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April 23, 2020

Peter Carroll
C&M Properties
12748 Barossa Valley Road
Colorado Springs, CO 80921

RE: Tamlin Road Storage
El Paso County, CO
Traffic Impact Study
PCD #: PPR1945
LSC #184610

Dear Mr. Carroll,

LSC Transportation Consultants, Inc. has prepared this traffic impact study for the proposed Tamlin Road storage site. The site is located south of Tamlin Road and east of Marksheffel Road in El Paso County, Colorado. This report is an update to the previously-accepted traffic impact study for this site (dated March 5, 2019) which assumed a commercial rezone.

REPORT CONTENTS

The report contains the following:

- Existing roadway and traffic conditions adjacent to and in the vicinity of the site, including the intersection lane geometries, traffic controls, posted speed limits, functional classifications, intersection spacing and alignment, sight distances, etc.
- Existing peak-hour turning movement traffic counts on Tamlin Road and at the intersections of Marksheffel Road/Tamlin Road (located southwest of the site)
- Description of the existing land uses in the vicinity of the site
- The status of Marksheffel Road and the potential for future connection to the master-planned Banning Lewis Ranch Roadway network
- Estimates of short- and long-term baseline/background traffic volumes at the proposed site access intersections on Tamlin Road and the intersection of Marksheffel/Tamlin
- A description of the currently proposed land use for the site (RV Storage) and potential future (long-term) land use scenarios assumed in this report associated with the proposed site
- Trip generation estimates for the RV storage and each of the future land use scenarios and estimates of the trip directional distribution
- Assignment of projected peak-hour and daily site-generated traffic volumes at the study area access point intersections

- Resulting traffic impacts of the proposed development expressed in terms of average daily traffic volumes and intersection levels of service
- Analysis of potential future intersection configurations at Marksheffel/Tamlin given that a future traffic signal is unlikely to be allowed at this intersection
- Recommendations for the roadway classification of Tamlin Road and auxiliary left-/right-turn lanes at the site access points and the Marksheffel/Tamlin intersection
- Summary of findings and recommendations

LAND USE AND ACCESS

The 16-acre site is located south of Tamlin Road and east of Marksheffel Road in El Paso County. The entire site is zoned for commercial use. Figure 1 shows the site location and the adjacent roadways.

Currently Proposed Land Use

Assumes RV storage would be the only land use for the short term. This report also includes a long-term scenario assuming the RV Storage remains on the site through 2038. The site plan is shown in Figure 2.

Future Land Use Scenarios

LSC analyzed two additional future land use scenarios with the rezone application (approved). These scenarios have been taken from the March 5, 2019 TIS report and assume the RV Storage use removed in the future and development of new uses. These scenarios include a "moderate-intensity" (in terms of vehicle-trip generation associated with land use) buildout scenario and a "high-intensity" future land use scenario.

Moderate-Intensity Buildout Scenario: Assumes 115,600-square-foot mini-warehouse development on Lot 2 and a mixed-use, non-residential development on Lot 1. A general site plan is shown in Figure 3. This LSC-developed scenario assumes the following land use mix for Lot 1. This scenario assumes that the parcel would be separated into two separate lots (Lot 1 – 7.5 acres, Lot 2 – 8.5 acres):

- 21,500 square feet of general office
- 21,500 square feet of general light industrial
- 16,000 square feet of "shopping center" (retail center) land uses

This scenario **may** be more likely than the high-intensity scenario presented below given the location of the site.

High-Intensity Future Land Use Scenario: The high-intensity future land use scenario assumed that Lots 1 and 2 would collectively consist of 113,000 total square feet of shopping center/retail space. This scenario assumes no mini storage. This scenario has been analyzed as a reasonable representation of the "highest and best use" of the property with commercial zoning and associated

estimate of "worst-case" trip generation resulting from the proposed land use. This scenario assumes that the parcel would be separated into two separate lots (Lot 1 – 7.5 acres, Lot 2 – 8.5 acres).

Currently Proposed RV Storage Access

The RV storage access is anticipated to align with the existing Trojan Storage of Stetson Hills access, as described in the "Sight Distance" section later in this report.

Potential Future Land Use Scenario Access

Potential future Lot 2 access point to Tamlin Road is shown on Figure 3. This eastern lot site access point is planned to align with the Trojan Storage of Stetson Hills access. Lot 1 access under a future redevelopment scenario would likely be located approximately 560 feet northeast of the intersection of Marksheffel Road/Tamlin Road.

Although the rezone traffic report (and Figure 3 of this report) show preliminary access point locations for the future land use scenarios, these final access point locations for future redevelopment scenarios will be determined at the time of redevelopment if/when the RV Storage is replaced with other future land uses. Access points must meet ECM standards for sight distance, should be placed a sufficient distance from Marksheffel for acceptable traffic operations, constructed in a location where any necessary auxiliary turn lanes can be installed, and result in adequate spacing between access points. Access points are anticipated to be stop-controlled, full-movement intersections with Tamlin Road.

ROADWAYS AND TRAFFIC CONDITIONS

Area Roadways

Study area roadways are identified below, followed by a brief description of each:

Marksheffel Road is designated as a Principal Arterial on the El Paso County 2016 Major Transportation Corridor Plan (MTCP). Currently a two-lane road, Marksheffel extends north-to-south for 17.4 miles between Link Road in the City of Fountain to the south (at the intersection of C&S Road/Link Road) and just north of Woodmen Road. Marksheffel Road is planned to be extended north to Vollmer Road in the short term. In the vicinity of the site, the posted speed limit on Marksheffel Road is 55 miles per hour (mph).

Tamlin Road is a rural, paved, local roadway that extends northeast from Marksheffel Road for just over one mile and serves the properties located within the unincorporated County enclave. Tamlin continues east as a gravel road through the Banning Lewis Ranch property to Meridian Road. However, use of the road is minimal and will be removed as future Banning Lewis Ranch development occurs. Tamlin is classified as a Collector on the El Paso County 2016 MTCP. Adjacent to the site, the posted speed limit is 35 mph.

Existing Traffic Volumes

Vehicular turning movement counts were conducted at the intersection of Marksheffel/Tamlin on Tuesday, July 10, 2018 from 6:30-8:30 a.m. and from 4:00-6:00 p.m. Existing morning and evening weekday peak-hour traffic volumes at this intersection is shown in Figure 4. Raw count reports are attached. LSC has estimated the current peak-hour turning movements (based on the land use and standard trip generation rates) at the existing storage business access point on Tamlin Road. The figure also shows estimated weekday traffic volumes.

SIGHT DISTANCE

Proposed RV Storage Access

Figure 2 shows the proposed location for the RV storage access. Field-measured sight distances for passenger vehicles are 445 feet to/from the southwest and 489 feet to/from the northeast. Assuming a 35-mph posted speed limit, field-measured sight distances for both approaches from this proposed site access location exceed the required 350-foot requirement for passenger vehicles per ECM Table 2-35. The requirement of 455 feet for single-unit trucks would be met as well with the driver's eye being significantly higher than 3.5 feet for single unit trucks. Therefore, access entering sight distance **would** be acceptable, if the future site access point were to align with the existing Trojan Storage of Stetson Hills access.

Future Access for Potential Future Land Use Scenarios

The following analysis corresponds to field-measured sight distances for a Lot 2 site access aligned with the existing Trojan Storage of Stetson Hills access and a potential future Lot 1 access located approximately 560 feet northeast of the intersection of Marksheffel Road/Tamlin Road.

<u>Potential Future Lot 2 Access to Align with the Trojan Storage of Stetson Hills Access</u>

Field-measured sight distances for passenger vehicles are 445 feet to/from the southwest and 489 feet to/from the northeast. Assuming a 35-mph posted speed limit, field-measured sight distances for both approaches from this proposed site access location exceed the required 350-foot requirement for passenger vehicles per ECM Table 2-35. The requirement of 455 feet for single-unit trucks would be met as well with the driver's eye being significantly higher than 3.5 feet for single unit trucks. Therefore, access entering sight distance **would** be acceptable, if the future site access point were to align with the existing Trojan Storage of Stetson Hills access. If the access is planned for regular use by multi-unit trucks, the sight distance should be verified for this design vehicle.

Potential Future Lot 1 Access 560 Feet East of Marksheffel Road

Field-measured sight distances for passenger vehicles are unobstructed from the potential future Lot 1 access to Marksheffel Road (560 feet). Looking to the northeast, sight distance from the

As this lot would be a commercial use at minimum it would have to meet the single unit truck sight distance (455') per table 2-35.

potential Lot 1 access exceeds the ECM's required 350-foot requirement. Therefore, access entering sight distance **would** be acceptable, if the future site access point were to be located 560 feet northeast of the intersection of Marksheffel Road/Tamlin Road.

All sight distance field measurements utilized a driver's eye height of 3.5 feet and a height of 3.5 feet for a southwest-bound vehicle approaching from the northeast.

As indicated above, the final access point locations associated with future development scenarios will be determined at the time of redevelopment if/when the RV Storage is replaced with other future land uses.

TRIP GENERATION

Estimates of the vehicle-trips projected to be generated by the proposed storage facility have been made using the nationally published trip generation rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 1 shows a summary of the results of the trip generation estimate. The morning peak hour generally occurs for one hour between 6:30 and 8:30 a.m., and the afternoon peak hour occurs for one hour between 4:00 and 6:00 p.m. A detailed trip generation estimate for the development, including ITE rates for the proposed land use, is presented in Table 3 (attached). Figure 2 contains a diagram of the proposed site plan.

Table 1: Estimated Site Vehicle-Trip Generation

Analysis Period	In	Out	Total
Currently-Proposed Land Use Scenario			
RV Storage-Only			
Morning peak hour (vehicle trips/hour)	8	5	14
Evening peak hour (vehicle trips/hour)	7	10	18
Weekday -- non-pass-by (vehicle trips/day)	37	37	74
Potential Future Land Use Scenarios			
Moderate-Intensity Buildout			
Morning peak hour (vehicle trips/hour)	141	71	211
Evening peak hour (vehicle trips/hour)	82	116	198
Weekday -- non-pass-by (vehicle trips/day)	1110	1110	2220
High-Intensity Buildout			
Morning peak hour (vehicle trips/hour)	129	79	208
Evening peak hour (vehicle trips/hour)	286	309	595
Weekday -- non-pass-by (vehicle trips/day)	3267	3267	6533

Currently-Proposed Land Use – RV Storage

The entire site is expected to generate about 74 vehicle-trips on the average weekday (one half entering and one half exiting in a 24-hour period) with the RV storage-only. During the morning

peak hour, 8 vehicles are projected to enter the site while 5 are projected to exit. Approximately 7 vehicles would enter and 10 vehicles would exit the site during the evening peak hour.

Note: This trip generation estimate is based on full, 100% occupancy of the RV Storage facility. However, the applicant has indicated that it will be about one year before they have their first customer. They anticipate that they might have 25 to 30 customers in the first year after completion and 30 new customers per year would be a best-case scenario.

Potential Future Land Use Scenarios

Moderate-Intensity Scenario

The entire site is expected to generate about 2,220 vehicle-trips on the average weekday (one half entering and one half exiting in a 24-hour period) in the moderate-intensity buildout scenario. During the morning peak hour, 141 vehicles are projected to enter the site while 71 are projected to exit. Approximately 82 vehicles would enter and 116 vehicles would exit the site during the evening peak hour.

High-Intensity Scenario

The entire site is expected to generate about 6,533 vehicle-trips on the average weekday (one half entering and one half exiting in a 24-hour period) in the high-intensity buildout scenario. During the morning peak hour, 129 vehicles are projected to enter the site while 79 are projected to exit. Approximately 286 vehicles would enter and 309 vehicles would exit the site during the evening peak hour.

Trip Distribution and Assignment

An estimate of the directional distribution of site-generated vehicle-trips to the study area streets and intersections is a necessary component in determining the site's traffic impacts. Figure 5 shows the directional distribution estimate for the site-generated trips and the percentages of the site-generated vehicle-trips projected to be oriented to and from the site's major approaches. Estimates were based on the following factors: traffic counts conducted at nearby intersections, the proposed land use and access plan, the existing and anticipated future area roadway system serving the site, the site's geographic location, adjacent existing land uses, projected traffic growth in the area, and lane geometry modifications to nearby turning movements.

As shown in Figure 5, half of all entering vehicles were assumed to come from both the northbound and southbound approaches on Marksheffel. Field observations showed that westbound left-turning drivers may have difficulty turning onto Marksheffel due to high opposing southbound through volumes. LSC anticipates that some exiting drivers may turn right onto Marksheffel then take a left at Stetson Hills Boulevard, rather than waiting at the stop sign to turn left directly onto Marksheffel.

Site-generated traffic volumes have been calculated at the following intersections:

- Tamlin Road/proposed site access point(s)
- Marksheffel Road/Tamlin Road

Directional distribution percentages estimated by LSC (from Figure 5) were applied to the trip generation estimates (from Table 1).

- Figure 6 shows the projected site-generated traffic volumes for the weekday evening peak hour for the currently proposed RV storage land use.
- Figure 7 shows the projected weekday evening peak-hour site-generated traffic volumes for the potential future moderate-intensity scenario.
- Figure 8 shows the projected weekday peak-hour site-generated traffic volumes for the potential future high-intensity scenario.

Short-Term Total Traffic Volumes

Figure 9 show volumes and LOS output for the short term with the RV storage only. Short-term total traffic volumes are the sum of the existing traffic volumes (from Figure 4) and RV storage site-generated peak-hour traffic volumes (from Figure 6).

Regarding the laneage/traffic control shown in Figure 9 for the short-term total scenario, Marksheffel is currently a two-lane roadway (one lane per direction). The short-term scenario assumes the upgraded, future five-lane Marksheffel Road. LSC is not aware of the timing of this Marksheffel widening project. However, El Paso County may have new information. Due to uncertainty regarding the timing, a growth rate was **not** applied to existing Marksheffel traffic volumes for the short-term scenario. Instead, existing traffic volumes were used as the "short-term" background/baseline traffic. The short-term scenario analysis and results reflect Marksheffel as an improved five-lane roadway, rather than the existing two-lane road.

Estimated Future Background Traffic Volumes

Figure 10 shows the projected 20-year background traffic volumes for the year 2038. Traffic from the proposed buildout land uses on Lots 1 and 2 is **not** included in the 2038 background traffic volumes. The 2038 background/baseline through traffic volumes on Marksheffel Road are based on MTCP projections. Background increases in vehicle turning movements at the intersection of Marksheffel Road/Tamlin Road could potentially vary from those estimated herein with significant other development projects served by Tamlin Road. However, any other significant development project would likely be required to also complete a traffic impact report. Traffic from the site is not included in the 2038 background traffic volumes.

2038 Total Traffic Volumes

RV Storage Land Use Scenario

Figure 11 shows the sum of 2038 background traffic volumes (from Figure 10) plus the currently-proposed RV storage-only site-generated traffic volumes (from Figure 6). This scenario has been provided to represent conditions if the RV storage remains the land use on the site through 2038.

Potential Future Land Use (Redevelopment) Scenario – Moderate-Intensity Buildout

Figure 12 shows the sum of 2038 background traffic volumes (from Figure 10) plus the moderate-intensity site-generated traffic volumes (from Figure 7).

Potential Future Land Use (Redevelopment) Scenario – High-Intensity Buildout

Figure 13 shows the sum of 2038 background traffic volumes (from Figure 10) plus the high-intensity site-generated traffic volumes (from Figure 8).

LEVEL OF SERVICE ANALYSIS

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection and is indicated on a scale from "A" to "F." LOS A is indicative of little congestion or delay. LOS F indicates a high level of congestion or delay. Table 2 shows the level of service delay ranges for signalized and unsignalized intersections.

Table 2: Intersection Levels of Service Delay Ranges

Level of Service	Signalized Intersections	Unsignalized Intersections
	Average Control Delay (seconds per vehicle)	Average Control Delay (seconds per vehicle)[1]
A	≤ 10.0	≤ 10.0
B	10.1 – 20.0	10.1 – 15.0
C	20.1 – 35.0	15.1 – 25.0
D	35.1 – 55.0	25.1 – 35.0
E	55.1 – 80.0	35.1 – 50.0
F	≥ 80.1	≥ 50.1

[1] For unsignalized intersections, if V/C is > 1.00, then LOS is LOS F regardless of the projected average control delay per vehicle

The following intersections have been analyzed to determine the projected levels of service:

- Tamlin Road/ site access point(s)
- Marksheffel Road/Tamlin Road

A summary of existing, projected short-term total, 2038 background, and 2038 total levels of service during the morning and evening peak hours is shown in Figure 1 through Figure 13. Please refer to the detailed Synchro and SimTraffic reports (attached) for additional details.

Proposed Site Access/Tamlin Road

All turning movements at both proposed site access points are projected to operate at LOS B or better during all short- and long-term scenarios during both the morning and evening peak hours.

Marksheffel Road/Tamlin Road

Short-Term Total Scenario

The southwest-bound approach currently operates at LOS E during the morning peak hour and LOS F during the evening peak hour. As noted above, this scenario assumes Marksheffel upgraded to a multi-lane facility. The results of this scenario (with the roadway expansion on Marksheffel) indicate the southwest-bound approach is projected to operate at LOS B during the morning peak hour and LOS D during the evening peak hour, regardless of the proposed land use (RV storage).

2038 Long-Term Site Buildout Scenarios

SimTraffic simulation LOS results were used in place of Synchro LOS output to account for gaps created by upstream signals on Marksheffel at Barnes and Stetson Hills. Three separate traffic control conditions were analyzed for the 2038 traffic scenarios:

- Two-way stop-sign-control (TWSC)
- Three-quarter movement (unsignalized)
- Channelized-T

If the intersection of Marksheffel/Tamlin were to remain TWSC, the westbound left-turn movement is projected to operate at LOS F during the 2038 background scenario evening peak hour and the southbound left-turn movement is projected to operate at LOS C.

During the moderate-intensity 2038 total traffic scenario, the westbound left-turn movement from Tamlin Road has been eliminated, while the westbound right turn operates at LOS D or better as a free movement.

A channelized-T intersection was assumed during the high-intensity 2038 potential future land use redevelopment scenario, where the southbound through lanes bypass the intersection, the southbound left-turn lane has a median-separated storage lane, and the westbound left-turn

lane has an interior acceleration lane. The westbound left-turn lane is projected to operate at LOS F during the evening peak hour.

