	25.5	20.2	3.1	0.0	19.7	11.0	14.2	14.4	5.9	14.1	5.5
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	177	637	549	100	0	562	248	506	492	179	923	408
V/C Ratio(X)	0.76	0.94	0.80	0.70	0.00	0.86	2.38	0.69	0.69	0.72	0.74	0.33
Avail Cap(c_a), veh/h	241	637	549	241	0	603	248	563	547	233	1153	510
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.1	25.5	23.7	37.1	0.0	26.5	34.6	25.2	25.6	34.7	27.2	24.0
Incr Delay (d2), s/veh	7.5	22.8	8.2	6.3	0.0	11.3	633.3	2.8	2.9	6.2	1.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	13.9	8.0	1.4	0.0	9.5	48.2	5.7	5.7	2.7	6.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.6	48.3	32.0	43.4	0.0	37.7	667.9	27.9	28.6	40.9	28.9	24.4
LnGrp LOS	D	D	C	D	A	D	F	C	C	D	C	C
Approach Vol, veh/h		1177			554			1279			946	
Approach Delay, s/veh		41.5			38.5			323.8			29.9	
Approach LOS		D			D			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	24.8	12.1	28.2	12.5	27.4	8.6	31.8
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	10.5	24.0	10.5	24.0	10.5	24.0	10.5	24.0
Max Q Clear Time (g_c+I1), s	13.6	16.1	8.0	21.7	7.9	16.4	5.1	27.5
Green Ext Time (p_c), s	0.0	2.7	0.1	0.5	0.1	2.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	129.6
HCM 6th LOS	F

HCM 6th Signalized Intersection Summary
23: River Rd & Chemawa Rd

2043 Land Use Option 1 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	225	200	180	295	130	210	1075	110	155	900	110
Future Volume (veh/h)	150	225	200	180	295	130	210	1075	110	155	900	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1710	1697	1683	1697	1710	1697	1697	1697	1697	1697	1683	1683
Adj Flow Rate, veh/h	158	237	211	189	311	137	221	1132	116	163	947	116
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	2	1	0	1	1	1	1	1	2	2
Cap, veh/h	180	266	215	211	303	245	243	1393	143	182	1257	154
Arrive On Green	0.11	0.16	0.16	0.13	0.18	0.18	0.15	0.47	0.47	0.23	0.88	0.87
Sat Flow, veh/h	1629	1697	1369	1616	1710	1387	1616	2947	302	1616	2862	351
Grp Volume(v), veh/h	158	237	211	189	311	137	221	618	630	163	529	534
Grp Sat Flow(s),veh/h/ln	1629	1697	1369	1616	1710	1387	1616	1612	1637	1616	1599	1613
Q Serve(g_s), s	12.4	17.8	20.0	15.0	23.0	11.7	17.5	42.7	42.9	12.7	15.5	15.6
Cycle Q Clear(g_c), s	12.4	17.8	20.0	15.0	23.0	11.7	17.5	42.7	42.9	12.7	15.5	15.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		0.22
Lane Grp Cap(c), veh/h	180	266	215	211	303	245	243	762	774	182	702	708
V/C Ratio(X)	0.88	0.89	0.98	0.90	1.03	0.56	0.91	0.81	0.81	0.89	0.75	0.75
Avail Cap(c_a), veh/h	194	266	215	242	303	245	360	762	774	186	702	708
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.89	0.89
Uniform Delay (d), s/veh	56.9	53.7	54.6	55.6	53.5	48.9	54.4	29.3	29.4	49.6	5.4	5.5
Incr Delay (d2), s/veh	26.6	24.4	50.7	27.6	59.1	1.7	15.6	9.2	9.2	33.4	6.6	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	9.4	9.9	7.7	14.8	4.2	8.1	17.9	18.3	6.2	3.4	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.5	78.1	105.3	83.2	112.6	50.6	70.0	38.5	38.5	82.9	12.0	12.0
LnGrp LOS	F	E	F	F	F	D	E	D	D	F	B	B
Approach Vol, veh/h		606			637			1469			1226	
Approach Delay, s/veh		89.0			90.6			43.3			21.4	
Approach LOS		F			F			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.7	65.9	21.0	24.4	23.5	61.1	18.4	27.0
Change Period (Y+Rc), s	4.0	4.5	4.0	4.0	4.0	4.5	4.0	4.0
Max Green Setting (Gmax), s	15.0	60.0	19.5	19.0	29.0	46.0	15.5	23.0
Max Q Clear Time (g_c+I1), s	14.7	44.9	17.0	22.0	19.5	17.6	14.4	25.0
Green Ext Time (p_c), s	0.0	1.7	0.0	0.0	0.0	1.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	51.1
HCM 6th LOS	D

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	505	557	531	123
Demand Flow Rate, veh/h	510	565	536	124
Vehicles Circulating, veh/h	292	368	276	746
Vehicles Exiting, veh/h	578	444	526	187
Ped Vol Crossing Leg, #/h	0	0	2	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.5	12.3	9.7	7.9
Approach LOS	A	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	510	565	536	124
Cap Entry Lane, veh/h	1024	948	1041	645
Entry HV Adj Factor	0.990	0.986	0.990	0.993
Flow Entry, veh/h	505	557	531	123
Cap Entry, veh/h	1014	935	1031	641
V/C Ratio	0.498	0.596	0.515	0.192
Control Delay, s/veh	9.5	12.3	9.7	7.9
LOS	A	B	A	A
95th %tile Queue, veh	3	4	3	1

HCM 6th Signalized Intersection Summary
25: Salem Pkwy & Verda Ln/Hyacinth St

2043 Land Use Option 1 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	640	40	455	850	305	95	1195	625	200	905	210
Future Volume (veh/h)	40	640	40	455	850	305	95	1195	625	200	905	210
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1856	1885	1885	1870	1826	1885	1856	1885	1870	1856	1900
Adj Flow Rate, veh/h	41	653	41	464	867	311	97	1219	0	204	923	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	3	1	1	2	5	1	3	1	2	3	0
Cap, veh/h	111	343	289	359	604	492	134	1193		260	1472	
Arrive On Green	0.06	0.18	0.18	0.20	0.32	0.32	0.07	0.34	0.00	0.15	0.42	0.00
Sat Flow, veh/h	1810	1856	1566	1795	1870	1522	1795	3526	1598	1781	3526	1610
Grp Volume(v), veh/h	41	653	41	464	867	311	97	1219	0	204	923	0
Grp Sat Flow(s),veh/h/ln	1810	1856	1566	1795	1870	1522	1795	1763	1598	1781	1763	1610
Q Serve(g_s), s	2.8	24.0	2.3	26.0	42.0	22.6	6.9	44.0	0.0	14.4	26.9	0.0
Cycle Q Clear(g_c), s	2.8	24.0	2.3	26.0	42.0	22.6	6.9	44.0	0.0	14.4	26.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	111	343	289	359	604	492	134	1193		260	1472	
V/C Ratio(X)	0.37	1.91	0.14	1.29	1.43	0.63	0.72	1.02		0.78	0.63	
Avail Cap(c_a), veh/h	111	343	289	359	604	492	290	1193		274	1472	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.6	53.0	29.4	52.0	44.0	37.4	58.8	43.0	0.0	53.5	29.9	0.0
Incr Delay (d2), s/veh	2.0	418.6	0.2	150.8	205.0	2.0	7.1	31.6	0.0	13.2	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	50.9	1.1	26.6	53.5	8.6	3.3	23.2	0.0	7.1	11.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.6	471.6	29.6	202.8	249.0	39.4	65.9	74.6	0.0	66.7	31.9	0.0
LnGrp LOS	E	F	C	F	F	D	E	F		E	C	
Approach Vol, veh/h		735			1642			1316	A		1127	A
Approach Delay, s/veh		424.0			196.3			74.0			38.2	
Approach LOS		F			F			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	58.3	12.0	46.0	24.0	48.0	30.0	28.0
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	6.0	* 6	5.0	5.0
Max Green Setting (Gmax), s	20.0	41.0	7.0	41.0	19.0	* 42	25.0	23.0
Max Q Clear Time (g_c+I1), s	7.3	28.9	4.8	44.0	16.4	46.0	28.0	26.0
Green Ext Time (p_c), s	0.1	5.1	0.0	0.0	0.1	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	160.7
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
1: River Rd & Brooklake Rd

2043 Land Use Option 2 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	95	30	315	145	195	25	125	145	270	175	25
Future Volume (veh/h)	5	95	30	315	145	195	25	125	145	270	175	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1604	1870	1870	1870	1841	1841	1856	1856	1856	1870	1870	1870
Adj Flow Rate, veh/h	5	99	31	328	151	203	26	130	151	281	182	26
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	20	2	2	2	4	4	3	3	3	2	2	2
Cap, veh/h	252	455	143	474	234	315	101	416	438	495	296	39
Arrive On Green	0.33	0.33	0.32	0.33	0.33	0.32	0.52	0.53	0.52	0.52	0.53	0.52
Sat Flow, veh/h	881	1366	428	1260	702	944	67	781	821	751	556	73
Grp Volume(v), veh/h	5	0	130	328	0	354	307	0	0	489	0	0
Grp Sat Flow(s),veh/h/ln	881	0	1793	1260	0	1647	1668	0	0	1380	0	0
Q Serve(g_s), s	0.3	0.0	3.1	15.2	0.0	11.0	0.0	0.0	0.0	8.3	0.0	0.0
Cycle Q Clear(g_c), s	11.3	0.0	3.1	18.3	0.0	11.0	6.2	0.0	0.0	14.5	0.0	0.0
Prop In Lane	1.00		0.24	1.00		0.57	0.08		0.49	0.57		0.05
Lane Grp Cap(c), veh/h	252	0	598	474	0	549	941	0	0	819	0	0
V/C Ratio(X)	0.02	0.00	0.22	0.69	0.00	0.64	0.33	0.00	0.00	0.60	0.00	0.00
Avail Cap(c_a), veh/h	252	0	598	474	0	549	941	0	0	819	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.8	0.0	14.4	21.0	0.0	17.1	8.1	0.0	0.0	9.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.2	4.3	0.0	2.6	0.9	0.0	0.0	3.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	1.0	4.3	0.0	3.8	1.7	0.0	0.0	3.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.8	0.0	14.6	25.2	0.0	19.7	9.0	0.0	0.0	12.9	0.0	0.0
LnGrp LOS	C	A	B	C	A	B	A	A	A	B	A	A
Approach Vol, veh/h		135			682			307			489	
Approach Delay, s/veh		14.9			22.4			9.0			12.9	
Approach LOS		B			C			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.0		24.0		36.0		24.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		19.5		31.5		19.5				
Max Q Clear Time (g_c+I1), s		8.2		13.3		16.5		20.3				
Green Ext Time (p_c), s		1.6		0.2		2.7		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			16.3									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	58.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	420	400	340	360	0	0	0	0	125	0	465
Future Vol, veh/h	0	420	400	340	360	0	0	0	0	125	0	465
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	180	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	12	9	3	12	0	0	0	0	0	0	10
Mvmt Flow	0	442	421	358	379	0	0	0	0	132	0	489

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	863	0	0	1748	1958	379
Stage 1	-	-	-	-	-	-	1095	1095	-
Stage 2	-	-	-	-	-	-	653	863	-
Critical Hdwy	-	-	-	4.13	-	-	6.4	6.5	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	-	-	-	2.227	-	-	3.5	4	3.39
Pot Cap-1 Maneuver	0	-	-	775	-	0	~ 96	64	651
Stage 1	0	-	-	-	-	0	323	292	-
Stage 2	0	-	-	-	-	0	522	374	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	775	-	-	~ 52	0	651
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 52	0	-
Stage 1	-	-	-	-	-	-	323	0	-
Stage 2	-	-	-	-	-	-	281	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	6.6	202.8
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	775	-	52	651
HCM Lane V/C Ratio	-	-	0.462	-	2.53	0.752
HCM Control Delay (s)	-	-	13.6	-	$ 862.9	25.3
HCM Lane LOS	-	-	B	-	F	D
HCM 95th %tile Q(veh)	-	-	2.5	-	13.6	6.8

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	149.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	325	220	0	0	505	160	195	0	305	0	0	0
Future Vol, veh/h	325	220	0	0	505	160	195	0	305	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	18	4	0	0	4	0	14	0	4	0	0	0
Mvmt Flow	357	242	0	0	555	176	214	0	335	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	731	0	-	-	-	0	1599	1687	242
Stage 1	-	-	-	-	-	-	956	956	-
Stage 2	-	-	-	-	-	-	643	731	-
Critical Hdwy	4.28	-	-	-	-	-	6.54	6.5	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	5.54	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.54	5.5	-
Follow-up Hdwy	2.362	-	-	-	-	-	3.626	4	3.336
Pot Cap-1 Maneuver	805	-	0	0	-	-	~ 109	95	792
Stage 1	-	-	0	0	-	-	355	339	-
Stage 2	-	-	0	0	-	-	501	430	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	805	-	-	-	-	-	~ 61	0	792
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 61	0	-
Stage 1	-	-	-	-	-	-	~ 198	0	-
Stage 2	-	-	-	-	-	-	501	0	-

Approach	EB	WB	NB
HCM Control Delay, s	7.7	0	$ 503.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	61	792	805	-	-	-
HCM Lane V/C Ratio	3.513	0.423	0.444	-	-	-
HCM Control Delay (s)	$ 1272	12.8	13	-	-	-
HCM Lane LOS	F	B	B	-	-	-
HCM 95th %tile Q(veh)	22.7	2.1	2.3	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 6th Signalized Intersection Summary
4: Portland Rd & Brooklake Rd

2043 Land Use Option 2 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	90	240	55	165	75	70	550	55	80	525	330
Future Volume (veh/h)	165	90	240	55	165	75	70	550	55	80	525	330
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1856	1870	1870	1870	1811	1856	1856	1900	1870	1826
Adj Flow Rate, veh/h	174	95	0	58	174	79	74	579	58	84	553	347
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	7	7	3	2	2	2	6	3	3	0	2	5
Cap, veh/h	312	133		137	320	131	330	747	75	328	850	703
Arrive On Green	0.28	0.30	0.00	0.28	0.30	0.28	0.05	0.45	0.43	0.05	0.45	0.45
Sat Flow, veh/h	719	450	1572	220	1076	441	1725	1659	166	1810	1870	1547
Grp Volume(v), veh/h	269	0	0	311	0	0	74	0	637	84	553	347
Grp Sat Flow(s),veh/h/ln	1169	0	1572	1738	0	0	1725	0	1826	1810	1870	1547
Q Serve(g_s), s	4.1	0.0	0.0	0.0	0.0	0.0	1.4	0.0	17.7	1.5	13.7	9.5
Cycle Q Clear(g_c), s	13.2	0.0	0.0	9.2	0.0	0.0	1.4	0.0	17.7	1.5	13.7	9.5
Prop In Lane	0.65		1.00	0.19		0.25	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	426	0		558	0	0	330	0	822	328	850	703
V/C Ratio(X)	0.63	0.00		0.56	0.00	0.00	0.22	0.00	0.77	0.26	0.65	0.49
Avail Cap(c_a), veh/h	829	0		1089	0	0	476	0	1309	474	1342	1110
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	0.0	18.2	0.0	0.0	10.1	0.0	14.0	11.2	12.7	11.5
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.6	0.0	0.0	0.3	0.0	2.3	0.3	1.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	0.0	3.5	0.0	0.0	0.4	0.0	6.2	0.5	4.8	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.0	0.0	0.0	18.9	0.0	0.0	10.3	0.0	16.2	11.5	13.9	12.3
LnGrp LOS	C	A		B	A	A	B	A	B	B	B	B
Approach Vol, veh/h		269	A		311			711			984	
Approach Delay, s/veh		21.0			18.9			15.6			13.1	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.2	31.0		21.8	6.9	31.2		21.8
Change Period (Y+Rc), s	4.5	* 5.4		5.0	4.5	* 5.4		5.0
Max Green Setting (Gmax), s	7.5	* 42		36.0	7.5	* 42		36.0
Max Q Clear Time (g_c+I1), s	3.5	19.7		15.2	3.4	15.7		11.2
Green Ext Time (p_c), s	0.0	5.9		1.4	0.0	7.4		1.5

Intersection Summary	
HCM 6th Ctrl Delay	15.6
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	90	0	20	0	65	55	15	190	0
Future Vol, veh/h	0	0	0	90	0	20	0	65	55	15	190	0
Conflicting Peds, #/hr	0	0	0	2	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	89	92	89	92	89	89	89	89	92
Heavy Vehicles, %	2	2	2	0	2	0	2	2	2	8	0	2
Mvmt Flow	0	0	0	101	0	22	0	73	62	17	213	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	362	384	215	355	353	106	213	0	0	137	0	0
Stage 1	247	247	-	106	106	-	-	-	-	-	-	-
Stage 2	115	137	-	249	247	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.2	4.12	-	-	4.18	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.3	2.218	-	-	2.272	-	-
Pot Cap-1 Maneuver	594	550	825	604	572	954	1357	-	-	1411	-	-
Stage 1	757	702	-	905	807	-	-	-	-	-	-	-
Stage 2	890	783	-	759	702	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	574	541	823	596	563	952	1357	-	-	1408	-	-
Mov Cap-2 Maneuver	574	541	-	596	563	-	-	-	-	-	-	-
Stage 1	757	692	-	903	805	-	-	-	-	-	-	-
Stage 2	869	781	-	747	692	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	12	0	0.6
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1357	-	-	-	639	1408	-	-
HCM Lane V/C Ratio	-	-	-	-	0.193	0.012	-	-
HCM Control Delay (s)	0	-	-	0	12	7.6	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.7	0	-	-

Intersection	
Int Delay, s/veh	21.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	50	20	90	115	105	30	150	55	80	430	45
Future Vol, veh/h	25	50	20	90	115	105	30	150	55	80	430	45
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	-	-	30	-	-	50	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	6	6	0	0	7	0	2	0	8	1	0
Mvmt Flow	26	52	21	93	119	108	31	155	57	82	443	46

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	935	904	467	914	899	184	489	0	0	212	0	0
Stage 1	630	630	-	246	246	-	-	-	-	-	-	-
Stage 2	305	274	-	668	653	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.56	6.26	7.1	6.5	6.27	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.1	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.054	3.354	3.5	4	3.363	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	248	273	588	256	281	846	1085	-	-	1323	-	-
Stage 1	473	469	-	762	706	-	-	-	-	-	-	-
Stage 2	709	676	-	451	467	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	124	241	587	188	248	846	1085	-	-	1323	-	-
Mov Cap-2 Maneuver	124	241	-	188	248	-	-	-	-	-	-	-
Stage 1	457	429	-	737	683	-	-	-	-	-	-	-
Stage 2	494	654	-	350	427	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.6	69.4	1.1	1.1
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1085	-	-	183	587	218	846	1323	-	-
HCM Lane V/C Ratio	0.029	-	-	0.423	0.035	0.969	0.128	0.062	-	-
HCM Control Delay (s)	8.4	0	-	38.3	11.4	99.8	9.9	7.9	0	-
HCM Lane LOS	A	A	-	E	B	F	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.9	0.1	8.5	0.4	0.2	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	180	50	15	330	90	20
Future Vol, veh/h	180	50	15	330	90	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	7	0	0	3	0	0
Mvmt Flow	220	61	18	402	110	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	281	0	689	251
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	438	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1293	-	415	793
Stage 1	-	-	-	-	795	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1293	-	408	793
Mov Cap-2 Maneuver	-	-	-	-	408	-
Stage 1	-	-	-	-	795	-
Stage 2	-	-	-	-	643	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	16.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	448	-	-	1293	-
HCM Lane V/C Ratio	0.299	-	-	0.014	-
HCM Control Delay (s)	16.4	-	-	7.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.2	-	-	0	-

Intersection	
Int Delay, s/veh	33.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	105	115	145	465	615	155
Future Vol, veh/h	105	115	145	465	615	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	240	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	4	4	5	1	2
Mvmt Flow	111	121	153	489	647	163

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1524	729	810	0	-	0
Stage 1	729	-	-	-	-	-
Stage 2	795	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	131	420	807	-	-	-
Stage 1	481	-	-	-	-	-
Stage 2	448	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 106	420	807	-	-	-
Mov Cap-2 Maneuver	~ 106	-	-	-	-	-
Stage 1	390	-	-	-	-	-
Stage 2	448	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	234.1	2.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	807	-	174	-	-
HCM Lane V/C Ratio	0.189	-	1.331	-	-
HCM Control Delay (s)	10.5	-	234.1	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	0.7	-	13.6	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	14.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	185	30	245	200	35	480
Future Vol, veh/h	185	30	245	200	35	480
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	1	0	2	2	0	1
Mvmt Flow	213	34	282	230	40	552

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1029	397	0	0	512	0
Stage 1	397	-	-	-	-	-
Stage 2	632	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	260	657	-	-	1064	-
Stage 1	681	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	246	657	-	-	1064	-
Mov Cap-2 Maneuver	246	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	503	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	75.8	0	0.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	270	1064	-
HCM Lane V/C Ratio	-	-	0.915	0.038	-
HCM Control Delay (s)	-	-	75.8	8.5	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	8.3	0.1	-

Intersection	
Int Delay, s/veh	12.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	45	100	145	75	10	70	95	165	15	45	5
Future Vol, veh/h	5	45	100	145	75	10	70	95	165	15	45	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	5	0	0	1	0	0	0	0	0	5	0
Mvmt Flow	6	51	114	165	85	11	80	108	188	17	51	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	498	544	54	533	453	202	57	0	0	296	0	0
Stage 1	88	88	-	362	362	-	-	-	-	-	-	-
Stage 2	410	456	-	171	91	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.55	6.2	7.1	6.51	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.55	-	6.1	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.55	-	6.1	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.045	3.3	3.5	4.009	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	486	442	1019	461	504	844	1560	-	-	1277	-	-
Stage 1	925	816	-	661	627	-	-	-	-	-	-	-
Stage 2	623	563	-	836	821	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	389	408	1019	349	466	844	1560	-	-	1277	-	-
Mov Cap-2 Maneuver	389	408	-	349	466	-	-	-	-	-	-	-
Stage 1	867	805	-	619	587	-	-	-	-	-	-	-
Stage 2	492	528	-	686	810	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.1	30.9	1.6	1.8
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1560	-	-	678	391	1277	-	-
HCM Lane V/C Ratio	0.051	-	-	0.251	0.668	0.013	-	-
HCM Control Delay (s)	7.4	-	-	12.1	30.9	7.9	0	-
HCM Lane LOS	A	-	-	B	D	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1	4.7	0	-	-

Intersection	
Int Delay, s/veh	15

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	35	190	150	600	660	35
Future Vol, veh/h	35	190	150	600	660	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	6	0	4	2	0
Mvmt Flow	38	204	161	645	710	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1696	729	748	0	-	0
Stage 1	729	-	-	-	-	-
Stage 2	967	-	-	-	-	-
Critical Hdwy	6.4	6.26	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.354	2.2	-	-	-
Pot Cap-1 Maneuver	103	416	870	-	-	-
Stage 1	481	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	73	416	870	-	-	-
Mov Cap-2 Maneuver	73	-	-	-	-	-
Stage 1	342	-	-	-	-	-
Stage 2	372	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	104.3	2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	870	-	240	-	-
HCM Lane V/C Ratio	0.185	-	1.008	-	-
HCM Control Delay (s)	10.1	0	104.3	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.7	-	9.6	-	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	100	230	400	575	90
Future Vol, veh/h	45	100	230	400	575	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	1	1	1	1	0
Mvmt Flow	50	111	256	444	639	100

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1645	689	739	0	-	0
Stage 1	689	-	-	-	-	-
Stage 2	956	-	-	-	-	-
Critical Hdwy	6.43	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	109	447	872	-	-	-
Stage 1	497	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	77	447	872	-	-	-
Mov Cap-2 Maneuver	200	-	-	-	-	-
Stage 1	351	-	-	-	-	-
Stage 2	372	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.7	4	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	872	-	323	-	-
HCM Lane V/C Ratio	0.293	-	0.499	-	-
HCM Control Delay (s)	10.8	-	26.7	-	-
HCM Lane LOS	B	-	D	-	-
HCM 95th %tile Q(veh)	1.2	-	2.6	-	-

HCM Signalized Intersection Capacity Analysis — 2043 Land Use Option 2 - PM Peak Hour

13: River Rd & Wheatland Rd/Springwood Dr

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	5	395	15	5	5	570	1020	15	15	915	15
Future Volume (vph)	15	5	395	15	5	5	570	1020	15	15	915	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	0.88		1.00		0.97	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.96		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1830	2663		1711		3502	3561		1805	3565	
Flt Permitted		0.96	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1830	2663		1711		3502	3561		1805	3565	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	5	429	16	5	5	620	1109	16	16	995	16
RTOR Reduction (vph)	0	0	389	0	5	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	21	40	0	21	0	620	1124	0	16	1010	0
Confl. Peds. (#/hr)			7	7			5		4	4		5
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	0%	2%	8%	0%	0%	0%	1%	8%	0%	1%	0%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		6.3	6.3		2.2		20.9	58.1		1.9	39.1	
Effective Green, g (s)		8.3	8.3		2.7		20.9	61.1		2.9	42.1	
Actuated g/C Ratio		0.09	0.09		0.03		0.23	0.68		0.03	0.47	
Clearance Time (s)		6.0	6.0		4.5		4.0	7.0		4.0	7.0	
Vehicle Extension (s)		1.0	1.0		0.5		0.5	0.5		0.5	0.5	
Lane Grp Cap (vph)		168	245		51		813	2417		58	1667	
v/s Ratio Prot		0.01			c0.01		c0.18	0.32		0.01	c0.28	
v/s Ratio Perm			c0.01									
v/c Ratio		0.12	0.16		0.41		0.76	0.47		0.28	0.61	
Uniform Delay, d1		37.5	37.6		42.9		32.2	6.8		42.5	17.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.1		2.0		3.8	0.6		0.9	1.6	
Delay (s)		37.6	37.8		44.9		36.1	7.4		43.5	19.4	
Level of Service		D	D		D		D	A		D	B	
Approach Delay (s)		37.8			44.9			17.6			19.8	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
14: Keizer Station Blvd & Ulali Dr

2043 Land Use Option 2 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	90	110	125	105	25	45	105	90	10	160	80
Future Volume (veh/h)	125	90	110	125	105	25	45	105	90	10	160	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1870	1870	1900	1885	1900
Adj Flow Rate, veh/h	142	102	125	142	119	28	51	119	102	11	182	91
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	2	2	0	1	0
Cap, veh/h	624	236	290	548	458	108	621	322	276	606	652	557
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1260	767	940	1172	1487	350	1124	930	797	1178	1885	1610
Grp Volume(v), veh/h	142	0	227	142	0	147	51	0	221	11	182	91
Grp Sat Flow(s),veh/h/ln	1260	0	1707	1172	0	1837	1124	0	1727	1178	1885	1610
Q Serve(g_s), s	2.2	0.0	2.5	2.5	0.0	1.4	0.8	0.0	2.2	0.2	1.6	0.9
Cycle Q Clear(g_c), s	3.6	0.0	2.5	5.0	0.0	1.4	2.4	0.0	2.2	2.4	1.6	0.9
Prop In Lane	1.00		0.55	1.00		0.19	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	624	0	526	548	0	566	621	0	597	606	652	557
V/C Ratio(X)	0.23	0.00	0.43	0.26	0.00	0.26	0.08	0.00	0.37	0.02	0.28	0.16
Avail Cap(c_a), veh/h	1380	0	1550	1251	0	1668	1739	0	2315	1778	2527	2158
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.4	0.0	6.4	8.4	0.0	6.0	6.4	0.0	5.7	6.6	5.5	5.2
Incr Delay (d2), s/veh	0.1	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.4	0.4	0.0	0.3	0.1	0.0	0.3	0.0	0.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.4	0.0	6.6	8.5	0.0	6.1	6.4	0.0	5.8	6.6	5.6	5.3
LnGrp LOS	A	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		369			289			272			284	
Approach Delay, s/veh		6.9			7.3			5.9			5.5	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	12.0	11.1	12.0	11.1
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	31.0	21.0	31.0	21.0
Max Q Clear Time (g_c+I1), s	4.4	7.0	4.4	5.6
Green Ext Time (p_c), s	0.2	0.2	0.3	0.3

Intersection Summary	
HCM 6th Ctrl Delay	6.4
HCM 6th LOS	A

HCM Signalized Intersection Capacity Analysis 2043 Land Use Option 2 - PM Peak Hour

15: River Rd & Lockhaven Dr

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	240	165	320	200	205	120	875	260	155	760	115
Future Volume (vph)	170	240	165	320	200	205	120	875	260	155	760	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1863	1557	3400	1863	1577	1805	3574	1523	1787	3478	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1863	1557	3400	1863	1577	1805	3574	1523	1787	3478	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	175	247	170	330	206	211	124	902	268	160	784	119
RTOR Reduction (vph)	0	0	142	0	0	176	0	0	145	0	7	0
Lane Group Flow (vph)	175	247	28	330	206	35	124	902	123	160	896	0
Confl. Peds. (#/hr)	1		7	7		1	5		3	3		5
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	1%	3%	2%	1%	0%	1%	3%	1%	1%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases			8			4			2			
Actuated Green, G (s)	16.4	21.7	21.7	16.7	22.0	22.0	12.4	60.6	60.6	17.5	65.7	
Effective Green, g (s)	17.4	22.7	22.7	17.7	23.0	23.0	12.9	62.6	62.6	18.0	67.7	
Actuated g/C Ratio	0.13	0.17	0.17	0.13	0.17	0.17	0.09	0.46	0.46	0.13	0.49	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.5	6.0	6.0	4.5	6.0	
Vehicle Extension (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	0.5	0.5	0.5	0.5	
Lane Grp Cap (vph)	226	308	257	439	312	264	169	1633	695	234	1718	
v/s Ratio Prot	c0.10	c0.13		0.10	0.11		c0.07	c0.25		c0.09	0.26	
v/s Ratio Perm			0.02			0.02			0.08			
v/c Ratio	0.77	0.80	0.11	0.75	0.66	0.13	0.73	0.55	0.18	0.68	0.52	
Uniform Delay, d1	57.9	55.0	48.6	57.5	53.3	48.5	60.4	27.0	22.0	56.8	23.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	13.9	13.2	0.1	6.3	4.0	0.1	13.2	1.4	0.6	6.4	1.1	
Delay (s)	71.8	68.2	48.6	63.9	57.4	48.6	73.6	28.4	22.5	63.2	24.7	
Level of Service	E	E	D	E	E	D	E	C	C	E	C	
Approach Delay (s)		63.6			57.8			31.5			30.5	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	137.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
16: Verda Ln & Lockhaven Dr

2043 Land Use Option 2 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	580	25	50	745	140	25	55	70	185	60	25
Future Volume (veh/h)	20	580	25	50	745	140	25	55	70	185	60	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1841	1841	1826	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	611	26	53	784	152	26	60	74	201	65	27
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Percent Heavy Veh, %	2	4	4	5	2	2	2	2	2	2	2	2
Cap, veh/h	241	1070	46	434	929	180	110	195	200	353	90	34
Arrive On Green	0.61	0.61	0.61	0.61	0.61	0.61	0.24	0.25	0.25	0.24	0.25	0.25
Sat Flow, veh/h	598	1752	75	772	1521	295	150	773	794	988	358	137
Grp Volume(v), veh/h	22	0	637	53	0	936	160	0	0	293	0	0
Grp Sat Flow(s),veh/h/ln	598	0	1827	772	0	1816	1718	0	0	1483	0	0
Q Serve(g_s), s	1.8	0.0	12.1	2.6	0.0	24.1	0.0	0.0	0.0	6.0	0.0	0.0
Cycle Q Clear(g_c), s	25.9	0.0	12.1	14.7	0.0	24.1	4.5	0.0	0.0	10.5	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.16	0.16		0.46	0.69		0.09
Lane Grp Cap(c), veh/h	241	0	1115	434	0	1109	490	0	0	465	0	0
V/C Ratio(X)	0.09	0.00	0.57	0.12	0.00	0.84	0.33	0.00	0.00	0.63	0.00	0.00
Avail Cap(c_a), veh/h	434	0	1703	683	0	1693	852	0	0	777	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.5	0.0	6.8	11.2	0.0	9.1	18.0	0.0	0.0	20.1	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.5	0.1	0.0	2.5	0.4	0.0	0.0	1.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	3.3	0.4	0.0	6.9	1.7	0.0	0.0	3.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.7	0.0	7.2	11.3	0.0	11.6	18.4	0.0	0.0	21.5	0.0	0.0
LnGrp LOS	B	A	A	B	A	B	B	A	A	C	A	A
Approach Vol, veh/h		659			989			160			293	
Approach Delay, s/veh		7.7			11.6			18.4			21.5	
Approach LOS		A			B			B			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	18.6	39.5	18.6	39.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	27.3	53.7	27.3	53.7
Max Q Clear Time (g_c+I1), s	6.5	27.9	12.5	26.1
Green Ext Time (p_c), s	0.9	4.8	1.6	8.9

Intersection Summary	
HCM 6th Ctrl Delay	12.3
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
17: Kafir Dr/14th Ave & Lockhaven Dr

2043 Land Use Option 2 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	810	15	10	905	145	20	50	15	50	20	40
Future Volume (veh/h)	55	810	15	10	905	145	20	50	15	50	20	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.98		0.97	0.97		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1841	1841	1900	1870	1900	1900	1900	1900	1885	1900	1900
Adj Flow Rate, veh/h	57	835	15	10	933	149	21	52	15	52	21	41
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	0	2	0	0	0	0	1	0	0
Cap, veh/h	352	1343	24	424	1362	1147	196	180	52	182	66	129
Arrive On Green	0.02	0.74	0.74	0.01	0.73	0.73	0.13	0.13	0.13	0.12	0.12	0.12
Sat Flow, veh/h	1810	1802	32	1810	1870	1575	1328	1406	406	1309	561	1096
Grp Volume(v), veh/h	57	0	850	10	933	149	21	0	67	52	0	62
Grp Sat Flow(s),veh/h/ln	1810	0	1835	1810	1870	1575	1328	0	1812	1309	0	1657
Q Serve(g_s), s	0.8	0.0	22.0	0.2	27.0	2.8	1.5	0.0	3.3	3.8	0.0	3.4
Cycle Q Clear(g_c), s	0.8	0.0	22.0	0.2	27.0	2.8	4.9	0.0	3.3	7.1	0.0	3.4
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.22	1.00		0.66
Lane Grp Cap(c), veh/h	352	0	1367	424	1362	1147	196	0	231	182	0	195
V/C Ratio(X)	0.16	0.00	0.62	0.02	0.68	0.13	0.11	0.00	0.29	0.29	0.00	0.32
Avail Cap(c_a), veh/h	454	0	1367	556	1362	1147	332	0	417	329	0	381
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.5	0.0	6.1	5.9	7.4	4.1	41.7	0.0	39.5	43.7	0.0	40.4
Incr Delay (d2), s/veh	0.1	0.0	2.1	0.0	2.8	0.2	0.1	0.0	0.3	0.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	7.1	0.0	9.3	0.8	0.5	0.0	1.5	1.2	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.6	0.0	8.2	5.9	10.2	4.3	41.8	0.0	39.8	44.0	0.0	40.8
LnGrp LOS	A	A	A	A	B	A	D	A	D	D	A	D
Approach Vol, veh/h		907			1092			88			114	
Approach Delay, s/veh		8.2			9.3			40.2			42.2	
Approach LOS		A			A			D			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.7	78.5		16.8	6.4	76.8		16.8
Change Period (Y+Rc), s	4.0	5.0		* 5	4.0	5.0		5.0
Max Green Setting (Gmax), s	8.0	56.0		* 23	8.0	56.0		22.0
Max Q Clear Time (g_c+I1), s	2.8	24.0		9.1	2.8	29.0		6.9
Green Ext Time (p_c), s	0.0	1.3		0.1	0.0	1.4		0.1

Intersection Summary	
HCM 6th Ctrl Delay	11.8
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
18: McLeod Ln & Lockhaven Dr

2043 Land Use Option 2 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	775	15	35	940	290	15	60	15	125	30	25
Future Volume (veh/h)	45	775	15	35	940	290	15	60	15	125	30	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1841	1841	1900	1885	1885	1900	1870	1900	1900	1900	1900
Adj Flow Rate, veh/h	49	842	16	38	1022	315	16	65	16	136	33	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	4	4	0	1	1	0	2	0	0	0	0
Cap, veh/h	63	2578	49	49	1951	596	19	101	86	111	101	83
Arrive On Green	0.04	0.73	0.73	0.05	1.00	1.00	0.01	0.05	0.05	0.06	0.10	0.10
Sat Flow, veh/h	1810	3511	67	1810	2686	821	1810	1870	1601	1810	965	790
Grp Volume(v), veh/h	49	419	439	38	678	659	16	65	16	136	0	60
Grp Sat Flow(s),veh/h/ln	1810	1749	1829	1810	1791	1716	1810	1870	1601	1810	0	1755
Q Serve(g_s), s	3.5	10.9	10.9	2.7	0.0	0.0	1.1	4.4	1.2	8.0	0.0	4.1
Cycle Q Clear(g_c), s	3.5	10.9	10.9	2.7	0.0	0.0	1.1	4.4	1.2	8.0	0.0	4.1
Prop In Lane	1.00		0.04	1.00		0.48	1.00		1.00	1.00		0.45
Lane Grp Cap(c), veh/h	63	1284	1343	49	1301	1247	19	101	86	111	0	184
V/C Ratio(X)	0.77	0.33	0.33	0.78	0.52	0.53	0.83	0.64	0.19	1.22	0.00	0.33
Avail Cap(c_a), veh/h	167	1284	1343	111	1301	1247	111	317	271	111	0	297
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	62.2	6.0	6.0	61.1	0.0	0.0	64.2	60.3	58.8	61.0	0.0	53.9
Incr Delay (d2), s/veh	7.2	0.7	0.6	6.4	1.0	1.1	27.3	2.5	0.4	156.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	3.8	4.0	1.3	0.4	0.4	0.7	2.2	0.5	8.5	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.4	6.7	6.7	67.5	1.0	1.1	91.5	62.8	59.1	217.4	0.0	54.3
LnGrp LOS	E	A	A	E	A	A	F	E	E	F	A	D
Approach Vol, veh/h		907			1375			97			196	
Approach Delay, s/veh		10.1			2.9			66.9			167.5	
Approach LOS		B			A			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.5	99.5	5.4	17.6	8.6	98.4	12.0	11.0
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	8.0	75.0	8.0	22.0	12.0	71.0	8.0	22.0
Max Q Clear Time (g_c+I1), s	4.7	12.9	3.1	6.1	5.5	2.0	10.0	6.4
Green Ext Time (p_c), s	0.0	1.1	0.0	0.1	0.0	2.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	20.3
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary — 2043 Land Use Option 2 - PM Peak Hour

