Summit Orchards West
Traffic Impact Study
Lee's Summit, Missouri

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Prepared by:

McCURDY ENGINEERS

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INTRODUCTION

The purpose of this traffic impact study is to assess the potential impact on traffic with the Summit Orchards West development on the northwest corner of the intersection of Ward Road and Chipman Road in Lee's Summit, Missouri. The location of the development in relation to the street network is shown in Figure 1. The site plan for the development is shown in Figure 2. The site plan includes the naming convention used for the various site entrances.

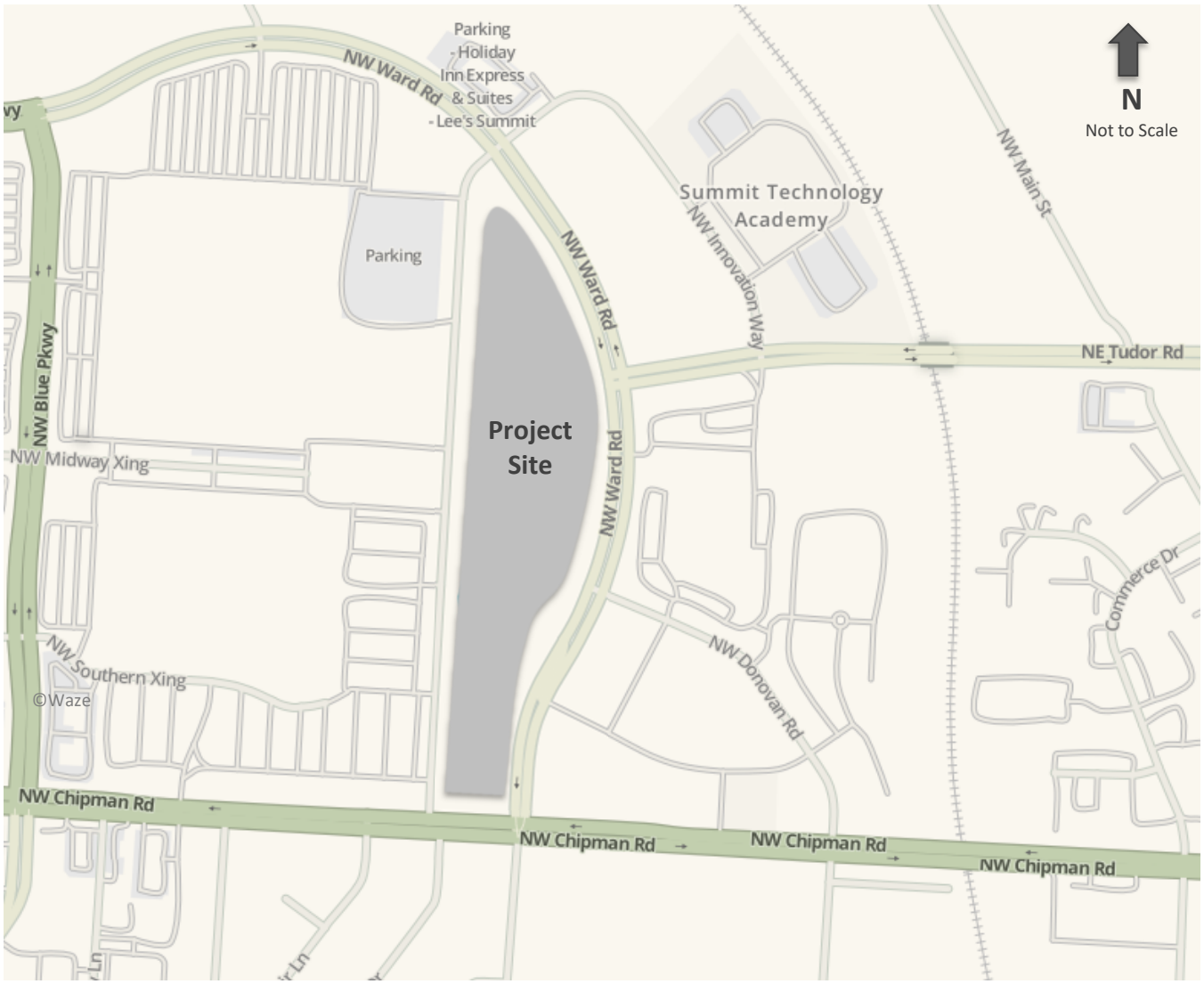

Figure 1 – Development Location

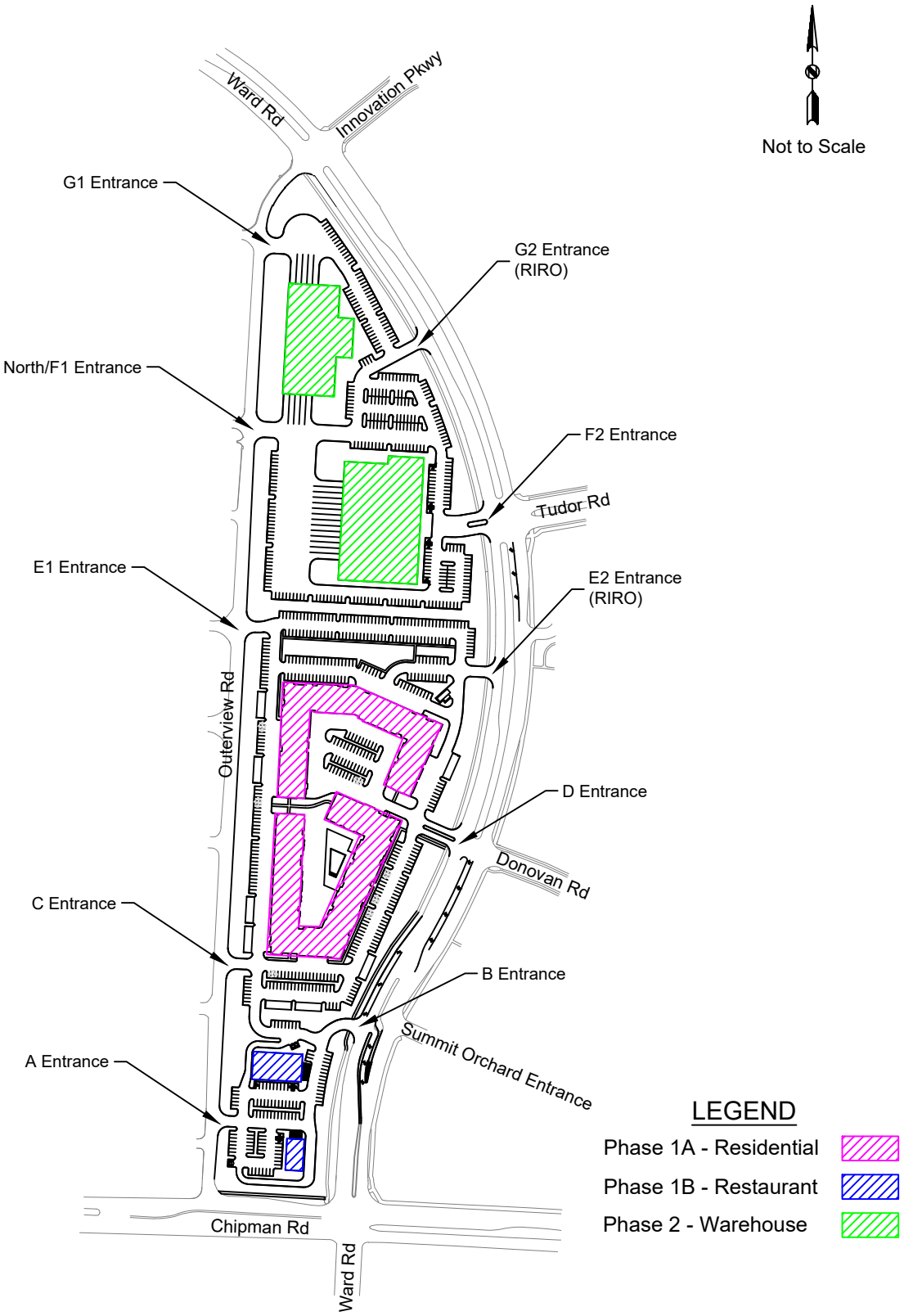

Figure 2 - Site Plan

EXISTING CONDITIONS

The site is in Lee's Summit, Missouri, in the northwest quadrant of the intersection of Chipman Road and Ward Road. The current land use of the planned development is undeveloped. The land use of the surrounding areas is undeveloped to the northeast, light industrial to the west, commercial/retail/multi-family housing to the east, and low density residential to the south.