AUXILIARY TURN LANES

Marksheffel/Tamlin Road

Left-Turn Deceleration Lane

According to the El Paso County *Engineering Criteria Manual* (ECM), exclusive left-turn lanes shall be provided for any access on a Principal Arterial with a projected peak-hour ingress turning volume of 10 vehicles per hour (vph) or greater. The projected southbound left-turn volume at the intersection of Marksheffel/Tamlin with the RV storage development would be below the 10 vph minimum left-turn volume threshold in the ECM requiring a left-turn lane.

A left-turn deceleration lane is projected to be warranted based on both 2038 background plus site moderate-intensity **and** high-intensity future redevelopment scenarios (if not completed with a Marksheffel upgrade project). The required lane dimensions would include a 290-foot deceleration distance (adjusted for grade as applicable) plus stacking distance plus an ECM standard-length 240-foot bay taper. Redirect tapers at a 55:1 ratio would also be necessary. For the long-term scenarios, the southbound left-turn deceleration lane stacking distance would be up to about 150 feet (for the high-intensity scenario).

Right-Turn/Left-Turn Acceleration Lanes

Projected total westbound right-turning volumes at the intersection of Marksheffel/Tamlin would **not** exceed the threshold for a northbound right-turn acceleration lane on Marksheffel Road for the RV/storage development only. However, a northbound right-turn acceleration lane on Marksheffel Road would be required for either of the potential future land use redevelopment scenarios.

A southbound left-turn acceleration lane with **channelizing raised median design** would be part of the channelized-T traffic control option analyzed with the potential high-intensity future land use site buildout scenario. This lane would likely extend south to Barnes Road and could potentially be configured as a continuous acceleration/deceleration southbound left-turn lane. A raised right-turn channelizing island for the westbound lane into the northbound acceleration lane would be an option to consider as, if properly designed, it could reasonably prevent westbound left-turn movements. A raised center median with three-quarter intersection design is another potential solution to consider.

Right-Turn Deceleration Lane

A northbound right-turn deceleration lane currently exists at the intersection of Marksheffel/Tamlin and meets turn lane design criteria in the ECM. No modifications to its existing geometry are required.

Tamlin Road/Site Access Points

Auxiliary turn lanes would not be required on Tamlin Road for the currently proposed RV storage land use.

Based on ECM criteria, an eastbound right-turn deceleration lane plus taper would be required at the west site access for either potential future land use redevelopment scenario. At the east access, the right-turn volume threshold requiring a turn lane would be exceeded for the high-intensity scenario.

POTENTIAL "MITIGATION" FOR LEVEL OF SERVICE AT MARKSHEFFEL/TAMLIN

Given the existing and projected peak-hour volumes at the intersection of Marksheffel/Tamlin, the calculated level of service E, and the County comment regarding the need to mitigate the level of service, LSC recommends that wayfinding signs be posted for purposes of guiding/redirecting motorists exiting the site to an alternate route if intending to travel south on Marksheffel during peak traffic periods. The signs would guide exiting motorists along an alternate route to southbound Marksheffel via a right turn when leaving the site, travel to the east on Tamlin to the intersection of Tamlin/Huber, then travel westbound on Huber to the signalized intersection of Marksheffel/Stetson Hills/Huber. This is an alternative to use of westbound Tamlin to the Marksheffel/Tamlin intersection. The first sign (adjacent to the exiting lane of the driveway) could include suggested time periods (during weekday morning and afternoon peak hours). This signage would operate similar to detour signage.

ACCESS TRUCK TURNING MOVEMENT ANALYSIS

AutoTurn analysis was run at the request of staff and to assist with the planning and design of the proposed site access. Detailed AutoTurn analysis exhibits depicting entering and exiting class A RV vehicle movement wheel paths are attached. Also included are similar exhibits for the intersection of Tamlin/Huber along the suggested "detour" route.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

Please refer to Table 1 for a summary of the results of the trip generation estimate for currently proposed RV storage land use and the potential future land use redevelopment (moderate- and high-intensity) land use scenarios. A detailed trip generation estimate for the development, including ITE rates for the proposed land uses, is presented in attached Table 3.

Level of Service Analysis

Access points to Tamlin Road are projected to operate at LOS A or B for all scenarios.

The southwest-bound approach at the intersection of Marksheffel/Tamlin currently operates at LOS E or worse and is projected to operate at a low level of service with the addition of the proposed RV storage development. Short-term improvements to the intersection, turn restrictions, and/or new traffic control are not practical based on the short-term, RV storage-only scenario. The County is requiring mitigation for this level of service at the intersection of Marksheffel/Tamlin. LSC recommends wayfinding signage be posted as described above. This signage would operate similar to detour signage.

With significant redevelopment on the property in the future (replacing the RV storage), the level of service is likely to be LOS F for the westbound-to-southbound left-turn movement, if the intersection were to remain in its current full-movement configuration. The potential future moderate intensity scenario shows LOS D for the southbound left-turning movement (southbound Marksheffel to eastbound Tamlin). The LOS for the westbound-to-southbound left-turn movement would not apply under this scenario as conversion of the intersection to a three-quarter movement (restriction of the westbound-to-southbound left turn) is assumed as part of the scenario.

Given the LOS F projected for the channelized-T configuration (as part of the high-intensity future scenario), a directional traffic signal would likely need to be considered. This would likely improve the LOS to acceptable levels and acceptable progression bandwidths would likely be easy to achieve with a directional signal rather than a “full” signal. However, the concept of a directional signal would need to be acceptable to the County and/or the City. A roundabout intersection would not likely be a viable solution as it would be inconsistent with the other intersections in the Marksheffel corridor.

Please refer to the Level of Service Analysis section above for detailed LOS results. A traffic analysis will be required with the individual site plans to determine which final off-site improvements are required.

Access Points

The proposed RV storage access/the future Lot 2 access point (under the moderate intensity future redevelopment scenario) is shown to align with the existing Trojan Storage at Stetson Hills access on the north side of Tamlin Road.

The future Lot 1 access point(s) (under one of the future redevelopment scenario) will be determined later. However, Lot 1 access is anticipated to be located approximately 560 feet northeast of the intersection of Marksheffel/Tamlin. Access points must meet ECM standards for sight distance, should be placed a sufficient distance from Marksheffel for acceptable traffic

operations, constructed in a location where any necessary auxiliary turn lanes can be installed, and result in adequate spacing between access points. Access points are anticipated to be stop-controlled, full-movement intersections with Tamlin Road.

Auxiliary Turn Lanes

Projected total westbound right-turning volumes at the intersection of Marksheffel/Tamlin would **not** exceed the threshold for a northbound right-turn acceleration lane on Marksheffel Road **for the RV/storage development only**.

Turn lanes at Marksheffel/Tamlin (if not completed with a Marksheffel upgrade project) and potentially at the site access points are projected to be warranted based on the potential future land use (redevelopment) scenarios. Please refer to the Auxiliary Turn Lanes section above and Table 4 for details and turn lane design recommendations.

Sight Distance

Entering sight distance at the proposed RV storage access would be acceptable. Please refer to the sight distance section above for additional details.

Roadway Classification/Upgrade

Tamlin Road is classified as a Collector on the El Paso County Major Transportation Corridor Plan. The short-term RV storage land use would not increase traffic volumes on Tamlin Road above the Rural Local Roadway level. However, Tamlin Road would likely need to be improved to County Collector standards with either potential future land use scenario. In the long term, Tamlin Road should be upgraded to an Urban Collector for both the moderate-intensity and high-intensity scenarios for Lots 1 and 2.

Road Improvement Summary

Table 4 (attached) presents a summary of roadway improvements with timing and responsibility for construction. Under future redevelopment scenarios, road improvements required for Lot 2 will be funded with Lot 2 and improvements required for Lot 1 would be with the redevelopment of Lot 1.

El Paso County Roadway Improvement Fee Program

This development will be subject to participation in the El Paso County Roadway Improvement Fee Program. Staff has indicated that it will investigate how the impact fees will be calculated for this site. A developer agreement may be required.

Recommended Stacking Distance at the Site Entrance

Per comments on the site plan, the following is a recommendation for the entry stacking distance at the RV storage site. The stacking distance would be measured southeast of the southeast edge of Tamlin Road to the point at which a vehicle would potentially stop prior to turning left or right to access storage unit aisles. The objective is to provide sufficient storage to accommodate the maximum length of the design vehicle or vehicle with trailer to avoid queue blockage of the public street.

Most vehicles entering the RV storage facility will be passenger vehicles, pickup trucks, potentially towing trailers, and motor homes. LSC recommends a 65-foot stacking distance southeast of the southeast edge of Tamlin Road. This would allow for a 45-foot-long class A motor home or a large passenger vehicle/pickup truck towing a boat or camping trailer.

* * * * *

Please contact me if you have any questions regarding this report.

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By: Jeffrey C. Hodsdon, P.E.
Principal

JCH/JAB:jas

Enclosures: Tables 3 and 4
Figure 1 – Figure 13
Traffic Count Reports
Level of Service Reports
AutoTurn Exhibits

Tables and Figures

TRANSPORTATION
CONSULTANTS, INC.

Table 3: Trip Generation Estimate and Comparison

Lots	Acres	ITE Code	ITE Description	Value	Units [1]	Trip Generation Rates [2] Average Weekday	A.M. In	A.M. Out	P.M. In	P.M. Out	Driveway Trips Generated Average Weekday	A.M. In	A.M. Out	P.M. In	P.M. Out	% Primary	% Non-Primary	Non-Pass-by Trips Generated Average Weekday	A.M. In	A.M. Out	P.M. In	P.M. Out
INITIAL DEVELOPMENT																						
RV Storage Only																						
1 + 2	16.0		RV/Vehicle Storage	3.700	HOC	20.00	2.28	1.37	1.98	2.81	74	8	5	7	10	100%	0%	74	8	5	7	10
POTENTIAL FUTURE LAND USE SCENARIOS																						
Low-Intensity																						
1	7.5	710	General Office Building	21.500	KSF	9.74	1.00	0.16	0.18	0.97	209	21	3	4	21	100%	0%	209	21	3	4	21
		110	General Light Industrial	21.500	KSF	4.96	0.62	0.08	0.08	0.55	107	13	2	2	12	100%	0%	107	13	2	2	12
		820	Shopping Center	16.000	KSF	108.07	6.19	3.79	4.20	4.55	1729	99	61	67	73	42%	58%	726	42	26	28	31
2	8.5	151	Mini-Warehousing	115.600	KSF	1.51	0.06	0.04	0.08	0.09	175	7	5	9	10	100%	0%	175	7	5	9	10
										Total	**2220**	**141**	**71**	**82**	**116**			**1217**	**83**	**35**	**43**	**10**
High-Intensity																						
1 + 2	16.0	820	Shopping Center	113.000	KSF	57.81	1.14	0.70	2.53	2.74	**6533**	**129**	**79**	**286**	**309**	42%	58%	**2744**	**54**	**33**	**120**	**130**

[1] KSF = 1,000 square feet, HOC = hundred occupied spaces

[2] Source: "Trip Generation, 10th Edition, 2017" by the Institute of Transportation Engineers (ITE)

Note: "RV/Vehicle Storage" rates are based on RV storage facility turning movement counts conducted by LSC in El Paso County (2018)

Table 4
Tamlin Road RV Storage
Roadway Improvements

Item #	Improvement	Timing/"Trigger"	Responsibility	Eligible for Fee Program Credit/Reimbursement?
Auxiliary Turn Lanes				
1	Marksheffel Road/Tamlin Road - Southbound Left-Turn Lane	Potentially with Lot 1 or Lot 2 redevelopment (future)	Applicant	Potentially
2	Marksheffel Road/Tamlin Road - Northbound Right-Turn Accel Lane	Potentially with Lot 1 redevelopment (future)	Applicant	Potentially
Intersection Improvements				
3	Marksheffel Road/Tamlin Road - Median improvements to restrict the intersection to a three-quarter movement **or** channelized-T type intersection with the addition of a left-turn acceleration lane	Potentially with Lot 1 redevelopment (future)	Applicant (potentially under a Lot 1 redevelopment scenario), if not completed with a Marksheffel Road improvement project	Potentially
4	Marksheffel Road/Tamlin Road - Directional Traffic Signal (w/ channelized T option identified in #5 above)	Potentially with Lot 1 redevelopment (future)	Applicant	Potentially
Roadway Segment Improvements				
5	Marksheffel Road - Upgrade to Principal Arterial Standards	Potentially with Lot 1 redevelopment (future)	City of Colorado Springs	N/A
6	Tamlin Road - Upgrade to County Collector Standard Road	Potentially with Lot 1 redevelopment (future)	Applicant	Potentially
Site Access Construction				
7	Lot 2 Access - Aligning with the self storage acess on the north side of Tamlin	With Lot 2 redevelopment (future)	Applicant	No
8	Wayfinding signs for exiting motorists (per the traffic report narrative)	With Lot 2 RV storage use	Applicant	No
9	Lot 1 Access - Location(s) to be determined	Potentially with Lot 1 redevelopment (future)	Applicant	No

Source: LSC Transportation Consultants, Inc. (04-09-2020)

Figure 1

Vicinity

Tamlin Rd. Rezone (LSC# 184610)

TRANSPORTATION CONSULTANTS, INC.

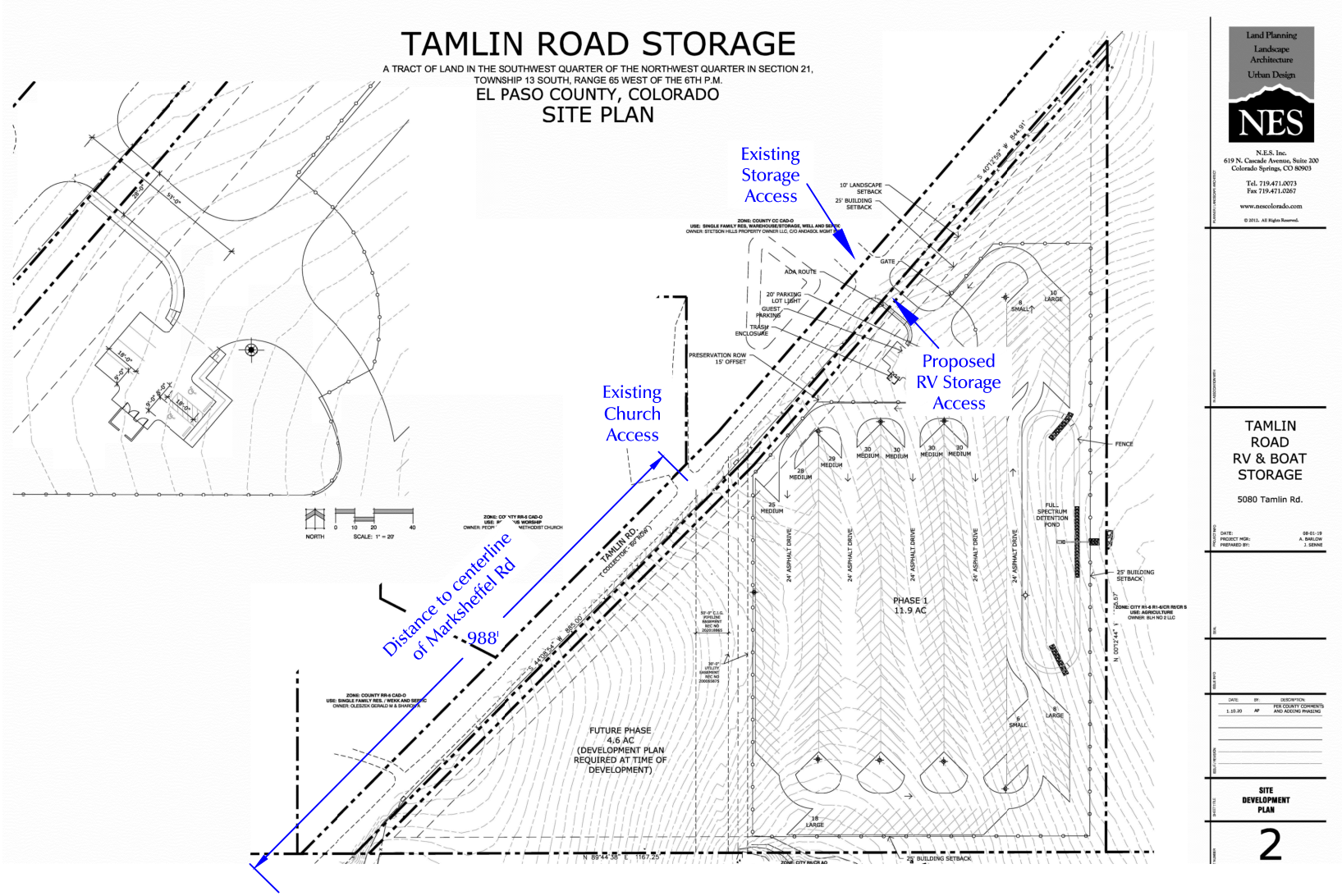


Figure 2

RV Storage Site Plan

Tamlin Rd. Rezone (LSC# 184610)

TRANSPORTATION CONSULTANTS, INC.