19: Chemawa Rd & Lockhaven Dr & Keizer Station Blvd

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	740	5	450	1125	65	10	105	255	280	95	130
Future Volume (veh/h)	170	740	5	450	1125	65	10	105	255	280	95	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1900	1885	1885	1900	1811	1811	1900	1826	1826
Adj Flow Rate, veh/h	177	771	5	469	1172	68	10	109	266	292	99	135
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	0	1	1	0	6	6	0	5	5
Cap, veh/h	225	1850	12	432	1970	114	13	209	305	223	423	354
Arrive On Green	0.13	1.00	1.00	0.12	0.57	0.56	0.01	0.12	0.12	0.12	0.23	0.23
Sat Flow, veh/h	3428	3591	23	3510	3441	199	1810	1811	2639	1810	1826	1526
Grp Volume(v), veh/h	177	378	398	469	610	630	10	109	266	292	99	135
Grp Sat Flow(s),veh/h/ln	1714	1763	1851	1755	1791	1849	1810	1811	1319	1810	1826	1526
Q Serve(g_s), s	6.5	0.0	0.0	16.0	28.7	28.8	0.7	7.4	12.9	16.0	5.7	9.7
Cycle Q Clear(g_c), s	6.5	0.0	0.0	16.0	28.7	28.8	0.7	7.4	12.9	16.0	5.7	9.7
Prop In Lane	1.00		0.01	1.00		0.11	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	225	908	954	432	1025	1059	13	209	305	223	423	354
V/C Ratio(X)	0.79	0.42	0.42	1.09	0.59	0.60	0.79	0.52	0.87	1.31	0.23	0.38
Avail Cap(c_a), veh/h	527	908	954	432	1025	1059	139	265	386	223	423	354
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.6	0.0	0.0	57.0	18.0	18.1	64.5	54.1	56.5	57.0	40.6	42.1
Incr Delay (d2), s/veh	2.1	1.3	1.2	68.3	2.5	2.5	32.0	0.7	13.9	168.3	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.3	0.3	11.1	12.1	12.5	0.4	3.4	4.9	17.7	2.6	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.7	1.3	1.2	125.3	20.5	20.5	96.4	54.8	70.4	225.3	40.7	42.3
LnGrp LOS	E	A	A	F	C	C	F	D	E	F	D	D
Approach Vol, veh/h		953			1709			385			526	
Approach Delay, s/veh		11.7			49.3			66.7			143.6	
Approach LOS		B			D			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	71.0	4.9	34.1	12.5	78.4	20.0	19.0
Change Period (Y+Rc), s	4.0	5.0	4.0	4.0	4.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	16.0	62.0	10.0	25.0	20.0	58.0	16.0	19.0
Max Q Clear Time (g_c+I1), s	18.6	2.0	2.7	11.7	8.5	30.8	18.0	14.9
Green Ext Time (p_c), s	0.0	1.0	0.0	0.1	0.0	1.8	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	55.0
HCM 6th LOS	E

HCM 6th Signalized Intersection Summary
20: Chemawa Rd & SB Ramp

2043 Land Use Option 2 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	695	1040	485	1790	0	0	0	0	290	15	410
Future Volume (veh/h)	0	695	1040	485	1790	0	0	0	0	290	15	410
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1885	1885	1885	0				1870	1648	1870
Adj Flow Rate, veh/h	0	724	1083	505	1865	0				302	16	427
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	3	1	1	1	0				2	17	2
Cap, veh/h	0	1498	1195	651	2361	0				367	19	686
Arrive On Green	0.00	0.42	0.42	0.19	0.66	0.00				0.22	0.25	0.25
Sat Flow, veh/h	0	3618	2812	3483	3676	0				1494	79	2790
Grp Volume(v), veh/h	0	724	1083	505	1865	0				318	0	427
Grp Sat Flow(s),veh/h/ln	0	1763	1406	1742	1791	0				1573	0	1395
Q Serve(g_s), s	0.0	12.5	30.4	11.6	31.2	0.0				16.2	0.0	11.5
Cycle Q Clear(g_c), s	0.0	12.5	30.4	11.6	31.2	0.0				16.2	0.0	11.5
Prop In Lane	0.00		1.00	1.00		0.00				0.95		1.00
Lane Grp Cap(c), veh/h	0	1498	1195	651	2361	0				387	0	686
V/C Ratio(X)	0.00	0.48	0.91	0.78	0.79	0.00				0.82	0.00	0.62
Avail Cap(c_a), veh/h	0	1715	1368	868	2361	0				766	0	1357
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.5	22.7	32.6	10.2	0.0				31.0	0.0	28.3
Incr Delay (d2), s/veh	0.0	0.1	7.6	2.2	1.7	0.0				1.7	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.7	10.4	5.0	10.5	0.0				6.0	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.6	30.3	34.7	11.9	0.0				32.7	0.0	28.6
LnGrp LOS	A	B	C	C	B	A				C	A	C
Approach Vol, veh/h		1807			2370						745	
Approach Delay, s/veh		25.2			16.8						30.4	
Approach LOS		C			B						C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	19.7	39.8		24.7		59.5
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0
Max Green Setting (Gmax), s	19.0	39.0		39.0		39.0
Max Q Clear Time (g_c+I1), s	13.6	32.4		18.2		33.2
Green Ext Time (p_c), s	0.1	1.4		0.5		2.8

Intersection Summary	
HCM 6th Ctrl Delay	21.9
HCM 6th LOS	C

HCM Signalized Intersection Capacity Analysis 2043 Land Use Option 2 - PM Peak Hour

21: NB Ramp & Chemawa Rd

09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	700	0	0	1095	315	1180	0	530	0	0	0
Future Volume (vph)	285	700	0	0	1095	315	1180	0	530	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00			
Frt	1.00	1.00			0.97		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (prot)	1770	3505			3432		1698	1698	1568			
Flt Permitted	0.95	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (perm)	1770	3505			3432		1698	1698	1568			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	303	745	0	0	1165	335	1255	0	564	0	0	0
RTOR Reduction (vph)	0	0	0	0	24	0	0	0	95	0	0	0
Lane Group Flow (vph)	303	745	0	0	1476	0	627	628	469	0	0	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	3%	0%	0%	1%	4%	1%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA		Perm	NA	Perm			
Protected Phases	5	2			6			4				
Permitted Phases							4		4			
Actuated Green, G (s)	18.1	53.3			29.2		40.2	40.2	40.2			
Effective Green, g (s)	20.1	55.3			31.2		42.2	42.2	42.2			
Actuated g/C Ratio	0.19	0.52			0.30		0.40	0.40	0.40			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	0.5	0.5			0.5		0.5	0.5	0.5			
Lane Grp Cap (vph)	337	1837			1014		679	679	627			
v/s Ratio Prot	c0.17	0.21			c0.43							
v/s Ratio Perm							0.37	0.37	0.30			
v/c Ratio	0.90	0.41			1.46		0.92	0.92	0.75			
Uniform Delay, d1	41.7	15.2			37.1		30.1	30.1	27.1			
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2	24.7	0.1			210.6		18.0	18.2	4.3			
Delay (s)	66.4	15.2			247.7		48.1	48.3	31.4			
Level of Service	E	B			F		D	D	C			
Approach Delay (s)		30.0			247.7			43.0			0.0	
Approach LOS		C			F			D			A	

Intersection Summary			
HCM 2000 Control Delay	110.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	105.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	98.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary
22: Portland Rd & Chemawa Rd/Hazelgreen Rd

2043 Land Use Option 2 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	555	435	60	410	35	560	525	130	110	650	140
Future Volume (veh/h)	145	555	435	60	410	35	560	525	130	110	650	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1870	1841	1885	1885	1900	1826	1826	1781	1870	1856
Adj Flow Rate, veh/h	156	597	468	65	441	38	602	565	140	118	699	151
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	4	4	2	4	1	1	0	5	5	8	2	3
Cap, veh/h	200	660	568	94	509	44	241	816	202	167	927	410
Arrive On Green	0.11	0.36	0.36	0.05	0.30	0.27	0.13	0.30	0.27	0.10	0.26	0.26
Sat Flow, veh/h	1753	1841	1585	1753	1711	147	1810	2757	681	1697	3554	1572
Grp Volume(v), veh/h	156	597	468	65	0	479	602	355	350	118	699	151
Grp Sat Flow(s),veh/h/ln	1753	1841	1585	1753	0	1859	1810	1735	1703	1697	1777	1572
Q Serve(g_s), s	7.1	25.4	22.2	3.0	0.0	20.1	11.0	14.9	15.1	5.6	14.9	6.5
Cycle Q Clear(g_c), s	7.1	25.4	22.2	3.0	0.0	20.1	11.0	14.9	15.1	5.6	14.9	6.5
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	200	660	568	94	0	553	241	513	504	167	927	410
V/C Ratio(X)	0.78	0.90	0.82	0.69	0.00	0.87	2.50	0.69	0.69	0.71	0.75	0.37
Avail Cap(c_a), veh/h	234	660	568	234	0	586	241	547	537	226	1120	495
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	25.1	24.1	38.4	0.0	27.5	35.8	25.7	26.1	36.1	28.1	24.9
Incr Delay (d2), s/veh	12.5	15.9	9.3	6.7	0.0	12.1	685.4	3.2	3.3	4.9	2.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	12.7	8.9	1.4	0.0	9.8	50.5	6.1	6.1	2.5	6.4	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.0	41.0	33.4	45.1	0.0	39.6	721.1	28.9	29.4	41.0	30.2	25.3
LnGrp LOS	D	D	C	D	A	D	F	C	C	D	C	C
Approach Vol, veh/h		1221			544			1307			968	
Approach Delay, s/veh		39.0			40.3			347.9			30.8	
Approach LOS		D			D			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	25.5	13.4	28.6	12.1	28.4	8.4	33.6
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	10.5	24.0	10.5	24.0	10.5	24.0	10.5	24.0
Max Q Clear Time (g_c+I1), s	13.6	16.9	9.1	22.1	7.6	17.1	5.0	27.4
Green Ext Time (p_c), s	0.0	2.6	0.0	0.4	0.1	1.9	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	137.1
HCM 6th LOS	F

HCM 6th Signalized Intersection Summary
23: River Rd & Chemawa Rd

2043 Land Use Option 2 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	155	220	205	190	305	140	210	1110	110	150	915	105
Future Volume (veh/h)	155	220	205	190	305	140	210	1110	110	150	915	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1710	1697	1683	1697	1710	1697	1697	1697	1697	1697	1683	1683
Adj Flow Rate, veh/h	163	232	216	200	321	147	221	1168	116	158	963	111
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	2	1	0	1	1	1	1	1	2	2
Cap, veh/h	185	260	210	222	303	245	243	1398	139	178	1258	145
Arrive On Green	0.11	0.15	0.15	0.14	0.18	0.18	0.15	0.47	0.47	0.22	0.87	0.86
Sat Flow, veh/h	1629	1697	1368	1616	1710	1387	1616	2957	293	1616	2884	332
Grp Volume(v), veh/h	163	232	216	200	321	147	221	636	648	158	534	540
Grp Sat Flow(s),veh/h/ln	1629	1697	1368	1616	1710	1387	1616	1612	1639	1616	1599	1617
Q Serve(g_s), s	12.8	17.4	19.9	15.8	23.0	12.7	17.5	44.6	44.9	12.3	16.7	16.9
Cycle Q Clear(g_c), s	12.8	17.4	19.9	15.8	23.0	12.7	17.5	44.6	44.9	12.3	16.7	16.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		0.21
Lane Grp Cap(c), veh/h	185	260	210	222	303	245	243	762	774	178	697	705
V/C Ratio(X)	0.88	0.89	1.03	0.90	1.06	0.60	0.91	0.83	0.84	0.89	0.77	0.77
Avail Cap(c_a), veh/h	194	260	210	242	303	245	360	762	774	186	697	705
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.89	0.89
Uniform Delay (d), s/veh	56.7	54.0	55.0	55.2	53.5	49.3	54.4	29.9	29.9	50.0	5.8	5.8
Incr Delay (d2), s/veh	27.9	25.2	64.8	30.1	68.8	2.8	15.6	10.4	10.5	31.9	7.0	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	9.3	10.6	8.3	15.6	4.6	8.1	18.9	19.3	6.0	3.6	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.7	79.2	119.9	85.3	122.3	52.1	70.0	40.3	40.4	81.9	12.8	12.8
LnGrp LOS	F	E	F	F	F	D	E	D	D	F	B	B
Approach Vol, veh/h		611			668			1505			1232	
Approach Delay, s/veh		95.0			95.8			44.7			21.7	
Approach LOS		F			F			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.3	65.9	21.8	23.9	23.5	60.7	18.8	27.0
Change Period (Y+Rc), s	4.0	4.5	4.0	4.0	4.0	4.5	4.0	4.0
Max Green Setting (Gmax), s	15.0	60.0	19.5	19.0	29.0	46.0	15.5	23.0
Max Q Clear Time (g_c+I1), s	14.3	46.9	17.8	21.9	19.5	18.9	14.8	25.0
Green Ext Time (p_c), s	0.0	1.8	0.0	0.0	0.0	1.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	53.8
HCM 6th LOS	D

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	500	567	541	123
Demand Flow Rate, veh/h	505	575	546	124
Vehicles Circulating, veh/h	297	378	271	756
Vehicles Exiting, veh/h	583	439	531	197
Ped Vol Crossing Leg, #/h	0	0	2	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.5	12.9	9.8	8.0
Approach LOS	A	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	505	575	546	124
Cap Entry Lane, veh/h	1019	938	1047	638
Entry HV Adj Factor	0.990	0.986	0.990	0.993
Flow Entry, veh/h	500	567	541	123
Cap Entry, veh/h	1009	925	1036	634
V/C Ratio	0.495	0.613	0.522	0.194
Control Delay, s/veh	9.5	12.9	9.8	8.0
LOS	A	B	A	A
95th %tile Queue, veh	3	4	3	1

HCM 6th Signalized Intersection Summary
25: Salem Pkwy & Verda Ln/Hyacinth St

2043 Land Use Option 2 - PM Peak Hour
09/08/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	650	45	450	880	345	90	1200	640	205	900	170
Future Volume (veh/h)	40	650	45	450	880	345	90	1200	640	205	900	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1856	1885	1885	1870	1826	1885	1856	1885	1870	1856	1900
Adj Flow Rate, veh/h	41	663	46	459	898	352	92	1224	0	209	918	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	3	1	1	2	5	1	3	1	2	3	0
Cap, veh/h	111	343	289	359	604	492	129	1193		260	1483	
Arrive On Green	0.06	0.18	0.18	0.20	0.32	0.32	0.07	0.34	0.00	0.15	0.42	0.00
Sat Flow, veh/h	1810	1856	1566	1795	1870	1522	1795	3526	1598	1781	3526	1610
Grp Volume(v), veh/h	41	663	46	459	898	352	92	1224	0	209	918	0
Grp Sat Flow(s),veh/h/ln	1810	1856	1566	1795	1870	1522	1795	1763	1598	1781	1763	1610
Q Serve(g_s), s	2.8	24.0	2.6	26.0	42.0	26.5	6.5	44.0	0.0	14.8	26.5	0.0
Cycle Q Clear(g_c), s	2.8	24.0	2.6	26.0	42.0	26.5	6.5	44.0	0.0	14.8	26.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	111	343	289	359	604	492	129	1193		260	1483	
V/C Ratio(X)	0.37	1.94	0.16	1.28	1.49	0.72	0.71	1.03		0.80	0.62	
Avail Cap(c_a), veh/h	111	343	289	359	604	492	290	1193		274	1483	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	58.6	53.0	29.8	52.0	44.0	38.7	59.0	43.0	0.0	53.7	29.5	0.0
Incr Delay (d2), s/veh	2.0	431.5	0.3	145.1	227.5	4.3	7.1	32.8	0.0	15.1	2.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	52.1	1.3	26.0	57.2	10.3	3.1	23.4	0.0	7.4	10.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.6	484.5	30.0	197.1	271.5	43.0	66.2	75.8	0.0	68.8	31.5	0.0
LnGrp LOS	E	F	C	F	F	D	E	F		E	C	
Approach Vol, veh/h		750			1709			1316	A		1127	A
Approach Delay, s/veh		433.5			204.4			75.1			38.4	
Approach LOS		F			F			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	58.7	12.0	46.0	24.0	48.0	30.0	28.0
Change Period (Y+Rc), s	5.0	6.0	5.0	5.0	6.0	* 6	5.0	5.0
Max Green Setting (Gmax), s	20.0	41.0	7.0	41.0	19.0	* 42	25.0	23.0
Max Q Clear Time (g_c+I1), s	8.5	28.5	4.8	44.0	16.8	46.0	28.0	26.0
Green Ext Time (p_c), s	0.1	5.2	0.0	0.0	0.1	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	166.6
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	9.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	50	20	90	115	105	30	150	55	80	430	45
Future Vol, veh/h	25	50	20	90	115	105	30	150	55	80	430	45
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Stop	-	-	None	-	-	None
Storage Length	100	-	30	100	-	50	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	6	6	0	0	7	0	2	0	8	1	0
Mvmt Flow	26	52	21	93	119	108	31	155	57	82	443	46

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	935	904	467	914	899	184	489	0	0	212	0	0
Stage 1	630	630	-	246	246	-	-	-	-	-	-	-
Stage 2	305	274	-	668	653	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.56	6.26	7.1	6.5	6.27	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.1	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.56	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.054	3.354	3.5	4	3.363	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	248	273	588	256	281	846	1085	-	-	1323	-	-
Stage 1	473	469	-	762	706	-	-	-	-	-	-	-
Stage 2	709	676	-	451	467	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	129	249	587	194	256	846	1085	-	-	1323	-	-
Mov Cap-2 Maneuver	129	249	-	194	256	-	-	-	-	-	-	-
Stage 1	459	440	-	740	686	-	-	-	-	-	-	-
Stage 2	497	656	-	360	438	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.1	26.2	1.1	1.1
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1085	-	-	129	249	587	194	256	846	1323	-	-
HCM Lane V/C Ratio	0.029	-	-	0.2	0.207	0.035	0.478	0.463	0.128	0.062	-	-
HCM Control Delay (s)	8.4	-	-	39.7	23.2	11.4	39.5	30.6	9.9	7.9	-	-
HCM Lane LOS	A	-	-	E	C	B	E	D	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0.8	0.1	2.3	2.3	0.4	0.2	-	-

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	105	115	145	465	615	155
Future Vol, veh/h	105	115	145	465	615	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	240	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	4	4	5	1	2
Mvmt Flow	111	121	153	489	647	163

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1524	729	810	0	-	0
Stage 1	729	-	-	-	-	-
Stage 2	795	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.236	-	-	-
Pot Cap-1 Maneuver	131	420	807	-	-	-
Stage 1	481	-	-	-	-	-
Stage 2	448	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 106	420	807	-	-	-
Mov Cap-2 Maneuver	238	-	-	-	-	-
Stage 1	390	-	-	-	-	-
Stage 2	448	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	45	2.5	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	807	-	308	-	-
HCM Lane V/C Ratio	0.189	-	0.752	-	-
HCM Control Delay (s)	10.5	-	45	-	-
HCM Lane LOS	B	-	E	-	-
HCM 95th %tile Q(veh)	0.7	-	5.7	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	4.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	185	30	245	200	35	480
Future Vol, veh/h	185	30	245	200	35	480
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	1	0	2	2	0	1
Mvmt Flow	213	34	282	230	40	552

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1029	397	0	0	512	0
Stage 1	397	-	-	-	-	-
Stage 2	632	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	260	657	-	-	1064	-
Stage 1	681	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	250	657	-	-	1064	-
Mov Cap-2 Maneuver	377	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	512	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.1	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	377	657	1064	-
HCM Lane V/C Ratio	-	-	0.564	0.052	0.038	-
HCM Control Delay (s)	-	-	26.2	10.8	8.5	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	3.3	0.2	0.1	-

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	45	100	145	75	10	70	95	165	15	45	5
Future Vol, veh/h	5	45	100	145	75	10	70	95	165	15	45	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	5	0	0	1	0	0	0	0	0	5	0
Mvmt Flow	6	51	114	165	85	11	80	108	188	17	51	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	498	544	54	533	453	202	57	0	0	296	0	0
Stage 1	88	88	-	362	362	-	-	-	-	-	-	-
Stage 2	410	456	-	171	91	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.55	6.2	7.1	6.51	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.55	-	6.1	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.55	-	6.1	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.045	3.3	3.5	4.009	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	486	442	1019	461	504	844	1560	-	-	1277	-	-
Stage 1	925	816	-	661	627	-	-	-	-	-	-	-
Stage 2	623	563	-	836	821	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	389	408	1019	349	466	844	1560	-	-	1277	-	-
Mov Cap-2 Maneuver	389	408	-	349	466	-	-	-	-	-	-	-
Stage 1	867	805	-	619	587	-	-	-	-	-	-	-
Stage 2	492	528	-	686	810	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.9	20.5	1.6	1.8
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1560	-	-	389	696	349	492	1277	-	-
HCM Lane V/C Ratio	0.051	-	-	0.015	0.237	0.472	0.196	0.013	-	-
HCM Control Delay (s)	7.4	0	-	14.4	11.8	24.2	14.1	7.9	0	-
HCM Lane LOS	A	A	-	B	B	C	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	0.9	2.4	0.7	0	-	-

HCM Signalized Intersection Capacity Analysis
11: Portland Rd & Perkins St

2043 Future Mitigations - PM Peak Hour
09/08/2020

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	35	190	150	600	660	35
Future Volume (vph)	35	190	150	600	660	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5			4.5	4.5	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	0.98			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.89			1.00	0.99	
Flt Protected	0.99			0.99	1.00	
Satd. Flow (prot)	1561			1823	1852	
Flt Permitted	0.99			0.61	1.00	
Satd. Flow (perm)	1561			1121	1852	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	38	204	161	645	710	38
RTOR Reduction (vph)	163	0	0	0	2	0
Lane Group Flow (vph)	79	0	0	806	746	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	6%	0%	4%	2%	0%
Turn Type	Prot		Perm	NA	NA	
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	18.0			63.0	63.0	
Effective Green, g (s)	18.0			63.0	63.0	
Actuated g/C Ratio	0.20			0.70	0.70	
Clearance Time (s)	4.5			4.5	4.5	
Lane Grp Cap (vph)	312			784	1296	
v/s Ratio Prot	c0.05				0.40	
v/s Ratio Perm				c0.72		
v/c Ratio	0.25			1.03	0.58	
Uniform Delay, d1	30.3			13.5	6.8	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.9			39.5	1.9	
Delay (s)	32.3			53.0	8.6	
Level of Service	C			D	A	
Approach Delay (s)	32.3			53.0	8.6	
Approach LOS	C			D	A	

Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	101.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

CITY COUNCIL MEETING: October 19, 2020

AGENDA ITEM NUMBER:_____

TO: **MAYOR CLARK AND COUNCIL MEMBERS**

THROUGH: **CHRISTOPHER C. EPPLEY, CITY MANAGER**

FROM: **E. SHANNON JOHNSON, CITY ATTORNEY**

SUBJECT: **MUNICIPAL JUDGE REPORT – COUNCILOR CHECK IN**

At the May 18, 2015 Council meeting, the Council adopted the updated Municipal Judge Evaluation process (Resolution R2015-2572). In accordance with such process, no later than the first City Council meeting in June each year, the Mayor is to announce two Councilors to attend arraignments and/or hearings and check in with the Judge for the upcoming year. The appointed Councilors are to report their observations to the Council at a regularly scheduled meeting no later than the announcement of the Councilors each year.

On January 7, 2019, Mayor Clark appointed Mayor Clark and Councilor Smith to attend arraignments and/or hearings and check in with the Judge for the 2020 evaluation. Due to COVID-19, court cases had been put on hold and the observation of the Judge was not able to be performed. Therefore, on May 18, 2020, the City Council extended the evaluation process to October 19, 2020 when the reports are to be given and when the Mayor shall announce the Councilors for the upcoming year.

Mayor Clark and Councilor Smith should give their verbal report to Council at tonight's meeting. If the Council deems it necessary, a formal evaluation between the Council and the Municipal Court Judge shall be scheduled, but it is not required. This process does not affect the Municipal Judge's position of validity, effectiveness or jurisdiction of the municipal court or the Municipal Judge.

Staff recommends that the announcement of the Councilors for the upcoming year's evaluations be postponed until the first meeting in January 2021 to allow for new Councilors to take their positions as well as to make it line up with up committee appointments.

RECOMMENDATION:

Mayor Clark and Councilor Smith should report their observations. Following the report, if the Council deems it necessary to hold a formal evaluation between the Council and the Municipal Court Judge, Council should direct staff to schedule the evaluation in executive session. If Council deems it appropriate, a minute motion should be made as follows: "Move to extend the Mayor's announcement of the Councilors for the upcoming year be made at the first meeting in January 2021."

Please contact me if you have any questions in this regard. Thank you.

ESJ/tmh

CITY COUNCIL MEETING: October 19, 2020

AGENDA ITEM NUMBER:_____

TO: **MAYOR CLARK AND CITY COUNCIL MEMBERS**

THROUGH: **CHRIS EPPELY**
CITY MANAGER

FROM: **BILL LAWYER**
PUBLIC WORKS DIRECTOR

SUBJECT: **PARKS AND RECREATION MASTER PLAN UPDATE**

DATE: **October 12, 2020**

BACKGROUND:

The Public Works Department issued a Request for Proposals through the public bidding process to provide consulting services for updating the Parks and Recreation Master Plan. A total of five proposals were received. Each of the proposals was reviewed and scored by staff and a representative from the Parks & Recreation Advisory Board. The firm MIG received the highest score and has been determined to be the preferred consultant.

FISCAL IMPACT:

The funds for the consulting services to update the Parks and Recreation Master Plan are available in the City Council adopted FY 20/21 Park Services Fund budget.

RECOMMENDATION:

Staff recommends the City Council adopt the attached resolution authorizing the City Manger enter into a contract with MIG for $79,993.00 to update the Parks and Recreation Master Plan.

CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

Resolution R2020-_____

AUTHORIZING CITY MANAGER TO ENTER INTO PROFESSIONAL SERVICES CONTRACT FOR KEIZER PARKS MASTER PLAN UPDATE WITH MIG

WHEREAS, City requires the assistance with the project to develop a Parks Master Plan Update;

WHEREAS, hiring outside contractor to render the specialized professional services with this project is in the best interests of the City;

WHEREAS, on August 3, 2020, a Request for Proposals was issued by the City;

WHEREAS, five proposals were received and opened. The City's selection committee determined that MIG submitted the best proposal and recommends that MIG be awarded the contract;

WHEREAS, the City Council wishes to engage the services of MIG to conduct the services necessary to update the Keizer Parks Master Plan;

NOW, THEREFORE,

BE IT RESOLVED by the City Council of the City of Keizer that the City Manager is authorized to award the contract to and enter into the attached Professional Services Contract with MIG.

///

///

///

Keizer City Attorney
930 Chemawa Road NE
PO Box 21000
Keizer, Oregon 97307
503-856-3433

BE IT FURTHER RESOLVED that this Resolution shall take effect immediately upon the date of its passage.

PASSED this _____ day of _____, 2020.

SIGNED this _____ day of _____, 2020.

_____
Mayor

_____
City Recorder

Keizer City Attorney
930 Chemawa Road NE
PO Box 21000
Keizer, Oregon 97307
503-856-3433

Professional Service Contract
for
Keizer Parks Master Plan Update

This Contract, made and entered into the _____ day of _____, 2020, by and between City of Keizer, Oregon, 930 Chemawa Rd., NE, Keizer, Oregon, 97303 ("City"), and MIG, 815 SW 2nd Avenue, #200, Portland, Oregon, 97204 ("Contractor").

RECITALS

WHEREAS City requires the assistance with a project to Develop a Parks Master Plan Update, hereinafter referred to as (“Project”) and as more fully described in this Contract;

WHEREAS, Contractor has offered to render certain specialized professional services in connection with this Project;

NOW, THEREFORE, the parties hereby agree as follows:

AGREEMENT

1. Term of Contract. This Contract shall cover services rendered from October 20, 2020 through April 30, 2021. Services shall begin within ten (10) days after receipt of the City’s Notice to Proceed.

2. Contractor’s Services. Contractor agrees to provide services described in Exhibit A (Exhibit A may include the Request for Proposals and Scope of Work, and any other related Contract documents), which is attached hereto and incorporated by reference into this Contract.

3. Project Deliverables. Contractor agrees to provide the following deliverables:

a. Facilitate and document the public involvement process
b. Survey data and summary report
c. Needs assessment report
d. Describe any major changes to the Capital Improvement Plan and recommend if the SDC Methodology should be revised to meet the need for the major changes in the Capital Improvement Plan
e. CIP, operations and funding plan
f. Maps to support the planning process
g. Draft System Master Plan Report
h. Final System Master Plan Report

4. Compensation. Contractor’s compensation shall be as outlined in Contractor’s proposal attached hereto as Exhibit B and incorporated by reference into this Contract. Contractor’s compensation for the services described under this Contract shall not exceed $79,993.00, unless the parties agree to a change in scope and/or compensation.

4.1. Extra Services beyond those basic services described in Exhibit A may be provided if requested by City and confirmed in writing by Contractor.

5. Payment Terms. Payment for services shall be made per monthly invoice for services performed within 30 days of receipt of invoice. Contractor may assess a late payment penalty of 1.5% per month on late payments. For extra services not a part of this Contract, payment shall be based on hourly rates in Exhibit B.

6. Independent Contractor. It is agreed to that Contractor shall act and be an independent contractor and not an employee of the City, and shall obtain no rights to any employee benefits, which accrue, to City's employees.

7. Assignments. Neither the City nor Contractor shall assign this Contract without the written consent of the other.

8. Changes to this Contract. Except as provided herein, this Contract may be modified only by a written agreement executed by City and Contractor.

9. Indemnification. The Contractor agrees to indemnify and defend the CITY, its agents, officers and employees, from and against any and all liability, claims, suits, loss, damages, costs, and expenses arising out of or resulting from the negligent or intentional acts, errors, or omissions of the Contractor, its officers, employees, or agents.

10. Insurance Requirements. During the term of this Contract, Contractor shall maintain, at a minimum, the following insurance.

10.1 General Liability. Contractor shall maintain commercial general liability insurance in the amount of $1,000,000 per occurrence / $2,000,000 annual aggregate, which protects it from claims for personal injury, bodily injury and property damage.

10.2 Automobile Liability. Contractor shall maintain automobile liability coverage for non-owned and hired autos, in the amount of $1,000,000.00 per occurrence which protects Contractor from claims for bodily injury and property damage.

10.3 Professional Liability. Contractor shall maintain professional liability insurance in the amount of $1,000,000 per occurrence.

10.4 Workers' Compensation Insurance. Contractor shall maintain workers' compensation insurance as required by State statutes.

10.5 Certificates of Insurance. Prior to commencing services, and on an annual basis thereafter, Contractor shall provide City with certificates of insurance and additional named insured endorsement attesting to the existence of the insurance coverage required by this Contract. Certificates shall be endorsed to name the City of Keizer, its officers, agents, contractors, and employees as an additional insured. Such certificates shall provide that no coverage shall be cancelled without 30 days written notice to City except 10 days' notice for non-payment of premium. In the event Contractor does not obtain or maintain the coverage required by this Contract, City may, at its option, terminate this Contract.

11. Ownership of Work Product. Upon payment of all fees an expenses, all instruments of professional services prepared by Contractor on this project, including but not limited to, drawings and specifications are the property of the City.

12. Mediation. City and Contractor agree to mediate claims or disputes arising out of or relating to this Contract before initiation litigation. The mediation shall be conducted by a mediation service acceptable to the parties. A party shall make a demand for mediation within a reasonable time after a claim or dispute arises, and the parties agree to mediate in good faith. In no event shall any demand for mediation be made after such claim or dispute would be barred by applicable law. Mediation fees shall be shared equally.

13. Severability. In the event that any term or provision of this Contract is found to be unenforceable or invalid for any reason, the remainder of this Contract shall continue in full force and effect, and the parties agree that any unenforceable or invalid term or provision shall be amended to the minimum extent required to make such term or provision enforceable and valid.

14. City Responsibilities. City agrees to provide Contractor with all information, surveys, reports, and professional recommendations and any other related items reasonably requested by Contractor in order to provide its professional services. Contractor may rely on the accuracy and completeness of these items. City agrees to provide such items and to render decisions in a timely manner so as not to delay the orderly and sequential progress of Contractor's services.

15. Governing Law. This Contract shall be construed, interpreted and applied in accordance with the laws of the State of Oregon.

16. Standard of Care. Contractor shall provide its services in accordance with generally accepted standards of its profession.

17. Schedule. Contractor's services shall be performed as expeditiously as is consistent with professional skill and care. The City reserves the right to require written status reports (no more than twice per month) to verify Project progress, any Project Schedule or budget changes, and to document/discuss any other issues that may affect successful on-time and on-budget Project implementation.

18. Termination. Either City or Contractor may terminate this Contract upon seven days' written notice. If this Contract is terminated, City agrees to pay Contractor for all services rendered and reimbursable expenses incurred up to the date of termination. Upon not less than seven days' written notice, Contractor may suspend the performance of its services if City fails to pay Contractor in full for services rendered or expense incurred. Contractor shall have no liability because of such suspension of services or termination due to City's non-payment.

19. Entire Agreement. This Contract represents the entire and integrated agreement between City and Contractor and supercedes all prior negotiations, statements or agreements, either written or oral. There are no conditions, agreements or representations between the parties except as expressed herein. Nothing in this Contract shall create a contractual relationship for the benefit of any third party.

20. Notices. All notices hereunder shall be given in writing and mailed postage prepaid, addressed as follows:

A. To City:

Bill Lawyer
Public Works Director
930 Chemawa Rd. NE
Keizer, OR 97303

B. To Contractor:

ME

Melissa ~~Erickson~~ Erikson
MIG
ME
~~815 SW 2nd Avenue, #200~~ 800 Hearst Avenue
~~Portland, OR 97204~~ Berkeley, CA 94710

21. No Responsibility for Construction Means or Methods. Irrespective of any other term in this Contract, Contractor shall not control or be responsible for construction means, methods, techniques, schedules, sequences or procedures, or for construction safety, any other related programs, or for another party's errors or omissions or for another party's failure to complete its work or services in accordance with Contractor's documents.

22. Prevailing Party. Should any legal proceeding be commenced between the parties to this Contract seeking to enforce any of its provisions, including, but not limited to, fee provisions, the prevailing party in such proceeding shall be entitled, in addition to such other relief as may be granted, to a reasonable sum for attorneys' and expert witnesses' fees, which shall be determined by the court or forum in such proceeding or in a separate action brought for that purpose. For purposes of this provision, "prevailing party" shall include a party that dismisses an action for recovery hereunder in exchange for payment of the sum allegedly due, performance of covenants allegedly breached, or consideration substantially equal to the relief sought in the action or proceeding.

23. Public and Media Relations. Contractor shall be permitted to identify City as a customer, to use City's name in connection with proposals to prospective customers, to reference City on the Contractor's website and to otherwise refer to City in print or electronic form for marketing, publicity or reference purposes. However, Contractor shall not publish City's confidential or proprietary information. Contractor and City shall coordinate all publicity efforts relating to the work covered in this Contract. Each party agrees to assist the other party in seeking to promote the work completed under this Contract and to mention the other party in press and promotional materials. City agrees to credit and reference Contractor in all material (print or electronic) relating to the work covered in this Contract and to seek prior written approval for content that makes reference to Contractor beyond simple mention.

24. Non-Discrimination/Equal Opportunity. During the term of this Contract, the Contractor agrees as follows:

The Contractor will not discriminate against any employee or applicant for employment because of creed, religion, race, color, sex, marital status, sexual orientation, political ideology, ancestry, national origin, or the presence of any sensory, mental or physical handicap, unless based upon a bona fide occupational qualification. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their creed, religion, race, color, sex, national origin, or the presence of any sensory, mental or

physical handicap. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer, recruitment or recruitment advertising layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

25. Exhibits. The Exhibits, if any, attached to this Contract are incorporated herein as if fully set forth in this Contract. If any provision of any Exhibit conflicts with the provisions of this Contract, the terms of this Contract shall govern.

26. Electronic Signatures. Any signature (including any electronic symbol or process attached to, or associated with, a contract or other record and adopted by a Person with the intent to sign, authenticate or accept such contract or record) hereto or to any other certificate, agreement or document related to this transaction, and any contract formation or record-keeping through electronic means shall have the same legal validity and enforceability as a manually executed signature or use of a paper-based recordkeeping system to the fullest extent permitted by applicable law.

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the day and year first above written.

CITY

City of Keizer

By:_____ _____
Christopher C. Eppley Date:
City Manager

CONTRACTOR

MIG

By: _____ 10/7/20
Melissa ~~Erickson,~~ Erikson ME Date:
Principal

ADDENDUM #1 TO THE REQUEST FOR PROPOSALS FOR PARKS MASTER PLAN UPDATE

City of Keizer

The Request for Proposal – Parks Master Plan Update is amended as follows:

1. **Scope of Work** – In each and every reference that describes the work, the item that reads "Review current Master Plan & System Development Charges (SDC) Methodology" shall be revised to:

Review and familiarize yourself with the current Master Plan & System Development Charges (SDC) Methodology.

2. **Scope of Work** – In each and every reference that describes the work, the item that reads "Evaluate existing SDCs to determine ability to meet demand" shall be revised to:

Evaluate existing SDCs to determine if the projected SDCs will be sufficient to complete projects listed in the Capital Improvement Plan assuming non-SDC funding is available. Proposer should describe any major changes to the Capital Improvement Plan and recommend if the SDC Methodology should be revised to meet the need for the major changes in the Capital Improvement Plan.

3. **Project Description** – Section 1.2 is amended as follows:

In general, the Project description includes facilitating the process to amend the Parks Master Plan and provide updates. The budgeted amount for this project is $80,000.

4. **Project Deliverables** – Section 4.8(d) and Sample Contract Section 3(d) shall be amended as follows:

Describe any major changes to the Capital Improvement Plan and recommend if the SDC Methodology should be revised to meet the need for the major changes in the Capital Improvement Plan.

Addendum No. 1 shall become a part of the Request for Proposal – Parks Master Plan Update and shall be binding as though it were contained therein. **This addendum must be signed and included with your proposal when submitted.** If you have questions, please call Bill Lawyer at 503-856-3555.

ADDENDUM NO.1 CONTENTS READ AND ACKNOWLEDGED

_____

Proposer

_____

Signature Title Date

END OF ADDENDUM #1

City of Keizer - Department of Public Works
*930 Chemawa Rd. N.E. * PO Box 21000*
Keizer, OR 97307 (503)390-3700 fax (503) 393-9437
www.keizer.org

CITY OF KEIZER REQUEST FOR PROPOSAL

PARKS MASTER PLAN UPDATE

Issue Date: August 3, 2020
Due Date: September 4, 2020

PROPOSER'S SUBMITTAL CHECKLIST

Proposals must be submitted by the time designated in the advertisement for the Request for Proposals at the City Hall Information counter and marked received by City staff indicating the time and date as shown on the City Bid Clock at the City Hall Information counter. Any Proposals submitted after the designated closing time or to any other location will be determined nonresponsive and will not be opened.

It is the responsibility of the Proposer to deliver the Proposal by the indicated deadline to the designated location. The City will not accept responsibility for the timely delivery of any Proposal sent via a delivery service (FedEx, UPS, USPS, etc.). Proposer is solely responsible for the Proposal to be delivered to the correct location by the correct time.

