MISSOURI TRAFFIC ENGINEERING ASSISTANCE PROGRAM

ROAD SEGMENT ANALYSIS

Route C Between Peculiar Drive and Schug Avenue

Prepared for

CITY OF PECULIAR

By

TranSystems

June 2015

TranSystems

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June 30, 2015

Mr. Carl M. Brooks, PE
City Engineer
250 S. Main Street
Peculiar, MO 64078

Re: Road Segment Analysis
Route C between Peculiar Drive and Schug Avenue

Dear Mr. Brooks,

In accordance with your request, TranSystems Corporation has prepared the following road segment analysis for the City of Peculiar, Missouri. The study included an assessment of existing operational and safety conditions along Route C, and identification of potential improvements to address deficiencies. Our data collection efforts, results and recommendations are summarized in the attached report.

We trust that this study has adequately addressed the concerns of the City. We have appreciated this opportunity to be of service to the Missouri Department of Transportation and the City of Peculiar. We will be available to review this study with you at your convenience.

Sincerely,

TranSystems

By: _____
Jeffrey J. Wilke, PE, PTOE

JJW:jjw:P101150072

STATE OF MISSOURI
JEFFREY J. WILKE
NUMBER
PE-2007032448
PROFESSIONAL ENGINEER
6-30-15

Introduction

TranSystems Corporation has prepared the following road segment analysis for the City of Peculiar, Missouri. The study included a review of existing operational and safety conditions along Route C, and identification of potential improvements to address deficiencies. In general, the focus of this study was the five-leg intersections with Peculiar Drive. The location of the study segment and vicinity are shown on Figure 1. This analysis was requested by Mr. Carl Brooks, City Engineer, under the Traffic Engineering Assistance Program (TEAP), administered by the Missouri Department of Transportation (MoDOT).

Existing Conditions and Study Purpose

Route C is maintained by the Missouri Department of Transportation. Within Peculiar, Route C is a two-lane arterial street that runs primarily north/south, providing access to the regional highway system by way of an interchange with I-49. The intersections along Route C are stop sign controlled for the side street movements, with uninterrupted flow along Route C.

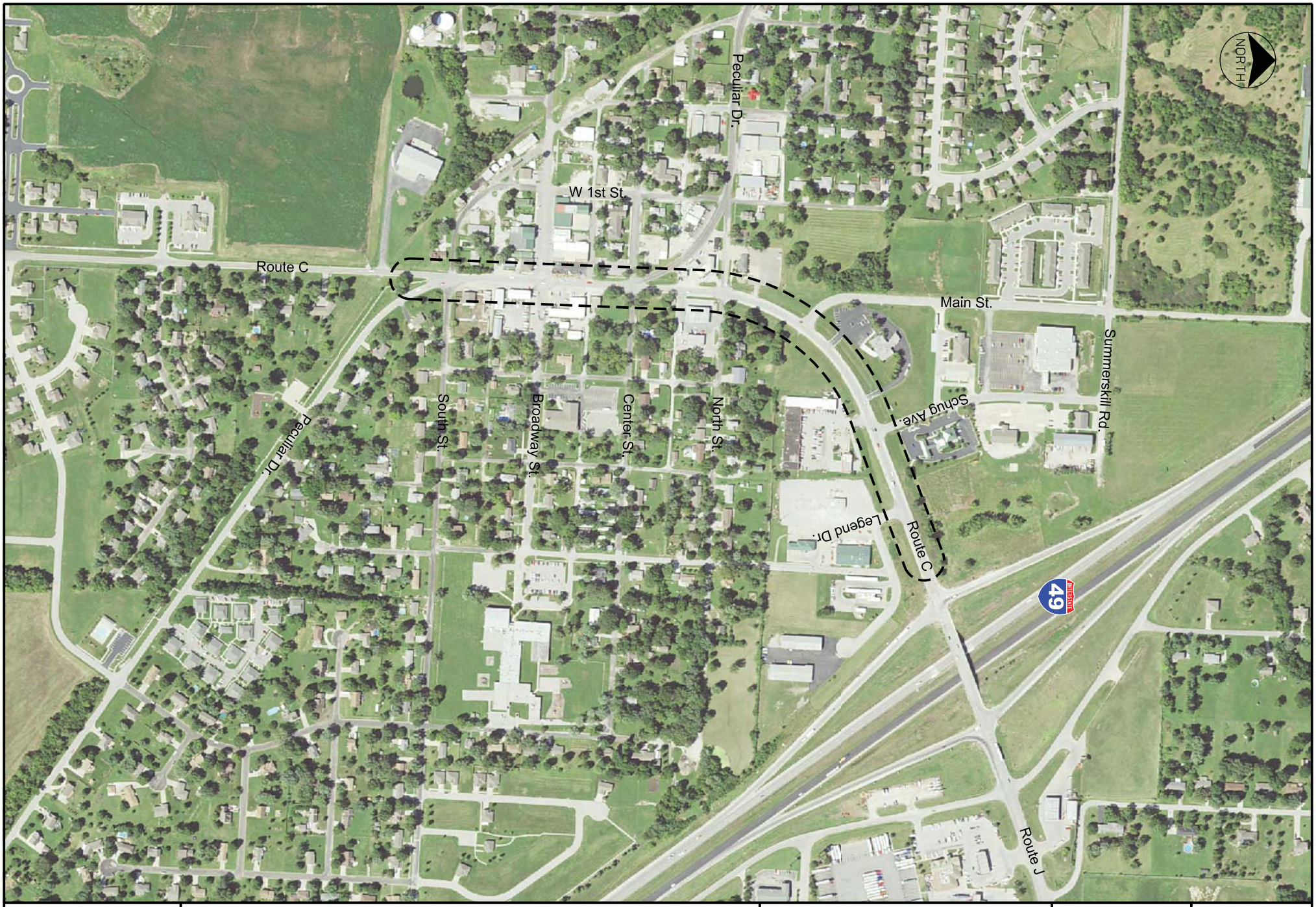
There are three different sections of Route C in the study area. To the south of the Peculiar Drive/South Street intersection, the roadway has a rural cross section without shoulders and a posted speed limit of 35 m.p.h. There are some residences and undeveloped land in this area. Between North Street and South Street there are aggregate shoulders varying in width along each side of the roadway, providing for some on-street parking activity. This segment of the road runs through the downtown commercial area of Peculiar, and the speed limit reduces to 25 m.p.h. To the north of North Street the alignment of Route C becomes more east/west with a large super-elevated horizontal curve. The speed limit is 25 m.p.h. through this section with 10-foot aggregate shoulders along each side of the road. Commercial developments line this section of the roadway.

A study was completed for this segment of Route C in 2004 to address operational and geometric concerns. Since that study was completed, a new interchange on I-49 at 211th Street has been planned and more information is known about future development potential. The City of Peculiar is interested to know if the recommendations of the 2004 study are still appropriate in light of this information. As a result, they have requested an update to that study.

Scope of Study

The following program was developed to complete the analysis:

1. Obtain manual traffic volume counts at five intersections along the study segment during a morning and afternoon peak period.
2. Develop future traffic volume projections for the study intersections based on anticipated growth rates and future development potential.
3. Perform capacity analysis using the methodology outlined in the *Highway Capacity Manual* (HCM) published by the Transportation Research Board (TRB) to determine existing operational conditions.
4. Review crash experience along the study segment and evaluate the existing safety conditions using procedures in the *Highway Safety Manual* (HSM) published by the American Association of State Highway and Transportation Officials (AASHTO).
5. Analyze the data that were collected to determine potential measures that could be implemented to address identified deficiencies in the area. Items to consider could include geometric modifications, addition of turn lanes, and traffic control modifications.
6. Prepare a report documenting our data collection, analysis and recommendations.



TranSystems	STUDY AREA	Route C Road Segment Analysis Peculiar, Missouri	JUNE 2015 No Scale	Figure 1

Data Collection

Manual Traffic Volume Counts

TranSystems conducted manual turning movement counts at the Route C study intersections. The counts were conducted at each location on Wednesday, April 22, 2015, Thursday April 23, 2015, and Tuesday April 28, 2015 during the morning peak period (7:00 a.m. to 9:00 a.m.) and the afternoon peak period (4:00 to 6:00 p.m.). The turning movement volumes recorded during these peak times are shown in the Appendix (Figure A-1). Some findings and other observations that were noted during the peak periods are summarized below:

- During both peak hours, there was steady traffic on Route C, especially in the section between North Street and the I-49 interchange.
- Drivers on North Street experienced long delays while waiting to make left-turns onto Route C during peak times. There were few gaps in the flow of traffic, and queues frequently formed on the eastbound approach. The maximum queues observed were 5 and 9 vehicles in the morning and afternoon peak periods, respectively. Queues were not sustained throughout the peak periods as they did clear.
- Driver confusion was observed at times on the Peculiar Drive approaches to Route C. The skewed angle of the approaches makes it difficult for drivers to have a full view of opposing traffic as drivers must turn their head and look over their shoulder. During our morning observations a northbound driver on Peculiar Drive at the south intersection made the slight right-turn movement onto Route C in front of a northbound driver who had to brake abruptly to avoid a collision.

Future Traffic Volume Projections

Several areas of Peculiar have the potential for significant future growth. These development areas are shown in the Appendix (Figure A-2). Several new residential developments have been planned and started in the southern portion of Peculiar, which will increase traffic volumes on Route C. Other new residential developments in the western portion of the city will not have as significant of an impact on Route C, as drivers traveling to and from these areas would be expected to use the new 211th Street interchange. The City's future land use plan indicates that retail development is planned along Main Street to the north of Route C.

Traffic volumes were adjusted to account for the new interchange at 211th Street and I-49. The traffic volumes presented in the Access Justification Report prepared for the interchange project estimate that traffic volumes on Route C to the west of the I-49 interchange will reduce by as much as 20% following construction. The new interchange will have the greatest impact on Route C traffic traveling to/from the west via North Street and Peculiar Drive. As such, the eastbound left-turn movement and the southbound right-turn movements at the Route C and North Street intersection were reduced. Those same reductions were applied to the volume of through traffic on Route C at the Main Street and Schug Avenue intersections.

To develop future traffic volume projections, trip generation estimates were made for the future developments that could impact the study area. Trip generation estimates were prepared using the Institute of Transportation Engineer's *Trip Generation*, 9th Edition. These trips were distributed to Route C and Main Street to reflect the movements that would be most impacted by new development. The trip generation calculations and distribution patterns through the study intersections are shown in Appendix B. For all other traffic movements, existing traffic volumes were increased by 22% to reflect background growth of 1% per year over the next 20 years. This growth rate is comparable to the City's recent growth patterns. The future traffic volume projections have been illustrated in the Appendix (Figure A-3).

Operational Analysis

Delay is an average measure of the time a vehicle is standing still while waiting in the approach to an intersection. A high level of delay can result in increased travel time, excessive fuel consumption, driver discomfort and frustration. Level of service (LOS) describes the quality of traffic operating conditions at an intersection based on delay, and is rated from "A" to "F". LOS A represents the most desirable condition with free-flow movement of traffic and minimal delays. LOS F generally indicates congested conditions with excessive delays to motorists. Intermediate grades of B, C, D, and E reflect incremental increases in the average stopped delay per vehicle. Table 1 on the following page shows the upper limit of delay associated with each level of service for unsignalized intersections.

Table 1
Unsignalized Intersection Level of Service Delay Thresholds

Level of Service (LOS)	Delay
A	0 – 10 seconds
B	> 10 - 15 seconds
C	> 15 - 25 seconds
D	> 25 - 35 seconds
E	> 35 - 50 seconds
F	> 50 seconds

Delay at the intersections was calculated using *Highway Capacity Manual* methods and the Synchro analysis program. This program uses a complex function that depends on a number of variables. Synchro input data included the existing lane configurations, traffic controls, and the traffic volumes shown on Figure A-1. The outputs from the Synchro analysis for the existing conditions are included in Appendix C. The average delay per vehicle and the corresponding levels of service during the peak hours are summarized in Table 2.

Table 2
Existing Conditions Delay and Operations

Intersection / *Movement*	Morning Peak Hour		Afternoon Peak Hour	
	LOS †	Delay *	LOS †	Delay *
Route C and South Street / Peculiar Drive				
Eastbound	*C*	*16.1*	*C*	*16.7*
Westbound	*B*	*14.5*	*B*	*10.5*
Northbound Left-Turn	*A*	*0.1*	*A*	*0.2*
Southbound Left-Turn	*A*	*3.0*	*A*	*2.6*
Route C and Center Street / Peculiar Drive				
Eastbound	*B*	*10.6*	*B*	*11.8*
Westbound	*B*	*11.0*	*C*	*15.6*
Northbound Left-Turn	*A*	*1.3*	*A*	*3.2*
Southbound Left-Turn	*A*	*0.2*	*A*	*0.1*
Route C and North Street				
Eastbound	***E***	***43.7***	***F***	***60.4***
Westbound	*B*	*13.4*	*C*	*16.1*
Northbound Left-Turn	*A*	*0.3*	*A*	*0.7*
Southbound Left-Turn	*A*	*1.3*	*A*	*1.3*
Route C and Main Street				
Eastbound Left-Turn	*A*	*0.1*	*A*	*0.7*
Southbound Left-Turn	*C*	*20.5*	*D*	*25.4*
Southbound Right-Turn	*A*	*9.8*	*B*	*13.0*
Route C and Schug Avenue				
Eastbound Left-Turn	*A*	*0.3*	*A*	*1.0*
Westbound Left-Turn	*A*	*0.2*	*A*	*0.8*
Northbound	*C*	*19.0*	*C*	*22.6*
Southbound	*B*	*12.9*	***F***	***59.5***

† Level of Service

* Average delay per stopped vehicle measured in seconds

The results of the analysis indicate that during both peak hours most of the intersections currently operate at an acceptable level of service (LOS D or better). The eastbound approach at the Route C and North Street intersection operates at LOS E and LOS F during the morning and afternoon peak hours, respectively. These lower levels of service are evidenced by the queuing that was observed. The southbound approach to the Route C and Schug Avenue intersection also operates at LOS F during the afternoon peak hour.

To assess operations of the corridor in the future, Synchro analysis was performed using the existing lane configurations, traffic controls, and the future traffic volumes shown on Figure A-3. The outputs from the Synchro analysis for the future conditions are included in Appendix C. The average delay per vehicle and the corresponding levels of service during the peak hours are summarized in Table 3.

Table 3
Future Year 2035 Conditions Delay and Operations

Intersection / *Movement*	Morning Peak Hour		Afternoon Peak Hour	
	LOS †	Delay *	LOS †	Delay *
Route C and South Street / Peculiar Drive				
Eastbound	*C*	*16.6*	*D*	*30.2*
Westbound	*B*	*14.0*	*B*	*13.2*
Northbound Left-Turn	*A*	*0.0*	*A*	*0.1*
Southbound Left-Turn	*A*	*2.6*	*A*	*2.9*
Route C and Center Street / Peculiar Drive				
Eastbound	*B*	*12.3*	*C*	*16.0*
Westbound	*B*	*12.5*	*D*	*29.6*
Northbound Left-Turn	*A*	*1.5*	*A*	*3.7*
Southbound Left-Turn	*A*	*0.3*	*A*	*0.1*
Route C and North Street				
Eastbound	***F***	***76.0***	***F***	***>100***
Westbound	*C*	*16.9*	*D*	*30.6*
Northbound Left-Turn	*A*	*0.3*	*A*	*0.8*
Southbound Left-Turn	*A*	*1.5*	*A*	*1.7*
Route C and Main Street				
Eastbound Left-Turn	*A*	*1.0*	*A*	*4.2*
Southbound Left-Turn	*D*	*25.0*	***F***	***>100***
Southbound Right-Turn	*A*	*9.5*	*C*	*18.8*
Route C and Schug Avenue				
Eastbound Left-Turn	*A*	*0.3*	*A*	*1.1*
Westbound Left-Turn	*A*	*0.3*	*A*	*1.2*
Northbound	*C*	*21.9*	***E***	***45.4***
Southbound	*C*	*15.4*	***F***	***>100***

† Level of Service

* Average delay per stopped vehicle measured in seconds

Lengthy delays are projected in the future for the stop controlled movements at the Route C intersections with North Street, Main Street, and Schug Avenue, especially during the afternoon peak hour. Improvements are needed to allow for side street traffic to access Route C in the future.

Crash Experience

Crash records were obtained from the City for the study segment for the time period between January 1, 2010, and December 31, 2014. Using the crash data, the Consultant prepared a crash location diagram to identify crash types and their approximate

locations along the corridor. This diagram has been included in the Appendix (Figure A-4). The numbers of each type of crash are listed in Table 4.

Table 4
Crash Types by Year

Year	Crash Type					Total
	Rear End	Angle	Left Turn	Fixed Object	Other	
2010	4	1	--	--	1	6
2011	4	--	1	1	1	7
2012	4	2	1	1	--	8
2013	5	1	--	--	--	6
2014	2	--	1	--	--	3
Total	19	4	3	2	2	30

Over this roughly 60-month time period, the data indicates that there is a moderate crash frequency along the study segment (6.0 crashes per year). The most predominant crash type along the corridor is rear end crashes. Twelve (12) of the 19 rear end crashes occurred on Route C at the Schug Avenue or Legend Drive intersection. All but one of these crashes occurred behind an eastbound or westbound vehicle on Route C stopped or slowing to turn left at the intersections. Other crash types that occurred include angle and left-turn crashes at various intersections. No further patterns or tendencies could be discerned from the data provided.

The five-leg intersections with Peculiar Drive do not have crash frequencies that are a concern, which is likely due to the low speed environment and driver familiarity with conditions. While the accidents types at these locations do not currently indicate a problem with this condition, studies have shown that sight angles at skewed intersections increase the difficulty for drivers to perceive safe crossing gaps, thereby resulting in higher accident rates.

Highway Safety Manual Analysis

To further evaluate the existing safety characteristics of the corridor, TranSystems used procedures outlined in the HSM to determine the predicted average crash frequency (crashes per year) for the study segment. Results from the HSM analysis for the road segments and intersections have been included in Appendix D and are summarized in Table 5. The actual crash frequencies for the study segments and intersections have also been included in Table 5.

Table 5
HSM Predicted Average Crash Frequency vs. Actual Crash Frequency

Road Segment	Crash Frequency (crashes per year)		
	Predicted	Actual	% difference
I-49 SB ramps to Schug Avenue	1.6	1.4	- 13 %
Schug Avenue to Main Street	1.3	1.2	- 8 %
Main Street to North Street	1.8	1.0	- 44 %
North Street to Center Street	1.4	1.0	- 29 %
Center Street to South Street	1.4	0.8	- 43 %
South Street to Fire Station driveway	0.8	0.6	- 25 %
Total	8.3	6.0	- 28%

Analysis

Based on the data that were collected, the consultant considers the Route C study segment to generally be operating satisfactorily overall. Levels of service for motorists are generally acceptable during the peak hours, and the crash frequency is less than the projected crash frequency for an urban or suburban arterial with similar characteristics. However, there are some areas of concern, which are listed below:

- The five-leg intersections create some driver confusion because they are not a standard type of intersection. The skew angle of the Peculiar Drive approaches makes it difficult for drivers to perceive safe crossing gaps, thereby resulting in the potential for higher accident rates.
- A number of rear end crashes have occurred on Route C behind vehicles stopped to turn left at Schug Avenue and at Legend Drive.
- Lengthy delays and long queues form during the peak hours on the eastbound approach of the Route C and North Street intersection.
- Long delays are projected in the future at several side street approaches to the Route C corridor. Improvements are needed to allow for side street traffic to access Route C in the future.