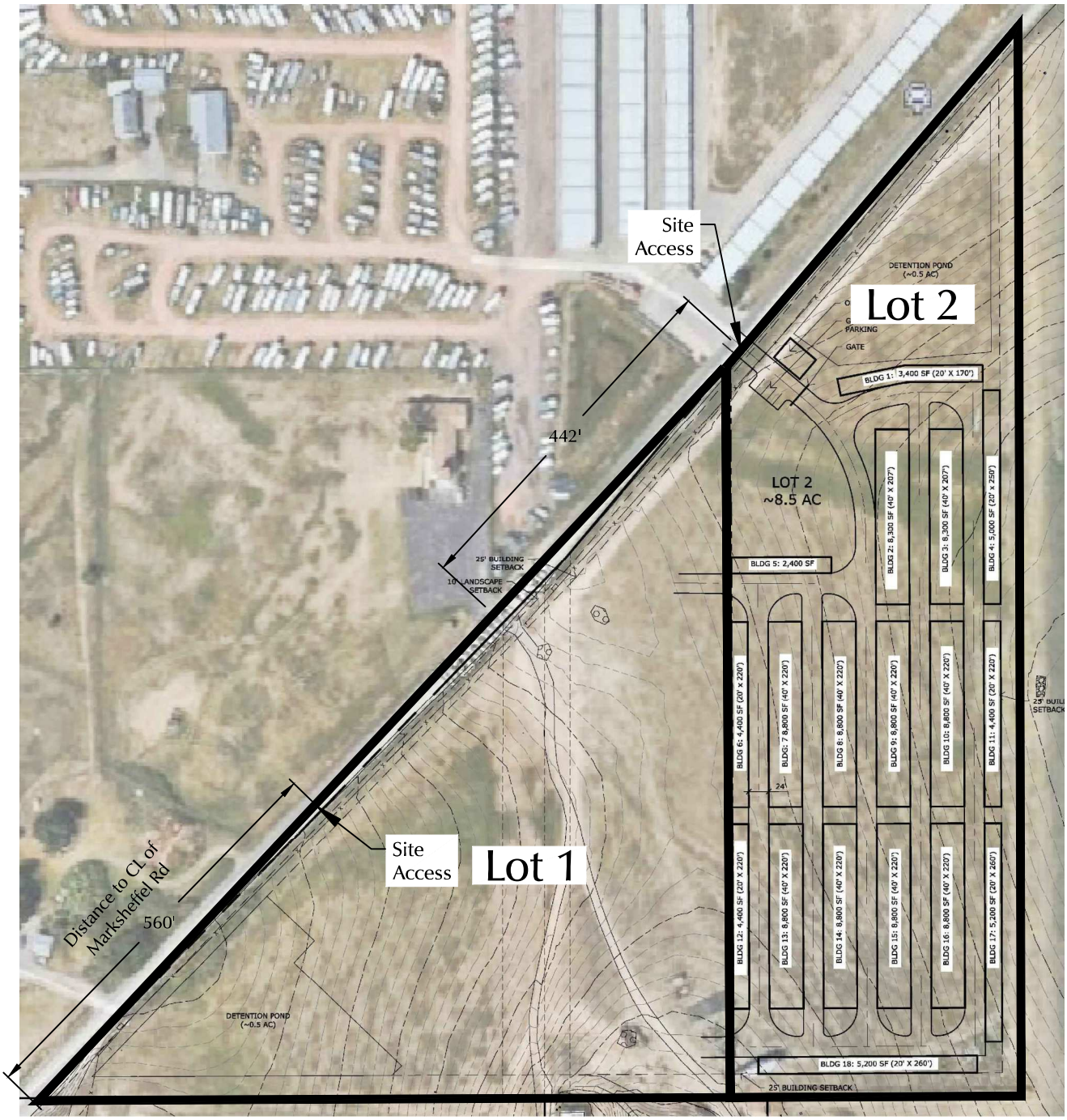


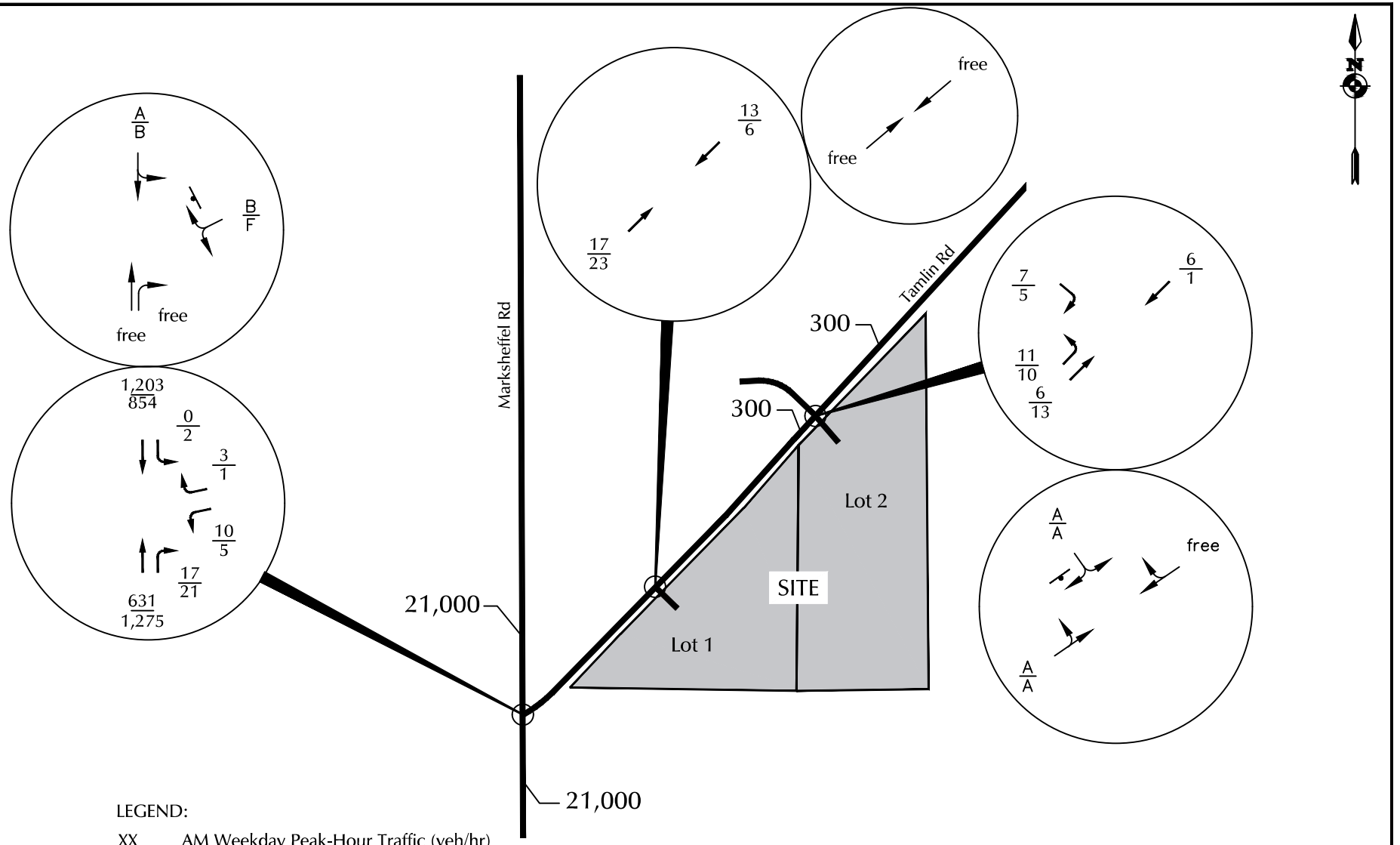
Figure 3

Potential Long Term Land Uses*

Tamlin Rd. Rezone (LSC# 184610)

*Potential "permanent" uses associated with the proposed zoning.

LSC TRANSPORTATION CONSULTANTS, INC.



LEGEND:

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (veh/hr) / PM Weekday Peak-Hour Traffic (veh/hr)

$\frac{A}{A}$ = AM Individual Movement LOS / PM Individual Movement LOS

$\frac{A}{A}$ = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

XX,XXX = Average Daily Traffic Volumes (ADTs)

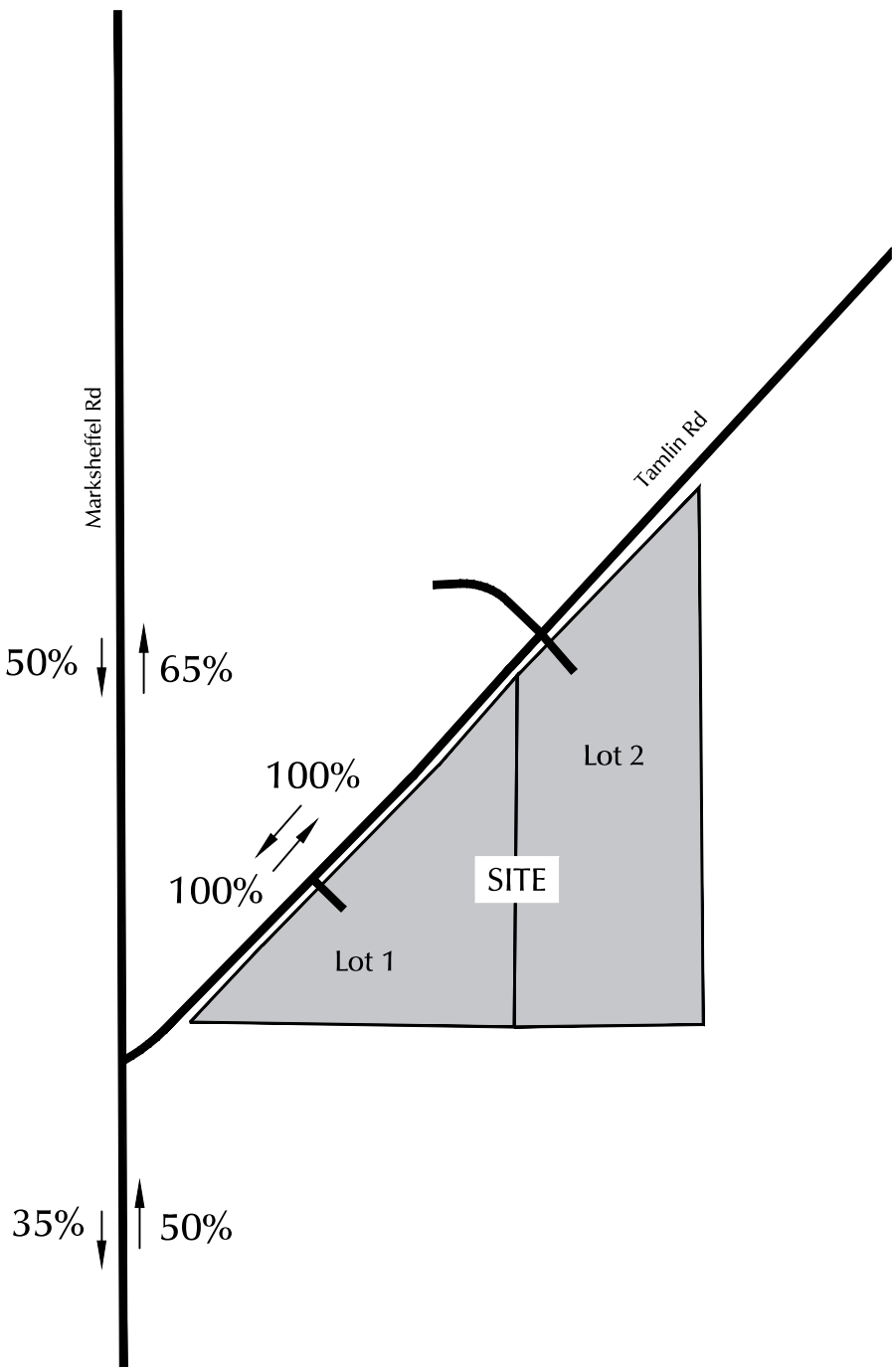
= Stop Sign

TRANSPORTATION CONSULTANTS, INC.

Figure 4

Existing Traffic, Lane Geometry, and Traffic Control

Tamlin Rd. Rezone (LSC# 184610)



XX% / XX% = Percent Directional Distribution (AM Peak Hour) / Percent Directional Distribution (PM Peak Hour)

Figure 5

Directional Distribution

Tamlin Rd. Rezone (LSC# 184610)

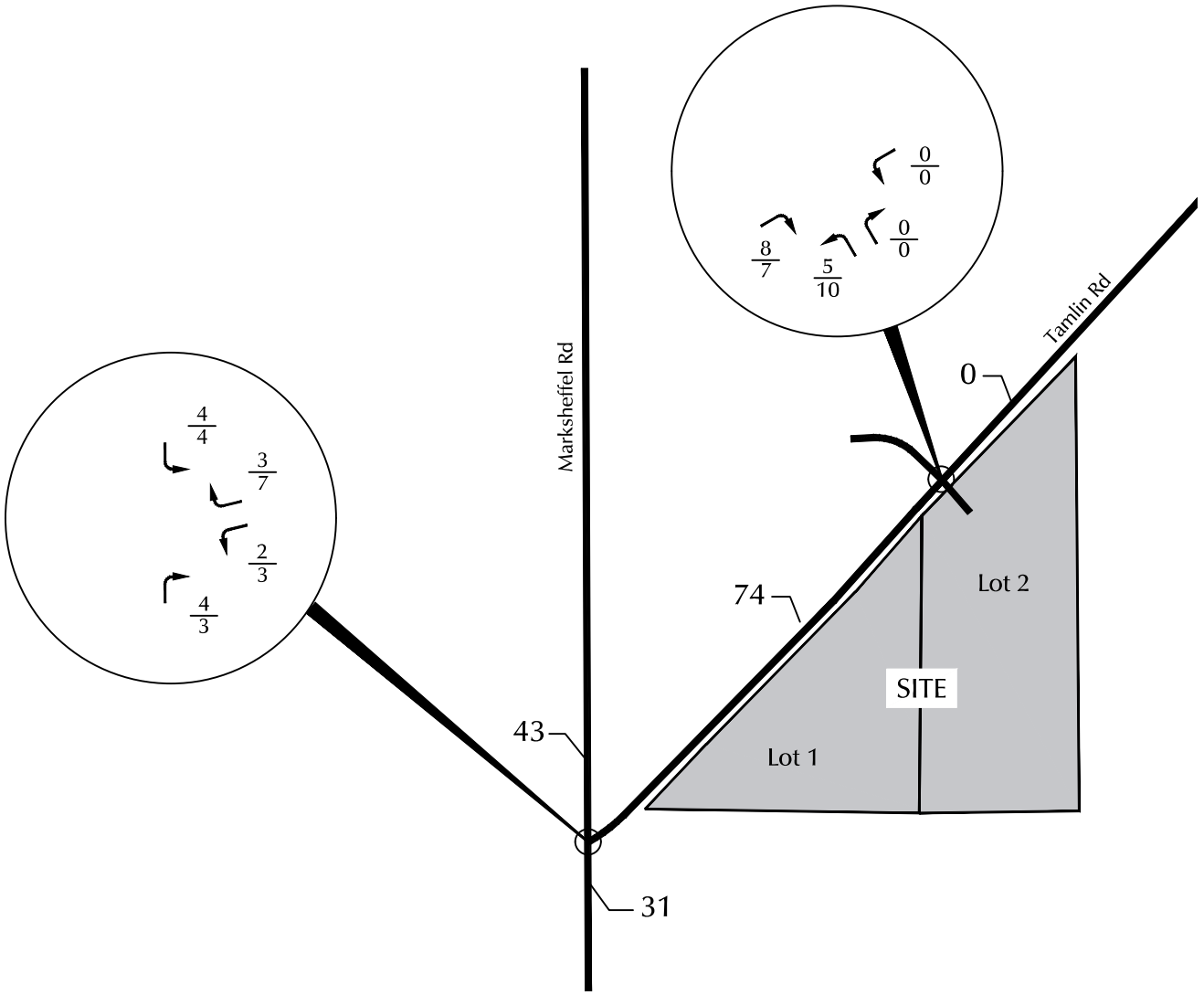


Figure 6

Site-Generated Traffic
Currently Proposed Use (Short Term)
(RV Storage Only)

Tamlin Rd. Rezone (LSC# 184610)

LEGEND:

$\frac{XX}{XX}$ = $\frac{\text{AM Weekday Peak-Hour Traffic (veh/hr)}}{\text{PM Weekday Peak-Hour Traffic (veh/hr)}}$

XX,XXX = Average Daily Traffic Volumes (ADTs)

LSC TRANSPORTATION CONSULTANTS, INC.

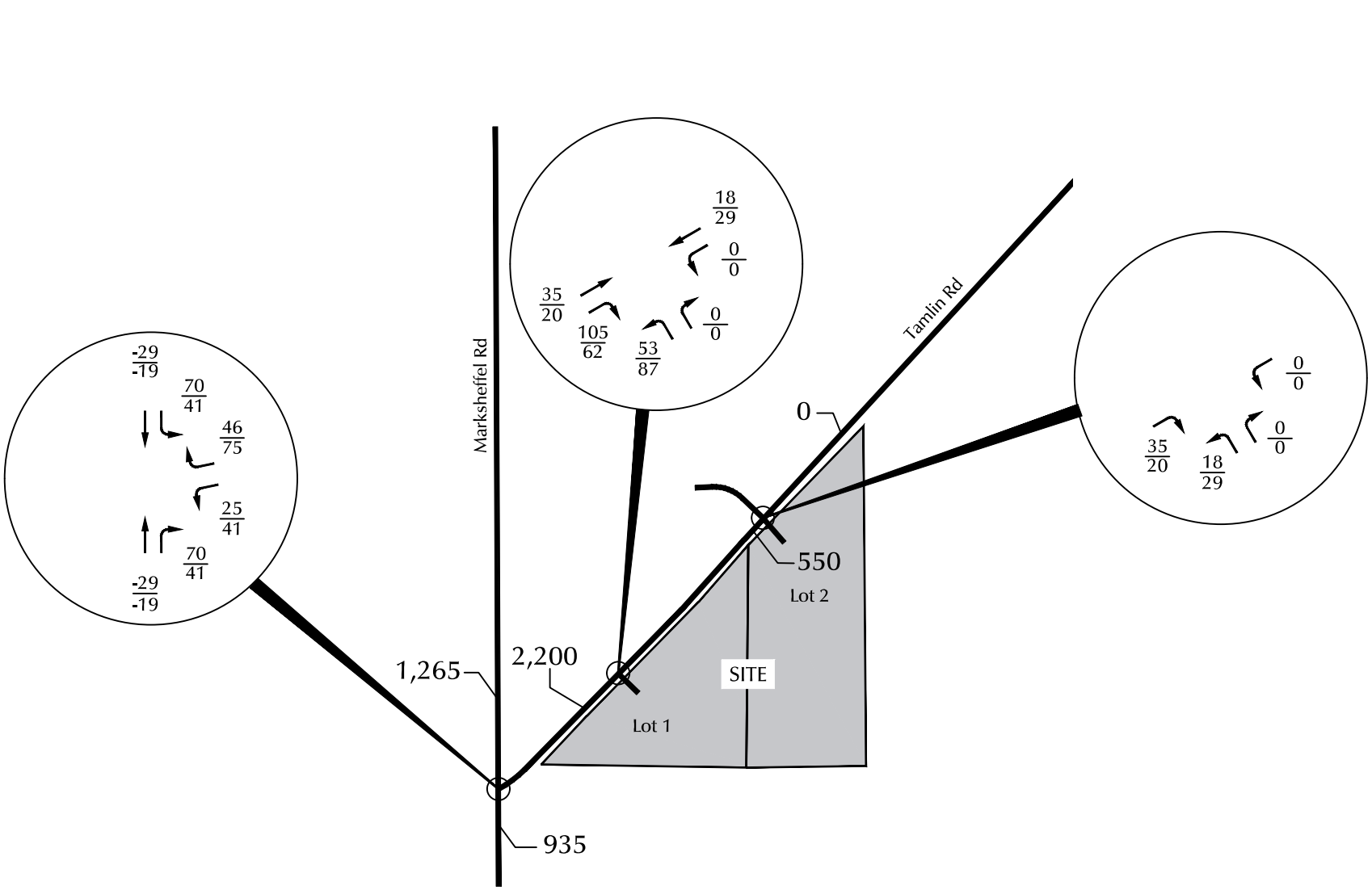


Figure 7

Potential Long-Term Site-Generated Traffic* Moderate-Intensity Buildout

*Associated with the proposed property zoning.