If the Proposer submits a Proposal via a delivery service (FedEX, UPS, etc.), the required sealed envelope must be enclosed in the delivery service packaging and the Project Title of the Proposal should be written on the outside delivery service packaging.

Proposers should submit one original and three copies of their proposal. In addition to the hard copy (printed paper) version of Proposal, Proposer should provide one electronic version of the Proposal on a USB dive in non-editable, Adobe format. All proposals should include the following submittals to be considered responsive:

- ☐ Introductory Letter
- ☐ Qualifications, Experience, and Project Team
- ☐ Project Approach and Understanding
- ☐ Work Plan and Deliverable Schedule
- ☐ Cost Proposal Summary (Exhibit A)
- ☐ References (Exhibit B)
- ☐ Non-Collusion and Conflict of Interest Certification (Exhibit C)
- ☐ Certification Statement for Corporation or Independent Contractor (Exhibit D)
- ☐ Proposer Representations and Certification Regarding Debarment, Suspension and Other Responsibility Matters (Exhibit E)
- ☐ Certification of Insurance Requirements (Exhibit F)
- ☐ Signed Addenda (if applicable)

CITY OF KEIZER, OREGON
REQUEST FOR PROPOSALS (RFP)
PARKS MASTER PLAN UPDATE
Proposals Due by 5:00 p.m. on September 4, 2020.

Notice is hereby given that the City of Keizer is requesting proposals from qualified firms that can demonstrate competency and experience to provide the following services to develop a ten-year Comprehensive Plan Update with a ten-year Capital Improvement Program. Work entails:

- Review current Master Plan & System Development Charges (SDC) Methodology
- Conduct community forum/survey to obtain input on desire for a recreation program, to include sports group survey and identification of park & facility needs
- Conduct a community forum/survey to obtain input on park improvements/replacements
- Evaluate park and recreation services and facilities offered by the City and other agencies in the community (School Dist., Salem, Marion County etc.)
- Evaluate service level standards and make recommendations as necessary
- Provide feasibility analysis for recreation services based on survey input
- Recommendations to the existing park system based on survey input
- Evaluate each park for condition, deficiencies and current operational problems
- Evaluate the overall park system including its strength and weaknesses
- Perform an Operations, Maintenance and Organizational analysis
- Recommend changes to operations, maintenance and organization based on analysis
- Forecast maintenance impacts based on plan recommendations
- Prepare an overall funding strategy for maintenance and improvements
- Prepare Capital Improvement Plan for improvements identified
- Evaluate existing SDCs to determine ability to meet demand
- Meet with Parks Board #1 – initial meeting to discuss goals and get input from the Board
- Meet with Parks Board #2 – discuss results of community survey on recreation programs and park improvements
- Meet with Parks Board #3 – final meeting with a goal of Board making a recommendation to Council
- Present Board recommended plan to Council

The Request for Proposals can be downloaded from the City of Keizer website at www.keizer.org, or a printed copy can be obtained from the Public Works Director, 930 Chemawa Road NE, Keizer, OR 97303.

The City will post all addenda on the City website. Prospective Proposers are solely responsible for checking the website to determine if addenda or clarifications have been issued. For questions or clarifications regarding this RFP, contact Bill Lawyer, Public Works Director at 503-856-3555.

Sealed proposals must be received by the City of Keizer, at the Information Counter, not later than 5:00 p.m., September 4, 2020 addressed to the City of Keizer, Public Works Director, Bill Lawyer, 930 Chemawa Road NE, Keizer, OR 97303. The outside of the envelopes shall plainly identify: (1) the name of the RFP and (2) the name and address of the proposer. Electronic proposals will not be accepted. Proposals received after the designated time and date will not be opened.

The City may reject any proposal not in compliance with all prescribed solicitation procedures and requirements and other applicable law and may reject any and all proposals in whole or in part when the cancellation or rejection is in the best interest of the City, and at no cost to the City.

Dated this 3rd day of August, 2020.

Bill Lawyer, Public Works Director

SECTION 1 – BACKGROUND AND INFORMATION

1.1 INTRODUCTION

The City of Keizer is a municipal governmental entity established in 1982. The City provides a full range of services, including police protection, water services, and an established street system. Sanitary sewer service is provided by the City of Salem through an intergovernmental agreement. Fire protection services are provided by the Keizer Fire District or Marion County Fire District #1. The City of Keizer currently has a population of approximately 38,505. The City is bordered on the western edge by the Willamette River, southern edge by the City of Salem, eastern edge by Interstate 5, and the northern edge by rural portions of Marion County. Keizer is approximately 35 miles south of Portland.

The City of Keizer operates under a Council-Manager form of government. The City Council consists of a Mayor and six Councilors. The Mayor's term runs two years and the Councilors serve four-year staggered terms. The City Manager is the administrative head of city government and is appointed by the City Council. The Council meets on the 1st and 3rd Mondays of each month and conducts work sessions on the 2nd Monday of each month (with some exceptions). The City Council acts as the Local Contract Review Board for the City.

The objective of requesting proposals is for the City to contract with a firm that can offer sound reinforcement services at the highest quality of service at a cost representing the best value to the City.

The current Parks Mater Plan is on the City website at: https://www.keizer.org/parks-facilities-division.

More information is available on the City website at: www.keizer.org.

1.2 PROJECT DESCRIPTION

In general, the Project description includes facilitating the process to amend the Parks Master Plan and provide updates.

1.3 REQUIRED SERVICES

The City is seeking a qualified firm to assist with review and suggest revisions to the Parks Master Plan by developing a ten-year comprehensive plan update with a ten-year Capital Improvement Program (CIP). These include:

- Review current Master Plan & System Development Charges (SDC) Methodology
- Conduct community forum/survey to obtain input on desire for a recreation program, to include sports group survey and identification of park & facility needs

- Conduct a community forum/survey to obtain input on park improvements/replacements
- Evaluate park and recreation services and facilities offered by the City and other agencies in the community (School Dist., Salem, Marion County etc.)
- Evaluate service level standards and make recommendations as necessary
- Provide feasibility analysis for recreation services based on survey input
- Recommendations to the existing park system based on survey input
- Evaluate each park for condition, deficiencies and current operational problems
- Evaluate the overall park system including its strength and weaknesses
- Perform an Operations, Maintenance and Organizational analysis
- Recommend changes to operations, maintenance and organization based on analysis
- Forecast maintenance impacts based on plan recommendations
- Prepare an overall funding strategy for maintenance and improvements
- Prepare Capital Improvement Plan for improvements identified
- Evaluate existing SDC's to determine ability to meet demand
- Meet with Parks Board #1 – initial meeting to discuss goals and get input from the Board
- Meet with Parks Board #2 – discuss results of community survey on recreation programs and park improvements
- Meet with Parks Board #3 – final meeting with a goal of Board making a recommendation to Council
- Present Board recommended plan to Council

SECTION 2 – PROCUREMENT REQUIREMENTS

2.1 ISSUING OFFICE AND SUBMITTAL LOCATION

The City's Public Works Director will issue the Request for Proposals document and will be the sole point of contact for the City for questions and concerns. The City Manager will be the recipient of any protests. Proposals must be received at the City of Keizer, Information Counter, not later than 5:00 p.m. on September 4, 2020.

Submittal Address & Questions
City of Keizer
Public Works Director
930 Chemawa Road NE
Keizer, OR 97303
lawyerb@keizer.org
503-856-3555

Protests
City of Keizer
City Manager
930 Chemawa Road NE
Keizer, OR 97303

Telephone, facsimile, or electronically transmitted Proposals will not be accepted. Proposals received after the specified date and time will not be given further consideration. **Proposers submitting proposals are solely responsible for the means and manner of their delivery and are encouraged to confirm delivery prior to the deadline.**

2.2 RFP SCHEDULE

The City anticipates the following general timeline for receiving and evaluating proposals and selecting a Contractor. The timeline listed below may be changed if it is in the City's best interest to do so.

RFP Advertised	August 3, 2020
Date to Submit Changes or Solicitation Protests	August 14, 2020 5:00 p.m.
Last Date for Addenda	August 28, 2020 12:00 p.m.
Proposal Due Date	September 4, 2020 5:00 p.m.
Evaluate Proposals	September 8, 2020 to September 18, 2020
Optional Interviews	September 21, 2020 to September 25, 2020
Notice of Intent to Award	September 28, 2020
Protest Period ends (seven calendar days)	October 5, 2020
Contract Award	October 19, 2020

2.3 CHANGES TO THE SOLICITATION BY CITY ADDENDA

The City of Keizer reserves the right to make changes to the RFP by written addendum, which shall be posted on the City of Keizer website. A prospective Proposer may request a change in the RFP by submitting a written request to the address set forth above. The request must specify the provision of the RFP in question and contain an explanation for

the requested change. All requests for changes or additional information must be submitted to the City of Keizer no later than the date set in the RFP Schedule.

The City of Keizer will evaluate any request submitted but reserves the right to determine whether to accept the requested change. If in the Public Works Director's opinion, additional information or interpretation is necessary; such information will be supplied in the form of an addendum as stated above. Any addenda shall have the same binding effect as though contained in the main body of the RFP. Oral instructions or information concerning the scope of work of the project given out by City of Keizer managers, employees, or agents to the prospective Proposers shall not bind the City of Keizer.

1. All addenda, clarification, and interpretations will be posted on the City of Keizer's website at: www.keizer.org.
2. No addenda will be issued later than the date set in the RFP Schedule, except an addendum, if necessary, postponing the date for receipt of Proposals, withdrawing the invitation, modifying elements of the proposal resulting from a delayed process, or requesting additional information, clarifications, or revisions of proposals leading to obtaining best offers or best and final offers.
3. Each Proposer shall ascertain, prior to submitting a Proposal, that the Proposer has received all addenda issued, and receipt of each addendum shall be acknowledged in the appropriate location on each addendum and included with the Proposal submitted.

2.4 TRADE SECRETS AND PUBLIC RECORDS LAW

All information submitted by Proposers shall be public records and subject to disclosure pursuant to the Oregon Public Records law, except such portions of the Proposals for which Proposer requests exemption from disclosure consistent with Oregon Law. All requests shall be in writing, noting specifically which portion of the Proposal the Proposer requests exemptions from disclosure and which Section of Oregon Public Records law supports such exemption. Proposer should not mark the whole proposal document "confidential". If a Proposal contains any information that is considered a trade secret under OS 192.345(2), Proposers must mark each sheet of such information with the following legend: "This data constitutes a trade secret under ORS 192.345(2), and shall not be disclosed except in accordance with the Oregon Public Records law, ORS Chapter 192." Proposer shall not copyright, or cause to be copyrighted, any portion of any said document submitted to the City of Keizer as a result of this RFP.

2.5 CANCELLATION

ORS 279B.100 provides for cancellation, rejections, or delay of proposals when the cancellation or rejection is in the best interest of the Contracting Agency as determined by the Contracting Agency. The City of Keizer reserves the right to cancel award of this Contract at any time before execution of the Contract by both parties if cancellation is deemed to be in the City of Keizer's best interest. In no event shall the City of Keizer have any liability for the cancellation of award.

2.6 LATE PROPOSALS, LATE WITHDRAWALS AND LATE MODIFICATIONS

Proposals must be submitted by the time designated in the RFP Schedule at the City Hall Information counter and marked received by City staff indicating the time and date as shown on the City Bid Clock at the Information counter. Any Proposals submitted after the designated closing time or to any other location will be considered late and determined nonresponsive and will not be opened or returned. A Proposer's request for modification of a proposal, or withdrawal of a proposal received after the closing date and time is late. The City shall not consider late proposals, later requests for modifications, or late withdrawals.

Delays due to mail and/or delivery handling, including, but not limited to delays within the City of Keizer's internal distribution systems, do not excuse the Proposer's responsibility for submitting the Proposal to the correct location by the stated deadline.

2.7 CONDITIONS OF SUBMITTAL

By the act of submitting a response to this RFP, the Proposer certifies that:

1. The Proposer and each person signing on behalf of any Proposer certifies, and in the case of a sole proprietorship, partnership or corporation, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of their knowledge and belief, no elected official, officer, employee, or person, whose salary is payable in whole or in party by the City of Keizer, has a direct or indirect financial interest in the Proposal, or in the services to which it relates, or in any of the profits thereof other than as fully described in the Proposer's response to this solicitation.
2. The Proposer has examined all parts of the Request for Proposal, including all requirements and Contract terms and conditions thereof, and, if its Proposal is accepted, the Proposer shall accept the Contract documents thereto unless substantive changes are made in same without the approval of the Proposer.
3. The Proposer, if an individual, is of lawful age; is the only one interested in this Proposal; and that no person, firm, or corporation, other than that named, has any interest in the Proposal, or in the proposed Contract.
4. The Proposer has demonstrated quality experience as required in this RFP.
5. The Proposer has examined the scope of services and conditions thoroughly and can provide the appropriate insurance, deposits, and bonds, if applicable.
6. The Proposer will comply fully with the scope of services for the agreed Contract.
7. The Proposer can meet any and all registration and certification requirements as set forth and required in the Oregon Revised Statutes and this RFP.

2.8 PROPOSER REQUESTS INTERPRETATION OF REP DOCUMENTS

1. Proposers shall promptly notify the City of Keizer of any ambiguity, inconsistency or error, which they may discover upon examination of the Proposal Documents.

2. Proposers requiring clarification or interpretation of the Proposal Documents shall make a written request for same to the Public Works Director at the submittal location listed above.

3. The City of Keizer shall make interpretations, corrections, or changes of the Proposal Documents in writing by published Addenda. Interpretations, corrections, or changes of the Proposal Documents made in any other manner will not be binding, and Proposers shall not rely upon such interpretations, corrections, and changes.

4. Should any doubt or difference of opinion arise between the City of Keizer and a Proposer as to the items to be furnished hereunder or the interpretation of the provisions of this solicitation, the decision of the City of Keizer shall be final and binding upon all parties.

5. To the maximum extent allowed by law, the City may waive irregularities or strict compliance with any requirement herein if it concludes such action to be in City's best interest.

2.9 PROPOSER REQUESTS FOR ADDITIONAL INFORMATION

Requests for information regarding City of Keizer services, programs, or personnel, or any other information shall be submitted in writing directly to the Public Works Director at the address in the Request for Proposals. All requests for additional information shall be submitted in writing. Answers shall be provided to all Proposers of record on the date that answers are available.

2.10 COMPETITION

Proposers are encouraged to comment, in writing, on any specification or requirement within this RFP, which the Proposer believes, will inordinately limit competition. Such comments shall be submitted no later than the deadline set in the RFP schedule for solicitation protests.

2.11 SOLICITATION PROTESTS

A protest of any provision in this RFP must be made in writing and directed to the City Manager at the address listed in the RFP and shall be received no later than the date listed in the RFP Schedule. Any protest must address the requirement, provision or feature of this RFP or its attachments, that the potential Proposer believes is ambiguous, unclear, unfair, contrary to law or likely to limit competition. Such submittals will be reviewed upon receipt and will be answered in writing. No such protests or requests will be considered if received after the deadline. No oral, telegraphic, telephone protests or requests will be accepted.

2.12 COST OF RFP AND ASSOCIATED RESPONSES

This RFP does not commit the City of Keizer to paying any costs incurred by any Proposer in the submission or presentation of a Proposal, or in making the necessary studies for the preparation thereof. Responses to this solicitation are purely voluntary. Proposers shall not include any such expenses as part of their Proposals.

2.13 CITY TO REQUEST CLARIFICATION, ADDITIONAL RESEARCH, AND REVISIONS

1. The City of Keizer reserves the right to obtain clarification of any point in a Proposal or to obtain additional information necessary to properly evaluate a Proposal. Failure of a Proposer to respond to such a request for additional information or clarification could result in a finding that the Proposer is non-responsive and consequent rejection of the Proposal.
2. The City of Keizer may obtain information from any legal source for clarification of any Proposal or for information on any Proposer. The City of Keizer need not inform the Proposer of any intent to perform additional research in this respect or of any information thereby received.
3. The City of Keizer may perform, at its sole option, investigations of the responsible Proposer. Information may include, but shall not necessarily be limited to recent financial statements, current litigation, bonding capacity and related history, and contacting references. All such documents, if requested by the City of Keizer, become part of the public records and may be disclosed accordingly.
4. The City reserves the right to investigate references including customers other than those listed in the Proposer's submission. Investigation may include past performance with respect to its successful performance of similar projects, conformance to Owner's budget, compliance with specifications and contractual obligations, its completion or delivery of a project on schedule, and its lawful payment to employees and workers or other criteria as determined by the City.
5. The City of Keizer reserves the right to request revisions of Proposals after the submission of Proposals and before award.
6. The City of Keizer reserves the right to negotiate revisions to the final Contract, as well as price, with the successful Proposer.
7. The City of Keizer reserves the right to request revisions of Proposals after the submission of Proposals and before award for the purpose of obtaining best offers or best and final offers.

2.14 REJECTION OF PROPOSALS

The City of Keizer reserves the right to reject any or all Proposals received as a result of this request. Proposals may be rejected for one or more of the following reasons, including but not limited to:

1. Failure of the Proposer to adhere to one or more of the provisions established in this RFP.
2. Failure of the Proposer to submit a Proposal in the format specified herein.

3. Failure of the Proposer to submit a Proposal within the time requirements established herein.

4. Failure of the Proposer to adhere to ethical and professional standards before, during, or following the Proposal process.

The City of Keizer may reject any Proposal not in compliance with all prescribed public procurement procedures and requirements and may reject for good cause any or all Proposals upon a finding of the City of Keizer that it is in the public interest to do so.

2.15 MODIFICATION OR WITHDRAWAL OF PROPOSAL BY PROPOSER

1. A Proposal may not be modified, withdrawn, or canceled by the Proposer for ninety (90) calendar days following the time and date designated for the receipt of Proposals.

2. Proposals submitted early may be modified or withdrawn only by notice to the City of Keizer Public Works Director at the Proposal submittal location prior to the time designated for receipt of Proposals. Such notice shall be in writing over the signature of the Proposer. All such communications shall be so worded as not to reveal the amount of the original Proposal or any other material contents of the original Proposal.

3. Withdrawn Proposals may be resubmitted up to the time designated for the receipt of Proposals provided they are then fully in conformance with this RFP.

2.16 PROPOSAL OWNERSHIP

1. All Proposals submitted become and remain the property of the City of Keizer and, as such, are considered public information and subject to public disclosure within the context of public records law under the Oregon Revised Statutes.

2. Except as provided in Section 2.4, unless certain pages or specific information are specifically marked “proprietary” and qualify as such within the context of the regulations stated in the preceding paragraph, the City of Keizer shall make available to any person requesting information through the City of Keizer’s processes for disclosure of public records, any and all information submitted as a result of this solicitation without obtaining permission from any Proposer to do so after the Notice of Intent to award has been released.

2.17 DURATION OF PROPOSAL

Proposal prices, terms and conditions shall be firm for a period of at least ninety (90) days from the deadline for receipt of submittal. The successful Proposal shall not be subject to future price escalation or changes of terms if accepted during the ninety (90) day period. Price decreases or changes in terms by others after the acceptance of a Proposal will not be considered.

2.18 AFFIRMATIVE ACTION

By submitting a Proposal, the Proposer agrees to comply with all applicable local, state and federal law, including but not limited to the Fair Labor Standard Act, Title VII of the

Civil Rights Act of 1964, Executive Order 11246 (as amended), Fair Employment Practices, Equal Employment Opportunity Act, Section 503 of the Rehabilitation Act of 1973, as amended; Vietnam Era Veterans' Readjustment Assistance Act of 1974; Americans with Disabilities Act; Age Discrimination in Employment Act of 1967 (ADEA); and Oregon Revised Statutes (ORS).

2.19 DISADVANTAGES, MINORITY, WOMEN, AND EMERGING SMALL BUSINESSES (DMWESB)

Keizer encourages the participation of Target Businesses. These businesses are defined as Disadvantaged, Minority-Owned, Women-Owned, and Emerging Small Businesses (DMWESB) certified by the State of Oregon (OMWESB), and businesses certified as Small Disadvantaged Businesses by the Small Business Administration. Proposers may not discriminate in the award of a subcontract because the subcontractor is a minority, women or emerging small business enterprise (MWESB) certified under ORS 200.055. By submitting a Proposal, the Proposer specifically certifies, under penalty of perjury, that the Proposer has not discriminated against minority, women or emerging small business enterprises in obtaining any required subcontracts.

2.20 SUBCONSULTANTS

In all solicitations either by competitive budding, proposals, or negotiation made by the successful Proposer for work to be performed under a subcontract or subconsultant, including procurements of materials or lease of equipment, each potential subcontractor or subconsultant or supplier shall be notified by the successful Proposer of the Proposer's obligations under the Contract, Title VI of the Civil Rights Act of 1964, and other federal nondiscrimination laws.

2.21 IDENTICAL PROPOSALS

If the City receives Proposals identical in price, fitness, availability and quality and chooses to award a contract, the City shall award the contract in accordance with ORS 279A.120 and OAR 137-046-0300. If the City determines that one or more proposals are identical, tiebreaker preference for identical offers are awarded on the following order of precedence: 1) Goods and services manufactured, produced or to be performed in Oregon, and 2) Drawing lots among the identical Proposals. The City shall provide the Proposers who submitted the identical Proposals notice of the date, time and location of the drawing of lots and an opportunity for the Proposers to be present when the lots are drawn.

2.22 COMPLIANCE WITH STATE OF OREGON LAWS

By submitting a response to this solicitation, Proposer agrees that any terms and conditions stated within any Contract awarded as a result of this solicitation shall include the following laws of the State of Oregon and are hereby incorporated by reference into the Contract: ORS 279B.220, 279B.225, 279B.230, and 279B.235.

2.23 NOTIFICATION OF INTENT TO AWARD

Responsive Proposers to this RFP will be notified of the Selection Review Committee's recommendation and the City's intent to award a Contract not less than seven (7) days prior to award of Contract. The notice of intent to award a Contract will be directed to the person who has signed the Proposal on behalf of the Proposer.

2.24 PROTEST OF AWARD

A Proposer may protest the award of a contract or the intent to award such a contract, which occurs first, if the following conditions are satisfied: (1) The Proposer must be adversely affected because the Proposer would be eligible to be awarded the contract in the event the protest is successful; (2) The reason for the protest is that all the lower Proposals or higher ranked Proposals are nonresponsive; (3) The City has failed to conduct the evaluation of Proposals in accordance with the criteria or processes described in this solicitation document; (4) The City has abused its discretion in rejecting the Protestor's Proposal as nonresponsive; (5) The City's evaluation of the Proposals or the subsequent determination of award is otherwise in violation of ORS 279A or 279B.

The Proposer must deliver the written protest to the City Manager within seven (7) days after issuance of the notice of intent to award the contract or if no notice of intent to award is issued, within forty-eight hours after award. A Proposer's written protest shall specify the grounds for protest to be considered by the City pursuant to ORS 279B.410(2). A Proposer's written protest shall specify the grounds for protest. The City shall not consider a Proposer's contract award protest submitted after the above timeline.

2.25 OBLIGATION TO AWARD

The City's obligation to award this RFP is contingent upon appropriation or approval of funds.

2.26 CONTRACT

The Successful Proposer will be required to sign a Contract to deliver to the City at the cost proposed providing the scope of services and conditions set forth herein. It is the City's intent to award a Contract in substantially the form of the Contract attached to this Proposal document. Proposers may submit an alternative Contract for City's review. The City, at its sole determination, may approve the Proposer's offered Contract as is, require modifications, or reject the Proposer's Contract and require that the City's Contract be executed for the purpose of this RFP.

2.27 NOTICE TO PROCEED

Work under the Contract may not begin until the Notice to Proceed has been issued. The City will issue the Notice to Proceed after execution of the Contract. The Notice to Proceed will state the date work under the Contract shall begin.

SECTION 3 – GENERAL PROVISIONS

3.1 DEFINITIONS (as used in these documents, except where the context otherwise clearly requires)

CIP means Capital Improvement Program.

CITY or OWNER means the City of Keizer.

CONTRACT DOCUMENTS are all written documents existing at the time of contract execution and setting forth the obligations of the parties, including the Request for Proposals, Professional Services Contract, Scope of Services, Non-Collusion and Conflict of Interest Certification, Certification Statement for Corporation or Independent Consultant, Proposer Representations and Certification Regarding Debarment, Suspension and Other Responsibility Matters, Certification of Insurance Requirements, References, Cost Proposal, Proposal Response, and other attachments, exhibits, or addenda applicable to the final Contract Documents. In addition, written amendments to the Contract Documents executed by the parties from time to time, and any documents expressly incorporated by reference elsewhere in Contract Documents enumerated above.

CONTRACTOR, CONSULTANT, PROPOSER, RESPONDENT, VENDOR, SUPPLIER is the person or firm that has undertaken to perform the work subject of this contract and by whom or on whose behalf the contract was signed.

DELIVERABLE is the acceptable product or service as identified in the statement of work; received as requested at the right: time, place, quality, quantity, and price. A deliverable must be measurable to determine that all conditions and acceptable performance are met.

OAR means Oregon Administrative Rules.

ORS means Oregon Revised Statutes.

RESPONSIBLE PROPOSER is a person who has submitted an Offer and meets the standards set forth in OAR 137-047-0640 and that has not been debarred or disqualified by the Contracting Agency under OAR 137-047-0575. When used alone, Responsible means meeting the aforementioned standards and is also defined in ORS 279B.110.

RESPONSIVE PROPOSAL is an Offer or Proposal that substantially complies in all material respects with all prescribed procurement procedures and applicable solicitation requirements. When used alone, Responsive means having the characteristic of substantially complying in all material respects with applicable solicitation requirements.

SDC means System Development Charges.

SPECIFICATIONS are the directions, requirements, explanations, terms and provisions pertaining to the various features of the work, the manner and method of proposing for the

work, the manner and method of performance of the work, and the manner and method of payment all as they appear in the contract documents.

STATEMENT OF TIME is a period of time, unless stated as a number of City business days, shall include Saturdays, Sundays, and holidays. The word "day" as used in this RFP document, and any resulting contract awarded as a result of this process, shall constitute a calendar day of 24 hours measured from midnight to the next midnight.

STATEMENT OF WORK or (SOW) is the formal document that defines the entire scope of the work involved for a vendor or contractor and clarifies deliverables, costs, and timeline, and provides direction on the specific services that the contractor is expected to perform by detailing the work activities and deliverables.

SUBSTANTIAL COMPLETION is a stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or use the Work or a portion thereof for its intended use.

WORK is all tasks specified or necessarily implied in these Contract Documents to perform and complete their intended result. The term encompasses all labor, materials, supplies, tools, equipment, fuel, administrative and support services, overhead, and other direct and indirect expenses necessary to achieve the result intended by the Contract Documents.

3.2 CITY REPRESENTATIVE

The City's Representative or designee shall have full authority to act on behalf of the City with respect to administration of the provisions of this Contract, including the authority to stop the work whenever such stoppage may be necessary to ensure the proper execution of the Contract. The Representative or designee shall also have authority to reject all work that does not conform to the Contract Documents.

The City Representative is:

Bill Lawyer
Public Works Director
Phone: 503-856-3555
LawyerB@Keizer.org

The City's Representative shall observe, monitor, and inspect the work to the extent required to determine the provisions of the Contract Documents are being properly fulfilled. The inspection of the work completed shall not relieve the Contractor of his/her obligation to perform acceptable work in conformance with these Contract Documents.

3.3 NOTICES, INVOICES, AND PAYMENTS

All invoices, and payments shall be made in writing and may be given by personal delivery or by mail. Bills, and payments sent by mail should be addressed as follows:

CITY OF KEIZER
Attn: Accounts Payable
P.O. Box 21000
Keizer, OR 97307

And when so addressed, shall be deemed given upon deposit in the United States mail, postage prepaid. In all other instances, bills, and payments shall be deemed given at the time of actual delivery.

All notices shall be made in writing and may be given by personal delivery or by mail. Notices sent by mail should be addressed as follows:

CITY OF KEIZER
Attn: Public Works Director
P.O. Box 21000
Keizer, OR 97307

And when so addressed, shall be deemed given upon deposit in the United States mail, postage prepaid. In all other instances, notices shall be deemed given at the time of actual delivery.

SECTION 4 – SCOPE OF WORK

4.1 REQUIRED SERVICES

The City is seeking a qualified firm to assist with review and suggest revisions to the current Parks Master Plan. The Proposer's project team should demonstrate the necessary experience, skills, and understanding to develop a ten-year Comprehensive Plan Update with a ten-year CIP.

4.2 CONTRACT TERM

The term of this contract shall be from October 20, 2020 through April 30, 2021. Services shall begin within ten (10) days after the receipt of the City's Notice to Proceed. Ultimate completion includes solutions developed, reviewed, presented, and adopted by the Keizer City Council.

4.2 SCOPE OF WORK

The scope of work entails:

- Review current Master Plan & System Development Charges (SDC) Methodology
- Conduct community forum/survey to obtain input on desire for a recreation program, to include sports group survey and identification of park & facility needs
- Conduct a community forum/survey to obtain input on park improvements/replacements
- Evaluate park and recreation services and facilities offered by the City and other agencies in the community (School Dist., Salem, Marion County etc.)
- Evaluate service level standards and make recommendations as necessary
- Provide feasibility analysis for recreation services based on survey input
- Recommendations to the existing park system based on survey input
- Evaluate each park for condition, deficiencies and current operational problems
- Evaluate the overall park system including its strength and weaknesses
- Perform an Operations, Maintenance and Organizational analysis
- Recommend changes to operations, maintenance and organization based on analysis
- Forecast maintenance impacts based on plan recommendations
- Prepare an overall funding strategy for maintenance and improvements
- Prepare Capital Improvement Plan for improvements identified
- Evaluate existing SDC’s to determine ability to meet demand
- Meet with Parks Board #1 – initial meeting to discuss goals and get input from the Board
- Meet with Parks Board #2 – discuss results of community survey on recreation programs and park improvements

- Meet with Parks Board #3 – final meeting with a goal of Board making a recommendation to Council
- Present Board recommended plan to Council

4.4 INDEPENDENT CONTRACTOR

The Proposer shall provide all labor, equipment, material, and supervision necessary to perform the scope of services described in this RFP. The parties intend that Consultant, in performing the services specified in this contract, shall act as an independent contractor and shall have the control of the work and the manner in which it is performed. Consultant is not considered an agent or employee of the City of Keizer and is not entitled to participate in any pension plan, insurance, bonus, or similar benefits the City of Keizer provides to its employees.

4.5 PROJECT SCHEDULE AND PLAN TIMELINE

The City expects the Proposer selected for award of contract to start work as soon as a contract is executed. Refer to Attachment A for the City's Standard Professional Services Contract. The City anticipates all work will be completed by April 30, 2021. The City reserves the right to add or delete services based on the availability of project funding.

4.6 PROJECT MANAGEMENT

The City reserves the right to require written status reports (no more than twice per month) to verify Project progress, any Project Schedule or budget changes, and to document/discuss any other issues that may affect successful on-time and on-budget Project implementation.

4.7 WORK PERFORMED BY CITY AND OTHERS

The selected Proposer will coordinate with the City to implement the Project Schedule. Any specific duties the City will perform for the Project shall be identified by the Consultant. Proposals should reflect a coordinated approach and should specify the type and level of support anticipated from City staff. At all times, the City will do its utmost to provide timely responses regarding all Project issues and questions that might arise.

4.8 PROJECT DELIVERABLES

a. Facilitate and document the public involvement process
b. Survey data and summary report
c. Needs assessment report
d. Parks SDC Methodology report
e. CIP, operations and funding plan
f. Maps to support the planning process
g Draft System Master Plan Report
h Final System Master Plan Report

SECTION 5 – PROPOSAL SUBMITTAL REQUIREMENTS

5.1 SUBMITTAL PROCESS

Each Proposer should provide four copies of their proposal with one copy marked "Original". In addition to the hard copy (printed paper) version of the proposal, Consultant should provide one electronic version of the proposal on a USB drive in non-editable, Adobe format.

Sealed proposals must be received by the City of Keizer, at the Information Counter, not later than the listed due date in the RFP Schedule. A corporate officer who has been authorized to make such a commitment must sign the proposals. Proposals shall be submitted in a sealed envelope and the outside of the envelope shall plainly identify: (1) the name of the RFP and (2) the name and address of the Proposer.

Each proposal must include, at a minimum, the items listed in Section 4, Scope of Work. The proposal must also contain the mandatory submittal content requirements requested below. Proposals not including this information may be considered nonresponsive and will not be evaluated. A completeness check will be conducted for each proposal.

5.2 PROPOSAL FORMAT

Proposals should be printed double-sided and prepared in a simple, economical manner, without stiff binders or covers, fastened in the top left-hand corner, with the sections tabbed to match those in the RFP, and with all pages numbered within each section. The proposal should be prepared succinctly, providing a straight forward, concise description of the Proposer's ability to meet the requirements of the RFP. There should be no unnecessary attachments or exhibits. City reserves the right to reject Proposals that are deemed illegible or too difficult to read.

5.3 PROPOSER REPRESENTATIONS

The Proposer further agrees to examine the scope of services and conditions thoroughly; provide for appropriate insurance, deposits, and bonds, if required; comply fully with the scope of services for the agreed contract; and ensure any and all registration and certification requirements are met as set forth and required in the Oregon Revised Statutes and this RFP.

5.4 JOINT PROPOSALS

If Proposer is a partnership or joint venture, information must be provided for each partner or joint ventures, and each partner or joint ventures must sign the Proposal and any contracts on behalf of both itself and the Proposer, and each will be jointly and severally liable. In the case of a legal partnership or joint venture, a written Memorandum of Understanding between the parties must be submitted with the Proposal setting forth the business and service delivery agreements between the parties.

5.5 PROPOSED PROJECT TEAM

It is the City's expectation that the Project Team presented in the proposal shall be the same team used once the project is initiated. If unforeseen circumstances require a deviation from the proposed Project Team, the City reserves the right to review, in writing, the proposed replacement. The City will then either approve the change or request that a different replacement be proposed. If an agreement cannot be reached, the City reserves the right to terminate the contract with the Consultant.

5.6 PROPOSAL CONTENT – MANDATORY SUBMITTAL

Proposers shall describe their qualifications and commitment to providing the required scope of services and a clear understanding of the work to be performed, demonstrated by the comprehensiveness and appropriateness of the Proposal. Failure to complete any question or request for information, in whole or in part, or any inaccurate or false information provided by the Proposer may disqualify the Proposer.

1. Introductory Letter

Summarize the key points of the proposal and provide an expression of interest in the project. Proposer should indicate a willingness to enter into a contract with the City based on the terms and conditions contained in the City's Standard Professional Services Contract, Attachment A, and meet the requirements of this RFP. The Introductory Letter shall also name the person(s) authorized to represent the Proposer in any negotiations and the name and title of the person(s) legally authorized to sign any contract that may result. The letter shall be signed by an authorized representative of the Proposer. Include email address and telephone numbers. Any exceptions to the City's Standard Professional Services Contract should be provided within this Letter. If Proposer is exempt from providing Workers' Compensation, Proposer should note exemption in the Introductory Letter.

2. Experience, Qualifications, and Project Team

a. The history of the firm including the number of locations, length of time in business, number of employees, and approximate number of projects worked on per year.
b. Resume of lead Consultant and detailed experience of other Consultants, including subconsultants if applicable, who may be assigned to the task.
c. Submit at least three (3) examples of related/relevant private or public projects for each member of the Project Team and their assigned role for the Project.
d. Project Team's knowledge of principles related to parks master planning, SDC methodology, and capital funding strategies.

3. Project Approach and Understanding

The Proposer must present a clear and concise understanding of the overall project and its objectives based on the available information. Proposer should list and describe the significant issues and concerns that need to be addressed. Other potential issues not previously indicated herein should be presented, along with any innovative or unique solutions. Include an explanation of how a collaborative relationship with the City will be established, including methods for communicating and sharing information and materials, as well as facilitating meetings and building consensus.

4. Work Plan, Deliverable Schedule, and Cost Proposal Summary

Proposers must present a Work Plan and Deliverable Schedule that best addresses and fulfills the project objectives and the City's needs as described in Section 4 Scope of Work. The Proposer will have primary responsibility for developing concepts and strategies and preparation of all meeting materials, plans and related documents. The Proposer should identify strategies for soliciting and articulating project ideas and plan updates suggested by the community. Additionally, the Proposer should identify strategies for illustrating and articulating proposed standards, guidelines, criteria, etc. so the intended purpose of such standards or guidelines are easily understandable.

Work Plan must include:

a. Assigned personnel, including any subconsultants, hours anticipated and by task.
b. Proposed Project Manager, hours anticipated and by task.
c. Proposer's Work Plan must clearly reflect work assignments and products to be completed by the Proposer or City staff.

Deliverable Schedule must include:

a. A Gantt chart to reflect the project timeline by date, project team member, hours and task.

Cost Proposal Summary:

a. Costs proposed should be listed on Exhibit A.
b. List the Project Team individuals by name and if applicable, include their hourly rate and total hours for the specific tasks indicated in Section 4.
c. Individual's travel costs for workshops, meetings, or other activities, and materials and supplies are considered incidentals.

5. References

Provide three (3) references from customers for whom the Proposer is currently or has previously provided services similar to those defined in this RFP. The projects must have been completed within the last three (3) years. Include the contact names, phone number, email, and mailing address. References may be contacted to assist with the evaluation of experience, qualifications, and customer satisfaction. Proposer shall provide reference information on Exhibit B. Additional references may be contacted by the City at its discretion.

5.7 ADDITIONAL ATTACHMENTS REQUIRED

1. Cost Proposal Summary (Exhibit A)

2. References (Exhibit B)

3. Non-Collusion and Conflict of Interest Certification (Exhibit C)

4. Certification Statement for Corporation or Independent Contractor (Exhibit D)

5. Proposer Representations and Certification Regarding Debarment, Suspension and Other Responsibility Matters (Exhibit E)

6. Certification of Insurance Requirements (Exhibit F)

7. Addenda – All addenda of this RFP should be submitted as part of the Proposal. Receipt of each addendum shall be acknowledged by the Proposer by signing in the appropriate designated location. Each Proposer should ascertain, prior to submitting a Proposal, that the Proposer has received all addenda issued by the City of Keizer. Addenda are posted on the City of Keizer's website.

SECTION 6 – EVALUATION CRITERIA

6.1 SELECTION PROCESS

Each proposal will be judged on its completeness and quality of its content. The City reserves the right to reject any or all proposals and is not liable for any costs the Proposer incurs while preparing the proposal. All proposals will become part of the public file, without obligation to the City. Upon the completion of the evaluations, the City intends to negotiate a contract with the Proposer whose proposal best meets the City's expectations. The City intends to contract for the "best value" product and service that offers the desired level of quality at a reasonable price.

6.2 SELECTION REVIEW COMMITTEE

The Selection Review Committee will be comprised of at least three members. The selection committee shall be comprised of the Public Works Director, Parks Facility Division Manager, and one Parks Board member to be nominated by the Parks Board. The City reserves the right to change the make-up of the committee depending on the availability of the proposed members. The role of the Selection Review Committee is to evaluate the proposals submitted and make a recommendation of award. The City may also seek expert advice to help review proposals. Such advisors to the Selection Review Committee may attend evaluation meetings and Proposer interviews and lend any such expertise to the process as requested by the City. However, any such person contacted by the City for their expert advice shall not at any time have communications with any Proposers regarding their proposals or the process.