The new interchange at I-49 and 211th Street will have a significant effect on traffic flow in Peculiar. The change in traffic volumes has been estimated, but the full effect will not be known until the project is completed an opened to traffic. For that reason, traffic volumes should be monitored following construction to determine the actual impacts to the Route C corridor. Traffic control changes should not be implemented until these impacts are determined.

Short Term Improvements

In the short-term, several of the concerns identified in can be addressed with some geometric improvements. These improvements will be applicable in the long-term as well. Sketches of the improvements are illustrated on Figures 2 and 3.

The following paragraphs describe the short-term improvement recommendations to address the concerns identified above.

Route C and South Street / Peculiar Drive

To create a more standard intersection configuration and eliminate the skewed approach, Peculiar Drive should be realigned to intersect Route C as indicated on Figure 2. This will result in a perpendicular angle of intersection, and a standard four-leg intersection configuration. The Route C and South street intersection will also be a standard four-leg intersection. Both intersections can operate with stop sign control for eastbound and westbound traffic, with Route C allowed uninterrupted flow.

Figure 2 shows the new Peculiar Drive intersection to be at the location of the existing fire station driveway on the west side of Route C. It may be advantageous to shift the intersection farther south so the future west leg of the intersection could provide access to the undeveloped land on the west side of the road. If that is the case, the fire station driveway should be reconfigured to access that new road instead of Route C.

Route C and Center Street / Peculiar Drive

At Center Street the skewed Peculiar Drive approach should be removed as indicated on Figure 3. This will result in a standard four-leg intersection configuration at Center Street, with stop sign control for eastbound and westbound traffic. The existing curved segment of Peculiar Drive between North Street and Route C should be converted to parking lots and alleys to provide parking and access to adjacent businesses. The Peculiar Drive approach to the intersection with North Street and W. 1st Street should also be eliminated. This will also result in a standard four-leg intersection at North Street and W. 1st Street, with stop sign control for northbound and southbound traffic. After these modifications, two-way traffic flow should be considered on Center Street and W. 1st Street.

Route C and North Street

Eliminating the curved segment of Peculiar Drive will increase traffic on the west leg of the North Street intersection with Route C.

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TranSystems	SHORT TERM IMPROVEMENTS	Route C Road Segment Analysis Peculiar, Missouri	JUNE 2015 No Scale	Figure 2

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TranSystems	SHORT TERM IMPROVEMENTS	Route C Road Segment Analysis Peculiar, Missouri	JUNE 2015 No Scale	Figure 3

To provide additional capacity for the increased traffic volume, eastbound and westbound left-turn lanes should be constructed on North Street. These turn lanes will allow the right-turn traffic to bypass the queues of left-turning vehicles during peak times.

Route C and Schug Avenue

The concepts presented in the 2004 study to the east of Main Street have been adopted by the Peculiar Board of Alderman, and are reflected Figure 3. These concepts include realigning Schug Avenue to the existing driveway on the south side of Route C, constructing left-turn lanes on Route C at Schug Avenue, eliminating the Legend Drive intersection with Route C, and providing cross-access through the parcels on the south side of Route C to connect to Legend Drive. The addition of turn lanes on Route C will considerably reduce the potential for rear-end crashes and decrease congestion in this area.

To assess operations along Route C with the short term improvements, traffic volumes were redistributed, as shown in the Appendix (Figure A-5). These volumes include the adjustment for the new interchange at 211th Street and I-49. Synchro analysis was performed, and the average delay per vehicle and the corresponding levels of service during the peak hours are summarized in Table 6. The outputs from the Synchro analysis for the short term improvements are included in Appendix C.

Table 6
Short-Term Improvements Delay and Operations

Intersection / *Movement*	Morning Peak Hour		Afternoon Peak Hour	
	LOS †	Delay *	LOS †	Delay *
Route C and Peculiar Drive				
Westbound	*B*	*11.1*	*A*	*10.0*
Southbound Left-Turn	*A*	*2.6*	*A*	*2.3*
Route C and South Street				
Eastbound	*B*	*12.6*	*B*	*14.4*
Westbound	*B*	*11.5*	*B*	*11.5*
Northbound Left-Turn	*A*	*0.1*	*A*	*0.1*
Southbound Left-Turn	*A*	*0.1*	*A*	*0.4*
Route C and Center Street				
Eastbound	*C*	*16.8*	*C*	*15.5*
Westbound	*B*	*11.6*	*B*	*13.4*
Northbound Left-Turn	*A*	*0.0*	*A*	*0.0*
Southbound Left-Turn	*A*	*0.3*	*A*	*0.1*
Route C and North Street				
Eastbound Left-Turn	*D*	*29.1*	***E***	***42.2***
Eastbound Shared Right-Turn / Through	*B*	*13.4*	*C*	*17.9*
Westbound Left-Turn	*C*	*25.4*	***E***	***39.0***
Westbound Shared Right-Turn / Through	*B*	*13.5*	*C*	*14.5*
Northbound Left-Turn	*A*	*1.6*	*A*	*3.7*
Southbound Left-Turn	*A*	*1.4*	*A*	*1.5*
Route C and Main Street				
Eastbound Left-Turn	*A*	*0.2*	*A*	*0.7*
Southbound Left-Turn	*C*	*17.6*	*C*	*19.5*
Southbound Right-Turn	*A*	*9.6*	*B*	*11.8*
Route C and Schug Avenue				
Eastbound Left-Turn	*A*	*7.8*	*A*	*9.0*
Westbound Left-Turn	*A*	*8.8*	*A*	*8.0*
Northbound	*C*	*16.5*	*C*	*16.9*
Southbound	*B*	*11.9*	*D*	*34.0*

† Level of Service

* Average delay per stopped vehicle measured in seconds

All intersections are projected to operate at acceptable levels of service with the proposed improvements, with the exception of the eastbound and westbound left-turn movements at the Route C and North Street intersection. During the afternoon peak hour these movements are projected to operate at LOS E. This is a slight improvement in the eastbound direction because the left-turn movement at that approach currently operates at LOS F during the afternoon peak hour. Queue lengths are also projected to be less than the existing queues. To further improve the levels of service on the side street approaches, a change in traffic control would be needed; however, the traffic volumes are not projected to satisfy warrants for a traffic signal installation.

Estimated Cost of Short Term Improvements

A preliminary cost estimate was prepared by TranSystems and is summarized in Table 7. A more detailed cost estimate is included in Appendix E.

Table 7
Short Term Improvements Cost Estimate

Item Of Work	Estimated Cost
Mobilization and Staking	$100,000
Earthwork and Removals	$307,000
Paving	$546,000
Miscellaneous	$87,000
Subtotal Construction Costs	$1,040,000
Design Fee	$125,000
Construction Inspection and Testing	$135,000
MoDOT and MARC Fees	$109,000
Total Project Cost*	$1,409,000

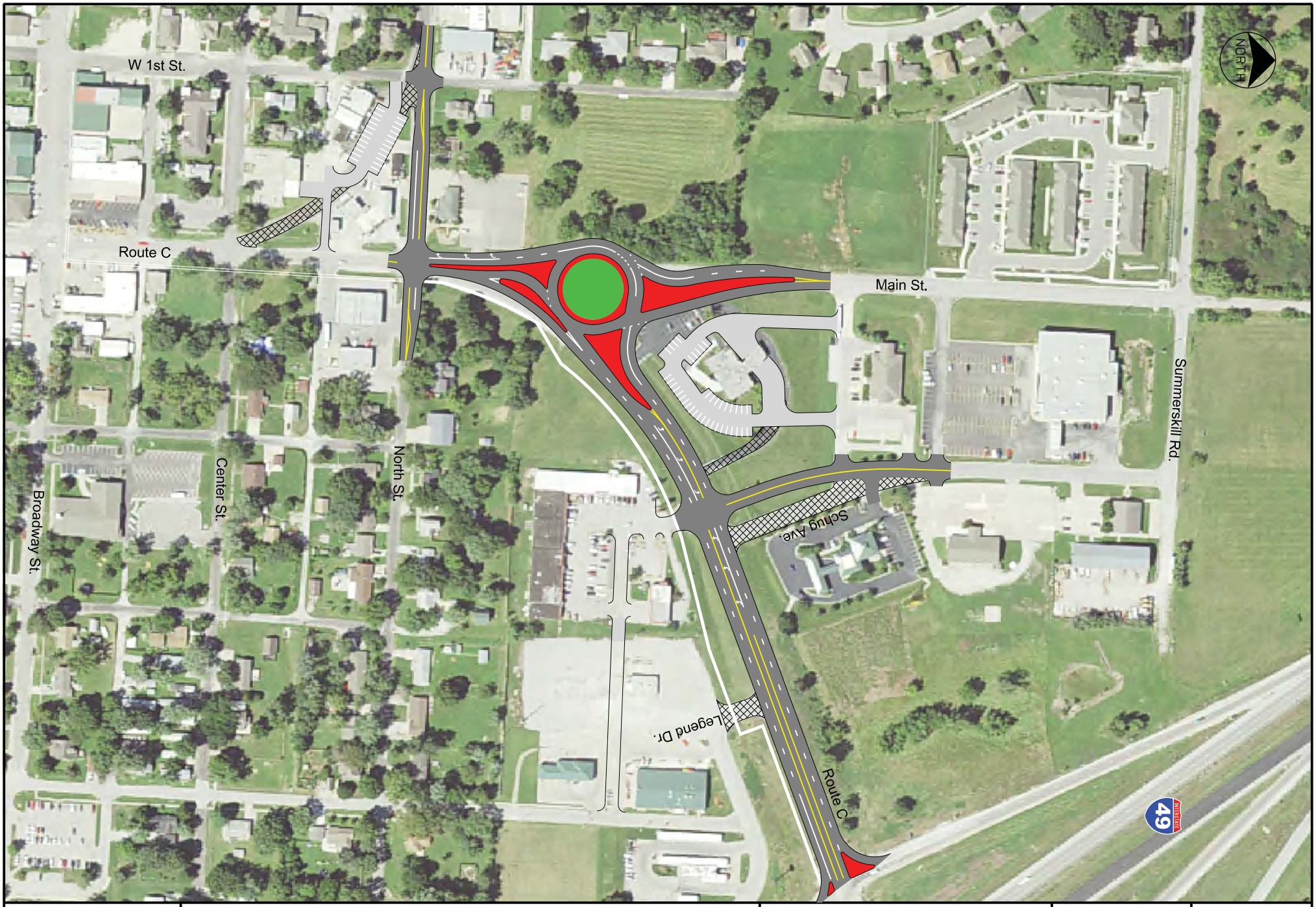
* Project cost does not include any utility relocations or property acquisition

Long Term Improvements

In the future, traffic volumes are projected to significantly increase along the Route C corridor and on Main Street. Long delays are projected for the side street movements at the intersections with North Street, Main Street and Schug Avenue. Traffic control improvements will be needed in order to provide acceptable operations for side street traffic accessing Route C. Traffic volumes at the Route C intersections with North Street and with Schug Avenue are projected to be near the thresholds for traffic signal installation, while the Main Street intersection is projected to exceed thresholds. None of these intersections is considered to be a good candidate for traffic signal installation due to the close spacing of the intersections. As a signalized corridor, there would be a high likelihood for queues to spill back through adjacent intersections during peak times.

Another option to consider is roundabout control. The previous study illustrated a dual lane roundabout that incorporated Route C, Main Street, and the west leg of the North Street intersection. This configuration provided a more direct route for east/west traffic between Route C and North Street/Peculiar Drive. The previously proposed roundabout would require significant property acquisition in the northwest quadrant of the Route C and North Street intersection.

In light of the new interchange at 211th Street, North Street/Peculiar Drive will become a less significant route for traffic to and from the west. Also, traffic to and from the west can access Route C at Main Street via Summerskill Road. Therefore, it is not as necessary to incorporate North Street into the roundabout. A dual lane roundabout at the Route C and Main Street intersection could provide substantial benefit with minor property acquisition. Additional lanes would also be needed on Route C between the dual lane roundabout and the I-49 interchange. A sketch of the roundabout is illustrated on Figure 4.



TranSystems	LONG TERM IMPROVEMENTS	Route C Road Segment Analysis Peculiar, Missouri	JUNE 2015 No Scale	Figure 4

An operational analysis of the long term improvements was performed. Future traffic volumes for the long-term improvements are shown in the Appendix (Figure A-6). The average delay per vehicle and the corresponding levels of service during the peak hours are summarized in Table 8. The outputs from the Synchro analysis for the future conditions are included in Appendix C.

Table 8
Long Term Improvements Delay and Operations

Intersection / *Movement*	Morning Peak Hour		Afternoon Peak Hour	
	LOS †	Delay *	LOS †	Delay *
Route C and Peculiar Drive				
Westbound	*B*	*12.6*	*B*	*11.8*
Southbound Left-Turn	*A*	*2.5*	*A*	*2.6*
Route C and South Street				
Eastbound	*B*	*14.4*	*C*	*22.4*
Westbound	*B*	*13.3*	*C*	*16.4*
Northbound Left-Turn	*A*	*0.1*	*A*	*0.1*
Southbound Left-Turn	*A*	*0.1*	*A*	*0.5*
Route C and Center Street				
Eastbound	*C*	*22.3*	*C*	*21.5*
Westbound	*B*	*14.1*	*D*	*25.8*
Northbound Left-Turn	*A*	*0.0*	*A*	*0.0*
Southbound Left-Turn	*A*	*0.3*	*A*	*0.1*
Route C and North Street				
Eastbound Left-Turn	***F***	***>100***	***F***	***>100***
Eastbound Shared Right-Turn / Through	*C*	*17.3*	***E***	***42.5***
Westbound Left-Turn	***E***	***40.6***	***F***	***>100***
Westbound Shared Right-Turn / Through	*C*	*18.0*	*D*	*26.3*
Northbound Left-Turn	*A*	*1.8*	*A*	*4.7*
Southbound Left-Turn	*A*	*1.4*	*A*	*1.8*
Route C and Main Street				
Roundabout Northbound	*B*	*13.7*	*A*	*9.6*
Roundabout Westbound	*A*	*4.9*	*A*	*8.2*
Roundabout Southbound	*A*	*5.1*	*A*	*8.3*
Route C and Schug Avenue				
Eastbound Left-Turn	*A*	*8.1*	*B*	*10.2*
Westbound Left-Turn	*A*	*9.3*	*A*	*8.7*
Northbound	*C*	*17.8*	*D*	*25.4*
Southbound	*B*	*12.0*	***F***	***>100***

Each approach to the roundabout is projected to operate at an acceptable LOS. Some lengthy delays are projected for the stop controlled movements from the North Street and the Schug Avenue intersections. As previously mentioned, these intersections are not good candidates for traffic signal installation due to the close spacing of the intersections. Further, it is generally not efficient to mix roundabouts and traffic signals along a corridor. Southbound drivers on Schug Avenue and eastbound drivers on North Street have alternate routes to access Route C via Main Street if delays are unacceptable to drivers.

Conclusion

The above study has focused on potential operational and safety improvements for the segment of Route C between Peculiar Drive and Schug Avenue in Peculiar, Missouri. The study included an assessment of the existing operational and safety conditions and along Route C, and identification of potential improvements to address deficiencies.

Based on the data that were collected, the study segment of Route C is generally operating satisfactorily overall. However, there are some areas of concern, which are summarized below:

- The five-leg intersections create some driver confusion because they are not a standard type of intersection. The skew angle of the Peculiar Drive approaches makes it difficult for drivers to perceive safe crossing gaps, thereby resulting in the potential for higher accident rates.

- A number of rear end crashes have occurred on Route C behind vehicles stopped to turn left at Schug Avenue and at Legend Drive.

- Lengthy delays and long queues form during the peak hours on the eastbound approach of the Route C and North Street intersection.

- Long delays are projected in the future at several side street approaches to the Route C corridor. Improvements are needed to allow for side street traffic to access Route C in the future.

Improvements were identified for two time frames. In the short term, it would be appropriate to eliminate the five-leg intersections with Peculiar Drive and add left-turn lanes at several intersection approaches. The short term improvements are illustrated on Figures 2 and 3. In the long term, traffic volumes are projected to increase, and traffic control improvements will be needed to improve operations for side street traffic accessing Route C. Construction of a dual lane roundabout at the intersection of Route C and Main Street would provide acceptable levels of service at a location that is accessible for many drivers in the western portion of Peculiar.