Street Network and Traffic Control

The development is bordered on the west by Outerview Road and on the east by Ward Road. Chipman Road is located to the south of the site and provides access to Missouri Highway 50.

Chipman Road is a four-lane east-west median divided major arterial with a posted speed limit is 45 miles per hour (mph).

Ward Road is a four-lane north-south median divided major arterial roadway with a posted speed limit of 35 mph. The intersection of Chipman Road and Ward Road is signalized with left-turn lanes on all approaches (dual lefts southbound and eastbound), a southbound right-turn lane, and a westbound right-turn lane. The intersection of Chipman Road and Ward Road is approximately 2,700 feet west of MO 50.

Outerview Road is a two-lane unmarked north-south private drive with no posted speed limit. The intersection of Outerview Road and Chipman Road is stop-controlled, with Outerview Road stopping; this intersection is right-in/right-out (RIRO) with a concrete median preventing left-turns on or off Chipman Road. The intersection of Outerview Road and Ward Road to the north is stop-controlled, with Outerview Road stopping and aligning with Innovation Parkway on the east side of Ward Road.

Donovan Road is a two-lane east-west collector roadway with a two-way left-turn lane and no posted speed limit. The intersection of Donovan Road and Ward Road is a stop-controlled T-intersection with Donovan Road stopping.

Tudor Road is a four-lane east-west median divided minor arterial roadway. There is a posted speed limit of 35 mph. The intersection of Tudor Road and Ward Road is a signalized T-intersection.

Traffic Volumes

Intersections counted for analysis in this study were:

- Chipman Road and Ward Road
- Chipman Road and Outerview Road
- Chipman Road and Donovan Road
- Ward Road and Summit Orchard Entrance
- Ward Road and Donovan Road
- Ward Road and Tudor Road
- Ward Road and Outerview Road
- Outerview Road and South Entrance (existing to the west)
- Outerview Road and North Entrance (existing to the west)

The turning movement traffic counts were completed on Tuesday, July 12th, 2022, and Wednesday, July 13th, 2022, for the peak volume time periods. Morning traffic counts were conducted from 7:00 AM until 9:00 AM and afternoon traffic counts were from 4:00 PM until 6:00 PM The morning peak period was determined to be from 8:00 AM until 9:00 AM and the afternoon peak period was determined to be from 5:00 PM until 6:00 PM.

Trips from the July 2022 counts were compared to City supplied counts from April 19th, 2018, counts at the intersection of Chipman Road and Ward Road to determine what changes in traffic counts and distribution the current construction and detours on MO 50 might have on the intersection. On average, the July 2022 counts from the Chipman Road and Ward Road intersection were found to be between 10-55% lower than the April 2018 counts. The lower counts were expected due to the local construction and due to lower traffic volumes in general due to change in traffic patterns as a result of COVID.

For the Chipman and Ward intersection, the higher April 2018 traffic counts were used for the existing conditions traffic counts with an increase of 1% per year to account for nearby development since 2018. In addition, traffic generated from adjacent developments as part of the 2016 McClure TIS and the 2018 Olsson TIS were added to existing counts (McClure Engineering Co, *Summit Orchards Traffic Impact Study*, March 2016 and Olsson Engineers, *Tudor Road Development Traffic Impact Study*, July 2021).

July 2022 counts were used for the remaining study intersections and balanced with the April 2018 traffic counts.

The generated existing traffic volumes are shown on Figure 3. The April 2018 counts, July 2022 counts, and the previous study trip/generation counts are included in the Appendix.