Tamlin Rd. Rezone (LSC# 184610)

LEGEND:

XX / XX = AM Weekday Peak-Hour Traffic (veh/hr) / PM Weekday Peak-Hour Traffic (veh/hr)

XX,XXX = Average Daily Traffic Volumes (ADTs)

LSC TRANSPORTATION CONSULTANTS, INC.

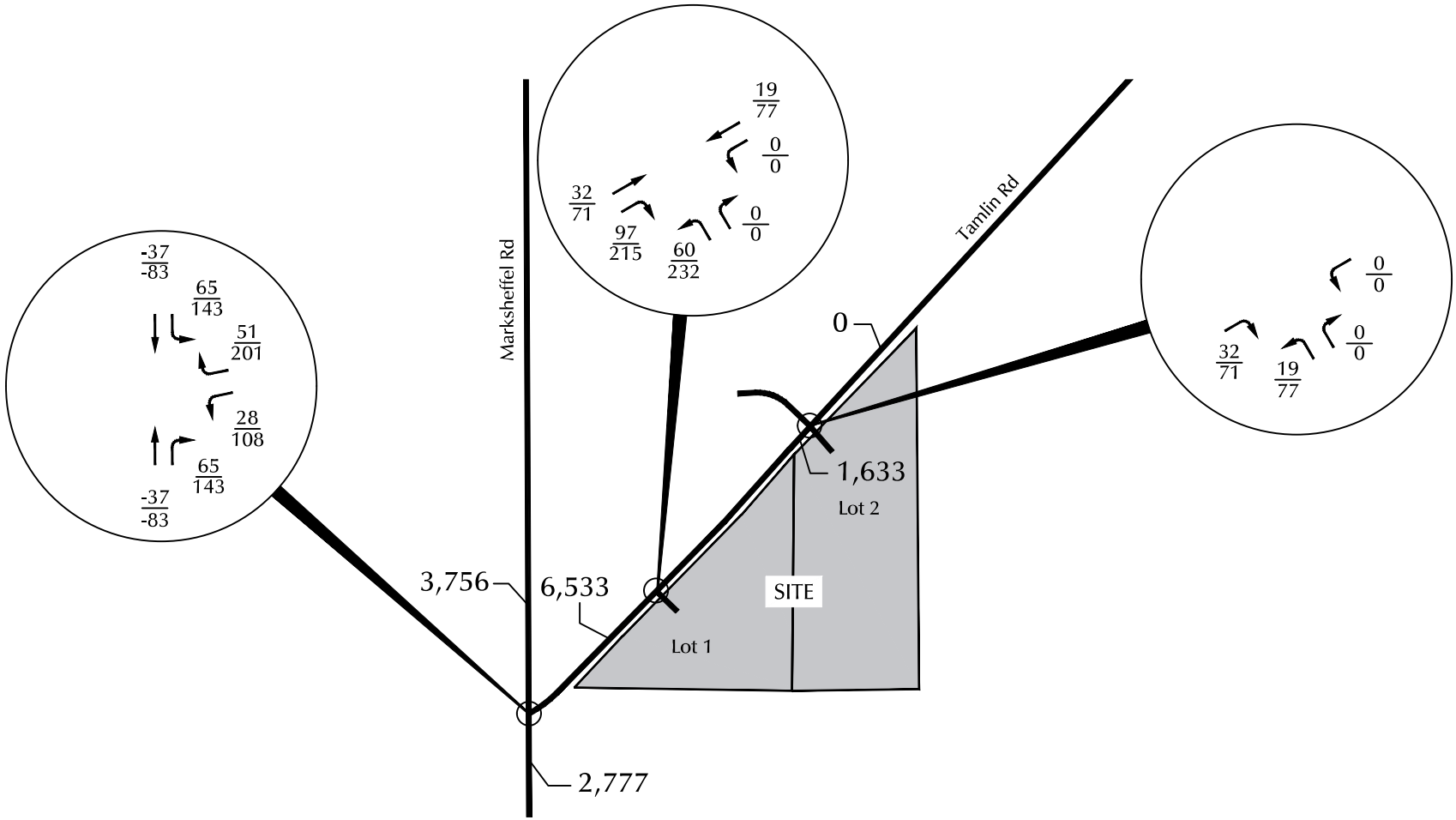


Figure 8

Potential Long-Term Site-Generated Traffic* High-Intensity Buildout

*Associated with the proposed property zoning

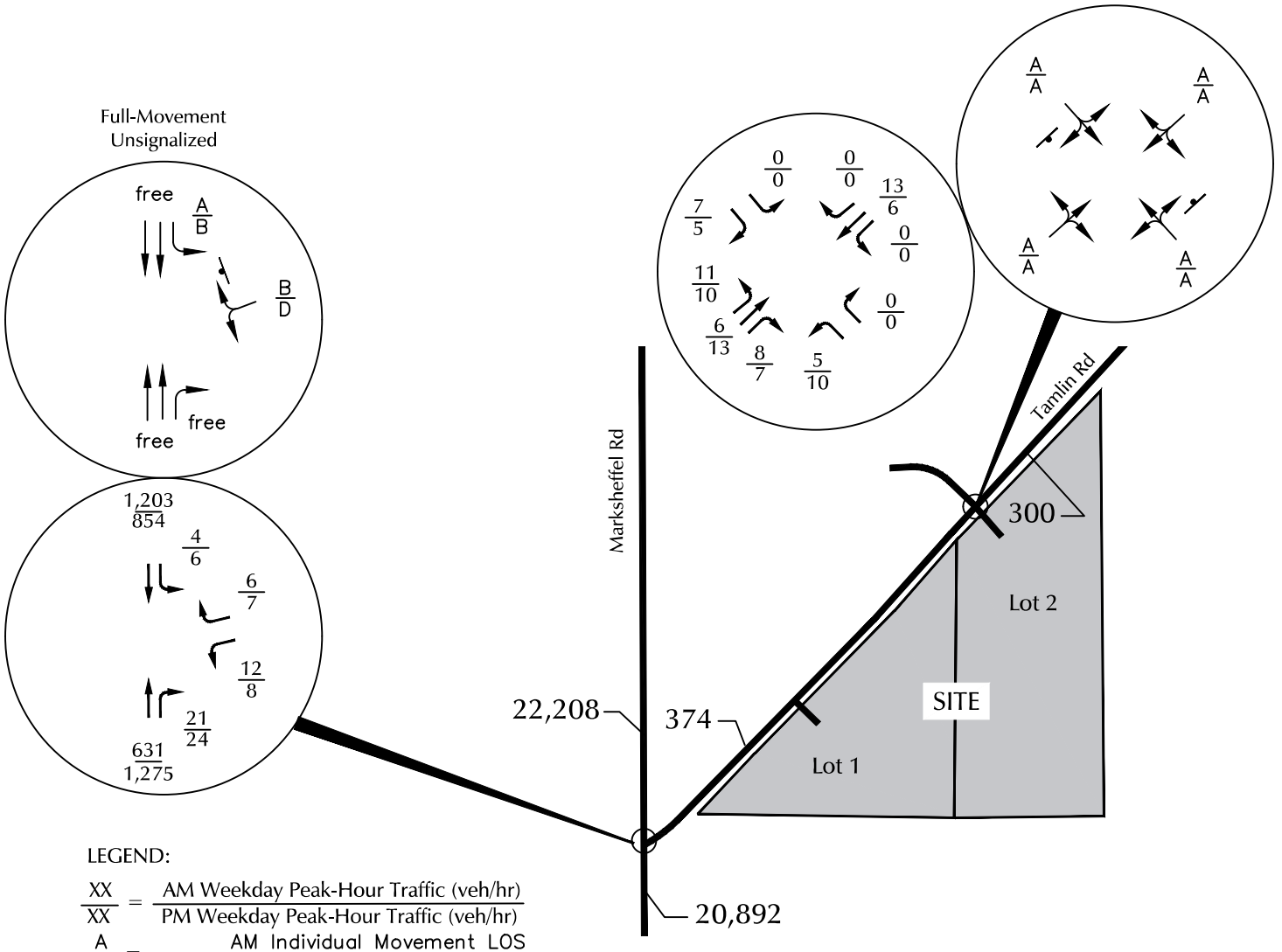
Tamlin Rd. Rezone (LSC# 184610)

LEGEND:

$\frac{XX}{XX}$ = $\frac{\text{AM Weekday Peak-Hour Traffic (veh/hr)}}{\text{PM Weekday Peak-Hour Traffic (veh/hr)}}$

XX,XXX = Average Daily Traffic Volumes (ADTs)

LSC TRANSPORTATION CONSULTANTS, INC.



LEGEND:

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (veh/hr) / PM Weekday Peak-Hour Traffic (veh/hr)

$\frac{A}{A}$ = AM Individual Movement LOS / PM Individual Movement LOS

$\frac{A}{A}$ = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

XX,XXX = Average Daily Traffic Volumes (ADTs)

= Stop Sign

* Volumes reflect existing plus the RV storage traffic volumes only.

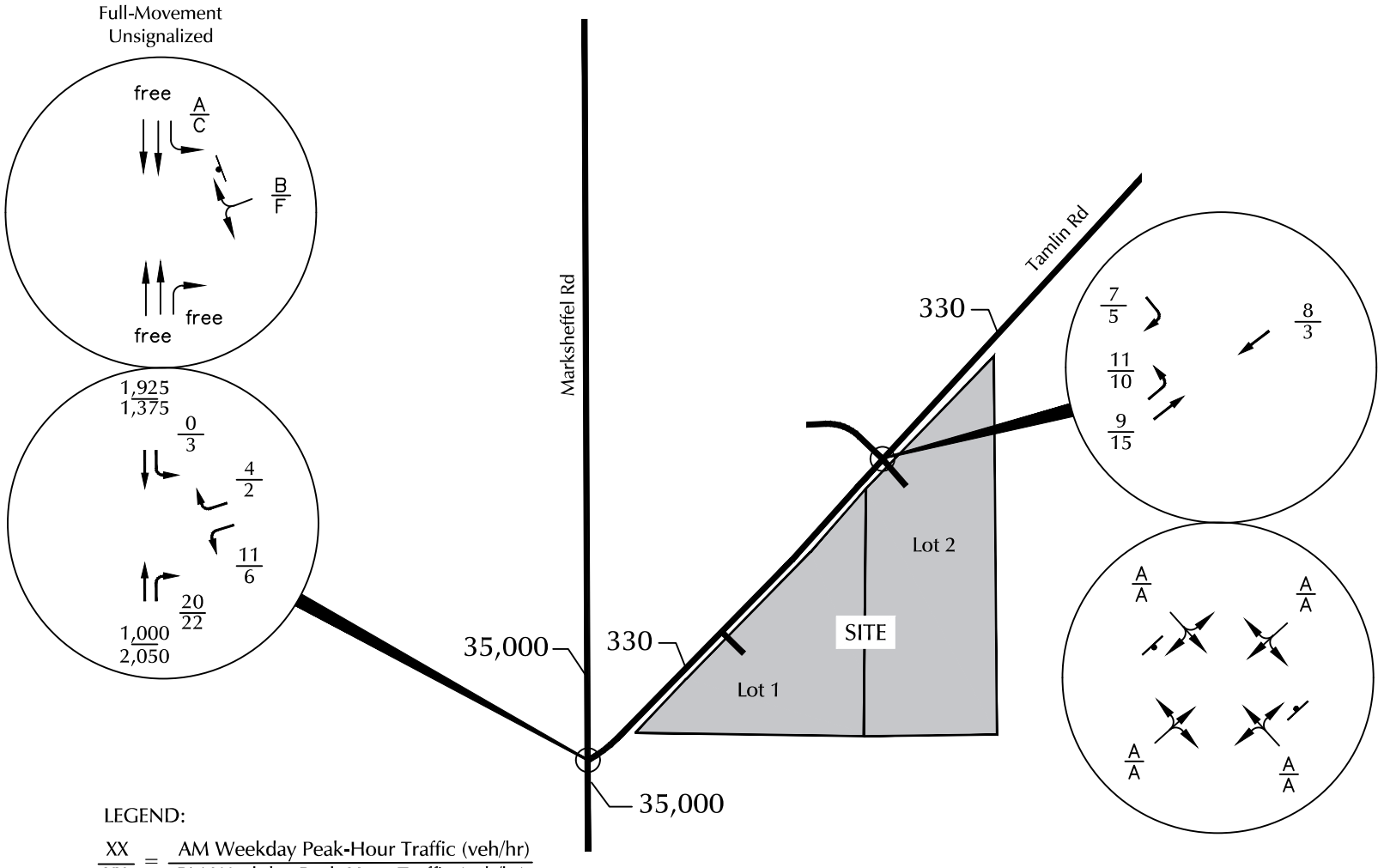
** Laneage for this scenario assumes Marksheffel improved to a five-lane roadway

TRANSPORTATION CONSULTANTS, INC.

Figure 9

Currently-Proposed Use (Short-Term) Total Traffic* (RV Storage Only), Lane Geometry**, and Traffic Control

Tamlin Rd. Rezone (LSC# 184610)



LEGEND:

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (veh/hr) / PM Weekday Peak-Hour Traffic (veh/hr)

$\frac{A}{A}$ = AM Individual Movement LOS / PM Individual Movement LOS

$\frac{A}{A}$ = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

XX,XXX = Average Daily Traffic Volumes (ADTs)

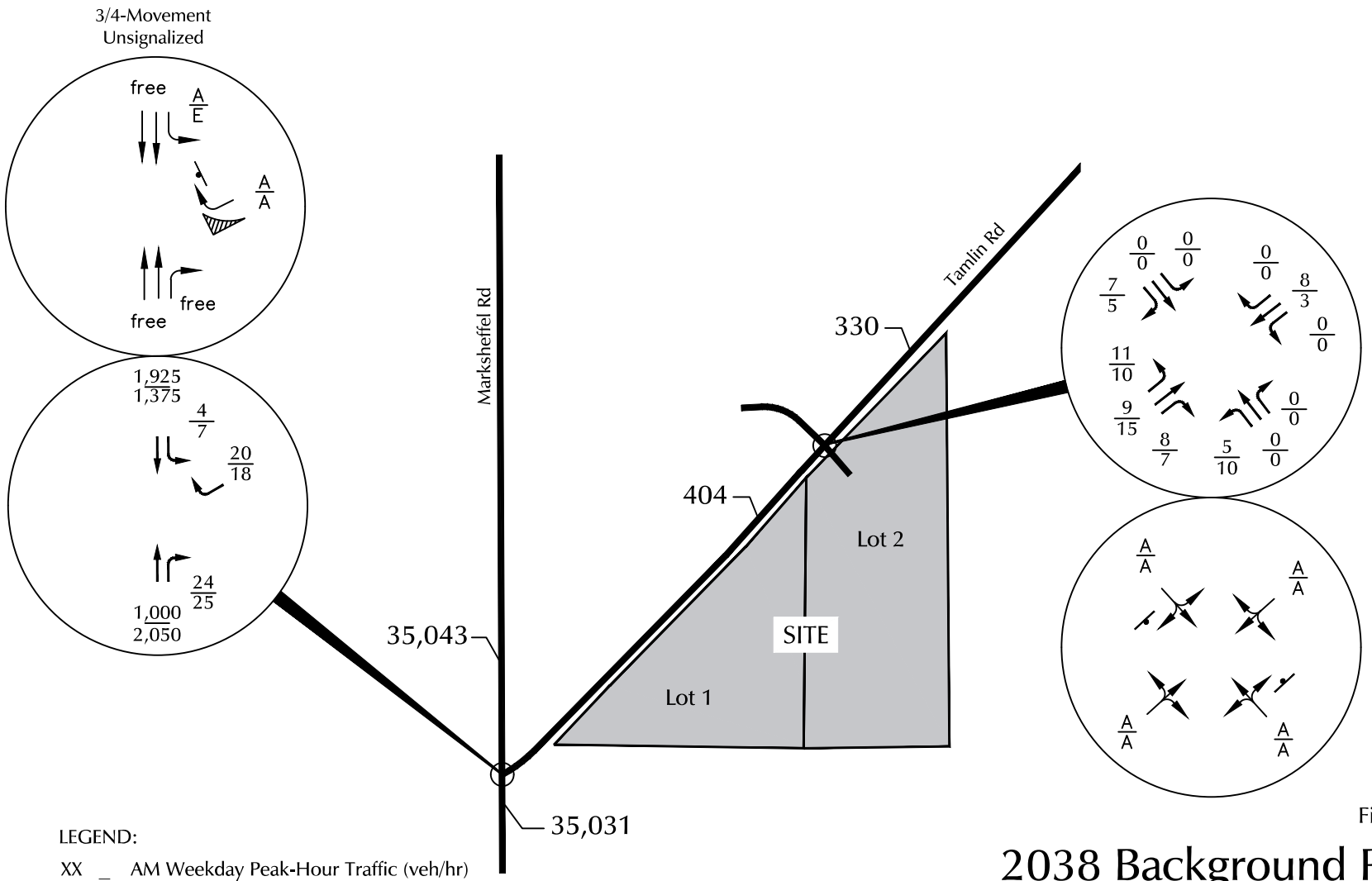
= Stop Sign

TRANSPORTATION CONSULTANTS, INC.