Appendix A

Existing Peak Hour Traffic Volumes ..... Figure A-1

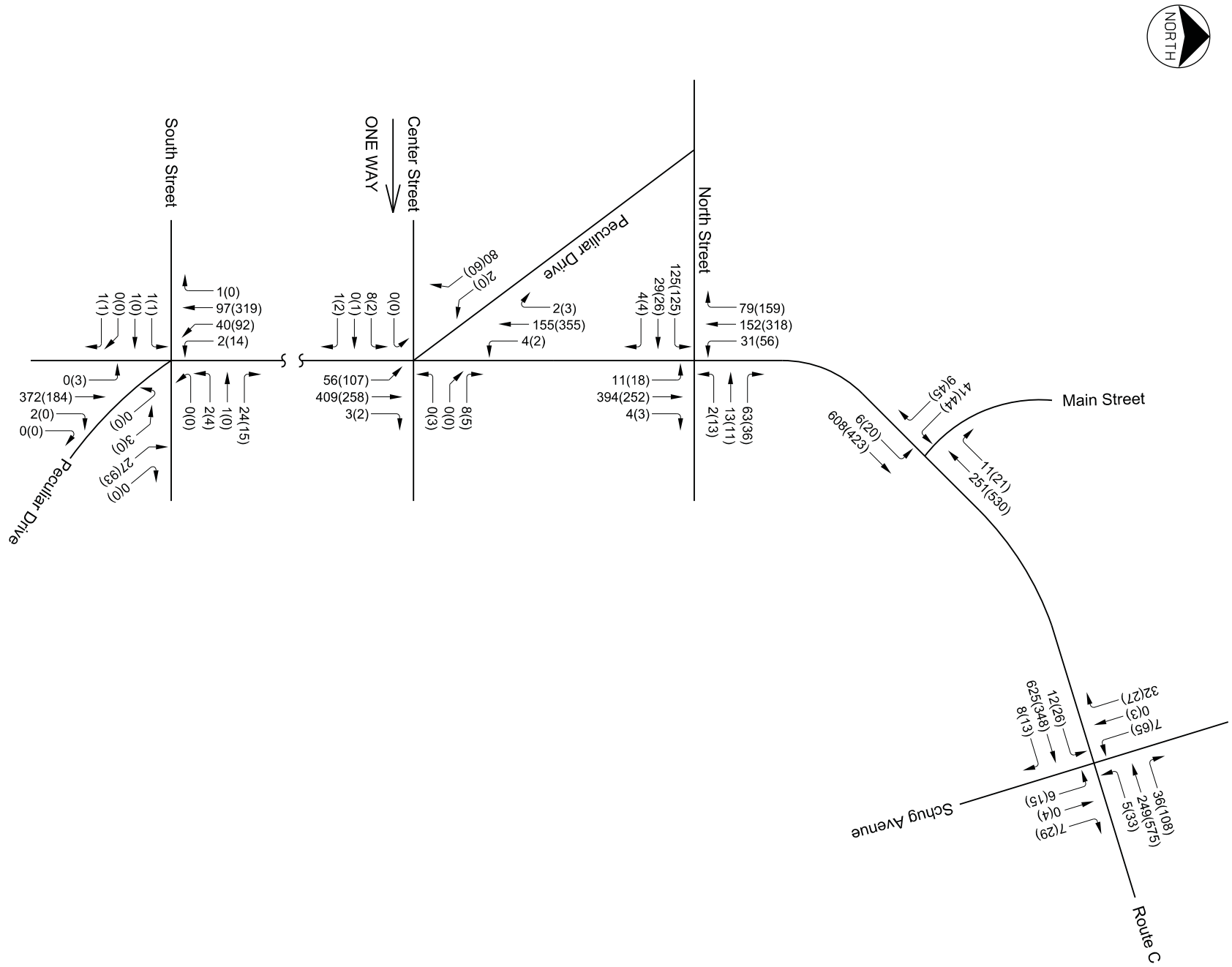
Future Development Areas ..... Figure A-2

Future Year 2035 Peak Hour Traffic Volume Projections ..... Figure A-3

Crash Types and Locations ..... Figure A-4

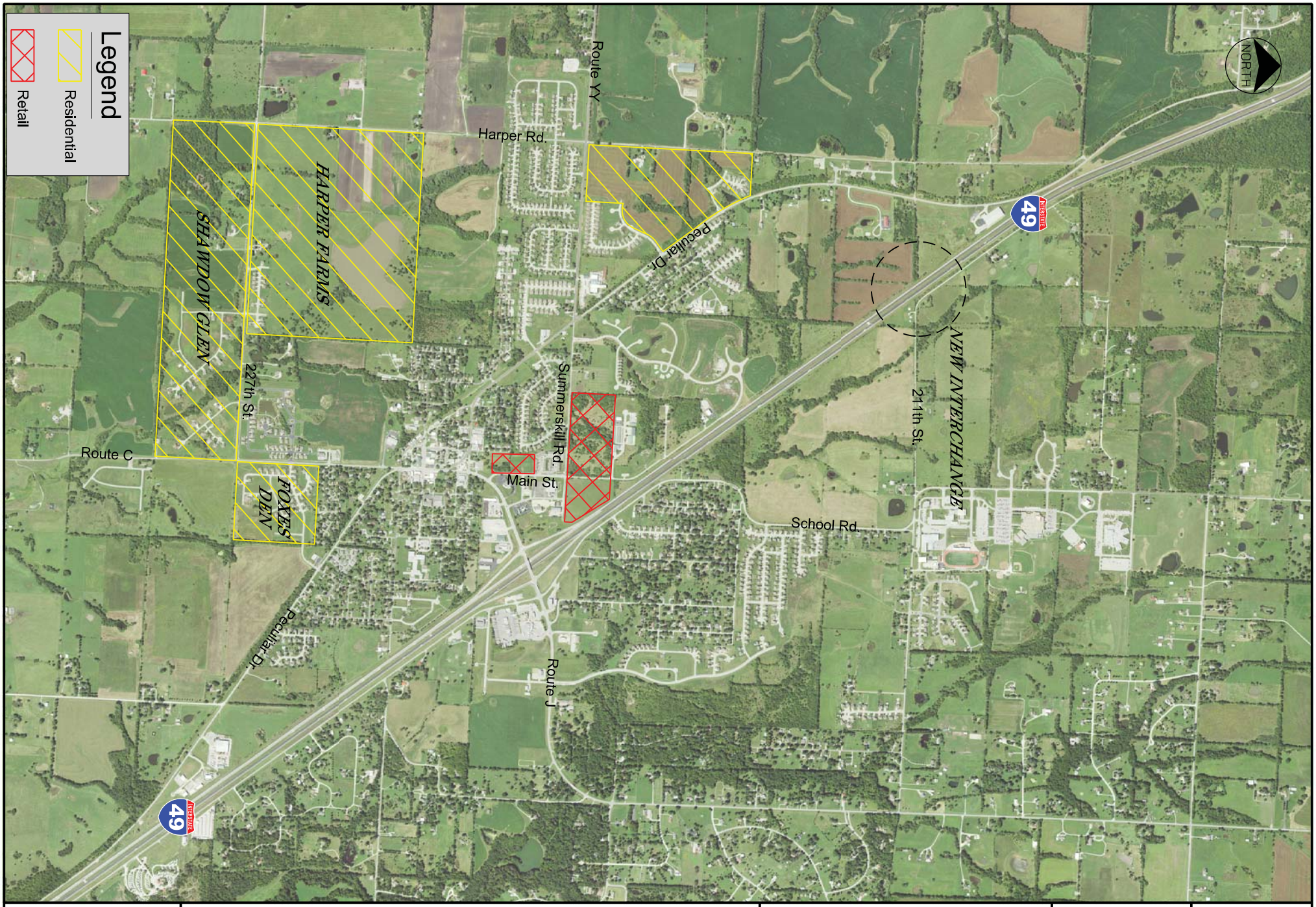
Short Term Improvements Traffic Volume Projections ..... Figure A-5

Long Term Improvements Traffic Volume Projections ..... Figure A-6

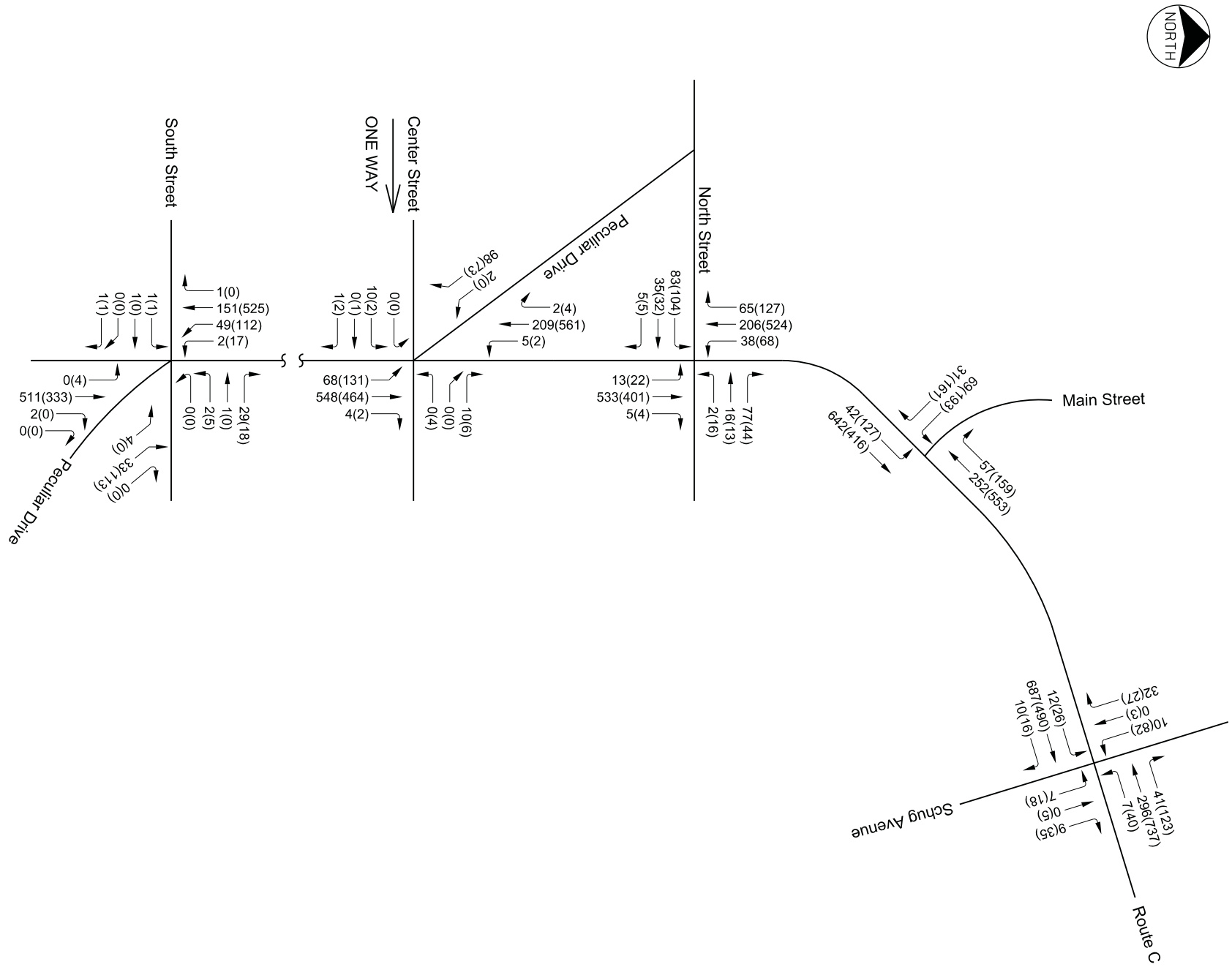


TranSystems	EXISTING PEAK HOUR TRAFFIC VOLUMES	Route C Road Segment Analysis Peculiar, Missouri	JUNE 2015 No Scale	Figure A-1

pw:\\HQ-PWINT01.A-E.TRANSYSCORP.COM:transyscorp-pw1\Documents\Projects\KC101 - Kansas City\P101150072 - Route C TEAP Study\40.0000 - Detailed Design (Specifications, Drawings, Calculations)\44.0000 - CMI\44.1200 - Traffic\Figures_P101150072



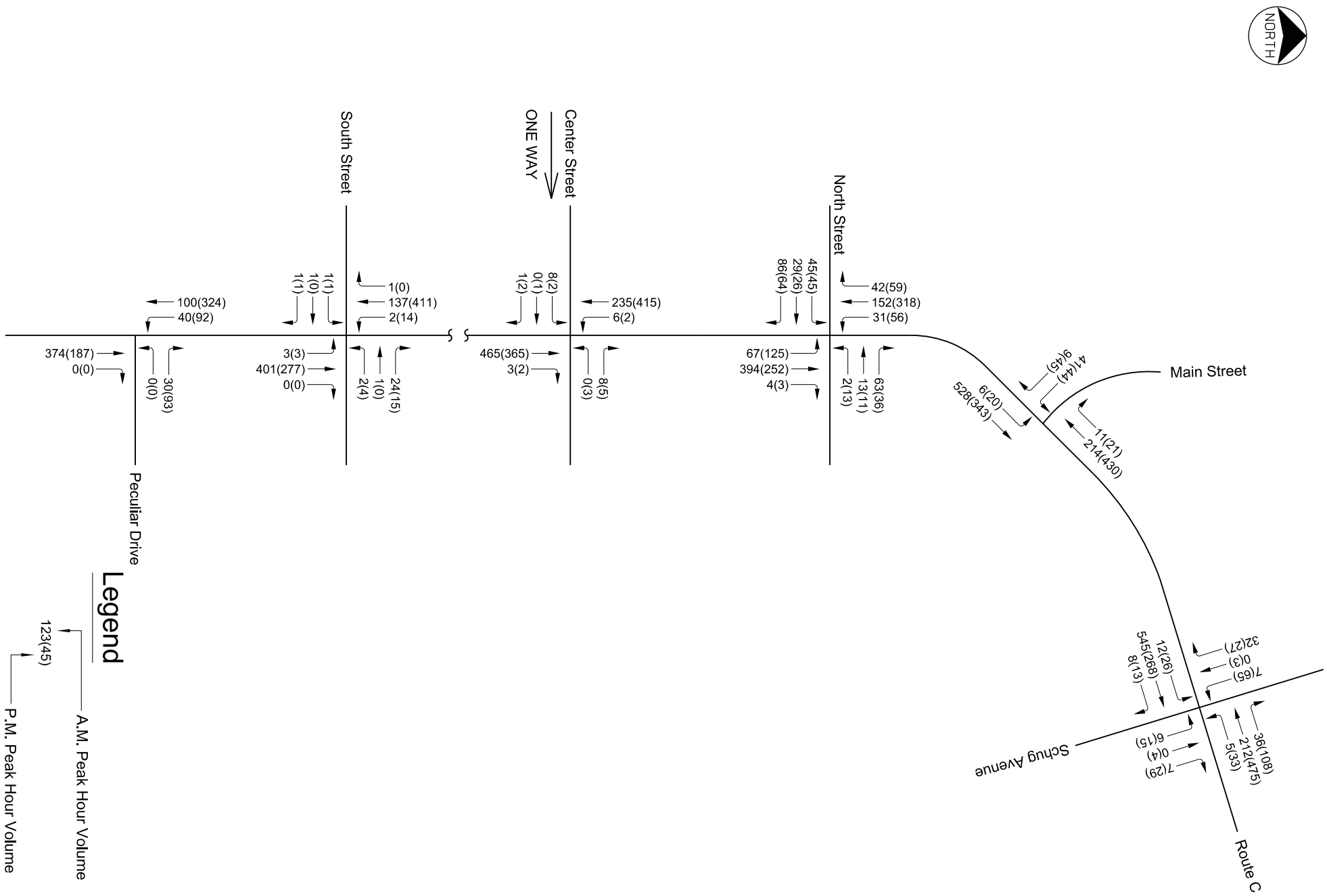
TranSystems	FUTURE DEVELOPMENT AREAS	Route C Road Segment Analysis Peculiar, Missouri	JUNE 2015 No Scale	Figure A-2



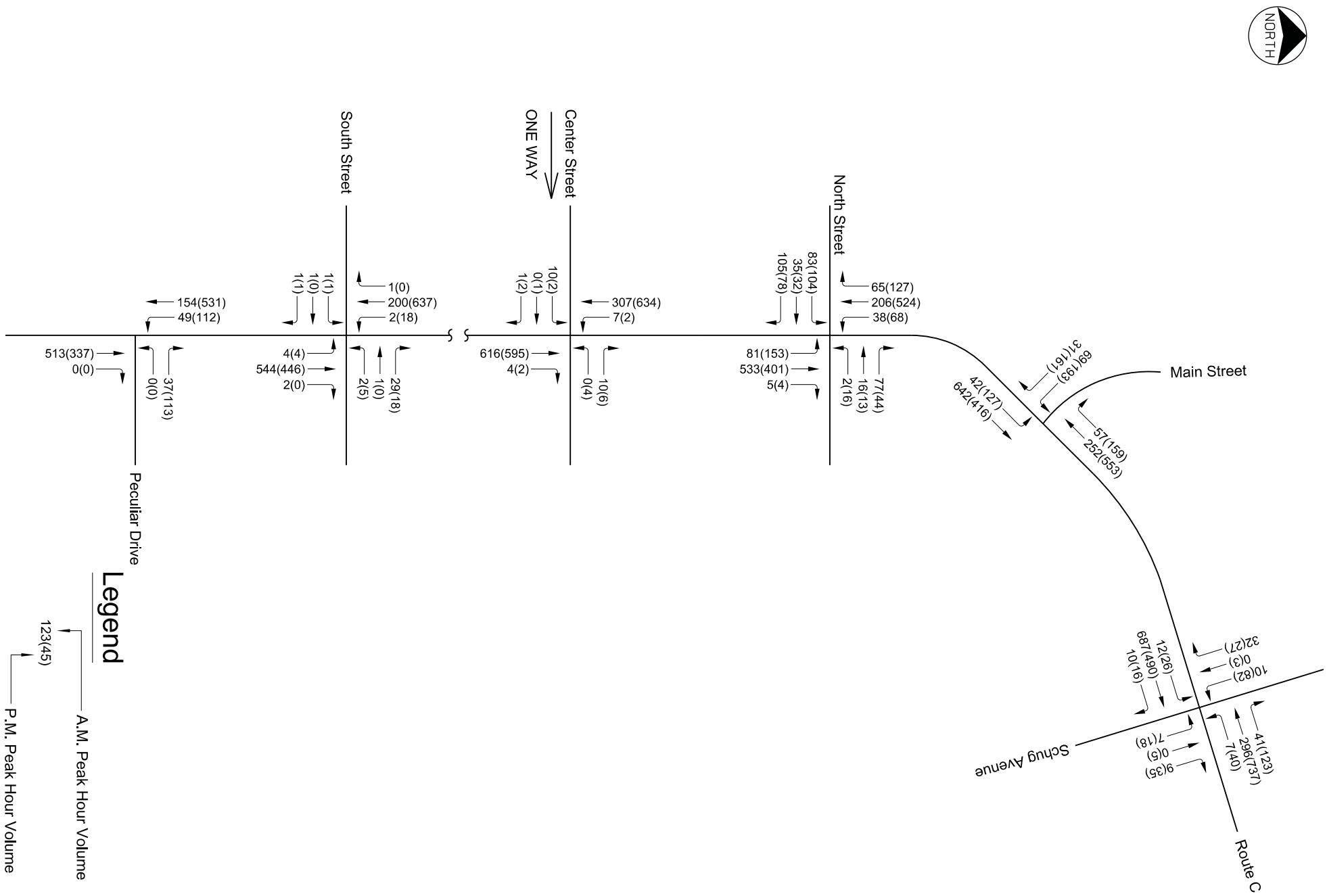
TranSystems	FUTURE YEAR 2035 PEAK HOUR TRAFFIC VOLUMES	Route C Road Segment Analysis Peculiar, Missouri	JUNE 2015 No Scale Figure A-3

pw:\\HQ-PWINT01.A-E.TRANSYSCORP.COM:transyscorp-pw1\Documents\Projects\KC101 - Kansas City\P101150072 - Route C TEAP Study\40.0000 - Detailed Design (Specifications, Drawings, Calculations)\44.0000 - CMM\44.1200 - Traffic\Figures_P101150072

TranSystems	CRASH LOCATIONS	Route C Road Segment Analysis Peculiar, Missouri	JUNE 2015 No Scale	Figure A-4



TranSystems	SHORT TERM IMPROVEMENTS PEAK HOUR TRAFFIC VOLUMES	Route C Road Segment Analysis Peculiar, Missouri	JUNE 2015 No Scale	Figure A-5



TranSystems	LONG TERM IMPROVEMENTS PEAK HOUR TRAFFIC VOLUMES	Route C Road Segment Analysis Peculiar, Missouri	JUNE 2015 No Scale	Figure A-6