Scoring will be completed covering all areas listed below in the Evaluation Criteria. Proposals must provide a concise description of the Proposer's ability to satisfy the requirements of the RFP with emphasis on completeness and clarity of content. All scores for each Proposer shall be added together to arrive at a final score for each Proposer. Proposals will then be ranked in descending order by the total proposal score. The City is seeking value from the service requested. If additional information is deemed necessary as part of the evaluations, such information will be solicited to allow the Committee to complete the evaluation process.

6.3 EVALUATION CRITERIA

The criteria listed below will be used to evaluate the Proposers to determine the apparent successful Proposer. Scoring will be completed covering all areas listed below in the Evaluation Criteria. All scores for each Proposer shall be added together to arrive at a final score for each Proposer. Proposals will then be ranked in descending order by the total Proposal score. If final scores are within five points, the City reserves the right to negotiate with any of these Proposers or may elect to negotiate a contract using best and final offers in accordance with OAR 137-047-0261. Total possible points will be 100.

6.3.1 INTRODUCTORY LETTER

- Did Proposer include an Introductory Letter indicating an expression of interest in the project and the capability to provide the entire scope of services described herein and a willingness to enter into a contract with the City based on the terms and conditions contained in the sample Contract?
- Were any exceptions to the City contract included in the Introductory Letter?
- Did the Proposer indicate the person(s) authorized to represent the Proposer in negotiations and legally authorized to sign the Contract?

6.3.2 EXPERIENCE AND QUALIFICATIONS

- Did the Proposer provide adequate detail to determine the firm and the employee's qualifications and experience providing the required services?
- Did the Proposer describe the proposed key personnel/employees' qualifications and experience relating to the described scope of work and the proposed Project Team.
- Does the Proposer have adequate relevant experience?
- Will the proposed experience of the firm and employees meet the needs of the City?
- Did Proposer list other relevant professional capabilities demonstrated on other projects, which may include mapping, graphic displays, and other methods for communicating project concepts.

6.3.3 PROJECT TEAM

A capable, dedicated project team is crucial to any successful project. The Consultant's team needs to be identified, along with its full capabilities relevant to the project at hand.

- Does the Project Team's qualifications and experience relate to the requested services?
- Will the proposed experience of the Team meet the needs of the City?
- Are there similar projects in complexity and duration, and the jurisdiction in which the work occurred characterizes the proposed Project Team's work quality and "successful" project results?
- Proposer should identify any other firms (subconsultants) included on the Project Team along with the Consultant and describe the scope of the Consultant's and each subconsultant or firm's services and responsibilities during the project.

6.3.4 PROJECT APPROACH AND UNDERSTANDING AND WORK PLAN

This evaluation component will allow the City to assess the Consultant's understanding of the services that are requested and needed for a successful project.

- Does the Proposer present a clear and concise understanding of the overall project and its objectives based on the available information?
- Did the Proposer describe their approach to the project?
- Did Proposer describe the significant issues and concerns that need to be addressed?
- Were there general or specific tasks the Proposer believes are important for prudent management and sequencing of the tasks, and detailed Schedule?
- Did Proposer include an explanation of how a collaborative relationship with the City will be established and the proposed best method for communication?

6.3.5 COST PROPOSAL SUMMARY

This evaluation component will confirm whether Proposer can meet the overall milestones identified in Section 4. A complete Cost Proposal Summary should be submitted on Exhibit A.

6.3.6 REFERENCES

- Did the Proposer provide three references and do the references provided by Proposer clearly demonstrate the type of services provided to customers and the length of service?
- Do the references represent customers requesting the same types of services required by the City?
- Were customers satisfied with the level of expertise and the qualifications of the key personnel and Project Team assigned to provide the required services?

6.4 EVALUATION CRITERIA SCORE GRID

The criteria listed below will be used to evaluate and score proposals to determine the apparent successful Proposer. **Total possible points will be 100. Points will be weighted as follows:**

Introductory Letter	Pass/Fail
Experience and Qualifications	30%
Project Team	25%
Project Approach, Understanding, and Work Plan	25%
Cost Proposal Summary — Exhibit A	10%
References — Exhibit B	10%

TOTAL POINTS AVAILABLE 1S 100	100%

6.5 INTERVIEWS (Optional)

At the City's option, interviews may be conducted with all or a select few of the Proposers after the Proposals are evaluated. The Selection Review Committee may interview the Proposers and ask additional questions related to the proposal and the scope of work. The City will schedule the time and locations of the interviews, if required, on the dates indicated in the RFP Schedule. Interviews will take place at a location to be determined in Keizer. Consultants invited to the interview will be responsible for making and paying for their own travel arrangements. If held, a possible 50 points will be attributed to interviews and the City will provide selected Proposers with a set of questions prior to the interview date.

6.6 RANKING OF PROPOSALS

Proposals may be ranked by the Evaluation Committee based on evaluation of responses and interviews (if any), with the first-ranked Proposer being that Proposer which is deemed to be the most appropriate and fully able to perform the services, and the second-ranked Proposer being the next most appropriate, all in the sole judgment of the Evaluation Committee. Contractor's scores will be totaled and ranked. Any Proposer's response to this RFP shall be considered de facto permission to the City of Keizer to disclose the results, when completed, to selected viewers at the sole discretion of the City of Keizer.

6.7 NEGOTIATIONS

The City may commence serial negotiations with the highest ranked, eligible Proposers or commence simultaneous negotiations with all eligible Proposers. The City may negotiate: (a) the statement of work; (b) the contract price as it is affected by negotiating the statement of work; and, (c) any other terms and conditions reasonably related to and expressly authorized for negotiation in the RFP or addenda thereto, or alternative terms and conditions that are reasonable and declared by Proposer within their proposal response to be considered for negotiation.

6.8 BEST AND FINAL OFFERS

If in the best interest of the City it has chosen to employ a method of Proposer selection leading to best and final offers, the City may conduct private discussions with qualified Proposers as allowed by ORS 279B.060(8).

SECTION 7 – CONTRACT REQUIREMENTS

7.1 CONTRACT AWARD

The award of a contract is accomplished by executing a contract with a written agreement that incorporates the entire RFP, Attachments, Exhibits, Proposer's Response, Clarifications, Addenda, and Statement of Work. All such materials constitute the Contract Documents. The Public Works Director is the sole point of contact for the issuance and compliance of the contract and insurance. The contract shall be substantially in the form of the Sample Professional Service Contract, Attachment A.

The Proposer must indicate a willingness to negotiate a contract in a timely, reasonable manner with the City. The City reserves the right to negotiate with the second-ranked Proposer, if the contract negotiation attempts are unsuccessful with the apparent successful Proposer.

In addition, the Proposer should indicate there is no conflict of interest or collusion on the part of the Proposer's submission of a proposal for the services being solicited under this RFP, see Exhibit C, Non-Collusion and Conflict of Interest Certification. If a potential conflict could be perceived to exist, then attach a letter of explanation disclosing the potential conflict or relationship.

The Proposer hereby agrees to accept the contract terms of the attached City Standard Professional Services Contract unless exceptions to the contract are submitted by the Proposer with their Proposal Response within the Introductory Letter. If Proposer does not provide written exceptions within the Introductory Letter and Proposer indicates exceptions after contract evaluations, City reserves the right to reject the Proposal and negotiate a contract with the next ranked Proposer or find the Proposal Response nonresponsive.

7.2 INSURANCE REQUIREMENTS

The successful Proposer must be covered by Workers' Compensation Insurance, which will extend to and include work in Oregon. If Proposer is exempt from Workers' Compensation, Proposer should indicate they are exempt from workers' compensation within the Introductory Letter of the Proposal Response.

Proposer must submit documents certifying they can meet City insurance requirements: Commercial General Liability Insurance, Automobile and Collision Insurance, and Professional Liability. An overview of the Insurance Requirements is provided in Exhibit F and Proposers must submit Exhibit F to acknowledge and accept the insurance requirements noted herein.

The Proposer shall demonstrate willingness to contract and the ability to provide a Certificate of Insurance and additional insured endorsement reflecting the Insurance Requirements within ten (10) days of the Notice of Contract Award. If Proposer does not provide the required insurances, the City may elect to negotiate a contract with the second-ranked Proposer.

ATTACHMENT A – SAMPLE CONTRACT

Professional Service Contract
for
Keizer Parks Master Plan Update

This Contract, made and entered into the _____ day of _____, 2020, by and between City of Keizer, Oregon, 930 Chemawa Rd., NE, Keizer, Oregon, 97303 ("City"), and _____, _____ ("Contractor").

RECITALS

WHEREAS City requires the assistance with a project to Develop a Parks Master Plan Update, hereinafter referred to as (“Project”) and as more fully described in this Contract;

WHEREAS, Contractor has offered to render certain specialized professional services in connection with this Project;

NOW, THEREFORE, the parties hereby agree as follows:

AGREEMENT

1. Term of Contract. This Contract shall cover services rendered from October 20, 2020 through April 30, 2021. Services shall begin within ten (10) days after receipt of the City’s Notice to Proceed.

2. Contractor’s Services. Contractor agrees to provide services described in Exhibit A (Exhibit A may include the Request for Proposals and Scope of Work, and any other related Contract documents), which is attached hereto and incorporated by reference into this Contract.

3. Project Deliverables. Contractor agrees to provide the following deliverables:

a. Facilitate and document the public involvement process
b. Survey data and summary report
c. Needs assessment report
d. Parks SDC Methodology report
e. CIP, operations and funding plan
f. Maps to support the planning process
g. Draft System Master Plan Report
h. Final System Master Plan Report

4. Compensation. Contractor’s compensation shall be as outlined in Contractor’s proposal attached hereto as Exhibit B and incorporated by reference into this Contract. Contractor’s compensation for the services described under this Contract shall not exceed $_____, unless the parties agree to a change in scope and/or compensation.

4.1. Extra Services beyond those basic services described in Exhibit A may be provided if requested by City and confirmed in writing by Contractor.

5. Payment Terms. Payment for services shall be made per monthly invoice for services performed within 30 days of receipt of invoice. Contractor may assess a late payment penalty of 1.5% per month on late payments. For extra services not a part of this Contract, payment shall be based on hourly rates in Exhibit B.

6. Independent Contractor. It is agreed to that Contractor shall act and be an independent contractor and not an employee of the City, and shall obtain no rights to any employee benefits, which accrue, to City's employees.

7. Assignments. Neither the City nor Contractor shall assign this Contract without the written consent of the other.

8. Changes to this Contract. Except as provided herein, this Contract may be modified only by a written agreement executed by City and Contractor.

9. Indemnification. The Contractor agrees to indemnify and defend the CITY, its agents, officers and employees, from and against any and all liability, claims, suits, loss, damages, costs, and expenses arising out of or resulting from the negligent or intentional acts, errors, or omissions of the Contractor, its officers, employees, or agents.

10. Insurance Requirements. During the term of this Contract, Contractor shall maintain, at a minimum, the following insurance.

10.1 General Liability. Contractor shall maintain commercial general liability insurance in the amount of $1,000,000 per occurrence / $2,000,000 annual aggregate, which protects it from claims for personal injury, bodily injury and property damage.

10.2 Automobile Liability. Contractor shall maintain automobile liability coverage for non-owned and hired autos, in the amount of $1,000,000.00 per occurrence which protects Contractor from claims for bodily injury and property damage.

10.3 Professional Liability. Contractor shall maintain professional liability insurance in the amount of $1,000,000 per occurrence.

10.4 Workers' Compensation Insurance. Contractor shall maintain workers' compensation insurance as required by State statutes.

///

///

///

10.5 Certificates of Insurance. Prior to commencing services, and on an annual basis thereafter, Contractor shall provide City with certificates of insurance and additional named insured endorsement attesting to the existence of the insurance coverage required by this Contract. Certificates shall be endorsed to name the City of Keizer, its officers, agents, contractors, and employees as an additional insured. Such certificates shall provide that no coverage shall be cancelled without 30 days written notice to City except 10 days' notice for non-payment of premium. In the event Contractor does not obtain or maintain the coverage required by this Contract, City may, at its option, terminate this Contract.

11. Ownership of Work Product. Upon payment of all fees an expenses, all instruments of professional services prepared by Contractor on this project, including but not limited to, drawings and specifications are the property of the City.

12. Mediation. City and Contractor agree to mediate claims or disputes arising out of or relating to this Contract before initiation litigation. The mediation shall be conducted by a mediation service acceptable to the parties. A party shall make a demand for mediation within a reasonable time after a claim or dispute arises, and the parties agree to mediate in good faith. In no event shall any demand for mediation be made after such claim or dispute would be barred by applicable law. Mediation fees shall be shared equally.

13. Severability. In the event that any term or provision of this Contract is found to be unenforceable or invalid for any reason, the remainder of this Contract shall continue in full force and effect, and the parties agree that any unenforceable or invalid term or provision shall be amended to the minimum extent required to make such term or provision enforceable and valid.

14. City Responsibilities. City agrees to provide Contractor with all information, surveys, reports, and professional recommendations and any other related items reasonably requested by Contractor in order to provide its professional services. Contractor may rely on the accuracy and completeness of these items. City agrees to provide such items and to render decisions in a timely manner so as not to delay the orderly and sequential progress of Contractor's services.

15. Governing Law. This Contract shall be construed, interpreted and applied in accordance with the laws of the State of Oregon.

16. Standard of Care. Contractor shall provide its services in accordance with generally accepted standards of its profession.

17. Schedule. Contractor's services shall be performed as expeditiously as is consistent with professional skill and care. The City reserves the right to require written status reports (no more than twice per month) to verify Project progress, any Project Schedule or budget changes, and to document/discuss any other issues that may affect successful on-time and on-budget Project implementation.

18. Termination. Either City or Contractor may terminate this Contract upon seven days' written notice. If this Contract is terminated, City agrees to pay Contractor for all services rendered and reimbursable expenses incurred up to the date of termination. Upon not less than seven days' written notice, Contractor may suspend the performance of its services if City fails to pay

Contractor in full for services rendered or expense incurred. Contractor shall have no liability because of such suspension of services or termination due to City's non-payment.

19. Entire Agreement. This Contract represents the entire and integrated agreement between City and Contractor and supercedes all prior negotiations, statements or agreements, either written or oral. There are no conditions, agreements or representations between the parties except as expressed herein. Nothing in this Contract shall create a contractual relationship for the benefit of any third party.

20. Notices. All notices hereunder shall be given in writing and mailed postage prepaid, addressed as follows:

A. To City:

Bill Lawyer
Public Works Director
930 Chemawa Rd. NE
Keizer, OR 97303

B. To Contractor:

21. No Responsibility for Construction Means or Methods. Irrespective of any other term in this Contract, Contractor shall not control or be responsible for construction means, methods, techniques, schedules, sequences or procedures, or for construction safety, any other related programs, or for another party's errors or omissions or for another party's failure to complete its work or services in accordance with Contractor's documents.

22. Prevailing Party. Should any legal proceeding be commenced between the parties to this Contract seeking to enforce any of its provisions, including, but not limited to, fee provisions, the prevailing party in such proceeding shall be entitled, in addition to such other relief as may be granted, to a reasonable sum for attorneys' and expert witnesses' fees, which shall be determined by the court or forum in such proceeding or in a separate action brought for that purpose. For purposes of this provision, "prevailing party" shall include a party that dismisses an action for recovery hereunder in exchange for payment of the sum allegedly due, performance of covenants allegedly breached, or consideration substantially equal to the relief sought in the action or proceeding.

23. Public and Media Relations. Contractor shall be permitted to identify City as a customer, to use City's name in connection with proposals to prospective customers, to reference City on the Contractor's website and to otherwise refer to City in print or electronic form for marketing, publicity or reference purposes. However, Contractor shall not publish City's confidential or proprietary information. Contractor and City shall coordinate all publicity efforts relating to the work covered in this Contract. Each party agrees to assist the other party in seeking to promote the work completed under this Contract and to mention the other party in press and promotional materials. City agrees to credit and reference Contractor in all material (print or

electronic) relating to the work covered in this Contract and to seek prior written approval for content that makes reference to Contractor beyond simple mention.

24. Non-Discrimination/Equal Opportunity. During the term of this Contract, the Contractor agrees as follows:

The Contractor will not discriminate against any employee or applicant for employment because of creed, religion, race, color, sex, marital status, sexual orientation, political ideology, ancestry, national origin, or the presence of any sensory, mental or physical handicap, unless based upon a bona fide occupational qualification. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their creed, religion, race, color, sex, national origin, or the presence of any sensory, mental or physical handicap. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer, recruitment or recruitment advertising layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship.

25. Exhibits. The Exhibits, if any, attached to this Contract are incorporated herein as if fully set forth in this Contract. If any provision of any Exhibit conflicts with the provisions of this Contract, the terms of this Contract shall govern.

26. Electronic Signatures. Any signature (including any electronic symbol or process attached to, or associated with, a contract or other record and adopted by a Person with the intent to sign, authenticate or accept such contract or record) hereto or to any other certificate, agreement or document related to this transaction, and any contract formation or record-keeping through electronic means shall have the same legal validity and enforceability as a manually executed signature or use of a paper-based recordkeeping system to the fullest extent permitted by applicable law.

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the day and year first above written.

CITY

City of Keizer

By:_____ _____
Christopher C. Eppley Date:
City Manager

CONTRACTOR

By: _____ _____
Date:

EXHIBIT A – COST PROPOSAL SUMMARY

In accordance with the Request for Proposals issued by the City of Keizer, the firm referenced below hereby submits a Cost Proposal Summary. Use Additional pages to provide clarifications if needed.

Items	Description	List Personnel	Hours	Hourly Rate	Total Cost
1	Assessment of current Parks & Recreation system				
2	Assessment and final report on Keizer's Parks SDC methodology, including recommended adjustments				
3	Draft and final reports on recommended updates to the Keizer Parks Master Plan, including proposed projects				
4	Meetings with staff, officials, and public groups				
	TOTAL				

I hereby certify that the undersigned is authorized to represent the firm stated below, and empowered to submit this proposal and if selected, agrees to furnish all services in accordance with the RFP and addenda. In addition, all City of Keizer project requirements, including insurance, have been reviewed and are incorporated in this Cost Proposal.

Firm Name: _____

Signature: _____

Printed Name: _____

Title: _____

Date: _____

EXHIBIT B – REFERENCES

Provide at least three (3) references with telephone numbers and email addresses. References must be able to verify the quality of your previous work in the proposed area of work. Add additional pages if needed.

REFERENCE 1

Organization Name	Telephone Number
Contact Person	Email
Mailing Address	Contract Term

Project Description

REFERENCE 2

Organization Name	Telephone Number
Contact Person	Email
Mailing Address	Contract Term

Project Description

REFERENCE 3

Organization Name	Telephone Number
Contact Person	Email
Mailing Address	Contract Term

Project Description

EXHIBIT C – NON-COLLUSION AND CONFLICT OF INTEREST CERTIFICATION

The undersigned hereby proposes and, if selected, agrees to furnish the services described in accordance with this RFP, Exhibits, Attachments, and Addenda, if applicable, for the term of the Contract and certifies that the Proposer is not in any way involved in collusion and has no known apparent conflict of interest in submitting a Proposal.

CERTIFICATIONS

Non-Collusion. The undersigned Proposer hereby certifies that it, its officers, partners, owners, providers, representatives, employees and parties in interest, including the affiant, has not in any way colluded, conspired, connived or agreed, directly or indirectly, with any other Proposer, potential Proposer, firm or person, in connection with this solicitation, to submit a collusive or sham bid, to refrain from bidding, to manipulate or ascertain the price(s) of other Proposers or potential Proposers, or to secure through any unlawful act an advantage over other Proposers or the City. The fees, prices, and Response submitted herein have been arrived at in an entirely independent and lawful manner by the Proposer without consultation with other Proposers or potential Proposers or foreknowledge of the prices or Response to be submitted in response to this solicitation by other Proposers or potential Proposers on the part of the Proposer, its officers, partners, owners, providers, representatives, employees or parties in interest, including the affiant.

Discrimination. The undersigned Proposer has not discriminated and will not discriminate against any minority, women or emerging small business enterprise or against a business enterprise that is owned or controlled by or that employs a disable veteran in obtaining a required subcontract.

Conflict of Interest. The undersigned Proposer and each person signing on behalf of the Proposer certifies, and in the case of a sole proprietorship, partnership, or corporation, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of their knowledge and belief, no member of the City Council, officer, employee, or person, whose salary is payable in whole or in party by the City, has a direct or indirect financial interest in the award of this Response, or in the services to which this Response relates, or in any of the profits, real or potential, thereof, except as noted otherwise herein. The undersigned hereby submits this Response to furnish all work, services, systems, materials, and labor as indicated herein and agrees to be bound by the following documents: Request for Proposals, Addenda, Agreement, Exhibits and Attachments, and associated inclusions and references, specifications, Proposer's response, mutually agreed clarifications, appropriately priced change orders, exceptions which are acceptable to the City, and all other Proposer's submittals.

Proposer must disclose any apparent or perceived conflict of interest, including but not limited to, current or past relationships with consultants, contractors, subcontractors, or engineers associated with this Project. Furthermore, Proposer must disclose any current or past relationship as a City of Keizer employee. If a perceived conflict may exist then attach a letter of explanation disclosing the potential conflict or relationship.

Disadvantaged, Minority, Emerging Small Business (DMESB) (check applicable box): ☐ Yes ☐ No

The Proposer hereby certifies that the information contained in these certifications and representations are accurate, complete, and current.

Proposer's Firm Name	Telephone Number
Mailing Address, City, State, Zip	Tax Identification No.
Fax Number	Email Address
Signature	Date

EXHIBIT D – CERTIFICATION STATEMENT FOR CORPORATION OR INDEPENDENT CONTRACTOR

A. Contractor is a Corporation, Limited Liability Company, or a Partnership

I certify under penalty of perjury that Contractor is a (check one):

☐ Corporation ☐ Limited Liability Company ☐ Partnership
☐ Nonprofit Corporation authorized to do business in the State of Oregon

Signature:_____

Title:_____ Date:_____

B. Contractor is a Sole Proprietor Working as an Independent Contractor

Contractor certifies under penalty of perjury, that the following statements are true:

1. If Contractor is providing services under this Contract for which registration is required under ORS Chapter 71 (Architects and Landscape Contractors) or 701 (Construction Contractors), Contractor has registered as required by law.

2. Contractor is free to determine and exercise control over the means and manner of providing the service subject to the right of the City to specify the desired results.

3. Contractor is responsible for obtaining all licenses or certifications necessary to provide the services.

4. Contractor is customarily engaged in providing services as an independent business. Contractor is customarily engaged as an independence contractor if at least three of the following statements are true.

Note: Check all that apply. You must check at least three to establish that you are an independent contractor.

- ☐ Contractor's services are primarily carried out at a location that is separate from Contractor's residence or primarily carried out in a specific portion of the residence which is set aside as the location of the business.
- ☐ Contractor bears the risk of loss related to the services provided under this Contract.
- ☐ Contractor provides services to two or more persons within a 12-month period or Contractor routinely engages in business advertising solicitation or other marketing efforts reasonably calculated to obtain new contracts for similar services.
- ☐ Contractor makes a significant financial investment in the business
- ☐ Contractor has the authority to hire additional persons to provide the services and has authority to fire such persons.

Contractor Signature:_____ Date:_____

EXHIBIT E – PROPOSER REPRESENTATIONS AND CERTIFICATION REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS

Failure of the Proposer to complete and sign this form may result in the rejection of the submitted offer. The Proposer will notify the Public Works Director within 30 days of any change in the information provided on this form.

The Proposer certifies to the best of its knowledge and belief that neither it nor any of its principals:

1. Are presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from submitting bids or proposals by any federal, state, or local entity, department or agency;

2. Have within a five-year period preceding the date of this certification been convicted of fraud or any other criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) contract embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

3. Are presently indicted for or otherwise criminally charged with commission of any of the offense enumerated in Paragraph 2 of this certification;

4. Have, within a five-year period preceding the date of this certification had a judgment entered against contractor or its principals arising out of the performance of a public or private contract;

5. Have pending in any state or federal court any litigation in which there is a claim against contractor or any of its principals arising out of the performance of a public or private contract;

6. Have within a five-year period preceding the date of this certification had one or more public contracts (federal, state, or local) terminated for any reasons related to contract performance.

If Proposer is unable to attest to any of the statements in this certification, Proposer shall attach an explanation to their offer. The inability to certify to all of the statements may not necessarily preclude the Proposer from award of a contract under this procurement.

ATTESTATION:

SIGNATURE OF AUTHORIZED PERSON:

Signature: _____ Date: _____

Print Name and Title: _____

Contact Person for this Procurement: _____

Phone:_____ Email:_____

EXHIBIT F – CERTIFICATION OF INSURANCE REQUIREMENTS

Contractor shall at all times maintain in force at Contractor's expense the insurance noted below.

General Liability. Contractor shall maintain commercial general liability insurance in the amount of $1,000,000 per occurrence / $2,000,000 annual aggregate, which protects it from claims for personal injury, bodily injury and property damage.

Automobile Liability. Contractor shall maintain automobile liability coverage for non-owned and hired autos, in the amount of $1,000,000.00 per occurrence which protects Contractor from claims for bodily injury and property damage.

Professional Liability. Contractor shall maintain professional liability insurance in the amount of $1,000,000 per occurrence which protects it from damages caused by error, omission or any negligent acts of Contractor, its subcontractors, agents, officers, or employees performance under this Contract.

Workers' Compensation Insurance. Contractor shall maintain workers' compensation insurance as required by State statutes.

Coverage must be provided by an insurance company authorized to do business in Oregon. Contactor's coverage will be primary in the event of loss. Contractor shall furnish a current Certificate of Insurance and additional named insured endorsement attesting to the existence of the insurance coverage required by this Contract. Certificates shall be endorsed to name the City of Keizer, its officers, agents, contractors, and employees as an additional insured.

Contractor shall provide renewal Certificates of Insurance upon expiration of any of the required insurance coverage. Contractor shall immediately notify the City of any change in insurance coverage.

Certificate holder should be: City of Keizer, PO Box 21000, Keizer, OR 97307. Certificates of insurance can be emails to City Recorder at DavisT@Keizer.org.

Contractor's Acceptance:_____

Date:_____

SEPTEMBER 4, 2020

CITY OF KEIZER

parks master plan update

MIG

815 SW 2ND AVENUE, #200 | PORTLAND, OR 97204-3022
(503) 297-1005 | WWW.MIGCOM.COM

In association with:
COMMUNITY ATTRIBUTES, INC.

43326

MIG

815 SW 2nd Avenue, #200
Portland, OR 97204-3022
P (503) 297-1005
F (503) 297-3195
www.migcom.com

CALIFORNIA
BERKELEY, FULLERTON, LOS ANGELES, PASADENA, RIVERSIDE, SACRAMENTO, SAN DIEGO, SAN JOSE, AND SONOMA

COLORADO
DENVER

OREGON
PORTLAND

TEXAS
SAN ANTONIO

WASHINGTON
SEATTLE

September 4, 2020

City of Keizer - Department of Public Works
930 Chemawa Rd. N.E.
Keizer, OR 97307

RE: City of Keizer Request for Proposal for a Parks Master Plan Update

Dear Mr. Lawyer and the Members of the Selection Committee:

MIG has been invested in the success, vibrancy, and future of Keizer since 2008, when we helped prepare and deliver the City's Parks and Recreation Master Plan. This plan has successfully guided Keizer for more than a decade, and now an updated Master Plan and capital improvement plan is needed to help prioritize your investment through the next 10 years.

MIG is extremely interested in working with you, the Parks Advisory Board, and the entire City to create an updated Master Plan that reflects current realities, community priorities, and forecasted needs.

Our proposal defines the following:

» **Qualifications and Experience:** MIG brings unparalleled expertise in parks, trails, and recreation planning throughout Oregon, the Pacific Northwest, and across the nation. Our local presence makes it easier for us to conduct a planning process amidst evolving COVID-19 restrictions.

» **Project Team:** The MIG Team is comprised of strong park and recreation professionals, and supported by a firm of multidisciplinary specialists that give us the ability to respond to unique project needs and circumstances. We are assisted by Community Attributes, Inc., who specializes in reviewing and updating Park System Development Charges (SDC) fees and methodologies.

» **Project Approach and Understanding:** Your Council's approval of dedicated funding creates the opportunity to strategically invest in park projects, requiring an updated Capital Improvement Plan that reflects new community priorities. The 2020 pandemic and changing trends will influence those priorities. MIG will lead both virtual and in-person outreach activities and coordinate with the Parks Advisory Board to create a realistic and prioritized action plan.

» **Work Plan and Deliverable Schedule:** MIG will deliver a comprehensive Master Plan update on a 6-month schedule that responds to the key needs identified in the RFP. Our work plan brings added value based on our previous work in with you and knowledge of best practices in implementation and park system management.

» **Cost Proposal:** Given our local presence, we are able to keep costs lean and deliver more for your targeted budget.

» **References:** We have provided contact information for three clients that will attest to our ability to deliver quality Master Plans that can respond to community needs. Two can speak to our success in recommending SDC revisions to support increased capital funding. We have worked with each of these clients within the last three years.

We look forward to this opportunity to work with you and key stakeholders to deliver a community-driven parks plan, while focusing attention on the vibrant future supported by City parks, recreation facilities, and trails.

MIG has reviewed and agrees to all RFP requirements and the terms and conditions noted in the City's Standard Professional Services Contract, without exception. We are not exempt from providing Workers' Compensation.

Our two project leads will ensure that all project requirements are met. Cindy Mendoza (cindym@migcom.com) is authorized to represent MIG in project negotiations and will serve as the Director/Project Manager. The contract will be signed by MIG Principal, Melissa Erickson (merikson@migcom.com), who serves as the project's Landscape Architect. We are both from our Portland office at the address noted on the letterhead. We can be reached by phone at 503-297-1005 at the following extensions: x2100 (Cindy) and x2240 (Melissa). Please contact either one of us if you have any questions or would like additional information.

Sincerely,

Cindy Mendoza, CPRP
Director of Parks and Recreation

Melissa Erickson, PLA, ASLA, BFQP
Principal

CONTENTS

Qualifications, Experience, and Project Team **1**

Key Team Member Resumes 3

Project Experience 10

Project Approach and Understanding **15**

Work Plan and Deliverable Schedule **19**

MIG Work Plan 19

Schedule 25

Cost Proposal Summary (Exhibit A) **27**

References (Exhibit B) **29**

Certificates **32**

Signed Addendum **37**

Qualifications, Experience, and Project Team

About MIG, Inc.

MIG, Inc., improves, adapts, and creates organizations, environments, and tools for human development. We are a community of designers, planners, engineers, scientists, and storytellers who engage people in creative problem solving and collective action. We believe that the physical and social environment around us have a profound impact on our lives, and this belief shapes the principles that guide our work:

- Communities can plan their own futures.
- The world needs an ecological perspective.
- Great projects work for everyone.
- Elegant design inspires new thinking.
- Every project presents an opportunity to advance racial and social equity.
- All work must be context driven.

MIG is at the forefront of innovation. We are leading local, regional, and national planning and design initiatives to ensure accessibility and equity; engage, educate, and empower people through participatory processes; facilitate strategy development for social change; create playful and inclusive communities; reimagine streets and repurpose infrastructure; revitalize cities and restore ecosystems; and promote environmental stewardship by recognizing that the health of the natural and built world is mutually dependent.

For nearly four decades, MIG has worked with public, private and nonprofit agencies and their constituents throughout the United States to effectively address any issue on the planning and design spectrum related to parks and recreation—concept to construction, strategic plan to master plan, historic preservation to open space conservation, sustainability to feasibility, and everything in between. Our dedicated staff has the background and experience to scope and implement projects that enable people to actively participate in making decisions that impact their access to and use of parks, open space, and recreation resources.

The depth of our expertise encompasses the full range of assessment, analysis, outreach, design and planning methods/skills required to help communities create and responsibly manage available resources—ensuring the right balance in the amount, size, types and locations of park land, recreation amenities and services for each community now and in the future. The breadth of our experience is unparalleled—from regional open space and trails to community and neighborhood parks to recreation centers and youth programs. Our approach is based on a thorough understanding of all factors associated with parks and recreation from maintenance and operations to site safety and funding; efficiency and accuracy in data gathering and analysis; and creativity and innovation in facility design, problem-solving and strategic implementation.

MIG was founded in 1982 and has 205 professional staff located throughout our 14 offices. Our firm works on an average of 300 projects a year.

AREAS OF EXPERTISE

- Park and Facility Condition Assessments
- Community Needs Assessments
- Level of Service and Demand Analyses
- GIS, Mapping and Data Analyses
- Demographic and Trends Analysis
- Maintenance, Operations and Programming
- Regional Recreation and Trails Planning
- CIP Development and Cost Estimating
- Park Funding, Financing and Partnerships
- Recreation Economics and Cost Recovery
- Green Infrastructure/Riparian Corridors
- Virtual Outreach and In-Person Engagement

About Community Attributes Inc.

Community Attributes Inc. (CAI) is a leader in economics, planning, and data systems. Founded in 2005 by Chris Mefford, this 12-person firm connects stakeholders, residents, the private sector, and government through an enhanced awareness of funding options, regional economic trends, market opportunities, and community needs. The hallmarks of their practice are flexibility, responsiveness, and innovation. They distinguish their firm with clear deliverables and interactive products that help inform policy decision-making to improve the quality of life within communities.

As a core part of their services, CAI is intimately familiar in evaluating, calculating and implementing system development charges, impact fees and mitigation fees. Staff have a strong track record for advising on the implementation of new and updated fees for cities in Oregon, Washington and California. CAI's impact fee studies clearly present the formulas, variables, and statutory basis for impact fees--in the context of the political and municipal insight necessary for fee adoption.

CAI works on an average of 75 projects per year from their office in Seattle.

Key Team Member Qualifications

The proposed MIG Team members bring critical skills and expertise to this project, including park and recreation planning, landscape architecture and facility assessments, outreach and engagement, and SDC methodology updates.

- **Cindy Mendoza, CPRP,** brings more than 20 years of experience in parks, recreation, and trails planning to Keizer. Known for her ability to make processes run smoothly, Cindy will be responsible for project direction, day-to-day task management and serve as the primary point-of-contact. Her strengths include her ability to coordinate residents, stakeholders, Advisory Board members, Council members, and staff in prioritizing investments to build support for implementation. Cindy ensures that projects are delivered on budget and on time by strategically deploying MIG's extensive staff resources where needed.
- **Melissa Erickson, PLA, ASLA, BFQP,** is a MIG Principal and licensed Landscape Architect with 20 years' experience in helping communities plan, design, and shape parks, play areas and public space. Known for her attention to detail and can-do attitude, Melissa evaluates park function, character, condition, accessibility, and operations to help cities see ways to enhance parks through design, improvements, and operational strategies to meet community needs.
- **Ryan Mottau** is one of MIG's firmwide leaders in parks and recreation and community outreach. Ryan leads MIG's virtual and in-person outreach, surveys, operational and organizational assessments, cost modeling and recreation data analyses. Ryan provides the data for data-driven recommendations based on the analysis of recreation participation, trends, priorities, park costs, access, and other metrics.
- **Michaela Jellicoe,** is a senior economist who leads CAI's impact fee practice, including system development charges and mitigation fees. Her strength lies in the way she presents data, evaluates SDCs in the context of other funding, breaks down the methodology, and communicate options to help cities decide what shifts are warranted to maximize revenues for capacity enhancement projects. She will lead the SDC methodology and rate evaluation and recommendations.

This project will also benefit from the support of associates and technical specialists in GIS, recreation facilities and program studies, digital and virtual engagement tools, green infrastructure and natural resources, and graphics and communication. The detailed resumes for our key team members are on the following pages. The resumes include each team member's qualifications, certifications, licenses, and areas of expertise, as well as highlighting more than three relevant projects each individual has completed and their roles.

Cindy Mendoza, CPRP

PROJECT DIRECTOR / PROJECT MANAGER

AREAS OF EXPERTISE

- Project Management
- Park and Recreation Planning
- Recreation Programming
- Community Needs Assessment
- Park and Recreation Trends

EDUCATION

- MA, Geography, (Teaching Fellowship), University of Oregon
- BS, Geography (Honors Scholar), minors in Environmental Studies and English, James Madison University

REGISTRATIONS / CERTIFICATIONS

- NRPA Certified Park and Recreation Professional
- SCORP University Instructor (2017)

PRESENTATIONS

- Creating Your Community's 10-minute Walk Strategy, CPRS 2020, TRAPS 2020, ORPA 2019
- Homelessness in Parks: Strategies and Solutions, NRPA 2019, NRPA 2018, CPRS 2019

Cindy Mendoza's leadership and award-winning expertise in park and recreation planning is a catalyst for community livability across the nation. Her affinity for developing parks and programs began 35 years ago as a recreation leader and soccer coach for underserved kids in her community. Through this work, she saw firsthand the life-changing benefits of parks, programs, and natural areas to youth and their families. Clients and colleagues find Cindy to be a solution-oriented pragmatist, working collaboratively to strategize the right mix of programs, facilities, and policies to maximize resources and meet each community's unique needs. As a writer and facilitator, she brings together diverse perspectives, synthesizing outreach findings and technical data to articulate desired outcomes and support action. An authority in the field, she has published and spoken extensively at the state and national level on the evolution of parks and recreation and its contributions to community livability. As MIG's Director of Parks and Recreation, Cindy offers best practices and the capacity to make all communities thrive though people, parks, and programs.

SELECTED PROJECT EXPERIENCE

- Parks and Recreation Master Plan (ORPA Planning Award), Tualatin, OR
  Role: Director/Project Manager
- Parks, Recreation, and Open Space Master Plan, SDCs, and Rogers Park Design, Forest Grove, OR
  Role: Director/Project Manager
- Park and Recreation Master Plan, Albany, OR
  Role: Director/Project Manager
- Recreational Programs Plan, Tigard, OR
  Role: Director/Recreation Planner
- Parks and Recreation Master Plan (CPRS Award for Excellence), Apple Valley, CA
  Role: Project Manager
- Parks, Recreation, and Open Space Master Plan, West Linn, OR
  Role: Director/Project Manager
- Parks and Open Space Master Plan, Lane County, OR
  Role: Project Manager
- Parks and Recreation, Trails, and Natural Areas Master Plan (ORPA Vision, Insight, Planning Award), Gresham, OR
  Role: Project Manager
- Parks, Recreation, and Open Space Master Plan, Addison, TX
  Role: Project Manager
- Parks Master Plan and Trails Signage Plan, Klamath Falls, OR
  Role: Project Director

Melissa Erikson, PLA, ASLA, BFQP

LANDSCAPE ARCHITECT / PRINCIPAL

AREAS OF EXPERTISE

- Landscape Architecture
- Public Facilities
- Parks and Trails
- Master Planning
- Universal Design and Accessibility
- Urban Design

EDUCATION

- MLA, UC Berkeley
- BA, Studio Art and Psychology, St. Olaf College

REGISTRATIONS / CERTIFICATIONS

- Landscape Architect: OR #LA0919

PROFESSIONAL AFFILIATIONS

- American Society of Landscape Architects (ASLA) Member

PUBLICATIONS

- 2019 Universal Design Guidelines, ASLA

Melissa Erikson is a principal at MIG with almost 20 years' experience helping communities plan, design, and shape their public space. A licensed landscape architect, Melissa is a creative problem solver specializing in public landscapes with a focus on accessibility and universal design. She is an effective problem solver who embraces complexity, blurs boundaries, makes connections, and reveals functionality whether the work is assessing conditions or designing solutions. Her broad expertise, ranging from assessments, to planning, to design and construction brings a holistic perspective to every project.