Figure 10

2038 Background Traffic, Lane Geometry, and Traffic Control

Tamlin Rd. Rezone (LSC# 184610)



LEGEND:

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (veh/hr) / PM Weekday Peak-Hour Traffic (veh/hr)

$\frac{A}{A}$ = AM Individual Movement LOS / PM Individual Movement LOS

$\frac{A}{A}$ = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

XX,XXX = Average Daily Traffic Volumes (ADTs)

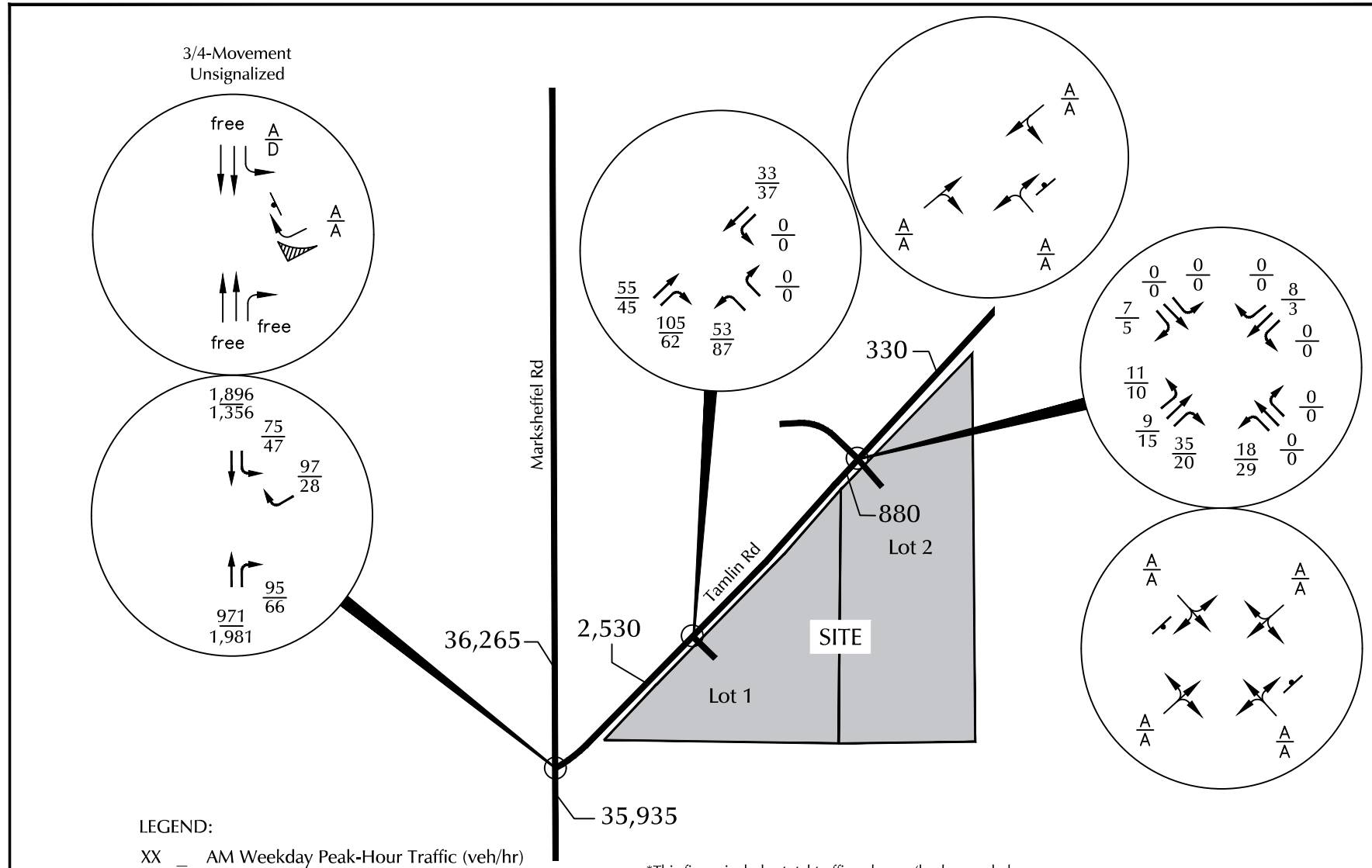
= Stop Sign

TRANSPORTATION CONSULTANTS, INC.

Figure 11

2038 Background Plus Currently-Proposed Use Site-Generated Traffic (RV Storage Only), Lane Geometry, and Traffic Control

Tamlin Rd. Rezone (LSC# 184610)



LEGEND:

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (veh/hr) / PM Weekday Peak-Hour Traffic (veh/hr)

$\frac{A}{A}$ = AM Individual Movement LOS / PM Individual Movement LOS

$\frac{A}{A}$ = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

XX,XXX = Average Daily Traffic Volumes (ADTs)

= Stop Sign

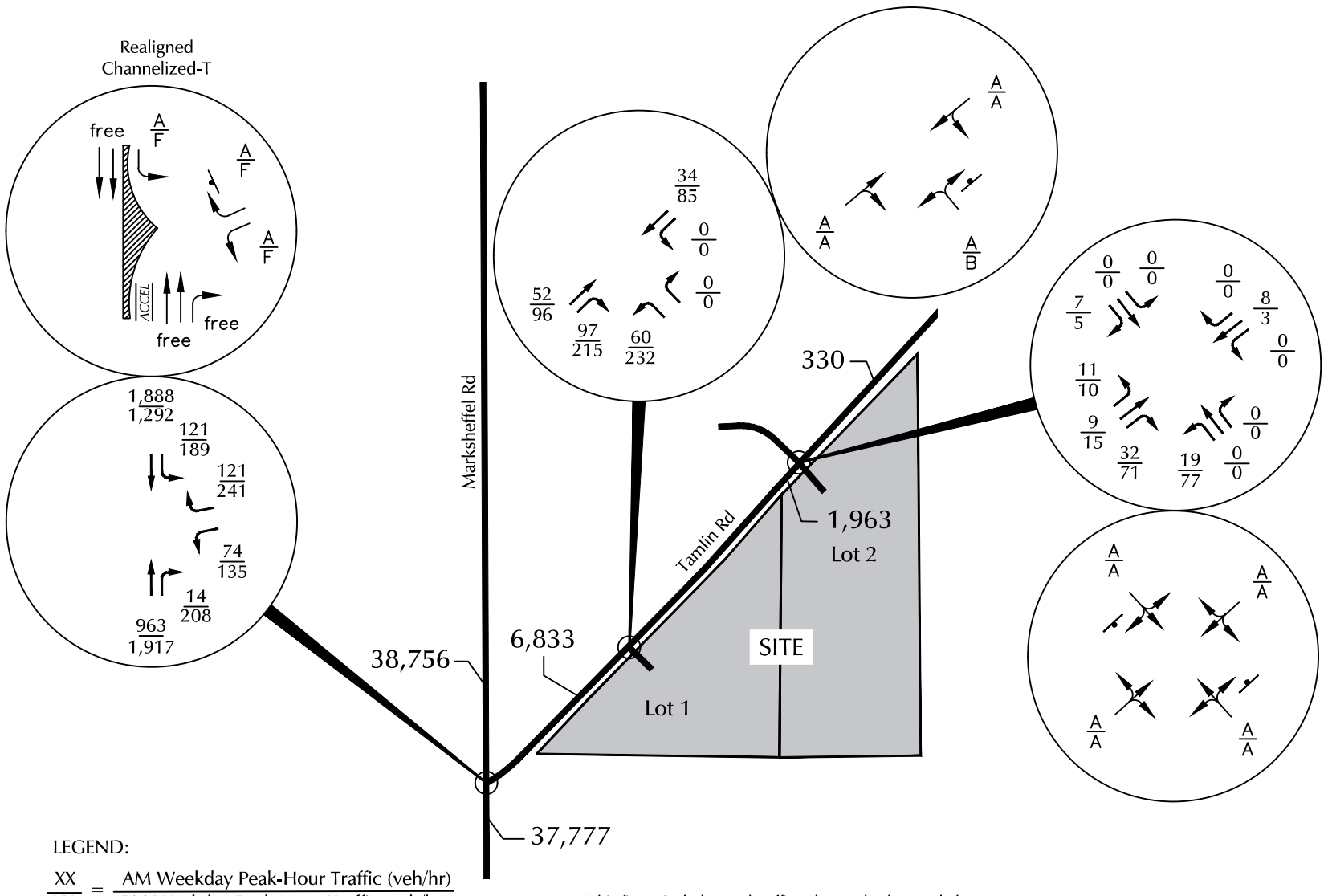
*This figure includes total traffic volumes (background plus moderate-intensity site-generated traffic), anticipated lane geometry and traffic control for the potential long-term moderate-intensity land use scenario associated with the proposed property zoning.

Figure 12

2038 Total Traffic Moderate Intensity Scenario*

Tamlin Rd. Rezone (LSC# 184610)

TRANSPORTATION CONSULTANTS, INC.



LEGEND:

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (veh/hr) / PM Weekday Peak-Hour Traffic (veh/hr)

$\frac{A}{A}$ = AM Individual Movement LOS / PM Individual Movement LOS

$\frac{A}{A}$ = AM Entire Intersection Peak-Hour Level of Service / PM Entire Intersection Peak-Hour Level of Service

XX,XXX = Average Daily Traffic Volumes (ADTs)

= Stop Sign

*This figure includes total traffic volumes (background plus moderate-intensity site-generated traffic), anticipated lane geometry and traffic control for the potential long-term high-intensity land use scenario associated with the proposed property zoning.

Figure 13

2038 Total Traffic High Intensity Scenario*

Tamlin Rd. Rezone (LSC# 184610)

TRANSPORTATION CONSULTANTS, INC.

Traffic Counts

TRANSPORTATION
CONSULTANTS, INC.

LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210
Colorado Springs, CO 80905
719-633-2868

File Name : Marksheffel rd - Tamlin Rd AM
Site Code : 184610
Start Date : 7/10/2018
Page No : 1

Groups Printed- Unshifted

	Marksheffel Rd Southbound				Tamlin Rd Westbound				Marksheffel Rd Northbound				Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
06:30	0	257	0	0	4	0	0	0	0	143	5	0	0	0	0	0	409
06:45	0	302	0	0	3	0	0	0	0	147	8	0	0	0	0	0	460
Total	0	559	0	0	7	0	0	0	0	290	13	0	0	0	0	0	869
07:00	0	306	0	0	2	0	0	0	0	158	5	0	0	0	0	0	471
07:15	0	312	0	0	2	0	3	0	0	166	3	0	0	0	0	0	486
07:30	0	283	0	0	3	0	0	0	0	160	1	0	0	0	0	0	447
07:45	0	278	0	0	2	0	0	0	0	165	2	0	0	0	0	0	447
Total	0	1179	0	0	9	0	3	0	0	649	11	0	0	0	0	0	1851
08:00	0	272	0	0	2	0	0	0	0	157	2	0	0	0	0	0	433
08:15	0	263	0	0	1	0	0	0	0	149	1	0	0	0	0	0	414
Grand Total	0	2273	0	0	19	0	3	0	0	1245	27	0	0	0	0	0	3567
Apprch %	0	100	0	0	86.4	0	13.6	0	0	97.9	2.1	0	0	0	0	0	
Total %	0	63.7	0	0	0.5	0	0.1	0	0	34.9	0.8	0	0	0	0	0	

LSC Transportation Consultants, Inc.

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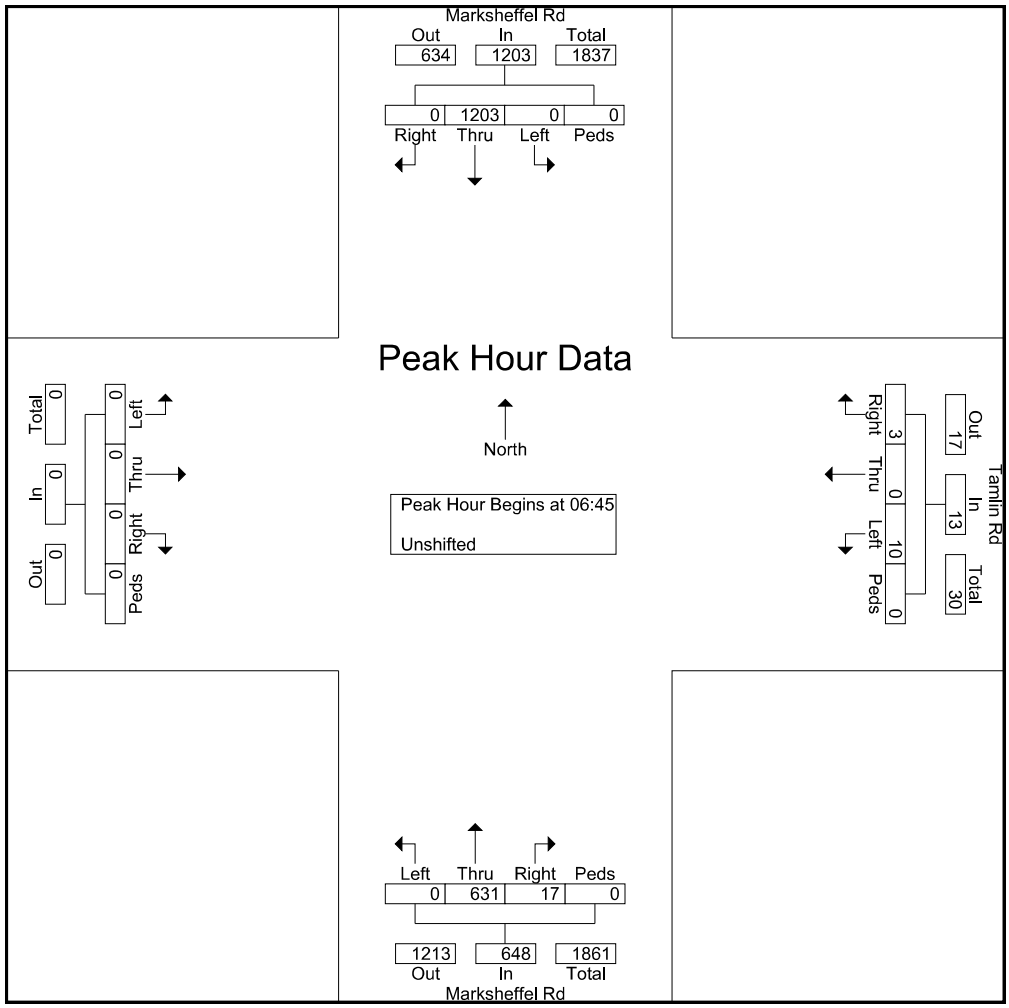
719-633-2868

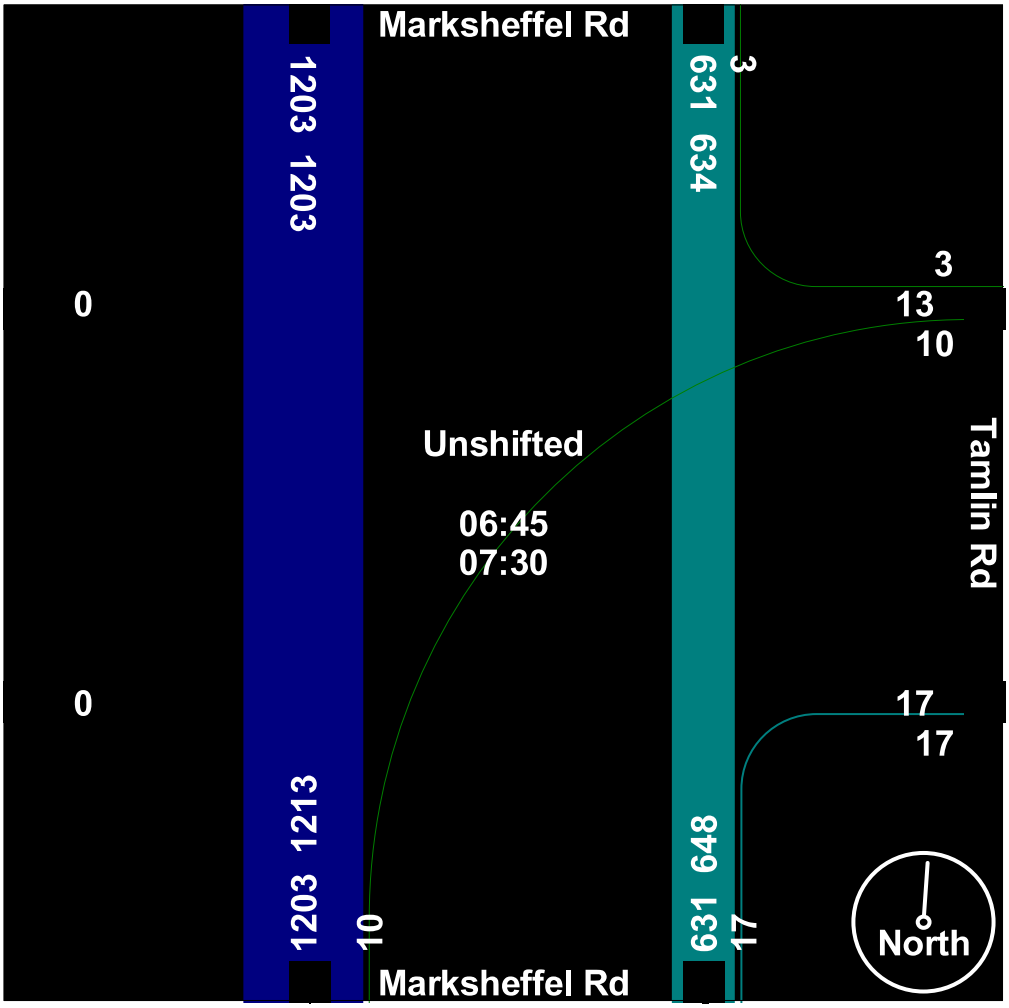
File Name : Marksheffel rd - Tamlin Rd AM
Site Code : 184610
Start Date : 7/10/2018