Appendix B

Trip Generation and Distribution Reports

See Attached Worksheets

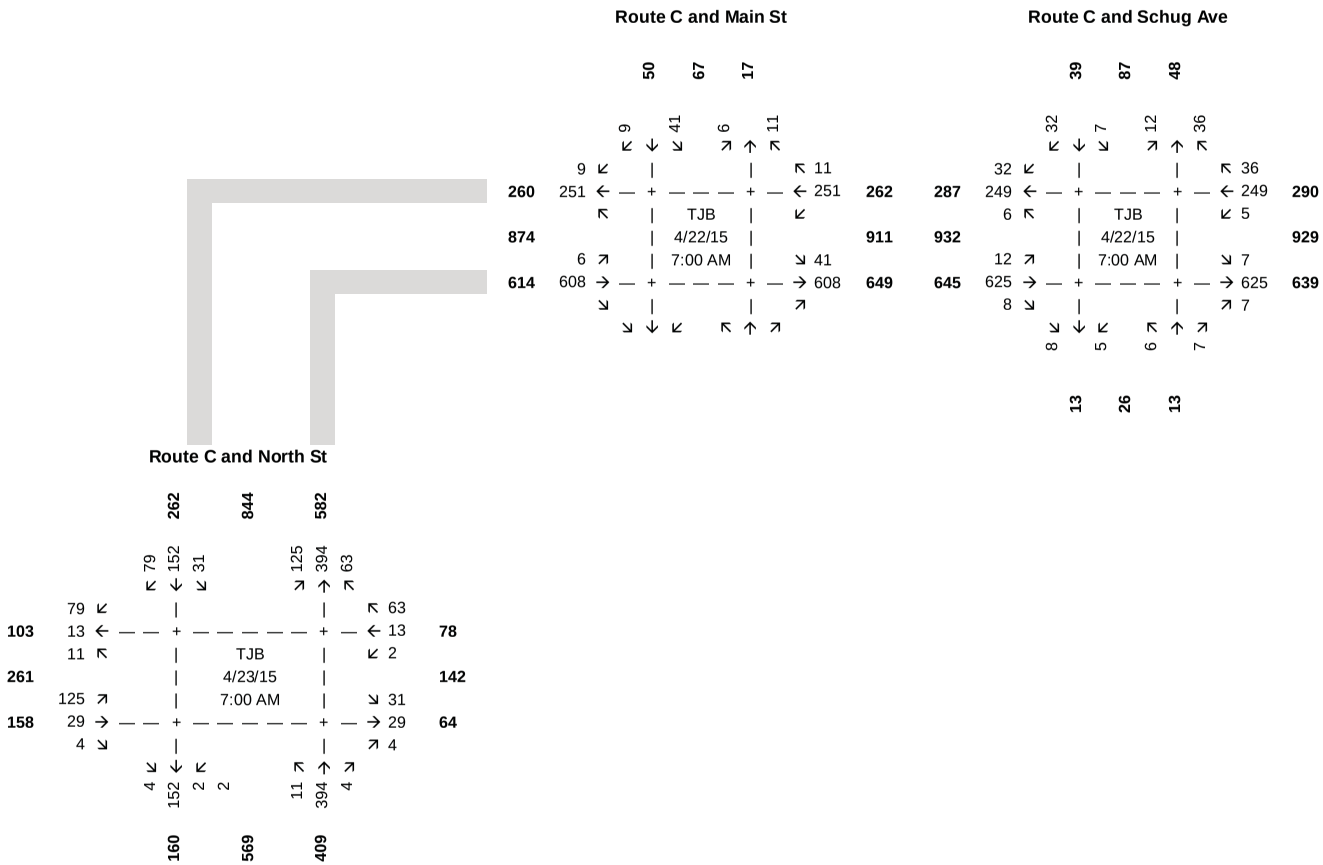
Route C
Peculiar, MO
Trip Generation

Land Use	Intensity	ITE Code	Daily	A.M. Peak Hour					P.M. Peak Hour				
				Total	% In	% Out	In	Out	Total	% In	% Out	In	Out
Proposed Development													
Single-Family Detached Housing (Shadow Gle	80 du	210	855	66	25%	75%	17	50	86	63%	37%	54	32
Single-Family Detached Housing (Fox's Den)	60 du	210	656	52	25%	75%	13	39	66	63%	37%	42	24
Single-Family Detached Housing (Harper Farm	250 du	210	2,440	185	25%	75%	46	139	240	63%	37%	151	89
	Residential Subtotal		***3,951***	***303***			***76***	***227***	***392***			***247***	***145***
Shopping Center (North)	110,000 sf	820	7,225	165	62%	38%	102	63	639	48%	52%	307	332
	Retail Subtotal		***7,225***	***165***			***102***	***63***	***639***			***307***	***332***
		Total	***11,176***	***468***			***178***	***290***	***1,031***			***554***	***477***

Notes ~ Estimates based on ITE's Trip Generation, 9th Edition

Route C Teap Study
Peculiar, MO

Existing Conditions
A.M. Peak Hour

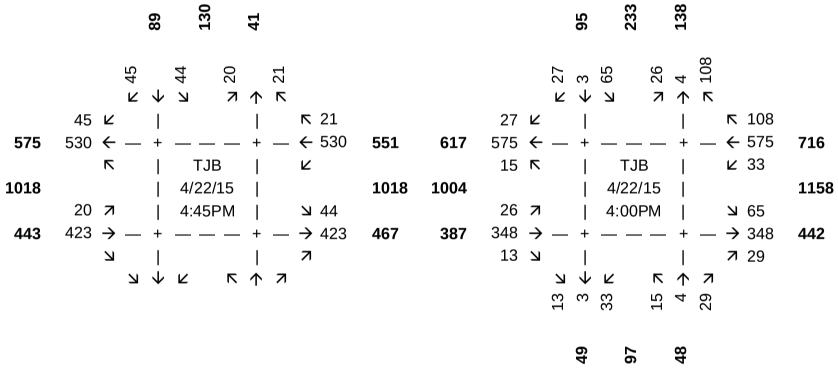


Route C Teap Study
Peculiar, MO

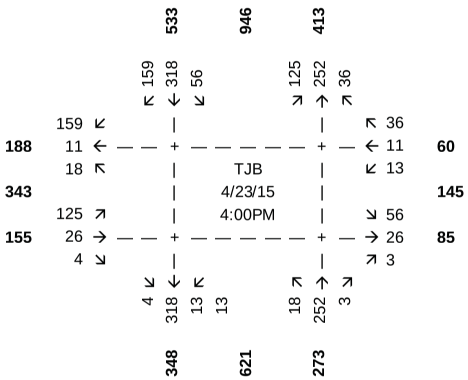
Existing Conditions
P.M. Peak Hour

Route C and Main St

Route C and Schug Ave



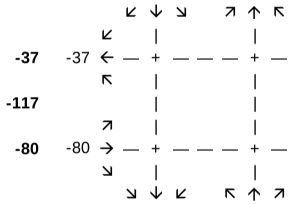
Route C and North St



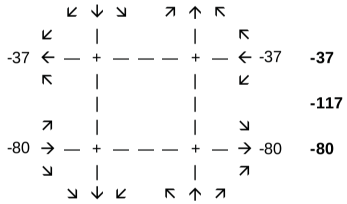
Route C Teap Study
Peculiar, MO

Diversion of Existing Traffic for 211th Street Interchange
A.M. Peak Hour

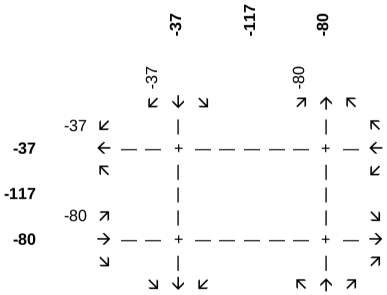
Route C and Main St



Route C and Schug Ave



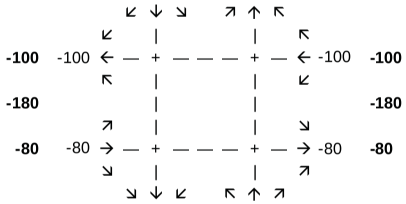
Route C and North St



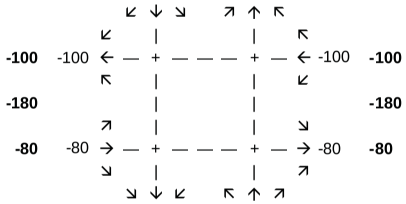
Route C Teap Study
Peculiar, MO

Diversion of Existing Traffic for 211th Street Interchange
P.M. Peak Hour

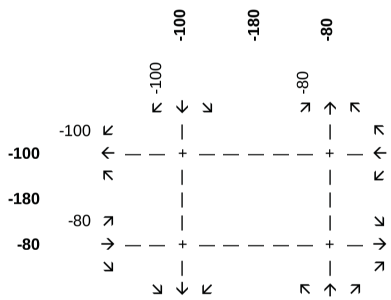
Route C and Main St



Route C and Schug Ave

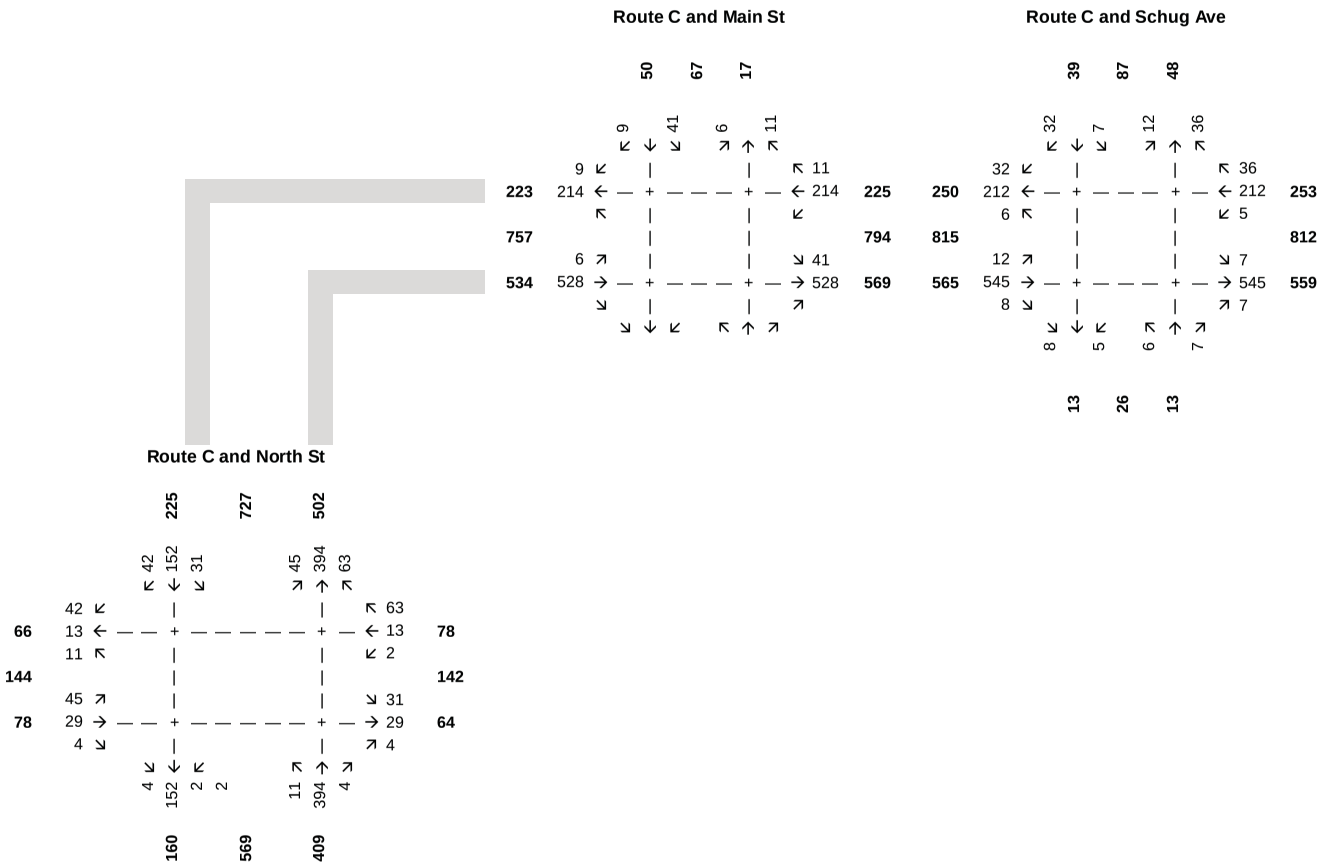


Route C and North St



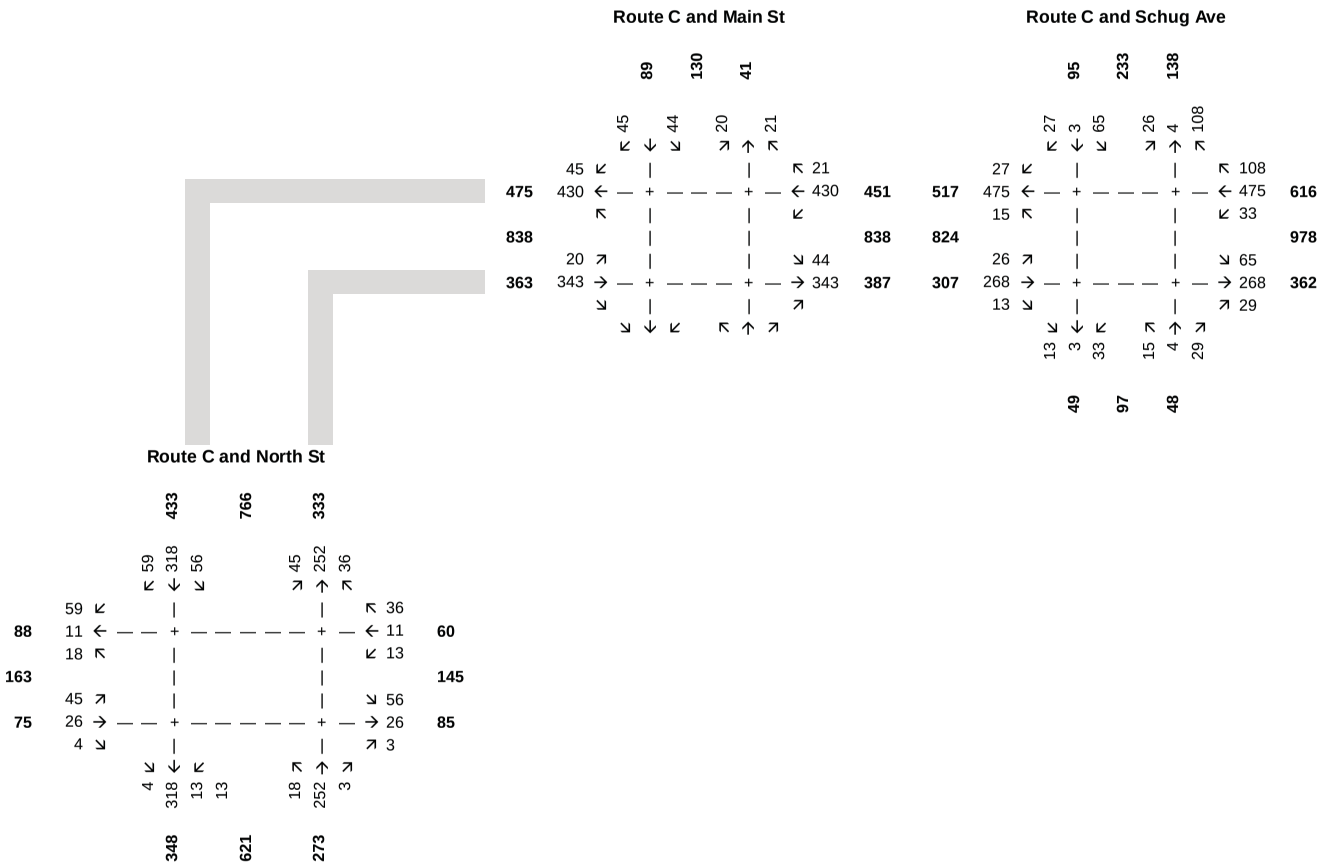
Route C Teap Study
Peculiar, MO

Existing Traffic Volumes with Diversion for 211th Street Interchange
A.M. Peak Hour



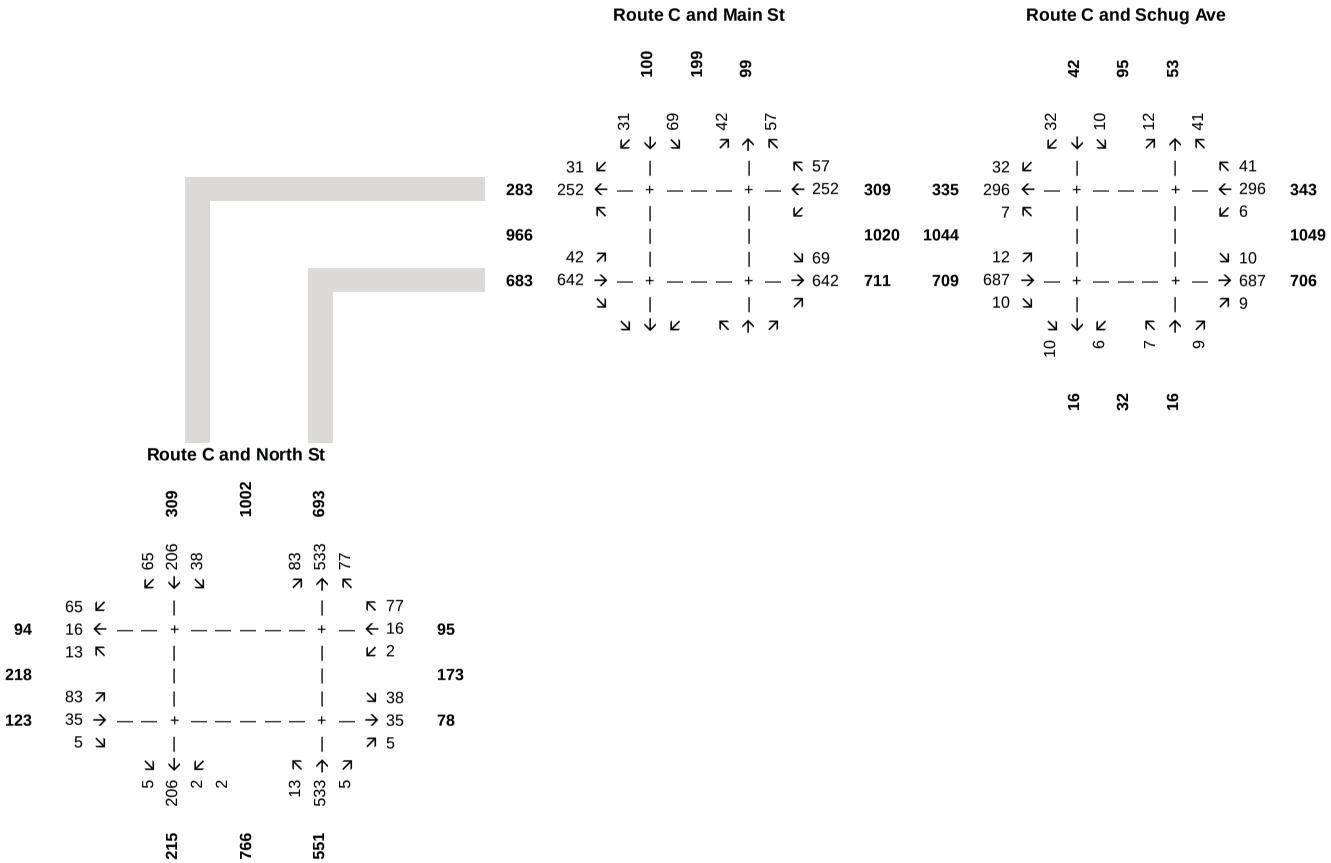
Route C Teap Study
Peculiar, MO

Existing Traffic Volumes with Diversion for 211th Street Interchange
P.M. Peak Hour