Melissa draws on her liberal arts background to holistically look at problems and help communities improve their surroundings. Her attention to detail and can-do attitude are contagious; she listens, looks, asks questions, helps build consensus and gives voice to the community. As a planner and designer, she brings together this broad skillset to create strong, thoughtful plans that strengthen communities.

SELECTED PROJECT EXPERIENCE

- Tualatin Parks and Recreation Master Plan, Tualatin, OR
  Role: Landscape Architect
- Park and Recreation Master Plan and Recreation Programs Plan and Anna and Abby's Yard, Forest Grove, OR
  Role: Landscape Architect/ Consulting Principal
- Rogers Park, Forest Grove, OR
  Role: Principal-in-Charge
- Lithia Park Master Plan, Ashland, OR
  Role: Landscape Architect
- Park and Recreation System Master Plan, Cupertino, CA
  Role: Landscape Architect
- San Jose Trail Network Planning and Design Toolkit, San Jose, CA
  Role: Landscape Architect
- Fresno Department of Parks and Recreation Self-Evaluation and Transition Plan, Fresno, CA
  Role: Landscape Architect
- Koret Children's Quarters, Golden Gate Park, San Francisco, CA
  Role: Landscape Architect
- Rainbow Play for All Park, San Jose, CA
  Role: Landscape Architect
- ADA Self-Evaluation Transition Plan, Tualatin, OR
  Role: Landscape Architect

Ryan Mottau

PARKS AND RECREATION PLANNER

AREAS OF EXPERTISE

- Park and Recreation Planning
- Decision Making Tools
- Funding and Operations Strategies
- Technology
- Public Involvement and Outreach

EDUCATION

- BBA, Urban Geography/ Business (joint major), Simon Fraser University, Burnaby, British Columbia

PRESENTATIONS

- Out'Reach: Beyond the Usual Limits of Engagement, NRPA 2015
- Go Big or Go Home! Creating Successful Destination Venues, NRPA 2013, 2014
- Reinvigorating the Mature Park and Recreation System, NRPA 2013, 2014
- ¼ Mile to What and Where?, NRPA 2012
- Why Can't We Play Here? Removing Barriers to Active Play. NRPA 2012; WRPA 2013

Ryan Mottau is a national expert in recreation and public facility planning who has prepared system plans that develop and improve park, trail, recreation, and education facilities for communities around the country. The potential of parks and recreation to enhance urban livability drew Ryan to this area of specialization. The emerging consensus about parks, recreation, and natural spaces as important contributors to urban economics, environmental impacts, and physical and mental health pushes him forward. He creatively adapts and applies community engagement and data collection tools —such as online platforms that increase turnout and broaden outreach —to test community priorities, evaluate park and recreation services, and gather valuable input for action-oriented decision making. Ryan combines his extensive content knowledge —drawing upon 18 years of project experience and continuous tracking of national and international trends —with skillful process design, facilitation, and analysis to ensure that communities develop politically and financially feasible implementation plans.

Ryan leads MIG's surveying, questionnaires, and other virtual outreach efforts. His expertise and approach has proven especially successful during COVID-era outreach, giving MIG the capacity to seamlessly integrate in-person, digital and virtual engagement activities into park and recreation planning and trends forecasting.

SELECTED PROJECT EXPERIENCE

- Park and Recreation Master Plan and Recreation Programs Plan, Tigard, OR
  Role: Project Manager
- Park and Recreation Master Plan, Albany, OR
  Role: Planner/Outreach Specialist
- Parks and Recreation Master Plan, Tualatin, OR
  Role: Planner/Outreach Specialist
- Parks Plan 2025 (Parks, Recreation, and Natural Areas System Plan), Lake Oswego, OR
  Role: Project Manager
- Park and Recreation District Comprehensive Plan, Bend, OR
  Role: Project Manager
- Parks, Recreation, and Open Space Plan, Tukwila, WA
  Role: Planner/Outreach Specialist
- Strategic Business Plan for Developed Parks, Metro Service Area, OR
  Role: Project Manager
- Parks, Recreation, Open Space, and Natural Resources Plan, (Governor's Smart Communities Award), Renton, WA
  Role: Project Manager

Michaela Jellicoe

MITIGATION FEE SPECIALIST | CAI

EDUCATION

- MS, Agricultural Economics, Purdue University
- BA, Economics and Political Science, Western Washington University

Michaela Jellicoe leads CAI's impact fee practice. For cities throughout Washington, Oregon, and California, she has updated park impact and mitigation programs, revised fee calculations, conducted fee nexus studies, and provided development fee feasibility studies to assess the impacts of increasing fee rates. She also has served as an expert advisor to cities regarding their impact fee programs. Michaela was mentored in the practice of impact fee studies by Randall L. Young of Henderson, Young & Company, a nationally recognized expert in impact fees. Michaela brings a wide range of experience in economic, data and policy analysis, and has worked with MIG on several SDC updates and impact fee studies.

SELECTED PROJECT EXPERIENCE

- Parks and Recreation Master Plan, Tualatin, OR
  Role: SDC Specialist
- Parks, Recreation, and Open Space Plan, Shoreline, WA
  Role: Impact Fee Specialist
- Park Impact Fee Methodology Update, Puyallup, WA
  Role: Impact Fee Specialist
- Park Development Impact Fee Nexus Study, Hayward, CA
  Role: Nexus Study Lead and Fee Specialist

Team Knowledge

Since our founding, MIG has completed more than 350 parks, recreation facilities, programs, open space and trails master plans, strategic plans, and comprehensive plans. We have been involved in multiple projects in park planning, site design and implementation—meaning we have the expertise to guide your community from creating a park system vision to constructing the types of parks desired. Even though this is a park and recreation system plan, our capabilities in visioning, planning, standards development, site master planning, recreation facility operations, and construction mean that **our plans are realistic and implementable.**

We bring expertise in multiple areas:

QUALITY CONTROL AND COORDINATION BY SENIOR PARK STAFF

MIG has a 38-year track record of working interactively with our clients to provide innovative plans and designs delivered in a timely and cost-effective manner. The result of our quality and cost control measures is that **80% of our clients return to us for service.**

MIG brings an NRPA Certified Parks and Recreation Professional (CPRP) to oversee the update of Keizer's Parks and Recreation Master Plan. A CPRP understands "the business" of parks and recreation, which helps ensure that the plan responds to community needs and supports project implementation and ongoing system management. MIG also offers an Oregon Registered Landscape Architect, versed in ADA accessibility, playground safety, and park design and construction to ensure that our recommended site improvements are informed by this knowledge.

OUTREACH AND COVID SUCCESS STRATEGIES

MIG is a leader in both in-person and virtual engagement, involving residents and stakeholders throughout the project to build support for project outcomes. We have a **suite of digital and virtual tools** that allow us to conduct business successfully even if group meetings are not possible. We have easily adapted our advisory group meetings, large community workshops, surveys, pop-up activities, focus groups, and other outreach activities into a forum that works successfully amidst COVID-19 restrictions. We've identified protocols for successful park fieldwork. MIG also has a deep bench of park and recreation planning staff and landscape architects in our Portland Office who can step in if urgent project issues arise or if backup is needed. This proactive approach means our team is prepared to deliver a high-quality master plan as circumstances evolve.

PARK ACCESS AND SERVICE LEVEL METRICS

The traditional approach to identifying gaps in service for parks and facilities is to map service areas using a ¼-mile or ½-mile circle radius around parks. However, the distribution of parks, the presence of sidewalks, trails, and parking, plus a variety of barriers all affect people's abilities to get to parks and recreation/sports facilities. To ensure that all residents have access to recreation opportunities, **MIG builds on TPL's Park Serve™ data to identify areas where residents do not have access to parks** or specific types of recreation options within a 10-minute walk of home. Our GIS specialists can map data to show what opportunities are available to meet needs, including partnership options that do not require land acquisition. This helps us update standards such as acres per 1,000 residents, facilities per population served, and travel distances so that these reflect your City's current and forecasted needs.

STEWARDSHIP THROUGH QUALITY MAINTENANCE AND OPERATIONS ASSESSMENTS

Politicians and city leaders love ribbon-cutting to open new facilities. However, Parks and Public Works staff know that capital development is only part of what's needed to provide parks and recreation opportunities. Based on years of experience in park and recreation planning, **MIG grounds all decision regarding capital projects in a firm understanding of maintenance and operations.** We conduct facility condition analyses, build in facility lifecycle estimates, factor in needs for routine and preventative maintenance, and consider the recreation programs and services that make a park system run effectively.

IDENTIFYING REALISTIC CAPITAL AND OPERATIONS COSTS

To keep Master Plan findings relevant for the next 10 years, MIG will provide cost estimating tools for ongoing decision-making. Rather than a fixed view of capital, operational, and maintenance costs, **we will deliver a spreadsheet-based module acquisition, development, renovation, asset replacement, maintenance, and operations costs** for recommended capital projects. This cost model will allow the planning team to determine project phasing, recalculate project costs and create an action plan for Master Plan implementation. More importantly, the model is set up for City use in annual CIP budgeting processes after the Master Plan is adopted.

COMPREHENSIVE CAPITAL AND OPERATIONS FUNDING STRATEGIES

Even with the approval of dedicated General Fund dollars, the City of Keizer has limited funds to expand, develop, improve, operate, maintain, and activate its parks. **MIG considers a whole suite of funding sources based on the types of projects various sources are most likely to fund.** MIG also advises on revenue-generating opportunities in parks. Combined, these include but are not limited to grants, donations, and sponsorships, general obligation bonds, operational levies, system development charges, parkland dedication requirements, development codes and requirements, REET, transient occupancy and tourism taxes, district or regional funds, rentals and reservations, user fees, concessionaire and event fees, Parks Foundation support, and even collaborative public-private partnerships and public-public partnerships. The goal is to provide the City with a menu of suitable options for funding and implementation.

GUIDANCE ON PARKS SYSTEM DEVELOPMENT CHARGES (SDCS)

SDCs for parks, trails, and recreation facilities are an important part of the capital funding package. Limited to funding projects that support the impacts of new growth, MIG and Team member CAI combine our knowledge in capital project planning with the requirements and options for updating SDC methodologies and adopting rates that satisfy developer and City needs. Based on our years of experience in navigating the politics and requirements of SDCs, **we will help the City consider residential and non-residential fees, improvement and reimbursement fees, escalators and construction indexes, service level metrics and zones, etc.** We can provide local benchmarks to compare Keizer's rate to that of other communities. We'll be able to forecast SDC revenues based on City growth projections to determine whether changes are needed to fund recommended capacity enhancement projects. Finally, the MIG Team will help City staff understand the statutes and ordinances that guide SDCs should this project recommend revisions to Keizer's methodology or rate.

Master Planning Project Experience

The following projects highlight four recent or current examples of MIG's local park and recreation planning projects. These include a mix of cities where MIG has completed multiple plans; riverfront cities with substantial natural areas; growing and diversifying communities; cities seeking greater funding support through SDC methodology evaluations or updates; and cities seeking to strengthen community identity, health, and vibrancy through the park and recreation system. Following those examples, our proposal provides a matrix that shows a sampling of the parks and recreation master plans we have completed for small- to mid-size cities over the last ten years.

Tualatin Parks and Recreation Master Plan

MIG

TUALATIN, OR

A small city with a big vision, Tualatin provides a unique combination of riverfront parks, trails, recreation facilities, programs, and natural areas. The park system is home to the world's largest Giant Pumpkin Regatta, the nationally recognized Ice Age Tonquin Trail, and the award-winning Ibach Park playground that features Tualatin's natural, prehistoric and Native American history. Yet the park system was aging, the Parks and Recreation Director was retiring, and new development was on the horizon.

Needing guidance during this transition period, the City of Tualatin hired MIG, a trusted firm who had worked with the City previously in the 2002 Facility Vision Project as well as site plans for Jurgens, Tualatin Community and Ibach Parks. This time, MIG revised the City's Parks and Recreation Master Plan and bring the community's future vision into alignment with funding and operational realities. With team member, Community Attributes, Inc., the MIG Team updated Tualatin's impact fees and gained Council approval for increasing Parks System Development Charge (SDC) for capacity-enhancement projects in residential and non-residential areas.

The Master Plan included a concurrent American with Disabilities Act (ADA) Assessment and 10-Minute Walk Plan to identify needs for accessible and inclusive parks and facilities.

The plan also identified the demand, costs, and funding options to provide sports fields, sports courts, and a new indoor recreation/art facility to support active recreation, performing and cultural arts, and maker space. It coordinated regional trail and park development to position Tualatin strongly as a community hub.

With outreach in Spanish and English and 2,850 community and business members participating, the new Master Plan helps promote Tualatin's unique identity, economic vitality, equity, connectivity, and high quality of life through parks, recreation tourism and programs. The plan received the 2019 Excellence in Planning Award from ORPA.

Tigard Parks and Recreation Master Plan, Programs Plan, and Master Plan Update

MIG

TIGARD, OR

The City of Tigard called on MIG to develop a Park System Master Plan to provide parks, recreation facilities and trails for a growing community. The Master Plan included recommendations to activate parks and facilities by building recreation programming staffing and operations. MIG implemented a wide-reaching community engagement strategy to define Tigard's future direction for parks and recreation.

Five years later, MIG was hired to create a Recreation Programming Study and action plan to define achievable and affordable strategies to increase recreation programming and support a healthy and engaged community. This included strategies to maximize existing resources and find new funding sources to increase recreation options for underserved communities.

MIG met with an advisory group, key stakeholders, potential partners, and recreation focus groups to identify the recreation services most needed. These were cross-checked in an online questionnaire distributed to residents and recreation groups. Outreach findings were combined with the results of a market, demand and gap analysis to identify three possible scenarios increasing recreation to meet community needs.

These scenarios were tested with voters via a random sample survey to identify the community's willingness to pay for services and determine the level of service with the most public support.

MIG then met with City staff, Parks Commissioners, and City Council to unite the City in applying best practices to enhance recreation services. In response, Council approved funding to hire a Recreation Coordinator to initiate short term recommendations to increase facility reservations, facilitate downtown events, develop a mobile recreation program and contract with other providers to increase trail, fitness, and arts programs. Completed in Spring 2015, the Recreation Study set the stage for the City to pursue a community recreation center in the long term.

In 2019, Tigard again hired MIG to revise its Parks and Recreation Master Plan. That update is anticipated to be completed in Winter 2020/2021.

Albany Parks and Recreation Master Plan and Master Plan Update

MIG

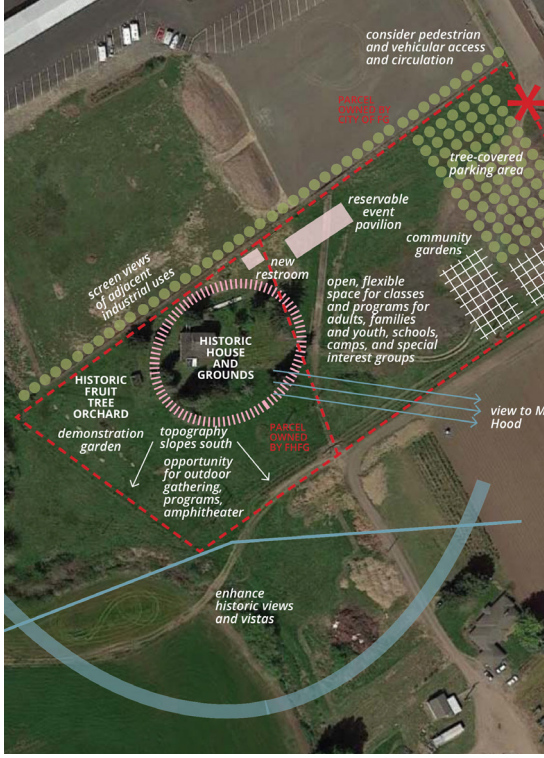
ALBANY, OR

One of the most visible services in Albany, the parks and recreation system is an ongoing investment in the identity of the community and the quality of life of residents. To guide this investment, the City has hired MIG twice to develop a Park and Recreation Master Plan that balances needs for asset management, new development, facility operations, and popular events and programs such as River Rhythms and the Northwest Art & Air Festival.

In 2006, MIG developed the 10-year Park and Recreation Plan and redesigned the 80-acre Timber Linn Park. These two projects helped the City define its vision and goals for parks, sports, and natural areas. The updated plan positioned the City to attract new residents, businesses, and visitors; promote youth development and active lifestyles; and enhance Albany's strong sense of community. More than ten years later, changing trends, a diversifying and growing community, and a deferred maintenance backlog led the City to bring MIG back to update this plan, create a 10-year CIP, 5-year Action Plan, and updated Systems Development Charge (SDC) Methodology.

MIG evaluated park and facility conditions and led a highly successful bilingual survey and pop-up outreach program to identify new community priorities. With the plan update in process during the 2020 pandemic and recession, MIG successfully pivoted Task Force and Parks Commission meetings to virtual formats to continue to build political and community support for a realistic action plan and new SDC rate that will support capacity enhancement projects.

The revised Master Plan, anticipated to be adopted in January 2021, includes site recommendations and systemwide policies to define essential services, sustain existing assets, implement a river vision, enhance pedestrian and bike connectivity, support health and fitness, and provide inclusive events and activities.



Forest Grove Parks, Recreation and Open Space Master Plan and Rogers Park Design

MIG

FOREST GROVE, OR

Recently recognized as one of "the coolest suburbs" in America, Forest Grove hired MIG in 2015 to update the Parks, Recreation, and Open Space Master Plan and evaluate indoor recreation options through a Community Center Feasibility Study. These efforts built on the highly successful 2002 PROS Plan, also completed by MIG, which guided the City in strategically acquiring land and engaging partners in growing the park, open space, and trail system.

Forest Grove needed clear direction to prioritize funding for park improvements and new development. MIG led a robust engagement process involving community leaders, political representatives, and staff in making key decisions. Advisory groups were informed through broad input from residents (telephone survey and community workshops), recreation stakeholders (interviews), park and recreation users (online questionnaire), and the Hispanic/Latino community (Spanish language focus group and workshop) to truly understand community priorities.

MIG also developed design concepts, park activation recommendations and partnership and revenue-generating strategies to maximize existing sites, while evaluating development options for five undeveloped park sites, a new downtown plaza, a sports field complex and multi-purpose recreation and aquatic center. Through a realistic action plan, MIG guided the City to adopt a new SDC Methodology and rate, supplemented by other funding options to support key capital projects and ongoing operations.

The success of this Master Plan led the City to continue working with MIG on the design and construction of Rogers Park and Anna + Abby's Yard. This project will reinvigorate existing amenities at this 3.7-acre neighborhood park. Inspired by the lives of two sisters who were killed in a tragic accident while playing, the design creates inclusive, welcoming, and safe places to play. It further illustrates MIG's commitment to creating park system and site plans that truly make a difference in local communities.

Additional Project Experience

MIG has completed hundreds of master plans for parks, recreation facilities, trails, and programs for small cities. This matrix shows selected MIG park master plans, either current or completed over the last ten years.

MIG PROJECTS	PROJECT COMPONENTS								
	Inventory and Existing Conditions	Public Engagement	Demands and Needs	Policies and Recommendations	CIP and Action Plan	Site Planning or Design	Advisory Group Coordination	Recreation, Arts and Events	City Population Less Than 50,000
Tualatin Parks and Recreation Master Plan, OR (ORPA Award)	●	●	●	●	●	●	●	●	●
Forest Grove Parks, Recreation and Open Space Plan, OR	●	●	●	●	●	●	●		●
Tigard Parks and Recreation Master Plan and Programs Plan, OR	●	●	●	●	●		●	●	
Albany Parks and Recreation Master Plan Update, OR	●	●	●	●	●	●	●		
Estacada Parks Master Plan and Waterfront Concept, OR	●	●	●	●	●	●	●		●
McMinnville Facilities and Recreation Plan, OR		●	●	●		●	●	●	●
Bend Park and Recreation Comprehensive Plan, Bend, OR	●	●	●	●	●	●	●	●	
West Linn Parks, Recreation, and Open Space Plan, OR	●	●	●	●	●		●		●
Apple Valley Parks and Recreation Master Plan, CA (CPRS Award)	●	●	●	●	●	●	●	●	
Addison Parks, Recreation and Open Space Plan, TX	●	●	●	●	●	●	●		●
Camas Parks, Trails and Open Space Plan, Camas, WA	●	●	●	●	●		●		●
Morgan Hill Bikeways, Trails, Parks and Recreation Master Plan Update, CA	●	●	●	●	●	●	●	●	●
Shoreline Plan for Parks, Recreation, and Cultural Services, WA	●	●	●	●	●		●	●	
Renton Parks, Recreation, Open Space, and Natural Resources Plan, WA (Governor's Award)	●	●	●	●	●	●	●	●	
Murray Parks and Recreation Master Plan, Murray, UT	●	●	●	●	●	●	●	●	●
Edmonds Parks, Recreation, Open Space Plan, WA	●	●	●	●	●		●	●	●
Westminster Parks and Recreation Facilities Plan, CA	●	●	●	●	●			●	
Gunnison Parks and Recreation Master Plan, CO	●	●	●	●			●		●
Tukwila Parks, Recreation, and Open Space Plan, WA	●	●	●	●	●	●	●	●	●
Palo Alto Parks, Trails, Open Space and Recreation Plan, CA	●	●	●	●	●	●	●		
Cosumnes Parks, Recreation, and Facilities Master Plan, CA	●	●	●	●	●	●	●	●	
Cupertino Parks and Recreation System Master Plan, CA	●	●	●	●		●	●	●	
Sparks Comprehensive Parks and Recreation Master Plan Update, NV	●	●	●	●			●	●	
South Lake Tahoe Parks, Trails and Recreation Master Plan, CA	●	●	●	●	●		●		●
Longmont Parks, Recreation and Trails Master Plan, CO	●	●	●	●	●	●	●	●	

Project Approach and Understanding

The City of Keizer is updating its Parks and Recreation Master Plan. Developed by MIG in 2007-08, the plan successfully guided the Keizer through several lean years during the recession, while more recently supporting Council in approving dedicated parks funding to support new projects. At this point, the City needs an updated Capital Improvement Plan (CIP) to guide its park investment.

The CIP must be grounded in community priorities and operational realities, so this Master Plan requires a strong community engagement strategy matched by in-field park assessments—carried out in a cost efficient way in the midst of COVID-19 restrictions. The City needs a local firm with nationwide expertise in park and recreation planning, plus knowledge of Keizer to support this planning process. MIG is this firm. We are ready to work with your community to achieve the follow planning objectives:

- Assess **park and facility condition, maintenance, and deferred maintenance** needs.
- Involve **residents, partners, and key stakeholders** in determining future priorities.
- Collaborate with the **Parks Advisory Board and Council** in identifying future directions for City investment and the provision of park and recreation services.
- Identify **site recommendations** and **systemwide policies**, including guidance on the organization, operation, maintenance, management, and funding for park and recreation services.
- Evaluate the City's **Park SDC Methodology and rate** to see if any changes are needed to fund recommended capacity enhancement projects.
- Prioritize a **10-year CIP** with matching funding and create a revised **10-year Parks and Recreation Master Plan** for the future.

Significant Issues to Address

To achieve these planning objectives, the MIG Team will address several planning issues as well as some circumstances unique to Keizer. We've proposed a work plan that addresses these specific challenges and others based on our familiarity in working with communities like yours:

- **Identifying the City's Role:** The City of Salem, Marion County, OPRD, the School District and other public and private providers also offer parks, recreation facilities, and recreation activities in or near Keizer. MIG will evaluate what is provided by nearby entities to determine the City of Keizer should provide in this context and where partnership options are advisable.
- **Balancing Growth and Character:** Keizer has experienced rapid growth and development, while working to preserve its small-town feel, community pride and character. Parks, sports, and community events play an important role in preserving the City's sense of community, while also needing to grow to match the increased demand. MIG will look at services levels, park access via walking and biking, parking sufficiency, maintenance and development needs to respond to increased demand while balancing the desired town character.
- **Prioritizing Capital and Operations Funding:** Council's approval of stable ongoing funding for the park system speaks to the importance of investing dollars wisely and prioritizing spending. As the City adds, enhances, and improves park features, it will need additional maintenance and operational funding to take care of these investments. MIG is prepared to consider both capital and operations funding needs, SDC-eligible projects, as well as the community's ability to pay recreation/user fees while supporting activities for lower income residents. We will also consider how a potential recession could impact City funding over the next few years.

- **Identifying Staffing Needs:** Besides funding, there will be staffing implications associated with recommended projects. MIG will evaluate needs for maintenance, administration and recreation staff, plus department organization for service administration.
- **Enhancing Little League Fields:** Little League Fields deserves added attention—both in terms of site/facility improvements and management guidance. MIG is prepared to work with City staff, stakeholders from the Little League Park Long Range Planning Task Force, and members from two sports leagues to identify the best approach for enhancing this site for the community. This may involve SDC-eligible improvements such as sports field lighting, but also will require other funding and partner efforts to address drainage issues and aging park amenities.
- **Building Partner Support and Consensus:** Besides the Parks Advisory Board and City Council, several stakeholders and partners have supported past projects throughout the city. MIG will introduce an an outreach strategy to involve Council, the Advisory Board, and stakeholders such as the Keizer Rotary, Keizer Parks Foundation, and others to build support among these groups, as well as potential volunteers, for plan implementation.

Collaboration with the City

MIG understands that every master plan is a team effort—between MIG, City staff, Parks Advisory Board members, City Council, and even key stakeholders. We set up a work plan and will put processes in place to ensure we are all coordinated and working together. Like a team, we bring different skills, information and expertise to the planning process that will be essential to creating a winning master plan.

We recognize that City staff and officials are busy, and we want to use your time most efficiently and effectively. We will start the project with a kickoff meeting that defines preferred communication strategies and any background information needed for this project. At that time, let us know whether you prefer phone calls, coordination meetings or emails to keep you informed. If desired, our project manager will set up regular, brief, bi-weekly check in calls with the City's project manager or project team (set up at your convenience) to discuss project needs, issues, and next steps. We could create monthly action-item project status reports if needed to clarify the timing and coordination of next tasks. This keeps the project on track and lets us proactively address potential issue before they arise.

Collaboration with Advisory Groups

MIG will meet three times with the Parks Advisory Board, who will be intrinsically involved in this process. We will provide them with a series of short, easy-to-read briefs that illustrate and describe key information and guidelines in an easily understandable way. The briefs make it easier for the Parks Advisory Board to make informed decisions.

MIG proposes two check-ins with Council members. The first is through interviews in Phase 1 to identify the issues that Council thinks the Master Plan must address. That gives us the opportunity to make sure Council concerns are addressed before we return to them for plan review and adoption.

Based on our years of experience in navigating the politics and requirements of Park SDCs, the MIG Team also added a videoconference with key City staff to discuss the findings and preliminary recommendations for SDCs before these are finalized and made public.

Collaboration with the Community

We propose a three-phased process designed to identify the strengths and weakness of the existing park and recreation, evaluate needs and opportunities for improvement, and build community support for implementation:

- Phase 1: System Assessment
- Phase 2: Needs and Opportunities
- Phase 3: Action Planning and Adoption

Community collaboration occurs through all three phases. The engagement strategy is based on the following principles:

- **We keep the community informed.** MIG provides the City with information that can be posted on the website to keep the community informed about the planning process.
- **We make it easy and fun for people to participate.** Through activities such as mobile-friendly online questionnaires and game-like prioritization challenges, residents and stakeholders can share their thoughts while at the park, at home, visiting the library, or at even school.
- **We involve key stakeholders.** MIG will facilitate three work sessions with focus groups or create a specific activity or survey to dial into the needs of key groups. Preliminary, we recommend coordinating with sports leagues; youth or Hispanic/Latino residents; and liaisons to key stakeholders or groups representing diverse interests in the community, such as the Chamber Of Commerce, Keizer Parks Foundation, Keizer Boys & Girls Club, Traffic Safety-Bikeways-Pedestrian Committee, Public Art Commission, Wilark Park Garden Club, Keizer Tennis Association, Keizer Art Association, Lion's Club, Rotary Club, The MOMS Club of North Salem/Keizer, Soroptimists, the Keizer/Salem Area Senior Center, and the Latino Business Alliance.
- **We use social networks to keep residents informed.** We know that residents are more likely to respond to questionnaires if asked to participate by someone they know and trust. For this reason, we involve the local leaders of sports leagues, social clubs and organizations, schools, homeowners associations, business groups, etc. in notifying people about opportunities to be involved.
- **We support social media announcements, eblast and flyers in parks.** MIG produces a scalable graphic with the link and QR code for questionnaires that the City can share via social media or blow up to hang as signage in parks. These also make good flyers and eblasts for Parks Advisory Board members to share with their constituent groups.

- **We sequence outreach to coordinate with community events.** Existing community events offer a great way to get the word out about the questionnaire, so we've scheduled to the questionnaire to overlap with early December holiday activities, including the Keizer Holiday Lights Parade, Christmas Tree Lighting, Miracle of Christmas Light Display. These events also provide an opportunity to hold a pop-up outreach event to reach residents who would not otherwise participate in the planning process.
- **We coordinate on reaching underrepresented groups.** We will coordinate with the City to determine whether outreach in Spanish is needed and explore other options for ensuring participation from hard-to-reach groups.
- **We involve the community in prioritizing projects.** A key issue in any planning process is the fact that residents will identify more park and recreation "needs" than the City can achieve. To address this, MIG adds a prioritization exercise in Phase 3—to be deployed either digitally/online or in a workshop format—inviting residents, stakeholders, and Parks Advisory Board to be at the table together to develop a consensus on the types of projects needed most. It creates buy-in for significant projects that are carried forward in a prioritized action and implementation plan.

MIG Work Plan

MIG's work plan is consistent with the tasks requested in the RFP, sequenced to ensure the planning process develops the support needed for adoption and successful implementation. The project initiation meeting will provide an opportunity to refine the project approach. Tasks and work plan assumptions are defined below.

Phase 1: System Assessment

1.1 PROJECT INITIATION VIDEOCONFERENCE

MIG will meet with key project staff in a 1-hour videoconference to define project goals and objectives, discuss the engagement strategy and communication preferences, clarify deliverables, and confirm the project schedule and deadlines. MIG will provide and agenda and schedule. Key decisions will be documented by email following the meeting.

1.2 BACKGROUND INFORMATION REQUEST AND REVIEW

MIG will submit an information request letter and create a shared drive where the City can upload relevant project information for MIG's review and use. This task includes a review of the 2008 Park and Recreation Master Plan, along with other key documents that have guided park projects and the provision of services.

1.3 PARKS, TRAILS, OPEN SPACE AND FACILITY INVENTORY AND BASE MAP

MIG will develop a draft and final inventory spreadsheet and existing system map using City-provided GIS data and available inventory data from community/regional partners and providers, such as the School District, nearby cities, and Marion County.

1.4 SITE VISITS AND CONDITION ASSESSMENT

The MIG team will tour Keizer's park system to observe park and facility conditions, access, and opportunities for improvements. The site visits will be kicked off in a 4-5 hour tour of representative parks and facilities accompanied by City staff to discuss and photograph operational issues and opportunities. Using existing MIG Park and Facility Assessment Tools, MIG staff will continue to visit sites, rating the quality and condition of each park.

1.5 STAKEHOLDER AND KEY LEADER VIDEOCONFERENCE INTERVIEWS

MIG will conduct 4-5 hours of one-on-one or small group interviews (2-3 people) via videoconference to identify issues and opportunities for the plan to address. These may include 30 or 45 minute sessions with Council members, the City Manager, School District representatives, community/partner providers or others. MIG will develop interview questions, and following the interview, a summary of key themes.

1.6 PARKS ADVISORY BOARD MEETING #1

Orientation and SWOT: MIG will facilitate a 1.5-hour meeting to discuss the goals for the project, along with opportunities, constraints and needs for enhancing the park and recreation system. This meeting will help set a framework for discussion with the community, informed by current financial realities and changes since the last plan was completed. MIG will provide agenda, presentation, and materials for this meeting.

1.7 EXISTING FUNDING AND SDC METHODOLOGY REVIEW

The MIG Team will provide a baseline summary of City resources available to fund parks and recreation, including System Development Charges. MIG team member CAI will review and evaluate the City's SDC Methodology, rate, and use of SDC funds for past projects, recommending options for revisions that could increase funding in the future. Findings will be presented in a Preliminary Parks SDC Methodology Evaluation Memo. The funding and SDC analysis will inform Brief #1.

1.8 MAINTENANCE, OPERATIONS, PROGRAMMING AND ORGANIZATIONAL REVIEW

MIG will evaluate the City's level of service, staffing and resources used for park and facility maintenance, facility operations, recreation programming and events, and other services including facility rentals, sport field scheduling, and system administration. Staffing, operations, and the Parks & Facilities Division's organization (within Public Works) will be compared to cities of similar sizes using NRPA's Park Metrics benchmarking data. The review will inform Brief #1.

1.9 BRIEF #1: STATE OF THE SYSTEM SUMMARY

MIG will summarize Phase 1 key findings in a short, attractive, graphic, easy-to-read brief, providing a status report on City parks, facilities, trails, programs, and services. The brief will identify and issues and opportunities that the Master Plan should address.

1.10 PROJECT MANAGEMENT AND ADMINISTRATION

This task includes short, bi-weekly project manager coordination calls, communication, schedule updates, and invoicing.

PHASE 1 DELIVERABLES

- Kickoff agenda, information request, and schedule
- Park system inventory and base map (draft and final)
- Park condition rating matrix
- Interview questions and key themes
- Board agenda and materials
- Preliminary Parks SDC Methodology Evaluation Memo
- Brief #1: State of the System Summary

Phase 2: Needs and Opportunities

2.1 PARKS PRIORITIES QUESTIONNAIRE

MIG will test public perceptions and priorities about parks, facilities, trails, and recreation programs in an online questionnaire to identify improvements and potential enhancements desired. MIG will develop draft questions, the online survey for beta testing, and a final survey for launch, providing a link and QR code for City distribution and posting. The questionnaire is anticipated to be posted for four weeks, with an update on the number of participants at the midpoint and final week. When completed, MIG will summarize results in data tables and key findings.

2.2 FOCUS GROUP OR POP-UP FORUMS (3)

MIG will facilitate three work sessions with focus groups or create a specific activity to dial into the needs of key groups. Preliminarily, we recommend coordinating with sports leagues; youth and teens; and key stakeholders or liaisons to community groups. As discussed with the City staff team and Parks Advisory Board members, these could be videoconferences, mini surveys, Instagram/ photo contests, pop-ups at existing events, or similar activities to collect specific feedback from key groups.

2.3 BRIEF #2: LOS, NEEDS AND OPPORTUNITIES ANALYSIS

MIG will summarize Phase 2 technical analysis findings related to park, facility, and recreation program demand for a 10-year period, in an attractive, graphic, easy-to-read brief, together with maps and attached relevant details.

2.4 PARKS ADVISORY BOARD MEETING #2

Priorities and Needs: MIG will facilitate a discussion with the Board of Phase 2 outreach and technical findings and their implications for future projects and services. MIG will provide an agenda and PowerPoint with highlights for discussion.

2.5 OPERATIONS AND POLICY RECOMMENDATIONS

MIG will identify systemwide policies for administration, operations, maintenance, management and programming the park and recreation system.

2.6 SITE RECOMMENDATIONS AND GUIDELINES

MIG will recommend a 10-year strategy for site acquisition, development, major and minor renovations, added facilities, and partner projects at existing and proposed sites, including guidance for off-street trails to support recreation and park access. This will include a review of the existing development guidelines and standards to ensure these address current trends and best practices.

2.7 CAPITAL IMPROVEMENT PLAN AND MAINTENANCE COST MODEL

MIG will develop a 10-year list of capital projects for discussion, City review, and refinement. Using an updatable spreadsheet and per-unit costs, MIG will estimate planning-level capital and operations costs associated with all capital projects in the CIP. SDC-eligible capacity enhancement projects will be the identified.

2.8 PROPOSED PARK, RECREATION AND TRAIL SYSTEM MAP

MIG will illustrate the proposed park and recreation system in an attractive, illustrative document map.

2.9 PROJECT MANAGEMENT AND ADMINISTRATION

This task includes short, bi-weekly project manager coordination calls, communication, schedule updates, and invoicing.

PHASE 2 DELIVERABLES:

- Questionnaire summary report
- Focus group forums summary
- Brief #2: LOS, Needs and Opportunities Analysis (maps and report)
- Board agenda and materials
- Policy and site recommendations
- CIP and capital and operations costs
- Proposed system map

Phase 3: Action Planning and Adoption

3.1 FUNDING, SDC AND PARTNERSHIP DIRECTION

The MIG team will identify and evaluate the suitability of park and recreation funding options. The task will include evaluating existing SDCs to determine their ability to meet demand for capacity enhancement projects.

3.2 STAFF MEETING ON FUNDING/SDC OPTIONS

The MIG team will facilitate a 1-hour videoconference with key City staff (including Public Works, Parks & Facilities, Finance, and City Management) to discuss the sufficiency of SDC funds to complete projects listed in the Capital Improvement Plan—based on City guidance on the availability of non-SDC funding. The meeting will determine whether changes to the Capital Improvement Plan and /or the SDC Methodology and Rate are warranted to address funding needs.

3.3 COMMUNITY PRIORITIZATION CHALLENGE

MIG will develop a prioritization exercise—to be deployed either digitally/online or in a workshop format—inviting residents, stakeholders and Parks Advisory Board Members to make hypothetical investment choices in various park projects, maintenance, programming and events, and different types of improvements. The data collected will help identify the right investment level and right mix of projects, programs, and services to provide in the future.

3.4 IMPLEMENTATION PLAN

Using data from Task 3.1, 3.2 and 3.3, MIG will recommend project phasing for the 10-year CIP, focusing on priority projects to include in a 3- to 5-year action plan. This task will include clear implementation steps to guide future operations and funding. The project list will be coordinated with and used to inform the Parks Advisory Board's Parks Priorities 3-5 Year Plan. This action, implementation, operations, and funding plan will be incorporated into the Administrative Draft Plan.

3.5 ADMINISTRATIVE DRAFT PLAN

MIG will present a full draft of the Master Plan for an internal review by City staff. The document will be formatted as an attractive, graphic, and easily digestible comprehensive plan that illustrates the connection between the community's vision, needs, priorities, and key projects.

3.6 DRAFT MASTER PLAN

Based on a consolidate set of staff comments, MIG will revise the Master Plan and develop an Executive Summary for public, Advisory Board, and Council review.