	Marksheffel Rd Southbound					Tamlin Rd Westbound					Marksheffel Rd Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 to 08:15 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:45																					
06:45	0	302	0	0	302	**3**	0	0	0	3	0	147	**8**	0	155	0	0	0	0	0	460
07:00	0	306	0	0	306	2	0	0	0	2	0	158	5	0	163	0	0	0	0	0	471
07:15	0	**312**	0	0	**312**	2	0	**3**	0	**5**	0	**166**	3	0	**169**	0	0	0	0	0	**486**
07:30	0	283	0	0	283	3	0	0	0	3	0	160	1	0	161	0	0	0	0	0	447
Total Volume	0	1203	0	0	1203	10	0	3	0	13	0	631	17	0	648	0	0	0	0	0	1864
% App. Total	0	100	0	0		76.9	0	23.1	0		0	97.4	2.6	0		0	0	0	0		
PHF	.000	.964	.000	.000	.964	.833	.000	.250	.000	.650	.000	.950	.531	.000	.959	.000	.000	.000	.000	.000	.959



LSC Transportation Consultants, Inc.
545 E Pikes Peak Ave, Suite 210
Colorado Springs, CO 80905
719-633-2868

File Name : Marksheffel rd - Tamlin Rd AM
Site Code : 184610
Start Date : 7/10/2018
Page No : 3



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545 E Pikes Peak Ave, Suite 210
Colorado Springs, CO 80905
719-633-2868

File Name : Marksheffel rd - Tamlin Rd PM
Site Code : 184610
Start Date : 7/10/2018
Page No : 1

Groups Printed- Unshifted

	Marksheffel Rd Southbound				Tamlin Rd Westbound				Marksheffel Rd Northbound				Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
16:00	1	184	0	0	1	0	1	0	0	273	2	0	0	0	0	0	462
16:15	0	207	0	0	2	0	2	0	0	283	7	0	0	0	0	0	501
16:30	0	199	0	0	1	0	0	0	0	304	1	0	0	0	0	0	505
16:45	0	211	0	0	0	0	0	0	0	330	5	0	0	0	0	0	546
Total	1	801	0	0	4	0	3	0	0	1190	15	0	0	0	0	0	2014
17:00	1	192	0	0	3	0	1	0	0	330	6	0	0	0	0	0	533
17:15	1	214	0	0	1	0	0	0	0	307	4	0	0	0	0	0	527
17:30	0	237	0	0	1	0	0	0	0	308	6	0	0	0	0	0	552
17:45	0	174	0	0	2	0	1	0	0	263	3	0	0	0	0	0	443
Total	2	817	0	0	7	0	2	0	0	1208	19	0	0	0	0	0	2055
Grand Total	3	1618	0	0	11	0	5	0	0	2398	34	0	0	0	0	0	4069
Apprch %	0.2	99.8	0	0	68.8	0	31.2	0	0	98.6	1.4	0	0	0	0	0	
Total %	0.1	39.8	0	0	0.3	0	0.1	0	0	58.9	0.8	0	0	0	0	0	

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File Name : Marksheffel rd - Tamlin Rd PM
Site Code : 184610
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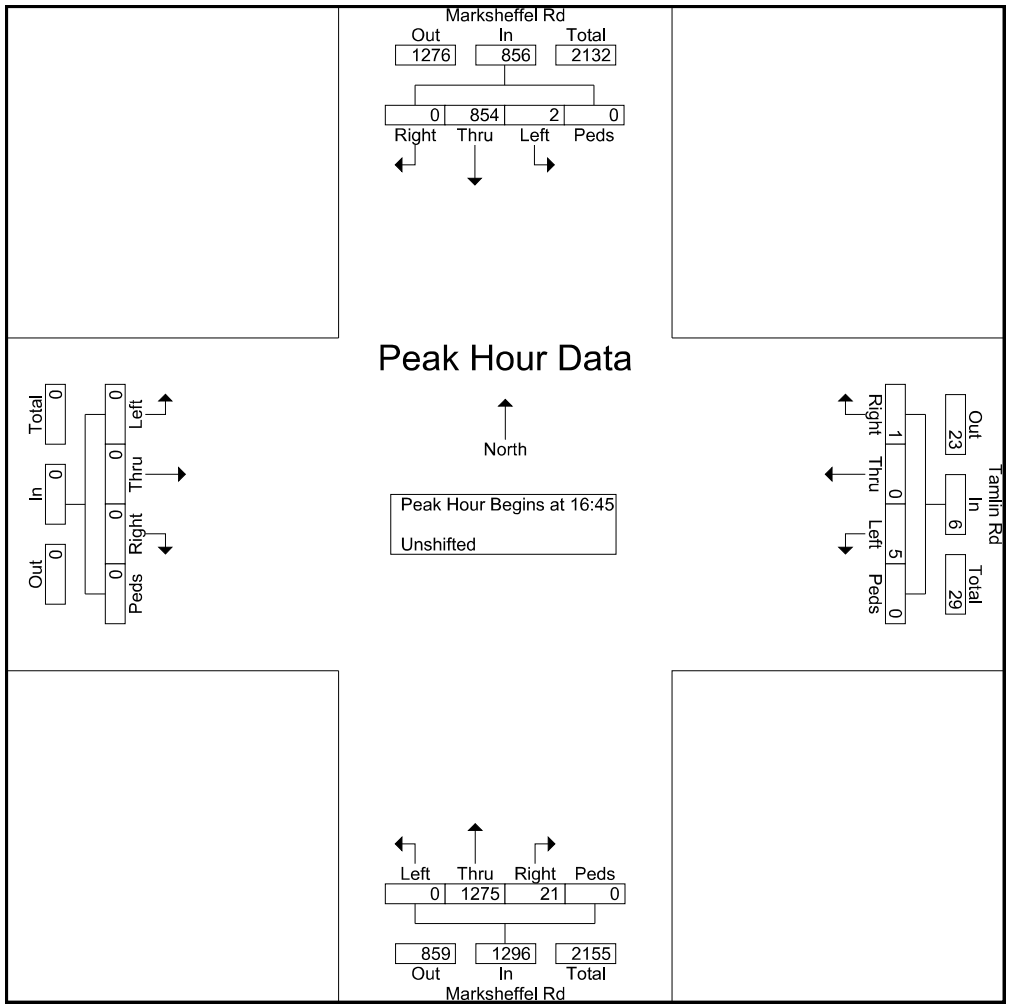
Page No : 2

	Marksheffel Rd Southbound					Tamlin Rd Westbound					Marksheffel Rd Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:45																					
16:45	0	211	0	0	211	0	0	0	0	0	0	**330**	5	0	335	0	0	0	0	0	546
17:00	**1**	192	0	0	193	**3**	0	**1**	0	**4**	0	330	**6**	0	**336**	0	0	0	0	0	533
17:15	1	214	0	0	215	1	0	0	0	1	0	307	4	0	311	0	0	0	0	0	527
17:30	0	**237**	0	0	**237**	1	0	0	0	1	0	308	6	0	314	0	0	0	0	0	**552**
Total Volume	2	854	0	0	856	5	0	1	0	6	0	1275	21	0	1296	0	0	0	0	0	2158
% App. Total	0.2	99.8	0	0		83.3	0	16.7	0		0	98.4	1.6	0		0	0	0	0		
PHF	.500	.901	.000	.000	.903	.417	.000	.250	.000	.375	.000	.966	.875	.000	.964	.000	.000	.000	.000	.000	.977



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File Name : Marksheffel rd - Tamlin Rd PM
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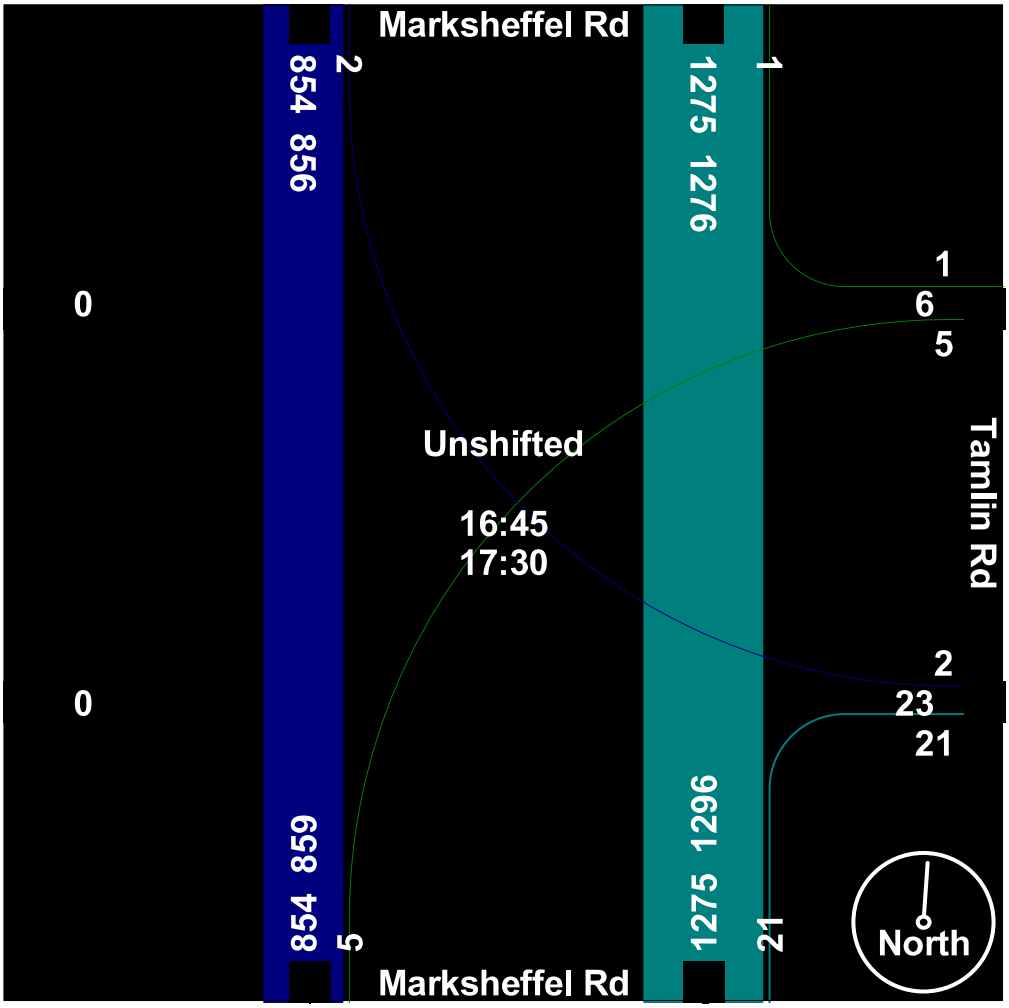


Levels of Service - SimTraffic

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #1 7:00

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.0	0.1		0.5	0.0	0.0	0.3
Total Del/Veh (s)	2.6	2.3		1.2	0.3	3.0	1.7

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #2 7:15

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.0	0.2	1.2	0.4		0.0	0.3
Total Del/Veh (s)	2.7	1.8	4.5	1.1		3.0	1.7

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #3 7:30

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.0	0.1	2.7	0.5	0.0	0.0	0.3
Total Del/Veh (s)	3.1	2.5	3.5	1.3	1.0	3.6	1.9

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #4 7:45

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.0	0.0		0.4	0.0	0.0	0.3
Total Del/Veh (s)	2.7	1.9	0.4	1.3	0.4	3.2	1.8

6: Marksheffel Rd & Tamlin Rd Performance by movement Entire Run

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.0	0.1	1.8	0.5	0.0	0.0	0.3
Total Del/Veh (s)	2.9	2.1	3.1	1.3	0.7	3.2	1.8

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #0 6:50

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.2	1.8	3.1	0.2	0.0	0.2
Total Del/Veh (s)	2.8	1.6	34.7	0.8	3.3	2.1

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #1 7:00

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.2	1.5	2.8	0.2	0.0	0.2
Total Del/Veh (s)	2.9	2.8	13.8	0.8	3.1	2.1

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #2 7:15

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.2	1.7	1.3	0.2	0.0	0.2
Total Del/Veh (s)	2.8	2.4	12.0	0.8	3.0	2.0

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #3 7:30

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.3	2.0	3.6	0.3	0.0	0.3
Total Del/Veh (s)	2.9	2.6	44.7	0.8	3.4	2.1

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #4 7:45

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.2	2.0	2.6	0.2	0.0	0.2
Total Del/Veh (s)	2.5	1.9	21.8	0.8	3.0	1.8

6: Marksheffel Rd & Tamlin Rd Performance by movement Entire Run

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.2	1.7	2.1	0.2	0.0	0.2
Total Del/Veh (s)	2.8	2.2	19.9	0.8	3.3	2.0

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #1 7:00

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.0	0.2	1.8	0.4	0.0	0.3
Total Del/Veh (s)	2.8	2.0	6.5	1.2	3.2	1.9

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #2 7:15

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.0	0.3	2.0	0.5	0.0	0.4
Total Del/Veh (s)	3.1	2.4	6.5	1.2	3.2	2.0

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #3 7:30

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.0	0.5	2.0	0.5	0.0	0.4
Total Del/Veh (s)	3.0	2.9	7.0	1.3	3.3	2.0

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #4 7:45

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.0	0.2	2.1	0.5	0.0	0.3
Total Del/Veh (s)	2.7	2.4	6.1	1.2	3.3	1.8

6: Marksheffel Rd & Tamlin Rd Performance by movement Entire Run

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.0	0.3	2.0	0.5	0.0	0.3
Total Del/Veh (s)	3.0	2.5	6.7	1.2	3.3	2.0

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #0 6:50

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.2	1.8	2.4	0.3		0.0	0.3
Total Del/Veh (s)	2.8	1.3	34.4	0.8		3.5	2.6

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #1 7:00

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.2	1.4	2.4	0.2	0.0	0.0	0.3
Total Del/Veh (s)	3.1	1.6	17.7	0.7	2.2	3.3	2.4

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #2 7:15

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.2	1.5	2.0	0.3		0.0	0.3
Total Del/Veh (s)	3.0	1.8	30.2	0.8		3.4	2.5

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #3 7:30

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.2	1.5	2.3	0.3	0.0	0.3
Total Del/Veh (s)	2.5	1.5	22.4	0.9	3.5	2.1

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #4 7:45

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.2	2.1	2.5	0.3	0.0	0.0	0.3
Total Del/Veh (s)	2.6	1.5	12.4	0.9	1.5	3.4	2.0

6: Marksheffel Rd & Tamlin Rd Performance by movement Entire Run

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.2	1.7	2.4	0.3	0.0	0.0	0.3
Total Del/Veh (s)	2.8	1.6	24.2	0.8	2.2	3.5	2.3

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #1 7:00

Movement	WBL	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	26.7	6.6	0.9	0.4	8.9	2.2

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #2 7:15

Movement	WBL	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	23.6	5.0	0.7	0.2	6.5	1.9

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #3 7:30

Movement	WBL	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	16.4	6.8	0.8	0.3	9.8	2.0

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #4 7:45

Movement	WBL	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	19.3	6.5	0.8	0.2	6.1	1.8

5: Marksheffel Rd & Tamlin Rd Performance by movement Entire Run

Movement	WBL	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	21.1	6.5	0.8	0.3	7.9	2.0

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #1 7:00

Movement	WBL	WBT	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	693.0		261.2	2.0	1.0	145.3	55.8

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #2 7:15

Movement	WBL	WBT	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	863.2		771.4	1.7	1.0	140.6	68.7

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #3 7:30

Movement	WBL	WBT	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)				0.0	0.0	0.0	0.3
Total Del/Veh (s)	900.0		900.0	1.7	0.9	173.7	69.8

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #4 7:45

Movement	WBL	WBT	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)				0.0	0.0	0.0	0.8
Total Del/Veh (s)	897.8		899.7	1.7	0.9	211.4	71.4

5: Marksheffel Rd & Tamlin Rd Performance by movement Entire Run

Movement	WBL	WBT	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	11.9		11.9	0.0	0.0	0.0	0.3
Total Del/Veh (s)	3060.6		1088.5	1.8	1.0	195.0	70.7

Levels of Service - Synchro

TRANSPORTATION
CONSULTANTS, INC.