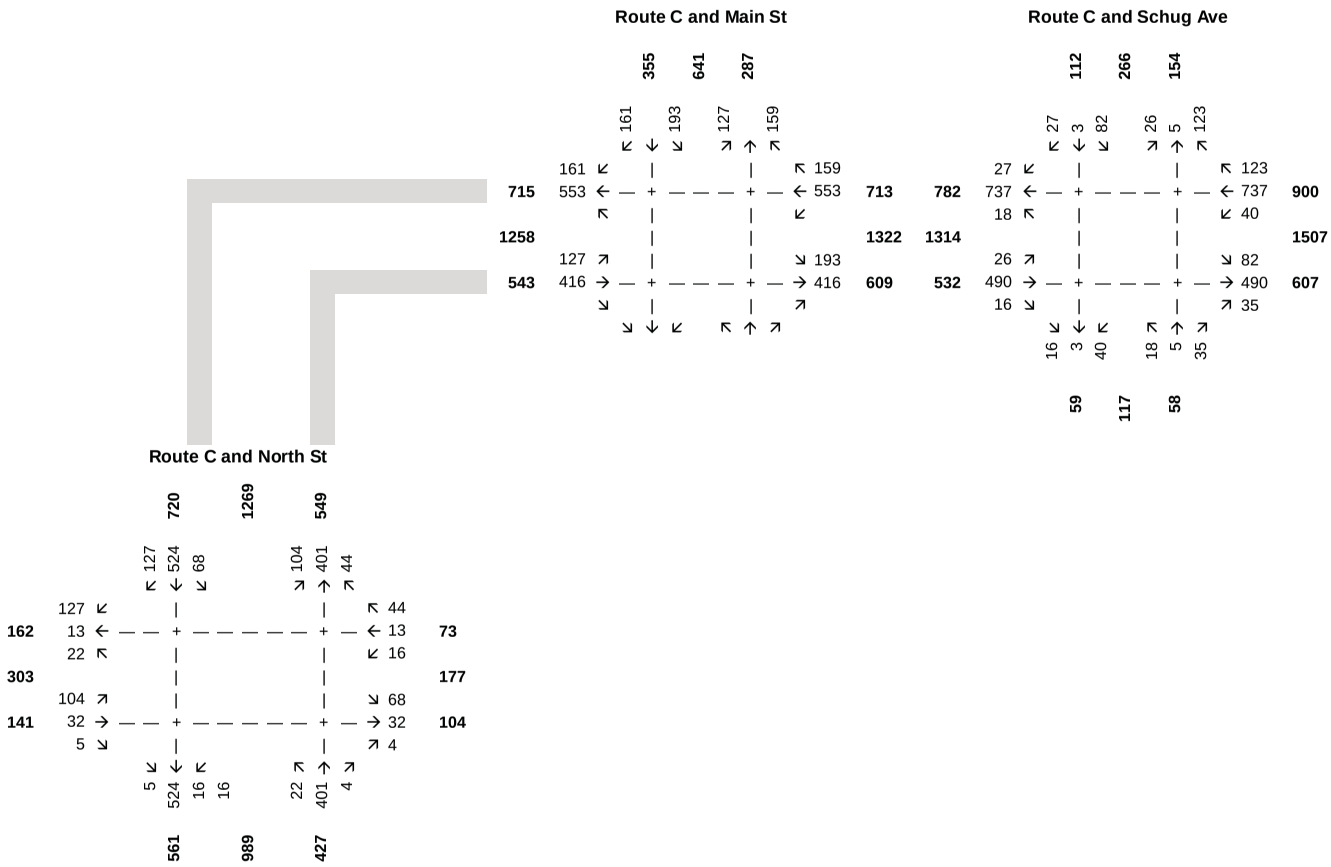
Route C Teap Study
Peculiar, MO

Future Traffic Volume
A.M. Peak Hour



Route C Teap Study
Peculiar, MO

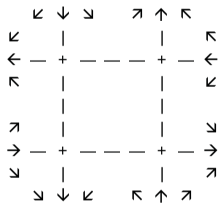
Future Traffic Volume
P.M. Peak Hour



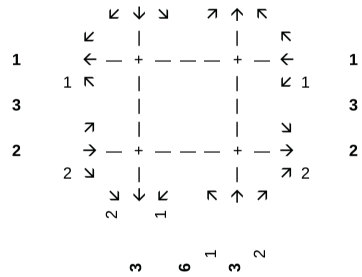
Route C Teap Study
Peculiar, MO

Future Background Growth
A.M. Peak Hour

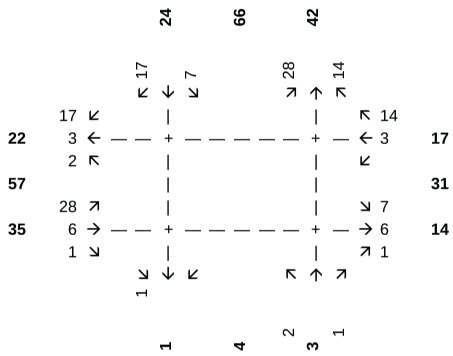
Route C and Main St



Route C and Schug Ave

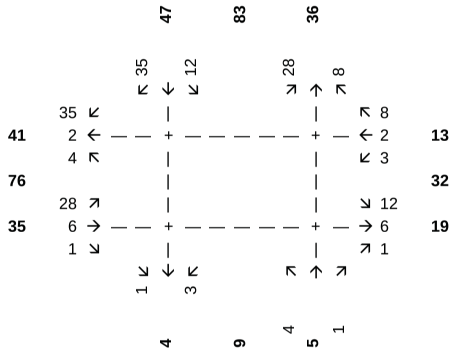


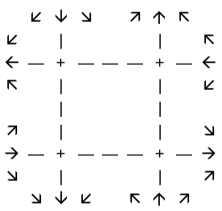
Route C and North St

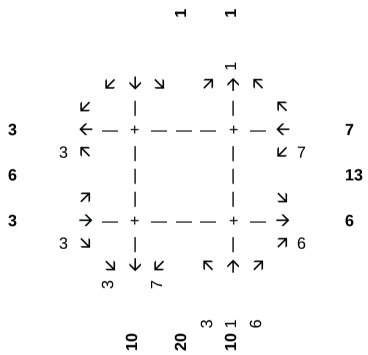


Route C Teap Study
Peculiar, MO

Future Background Growth
P.M. Peak Hour

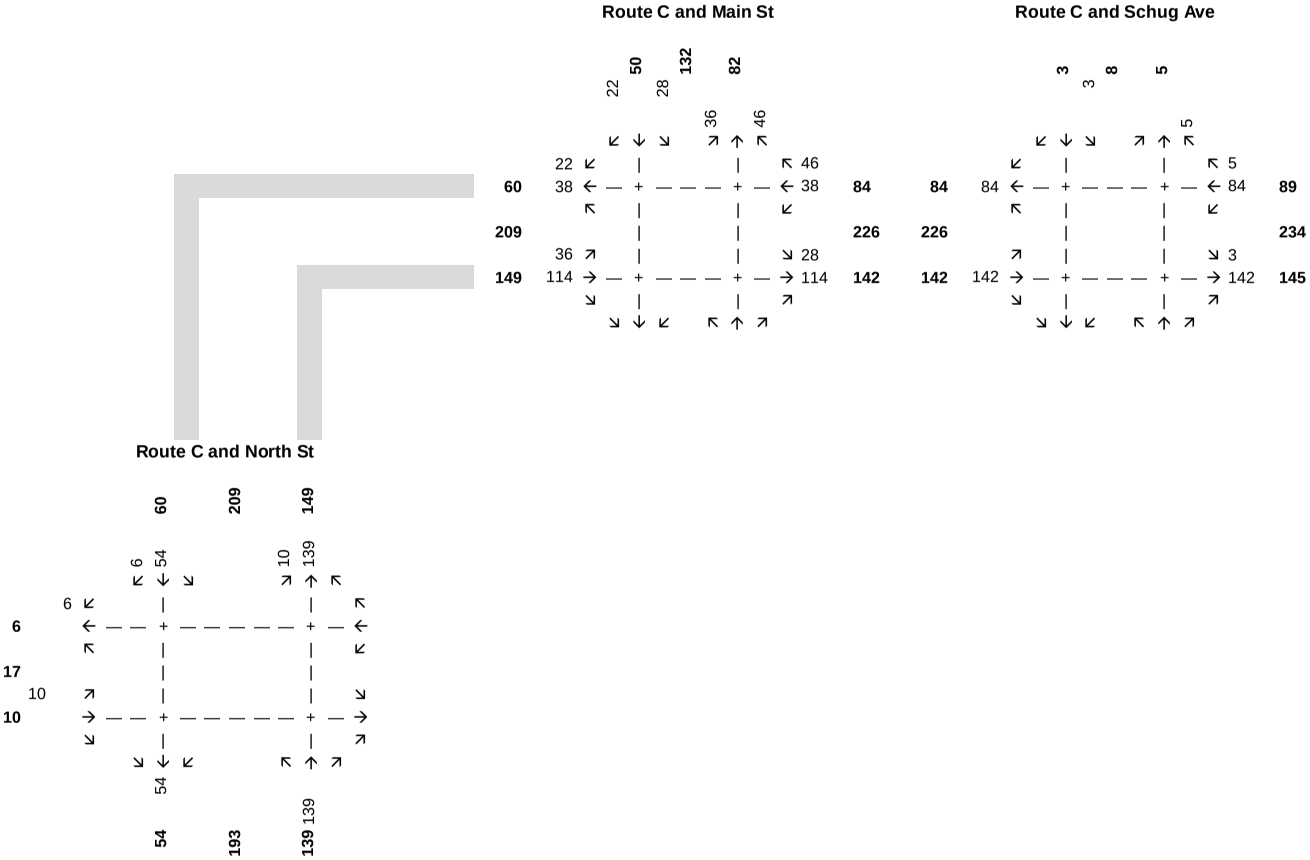






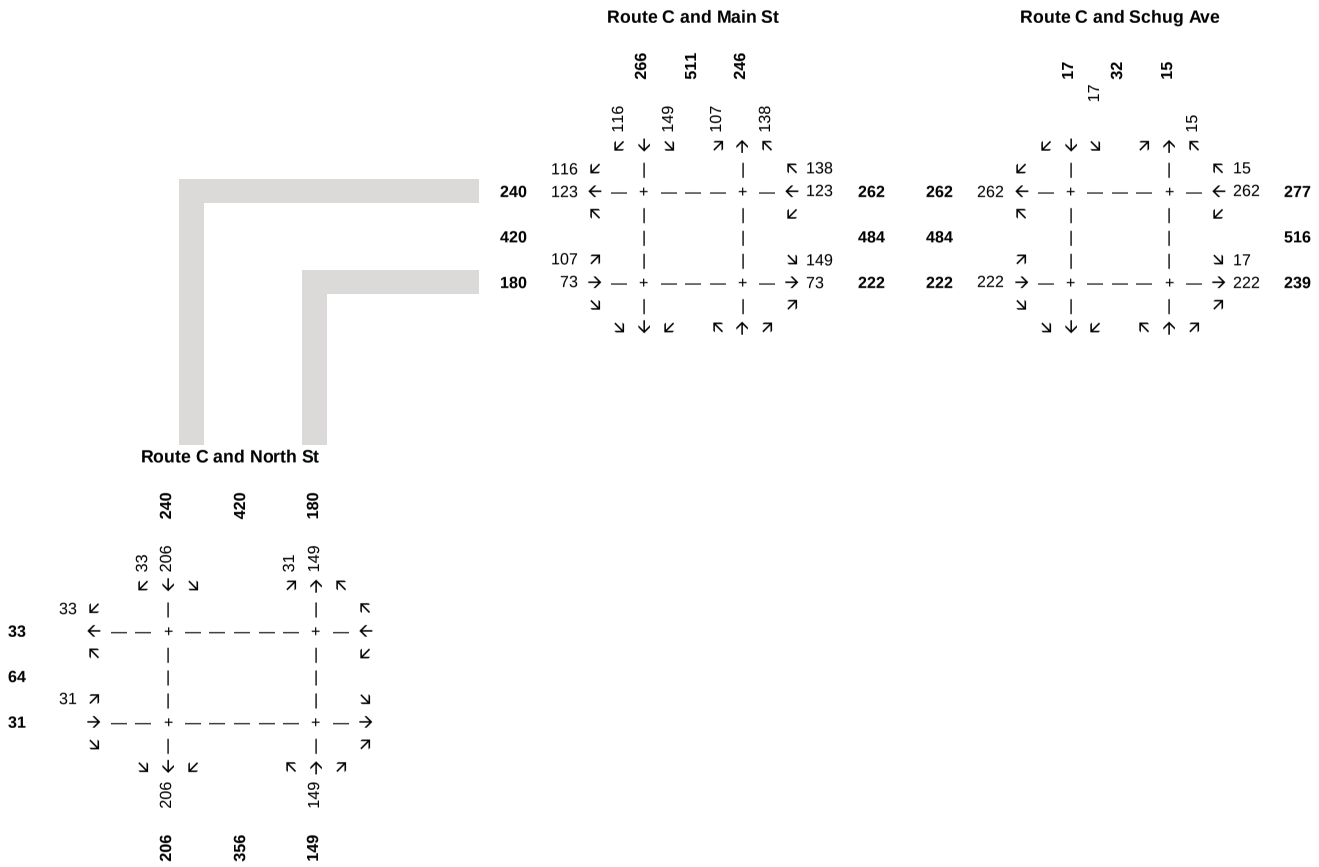
Route C Teap Study
Peculiar, MO

Future Development Trips
A.M. Peak Hour



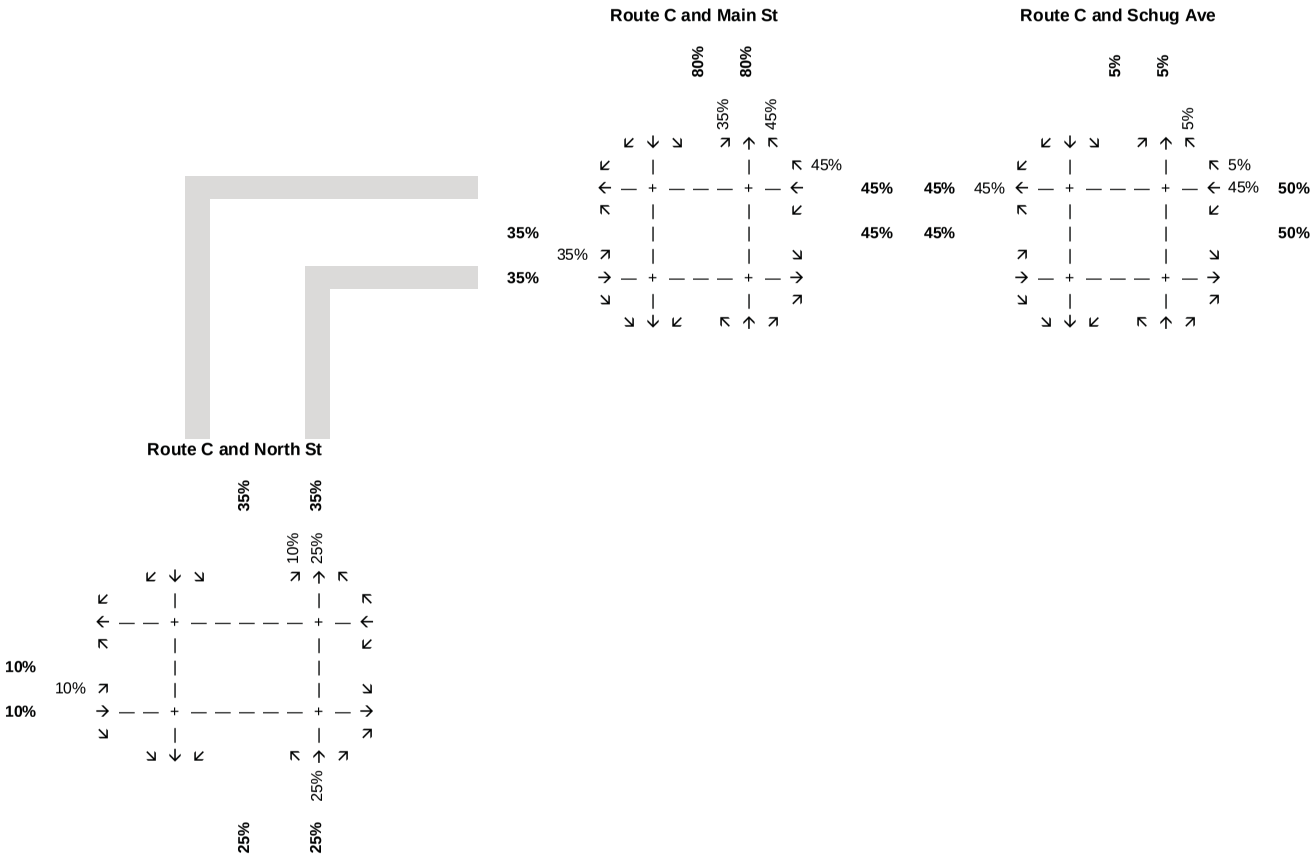
Route C Teap Study
Peculiar, MO

Future Development Trips
P.M. Peak Hour



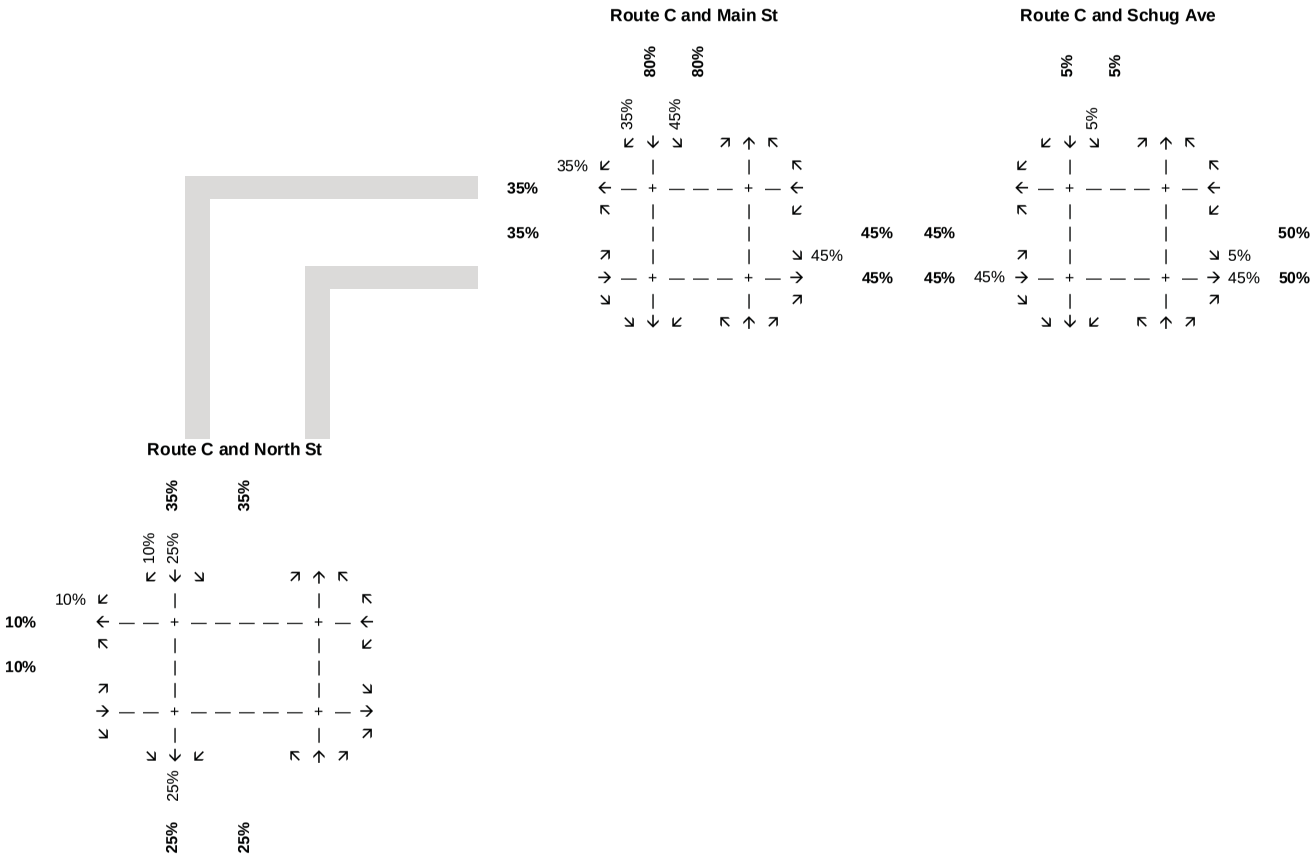
Route C Teap Study
Peculiar, MO

Trip Distribution
INBOUND - Retail



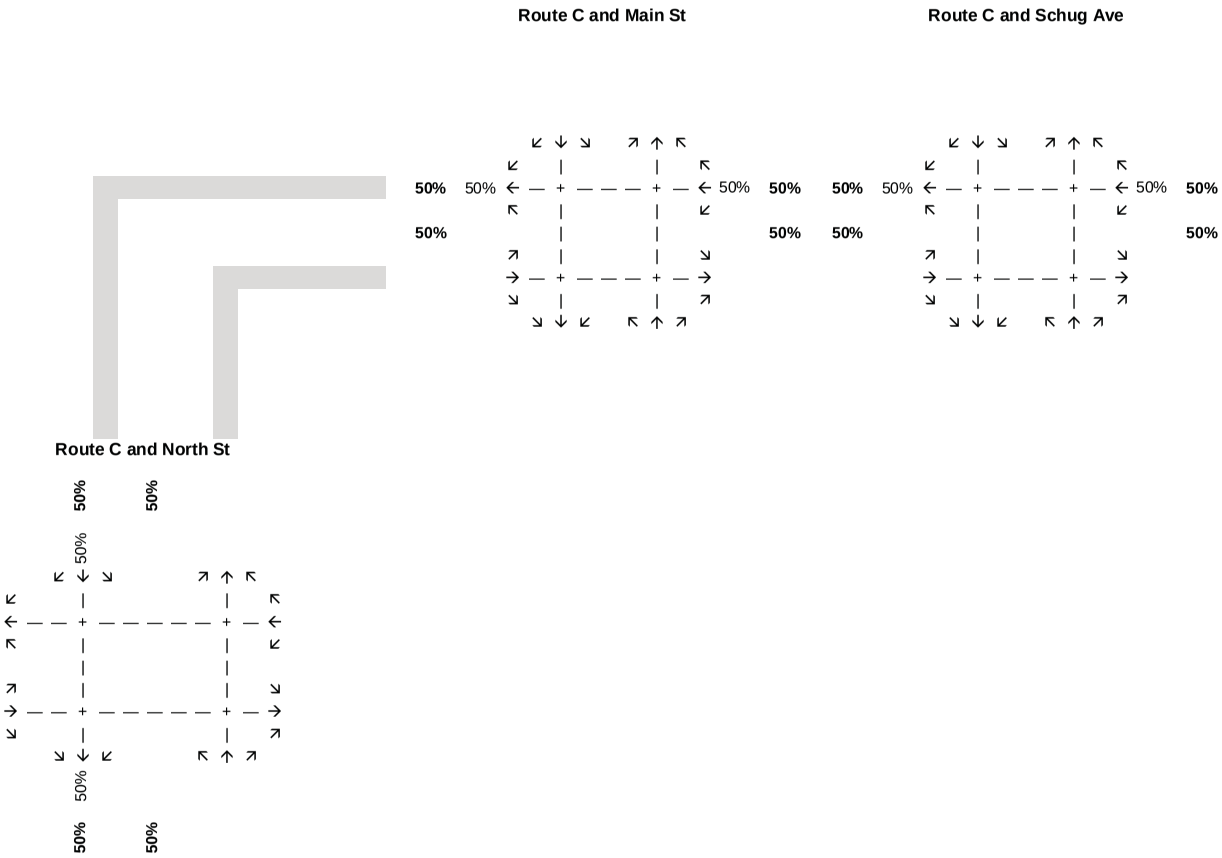
Route C Teap Study
Peculiar, MO

Trip Distribution
OUTBOUND - Retail



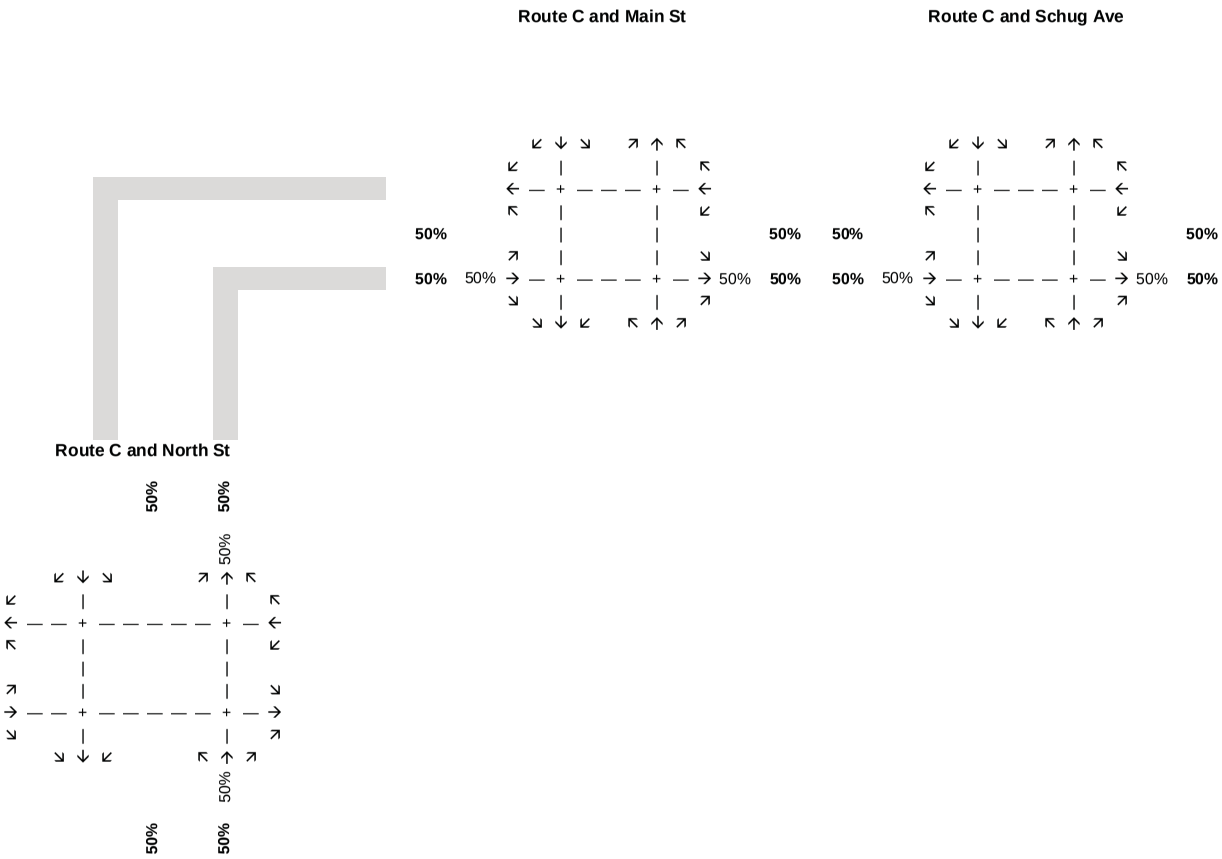
Route C Teap Study
Peculiar, MO

Trip Distribution
INBOUND - Residential



Route C Teap Study
Peculiar, MO

Trip Distribution
OUTBOUND - Residental



Appendix C

Capacity Analysis Reports

See Attached Reports

HCM Unsignalized Intersection Capacity Analysis
1: Schug Avenue & Route C

AM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	625	8	5	249	36	6	0	7	7	0	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	694	9	6	277	40	7	0	8	8	0	36
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	317			703			1069	1053	699	1041	1038	297
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	317			703			1069	1053	699	1041	1038	297
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	100	98	96	100	95
cM capacity (veh/h)	1243			894			187	222	440	202	227	743

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	717	322	14	43
Volume Left	13	6	7	8
Volume Right	9	40	8	36
cSH	1243	894	271	501
Volume to Capacity	0.01	0.01	0.05	0.09
Queue Length 95th (ft)	1	0	4	7
Control Delay (s)	0.3	0.2	19.0	12.9
Lane LOS	A	A	C	B
Approach Delay (s)	0.3	0.2	19.0	12.9
Approach LOS			C	B

Intersection Summary				
Average Delay		1.0		
Intersection Capacity Utilization		49.8%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
2: Route C & Main Street

AM Peak Hour
Existing Conditions

Movement	EBL2	EBL	SBL	SBR	SWR	SWR2
Lane Configurations						
Volume (veh/h)	6	608	41	9	251	11
Sign Control		Free	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	676	46	10	279	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None			None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	291		974	285		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	291		974	285		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	99		84	99		
cM capacity (veh/h)	1271		278	754		

Direction, Lane #	EB 1	SB 1	SB 2	SW 1
Volume Total	682	46	10	291
Volume Left	7	46	0	0
Volume Right	0	0	10	12
cSH	1271	278	754	1700
Volume to Capacity	0.01	0.16	0.01	0.17
Queue Length 95th (ft)	0	14	1	0
Control Delay (s)	0.1	20.5	9.8	0.0
Lane LOS	A	C	A	
Approach Delay (s)	0.1	18.6		0.0
Approach LOS		C		

Intersection Summary				
Average Delay		1.1		
Intersection Capacity Utilization		44.0%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
3: Route C & North Street

AM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	125	29	4	2	13	63	11	394	4	31	152	79
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	139	32	4	2	14	70	12	438	4	34	169	88
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	823	748	213	767	790	440	257			442		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	823	748	213	767	790	440	257			442		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	43	90	99	99	95	89	99			97		
cM capacity (veh/h)	242	327	827	285	310	617	1308			1118		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	176	87	454	291
Volume Left	139	2	12	34
Volume Right	4	70	4	88
cSH	259	516	1308	1118
Volume to Capacity	0.68	0.17	0.01	0.03
Queue Length 95th (ft)	110	15	1	2
Control Delay (s)	43.7	13.4	0.3	1.3
Lane LOS	E	B	A	A
Approach Delay (s)	43.7	13.4	0.3	1.3
Approach LOS	E	B		

Intersection Summary				
Average Delay		9.3		
Intersection Capacity Utilization	50.7%	ICU Level of Service	A	
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
4: Route C & Center Street

AM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	0	81	0	0	8	56	409	3	4	155	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	0	90	0	0	9	62	454	3	4	172	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	772	764	173	853	764	456	174			458		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	772	764	173	853	764	456	174			458		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	90	100	100	99	96			100		
cM capacity (veh/h)	301	317	870	241	318	604	1402			1103		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	99	9	520	179
Volume Left	9	0	62	4
Volume Right	90	9	3	2
cSH	744	604	1402	1103
Volume to Capacity	0.13	0.01	0.04	0.00
Queue Length 95th (ft)	11	1	3	0
Control Delay (s)	10.6	11.0	1.3	0.2
Lane LOS	B	B	A	A
Approach Delay (s)	10.6	11.0	1.3	0.2
Approach LOS	B	B		

Intersection Summary				
Average Delay		2.3		
Intersection Capacity Utilization	55.4%	ICU Level of Service	B	
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
5: Route C & South Street

AM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	1	1	5	1	51	3	572	2	42	97	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	1	1	6	1	57	3	636	2	47	108	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	902	846	108	847	846	637	109			638		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	902	846	108	847	846	637	109			638		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	98	100	88	100			95		