3.7 PARKS ADVISORY BOARD MEETING #3

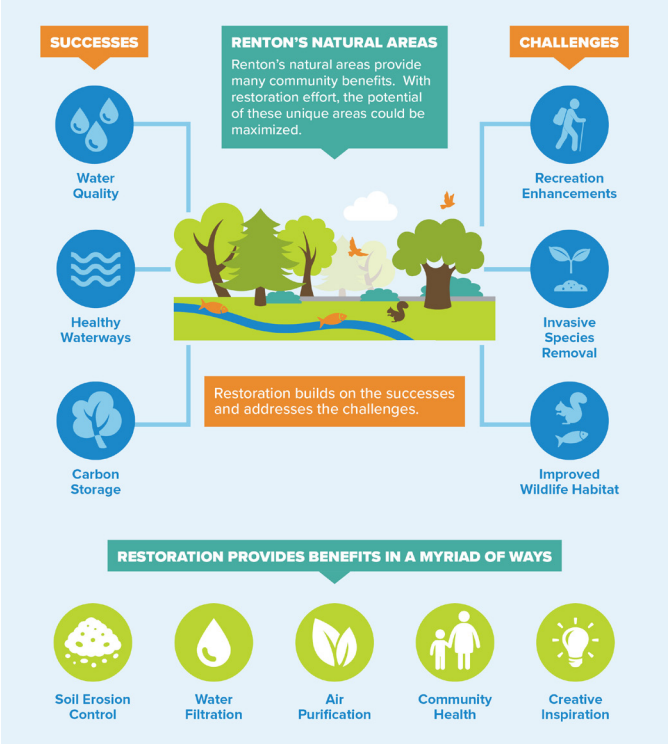
Draft Plan Review: MIG will present the Draft Master Plan to the Parks Board to identify changes needed and determine if the plan should be recommended to City Council for approval and adoption. MIG will provide a PowerPoint presentation and facilitate the Master Plan review discussion.

3.8 COUNCIL WORK SESSION: DRAFT PLAN REVIEW

MIG will present the Draft Plan to City Council in a work session. The PowerPoint used in Task 3.7 will be updated to incorporate comments from the Park Advisory Board Meeting so that Council may review and recommend final changes before adoption.

3.9 FINAL PLAN

MIG will incorporate comments from Tasks 3.7 and 3.8 into a Final Parks and Recreation Master Plan.



Graphic: Renton Parks, Recreation, and Natural Areas Master Plan

3.10 PROJECT MANAGEMENT, ADMINISTRATION AND CLOSE OUT

This task includes short monthly project manager coordination calls, communication, schedule updates, and invoicing, as well as the transmission of project files to the City.

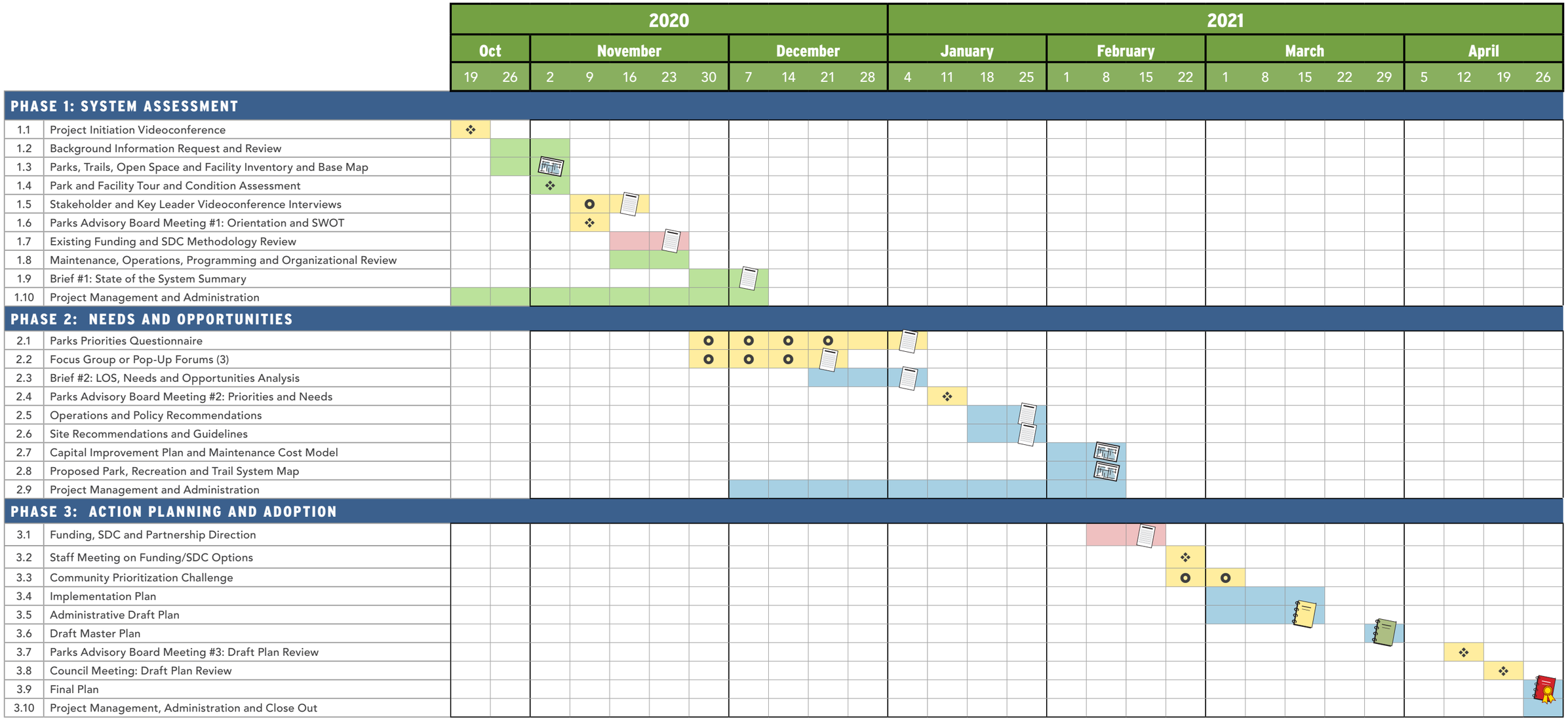
PHASE 3 DELIVERABLES:

- Staff meeting agenda, materials summarizing SDC/ funding sufficiency and recommendations
- Community prioritization tool (online or materials)
- Administrative Draft Plan (with implementation and funding plan)
- Draft Plan
- Board agenda and presentation
- Council presentation
- Final Plan

Work Plan Assumptions

- The project management budget assumes a 6-month project. It includes two hours per month for coordination between MIG and the City's Project Manager.
- Due to COVID-19, the Phase 1 meetings and interviews have been scoped as videoconferences, while fieldwork will be conducted on site. Other meetings are budgeted as single staff in-person meetings (or two staff facilitated videoconferences) unless otherwise noted. MIG offers a suite of virtual meeting tools and workshops that can be used within this budget if social distancing continues or is re-instituted at some point during this project.
- The City will provide consolidated documents and GIS data as noted in the RFP.
- The City will post to existing official social media communications channels and promote the online questionnaire.
- MIG will provide digital files (pdfs) of all project briefs, master plans, and PowerPoint presentations. The City will be responsible for web posting, printing, and distributing copies of documents.
- Project briefs will be formatted as an attractive communications-focused document with details presented in appendices. Other documents are anticipated to be analysis deliverables/discussion papers for review, with edits incorporated into later deliverables.
- City staff will provide a single, consolidated set of comments in electronic format for all documents where requested. If possible, changes will be provided using track-changes or similar digital comment format.
- The City will arrange, advertise, promote, host, recruit participants, schedule, and identify locations for in-person public meetings, interviews, and outreach activities. The City will record and/or summarize Parks Advisory Board meeting discussions. MIG will provide content, present, and facilitate the discussion.

Schedule



SCHEDULE KEY

- Assessment of Current Parks and Recreation System
- Assessment and Report on Keizer's Parks SDC Methodology
- Draft and Final Reports on Recommended Master Plan Updates
- Meetings/outreach with staff, officials, and public groups

- Meetings
- Outreach/Engagement Activities
- Document Deliverables
- Map, Inventory, or Spreadsheet
- Draft/Final Master Plans

Estimated Staff Hours by Task

		MIG, Inc.						
		Cindy Mendoza *Director/PM*	**Melissa Erickson** *Landscape Architect*	**Ryan Mottau** *Park and Recreation Planner*	*Project Associate*	*Project Assistant*	**Michaela Jellicoe** SDC Specialist	**MIG Team Totals**
		Hours	*Hours*	*Hours*	*Hours*	*Hours*	**Hours**	
Phase 1: System Assessment								
1.1	Project Initiation Videoconference	4	2		2			8
1.2	Background Information Request and Review	2	2	2		2		8
1.3	Parks, Trails, Open Space and Facility Inventory and Base Map	2			10			12
1.4	Park and Facility Tour and Condition Assessment	8	16		20			44
1.5	Stakeholder and Key Leader Videoconference Interviews	8				4		12
1.6	Parks Advisory Board Meeting #1: Orientation and SWOT	6		6		4		16
1.7	Existing Funding and SDC Methodology Review	2		10			6.8	19
1.8	Maintenance, Operations, Programming and Organizational Review	6	4	8				18
1.9	Brief #1: State of the System Summary	2		8	12	4		26
1.10	Project Management and Administration	6	2			2		10
	Subtotal	46	26	34	44	16	6.8	173
Phase 2: Needs and Opportunities								
2.1	Parks Priorities Questionnaire	4		16	18			38
2.2	Focus Group or Pop-Up Forums (3)	8		4	12			24
2.3	Brief #2: LOS, Needs and Opportunities Analysis	8	4	12	8			32
2.4	Parks Advisory Board Meeting #2: Priorities and Needs	6		6		4		16
2.5	Operations and Policy Recommendations	8		8				16
2.6	Site Recommendations and Guidelines	2	8		16			26
2.7	Capital Improvement Plan and Maintenance Cost Model	2	2	10				14
2.8	Proposed Park, Recreation and Trail System Map	2			6			8
2.9	Project Management and Administration	6	2			2		10
	Subtotal	46	16	56	60	6	0.0	184
Phase 3: Action Planning and Adoption								
3.1	Funding, SDC and Partnership Direction	6		8			3.5	18
3.2	Staff Meeting on Funding/SDC Options	4					3.5	8
3.3	Community Prioritization Challenge	6		12	12	2		32
3.4	Implementation Plan	8		8				16
3.5	Administrative Draft Plan	8	8	16	16	8		56
3.6	Draft Master Plan	6		4	8			18
3.7	Parks Advisory Board Meeting #3: Draft Plan Review	6				2		8
3.8	Council Meeting: Draft Plan Review	6				2		8
3.9	Final Plan	4			6			10
3.10	Project Management, Administration and Close Out	4	2			2		8
	Subtotal	58	10	48	42	16	7	181
TOTAL		**150**	**52**	**138**	**146**	**38**	**13.8**	**537.8**

EXHIBIT A – COST PROPOSAL SUMMARY

In accordance with the Request for Proposals issued by the City of Keizer, the firm referenced below hereby submits a Cost Proposal Summary. Use Additional pages to provide clarifications if needed.

MIG Cost Proposal Summary table can be found on the following page

I hereby certify that the undersigned is authorized to represent the firm stated below, and empowered to submit this proposal and if selected, agrees to furnish all services in accordance with the RFP and addenda. In addition, all City of Keizer project requirements, including insurance, have been reviewed and are incorporated in this Cost Proposal.

Firm Name: Moore Iacofano Goltsman, Inc. (dba MIG)

Signature:

Printed Name: Melissa Erikson, PLA, ASLA, BFQP

Title: Principal Landscape Architect

Date: 9/2/2020

ITEM	DESCRIPTION	PERSONNEL	HOURS	HOURLY RATE	TOTAL COST
1	Assessment of Current Parks & Recreation System	Cindy Mendoza	26	$165	$4,290
		Melissa Erikson	24	$210	$5,040
		Ryan Mottau	18	$155	$2,790
		Project Associate	42	$105	$4,410
		Project Assistant	8	$85	$680
2	Assessment and Report on Keizer's Parks SDC Methodology	Cindy Mendoza	8	$165	$1,320
		Ryan Mottau	18	$155	$2,790
		Michaela Jellicoe	6.8	$145	$986
3	Draft and Final Reports on Recommended Master Plan Updates	Cindy Mendoza	66	$165	$10,890
		Melissa Erikson	28	$210	$5,880
		Ryan Mottau	58	$155	$8,990
		Project Associate	62	$105	$6,510
		Project Assistant	12	$85	$1,020
4	Meetings/outreach with staff, officials, and public groups	Cindy Mendoza	50	$165	$8,250
		Ryan Mottau	44	$155	$6,820
		Project Associate	42	$105	$4,410
		Project Assistant	18	$85	$1,530
		Michaela Jellicoe	7	$145	$1,015
Total		Cindy Mendoza	150	$165	$24,750
		Melissa Erikson	52	$210	$10,920
		Ryan Mottau	138	$155	$21,390
		Project Associate	146	$105	$15,330
		Project Assistant	38	$85	$3,230
		Michaela Jellicoe	13.8	$145	$2,001
Total Cost (incl. direct/administrative costs)					**$79,993**

EXHIBIT B – REFERENCES

Provide at least three (3) references with telephone numbers and email addresses. References must be able to verify the quality of your previous work in the proposed area of work. Add additional pages if needed.

REFERENCE 1

City of Forest Grove	(503) 992-3237
Organization Name	Telephone Number
Tom Gamble, Parks and Recreation Director	tgamble@forestgrove-or.gov
Contact Person	Email
2300 Sunset Drive, Forest Grove, OR 97116	2015 - 2018
Mailing Address	Contract Term

Project Description

The Forest Grove Parks, Recreation and Open Space Master Plan, Community Center Feasibility Study and Rogers Park Design included:

- An update of the 2002 plan that was also developed by MIG
- Advisory group guidance and community outreach, including bilingual meetings in English/Spanish
- A needs assessment to identify underserved areas and groups
- An evaluation and update of the City's SDC methodology and adopted new rate
- An evaluation of the costs and feasibility of meeting community needs for indoor and outdoor recreation options
- Recommendations for acquisition, development, renovation, activation and programs
- Design concepts for several key parks, plus a followup master plan for Rogers Park

REFERENCE 2

City of Tualatin	(503) 691-3060
Organization Name	Telephone Number
Ross Hoover, Parks and Recreation Director	rhoover@tualatin.gov
Contact Person	Email
18880 SW Martinazzi Ave, Tualatin OR 97062	2017 - 2018
Mailing Address	Contract Term

Project Description

Tualatin's Parks and Recreation Master Plan process included:

- An extensive, multi-activity outreach process (including sports, Latino, business, and art focus groups)
- An evaluation of park and sports facility level of service and needs
- A park and facility condition assessment and ADA evaluation
- Goals, strategies and guidelines for park land, facilities, natural areas, trails, arts and tourism, maintenance, and funding
- Site recommendations for all parks, trails and greenways
- An update of the City's SDC Methodology and adopted new rate
- Short-term action plan
- An ORPA award-winning master planning process

REFERENCE 3

Lane County	(541) 682-6910
Organization Name	Telephone Number
Dan Hurley, Public Works Director	daniel.hurley@co.lane.or.us
Contact Person	Email
3050 N Delta Hwy, Eugene, OR 97408	2016 - 2018
Mailing Address	Contract Term

Project Description

Lane County's Parks and Open Space Master Plan included:

- Coordination with the Public Works Department on a plan for Parks Division implementation
- Task Force and Parks Advisory Committee meeting facilitation
- Recreation market study to identify County's role and service level
- Site and systemwide recommendations, policies and projects
- Prioritization process to focus on critical funding and asset management needs

EXHIBIT C – NON-COLLUSION AND CONFLICT OF INTEREST CERTIFICATION

The undersigned hereby proposes and, if selected, agrees to furnish the services described in accordance with this RFP, Exhibits, Attachments, and Addenda, if applicable, for the term of the Contract and certifies that the Proposer is not in any way involved in collusion and has no known apparent conflict of interest in submitting a Proposal.

CERTIFICATIONS

Non-Collusion. The undersigned Proposer hereby certifies that it, its officers, partners, owners, providers, representatives, employees and parties in interest, including the affiant, has not in any way colluded, conspired, connived or agreed, directly or indirectly, with any other Proposer, potential Proposer, firm or person, in connection with this solicitation, to submit a collusive or sham bid, to refrain from bidding, to manipulate or ascertain the price(s) of other Proposers or potential Proposers, or to secure through any unlawful act an advantage over other Proposers or the City. The fees, prices, and Response submitted herein have been arrived at in an entirely independent and lawful manner by the Proposer without consultation with other Proposers or potential Proposers or foreknowledge of the prices or Response to be submitted in response to this solicitation by other Proposers or potential Proposers on the part of the Proposer, its officers, partners, owners, providers, representatives, employees or parties in interest, including the affiant.

Discrimination. The undersigned Proposer has not discriminated and will not discriminate against any minority, women or emerging small business enterprise or against a business enterprise that is owned or controlled by or that employs a disable veteran in obtaining a required subcontract.

Conflict of Interest. The undersigned Proposer and each person signing on behalf of the Proposer certifies, and in the case of a sole proprietorship, partnership, or corporation, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of their knowledge and belief, no member of the City Council, officer, employee, or person, whose salary is payable in whole or in party by the City, has a direct or indirect financial interest in the award of this Response, or in the services to which this Response relates, or in any of the profits, real or potential, thereof, except as noted otherwise herein. The undersigned hereby submits this Response to furnish all work, services, systems, materials, and labor as indicated herein and agrees to be bound by the following documents: Request for Proposals, Addenda, Agreement, Exhibits and Attachments, and associated inclusions and references, specifications, Proposer's response, mutually agreed clarifications, appropriately priced change orders, exceptions which are acceptable to the City, and all other Proposer's submittals.

Proposer must disclose any apparent or perceived conflict of interest, including but not limited to, current or past relationships with consultants, contractors, subcontractors, or engineers associated with this Project. Furthermore, Proposer must disclose any current or past relationship as a City of Keizer employee. If a perceived conflict may exist then attach a letter of explanation disclosing the potential conflict or relationship.

Disadvantaged, Minority, Emerging Small Business (DMESB) (check applicable box): ☐ Yes ☒ No

The Proposer hereby certifies that the information contained in these certifications and representations are accurate, complete, and current.

Moore Iacofano Goltsman, Inc. (dba MIG)	(503) 297-1005
Proposer's Firm Name	Telephone Number
815 SW 2nd Ave, #200, Portland, OR 97204-3022	94-3116998
Mailing Address, City, State, Zip	Tax Identification No.
(503) 297-3195	cindym@migcom.com
Fax Number	Email Address
	9/2/2020
Signature	Date

EXHIBIT D – CERTIFICATION STATEMENT FOR CORPORATION OR INDEPENDENT CONTRACTOR

A. Contractor is a Corporation, Limited Liability Company, or a Partnership

I certify under penalty of perjury that Contractor is a (check one):

☒ Corporation ☐ Limited Liability Company ☐ Partnership
☐ Nonprofit Corporation authorized to do business in the State of Oregon

Signature:_____

Title: Principal Landscape Architect Date: 9/2/2020

B. Contractor is a Sole Proprietor Working as an Independent Contractor

Contractor certifies under penalty of perjury, that the following statements are true:

1. If Contractor is providing services under this Contract for which registration is required under ORS Chapter 71 (Architects and Landscape Contractors) or 701 (Construction Contractors), Contractor has registered as required by law.

2. Contractor is free to determine and exercise control over the means and manner of providing the service subject to the right of the City to specify the desired results.

3. Contractor is responsible for obtaining all licenses or certifications necessary to provide the services.

4. Contractor is customarily engaged in providing services as an independent business. Contractor is customarily engaged as an independence contractor if at least three of the following statements are true.

Note: Check all that apply. You must check at least three to establish that you are an independent contractor.

- ☐ Contractor's services are primarily carried out at a location that is separate from Contractor's residence or primarily carried out in a specific portion of the residence which is set aside as the location of the business.
- ☐ Contractor bears the risk of loss related to the services provided under this Contract.
- ☐ Contractor provides services to two or more persons within a 12-month period or Contractor routinely engages in business advertising solicitation or other marketing efforts reasonably calculated to obtain new contracts for similar services.
- ☐ Contractor makes a significant financial investment in the business
- ☐ Contractor has the authority to hire additional persons to provide the services and has authority to fire such persons.

Contractor Signature:_____ Date:_____

EXHIBIT E – PROPOSER REPRESENTATIONS AND CERTIFICATION REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS

Failure of the Proposer to complete and sign this form may result in the rejection of the submitted offer. The Proposer will notify the Public Works Director within 30 days of any change in the information provided on this form.

The Proposer certifies to the best of its knowledge and belief that neither it nor any of its principals:

1. Are presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from submitting bids or proposals by any federal, state, or local entity, department or agency;

2. Have within a five-year period preceding the date of this certification been convicted of fraud or any other criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) contract embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

3. Are presently indicted for or otherwise criminally charged with commission of any of the offense enumerated in Paragraph 2 of this certification;

4. Have, within a five-year period preceding the date of this certification had a judgment entered against contractor or its principals arising out of the performance of a public or private contract;

5. Have pending in any state or federal court any litigation in which there is a claim against contractor or any of its principals arising out of the performance of a public or private contract;

6. Have within a five-year period preceding the date of this certification had one or more public contracts (federal, state, or local) terminated for any reasons related to contract performance.

If Proposer is unable to attest to any of the statements in this certification, Proposer shall attach an explanation to their offer. The inability to certify to all of the statements may not necessarily preclude the Proposer from award of a contract under this procurement.

ATTESTATION:

SIGNATURE OF AUTHORIZED PERSON:

Signature: _____ Date: 9/2/2020

Print Name and Title: Melissa Erikson, PLA, ASLA, BFQP, Principal Landscape Architect

Contact Person for this Procurement: Cindy Mendoza, CPRP

Phone: (503) 297-1005 Email: cindym@migcom.com

EXHIBIT F – CERTIFICATION OF INSURANCE REQUIREMENTS

Contractor shall at all times maintain in force at Contractor's expense the insurance noted below.

General Liability. Contractor shall maintain commercial general liability insurance in the amount of $1,000,000 per occurrence / $2,000,000 annual aggregate, which protects it from claims for personal injury, bodily injury and property damage.

Automobile Liability. Contractor shall maintain automobile liability coverage for non-owned and hired autos, in the amount of $1,000,000.00 per occurrence which protects Contractor from claims for bodily injury and property damage.

Professional Liability. Contractor shall maintain professional liability insurance in the amount of $1,000,000 per occurrence which protects it from damages caused by error, omission or any negligent acts of Contractor, its subcontractors, agents, officers, or employees performance under this Contract.

Workers' Compensation Insurance. Contractor shall maintain workers' compensation insurance as required by State statutes.

Coverage must be provided by an insurance company authorized to do business in Oregon. Contactor's coverage will be primary in the event of loss. Contractor shall furnish a current Certificate of Insurance and additional named insured endorsement attesting to the existence of the insurance coverage required by this Contract. Certificates shall be endorsed to name the City of Keizer, its officers, agents, contractors, and employees as an additional insured.

Contractor shall provide renewal Certificates of Insurance upon expiration of any of the required insurance coverage. Contractor shall immediately notify the City of any change in insurance coverage.

Certificate holder should be: City of Keizer, PO Box 21000, Keizer, OR 97307. Certificates of insurance can be emails to City Recorder at DavisT@Keizer.org.

Contractor's Acceptance:_____

Date: 9/2/2020

ADDENDUM #1 TO THE REQUEST FOR PROPOSALS FOR PARKS MASTER PLAN UPDATE

City of Keizer

The Request for Proposal – Parks Master Plan Update is amended as follows:

1. **Scope of Work** – In each and every reference that describes the work, the item that reads "Review current Master Plan & System Development Charges (SDC) Methodology" shall be revised to:

Review and familiarize yourself with the current Master Plan & System Development Charges (SDC) Methodology.

2. **Scope of Work** – In each and every reference that describes the work, the item that reads "Evaluate existing SDCs to determine ability to meet demand" shall be revised to:

Evaluate existing SDCs to determine if the projected SDCs will be sufficient to complete projects listed in the Capital Improvement Plan assuming non-SDC funding is available. Proposer should describe any major changes to the Capital Improvement Plan and recommend if the SDC Methodology should be revised to meet the need for the major changes in the Capital Improvement Plan.

3. **Project Description** – Section 1.2 is amended as follows:

In general, the Project description includes facilitating the process to amend the Parks Master Plan and provide updates. The budgeted amount for this project is $80,000.

4. **Project Deliverables** – Section 4.8(d) and Sample Contract Section 3(d) shall be amended as follows:

Describe any major changes to the Capital Improvement Plan and recommend if the SDC Methodology should be revised to meet the need for the major changes in the Capital Improvement Plan.

Addendum No. 1 shall become a part of the Request for Proposal – Parks Master Plan Update and shall be binding as though it were contained therein. **This addendum must be signed and included with your proposal when submitted.** If you have questions, please call Bill Lawyer at 503-856-3555.

ADDENDUM NO.1 CONTENTS READ AND ACKNOWLEDGED

Moore Iacofano Goltsman, Inc. (dba MIG)

Proposer

	Principal Landscape Architect	9/2/2020
Signature	Title	Date

END OF ADDENDUM #1

CITY COUNCIL MEETING: October 19, 2020

AGENDA ITEM NUMBER:_____

TO: **MAYOR CLARK AND COUNCIL MEMBERS**

THROUGH: **CHRISTOPHER C. EPPLEY, CITY MANAGER**

FROM: **TIM WOOD, FINANCE DIRECTOR**

SUBJECT: **RESOLUTION RATIFYING FINANCE DIRECTOR'S SIGNING OF AGREEMENT WITH THE COUNCIL OF MID-WILLAMETTE SOCIETY OF ST. VINCENT DE PAUL FOR CARES ACT COMMUNITY SUPPORT FUND GRANT**

On October 5, 2020 the Finance Director entered into an agreement with the Council of Mid-Willamette Society of St. Vincent de Paul for a Cares Act Community Support Fund Grant.

The agreement provides that the City will give up to $175,000 of Cares Act Funding to the Mid-Willamette Society of St. Vincent de Paul for utility, mortgage and rental assistance for residents experiencing financial distress as the result of the impacts of COVID-19.

RECOMMENDATION:
Adopt the attached Resolution.

Please let me know if you have any questions. Thank you.

CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

Resolution R2020-_____

RATIFYING FINANCE DIRECTOR'S SIGNING OF AGREEMENT WITH COUNCIL OF MID-WILLAMETTE SOCIETY OF ST. VINCENT DE PAUL FOR CARES ACT COMMUNITY SUPPORT FUND GRANT

WHEREAS, COVID-19 has been a global pandemic since March 2020, causing disruption, additional expenses, and forced closures or unemployment for businesses and individuals;

WHEREAS, Oregon Governor Kate Brown has issued a number of executive orders that have resulted in job loss or job/wage reductions;

WHEREAS, resources are necessary to help provide utility, mortgage and rent relief to vulnerable populations within the community through public aid;

WHEREAS, the United States Congress adopted the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) that appropriated funds to be used to make payments for specific uses to States and certain local governments;

WHEREAS, the State of Oregon allocation of the CARES funds has been designated to reimburse certain additional local governments for specified expenditures through contracts administered by the State of Oregon Department of Administrative Services;

WHEREAS, the City entered into an Intergovernmental Agreement for the period March 1, 2020 through December 30, 2020 to allow receipt of CARES funds;

WHEREAS, the Council of Mid-Willamette Society of St. Vincent de Paul has been selected to receive a grant from the CARES funds to provide individual grants on behalf of Keizer individuals that have eligible expenses for utility, mortgage and rent relief;

Keizer City Attorney
930 Chemawa Road NE
PO Box 21000
Keizer, Oregon 97307
503-390-3700

WHEREAS, the Finance Director signed the agreement with Council of Mid-Willamette Society of St. Vincent de Paul on October 5, 2020;

WHEREAS, the Council finds it is appropriate to ratify the signing of the agreement by the Finance Director;

NOW, THEREFORE,

BE IT RESOLVED by the City Council of the City of Keizer that the signing of the agreement with Council of Mid-Willamette Society of St. Vincent de Paul for CARES Act community support fund grant by the Finance Director, a copy of which is attached, is hereby ratified.

BE IT FURTHER RESOLVED that this Resolution shall take effect immediately upon the date of its passage.

PASSED this _____ day of _____, 2020.

SIGNED this _____ day of _____, 2020.

_____
Mayor

_____
City Recorder

Keizer City Attorney
930 Chemawa Road NE
PO Box 21000
Keizer, Oregon 97307
503-390-3700

AGREEMENT BETWEEN THE CITY OF KEIZER, OREGON AND COUNCIL OF MID-WILLAMETTE SOCIETY OF ST. VINCENT DE PAUL FOR CARES ACT COMMUNITY SUPPORT FUND GRANT

THIS AGREEMENT is made this 5th day of October 2020 ("Effective Date"), by and between the City of Keizer, an Oregon municipal corporation ("City") and Council of Mid-Willamette Society of St. Vincent de Paul ("Recipient"), collectively referred to as the "Parties."

Recitals

1. SARS-CoV2, the novel coronavirus, or COVID-19, has been a global pandemic since at least March, 2020, causing disruption, additional expenses, and forced closures or unemployment for businesses and individuals.

2. Since March, 2020, Oregon Governor Kate Brown has issued a number of executive orders that have provided directives including an initial prohibition on all people in the State of Oregon from leaving their homes or participating in social, spiritual and recreational gatherings of any kind regardless of the number of participants, and all non-essential businesses in the State of Oregon from conducting business, within the limitations therein. This has resulted in job loss or job/wage reductions.

3. Resources are necessary to help provide utility, mortgage and rent relief to vulnerable populations within the community through public aid.

4. On March 27, 2020, the United States Congress adopted the Coronavirus Aid, Relief, and Economic Security Act ("CARES Act") (PL 116-136) which, among other things, amended Section 601(a) of the Social Security Act, established the Coronavirus Relief Fund, and appropriated $150 billion to the Fund be used to make payments for specified uses to States and certain local governments.

5. The State of Oregon allocation of Coronavirus Relief Fund resources has been designated to reimburse certain additional local governments in the state for specified expenditures though contracts administered by the State of Oregon Department of Administrative Services ("DAS") (the "State Fund").

6. The City entered into an Intergovernmental Agreement known as "Amended and Restated Grant Agreement No. 1079" with DAS regarding the City's allocation from the State Fund for the period March 1, 2020 through December 30, 2020, attached as Exhibit 2 (the "Intergovernmental Agreement").

7. The Intergovernmental Agreement (Exhibit 2) incorporates Special Terms and Conditions – Intergovernmental Agreement – Federal Funds ("Special Terms and Conditions").

8. Recipient has been selected by the City to receive a grant from the Grant Funds for allowable expenses, as set forth in this Agreement. Pursuant to the Emergency Ordinance allowing procurement without compliance with normal procurement procedures, Recipient was selected because it is an established local nonprofit that has the existing connections and administrative capacity to provide individual grants on behalf of Keizer individuals ("Subrecipients") that have Eligible Expenses for utility, mortgage and rent relief and can meet the objectives of this Agreement.

NOW THEREFORE, the Parties agree as follows:

AGREEMENT

1. Incorporation of Recitals/Exhibits. The Recitals and referenced Exhibits are incorporated into this Agreement by this reference.

2. Award Amount and Eligible Expenses. The City's total payments under this Agreement shall not exceed $175,000.00 subject to possible additional amounts as detailed below. Recipient shall use Grant Funds only to pay Subrecipients' utilities, rent or mortgage incurred during the time period set forth in Exhibit 1. Recipient shall use the Grant Funds and carry out the work described in the Statement of Work, attached as Exhibit 3. Eligible expenses are those provided in Exhibit 1 ("Eligible Expenses"). Exhibit 1 also sets forth ineligible expenses. In the event an expenditure is submitted that is ineligible for payment per Exhibit 1, it will not be reimbursed by DAS or the City. The City shall pay Recipient as set forth below, provided Recipient remains in compliance with this Agreement.

a. Following the final signature on this Agreement, the City shall make an initial payment to Recipient in the amount of $25,000.00.

b. The City shall make subsequent payments in the amount of $25,000.00 when Recipient has disbursed 75% of the previous payment and requests subsequent payment in writing.

c. In the City's sole discretion, the City may exceed the total of $175,000.00 upon written request of Recipient.

d. Payments shall be made to Recipient at:

Council of Mid-Willamette Society of St. Vincent de Paul
P.O. Box 7864
Salem, Oregon 97303

3. Time Period. All Eligible Expenses must be disbursed and expended by the Recipient or Subrecipient between September 25, 2020, and December 30, 2020, however, the expenses covered can be from March 1, 2020 to December 30, 2020 (see Exhibit 1). Any expenses disbursed or incurred before or after this period are not Eligible Expenses for Grant Funds. The Recipient understands that any expenses incurred in excess of Grant Funds are the Recipient's sole responsibility and will not be paid by the City. Recipient agrees to ensure that all funds disbursed to Subrecipients' utility providers, landlord, property management/owner, or mortgage lender under this

grant will also expend all funds on or before December 30, 2020. Recipient agrees to return any undisbursed funds remaining at the end of the performance period.

4. Reporting Requirements. The Recipient is subject to the applicable Recipient Reporting Requirements outlined in Exhibit 4, including Exhibit 4-A Recipient Reporting Requirements Documentation

5. Source of Grant Funds. The Parties acknowledge that funding for this Agreement comes solely as reimbursement of, or payments made to, the City from the CARES Act and passed through the State of Oregon. The City has no independent obligation to provide the Recipient with funds from any other source.

6. Intergovernmental Agreement. The Parties to this Agreement agree to be bound to the provisions of the Intergovernmental Grant Agreement Number 1079 between the City and the State of Oregon DAS, included as Exhibit 2 to this Agreement.

7. Compliance with Federal, State and Local Laws. The Recipient shall comply with and obey all applicable federal, state and local laws, regulations, and ordinances. Should the Recipient's spending of the Grant Funds be inconsistent with applicable laws, provisions of this Agreement, or otherwise inappropriate, the City shall have the right to the return of any portion of the Funds that are later determined to have been spent in violation of applicable laws. In the alternative, the City may recapture such funds from payments due under this Agreement. The City shall not exercise this right until it has given written notice of noncompliance with applicable laws or this Agreement to Recipient and allowed Recipient a period of ten (10) days from the date of notice for Recipient to cure the noncompliance. Such cure must be acceptable to the State of Oregon DAS. The right of recapture provided in this section is in addition to and not in lieu of any right which State of Oregon law provides for breach of contract.

a. No Use of Grant Funds for Expenses Covered by Other Programs. The Recipient shall not use Grant Funds to cover payroll or other employee-related or business-associated costs for which the Recipient has received other federal, state or regional funds, including without limitation funds made available under the Payroll Protection Program ("PPP") or unemployment insurance compensation. Recipient agrees to ensure Subrecipients under this grant will also certify that no duplicate payments are received for such expenses per section 7.3 of Exhibit 2.

b. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – Lower Tier Covered Transaction. Recipient certifies, by signing this Agreement that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal or State department or agency.

c. Recipient agrees to obtain signed certifications from each applicable Subrecipient subject to provisions outlined in Exhibit 5, Federal Regulation and Administrative Requirement, Exhibit 5-A, Non-Duplication of Benefit Certification

(Tenant/Borrower), and Exhibit 5-B, Non-Duplication of Benefit Certification (Landlord). All Subrecipients must provide signed copies of Exhibit 5-A to Recipient. All rental / mortgage assistance provider Subrecipients must provide signed copies of Exhibits 5-A (Tenant/Borrower) to funding Recipient. In the case of rental assistance, a landlord receiving rental assistance from a tenant or Subrecipient must complete Exhibit 5-B (Landlord). All completed Exhibit 5 documentation is subject to review by the City upon request.

8. Maintenance of Records; Public Records. Recipient shall maintain accurate written records, including accounting records such as invoices, sales receipts, and proof of payment, books, documents, data and other evidence that reflects all of Recipient's expenditures of Grant Funds. These records must be sufficient to demonstrate that the funds have been used in accordance with Section 601(d) of the Social Security Act and Treasury Guidance issued for the expenditure of these funds. The City may at any time review the documentation to determine the Recipient's conformance with the requirements of the Grant Funds program, and the Recipient shall make available to the City, upon request, all of the Recipient's records and documents with respect to all matters covered by this Agreement.

a. The City may require the Recipient to provide additional documentation if the existing documentation is deemed incomplete.

b. The Recipient shall retain all records related to this Agreement for a period of six *(6) years* following the receipt of Grant Funds. These records, including materials generated under the contract, shall be subject at all reasonable times to inspection and review by the City, and to an audit by the State of Oregon Department of Administrative Services (DAS), personnel duly authorized by DAS, the Office of the Secretary of State Audit Program, and federal and state officials so authorized by law, regulation or agreement. Recipient agrees and understands it may be subject to the audit requirements of 2 CFR 200.501 and agrees to take all necessary steps to meet those requirements.

c. If any litigation, claim or audit is started before the expiration of the six (6) year period provided in Section 8(b) above, the records shall be retained until all litigation, claims, or audit findings involving the records have been resolved.

d. Recipient acknowledges and agrees it is subject to all provisions of Exhibit 1, including Paragraphs 10.1 and 10.2 of Exhibit 2, regarding Confidential Information and Nondisclosure. All Recipient documents and records comprising this Agreement, and all other documents and records provided to the City by the Recipient, may be public records subject to disclosure under the State of Oregon Public Records Law, ORS 192.410 – 192.505. Thus, the City may be required, upon request, to disclose the Agreement and documents or records related to it unless an exemption under the Public Records Law or other laws applies.

9. Grant Contract Amendments. The Parties acknowledge that DAS or the State of Oregon may request changes to the Grant Funds or its provisions. Any changes or revisions to the Grant Fund terms and conditions that are applicable to this Agreement shall be incorporated by amendment of this Agreement, following written notice by City to the Recipient.

10. Nondiscrimination. Recipient agrees to comply with Title VI of the Civil Rights Act of 1964, with Section V of the Rehabilitation Act of 1973, and with all applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations. Recipient also shall comply with the Americans with Disabilities Act (ADA) of 1990, as amended by the ADA Amendments Act (ADAAA) of 2008 and any subsequent amendments (42 U.S.C. § 12101, et seq.) (Pub No. 101-336), ORS 659A, and all regulations and administrative rules established pursuant to those laws. Recipient agrees to comply with ADA in its employment and nondiscrimination practices, and that it shall perform its contractual obligations consistent with ADA federal requirements/regulations, state disability and accessibility law and requirements, and applicable regulations and administrative rules established pursuant to those laws. In the event of the Recipient's noncompliance or refusal to comply with any nondiscrimination law, regulation, or policy, this Agreement may be rescinded, canceled, or terminated in whole or in part.

11. Termination. If the Recipient fails to fulfill its obligations under this Agreement, the City may terminate this Agreement upon written notice to the Recipient specifying the reason for termination. The termination date shall be specified in the notice of termination.

a. City may require Recipient to repay some or all money provided to Recipient if City determines any funds provided under this Agreement have been used for ineligible or unauthorized expenses.