Intersection	
Int Delay, s/veh	0.3

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	1275	21	2	854	5	1
Future Vol, veh/h	1275	21	2	854	5	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	215	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	90	90	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1328	22	2	949	6	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1350	0	2281	1328
Stage 1	-	-	-	-	1328	-
Stage 2	-	-	-	-	953	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	510	-	44	190
Stage 1	-	-	-	-	247	-
Stage 2	-	-	-	-	375	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	510	-	44	190
Mov Cap-2 Maneuver	-	-	-	-	44	-
Stage 1	-	-	-	-	247	-
Stage 2	-	-	-	-	372	-

Approach	NB	SB	SW
HCM Control Delay, s	0	0	88.5
HCM LOS			F

Minor Lane/Major Mvmt	NBT	NBR	SBL	SBT	SWLn1
Capacity (veh/h)	-	-	510	-	50
HCM Lane V/C Ratio	-	-	0.004	-	0.141
HCM Control Delay (s)	-	-	12.1	0	88.5
HCM Lane LOS	-	-	B	A	F
HCM 95th %tile Q(veh)	-	-	0	-	0.5

Intersection	
Int Delay, s/veh	0.1

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	631	17	0	1203	10	3
Future Vol, veh/h	631	17	0	1203	10	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	215	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	65	65
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	657	18	0	1253	15	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	675	0	1910	657
Stage 1	-	-	-	-	657	-
Stage 2	-	-	-	-	1253	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	916	-	*0	465
Stage 1	-	-	-	-	*516	-
Stage 2	-	-	-	-	*108	-
Platoon blocked, %	-	-		-	1	
Mov Cap-1 Maneuver	-	-	916	-	*0	465
Mov Cap-2 Maneuver	-	-	-	-	*0	-
Stage 1	-	-	-	-	*516	-
Stage 2	-	-	-	-	*108	-

Approach	NB	SB	SW
HCM Control Delay, s	0	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBT	NBR	SBL	SBT	SWLn1
Capacity (veh/h)	-	-	916	-	465
HCM Lane V/C Ratio	-	-	-	-	0.043
HCM Control Delay (s)	-	-	0	-	13.1
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	0.1

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

Intersection	
Int Delay, s/veh	0.3

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	1275	24	6	854	8	7
Future Vol, veh/h	1275	24	6	854	8	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	215	215	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	90	90	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1328	25	7	949	9	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1353	0	1817	664
Stage 1	-	-	-	-	1328	-
Stage 2	-	-	-	-	489	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	504	-	*103	403
Stage 1	-	-	-	-	*212	-
Stage 2	-	-	-	-	*728	-
Platoon blocked, %	-	-		-	1	
Mov Cap-1 Maneuver	-	-	504	-	*101	403
Mov Cap-2 Maneuver	-	-	-	-	*101	-
Stage 1	-	-	-	-	*212	-
Stage 2	-	-	-	-	*718	-

Approach	NB	SB	SW
HCM Control Delay, s	0	0.1	31.2
HCM LOS			D

Minor Lane/Major Mvmt	NBT	NBR	SBL	SBT	SWLn1
Capacity (veh/h)	-	-	504	-	155
HCM Lane V/C Ratio	-	-	0.013	-	0.114
HCM Control Delay (s)	-	-	12.2	-	31.2
HCM Lane LOS	-	-	B	-	D
HCM 95th %tile Q(veh)	-	-	0	-	0.4

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

Intersection	
Int Delay, s/veh	4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	5	10	0	0	10	13	7	0	6	0
Future Vol, veh/h	0	0	5	10	0	0	10	13	7	0	6	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	5	11	0	0	11	14	8	0	7	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	47	51	7	50	47	18	7	0	0	22	0	0
Stage 1	7	7	-	40	40	-	-	-	-	-	-	-
Stage 2	40	44	-	10	7	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	954	840	1075	950	845	1061	1614	-	-	1593	-	-
Stage 1	1015	890	-	975	862	-	-	-	-	-	-	-
Stage 2	975	858	-	1011	890	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	949	834	1075	941	839	1061	1614	-	-	1593	-	-
Mov Cap-2 Maneuver	949	834	-	941	839	-	-	-	-	-	-	-
Stage 1	1008	890	-	968	856	-	-	-	-	-	-	-
Stage 2	968	852	-	1006	890	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	8.4	8.9	2.4	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1614	-	-	941	1075	1593	-	-
HCM Lane V/C Ratio	0.007	-	-	0.012	0.005	-	-	-
HCM Control Delay (s)	7.2	0	-	8.9	8.4	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	631	21	4	1203	12	6
Future Vol, veh/h	631	21	4	1203	12	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	215	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	664	22	4	1266	14	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	686	0	1305	332
Stage 1	-	-	-	-	664	-
Stage 2	-	-	-	-	641	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	904	-	*555	664
Stage 1	-	-	-	-	*474	-
Stage 2	-	-	-	-	*585	-
Platoon blocked, %	-	-		-	1	
Mov Cap-1 Maneuver	-	-	904	-	*552	664
Mov Cap-2 Maneuver	-	-	-	-	*548	-
Stage 1	-	-	-	-	*474	-
Stage 2	-	-	-	-	*582	-

Approach	NB	SB	SW
HCM Control Delay, s	0	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NBT	NBR	SBL	SBT	SWLn1
Capacity (veh/h)	-	-	904	-	582
HCM Lane V/C Ratio	-	-	0.005	-	0.036
HCM Control Delay (s)	-	-	9	-	11.4
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	0.1

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

Intersection	
Int Delay, s/veh	3.7

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	7	5	0	0	11	6	8	0	13	0
Future Vol, veh/h	0	0	7	5	0	0	11	6	8	0	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	7	5	0	0	12	6	8	0	14	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	48	52	14	52	48	10	14	0	0	14	0	0
Stage 1	14	14	-	34	34	-	-	-	-	-	-	-
Stage 2	34	38	-	18	14	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	953	839	1066	947	844	1071	1604	-	-	1604	-	-
Stage 1	1006	884	-	982	867	-	-	-	-	-	-	-
Stage 2	982	863	-	1001	884	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	947	832	1066	935	837	1071	1604	-	-	1604	-	-
Mov Cap-2 Maneuver	947	832	-	935	837	-	-	-	-	-	-	-
Stage 1	998	884	-	974	860	-	-	-	-	-	-	-
Stage 2	974	856	-	994	884	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	8.4	8.9	3.2	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1604	-	-	935	1066	1604	-	-
HCM Lane V/C Ratio	0.007	-	-	0.006	0.007	-	-	-
HCM Control Delay (s)	7.3	0	-	8.9	8.4	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	2050	22	3	1375	6	2
Future Vol, veh/h	2050	22	3	1375	6	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	215	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2158	23	3	1447	6	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	2181	0	2888	1079
Stage 1	-	-	-	-	2158	-
Stage 2	-	-	-	-	730	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	240	-	*8	214
Stage 1	-	-	-	-	*74	-
Stage 2	-	-	-	-	*537	-
Platoon blocked, %	-	-		-	1	
Mov Cap-1 Maneuver	-	-	240	-	*8	214
Mov Cap-2 Maneuver	-	-	-	-	*61	-
Stage 1	-	-	-	-	*74	-
Stage 2	-	-	-	-	*531	-

Approach	NB	SB	SW
HCM Control Delay, s	0	0	59.8
HCM LOS			F

Minor Lane/Major Mvmt	NBT	NBR	SBL	SBT	SWLn1
Capacity (veh/h)	-	-	240	-	74
HCM Lane V/C Ratio	-	-	0.013	-	0.114
HCM Control Delay (s)	-	-	20.2	-	59.8
HCM Lane LOS	-	-	C	-	F
HCM 95th %tile Q(veh)	-	-	0	-	0.4

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

Intersection	
Int Delay, s/veh	3.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	5	0	0	0	10	15	0	0	3	0
Future Vol, veh/h	0	0	5	0	0	0	10	15	0	0	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	5	0	0	0	11	16	0	0	3	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	41	41	3	44	41	16	3	0	0	16	0	0
Stage 1	3	3	-	38	38	-	-	-	-	-	-	-
Stage 2	38	38	-	6	3	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	963	851	1081	958	851	1063	1619	-	-	1602	-	-
Stage 1	1020	893	-	977	863	-	-	-	-	-	-	-
Stage 2	977	863	-	1016	893	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	958	845	1081	948	845	1063	1619	-	-	1602	-	-
Mov Cap-2 Maneuver	958	845	-	948	845	-	-	-	-	-	-	-
Stage 1	1013	893	-	970	857	-	-	-	-	-	-	-
Stage 2	970	857	-	1011	893	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	8.3	0	2.9	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1619	-	-	-	1081	1602	-	-
HCM Lane V/C Ratio	0.007	-	-	-	0.005	-	-	-
HCM Control Delay (s)	7.2	0	-	0	8.3	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	1000	20	0	1925	11	4
Future Vol, veh/h	1000	20	0	1925	11	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	215	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1053	21	0	2026	12	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1074	0	2066	527
Stage 1	-	-	-	-	1053	-
Stage 2	-	-	-	-	1013	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	645	-	*298	496
Stage 1	-	-	-	-	*297	-
Stage 2	-	-	-	-	*299	-
Platoon blocked, %	-	-		-	1	
Mov Cap-1 Maneuver	-	-	645	-	*298	496
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	*297	-
Stage 2	-	-	-	-	*299	-

Approach	NB	SB	SW
HCM Control Delay, s	0	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBT	NBR	SBL	SBT	SWLn1
Capacity (veh/h)	-	-	645	-	496
HCM Lane V/C Ratio	-	-	-	-	0.032
HCM Control Delay (s)	-	-	0	-	12.5
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	0.1

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

Intersection	
Int Delay, s/veh	4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	7	0	0	0	11	9	0	0	8	0
Future Vol, veh/h	0	0	7	0	0	0	11	9	0	0	8	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	7	0	0	0	12	9	0	0	8	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	41	41	8	45	41	9	8	0	0	9	0	0
Stage 1	8	8	-	33	33	-	-	-	-	-	-	-
Stage 2	33	33	-	12	8	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	963	851	1074	957	851	1073	1612	-	-	1611	-	-
Stage 1	1013	889	-	983	868	-	-	-	-	-	-	-
Stage 2	983	868	-	1009	889	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	958	845	1074	946	845	1073	1612	-	-	1611	-	-
Mov Cap-2 Maneuver	958	845	-	946	845	-	-	-	-	-	-	-
Stage 1	1006	889	-	976	862	-	-	-	-	-	-	-
Stage 2	976	862	-	1002	889	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	8.4	0	4	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1612	-	-	-	1074	1611	-	-
HCM Lane V/C Ratio	0.007	-	-	-	0.007	-	-	-
HCM Control Delay (s)	7.2	0	-	0	8.4	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0	0	-	-

Intersection	
Int Delay, s/veh	4.1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	5	10	0	0	10	15	7	0	3	0
Future Vol, veh/h	0	0	5	10	0	0	10	15	7	0	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	5	11	0	0	11	16	7	0	3	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	45	48	3	48	45	20	3	0	0	23	0	0
Stage 1	3	3	-	42	42	-	-	-	-	-	-	-
Stage 2	42	45	-	6	3	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	957	844	1081	953	847	1058	1619	-	-	1592	-	-
Stage 1	1020	893	-	972	860	-	-	-	-	-	-	-
Stage 2	972	857	-	1016	893	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	952	838	1081	943	841	1058	1619	-	-	1592	-	-
Mov Cap-2 Maneuver	952	838	-	943	841	-	-	-	-	-	-	-
Stage 1	1013	893	-	965	854	-	-	-	-	-	-	-
Stage 2	965	851	-	1011	893	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	8.3	8.9	2.3	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1619	-	-	943	1081	1592	-	-
HCM Lane V/C Ratio	0.007	-	-	0.011	0.005	-	-	-
HCM Control Delay (s)	7.2	0	-	8.9	8.3	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	4.1

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	5	10	0	0	11	9	8	0	8	0
Future Vol, veh/h	0	0	5	10	0	0	11	9	8	0	8	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	5	11	0	0	12	9	8	0	8	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	45	49	8	48	45	13	8	0	0	17	0	0
Stage 1	8	8	-	37	37	-	-	-	-	-	-	-
Stage 2	37	41	-	11	8	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	957	843	1074	953	847	1067	1612	-	-	1600	-	-
Stage 1	1013	889	-	978	864	-	-	-	-	-	-	-
Stage 2	978	861	-	1010	889	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	951	836	1074	943	840	1067	1612	-	-	1600	-	-
Mov Cap-2 Maneuver	951	836	-	943	840	-	-	-	-	-	-	-
Stage 1	1005	889	-	970	857	-	-	-	-	-	-	-
Stage 2	970	854	-	1005	889	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	8.4	8.9	2.8	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1612	-	-	943	1074	1600	-	-
HCM Lane V/C Ratio	0.007	-	-	0.011	0.005	-	-	-
HCM Control Delay (s)	7.2	0	-	8.9	8.4	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	5	29	0	0	10	15	20	0	3	0
Future Vol, veh/h	0	0	5	29	0	0	10	15	20	0	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	5	31	0	0	11	16	21	0	3	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	52	62	3	55	52	27	3	0	0	37	0	0
Stage 1	3	3	-	49	49	-	-	-	-	-	-	-
Stage 2	49	59	-	6	3	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	947	829	1081	943	839	1048	1619	-	-	1574	-	-
Stage 1	1020	893	-	964	854	-	-	-	-	-	-	-
Stage 2	964	846	-	1016	893	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	942	823	1081	934	833	1048	1619	-	-	1574	-	-
Mov Cap-2 Maneuver	942	823	-	934	833	-	-	-	-	-	-	-
Stage 1	1013	893	-	957	848	-	-	-	-	-	-	-
Stage 2	957	840	-	1011	893	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	8.3	9	1.6	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1619	-	-	934	1081	1574	-	-
HCM Lane V/C Ratio	0.007	-	-	0.033	0.005	-	-	-
HCM Control Delay (s)	7.2	0	-	9	8.3	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	3.6

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	87	0	45	62	0	37
Future Vol, veh/h	87	0	45	62	0	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	92	0	47	65	0	39

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	119	80	0	0	112	0
Stage 1	80	-	-	-	-	-
Stage 2	39	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	877	980	-	-	1478	-
Stage 1	943	-	-	-	-	-
Stage 2	983	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	877	980	-	-	1478	-
Mov Cap-2 Maneuver	877	-	-	-	-	-
Stage 1	943	-	-	-	-	-
Stage 2	983	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	877	1478	-
HCM Lane V/C Ratio	-	-	0.104	-	-
HCM Control Delay (s)	-	-	9.6	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #0 6:50

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.2	1.8	2.4	0.3		0.0	0.3
Total Del/Veh (s)	2.8	1.3	34.4	0.8		3.5	2.6

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #1 7:00

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.2	1.4	2.4	0.2	0.0	0.0	0.3
Total Del/Veh (s)	3.1	1.6	17.7	0.7	2.2	3.3	2.4

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #2 7:15

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.2	1.5	2.0	0.3		0.0	0.3
Total Del/Veh (s)	3.0	1.8	30.2	0.8		3.4	2.5

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #3 7:30

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.2	1.5	2.3	0.3	0.0	0.3
Total Del/Veh (s)	2.5	1.5	22.4	0.9	3.5	2.1

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #4 7:45

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.2	2.1	2.5	0.3	0.0	0.0	0.3
Total Del/Veh (s)	2.6	1.5	12.4	0.9	1.5	3.4	2.0

6: Marksheffel Rd & Tamlin Rd Performance by movement Entire Run

Movement	NBT	NBR	SBL	SBT	SWT	SWR	All
Denied Del/Veh (s)	0.2	1.7	2.4	0.3	0.0	0.0	0.3
Total Del/Veh (s)	2.8	1.6	24.2	0.8	2.2	3.5	2.3

Intersection	
Int Delay, s/veh	3.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	7	18	0	0	11	9	35	0	8	0
Future Vol, veh/h	0	0	7	18	0	0	11	9	35	0	8	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	7	19	0	0	12	9	37	0	8	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	60	78	8	64	60	28	8	0	0	46	0	0
Stage 1	8	8	-	52	52	-	-	-	-	-	-	-
Stage 2	52	70	-	12	8	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	936	812	1074	930	831	1047	1612	-	-	1562	-	-
Stage 1	1013	889	-	961	852	-	-	-	-	-	-	-
Stage 2	961	837	-	1009	889	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	930	806	1074	918	824	1047	1612	-	-	1562	-	-
Mov Cap-2 Maneuver	930	806	-	918	824	-	-	-	-	-	-	-
Stage 1	1005	889	-	953	845	-	-	-	-	-	-	-
Stage 2	953	830	-	1002	889	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	8.4	9	1.4	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1612	-	-	918	1074	1562	-	-
HCM Lane V/C Ratio	0.007	-	-	0.021	0.007	-	-	-
HCM Control Delay (s)	7.2	0	-	9	8.4	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	53	0	55	105	0	33
Future Vol, veh/h	53	0	55	105	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	56	0	58	111	0	35

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	149	114	0	0	169	0
Stage 1	114	-	-	-	-	-
Stage 2	35	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	843	939	-	-	1409	-
Stage 1	911	-	-	-	-	-
Stage 2	987	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	843	939	-	-	1409	-
Mov Cap-2 Maneuver	843	-	-	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	987	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	843	1409	-
HCM Lane V/C Ratio	-	-	0.066	-	-
HCM Control Delay (s)	-	-	9.6	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #1 7:00

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.0	0.2	1.8	0.4	0.0	0.3
Total Del/Veh (s)	2.8	2.0	6.5	1.2	3.2	1.9

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #2 7:15

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.0	0.3	2.0	0.5	0.0	0.4
Total Del/Veh (s)	3.1	2.4	6.5	1.2	3.2	2.0

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #3 7:30

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.0	0.5	2.0	0.5	0.0	0.4
Total Del/Veh (s)	3.0	2.9	7.0	1.3	3.3	2.0

6: Marksheffel Rd & Tamlin Rd Performance by movement Interval #4 7:45

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.0	0.2	2.1	0.5	0.0	0.3
Total Del/Veh (s)	2.7	2.4	6.1	1.2	3.3	1.8

6: Marksheffel Rd & Tamlin Rd Performance by movement Entire Run

Movement	NBT	NBR	SBL	SBT	SWR	All
Denied Del/Veh (s)	0.0	0.3	2.0	0.5	0.0	0.3
Total Del/Veh (s)	3.0	2.5	6.7	1.2	3.3	2.0

Intersection	
Int Delay, s/veh	9.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	114	203	1917	165	146	0
Future Vol, veh/h	114	203	1917	165	146	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	265	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	15
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	120	214	2018	174	154	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	2018	1009	0	0	
Stage 1	2018	-	-	-	
Stage 2	0	-	-	-	
Critical Hdwy	6.84	6.94	-	-	
Critical Hdwy Stg 1	5.84	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	
Follow-up Hdwy	3.52	3.32	-	-	
Pot Cap-1 Maneuver	~ 51	238	-	-	
Stage 1	~ 89	-	-	-	
Stage 2	-	-	-	-	
Platoon blocked, %			-	-	
Mov Cap-1 Maneuver	~ 51	238	-	-	
Mov Cap-2 Maneuver	~ 75	-	-	-	
Stage 1	~ 89	-	-	-	
Stage 2	-	-	-	-	

Approach	WB	NB
HCM Control Delay, s	72.4	0
HCM LOS	F	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2
Capacity (veh/h)	-	-	175	238
HCM Lane V/C Ratio	-	-	0.686	0.898
HCM Control Delay (s)	-	-	61.4	78.6
HCM Lane LOS	-	-	F	F
HCM 95th %tile Q(veh)	-	-	4.1	7.6