cM capacity (veh/h)	218	284	945	270	284	477	1482			946		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	3	63	641	156
Volume Left	1	6	3	47
Volume Right	1	57	2	1
cSH	327	442	1482	946
Volume to Capacity	0.01	0.14	0.00	0.05
Queue Length 95th (ft)	1	12	0	4
Control Delay (s)	16.1	14.5	0.1	3.0
Lane LOS	C	B	A	A
Approach Delay (s)	16.1	14.5	0.1	3.0
Approach LOS	C	B		

Intersection Summary				
Average Delay		1.7		
Intersection Capacity Utilization	48.6%	ICU Level of Service	A	
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
1: Schug Avenue & Route C

PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	26	348	13	33	575	108	15	4	29	65	3	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	29	387	14	37	639	120	17	4	32	72	3	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	759			401			1256	1284	394	1258	1231	699
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	759			401			1256	1284	394	1258	1231	699
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			87	97	95	45	98	93
cM capacity (veh/h)	853			1158			129	154	655	131	166	440

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	430	796	53	106
Volume Left	29	37	17	72
Volume Right	14	120	32	30
cSH	853	1158	258	165
Volume to Capacity	0.03	0.03	0.21	0.64
Queue Length 95th (ft)	3	2	19	90
Control Delay (s)	1.0	0.8	22.6	59.5
Lane LOS	A	A	C	F
Approach Delay (s)	1.0	0.8	22.6	59.5
Approach LOS			C	F

Intersection Summary				
Average Delay		6.2		
Intersection Capacity Utilization	63.7%	ICU Level of Service	B	
Analysis Period (min)		15		

Movement	EBL2	EBL	SBL	SBR	SWR	SWR2
Lane Configurations						
Volume (veh/h)	20	423	44	45	530	21
Sign Control		Free	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	470	49	50	589	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None			None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	612		1115	601		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	612		1115	601		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	98		78	90		
cM capacity (veh/h)	967		225	501		

Direction, Lane #	EB 1	SB 1	SB 2	SW 1
Volume Total	492	49	50	612
Volume Left	22	49	0	0
Volume Right	0	0	50	23
cSH	967	225	501	1700
Volume to Capacity	0.02	0.22	0.10	0.36
Queue Length 95th (ft)	2	20	8	0
Control Delay (s)	0.7	25.4	13.0	0.0
Lane LOS	A	D	B	
Approach Delay (s)	0.7	19.1		0.0
Approach LOS		C		

Intersection Summary				
Average Delay		1.8		
Intersection Capacity Utilization		44.1%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	125	26	4	13	11	36	18	252	3	56	318	159
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	139	29	4	14	12	40	20	280	3	62	353	177
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	934	889	442	907	976	282	530			283		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	934	889	442	907	976	282	530			283		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	35	89	99	93	95	95	98			95		
cM capacity (veh/h)	212	263	616	222	234	757	1037			1279		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	172	67	303	592
Volume Left	139	14	20	62
Volume Right	4	40	3	177
cSH	223	392	1037	1279
Volume to Capacity	0.77	0.17	0.02	0.05
Queue Length 95th (ft)	136	15	1	4
Control Delay (s)	60.4	16.1	0.7	1.3
Lane LOS	F	C	A	A
Approach Delay (s)	60.4	16.1	0.7	1.3
Approach LOS	F	C		

Intersection Summary				
Average Delay		11.0		
Intersection Capacity Utilization		65.8%	ICU Level of Service	C
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
4: Route C & Center Street

PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	1	60	3	0	5	107	258	2	2	355	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	1	67	3	0	6	119	287	2	2	394	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	932	927	396	993	928	288	398			289		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	932	927	396	993	928	288	398			289		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	90	98	100	99	90			100		
cM capacity (veh/h)	226	240	653	185	240	751	1161			1273		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	70	9	408	400
Volume Left	2	3	119	2
Volume Right	67	6	2	3
cSH	601	349	1161	1273
Volume to Capacity	0.12	0.03	0.10	0.00
Queue Length 95th (ft)	10	2	9	0
Control Delay (s)	11.8	15.6	3.2	0.1
Lane LOS	B	C	A	A
Approach Delay (s)	11.8	15.6	3.2	0.1
Approach LOS	B	C		

Intersection Summary				
Average Delay		2.6		
Intersection Capacity Utilization	52.5%	ICU Level of Service	A	
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
5: Route C & South Street

PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	0	1	4	0	108	3	184	0	106	319	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	1	4	0	120	3	204	0	118	354	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	921	801	354	802	801	204	354			204		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	921	801	354	802	801	204	354			204		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	98	100	86	100			91		
cM capacity (veh/h)	200	289	689	281	289	836	1204			1367		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	124	208	472
Volume Left	1	4	3	118
Volume Right	1	120	0	0
cSH	311	781	1204	1367
Volume to Capacity	0.01	0.16	0.00	0.09
Queue Length 95th (ft)	1	14	0	7
Control Delay (s)	16.7	10.5	0.2	2.6
Lane LOS	C	B	A	A
Approach Delay (s)	16.7	10.5	0.2	2.6
Approach LOS	C	B		

Intersection Summary				
Average Delay		3.2		
Intersection Capacity Utilization	49.4%	ICU Level of Service	A	
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
1: Schug Avenue & Route C

PM Peak Hour
Future Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	687	10	7	296	41	7	0	9	10	0	32
Future Volume (Veh/h)	12	687	10	7	296	41	7	0	9	10	0	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	763	11	8	329	46	8	0	10	11	0	36
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	375			774			1198	1186	768	1172	1168	352
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	375			774			1198	1186	768	1172	1168	352
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	100	98	93	100	95
cM capacity (veh/h)	1183			842			151	185	401	162	189	692