12. Subrogation. In consideration of Recipient's receipt of funds from the City, Recipient assigns to the City all of its future rights to reimbursement and all payments received from any grant, subsidized loan, or insurance policies of any type or coverage or under any reimbursement or relief program related to or administered by the Federal Emergency Management Agency or the Small Business Administration or other program to the extent of proceeds paid to Recipient under this Agreement and that are determined in the sole discretion of the City to be a duplication of benefits ("DOB"). Upon receiving any DOB proceeds, Recipient agrees to immediately notify the City. If some or all of the proceeds are determined to be a DOB, the portion that is a DOB shall be paid to the City forthwith. If Recipient is entering into sub-grant agreements for reallocating funds received under this Agreement, Recipient shall ensure Subrecipients agree to this provision as well.

13. Governing Law and Venue. This Agreement shall be governed by and interpreted and enforced in accordance with the laws of the State of Oregon and the venue for any claim or dispute between Recipient and City will be in Marion County, Oregon, unless venue is otherwise required to be elsewhere pursuant to Exhibit 2.

14. Notices. All notices and demands of a legal nature that either party may be required or may desire to serve upon the other party shall be in writing and shall be served upon the other party be personal service, by facsimile transmission, E-Mail followed by mail delivery of the original of the notice, by overnight courier with proof of receipt, or by certified mail, return receipt requested, postage prepaid, addressed as follows:

City of Keizer, 930 Chemawa Road NE, Keizer, Oregon 97303
Attn: Tim Wood, Finance Director, Phone: 503-856-3413 & Fax: 503-393-9437
Email: woodt@keizer.org

Council of Mid-Willamette Society of St. Vincent De Paul, P.O. Box 7864, Salem, Oregon 97303
Attn: Carolyn Criteser, Phone: 503-364-5672 & Fax: 503-361-7475
Email: Assistance@SVDPSalem.org

Service by mail shall be deemed complete on the date of actual delivery or three business days after being sent via certified mail. Service by facsimile transmission or E-Mail shall be deemed served upon receipt of the facsimile or E-Mail, followed by mail delivery.

15. Assignment of Contract. The Recipient shall not assign this contract without the prior written consent of the City.

16. Entire Agreement. The Parties agree that this Agreement, including referenced exhibits, is the complete expression of the terms agreed to by the Parties. No other understandings or representations, oral or otherwise, regarding the subject matter of this contract shall be deemed to exist or to bind the Parties

17. Severability. In the event any term or condition of this Agreement or application thereof to any person or circumstances is held invalid, such invalidity shall not affect other terms, conditions, or applications of this Agreement that can be given effect without the invalid term, condition, or application. To this end, the terms and conditions of this Agreement are declared severable.

CITY OF KEIZER, OREGON

By: Tim E. Wood
Tim Wood,
Finance Director

Approved as to form:

10-5-20
Keizer City Attorney

RECIPIENT

By: Carolyn Criteser

Printed Name: CAROLYN CRITESER

Title: Board President, St. Vincent de Paul

Exhibit 1

CITY OF KEIZER COMMUNITY RELIEF FUND

Grant Funds may only be used to cover expenses that:

1. Are necessary expenditures incurred due to the public health emergency with respect to the Coronavirus Disease 2019 (COVID–19);
2. Were not accounted for in the budget most recently approved as of March 27, 2020 (the date of enactment of the CARES Act) for the State or government; and
3. Were incurred during the period that begins on March 1, 2020, and ends on December 30, 2020.

A. Eligible Uses of Grant Funds include but are not limited to:

a. Payment of utilities, rent or required monthly loan payments including escrow accounts. "Utilities" shall include only natural gas, electricity, sanitation and water/sewer bills. Subrecipients must be Keizer residents and the payments shall be for residences in Keizer only. Amounts paid must be for the period between March 1, 2020 and December 30, 2020.

B. Ineligible Uses of Program Grant Funds:

a. Political campaign contributions or donations.
b. Charitable contributions or gifts.
c. Bonus payments to Recipient owners, officers or employees.
d. Payment of wages to any member of the Recipient owner's family who is not a bona fide employee.
e. Draws or salary to Recipient owner that exceeds the amount paid over a corresponding interval, quarter, or year in 2019.
f. Pay-down or payoff of debt by more than the monthly amount required by the underlying debt instrument.
g. Payroll and other employee- or business-associated costs for which the Recipient has received or expects to receive reimbursement from other federal, state or regional funds (e.g. Payroll Protection Program or unemployment insurance).
h. Damages covered by insurance.
i. Reimbursement to donors for donated items or services.
j. Severance pay.
k. Legal settlements.
l. Any expense not considered an eligible business expense by the Department of the Treasury Internal Revenue Service

STATE OF OREGON
AMENDED AND RESTATED GRANT AGREEMENT

Grant No. 1079

This Amended and Restated Grant Agreement ("Grant") is between the State of Oregon acting by and through its Department of Administrative Services ("Agency") and City of Keizer ("Grantee"), each a "Party" and, together, the "Parties".

SECTION 1: AUTHORITY AND BACKGROUND

Pursuant to funding available under section 601(a) of the Social Security Act, as added by section 5001 of the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) and as allocated to Agency by the Oregon Emergency Board, Agency is authorized to enter into a grant agreement and provide funding for the purposes described in this Grant.

Accordingly, on 6/28/2020, Agency and Grantee entered into a Grant Agreement by which Agency agreed to disburse, and Grantee agreed to accept, certain CARES Act funds as more fully described in that Agreement. The parties now enter into this Amended and Restated Grant Agreement to update the period for which Grantee may seek reimbursement of eligible costs using CARES Act funds, as well as to amend the reimbursement-submission procedure.

SECTION 2: PURPOSE

Section 5001 of the CARES Act provides funds to state, local and tribal governments through the Coronavirus Relief Fund to be used for expenditures incurred due to COVID-19 during the period of March 1, 2020 through December 30, 2020 (the "Performance Period"). This Grant governs the disbursement of funds from the Coronavirus Relief Fund to Grantee for the Performance Period to reimburse the costs of the activities described in Exhibit A.

SECTION 3: EFFECTIVE DATE AND DURATION

When all Parties have executed this Grant, and all necessary approvals have been obtained ("Executed Date"), this Grant is effective and has a Grant funding start date as of March 1, 2020 ("Effective Date"), and, unless extended or terminated earlier in accordance with its terms, will expire on December 30, 2020.

SECTION 4: GRANT MANAGERS

4.1 Agency's Grant Manager is:

Gerold Floyd

Department of Administrative Services
Attention: Coronavirus Relief Fund
155 Cottage Street NE, Salem, OR 97301
Phone: 503-378-2709
Email: CoronavirusReliefFund@Oregon.gov

4.2 Grantee's Grant Manager is:

Name: Tim Wood

Address: 930 Chemawa Rd. NE, Keizer, OR 97303

Phone: 503-856-3413

Email: woodt@keizer.org

4.3 A Party may designate a new Grant Manager by written notice to the other Party.

SECTION 5: PROJECT ACTIVITIES

To receive funds under this Grant, Grantee must perform the project activities set forth in Exhibit A (the "Project"), attached hereto and incorporated in this Grant by this reference, during the Performance Period.

SECTION 6: GRANT FUNDS

In accordance with the terms and conditions of this Grant, Agency will provide Grantee up to an amount not to exceed $1,151,914.13 (the "Grant Funds") for eligible Project costs incurred during the Performance Period. Agency will pay the Grant Funds from monies made available through the Coronavirus Relief Fund ("Funding Source").

SECTION 7: DISBURSEMENT GENERALLY

7.1 Disbursement.

7.1.1 Subject to the availability of sufficient moneys in and from the Funding Source based on Agency's reasonable projections of moneys accruing to the Funding Source, Agency will disburse Grant Funds to Grantee for the allowable Project activities described in Exhibit A that

are undertaken during the Performance Period.

7.1.2 Grantee must provide to Agency any information or detail regarding the expenditure of Grant Funds required under Exhibit A prior to disbursement or as Agency may request.

7.2 **Conditions Precedent to Disbursement.** Agency's obligation to disburse Grant Funds to Grantee under this Grant is subject to satisfaction of each of the following conditions precedent:

7.2.1 Agency has received sufficient funding, appropriations, expenditure limitation, allotments or other necessary expenditure authorizations to allow Agency, in the exercise of its reasonable administrative discretion, to make the disbursement from the Funding Source;

7.2.2 No default as described in Section 15 has occurred; and

7.2.3 Grantee's representations and warranties set forth in Section 8 are true and correct on the date of disbursement(s) with the same effect as though made on the date of disbursement.

7.3 **No Duplicate Payment.** Grantee may use other funds in addition to the Grant Funds to complete the Project; provided, however, funds received pursuant to this Grant are not used for expenditures for which a local government entity has received any other supplemental funding (whether state, federal or private in nature) for that same expense unless otherwise authorized by Agency in writing.

SECTION 8: REPRESENTATIONS AND WARRANTIES

8.1 **Organization/Authority.** Grantee represents and warrants to Agency that:

8.1.1 Grantee is a local government or tribal government duly organized and validly existing;

8.1.2 Grantee has all necessary rights, powers and authority under any organizational documents and under Oregon Law to (i) execute this Grant, (ii) incur and perform its obligations under this Grant, and (iii) receive financing, including the Grant Funds, for the Project;

8.1.3 This Grant has been duly executed by Grantee and when executed by Agency, constitutes a legal, valid and binding obligation of Grantee enforceable in accordance with its terms;

8.1.4 If applicable and necessary, the execution and delivery of this Grant by Grantee has been authorized by an ordinance, order or resolution of its governing body, or voter approval, that was adopted in accordance with applicable law and requirements for filing public notices and holding public meetings; and

8.1.5 There is no proceeding pending or threatened against Grantee before any court or governmental authority that if adversely determined would materially adversely affect the Project or the ability of Grantee to carry out the Project.

8.2 **False Claims Act.** Grantee acknowledges the Oregon False Claims Act, ORS 180.750 to 180.785, applies to any "claim" (as defined by ORS 180.750) made by (or caused by) Grantee that pertains

to this Grant or to the Project. Grantee certifies that no claim described in the previous sentence is or will be a "false claim" (as defined by ORS 180.750) or an act prohibited by ORS 180.755. Grantee further acknowledges in addition to the remedies under Section 16, if it makes (or causes to be made) a false claim or performs (or causes to be performed) an act prohibited under the Oregon False Claims Act, the Oregon Attorney General may enforce the liabilities and penalties provided by the Oregon False Claims Act against the Grantee.

8.3 **No limitation.** The representations and warranties set forth in this Section are in addition to, and not in lieu of, any other representations or warranties provided by Grantee.

SECTION 9: OWNERSHIP

9.1 **Intellectual Property Definitions.** As used in this Section and elsewhere in this Grant, the following terms have the meanings set forth below:

"Third Party Intellectual Property" means any intellectual property owned by parties other than Grantee or Agency.

"Work Product" means every invention, discovery, work of authorship, trade secret or other tangible or intangible item Grantee is required to create or deliver as part of the Project, and all intellectual property rights therein.

9.2 **Grantee Ownership.** Grantee must deliver copies of all Work Product as directed in Exhibit A. Grantee retains ownership of all Work Product, and grants Agency an irrevocable, non-exclusive, perpetual, royalty-free license to use, to reproduce, to prepare derivative works based upon, to distribute, to perform and to display the Work Product, to authorize others to do the same on Agency's behalf, and to sublicense the Work Product to other entities without restriction.

9.3 **Third Party Ownership.** If the Work Product created by Grantee under this Grant is a derivative work based on Third Party Intellectual Property, or is a compilation that includes Third Party Intellectual Property, Grantee must secure an irrevocable, non-exclusive, perpetual, royalty-free license allowing Agency and other entities the same rights listed above for the pre-existing element of the Third party Intellectual Property employed in the Work Product. If state or federal law requires that Agency or Grantee grant to the United States a license to any intellectual property in the Work Product, or if state or federal law requires Agency or the United States to own the intellectual property in the Work Product, then Grantee must execute such further documents and instruments as Agency may reasonably request in order to make any such grant or to assign ownership in such intellectual property to the United States or Agency.

9.4 **Real Property.** If the Project includes the acquisition, construction, remodel or repair of real property or improvements to real property, and if such assets are disposed of prior to December 30, 2020, the proceeds would be subject to the restrictions on the eligible use of payments from the Grant Funds provided by section 601(d) of the Social Security Act.

SECTION 10: CONFIDENTIAL INFORMATION

10.1 **Confidential Information Definition.** Grantee acknowledges it and its employees or agents may, in the course of performing its responsibilities, be exposed to or acquire information that is: (i) confidential to Agency or Project participants or (ii) the disclosure of which is restricted under federal or state law, including without limitation: (a) personal information, as that term is used in ORS 646A.602(12) and (b) social security numbers (items (i) and (ii) separately and collectively "Confidential Information").

10.2 **Nondisclosure.** Grantee agrees to hold Confidential Information as required by any applicable law and in all cases in strict confidence, using at least the same degree of care Grantee uses in maintaining the confidentiality of its own confidential information. Grantee may not copy, reproduce, sell, assign, license, market, transfer or otherwise dispose of, give, or disclose Confidential Information to third parties, or use Confidential Information except as is allowed by law and for the Project activities and Grantee must advise each of its employees and agents of these restrictions. Grantee must assist Agency in identifying and preventing any unauthorized use or disclosure of Confidential Information. Grantee must advise Agency immediately if Grantee learns or has reason to believe any Confidential Information has been, or may be, used or disclosed in violation of the restrictions in this Section. Grantee must, at its expense, cooperate with Agency in seeking injunctive or other equitable relief, in the name of Agency or Grantee, to stop or prevent any use or disclosure of Confidential Information. At Agency's request, Grantee must return or destroy any Confidential Information. If Agency requests Grantee to destroy any Confidential Information, Grantee must provide Agency with written assurance indicating how, when and what information was destroyed.

10.3 **Identity Protection Law.** Grantee must have and maintain a formal written information security program that provides safeguards to protect Confidential Information from loss, theft, and disclosure to unauthorized persons, as required by the Oregon Consumer Information Protection Act, ORS 646A.600-628. If Grantee or its agents discover or are notified of a potential or actual "Breach of Security", as defined by ORS 646A.602(1)(a), or a failure to comply with the requirements of ORS 646A.600-628, (collectively, "Breach") with respect to Confidential Information, Grantee must promptly but in any event within one calendar day (i) notify the Agency Grant Manager of such Breach and (ii) if the applicable Confidential Information was in the possession of Grantee or its agents at the time of such Breach, Grantee must (a) investigate and remedy the technical causes and technical effects of the Breach and (b) provide Agency with a written root cause analysis of the Breach and the specific steps Grantee will take to prevent the recurrence of the Breach or to ensure the potential Breach will not recur. For the avoidance of doubt, if Agency determines notice is required of any such Breach to any individual(s) or entity(ies), Agency will have sole control over the timing, content, and method of such notice, subject to Grantee's obligations under applicable law.

10.4 **Subgrants/Contracts.** Grantee must require any subgrantees, contractors or subcontractors under this Grant who are exposed to or acquire Confidential Information to treat and maintain such information in the same manner as is required of Grantee under subsections 10.1 and 10.2 of this Section.

10.5 **Background Check.** If requested by Agency and permitted by law, Grantee's employees, agents, contractors, subcontractors, and volunteers that perform Project activities must agree to submit to

a criminal background check prior to performance of any Project activities or receipt of Confidential Information. Background checks will be performed at Grantee's expense. Based on the results of the background check, Grantee or Agency may refuse or limit (i) the participation of any Grantee employee, agent, contractor, subgrantee, or volunteer, in Project activities or (ii) access to Agency Personal Information or Grantee premises.

SECTION 11: INDEMNITY/LIABILITY

11.1 **Indemnity.** Grantee must defend, save, hold harmless, and indemnify the State of Oregon and Agency and their officers, employees and agents from and against all claims, suits, actions, losses, damages, liabilities, costs, and expenses of any nature whatsoever, including attorneys' fees, resulting from, arising out of, or relating to the activities of Grantee or its officers, employees, subgrantees, contractors, subcontractors, or agents under this Grant (each of the foregoing individually or collectively a "Claim" for purposes of this Section). If legal limitations apply to the indemnification ability of Grantee, this indemnification must be for the maximum amount of funds available for expenditure, including any available contingency funds, insurance, funds available under ORS 30.260 to 30.300 or other available non-appropriated funds.

11.2 **Defense.** Grantee may have control of the defense and settlement of any Claim subject to this Section. But neither Grantee nor any attorney engaged by Grantee may defend the Claim in the name of the State of Oregon, nor purport to act as legal representative of the State of Oregon or any of its agencies, without first receiving from the Attorney General, in a form and manner determined appropriate by the Attorney General, authority to act as legal counsel for the State of Oregon. Nor may Grantee settle any Claim on behalf of the State of Oregon without the approval of the Attorney General. The State of Oregon may, at its election and expense, assume its own defense and settlement in the event the State of Oregon determines Grantee is prohibited from defending the State of Oregon, or is not adequately defending the State of Oregon's interests, or an important governmental principle is at issue and the State of Oregon desires to assume its own defense. Grantee may not use any Grant Funds to reimburse itself for the defense of or settlement of any Claim.

11.3 **Limitation.** Except as provided in this Section, neither Party will be liable for incidental, consequential, or other direct damages arising out of or related to this Grant, regardless of whether the damages or other liability is based in contract, tort (including negligence), strict liability, product liability or otherwise. Neither Party will be liable for any damages of any sort arising solely from the termination of this Grant in accordance with its terms.

SECTION 12: INSURANCE

12.1 **Private Insurance.** If Grantee is a private entity, or if any contractors, subcontractors, or subgrantees used to carry out the Project are private entities, Grantee and any private contractors, subcontractors or subgrantees must obtain and maintain insurance covering Agency in the types and amounts indicated in Exhibit B.

12.2 **Public Body Insurance.** If Grantee is a "public body" as defined in ORS 30.260, Grantee agrees to

insure any obligations that may arise for Grantee under this Grant, including any indemnity obligations, through (i) the purchase of insurance as indicated in Exhibit B or (ii) the use of self-insurance or assessments paid under ORS 30.282 that is substantially similar to the types and amounts of insurance coverage indicated on Exhibit B, or (iii) a combination of any or all of the foregoing.

12.3 **Real Property.** If the Project includes the construction, remodel or repair of real property or improvements to real property, Grantee must insure the real property and improvements against liability and risk of direct physical loss, damage or destruction at least to the extent that similar insurance is customarily carried by entities constructing, operating and maintaining similar property or facilities.

SECTION 13: GOVERNING LAW, JURISDICTION

This Grant is governed by and construed in accordance with the laws of the State of Oregon without regard to principles of conflicts of law. Any claim, action, suit or proceeding (collectively "Claim") between Agency or any other agency or department of the State of Oregon, or both, and Grantee that arises from or relates to this Grant must be brought and conducted solely and exclusively within the Circuit Court of Marion County for the State of Oregon; provided, however, if a Claim must be brought in a federal forum, then it will be brought and conducted solely and exclusively within the United States District Court for the District of Oregon. In no event may this Section be construed as a waiver by the State of Oregon of any form of defense or immunity, whether sovereign immunity, governmental immunity, immunity based on the eleventh amendment to the Constitution of the United States or otherwise, to or from any Claim or from the jurisdiction of any court. GRANTEE, BY EXECUTION OF THIS GRANT, HEREBY CONSENTS TO THE PERSONAL JURISDICTION OF SUCH COURTS.

SECTION 14: ALTERNATIVE DISPUTE RESOLUTION

The Parties should attempt in good faith to resolve any dispute arising out of this Grant. This may be done at any management level, including at a level higher than persons directly responsible for administration of the Grant. In addition, the Parties may agree to utilize a jointly selected mediator or arbitrator (for non-binding arbitration) to resolve the dispute short of litigation. Each Party will bear its own costs incurred for any mediation or non-binding arbitration.

SECTION 15: DEFAULT

15.1 **Grantee.** Grantee will be in default under this Grant upon the occurrence of any of the following events:

15.1.1 Grantee fails to use the Grant Funds for the intended purpose described in Exhibit A or otherwise fails to perform, observe or discharge any of its covenants, agreements or obligations under this Grant;

15.1.2 Any representation, warranty or statement made by Grantee in this Grant or in any documents

or reports relied upon by Agency to measure the Project, the expenditure of Grant Funds or the performance by Grantee is untrue in any material respect when made; or

15.1.3 A petition, proceeding or case is filed by or against Grantee under any federal or state bankruptcy, insolvency, receivership or other law relating to reorganization, liquidation, dissolution, winding-up or adjustment of debts; in the case of a petition filed against Grantee, Grantee acquiesces to such petition or such petition is not dismissed within 20 calendar days after such filing, or such dismissal is not final or is subject to appeal; or Grantee becomes insolvent or admits its inability to pay its debts as they become due, or Grantee makes an assignment for the benefit of its creditors.

15.2 **Agency.** Agency will be in default under this Grant if, after 15 days written notice specifying the nature of the default, Agency fails to perform, observe or discharge any of its covenants, agreements, or obligations under this Grant; provided, however, Agency will not be in default if Agency fails to disburse Grant Funds because there is insufficient expenditure authority for, or moneys available from, the Funding Source.

SECTION 16: REMEDIES

16.1 **Agency Remedies.** In the event Grantee is in default under Section 15.1, Agency may, at its option, pursue any or all of the remedies available to it under this Grant and at law or in equity, including, but not limited to: (i) termination of this Grant under Section 18.2, (ii) reducing or withholding payment for Project activities or materials that are deficient or Grantee has failed to complete by any scheduled deadlines, (iii) requiring Grantee to complete, at Grantee's expense, additional activities necessary to satisfy its obligations or meet performance standards under this Grant, (iv) initiation of an action or proceeding for damages, specific performance, or declaratory or injunctive relief, (v) exercise of its right of recovery of overpayments under Section 17 of this Grant or setoff, or both, or (vi) declaring Grantee ineligible for the receipt of future awards from Agency. These remedies are cumulative to the extent the remedies are not inconsistent, and Agency may pursue any remedy or remedies singly, collectively, successively or in any order whatsoever.

16.2 **Grantee Remedies.** In the event Agency is in default under Section 15.2 and whether or not Grantee elects to terminate this Grant, Grantee's sole monetary remedy will be, within any limits set forth in this Grant, reimbursement of Project activities completed and accepted by Agency and authorized expenses incurred, less any claims Agency has against Grantee. In no event will Agency be liable to Grantee for any expenses related to termination of this Grant or for anticipated profits.

SECTION 17: WITHHOLDING FUNDS, RECOVERY

Agency may withhold from disbursements of Grant Funds due to Grantee, or Grantee must return to Agency within 30 days of Agency's written demand:

17.1 Any Grant Funds paid to Grantee under this Grant, or payments made under any other agreement between Agency and Grantee, that exceed the amount to which Grantee is entitled;

17.2 Any Grant Funds received by Grantee that remain unexpended or contractually committed for payment of the Project at the end of the Performance Period;

17.3 Any Grant Funds determined by Agency to be spent for purposes other than allowable Project activities; or

17.4 Any Grant Funds requested by Grantee as payment for deficient activities or materials.

SECTION 18: TERMINATION

18.1 **Mutual.** This Grant may be terminated at any time by mutual written consent of the Parties.

18.2 **By Agency.** Agency may terminate this Grant as follows:

18.2.1 At Agency's discretion, upon 30 days advance written notice to Grantee;

18.2.2 Immediately upon written notice to Grantee, if Agency fails to receive funding, or appropriations, limitations or other expenditure authority at levels sufficient in Agency's reasonable administrative discretion, to perform its obligations under this Grant;

18.2.3 Immediately upon written notice to Grantee, if federal or state laws, rules, regulations or guidelines are modified or interpreted in such a way that Agency's performance under this Grant is prohibited or Agency is prohibited from funding the Grant from the Funding Source; or

18.2.4 Immediately upon written notice to Grantee, if Grantee is in default under this Grant and such default remains uncured 15 days after written notice thereof to Grantee.

18.3 **By Grantee.** Grantee may terminate this Grant as follows:

18.3.1 If Grantee is a governmental entity, immediately upon written notice to Agency, if Grantee fails to receive funding, or appropriations, limitations or other expenditure authority at levels sufficient to perform its obligations under this Grant.

18.3.2 If Grantee is a governmental entity, immediately upon written notice to Agency, if applicable laws, rules, regulations or guidelines are modified or interpreted in such a way that the Project activities contemplated under this Grant are prohibited by law or Grantee is prohibited from paying for the Project from the Grant Funds or other planned Project funding; or

18.3.3 Immediately upon written notice to Agency, if Agency is in default under this Grant and such default remains uncured 15 days after written notice thereof to Agency.

18.4 **Cease Activities.** Upon receiving a notice of termination of this Grant, Grantee must immediately cease all activities under this Grant, unless Agency expressly directs otherwise in such notice. Upon termination, Grantee must deliver to Agency all materials or other property that are or would be required to be provided to Agency under this Grant or that are needed to complete the Project activities that would have been performed by Grantee.

SECTION 19: MISCELLANEOUS

19.1 Conflict of Interest. Grantee by signature to this Grant declares and certifies the award of this Grant and the Project activities to be funded by this Grant, create no potential or actual conflict of interest, as defined by ORS Chapter 244, for a director, officer or employee of Grantee.

19.2 Nonappropriation. Agency's obligation to pay any amounts and otherwise perform its duties under this Grant is conditioned upon Agency receiving funding, appropriations, limitations, allotments, or other expenditure authority sufficient to allow Agency, in the exercise of its reasonable administrative discretion, to meet its obligations under this Grant. Nothing in this Grant may be construed as permitting any violation of Article XI, Section 7 of the Oregon Constitution or any other law limiting the activities, liabilities or monetary obligations of Agency.

19.3 Amendments. The terms of this Grant may not be altered, modified, supplemented or otherwise amended, except by written agreement of the Parties.

19.4 Notice. Except as otherwise expressly provided in this Grant, any notices to be given under this Grant must be given in writing by email, personal delivery, or postage prepaid mail, to a Party's Grant Manager at the physical address or email address set forth in this Grant, or to such other addresses as either Party may indicate pursuant to this Section. Any notice so addressed and mailed becomes effective five (5) days after mailing. Any notice given by personal delivery becomes effective when actually delivered. Any notice given by email becomes effective upon the sender's receipt of confirmation generated by the recipient's email system that the notice has been received by the recipient's email system.

19.5 Survival. All rights and obligations of the Parties under this Grant will cease upon termination of this Grant, other than the rights and obligations arising under Sections 11, 13, 14, 16, 17 and subsection 19.5 hereof and those rights and obligations that by their express terms survive termination of this Grant; provided, however, termination of this Grant will not prejudice any rights or obligations accrued to the Parties under this Grant prior to termination.

19.6 Severability. The Parties agree if any term or provision of this Grant is declared by a court of competent jurisdiction to be illegal or in conflict with any law, the validity of the remaining terms and provisions will not be affected, and the rights and obligations of the Parties will be construed and enforced as if the Grant did not contain the particular term or provision held to be invalid.

19.7 Counterparts. This Grant may be executed in several counterparts, all of which when taken together constitute one agreement, notwithstanding that all Parties are not signatories to the same counterpart. Each copy of the Grant so executed constitutes an original.

19.8 Compliance with Law. In connection with their activities under this Grant, the Parties must comply with all applicable federal, state and local laws.

19.9 Intended Beneficiaries. Agency and Grantee are the only parties to this Grant and are the only parties entitled to enforce its terms. Nothing in this Grant provides, is intended to provide, or may be construed to provide any direct or indirect benefit or right to third persons unless such third persons are individually identified by name herein and expressly described as intended

beneficiaries of this Grant.

19.10 **Assignment and Successors.** Grantee may not assign or transfer its interest in this Grant without the prior written consent of Agency and any attempt by Grantee to assign or transfer its interest in this Grant without such consent will be void and of no force or effect. Agency's consent to Grantee's assignment or transfer of its interest in this Grant will not relieve Grantee of any of its duties or obligations under this Grant. The provisions of this Grant will be binding upon and inure to the benefit of the Parties hereto, and their respective successors and permitted assigns.

19.11 **Contracts and Subgrants.** Grantee may enter into contracts or subgrants for any of the Project activities required of Grantee under this Grant, however Grantee is required to communicate subgrantee information to Agency in such a manner and timing as prescribed by Agency that Agency considers necessary to fulfill its federal reporting obligations.

19.12 **Time of the Essence.** Time is of the essence in Grantee's performance of the Project activities under this Grant.

19.13 **Records Maintenance and Access.** Grantee must maintain all financial records relating to this Grant in accordance with generally accepted accounting principles. In addition, Grantee must maintain any other records, whether in paper, electronic or other form, pertinent to this Grant in such a manner as to clearly document Grantee's performance. All financial records and other records, whether in paper, electronic or other form, that are pertinent to this Grant, are collectively referred to as "Records." Grantee acknowledges and agrees Agency and the Oregon Secretary of State's Office and the federal government and their duly authorized representatives will have access to all Records to perform examinations and audits and make excerpts and transcripts. Grantee must retain and keep accessible all Records for a minimum of six (6) years, or such longer period as may be required by applicable law, following termination of this Grant, or until the conclusion of any audit, controversy or litigation arising out of or related to this Grant, whichever date is later.

19.14 **Headings.** The headings and captions to sections of this Grant have been inserted for identification and reference purposes only and may not be used to construe the meaning or to interpret this Grant.

19.15 **Grant Documents.** This Grant consists of the following documents, which are incorporated by this reference and listed in descending order of precedence:

- This Grant less all exhibits
- Exhibit A (the "Project")
- Exhibit B (Insurance)
- Exhibit C (Federal Terms and Conditions)
- Exhibit D (Federal Award Identification)

19.16 **Merger, Waiver.** This Grant and all exhibits and attachments, if any, constitute the entire agreement between the Parties on the subject matter hereof. There are no understandings, agreements, or representations, oral or written, not specified herein regarding this Grant. No waiver or consent under this Grant binds either Party unless in writing and signed by both Parties.

Such waiver or consent, if made, is effective only in the specific instance and for the specific purpose given.

SECTION 20: SIGNATURES

EACH PARTY, BY SIGNATURE OF ITS AUTHORIZED REPRESENTATIVE, HEREBY ACKNOWLEDGES IT HAS READ THIS GRANT, UNDERSTANDS IT, AND AGREES TO BE BOUND BY ITS TERMS AND CONDITIONS. The Parties further agree that by the exchange of this Grant electronically, each has agreed to the use of electronic means, if applicable, instead of the exchange of physical documents and manual signatures. By inserting an electronic or manual signature below, each authorized representative acknowledges that it is their signature, that each intends to execute this Grant, and that their electronic or manual signature should be given full force and effect to create a valid and legally binding agreement.

IN WITNESS WHEREOF, the Parties have executed this Grant as of the dates set forth below.

STATE OF OREGON acting by and through its Department of Administrative Services

By: _____ August 5, 2020
George Naughton, Chief Financial Officer — Date

City of Keizer

By: Timothy E. Wood — 8/4/2020
Authorized Signature — Date

Timothy E. Wood — Finance Director
Printed Name — Title

93-0836902 — 038038147
Federal Tax ID Number — DUNS Number

Approved for Legal Sufficiency in accordance with ORS 291.047

By: *s/ Sam Zeigler* — by email dated 7/17/20
Senior Assistant Attorney General — Date
Oregon Department of Justice

Approved as to form:
8-4-20
Keizer City Attorney

EXHIBIT A
THE PROJECT

SECTION I. BACKGROUND AND GOALS

To support local government actions in the statewide fight against the Coronavirus by providing reimbursement of federally eligible expenses under the CARES Act. Coronavirus Relief Funds may be used to cover costs that are:

1. *Necessary expenditures incurred due to the public health emergency with respect to the Coronavirus Disease 2019 (COVID-19);*
2. *Were not accounted for in the Grantee's budget most recently approved as of March 27, 2020; and*
3. *Were incurred during the period that begins on March 1, 2020, and ends on December 30, 2020.*

SECTION II. PROJECT ACTIVITIES, SCHEDULE, AND BUDGET

Agency will disburse Grant Funds only for eligible costs incurred by Grantee for the Performance Period and in accordance with criteria and guidance established by US Treasury:

(https://home.treasury.gov/system/files/136/Coronavirus-Relief-Fund-Guidance-for-State-Territorial-Local-and-Tribal-Governments.pdf)

Additionally, the US Treasury has provided answers to frequently asked questions regarding eligible costs under the Coronavirus Relief Fund:

https://home.treasury.gov/system/files/136/Coronavirus-Relief-Fund-Frequently-Asked-Questions.pdf

Indirect/Administrative Costs. Grantee will not be reimbursed for any indirect costs with Grant Funds in accordance with U.S. Treasury guidance. The information described in this paragraph overrides any other verbal or written rate(s) or information provided by Agency

SECTION III. RESERVED

SECTION IV. REPORTING REQUIREMENTS

In a form provided by Agency, Grantee shall report eligible costs to Agency when seeking reimbursement for costs incurred during the Performance Period. Agency may require additional reporting in form and at such times as Agency specifies by notification to Grantee through its Grant Manager identified in Section 4.2.

If the Performance Period begins prior to the Executed Date, any reports for Project activities shown in this Exhibit A as due prior to the Executed Date must be provided to Agency, if not already provided to Agency despite the lack of an executed Grant. Grantee will not be in default for failure to perform any reporting requirements prior to the Executed Date.

SECTION V. DISBURSEMENT PROVISIONS

Agency will disburse the Grant Funds upon receipt and approval of Grantee's request for disbursement.

To be processed for payment, Grantee's request must include the following information at the minimum:

- Request date;
- Period covered by request;
- Agency's Grant number;
- Amount being requested; and
- Aggregated costs by available cost category.

Agency may request, at its discretion, additional information it considers necessary to determine the eligibility of costs for reimbursement. Reimbursement requests shall be submitted via an Agency-developed grant website portal, if operable and available, otherwise, Grantee must send its requests for disbursement via email to the Agency's Grant Manager identified in Section 4.

EXHIBIT B
INSURANCE

INSURANCE REQUIREMENTS

Grantee must obtain at Grantee's expense, and require its first tier contractors and subgrantees, if any, to obtain the insurance specified in this exhibit prior to performing under this Grant, and must maintain it in full force and at its own expense throughout the duration of this Grant, as required by any extended reporting period or tail coverage requirements, and all warranty periods that apply. Grantee must obtain and require its first tier contractors and subgrantees, if any, to obtain the following insurance from insurance companies or entities acceptable to Agency and authorized to transact the business of insurance and issue coverage in Oregon. Coverage must be primary and non-contributory with any other insurance and self-insurance, with the exception of professional liability and workers' compensation. Grantee must pay and require its first tier contractors and subgrantees to pay, if any, for all deductibles, self-insured retention and self-insurance, if any.

WORKERS' COMPENSATION

All employers, including Grantee, that employ subject workers, as defined in ORS 656.027, shall comply with ORS 656.017 and provide workers' compensation insurance coverage for those workers, unless they meet the requirement for an exemption under ORS 656.126(2). Grantee shall require and ensure that each of its subgrantees, contractors, and subcontractors complies with these requirements. If Grantee is a subject employer, as defined in ORS 656.023, Grantee shall also obtain employers' liability insurance coverage with limits not less than $500,000 each accident. If Grantee is an employer subject to any other state's workers' compensation law, Grantee shall provide workers' compensation insurance coverage for its employees as required by applicable workers' compensation laws including employers' liability insurance coverage with limits not less than $500,000, and shall require and ensure that each of its out-of-state subgrantees, contractors, and subcontractors complies with these requirements.

COMMERCIAL GENERAL LIABILITY

☒ **Required** ☐ **Not required**

Commercial general liability insurance covering bodily injury and property damage in a form and with coverage that are satisfactory to Agency. This insurance must include personal and advertising injury liability, products and completed operations, contractual liability coverage for the indemnity provided under this Grant, and have no limitation of coverage to designated premises, project or operation. Coverage must be written on an occurrence basis in an amount of not less than $1,000,000 per occurrence. Annual aggregate limit may not be less than $2,000,000.

AUTOMOBILE LIABILITY INSURANCE

☒ **Required** ☐ **Not required**

Automobile liability insurance covering Grantee's business use including coverage for all owned, non-owned, or hired vehicles with a combined single limit of not less than $1,000,000 for bodily injury and property damage. This coverage may be written in combination with the commercial general liability insurance (with separate limits for commercial general liability and automobile liability). Use of

personal automobile liability insurance coverage may be acceptable if evidence that the policy includes a business use endorsement is provided.

PROFESSIONAL LIABILITY

☐ **Required** ☒ **Not required**

Professional liability insurance covering any damages caused by an error, omission or any negligent acts related to the activities performed under this Grant by the Grantee and Grantee's contractors, subgrantees, agents, officers or employees in an amount not less than $_____ per claim. Annual aggregate limit may not be less than $_____. If coverage is on a claims made basis, then either an extended reporting period of not less than 24 months must be included in the professional liability insurance coverage, or the Grantee must provide tail coverage as stated below.

NETWORK SECURITY AND PRIVACY LIABILITY

☐ **Required** ☒ **Not required**

Grantee must provide network security and privacy liability insurance for the duration of the Grant and for the period of time in which Grantee (or its business associates, contractors, or subgrantees) maintains, possesses, stores or has access to Agency or client data, whichever is longer, with a combined single limit of no less than $_____ per claim or incident. This insurance must include coverage for third party claims and for losses, thefts, unauthorized disclosures, access or use of Agency or client data (which may include, but is not limited to, Personally Identifiable Information ("PII"), payment card data and Protected Health Information ("PHI")) in any format, including coverage for accidental loss, theft, unauthorized disclosure access or use of Agency data.

POLLUTION LIABILITY

☐ **Required** ☒ **Not required**

Pollution liability insurance covering Grantee's or appropriate contractor or subgrantee's liability for bodily injury, property damage and environmental damage resulting from sudden, accidental, or gradual pollution and related cleanup costs incurred by Grantee, all arising out of the Project activities (including transportation risk) performed under this Grant is required. Combined single limit per occurrence may not be less than $_____. Annual aggregate limit may not be less than $_____.

An endorsement to the commercial general liability or automobile liability policy, covering Grantee's, contractor, or subgrantee's liability for bodily injury, property damage and environmental damage resulting from sudden, accidental, or gradual pollution and related clean-up costs incurred by Grantee that arise from the Project activities (including transportation risk) performed by Grantee under this Grant is also acceptable.

DIRECTORS, OFFICERS AND ORGANIZATION LIABILITY

☐ **Required** ☒ **Not required**

Directors, officers and organization liability insurance covering the Grantee's organization, directors, officers, and trustees actual or alleged errors, omissions, negligent, or wrongful acts, including improper governance, employment practices and financial oversight - including improper oversight and/or use of Grant Funds and donor contributions - with a combined single limit of no less than $_____ per claim.

CRIME PROTECTION COVERAGE: EMPLOYEE DISHONESTY or FIDELITY BOND

☐ **Required** ☒ **Not required**

Employee dishonesty or fidelity bond covering loss of money, securities and property caused by dishonest acts of Grantee's employees. Coverage limits may not be less than $_____.