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

Intersection	
Int Delay, s/veh	4.7

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	5	77	0	0	10	15	71	0	3	0
Future Vol, veh/h	0	0	5	77	0	0	10	15	71	0	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	5	81	0	0	11	16	75	0	3	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	79	116	3	82	79	54	3	0	0	91	0	0
Stage 1	3	3	-	76	76	-	-	-	-	-	-	-
Stage 2	76	113	-	6	3	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	910	774	1081	905	811	1013	1619	-	-	1504	-	-
Stage 1	1020	893	-	933	832	-	-	-	-	-	-	-
Stage 2	933	802	-	1016	893	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	905	769	1081	896	805	1013	1619	-	-	1504	-	-
Mov Cap-2 Maneuver	905	769	-	896	805	-	-	-	-	-	-	-
Stage 1	1013	893	-	926	826	-	-	-	-	-	-	-
Stage 2	926	796	-	1011	893	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	8.3	9.4	0.8	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1619	-	-	896	1081	1504	-	-
HCM Lane V/C Ratio	0.007	-	-	0.09	0.005	-	-	-
HCM Control Delay (s)	7.2	0	-	9.4	8.3	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0	0	-	-

Intersection	
Int Delay, s/veh	5

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	232	0	96	215	0	85
Future Vol, veh/h	232	0	96	215	0	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	22355
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	244	0	101	226	0	89

Major/Minor	Minor1		Major1	
Conflicting Flow All	214	214	0	0
Stage 1	214	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.42	6.22	-	-
Critical Hdwy Stg 1	5.42	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-
Pot Cap-1 Maneuver	774	826	-	-
Stage 1	822	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	774	826	-	-
Mov Cap-2 Maneuver	774	-	-	-
Stage 1	822	-	-	-
Stage 2	-	-	-	-

Approach	NB	NE
HCM Control Delay, s	11.8	0
HCM LOS	B	

Minor Lane/Major Mvmt	NET	NER	NBLn1
Capacity (veh/h)	-	-	774
HCM Lane V/C Ratio	-	-	0.316
HCM Control Delay (s)	-	-	11.8
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	1.4

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #1 7:00

Movement	WBL	WBT	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	693.0		261.2	2.0	1.0	145.3	55.8

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #2 7:15

Movement	WBL	WBT	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	863.2		771.4	1.7	1.0	140.6	68.7

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #3 7:30

Movement	WBL	WBT	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)				0.0	0.0	0.0	0.3
Total Del/Veh (s)	900.0		900.0	1.7	0.9	173.7	69.8

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #4 7:45

Movement	WBL	WBT	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)				0.0	0.0	0.0	0.8
Total Del/Veh (s)	897.8		899.7	1.7	0.9	211.4	71.4

5: Marksheffel Rd & Tamlin Rd Performance by movement Entire Run

Movement	WBL	WBT	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	11.9		11.9	0.0	0.0	0.0	0.3
Total Del/Veh (s)	3060.6		1088.5	1.8	1.0	195.0	70.7

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	39	55	963	85	65	0
Future Vol, veh/h	39	55	963	85	65	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	300	-	-	265	-	-
Veh in Median Storage, #	0	-	0	-	-	16979
Grade, %	0	-	0	-	-	15
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	58	1014	89	68	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	1014	507	0	0	
Stage 1	1014	-	-	-	
Stage 2	0	-	-	-	
Critical Hdwy	6.84	6.94	-	-	
Critical Hdwy Stg 1	5.84	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	
Follow-up Hdwy	3.52	3.32	-	-	
Pot Cap-1 Maneuver	235	511	-	-	
Stage 1	311	-	-	-	
Stage 2	-	-	-	-	
Platoon blocked, %			-	-	
Mov Cap-1 Maneuver	235	511	-	-	
Mov Cap-2 Maneuver	317	-	-	-	
Stage 1	311	-	-	-	
Stage 2	-	-	-	-	

Approach	WB	NB
HCM Control Delay, s	15	0
HCM LOS	C	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2
Capacity (veh/h)	-	-	317	511
HCM Lane V/C Ratio	-	-	0.13	0.113
HCM Control Delay (s)	-	-	18	12.9
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0.4	0.4

Intersection	
Int Delay, s/veh	3.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	7	19	0	0	11	9	32	0	8	0
Future Vol, veh/h	0	0	7	19	0	0	11	9	32	0	8	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	7	20	0	0	12	9	34	0	8	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	58	75	8	62	58	26	8	0	0	43	0	0
Stage 1	8	8	-	50	50	-	-	-	-	-	-	-
Stage 2	50	67	-	12	8	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	939	815	1074	933	833	1050	1612	-	-	1566	-	-
Stage 1	1013	889	-	963	853	-	-	-	-	-	-	-
Stage 2	963	839	-	1009	889	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	933	808	1074	921	826	1050	1612	-	-	1566	-	-
Mov Cap-2 Maneuver	933	808	-	921	826	-	-	-	-	-	-	-
Stage 1	1005	889	-	955	846	-	-	-	-	-	-	-
Stage 2	955	832	-	1002	889	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	8.4	9	1.5	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1612	-	-	921	1074	1566	-	-
HCM Lane V/C Ratio	0.007	-	-	0.022	0.007	-	-	-
HCM Control Delay (s)	7.2	0	-	9	8.4	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	60	0	52	97	0	34
Future Vol, veh/h	60	0	52	97	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	22355
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	0	55	102	0	36

Major/Minor	Minor1		Major1	
Conflicting Flow All	106	106	0	0
Stage 1	106	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.42	6.22	-	-
Critical Hdwy Stg 1	5.42	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-
Pot Cap-1 Maneuver	892	948	-	-
Stage 1	918	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	892	948	-	-
Mov Cap-2 Maneuver	892	-	-	-
Stage 1	918	-	-	-
Stage 2	-	-	-	-

Approach	NB	NE
HCM Control Delay, s	9.3	0
HCM LOS	A	

Minor Lane/Major Mvmt	NET	NER	NBLn1
Capacity (veh/h)	-	-	892
HCM Lane V/C Ratio	-	-	0.071
HCM Control Delay (s)	-	-	9.3
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.2

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #1 7:00

Movement	WBL	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	26.7	6.6	0.9	0.4	8.9	2.2

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #2 7:15

Movement	WBL	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	23.6	5.0	0.7	0.2	6.5	1.9

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #3 7:30

Movement	WBL	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	16.4	6.8	0.8	0.3	9.8	2.0

5: Marksheffel Rd & Tamlin Rd Performance by movement Interval #4 7:45

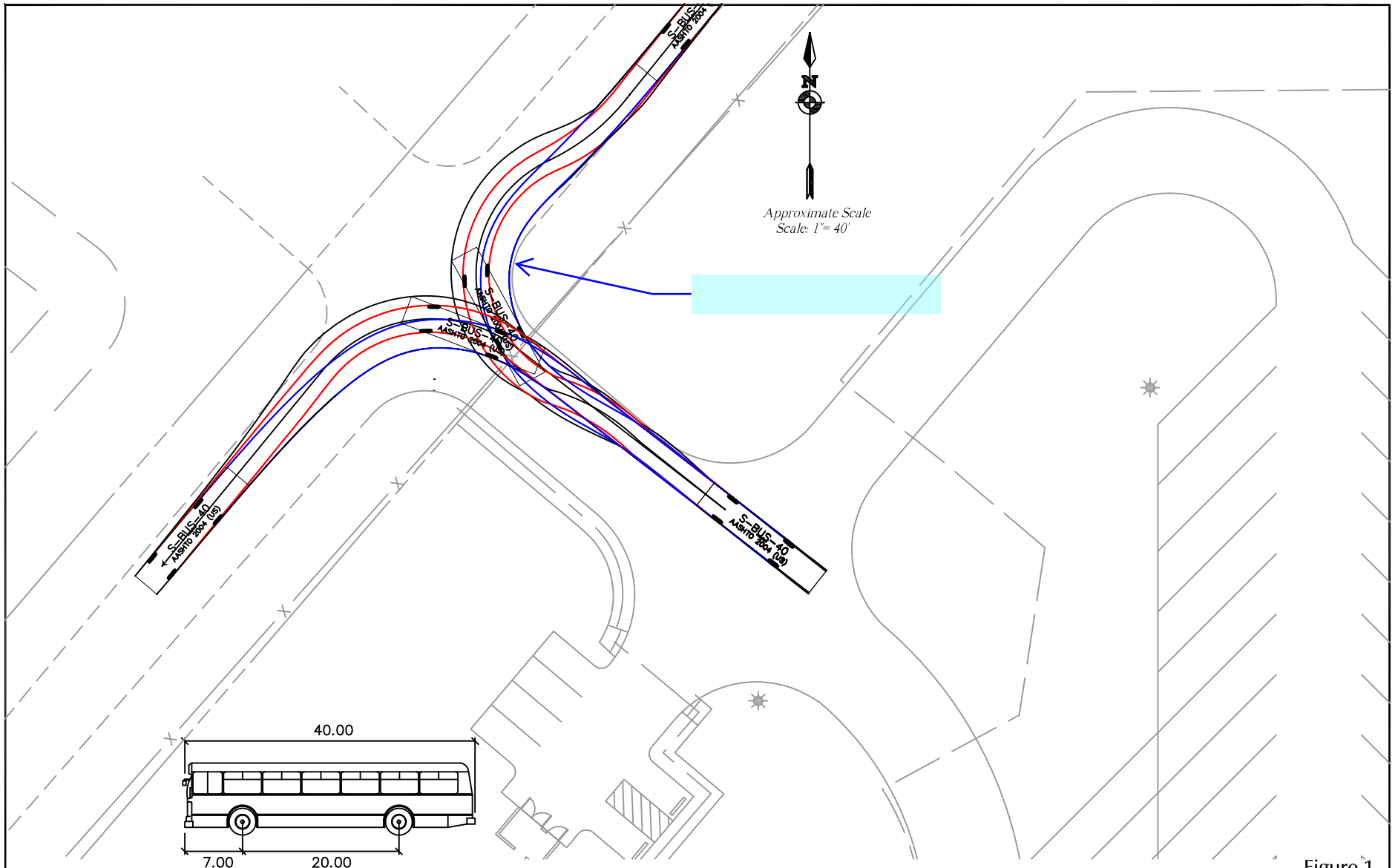
Movement	WBL	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	19.3	6.5	0.8	0.2	6.1	1.8

5: Marksheffel Rd & Tamlin Rd Performance by movement Entire Run

Movement	WBL	WBR	NBT	NBR	SBL	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	21.1	6.5	0.8	0.3	7.9	2.0

Exhibits

TRANSPORTATION
CONSULTANTS, INC.



S-BUS-40
feet

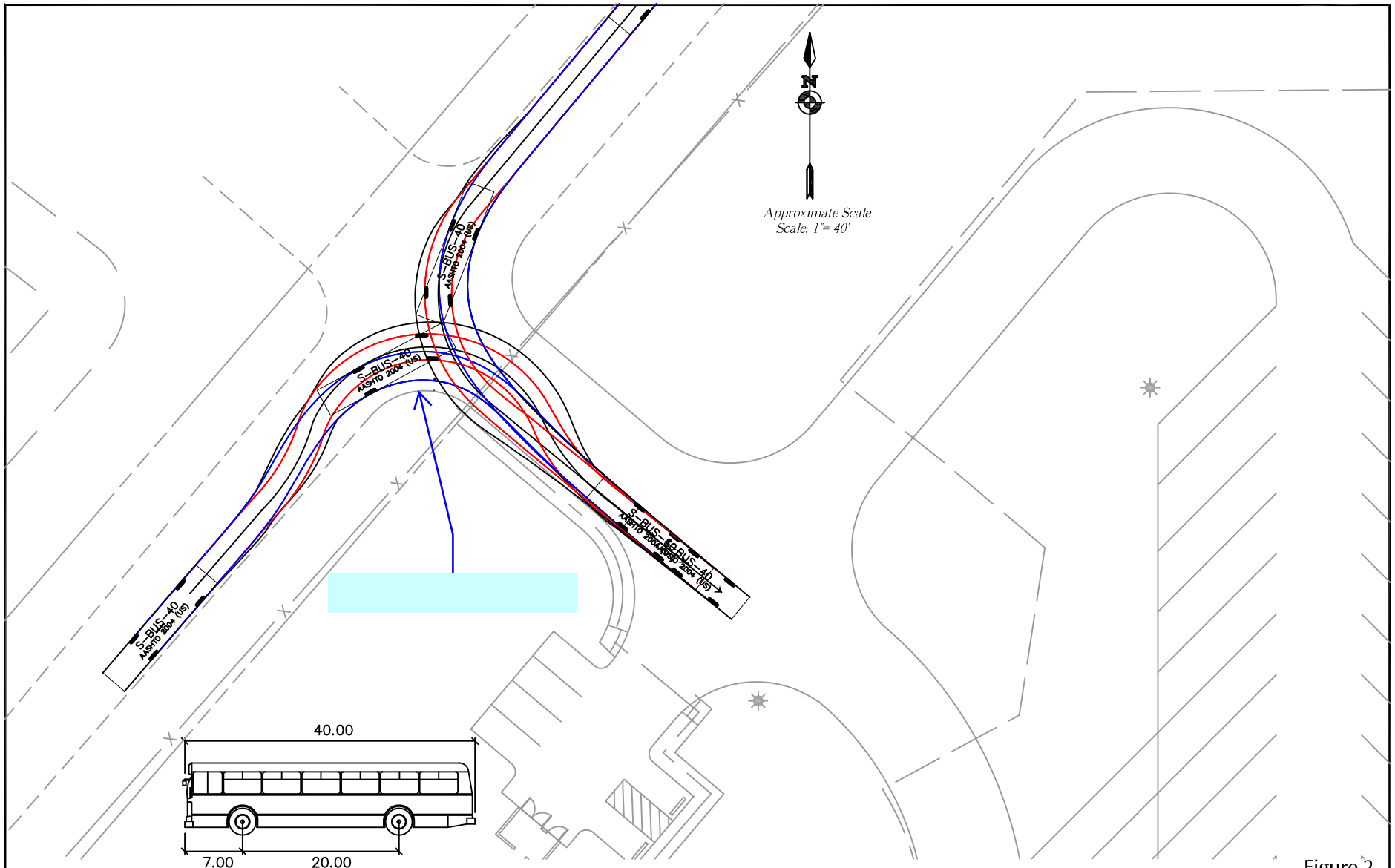
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 34.4

TRANSPORTATION CONSULTANTS, INC.

Figure 1

Exiting AutoTurn Analysis

Tamlin Road Rezone (LSC #184610)



S-BUS-40
feet

Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 34.4

TRANSPORTATION CONSULTANTS, INC.

Figure 2

Entering AutoTurn Analysis

Tamlin Road Rezone (LSC #184610)

Figure 3

AutoTurn Analysis

Tamlin Road Rezone (LSC #184610)

LSC TRANSPORTATION CONSULTANTS, INC.

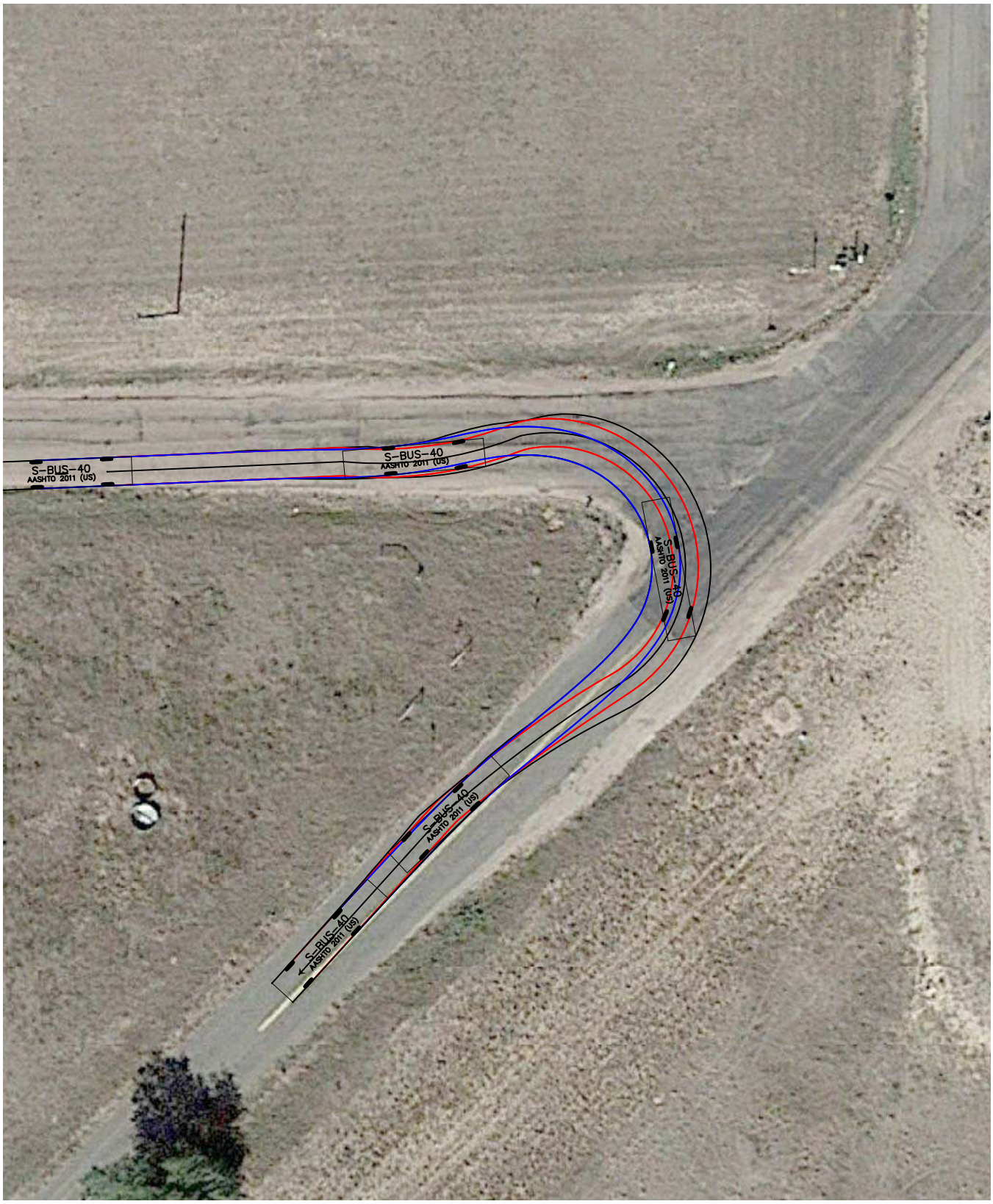


Figure 4

AutoTurn Analysis

Tamlin Road Rezone (LSC #184610)

LSC TRANSPORTATION CONSULTANTS, INC.