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	787	383	18	47
Volume Left	13	8	8	11
Volume Right	11	46	10	36
cSH	1183	842	232	392
Volume to Capacity	0.01	0.01	0.08	0.12
Queue Length 95th (ft)	1	1	6	10
Control Delay (s)	0.3	0.3	21.9	15.4
Lane LOS	A	A	C	C
Approach Delay (s)	0.3	0.3	21.9	15.4
Approach LOS			C	C

Intersection Summary				
Average Delay		1.2		
Intersection Capacity Utilization		52.8%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
2: Route C & Main Street

PM Peak Hour
Future Conditions

Movement	EBL2	EBL	SBL	SBR	SWR	SWR2
Lane Configurations						
Traffic Volume (veh/h)	42	642	69	31	57	252
Future Volume (Veh/h)	42	642	69	31	57	252
Sign Control		Free	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	47	713	77	34	63	280
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None			None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	343		1010	203		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	343		1010	203		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	96		70	96		
cM capacity (veh/h)	1216		256	838		

Direction, Lane #	EB 1	SB 1	SB 2	SW 1
Volume Total	760	77	34	343
Volume Left	47	77	0	0
Volume Right	0	0	34	280
cSH	1216	256	838	1700
Volume to Capacity	0.04	0.30	0.04	0.20
Queue Length 95th (ft)	3	31	3	0
Control Delay (s)	1.0	25.0	9.5	0.0
Lane LOS	A	D	A	
Approach Delay (s)	1.0	20.3		0.0
Approach LOS		C		

Intersection Summary				
Average Delay		2.5		
Intersection Capacity Utilization		48.4%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
3: Route C & North Street

PM Peak Hour
Future Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	35	5	2	16	77	13	533	5	38	206	65
Future Volume (Veh/h)	83	35	5	2	16	77	13	533	5	38	206	65
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	92	39	6	2	18	86	14	592	6	42	229	72
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1067	975	265	998	1008	595	301			598		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1067	975	265	998	1008	595	301			598		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	38	84	99	99	92	83	99			96		
cM capacity (veh/h)	149	238	774	186	228	504	1260			979		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	137	106	612	343
Volume Left	92	2	14	42
Volume Right	6	86	6	72
cSH	174	407	1260	979
Volume to Capacity	0.79	0.26	0.01	0.04
Queue Length 95th (ft)	131	26	1	3
Control Delay (s)	76.0	16.9	0.3	1.5
Lane LOS	F	C	A	A
Approach Delay (s)	76.0	16.9	0.3	1.5
Approach LOS	F	C		

Intersection Summary				
Average Delay			10.8	
Intersection Capacity Utilization			55.1%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
4: Route C & Center Street

PM Peak Hour
Future Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	2	99	0	0	10	68	548	4	5	209	2
Future Volume (Veh/h)	10	2	99	0	0	10	68	548	4	5	209	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	2	110	0	0	11	76	609	4	6	232	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1019	1010	233	1119	1009	611	234			613		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1019	1010	233	1119	1009	611	234			613		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	99	86	100	100	98	94			99		
cM capacity (veh/h)	200	225	806	150	225	494	1333			966		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	123	11	689	240
Volume Left	11	0	76	6
Volume Right	110	11	4	2
cSH	614	494	1333	966
Volume to Capacity	0.20	0.02	0.06	0.01
Queue Length 95th (ft)	19	2	5	0
Control Delay (s)	12.3	12.5	1.5	0.3
Lane LOS	B	B	A	A
Approach Delay (s)	12.3	12.5	1.5	0.3
Approach LOS	B	B		

Intersection Summary				
Average Delay			2.6	
Intersection Capacity Utilization			67.7%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
5: Route C & South Street

PM Peak Hour
Future Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	2	5	62	0	511	2	51	151	1
Future Volume (Veh/h)	1	1	1	2	5	62	0	511	2	51	151	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	1	1	2	6	69	0	568	2	57	168	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	924	852	168	853	852	569	169			570		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	924	852	168	853	852	569	169			570		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	98	87	100			94		
cM capacity (veh/h)	204	280	876	266	280	522	1409			1002		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	3	77	570	226
Volume Left	1	2	0	57
Volume Right	1	69	2	1
cSH	312	478	1409	1002
Volume to Capacity	0.01	0.16	0.00	0.06
Queue Length 95th (ft)	1	14	0	5
Control Delay (s)	16.6	14.0	0.0	2.6
Lane LOS	C	B		A
Approach Delay (s)	16.6	14.0	0.0	2.6
Approach LOS	C	B		

Intersection Summary				
Average Delay			2.0	
Intersection Capacity Utilization			52.1%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1: Schug Avenue & Route C

PM Peak Hour
Future Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	490	16	40	737	123	18	5	35	82	3	27
Future Volume (Veh/h)	26	490	16	40	737	123	18	5	35	82	3	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	29	544	18	44	819	137	20	6	39	91	3	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	956			562			1618	1655	553	1628	1596	888
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	956			562			1618	1655	553	1628	1596	888
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			96			71	93	93	0	97	91
cM capacity (veh/h)	719			1009			69	90	533	67	98	343

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	591	1000	65	124
Volume Left	29	44	20	91
Volume Right	18	137	39	30
cSH	719	1009	152	84
Volume to Capacity	0.04	0.04	0.43	1.47
Queue Length 95th (ft)	3	3	48	243
Control Delay (s)	1.1	1.2	45.4	351.7
Lane LOS	A	A	E	F
Approach Delay (s)	1.1	1.2	45.4	351.7
Approach LOS			E	F

Intersection Summary				
Average Delay			27.2	
Intersection Capacity Utilization			79.8%	ICU Level of Service
Analysis Period (min)			15	

Movement	EBL2	EBL	SBL	SBR	SWR	SWR2
Lane Configurations						
Traffic Volume (veh/h)	127	416	193	161	553	159
Future Volume (Veh/h)	127	416	193	161	553	159
Sign Control		Free	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	141	462	214	179	614	177
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None			None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	791		1446	702		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	791		1446	702		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	83		0	59		
cM capacity (veh/h)	829		120	438		

Direction, Lane #	EB 1	SB 1	SB 2	SW 1
Volume Total	603	214	179	791
Volume Left	141	214	0	0
Volume Right	0	0	179	177
cSH	829	120	438	1700
Volume to Capacity	0.17	1.78	0.41	0.47
Queue Length 95th (ft)	15	414	49	0
Control Delay (s)	4.2	444.2	18.8	0.0
Lane LOS	A	F	C	
Approach Delay (s)	4.2	250.4		0.0
Approach LOS		F		

Intersection Summary				
Average Delay		56.5		
Intersection Capacity Utilization		60.7%	ICU Level of Service	B
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	32	5	16	13	44	22	401	4	68	524	127
Future Volume (Veh/h)	104	32	5	16	13	44	22	401	4	68	524	127
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	116	36	6	18	14	49	24	446	4	76	582	141
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1356	1302	652	1324	1371	448	723			450		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1356	1302	652	1324	1371	448	723			450		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	75	99	82	89	92	97			93		
cM capacity (veh/h)	99	146	468	99	132	611	879			1110		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	158	81	474	799
Volume Left	116	18	24	76
Volume Right	6	49	4	141
cSH	111	220	879	1110
Volume to Capacity	1.43	0.37	0.03	0.07
Queue Length 95th (ft)	280	40	2	6
Control Delay (s)	308.2	30.6	0.8	1.7
Lane LOS	F	D	A	A
Approach Delay (s)	308.2	30.6	0.8	1.7
Approach LOS	F	D		

Intersection Summary				
Average Delay		35.0		
Intersection Capacity Utilization		80.5%	ICU Level of Service	D
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
4: Route C & Center Street

PM Peak Hour
Future Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	2	75	4	0	6	131	464	2	2	561	4
Future Volume (Veh/h)	2	2	75	4	0	6	131	464	2	2	561	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	2	83	4	0	7	146	516	2	2	623	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1445	1439	625	1522	1440	517	627			518		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1445	1439	625	1522	1440	517	627			518		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	83	94	100	99	85			100		
cM capacity (veh/h)	95	112	485	70	112	558	955			1048		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	87	11	664	629
Volume Left	2	4	146	2
Volume Right	83	7	2	4
cSH	414	158	955	1048
Volume to Capacity	0.21	0.07	0.15	0.00
Queue Length 95th (ft)	20	6	13	0
Control Delay (s)	16.0	29.6	3.7	0.1
Lane LOS	C	D	A	A
Approach Delay (s)	16.0	29.6	3.7	0.1
Approach LOS	C	D		

Intersection Summary				
Average Delay			3.0	
Intersection Capacity Utilization			76.5%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
5: Route C & South Street

PM Peak Hour
Future Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	1	5	0	131	4	333	0	129	525	0
Future Volume (Veh/h)	1	0	1	5	0	131	4	333	0	129	525	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	1	6	0	146	4	370	0	143	583	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1393	1247	583	1248	1247	370	583			370		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1393	1247	583	1248	1247	370	583			370		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	96	100	78	100			88		
cM capacity (veh/h)	85	152	512	136	152	676	991			1189		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	152	374	726
Volume Left	1	6	4	143
Volume Right	1	146	0	0
cSH	145	584	991	1189
Volume to Capacity	0.01	0.26	0.00	0.12
Queue Length 95th (ft)	1	26	0	10
Control Delay (s)	30.2	13.3	0.1	2.9
Lane LOS	D	B	A	A
Approach Delay (s)	30.2	13.3	0.1	2.9
Approach LOS	D	B		

Intersection Summary				
Average Delay			3.4	
Intersection Capacity Utilization			70.9%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
1: Schug Avenue & Route C

AM Peak Hour
Existing Conditions Short-Term

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	545	8	5	212	36	6	0	7	7	0	32
Future Volume (Veh/h)	12	545	8	5	212	36	6	0	7	7	0	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	606	9	6	236	40	7	0	8	8	0	36
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	276			615			920	924	610	908	909	256
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	276			615			920	924	610	908	909	256
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	100	98	97	100	95
cM capacity (veh/h)	1287			965			237	265	494	249	270	783

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	13	615	6	276	15	44
Volume Left	13	0	6	0	7	8
Volume Right	0	9	0	40	8	36
cSH	1287	1700	965	1700	328	563
Volume to Capacity	0.01	0.36	0.01	0.16	0.05	0.08
Queue Length 95th (ft)	1	0	0	0	4	6
Control Delay (s)	7.8	0.0	8.8	0.0	16.5	11.9
Lane LOS	A		A		C	B
Approach Delay (s)	0.2		0.2		16.5	11.9
Approach LOS					C	B

Intersection Summary				
Average Delay		1.0		
Intersection Capacity Utilization		39.2%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
2: Route C & Main Street

AM Peak Hour
Existing Conditions Short-Term

Movement	EBL2	EBL	SBL	SBR	SWR	SWR2
Lane Configurations						
Traffic Volume (veh/h)	6	528	41	9	214	11
Future Volume (Veh/h)	6	528	41	9	214	11
Sign Control		Free	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	587	46	10	238	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None			None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	250		845	244		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	250		845	244		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	99		86	99		
cM capacity (veh/h)	1316		331	795		

Direction, Lane #	EB 1	SB 1	SB 2	SW 1
Volume Total	594	46	10	250
Volume Left	7	46	0	0
Volume Right	0	0	10	12
cSH	1316	331	795	1700
Volume to Capacity	0.01	0.14	0.01	0.15
Queue Length 95th (ft)	0	12	1	0
Control Delay (s)	0.2	17.6	9.6	0.0
Lane LOS	A	C	A	
Approach Delay (s)	0.2	16.2		0.0
Approach LOS		C		

Intersection Summary				
Average Delay		1.1		
Intersection Capacity Utilization		39.6%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
3: Route C & North Street

AM Peak Hour
Existing Conditions Short-Term

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	29	86	2	13	63	67	394	4	31	152	42
Future Volume (Veh/h)	45	29	86	2	13	63	67	394	4	31	152	42
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	32	96	2	14	70	74	438	4	34	169	47
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	926	850	192	960	872	440	216			442		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	926	850	192	960	872	440	216			442		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	75	88	89	99	95	89	95			97		
cM capacity (veh/h)	199	273	849	179	265	617	1354			1118		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	50	128	2	84	516	250
Volume Left	50	0	2	0	74	34
Volume Right	0	96	0	70	4	47
cSH	199	555	179	505	1354	1118
Volume to Capacity	0.25	0.23	0.01	0.17	0.05	0.03
Queue Length 95th (ft)	24	22	1	15	4	2
Control Delay (s)	29.1	13.4	25.4	13.5	1.6	1.4
Lane LOS	D	B	D	B	A	A
Approach Delay (s)	17.8		13.8		1.6	1.4
Approach LOS	C		B			

Intersection Summary				
Average Delay		5.4		
Intersection Capacity Utilization	49.3%		ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
4: Route C & Center Street

AM Peak Hour
Existing Conditions Short-Term

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	1	0	0	8	0	465	3	6	235	0
Future Volume (Veh/h)	8	0	1	0	0	8	0	465	3	6	235	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	0	1	0	0	9	0	517	3	7	261	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	802	795	261	794	794	518	261			520		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	802	795	261	794	794	518	261			520		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	100	100	100	98	100			99		
cM capacity (veh/h)	296	318	778	304	319	557	1303			1046		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	9	520	268
Volume Left	9	0	0	7
Volume Right	1	9	3	0
cSH	315	557	1303	1046
Volume to Capacity	0.03	0.02	0.00	0.01
Queue Length 95th (ft)	2	1	0	1
Control Delay (s)	16.8	11.6	0.0	0.3
Lane LOS	C	B		A
Approach Delay (s)	16.8	11.6	0.0	0.3
Approach LOS	C	B		

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization	38.3%		ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	1	2	1	24	3	401	0	2	137	1
Future Volume (Veh/h)	1	1	1	2	1	24	3	401	0	2	137	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	1	1	2	1	27	3	446	0	2	152	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	636	608	152	610	609	446	153			446		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	636	608	152	610	609	446	153			446		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	96	100			100		
cM capacity (veh/h)	372	408	894	404	408	612	1428			1114		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	3	30	449	155
Volume Left	1	2	3	2
Volume Right	1	27	0	1
cSH	479	583	1428	1114
Volume to Capacity	0.01	0.05	0.00	0.00
Queue Length 95th (ft)	0	4	0	0
Control Delay (s)	12.6	11.5	0.1	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	12.6	11.5	0.1	0.1
Approach LOS	B	B		

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	30	374	1	40	100
Future Volume (Veh/h)	1	30	374	1	40	100
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	33	416	1	44	111
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	616	416			417	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	616	416			417	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	95			96	
cM capacity (veh/h)	437	636			1142	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	34	417	155
Volume Left	1	0	44
Volume Right	33	1	0
cSH	628	1700	1142
Volume to Capacity	0.05	0.25	0.04
Queue Length 95th (ft)	4	0	3
Control Delay (s)	11.1	0.0	2.6
Lane LOS	B		A
Approach Delay (s)	11.1	0.0	2.6
Approach LOS	B		

Intersection Summary				
Average Delay		1.3		
Intersection Capacity Utilization	40.6%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Schug Avenue & Route C

PM Peak Hour
Existing Conditions Short-Term

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	268	13	33	475	108	15	4	29	65	3	27
Future Volume (Veh/h)	26	268	13	33	475	108	15	4	29	65	3	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	29	298	14	37	528	120	17	4	32	72	3	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	648			312			996	1085	305	1052	1032	588
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	648			312			996	1085	305	1052	1032	588
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			91	98	96	61	99	94
cM capacity (veh/h)	938			1248			198	204	735	184	219	509

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	29	312	37	648	53	105
Volume Left	29	0	37	0	17	72
Volume Right	0	14	0	120	32	30
cSH	938	1700	1248	1700	356	226
Volume to Capacity	0.03	0.18	0.03	0.38	0.15	0.46
Queue Length 95th (ft)	2	0	2	0	13	57
Control Delay (s)	9.0	0.0	8.0	0.0	16.9	34.0
Lane LOS	A		A		C	D
Approach Delay (s)	0.8		0.4		16.9	34.0
Approach LOS					C	D

Intersection Summary				
Average Delay		4.2		
Intersection Capacity Utilization		49.0%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
2: Route C & Main Street

PM Peak Hour
Existing Conditions Short-Term

Movement	EBL2	EBL	SBL	SBR	SWR	SWR2
Lane Configurations						
Traffic Volume (veh/h)	20	343	44	45	430	21
Future Volume (Veh/h)	20	343	44	45	430	21
Sign Control		Free	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	22	381	49	50	478	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None			None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	501		914	490		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	501		914	490		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	98		83	91		
cM capacity (veh/h)	1063		297	579		

Direction, Lane #	EB 1	SB 1	SB 2	SW 1
Volume Total	403	49	50	501
Volume Left	22	49	0	0
Volume Right	0	0	50	23
cSH	1063	297	579	1700
Volume to Capacity	0.02	0.17	0.09	0.29
Queue Length 95th (ft)	2	15	7	0
Control Delay (s)	0.7	19.5	11.8	0.0
Lane LOS	A	C	B	
Approach Delay (s)	0.7	15.6		0.0
Approach LOS		C		

Intersection Summary				
Average Delay		1.8		
Intersection Capacity Utilization		37.9%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
3: Route C & North Street

PM Peak Hour
Existing Conditions Short-Term

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	26	64	13	11	36	125	252	3	56	318	59
Future Volume (Veh/h)	45	26	64	13	11	36	125	252	3	56	318	59
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	50	29	71	14	12	40	139	280	3	62	353	66
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1116	1071	386	1155	1102	282	419			283		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1116	1071	386	1155	1102	282	419			283		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	66	84	89	88	93	95	88			95		
cM capacity (veh/h)	145	184	662	120	177	757	1140			1279		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	50	100	14	52	422	481
Volume Left	50	0	14	0	139	62
Volume Right	0	71	0	40	3	66
cSH	145	378	120	431	1140	1279
Volume to Capacity	0.34	0.26	0.12	0.12	0.12	0.05
Queue Length 95th (ft)	35	26	10	10	10	4
Control Delay (s)	42.2	17.9	39.0	14.5	3.7	1.5
Lane LOS	E	C	E	B	A	A
Approach Delay (s)	26.0		19.7		3.7	1.5
Approach LOS	D		C			

Intersection Summary				
Average Delay			6.7	
Intersection Capacity Utilization			57.7%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
4: Route C & Center Street

PM Peak Hour
Existing Conditions Short-Term

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1	2	3	0	5	0	365	2	2	415	0
Future Volume (Veh/h)	2	1	2	3	0	5	0	365	2	2	415	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	1	2	3	0	6	0	406	2	2	461	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	878	873	461	874	872	407	461			408		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	878	873	461	874	872	407	461			408		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	99	100	99	100			100		
cM capacity (veh/h)	266	288	600	268	288	644	1100			1151		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	9	408	463
Volume Left	2	3	0	2
Volume Right	2	6	2	0
cSH	349	439	1100	1151
Volume to Capacity	0.01	0.02	0.00	0.00
Queue Length 95th (ft)	1	2	0	0
Control Delay (s)	15.5	13.4	0.0	0.1
Lane LOS	C	B		A
Approach Delay (s)	15.5	13.4	0.0	0.1
Approach LOS	C	B		