PHYSICAL ABUSE AND MOLESTATION INSURANCE COVERAGE

☐ **Required** ☒ **Not required**

Abuse and molestation insurance in a form and with coverage satisfactory to the State covering damages arising out of actual or threatened physical abuse, mental injury, sexual molestation, negligent: hiring, employment, supervision, investigation, reporting to proper authorities, and retention of any person for whom the Grantee, its contractors, subcontractors or subgrantees ("Covered Entity") is responsible including but not limited to any Covered Entity's employees and volunteers. Policy endorsement's definition of an insured must include the Covered Entity and its employees and volunteers. Coverage must be written on an occurrence basis in an amount of not less than $_____ per occurrence. Any annual aggregate limit may not be less than $_____. Coverage can be provided by a separate policy or as an endorsement to the commercial general liability or professional liability policies. The limits must be exclusive to this required coverage. Incidents related to or arising out of physical abuse, mental injury, or sexual molestation, whether committed by one or more individuals, and irrespective of the number of incidents or injuries or the time period or area over which the incidents or injuries occur, must be treated as a separate occurrence for each victim. Coverage must include the cost of defense and the cost of defense must be provided outside the coverage limit.

EXCESS/UMBRELLA INSURANCE

A combination of primary and excess/umbrella insurance may be used to meet the required limits of insurance.

ADDITIONAL INSURED

All liability insurance, except for workers' compensation, professional liability, and network security and privacy liability (if applicable), required under this Grant must include an additional insured endorsement specifying the State of Oregon, its officers, employees and agents as Additional Insureds, including additional insured status with respect to liability arising out of ongoing operations and completed operations, but only with respect to Grantee's activities to be performed under this Grant. Coverage must be primary and non-contributory with any other insurance and self-insurance. The Additional Insured endorsement with respect to liability arising out of Grantee's ongoing operations must be on ISO Form CG 20 10 07 04 or equivalent and the Additional Insured endorsement with respect to completed operations must be on ISO form CG 20 37 04 13 or equivalent.

WAIVER OF SUBROGATION

Grantee waives, and must require its first tier contractors and subgrantees waive, rights of subrogation which Grantee, Grantee's first tier contractors and subgrantees, if any, or any insurer of Grantee may acquire against the Agency or State of Oregon by virtue of the payment of any loss. Grantee must obtain, and require its first tier contractors and subgrantees to obtain, any endorsement that may be necessary to affect this waiver of subrogation, but this provision applies regardless of whether or not the Agency has received a waiver of subrogation endorsement from the Grantee or the Grantee's insurer(s).

TAIL COVERAGE

If any of the required insurance is on a claims made basis and does not include an extended reporting period of at least 24 months, Grantee must maintain, and require its first tier contractors and subgrantees, if any, maintain, either tail coverage or continuous claims made liability coverage, provided the effective date of the continuous claims made coverage is on or before the Effective Date of this Grant, for a minimum of 24 months following the later of (i) Grantee's completion and Agency's acceptance of all Project activities required under this Grant, or, (ii) Agency or Grantee termination of Grant, or, iii) the expiration of all warranty periods provided under this Grant.

CERTIFICATE(S) AND PROOF OF INSURANCE

At Agency's request, Grantee must provide to Agency a Certificate(s) of Insurance for all required insurance. The Certificate(s) must list the State of Oregon, its officers, employees and agents as a Certificate holder and as an endorsed Additional Insured. The Certificate(s) must also include all required endorsements or copies of the applicable policy language effecting coverage required by this Grant. If excess/umbrella insurance is used to meet the minimum insurance requirement, the Certificate of Insurance must include a list of all policies that fall under the excess/umbrella insurance. As proof of insurance, Agency has the right to request copies of insurance policies and endorsements relating to the insurance requirements in this Grant. Grantee must furnish acceptable insurance certificates to: CoronavirusReliefFund@oregon.gov or by mail to: Department of Administrative Services, Attention: Coronavirus Relief Fund, 155 Cottage Street NE, Salem, OR, 97301 prior to commencing the work.

NOTICE OF CHANGE OR CANCELLATION

Grantee or its insurer must provide at least 30 days' written notice to Agency before cancellation of, material change to, potential exhaustion of aggregate limits of, or non-renewal of the required insurance coverage(s).

INSURANCE REQUIREMENT REVIEW

Grantee agrees to periodic review of insurance requirements by Agency under this Grant, and to provide updated requirements as mutually agreed upon by Grantee and Agency.

STATE ACCEPTANCE

All insurance providers are subject to Agency acceptance. If requested by Agency, Grantee must provide complete copies of insurance policies, endorsements, self-insurance documents and related insurance documents to Agency's representatives responsible for verification of the insurance coverages required under this exhibit.

EXHIBIT C
FEDERAL TERMS AND CONDITIONS

1. FEDERAL FUNDS

1.1. If specified below, Agency's payments to Grantee under this Grant will be paid in whole or in part by funds received by Agency from the United States Federal Government. If so specified then Grantee, by signing this Grant, certifies neither it nor its employees, contractors, subcontractors or subgrantees who will perform the Project activities are currently employed by an agency or department of the federal government.

Payments ☒ will ☐ will not be made in whole or in part with federal funds.

1.2. In accordance with the Chief Financial Office's Oregon Accounting Manual, policy 30.40.00.104, Agency has determined:

☒ Grantee is a subrecipient ☐ Grantee is a contractor ☐ Not applicable

1.3. Catalog of Federal Domestic Assistance (CFDA) #(s) of federal funds to be paid through this Grant: 21.019

2. FEDERAL PROVISIONS

2.1. The use of all federal funds paid under this Grant are subject to all applicable federal regulations, including the provisions described below.

2.2. Grantee must ensure that any further distribution or payment of the federal funds paid under this Grant by means of any contract, subgrant, or other agreement between Grantee and another party for the performance of any of the activities of this Grant, includes the requirement that such funds may be used solely in a manner that complies with the provisions of this Grant.

2.3. Grantee must include and incorporate the provisions described below in all contracts and subgrants that may use, in whole or in part, the funds provided by this Grant.

2.4. Grantee must comply, and ensure the compliance by subcontractors or subgrantees, with 41 U.S.C. 4712, Program for Enhancement of Employee Whistleblower Protection. Grantee must inform subrecipients, contractors and employees, in writing, in the predominant language of the workforce, of the employee whistleblower rights and protections under 41 USC § 4712.

In accordance with U.S. Treasury guidance – Grantee is subject to the following provisions, as applicable.

For purposes of these provisions, the following definitions apply:

"Contract" means this Grant or any contract or subgrant funded by this Grant.

"Contractor" and **"Subrecipient"** and **"Non-Federal entity"** mean Grantee or Grantee's contractors or subgrantees, if any.

(A) 2 CFR §200.303 Internal Controls

(B) 2 CFR §§ 200.330 through 200.332 Subrecipient Monitoring and Management

(C) Subpart F – Audit Requirements of 2 CFR §200.5XX

i. Contractor must comply, and require any subcontractor to comply, with applicable audit requirements and responsibilities set forth in this Contract and applicable state or federal law.

ii. If Contractor receives federal awards in excess of $750,000 in a fiscal year, Contractor is subject to audit conducted in accordance with the provisions of 2 CFR part 200, subpart F. Copies of all audits must be submitted to Agency within 30 days of completion.

iii. Contractor must save, protect and hold harmless Agency from the cost of any audits or special investigations performed by the Secretary of State with respect to the funds expended under this Contract. Contractor acknowledges and agrees that any audit costs incurred by Contractor as a result of allegations of fraud, waste or abuse are ineligible for reimbursement under this or any other agreement between Contractor and State.

(D) System for Award Management. Grantee must comply with applicable requirements regarding the System for Award Management (SAM), currently accessible at https://www.sam.gov. This includes applicable requirements regarding registration with SAM, as well as maintaining current information in SAM. The Grantee also must comply with applicable restrictions on subawards ("subgrants") to first-tier subrecipients (first-tier "subgrantees"), including restrictions on subawards to entities that do not acquire and provide (to the Grantee) the unique entity identifier required for SAM registration.

3. ADDITIONAL FEDERAL REQUIREMENTS

None.

EXHIBIT D
FEDERAL AWARD IDENTIFICATION
(Required by 2 CFR 200.331(a))

(i)	Grantee Name: *(must match DUNS registration)*	KEIZER, CITY OF
(ii)	Grantee's DUNS number:	038038147
(iii)	Federal Award Identification Number (FAIN):	
(iv)	Federal award date: *(date of award to DAS by federal agency)*	March 27, 2020
(v)	Grant period of performance start and end dates:	Start: March 1, 2020 End: December 30, 2020
(vi)	Total amount of federal funds obligated by this Grant:	
(vii)	Total amount of federal award committed to Grantee by Agency: *(amount of federal funds from this FAIN committed to Grantee)*	$1,151,914.13
(viii)	Federal award project description:	Coronavirus Relief Fund
(ix)	Federal awarding agency:	U.S. Department of the Treasury
	Name of pass-through entity:	Oregon Department of Administrative Services
	Contact information for awarding official of pass-through entity:	Gerold Floyd, CoronavirusReliefFund@Oregon.gov
(x)	CFDA number, name, and amount:	Number: 21.019 Name: Coronavirus Relief Fund Amount: $1,388,506,837.10
(xi)	Is award research and development?	Yes ☐ No ☒
(xii)	Indirect cost rate:	Not allowed per U.S. Treasury guidance
	Is the 10% de minimis rate being used per §200.414?	Yes ☐ No ☒

Exhibit 3

GRANT RECIPIENT STATEMENT OF WORK – UTILITIES, RENTAL AND MORTGAGE ASSISTANCE

The Recipient shall provide services as described below:

The need or problem addressed by the project:

A significant amount of the households served by Recipient are on the margins of losing housing due to the issues of shared housing, under-employment and fixed income. The current circumstances from COVID-19 have increased the barriers for these households.

A description of the work to be performed, including how the project will address the identified need or problem, project objectives, services to be provided by the project, the populations or areas to be served, and how the funds will be used:

Recipient will provide utilities, mortgage and rental assistance through their existing and established programs to deploy funding supports for housing expenses related to COVID-19 impacts. "Utilities" shall include only natural gas, electricity, sanitation and water/sewer bills.

Residential Mortgage Payment Assistance: This grant will be used by Recipient to directly support the Mortgage Payment Assistance Program for homeowners within Keizer city limits.

Applications will be available through email, mail online at Recipient's website or at Recipient's office. They will distribute information/applications through networking channels (partner agencies, community mobilizers, email lists of interested parties, social media, etc.). Applications will be accepted on a first come, first serve basis and will confirm that the assistance needed for their mortgage payment is due to COVID-19 impacts. Applicants who turn in complete applications must meet the eligibility criteria (80% AMI, live in the City of Keizer, owner occupied home without owning additional property, have had monthly gross income decrease due to COVID-19) and provide needed document (Income verification, Mortgage Statements, proof of ownership, etc.). The Mortgage Assistance will go directly to their Mortgage Company in monthly installments equal to their monthly Mortgage payment (including funds for escrow accounts).

Residential Rental Assistance: This grant will be used by Recipient to support rental assistance for Keizer residents. Applications will confirm that the assistance needed for their rental payment is due to COVID-19 impacts. Applications may be accessed in person from Recipient's offices, via email, or via postal mail. In the instance the applicant needs assistance completing the application, Recipient is able to help. Applicants are placed on a waitlist and will be selected based on application date in order to complete

the earliest applications first. Funds are distributed to landlords by check or ACH deposit on a monthly basis for a total of 3 months forward, plus any arrears from March 2020 to present, based on the date of the application.

Recipient will provide any financial reports and other documents required under the Intergovernmental Agreement, or state or federal law.

The location of the project:

Recipient will serve most applicants from the phone and via email until safe to resume meeting at public spaces. Recipient's office is located at 3745 Portland Road NE, Salem, Oregon 97301.

Exhibit 4

RECIPIENT REPORTING REQUIREMENTS

Grant Recipients must collect and provide the following details to the City from each Sub-Recipient as funds are distributed:

1. **Subrecipient Name**

2. **Subrecipient Address**

3. **Subrecipient Contact Phone Number**

4. **Subrecipient Assistance Provided:**
    a. **Natural Gas**
    b. **Electricity**
    c. **Sanitation**
    d. **Water/Sewer Bills**
    e. **Residential Mortgage Payment**
    f. **Residential Rental Assistance**

5. **Subrecipient Evidence Related to COVID-19**

6. **Amount of Total Support Awarded (in Dollars $) to each Subrecipient**

Exhibit 4-A

RECIPIENT REPORTING REQUIREMENTS DOCUMENTATION

Exhibit 4-A provides an example format for Recipient reporting requirements of all Subrecipients:

Name of Subrecipient	Address of Subrecipient	Contact Phone Number of Subrecipient	Assistance Provided on Behalf of Subrecipient	Evidence Provided by Subrecipient as Evidence Related to COVID-19	Total Support Awarded to Subrecipient
Jane Doe	555 Any Place Dr Keizer OR 97303	503-555-5555	Natural Gas	Past Due Bill – Verified by Clerk	$105.00
James Doe	8080 Hideaway Pl Keizer OR 97303	503-888-3025	Residential Mortgage Payment	Mortgage Statement – Proof of Ownership	$1,078.00
Cisco Downey	3518 Juniper Ln Keizer, Or 97303	503-486-8080	Residential Rental Assistance	Landlord Statement	$1,328.00
Sub-Total					$2,511.00

Exhibit 5

FEDERAL REGULATION AND ADMINISTRATIVE REQUIREMENTS

Subrecipients are required to comply with all federal & state regulations that apply to recipients of any grant funding, as outlined in the CARES Act (PL 116-136); Amendment to Section 601(a) of the Social Security Act and State of Oregon Department of Administrative Services Grant Agreement #1079 (Exhibit 2).

SPECIFIC REGULATIONS AND ADMINISTRATIVE REQUIREMENTS

Subrecipients shall comply with the following applicable rules and regulations, complete the related administrative requirements, and maintain documentation demonstrating compliance with these rules and regulations:

1. **DUPLICATION OF BENEFITS (ALL SUBRECIPENTS)**

   Because CARES Act funds are one of multiple federal funding sources available for the purpose of (1) prevention, (2) preparation for, and (3) response to Coronavirus, the **CARES Act** requires coordination with other organizations that provide such relief to prevent the duplication of benefits.

   Administrative Requirements:

   Recipients providing grant award assistance shall obtain a Duplication of Benefits Certification from all Subrecipients (attached as EXHIBIT 5-A). All Recipients providing grant awards for rental/mortgage assistance are subject to Certification from all tenant/borrower and landlord Subrecipients, when applicable (attached as EXHIBIT 5-A and EXHIBIT 5-B).

Exhibit 5-A

NON-DUPLICATION OF BENEFIT CERTIFICATION (Tenant/Borrower)

Date: _____

Client Name: _____ Client Name: _____

Please mark the box below regarding any prior assistance:

- I/we have **not** applied for or received **any** funding assistance for mortgage/rent and/or utilities from another agency in the past 12 months.
  (Initial)_____(Initial)_____

- I/we have applied and received funding assistance from the following agencies to assist us with mortgage, rent and/or utilities in the past 12 months.
  (Initial)_____(Initial)_____

  Please list name of all organizations and amount received:

  Name:_____

  Requested$_____Received$_____Date Received:_____

  Name:_____

  Requested$_____Received$_____Date Received:_____

  Name:_____

  Requested$_____Received$_____Date Received:_____

- Are there **any** applications pending from other agencies: Yes or No
  (IF yes name of agency and date applied)

  Name:_____Date_____

  Name:_____Date_____

CERTIFICATION: I Certify that the information that I have provided above is an accurate and complete disclosure. I understand that to perjure myself in order to obtain assistance is a fraudulent offense for which I can be prosecuted.

Client Signature:_____

Client Signature:_____

Exhibit 5-B

NON-DUPLICATION OF BENEFIT CERTIFICATION (Landlord)

Please complete the following information regarding your current resident who has applied for funding assistance.

Date: _____

Owner/Landlord/Agent Name: _____

Rental Agency Name: _____

Address: _____

Phone Number: _____ Email: _____

Resident Name: _____

Property Address: _____

- I/we have **not** received **any** insurance or other assistance for loss of rent and/or utilities from another agency to cover cost for the above resident in the past 12 months_____(Initial)

- I/we have **not** received **any** funding assistance for rent and/or utilities from another agency to cover cost for the above resident in the past 12 months_____(Initial)

- I/we have received funding assistance from the following agencies to assist our resident in the past 12 months_____(Initial)

Please list name of all organizations and amount received:

Name:_____Amount$_____

Name:_____Amount$_____

CERTIFICATION: I Certify that the information that I have provided above is an accurate and complete disclosure. I understand that to perjure myself in order to help another obtain assistance is a fraudulent offense for which I can be prosecuted.

Owner/Landlord/Agent Name: _____ Date: _____

Signature: _____

COUNCIL MEETING: October 19, 2020

AGENDA ITEM NUMBER:_____

TO: **MAYOR CLARK AND CITY COUNCIL MEMBERS**

THROUGH: **Chris Eppley, City Manager**

FROM: **Tim Wood, Finance Director**

SUBJECT: Authorization to enter into a five-year agreement with Ricoh for the lease of a multi-function photocopy machine for the City Hall main copier.

BACKGROUND: The City entered into a five-year agreement with Ricoh in October 2015 for a multi-function photocopy machine at $287.10 per month for the City Hall main copier. The agreement is set to expire in October 2020.

The City would like enter into a new agreement with Ricoh for an updated multi-function photocopy machine using the State negotiated purchasing contract.

FISCAL IMPACT: The multi-function photocopier will cost $227.65 per month or $2,731.80 a year. This expense is covered by existing budget appropriation and reflects a $59.45 per month cost savings over the existing contract.

RECOMMENDATION: Staff recommends the City Council authorize the Finance Director to enter into a five-year agreement with Ricoh to lease a multi-function photocopy machine.

CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

Resolution R2020-_____

AUTHORIZING THE FINANCE DIRECTOR TO ENTER INTO LEASE AGREEMENT WITH RICOH USA INC FOR CITY HALL MAIN COPIER

WHEREAS, the City of Keizer has been utilizing a leasing program for copier machines for the last few years;

WHEREAS, the copier lease for the City Hall is at the end of its five-year agreement with Ricoh USA Inc;

WHEREAS, the City has determined procurement through the Oregon Cooperative Procurement Program (ORCPP) provided the best price of $227.65 per month from Ricoh USA Inc.;

WHEREAS, State of Oregon Contract No. 9491 authorizes ORCPP participants to use Contract No. 9491 to lease copiers from Ricoh USA Inc. by issuance of a Purchase Order;

WHEREAS, the lease has been included in the approved 2020-2021 fiscal year budget and will be included in upcoming fiscal year budgets until the termination date;

NOW, THEREFORE,

BE IT RESOLVED by the City Council of the City of Keizer that the Finance Director is hereby authorized to sign the Purchase Order for a five-year lease agreement with Ricoh USA Inc. as outlined on the attached Purchase Order.

Keizer City Attorney
930 Chemawa Road NE
PO Box 21000
Keizer, Oregon 97307
503-390-3700

BE IT FURTHER RESOLVED that this Resolution shall take effect immediately upon the date of its passage.

PASSED this _____ day of _____, 2020.

SIGNED this _____ day of _____, 2020.

_____
Mayor

_____
City Recorder

Keizer City Attorney
930 Chemawa Road NE
PO Box 21000
Keizer, Oregon 97307
503-390-3700

City of Keizer

P.O. Box 21000
Keizer, Oregon 97307-1000
Phone: 503-390-3700

Purchase Order Number

Ricoh 2020-10-19

TO	SHIP TO/BILL TO
Ricoh USA Inc	City of Keizer
5 Dedrick PL	930 Chemawa Rd NE
West Caldwell, NJ 07006	Keizer, OR 97303

PLEASE ENTER OUR ORDER FOR THE FOLLOWING:

This Purchase Order is subject to the State of Colorado, Master Agreement #140602 and Participating Addendum #9491. The terms and conditions of the Master Agreement and the Participating Addendum apply to this purchase and take precedence over all other conflicting terms and conditions, express or implied. There are no understandings, agreements or representations, oral or written, not specified herein.

Item Description:

RICOH IMC6000 CONFIGURABLE PTO MODEL
RICOH IMC6000 BRANDING SET
BRIDGE UNIT BU3090
LCIT PB3290
FINISHER SR3260
PUNCH UNIT PU3080 NA
ESP XG-PCS-15D
FAX OPTION TYPE M37
TS NETWORK & SCAN - SEG BC4

0 B&W copies per Month per unit overages at $0.0110 per page
0 color copies per Month per unit overages at $0.0821 per page
GOLD - includes Parts, Labor, Toner and Staples, excludes Paper

60-month lease of $227.65 per month

Customer Contact: Tim Wood, 503-856-3413, woodt@keizer.org

Timothy E Wood PURCHASING AGENT

CITY COUNCIL MEETING: October 19, 2020

AGENDA ITEM NUMBER:_____

TO: **MAYOR CLARK AND COUNCIL MEMBERS**

THROUGH: **CHRISTOPHER C. EPPLEY, CITY MANAGER**

FROM: **E. SHANNON JOHNSON, CITY ATTORNEY**

SUBJECT: **POLICE VEHICLE PURCHASE**

The 2020-2021 adopted City of Keizer budget includes appropriations to purchase vehicles for the Police Department. Staff has determined that two 2021 K81 AWD Police Interceptor Utility vehicles will meet the needs of the Police Department and they are available utilizing the State of Oregon purchasing contract number 5551 with Gresham Ford. The cost of each vehicle is $33,720.37 for a total of $67,440.74.

RECOMMENDATION:

Adopt the attached Resolution.

Please contact me if you have any questions in this regard. Thank you.

ESJ/tmh

CITY COUNCIL, CITY OF KEIZER, STATE OF OREGON

Resolution R2020-_____

AUTHORIZING THE CITY MANAGER TO PURCHASE TWO 2021 K8A AWD POLICE INTERCEPTOR UTILITY VEHICLES FOR POLICE DEPARTMENT

WHEREAS, the City of Keizer budgeted funds in the 2020-2021 Police Services Fee to purchase vehicles for the Police Department;

WHEREAS, it has been determined that two 2021 K8A AWD Police Interception Utility vehicles meet the needs of the Police Department;

WHEREAS, the City has determined procurement through the Oregon Cooperative Procurement Program (ORCPP) provided the best price of $67,440.74 from Gresham Ford;

WHEREAS, State of Oregon Contract No. 5551 authorizes ORCPP participants to purchase vehicles from Gresham Ford by issuance of a Purchase Order;

NOW, THEREFORE,

BE IT RESOLVED by the City Council of the City of Keizer that the City Manager is hereby authorized to purchase two 2021 K8A AWD Police Interception Utility vehicles from Gresham Ford for a purchase price of $67,440.74 by issuing a Purchase Order containing the mandatory language as shown on the attached exhibit.

BE IT FURTHER RESOLVED that the City Manager is authorized to take any and all necessary acts to effectuate the purchase of the vehicle.

Keizer City Attorney
930 Chemawa Road NE
PO Box 21000
Keizer, Oregon 97307
503-856-3433

BE IT FURTHER RESOLVED that this Resolution shall take effect immediately upon the date of its passage.

PASSED this _____ day of _____, 2020.

SIGNED this _____ day of _____, 2020.

_____
Mayor

_____
City Recorder

Keizer City Attorney
930 Chemawa Road NE
PO Box 21000
Keizer, Oregon 97307
503-856-3433

City of Keizer

PO Box 21000
Keizer OR 97307-1000
Phone: 503-390-3713

PURCHASE ORDER

Number
20-

TO:
Gresham Ford
1999 East Powell Blvd
Gresham, OR 97080

SHIP TO:
Lt. Trevor Wenning
930 Chemawa Rd NE
Keizer OR 97303

PLEASE ENTER OUR ORDER FOR THE FOLLOWING:

DATE REQUIRED	SHIP VIA	TERMS	ACCOUNT OR JOB NO.	ORDER DATE
		30 NET		

QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT	
2	K8A AWD Police Interceptor Utility vehicles as specified in attached quote.	33,720.37	67,440.74	
	This purchase order, in addition to any exhibits or addenda			
	Attached is placed against State of Oregon Price Agreement #5551.			
	The terms and conditions contained in the Price Agreement apply			
	to this purchase and take precedence over all other conflicting terms			
	and conditions, express or implied. There are no understandings,			
	agreements or representations, oral or written, not specified herein.			

PLEASE ACKNOWLEDGE IMMEDIATELY AND STATE WHEN YOU WILL SHIP – OUR ORDER NO. MUST APPEAR ON ALL RELATED PACKAGES AND FORMS

Christopher C. Eppley, Purchasing Agent

BILLING ADDRESS IS:

PO BOX 21000
KEIZER OR 97303

Fleet Price Quote — Gresham Ford-1999 East Powell Blvd. Gresham, OR 97080

Gresham Ford
The Dealer with A Heart!

Paul Blankenship
Government and Commercial Fleet Manager
Military Deliveries
State of Oregon Contract #5551

Cell: 503.490.6510
Office: 503.665.0101
Fax: 503.665.0497
Paul@GreshamFord.com

Quoted to: City of Keizer
Lt. Trevor Wenning

Cell/Phone	503-390-3713	Date Quoted	9/9/2020	Contract FIN	QS045
Ext. #	3508	This Quote is per one vehicle			
E-Mail	wenningt@keizer.org				

Vehicle Quoted: Model Code K8A AWD Police Interceptor Utility
Model Year 2021

Quote:

	Item Code	Item Description	Price
Base	K8A AWD	Police Interceptor Utility	$ 35,499.00
WB	119	In. Wheel Base	incl.
Color	UM	Agate Black	incl.
Interior	9	Cloth Buckets/Vinyl Rear	incl.
Interior Color	6	Ebony Black	incl.
Trim	500A	Equip Group, Premium AM/FM	incl.
Engine	99B	3.3L V6 TIVCT	$ (3,319.00)
Transmission	44U	10-Speed Automatic Transmission	incl.
Emissions	425	50 States Emissions	incl.
	18D	Global Lock and Unlock	incl.
	43D	Courtesy Lamp Disable	$ 24.00
	51T	Driver LED Spot Lamp (Whelen)	$ 394.00
	55F	4 Keys and 4 Keyless FOBs	$ 320.00
	59E	Key Code 1435X	$ 47.00
	68G	Rear Door Handle and Lock Inoperable	$ 71.00
	76R	Reverse Sensing System	$ 259.00
	92R	Solar Tint 2nd Row Only	$ 80.00
	153	Front License Plate Bracket	incl.
	61B	OBD II SPLITTER	$ 55.00

Cost of Vehicle	$ 33,375.00
Oregon Vehicle Privilege Tax	$ 166.88
Oregon Corporate Activity Tax	$ 123.49
Delivered to	Salem, Oregon
#178 Total Vehicle Quote	$ ~~33,665.37~~ $ 33,720.37

MINUTES
KEIZER CITY COUNCIL WORK SESSION
Monday, September 28, 2020
Keizer Civic Center, Council Chambers
Keizer, Oregon

CALL TO ORDER

Mayor Clark called the meeting to order at 6:00 pm. Roll call was taken as follows:

Present:
Cathy Clark, Mayor
Kim Freeman, Councilor
Marlene Parsons, Councilor
Laura Reid, Councilor
Roland Herrera, Councilor
Elizabeth Smith, Councilor
Dan Kohler, Councilor

Staff:
Chris Eppley, City Manager
Shane Witham, Community Development
Tim Wood, Finance Director
John Teague, Police Chief
Bill Lawyer, Public Works Director
Machell DePina, Human Resources
Tracy Davis, City Recorder

DISCUSSION
Values Statements Regarding Justice, Equity, Diversity and Inclusion

a. Training Video

Mayor Clark opened the meeting with a short summary of the process. The video “Race, Equity and Leadership” provided by the National League of Cities was shown. Mayor Clark noted that she wanted the video to set the tone that Keizer is willing to lead the way on how systems are addressed to ensure that the community is open and equitable.

b. 2019-2020 City Council Goal – Community Engagement and Staff Diversity

Discussion then took place regarding ‘the starting line’, taking advantage of opportunities, making adjustments, understanding others, being open minded toward other points of view, commitment, equity and inclusion in our leaders, the need for less talk and more action, embracing humanity, communication, necessary steps, learning from other cities, and getting various perspectives.

Department Heads then explained how their department addresses diversity.

City Manager Chris Eppley noted that most anyone can be taught and trained to do something, but it is impossible to change who they are. He explained that a set of core values is being developed to keep everyone moving in the same direction and barriers to employment are being removed. The bi-lingual agenda packets, reader board postings and Spanish Facebook Live are all diversity-related efforts. Although 90% of those who speak Spanish also speak English, the City wants to honor the

tradition and cultures by sharing information in their primary language. He shared details on the method used in interviewing and hiring new staff noting that more efforts could be made to include the Latino community in the interview panels. He added that he would like to have a Diversity, Equity and Inclusion position on staff but budget constraints have always prevented this.

Human Resources Director Machell DePina explained that the department is evaluating the language used in recruitments and wants to fold in some of the value information so that candidates get a strong message of what the City is.

Public Works Director Bill Lawyer distributed a map showing all the projects that have been accomplished since the implementation of the parks fee noting that improvements have been spread throughout the community as a whole. He added that the same is true of street/waterline improvements; a matrix is used so that all areas of the city are served with equity.

Police Chief Teague stressed the importance of justice as the priority in any police department and his department pursues justice for all, not just for people of color. The department is working on establishing a culture in which everyone thinks in a particular way: treat with justice, proceed with justice. Police Officers are hired for five characteristics: courage, conscientiousness, empathy, helpfulness and humility. They are most interested in exonerating suspects, avoiding a wrongful conviction, having a positive impact and making people's lives better.

Finance Director Tim Wood noted that within the past six months he has experienced several examples of racism in the community so this discussion is timely. He noted that his staff is more interested in providing services than collecting fees and being part of a government that is easy to work with.

Interim Community Development Director Shane Witham explained that Keizer does not have any exclusionary zoning. He stressed the need for equity in housing adding that regulations are being passed to provide more affordable housing. Additionally, his department is getting more information out in Spanish, but it is challenging.

c. Diversity Equity and Inclusion Statement Components

Mayor Clark reminded everyone that Keizer had already passed a resolution that Measure 105 will be detrimental to the public safety of everyone in the community and noted that the suggested resolutions all include state and federal definitions for protected classes. Next meeting will focus on justice and equity, public safety, equity in City services, recruitment, promotion and retention, and the Council roll in implementation of inclusivity.

PUBLIC INPUT

Michael DeBlasi, Keizer, urged everyone not to look at the color of peoples' skin, but instead to focus on their character.

Carol Doerfler, Keizer, praised the video and Dr. Andrews and urged citizens to step forward and make sure their neighbors feel welcome. She

urged the City to make a public statement that says everyone is welcome.

R.J. Navarro, Keizer, reviewed points in the video including how racial equity improves a community, provided examples of the importance of being bi-lingual and urged Council to pass a resolution and take steps to encourage inclusivity.

Michele Roland-Schwartz and *Carolyn Holman*, Keizer, echoed Mr. Navarro's request for passage of an inclusivity resolution.

Dylan Juran, Keizer, stated that it is not enough to just be 'not racist'. We must actively foster a culture of anti-racism and find racist components and dismantle them.

Eric Howald, Keizer, encouraged the City government to get out into the community and hold conversations in areas other than the City Hall building in order to include people who are not comfortable coming to a government building.

Lisa Cejeka, Keizer, pointed out that words matter and a statement affirming that all people are welcome would make a difference.

Councilors provided input regarding, affirmative action, racial equality, diversity in staffing, valuing everyone through actions and policies, the complexity of the issue, equity, loving one another, the importance of getting the word out, carrying on conversations outside of the City Hall building, using tools available to move forward, commitment, action, and accountability.

NEXT WORK SESSION October 26, 2020

ADJOURNMENT Mayor Clark adjourned the meeting at 8:12 p.m.

MAYOR: APPROVED:

Cathy Clark

Debbie Lockhart, Deputy City Recorder

COUNCIL MEMBERS

Councilor #1 – Laura Reid

Councilor #4 – Roland Herrera

Councilor #2 – Kim Freeman

Councilor #5 – Elizabeth Smith

Councilor #3 – Marlene Parsons

Councilor #6 – Daniel R. Kohler

Minutes approved:_____

MINUTES
KEIZER CITY COUNCIL
Monday, October 5, 2020
Keizer Civic Center, Council Chambers
Keizer, Oregon

CALL TO ORDER

Mayor Clark called the meeting to order at 7:00 pm. Roll call was taken as follows:

Present:
Cathy Clark, Mayor
Kim Freeman, Councilor
Roland Herrera, Councilor
Daniel Kohler, Councilor
Laura Reid, Councilor
Elizabeth Smith, Councilor
Marlene Parsons, Councilor

Staff:
Chris Eppley, City Manager
Shannon Johnson, City Attorney
Shane Witham, Community Development
Tim Wood, Finance Director
John Teague, Police Chief
Tracy Davis, City Recorder

FLAG SALUTE

Mayor Clark led the pledge of allegiance.

SPECIAL ORDERS OF BUSINESS

None

COMMITTEE REPORTS

Bob Busch, Keizer, reported that the Keizer Points of Interest Committee was working on establishing a marker for Longitude 123 where it crosses the 45th parallel, has updated the Points of Interest map to include little libraries and has almost completed historical signage for the Cultural Center.

PUBLIC TESTIMONY

Carol Doerfler, Keizer, thanked Council for their work session on equity and urged that a welcoming message such as: 'Keizer welcomes every person of every color and every gender' be posted on the reader board and Community Center doors. She also announced the upcoming West Keizer Neighborhood Association meeting/candidate forum.

Pattie Tischer, Keizer, announced that the Greater Gubser Neighborhood Association will also be having a candidate forum and noted that the Little Library at the Big Toy in Keizer Rapids Park had been vandalized but, since it was her son's Eagle Scout project, he will be repairing the damage.

PUBLIC HEARING

a. El Vaquero

Mayor Clark opened the Public Hearing.

City Manager Chris Eppley read his staff report.

Santa Maria BBQ Liquor License Change of Ownership

With no further testimony, Mayor Clark closed the Public Hearing.

Councilor Freeman moved that the Keizer City Council recommend approval of the application for El Vaquero Santa Maria BBQ Liquor License Change of Ownership under the guidelines established by ORS 471.178 and the Ordinances of the City of Keizer and to forward this recommendation to the Oregon Liquor Control Commission for final approval. Councilor Herrera seconded. Motion passed unanimously as follows:

AYES: Clark, Reid, Freeman, Parsons, Herrera, Smith and Kohler (7)
NAYS: None (0)
ABSTENTIONS: None (0)
ABSENT: None (0)

ADMINISTRATIVE ACTION

a. ORDINANCE – Creating A Planning Commission; Providing For Its Composition and Organization; Providing Its Powers And Duties

City Attorney Shannon Johnson summarized his staff report and corrected a typographical error on page 2 line 22.

Council Freeman moved that the Keizer City Council adopt a Bill for an Ordinance Creating a Planning Commission; Providing for Its Composition and Organization; Providing Its Powers and Duties; Repeal of Ordinances 83-006, 2013-674, And 2017-783 with the correction on line 22 from 'they' to 'the'. Councilor Herrera seconded. Motion passed unanimously as follows:

AYES: Clark, Reid, Freeman, Parsons, Herrera, Smith and Kohler (7)
NAYS: None (0)
ABSTENTIONS: None (0)
ABSENT: None (0)

CONSENT CALENDAR

a. RESOLUTION – Authorizing the City Manager to Enter into Contract for Manzanita Street Storm Drain Repair with Michels Corporation
b. RESOLUTION – Authorizing City Manager to Enter into Contract for Lauderback Street Storm Drain Repair with Michels Corporation
c. RESOLUTION – Authorizing The Finance Director to Enter into Purchase Agreement for Albert Monitoring Services with Center for Internet Security, Inc (CIS)
d. RESOLUTION – Authorizing The Finance Director to Enter into Enzoic Proposal for Enzioc for Active Directory Software Services
e. Approval of September 21, 2020 City Council Regular Session Minutes

Councilor Freeman moved that the Keizer City Council approve the Consent Calendar. Councilor Herrera seconded. Motion passed as follows:

AYES: Clark, Reid, Freeman, Parsons, Smith, Herrera and Kohler (7)
NAYS: None (0)
ABSTENTIONS: None (0)
ABSENT: None (0)

COUNCIL LIAISON REPORTS

Councilor Kohler reported on meetings and events he had attended and announced upcoming ones, thanked volunteers who helped at the Wallace House Park clean up, and voiced support for Ms. Doerfler's suggested message.

Councilor Reid provided information regarding school related activities and conferences.

Councilor Freeman announced upcoming events and meetings, thanked Mr. Eppley for his continuous stream of information on disaster recovery, praised Marion County for their bi-lingual publications, and announced the availability of funds for homeowners who have suffered due to Covid.

Councilor Herrera reported on meetings and events he had attended and announced future ones. He shared information regarding the McNary efforts to reach out to the Latino population, thanked everyone who attended the recent work session noting the importance of participation so everyone can expand and grow, and echoed Councilor Kohler's support for Carol Doerfler's suggested city message.

Councilor Smith announced that the Facebook page for the Charter vote is active, provided details on disaster recovery efforts, praised city staff for keeping everyone informed, and announced upcoming meetings and events.

Councilor Parsons thanked everyone who attended the recent work session, Councilors who were covering for her at upcoming meetings and particularly Councilor Smith for her tireless efforts in multiple venues and reported that she will be participating in virtual mentoring with McNary students.

Mayor Clark reported on past meetings and events and announced upcoming ones. She thanked everyone involved in getting assistance out to those impacted by Covid-19 or the wildfires and Kelly Walther for her efforts in securing a grant for the Cultural Center, and announced that unemployment numbers continue to drop and the gazebo is being painted as an Eagle Scout project.

OTHER BUSINESS

Chief Teague announced that jobs have been offered to two police officers: Tim Hine from Silverton and Cody Stupfel from the National Guard.

Interim Community Development Director Shane Witham announced that the Planning Commission will be reviewing the Keizer Growth Transportation Impacts Study and that Covid-19 small business grants are still available.

Finance Director Tim Wood announced that the water department will begin the normal shut-off process; relief funds are available to assist with payments. He urged people in need of assistance to contact the City.

WRITTEN COMMUNICATIONS

Mayor Clark commended Dan Collingham and Debbie Lockhart for their efforts in cleaning up and maintaining the T.D. Keizer statue, read an email from Beverly Birr in the Police Department in which she reported that a Mr. Smith had visited the department to tell them they were doing a good job, and announced that related to the 2020 Census, Oregon is at 99.6% counted and Keizer is above the state average.

AGENDA INPUT

October 12, 2020 – 6:00 p.m. – City Council Work Session - Cancelled
October 19, 2020 – 7:00 p.m. – Council Regular Session
October 26, 2020 – 6:00 p.m. – City Council Work Session – Community Demographics, Equity and Diversity

ADJOURNMENT

Mayor Clark adjourned the meeting at 8:10 p.m.

MAYOR: APPROVED:

Cathy Clark

Debbie Lockhart, Deputy City Recorder

COUNCIL MEMBERS

Councilor #1 – Laura Reid

Councilor #4 – Roland Herrera

Councilor #2 – Kim Freeman

Councilor #5 – Elizabeth Smith

Councilor #3 – Marlene Parsons

Councilor #6 – Daniel R. Kohler

Minutes approved:_____