Intersection Summary				
Average Delay			0.3	
Intersection Capacity Utilization			33.4%	ICU Level of Service
Analysis Period (min)			15	

HCM Unsignalized Intersection Capacity Analysis
5: Route C & South Street

PM Peak Hour
Existing Conditions Short-Term

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	1	4	0	15	3	277	0	14	411	0
Future Volume (Veh/h)	1	0	1	4	0	15	3	277	0	14	411	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	1	4	0	17	3	308	0	16	457	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	820	803	457	804	803	308	457			308		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	820	803	457	804	803	308	457			308		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	98	100			99		
cM capacity (veh/h)	284	312	604	297	312	732	1104			1253		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	21	311	473
Volume Left	1	4	3	16
Volume Right	1	17	0	0
cSH	386	572	1104	1253
Volume to Capacity	0.01	0.04	0.00	0.01
Queue Length 95th (ft)	0	3	0	1
Control Delay (s)	14.4	11.5	0.1	0.4
Lane LOS	B	B	A	A
Approach Delay (s)	14.4	11.5	0.1	0.4
Approach LOS	B	B		

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		40.3%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
6: Route C & Peculiar Dr

PM Peak Hour
Existing Conditions Short-Term

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	93	187	0	92	324
Future Volume (Veh/h)	1	93	187	0	92	324
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	103	208	0	102	360
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	772	208			208	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	772	208			208	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	88			93	
cM capacity (veh/h)	340	832			1363	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	104	208	462
Volume Left	1	0	102
Volume Right	103	0	0
cSH	821	1700	1363
Volume to Capacity	0.13	0.12	0.07
Queue Length 95th (ft)	11	0	6
Control Delay (s)	10.0	0.0	2.3
Lane LOS	B		A
Approach Delay (s)	10.0	0.0	2.3
Approach LOS	B		

Intersection Summary				
Average Delay		2.7		
Intersection Capacity Utilization		47.8%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	687	10	6	296	41	7	0	9	10	0	32
Future Volume (Veh/h)	12	687	10	6	296	41	7	0	9	10	0	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	763	11	7	329	46	8	0	10	11	0	36
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	375			774			1009	1184	387	784	1166	188
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	375			774			1009	1184	387	784	1166	188
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			96	100	98	96	100	96
cM capacity (veh/h)	1180			837			183	184	611	275	189	823

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	13	509	265	7	219	156	18	47
Volume Left	13	0	0	7	0	0	8	11
Volume Right	0	0	11	0	0	46	10	36
cSH	1180	1700	1700	837	1700	1700	300	561
Volume to Capacity	0.01	0.30	0.16	0.01	0.13	0.09	0.06	0.08
Queue Length 95th (ft)	1	0	0	1	0	0	5	7
Control Delay (s)	8.1	0.0	0.0	9.3	0.0	0.0	17.8	12.0
Lane LOS	A			A			C	B
Approach Delay (s)	0.1			0.2			17.8	12.0
Approach LOS							C	B

Intersection Summary				
Average Delay		0.9		
Intersection Capacity Utilization		29.3%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Right Turn Channelized						
Traffic Volume (veh/h)	42	642	69	31	252	57
Future Volume (veh/h)	42	642	69	31	252	57
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	47	713	77	34	280	63
Approach Volume (veh/h)	760			111	343	
Crossing Volume (veh/h)	77			280	47	
High Capacity (veh/h)	1304			1112	1335	
High v/c (veh/h)	0.58			0.10	0.26	
Low Capacity (veh/h)	1088			914	1116	
Low v/c (veh/h)	0.70			0.12	0.31	

Intersection Summary				
Maximum v/c High		0.58		
Maximum v/c Low		0.70		
Intersection Capacity Utilization		38.2%	ICU Level of Service	A

HCM Unsignalized Intersection Capacity Analysis
3: Route C & North Street

AM Peak Hour
FutureConditions Long-Term

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	35	105	2	16	77	81	533	5	38	206	65
Future Volume (Veh/h)	83	35	105	2	16	77	81	533	5	38	206	65
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	92	39	117	2	18	86	90	592	6	42	229	72
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1183	1091	229	1224	1160	595	301			598		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1183	1091	229	1224	1160	595	301			598		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	21	80	86	98	90	83	93			96		
cM capacity (veh/h)	116	191	810	103	174	504	1260			979		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	92	156	2	104	688	271	72
Volume Left	92	0	2	0	90	42	0
Volume Right	0	117	0	86	6	0	72
cSH	116	447	103	379	1260	979	1700
Volume to Capacity	0.79	0.35	0.02	0.27	0.07	0.04	0.04
Queue Length 95th (ft)	114	39	1	27	6	3	0
Control Delay (s)	103.8	17.3	40.6	18.0	1.8	1.7	0.0
Lane LOS	F	C	E	C	A	A	
Approach Delay (s)	49.4		18.5		1.8	1.4	
Approach LOS	E		C				

Intersection Summary				
Average Delay		11.5		
Intersection Capacity Utilization		67.0%	ICU Level of Service	C
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
4: Route C & Center Street

AM Peak Hour
FutureConditions Long-Term

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1	2	1	0	10	0	616	4	7	307	0
Future Volume (Veh/h)	10	1	2	1	0	10	0	616	4	7	307	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	1	2	1	0	11	0	684	4	8	341	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1054	1045	341	1046	1043	686	341			688		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1054	1045	341	1046	1043	686	341			688		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	100	100	100	98	100			99		
cM capacity (veh/h)	198	227	701	204	227	447	1218			906		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	14	12	688	349
Volume Left	11	1	0	8
Volume Right	2	11	4	0
cSH	222	407	1218	906
Volume to Capacity	0.06	0.03	0.00	0.01
Queue Length 95th (ft)	5	2	0	1
Control Delay (s)	22.3	14.1	0.0	0.3
Lane LOS	C	B		A
Approach Delay (s)	22.3	14.1	0.0	0.3
Approach LOS	C	B		

Intersection Summary				
Average Delay		0.6		
Intersection Capacity Utilization		43.0%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
5: Route C & South Street

AM Peak Hour
FutureConditions Long-Term

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	1	2	1	29	4	544	0	2	200	1
Future Volume (Veh/h)	1	0	1	2	1	29	4	544	0	2	200	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	1	2	1	32	4	604	0	2	222	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	871	838	222	840	839	604	223			604		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	871	838	222	840	839	604	223			604		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	94	100			100		
cM capacity (veh/h)	252	301	817	284	300	498	1346			974		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	35	608	225
Volume Left	1	2	4	2
Volume Right	1	32	0	1
cSH	386	469	1346	974
Volume to Capacity	0.01	0.07	0.00	0.00
Queue Length 95th (ft)	0	6	0	0
Control Delay (s)	14.4	13.3	0.1	0.1
Lane LOS	B	B	A	A
Approach Delay (s)	14.4	13.3	0.1	0.1
Approach LOS	B	B		

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
6: Route C & Peculiar Dr

AM Peak Hour
FutureConditions Long-Term

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	37	513	0	49	154
Future Volume (Veh/h)	1	37	513	0	49	154
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	41	570	0	54	171
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	849	570			570	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	849	570			570	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	92			95	
cM capacity (veh/h)	313	521			1002	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	42	570	225
Volume Left	1	0	54
Volume Right	41	0	0
cSH	513	1700	1002
Volume to Capacity	0.08	0.34	0.05
Queue Length 95th (ft)	7	0	4
Control Delay (s)	12.6	0.0	2.5
Lane LOS	B		A
Approach Delay (s)	12.6	0.0	2.5
Approach LOS	B		

Intersection Summary				
Average Delay		1.3		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	490	16	40	737	123	18	5	35	82	3	27
Future Volume (Veh/h)	26	490	16	40	737	123	18	5	35	82	3	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	29	544	18	44	819	137	20	6	39	91	3	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	956			562			1140	1655	281	1348	1596	478
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	956			562			1140	1655	281	1348	1596	478
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			96			85	93	95	1	97	94
cM capacity (veh/h)	715			1005			135	89	716	92	97	534

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	29	363	199	44	546	410	65	124
Volume Left	29	0	0	44	0	0	20	91
Volume Right	0	0	18	0	0	137	39	30
cSH	715	1700	1700	1005	1700	1700	240	115
Volume to Capacity	0.04	0.21	0.12	0.04	0.32	0.24	0.27	1.08
Queue Length 95th (ft)	3	0	0	3	0	0	27	185
Control Delay (s)	10.2	0.0	0.0	8.7	0.0	0.0	25.4	177.5
Lane LOS	B			A			D	F
Approach Delay (s)	0.5			0.4			25.4	177.5
Approach LOS							D	F

Intersection Summary			
Average Delay		13.7	
Intersection Capacity Utilization		50.6%	ICU Level of Service A
Analysis Period (min)		15	

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Right Turn Channelized						
Traffic Volume (veh/h)	127	416	193	161	553	159
Future Volume (veh/h)	127	416	193	161	553	159
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	141	462	214	179	614	177
Approach Volume (veh/h)	603			393	791	
Crossing Volume (veh/h)	214			614	141	
High Capacity (veh/h)	1171			852	1240	
High v/c (veh/h)	0.51			0.46	0.64	
Low Capacity (veh/h)	967			682	1030	
Low v/c (veh/h)	0.62			0.58	0.77	

Intersection Summary			
Maximum v/c High		0.64	
Maximum v/c Low		0.77	
Intersection Capacity Utilization		56.6%	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis
3: Route C & North Street

PM Peak Hour
FutureConditions Long-Term

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	32	78	16	13	44	153	401	4	68	524	127
Future Volume (Veh/h)	104	32	78	16	13	44	153	401	4	68	524	127
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	116	36	87	18	14	49	170	446	4	76	582	141
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1578	1524	582	1627	1663	448	723			450		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1578	1524	582	1627	1663	448	723			450		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	59	83	53	81	92	81			93		
cM capacity (veh/h)	57	89	513	38	73	611	879			1110		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	116	123	18	63	620	658	141
Volume Left	116	0	18	0	170	76	0
Volume Right	0	87	0	49	4	0	141
cSH	57	214	38	231	879	1110	1700
Volume to Capacity	2.05	0.58	0.47	0.27	0.19	0.07	0.08
Queue Length 95th (ft)	282	79	41	27	18	6	0
Control Delay (s)	644.5	42.5	165.3	26.3	4.7	1.8	0.0
Lane LOS	F	E	F	D	A	A	
Approach Delay (s)	334.7		57.2		4.7	1.4	
Approach LOS	F		F				

Intersection Summary				
Average Delay		51.0		
Intersection Capacity Utilization	83.6%	ICU Level of Service	E	
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
4: Route C & Center Street

PM Peak Hour
FutureConditions Long-Term

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1	2	4	0	6	0	595	2	2	634	0
Future Volume (Veh/h)	2	1	2	4	0	6	0	595	2	2	634	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2	1	2	4	0	7	0	661	2	2	704	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1377	1371	704	1372	1370	662	704			663		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1377	1371	704	1372	1370	662	704			663		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	99	100	97	100	98	100			100		
cM capacity (veh/h)	120	146	437	122	146	462	894			926		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	5	11	663	706
Volume Left	2	4	0	2
Volume Right	2	7	2	0
cSH	178	229	894	926
Volume to Capacity	0.03	0.05	0.00	0.00
Queue Length 95th (ft)	2	4	0	0
Control Delay (s)	25.8	21.5	0.0	0.1
Lane LOS	D	C		A
Approach Delay (s)	25.8	21.5	0.0	0.1
Approach LOS	D	C		

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A	
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	1	5	0	18	4	446	0	17	637	0
Future Volume (Veh/h)	1	0	1	5	0	18	4	446	0	17	637	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	0	1	6	0	20	4	496	0	19	708	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1270	1250	708	1251	1250	496	708			496		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1270	1250	708	1251	1250	496	708			496		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	96	100	97	100			98		
cM capacity (veh/h)	137	169	435	146	169	574	891			1068		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	26	500	727
Volume Left	1	6	4	19
Volume Right	1	20	0	0
cSH	209	343	891	1068
Volume to Capacity	0.01	0.08	0.00	0.02
Queue Length 95th (ft)	1	6	0	1
Control Delay (s)	22.4	16.4	0.1	0.5
Lane LOS	C	C	A	A
Approach Delay (s)	22.4	16.4	0.1	0.5
Approach LOS	C	C		

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		54.4%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	1	113	337	0	112	531
Future Volume (Veh/h)	1	113	337	0	112	531
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	126	374	0	124	590
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1212	374			374	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1212	374			374	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	81			90	
cM capacity (veh/h)	180	672			1184	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	127	374	714
Volume Left	1	0	124
Volume Right	126	0	0
cSH	658	1700	1184
Volume to Capacity	0.19	0.22	0.10
Queue Length 95th (ft)	18	0	9
Control Delay (s)	11.8	0.0	2.6
Lane LOS	B		A
Approach Delay (s)	11.8	0.0	2.6
Approach LOS	B		

Intersection Summary				
Average Delay		2.7		
Intersection Capacity Utilization		68.9%	ICU Level of Service	C
Analysis Period (min)		15		

LANE SUMMARY

Site: Route C & Main

AM Peak Hour
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Route C													
Lane 1[d]	46	3.0	1016	0.045	100	3.9	LOS A	5.9	149.8	Full	1600	0.0	0.0
Lane 2	698	3.0	1016	0.687	100	14.4	LOS B	5.9	149.8	Short	200	0.0	0.0
Approach	743	3.0		0.687		13.7	LOS B	5.9	149.8				
East: Route C													
Lane 1	168	3.0	1047	0.160	100	4.9	LOS A	0.6	15.7	Full	1600	0.0	0.0
Lane 2[d]	168	3.0	1047	0.160	100	4.9	LOS A	0.6	15.7	Full	1600	0.0	0.0
Approach	336	3.0		0.160		4.9	LOS A	0.6	15.7				
North: Main Street													
Lane 1[d]	109	3.0	900	0.121	100	5.1	LOS A	0.3	8.0	Full	1600	0.0	0.0
Approach	109	3.0		0.121		5.1	LOS A	0.3	8.0				
Intersection	1188	3.0		0.687		10.5	LOS B	5.9	149.8				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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LANE SUMMARY

Site: Route C & Main

PM Peak Hour
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Route C													
Lane 1[d]	138	3.0	884	0.156	100	5.6	LOS A	2.7	70.4	Full	1600	0.0	0.0
Lane 2	452	3.0	884	0.512	100	10.8	LOS B	2.7	70.4	Short	200	0.0	0.0
Approach	590	3.0		0.512		9.6	LOS A	2.7	70.4				
East: Route C													
Lane 1	376	3.0	952	0.395	100	8.2	LOS A	1.9	49.2	Full	1600	0.0	0.0
Lane 2[d]	376	3.0	952	0.395	100	8.2	LOS A	1.9	49.2	Short	150	0.0	0.0
Approach	752	3.0		0.395		8.2	LOS A	1.9	49.2				
North: Main Street													
Lane 1[d]	210	3.0	722	0.290	100	8.5	LOS A	0.8	21.6	Full	1600	0.0	0.0
Lane 2	175	3.0	701	0.250	86[5]	8.1	LOS A	0.7	18.9	Short	150	0.0	0.0
Approach	385	3.0		0.290		8.3	LOS A	0.8	21.6				
Intersection	1727	3.0		0.512		8.7	LOS A	2.7	70.4				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane underutilisation determined by program
d Dominant lane on roundabout approach

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Appendix D

Highway Safety Manual Analysis Results

See Attached Worksheets

Route C between	N_{spf}	CMF					N_{ped}	N_{biker}
		On-Street Parking	Roadside Fixed Objects	Median Width	Lighting	Automated Speed Enforcement		
I-49 SB Ramps to Schug Avenue	0.464	1.00	1.00	1.00	0.93	1.00	0.016	0.008
Schug Avenue to Main Street	0.379	1.00	1.00	1.00	0.93	1.00	0.013	0.006
Main Street to North Street	0.171	1.00	1.00	1.00	0.93	1.00	0.006	0.003
North Street to Center Street	0.165	1.00	1.18	1.00	0.93	1.00	0.007	0.003
Center Street to South Street	0.548	1.00	1.19	1.00	0.93	1.00	0.022	0.011
South Street to Private Drive	0.100	1.00	1.07	1.00	0.93	1.00	0.000	0.000

Route C at	N_{spf}	CMF						N_{ped}
		Left-Turn Lanes	Left-Turn Signal Phasing	Right-Turn	Right-Turn on Red	Lighting	Red Light	
Schug Avenue	1.15	1.00	1.00	1.00	1.00	0.91	1.00	0.022
Main Street	1.00	1.00	1.00	1.00	1.00	0.91	1.00	0.019
North Street	1.72	1.00	1.00	1.00	1.00	0.91	1.00	0.035
Center Street	1.24	1.00	1.00	1.00	1.00	0.91	1.00	0.025
South Street	0.91	1.00	1.00	1.00	1.00	0.91	1.00	0.018
Peculiar Road	0.74	1.00	1.00	1.00	1.00	0.91	1.00	0.014

Appendix E

Preliminary Opinion of Probable Cost

See Attached Worksheets

Route C Short Term Improvements

ITEM OF WORK	PROJECT QUANTITY	UNIT	UNIT PRICE	TOTAL
MOBILIZATION	1	L.S.	$70,000.00	$70,000.00
CONTRACTOR CONSTRUCTION STAKING	1	L.S.	$30,000.00	$30,000.00
EROSION CONTROL	1	L.S.	$25,000.00	$25,000.00
PAVEMENT REMOVALS	10463	S.Y.	$25.00	$261,583.06
EARTHWORK	1	L.S.	$20,000.00	$20,000.00
ROADWAY PAVEMENT	6459	S.Y.	$60.00	$387,526.67
DRIVEWAY PAVEMENT	1605	S.Y.	$50.00	$80,273.83
SHOULDER PAVEMENT	721	S.Y.	$45.00	$32,455.00
PARKING LOT PAVEMENT	953	S.Y.	$30.00	$28,590.00
CURB AND GUTTER	690	L.F.	$25.00	$17,250.00
PERMANENT SEEDING	2917	S.Y.	$2.50	$7,292.78
DRAINAGE	1	L.S.	$50,000.00	$50,000.00
TRAFFIC CONTROL	1	L.S.	$30,000.00	$30,000.00

CONSTRUCTION COSTS			$1,039,971.33
DESGN	12%	of construction	$124,796.56
INSPECTION	10%	of construction	$103,997.13
CONSTRUCTION TESTING	3%	of construction	$31,199.14
MODOT MAINTENANCE FEE	10%	of construction	$103,997.13
MARC PROJECT FEE	0.5%	of construction	$5,199.86
TOTAL PROJECT COST			$1,409,161.16