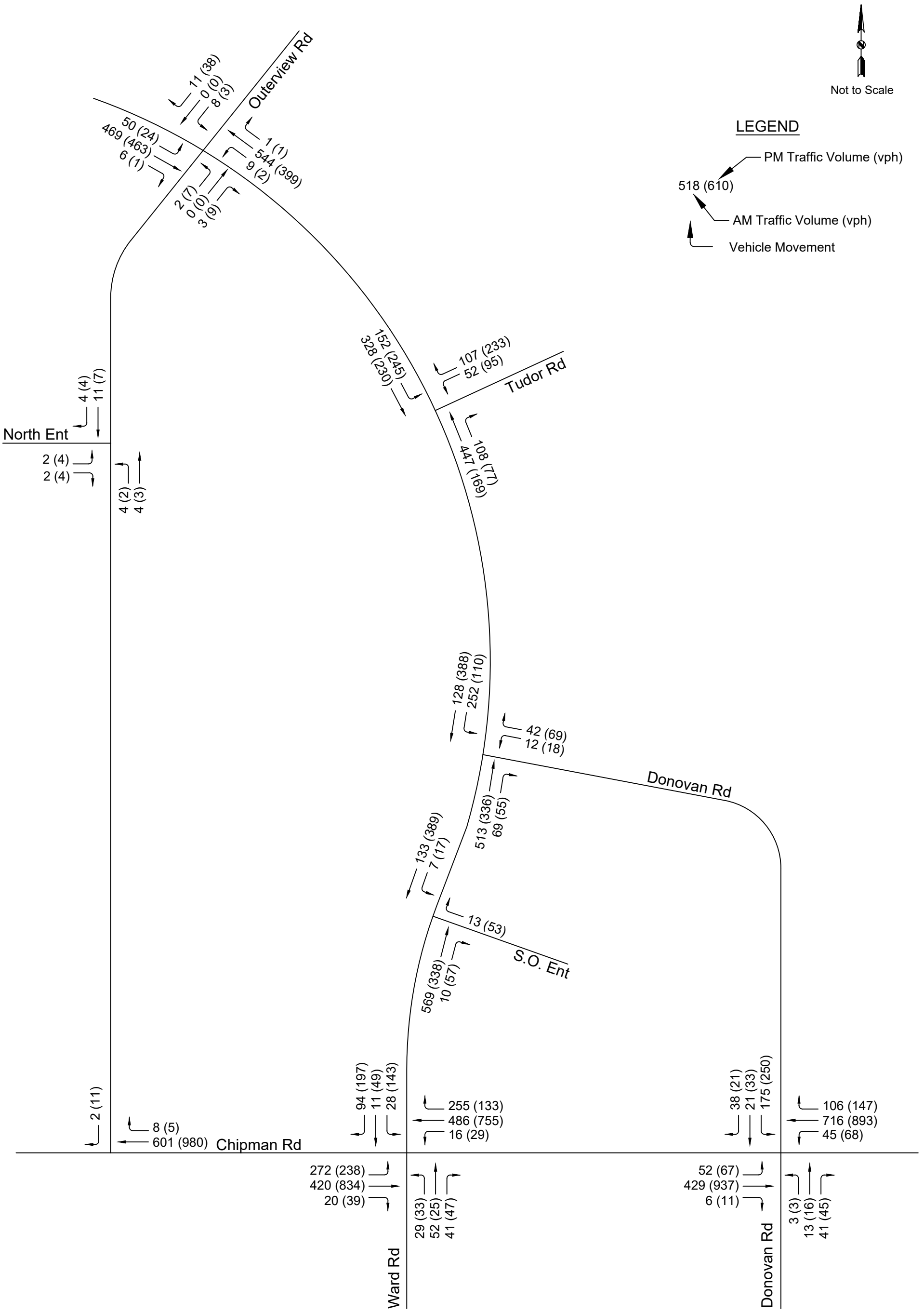

Figure 3 - Existing plus Approved Peak Hour Volumes

PROPOSED CONDITIONS

Summit Orchard West is expected to be constructed in two phases. The first phase will be on the south side of the development and will include two fast-food restaurants with drive-through windows and a residential multi-family housing complex with 323 units. The second phase will be on the north side of the development and will include two warehouse buildings totally 123,000 square feet.

Access Plan

The site will be accessed from the west (Outerview Road) via five entrances. There will be two entrances into each of the different land use areas—one of the two entrances for the restaurant and residential site will be a shared entrance accessing both the restaurant and residential sites and providing interconnectivity between them. There will be no interconnectivity between the residential and warehouse land uses. Where possible, these entrances will align with existing drives on the west side of Outerview Road. All entrances onto Outerview Road will be full access points and will be stop controlled.

The site will be accessed from Ward Road via five entrances. The southern entrance will be a three-quarter access into the restaurant portion of the site. Two entrances will access the residential portion of the site; one will be a full access aligned with Donovan Road and the second will be RIRO between Donovan Road and Tudor Road. The warehouse site will also be accessed in two locations, with the southern access being a full access aligning with Tudor Road and the northern access being a RIRO between Tudor Road and Outerview Road.

There will be no access into the site from Chipman Road.

Sight Distance

Sight distance was measured at the proposed accesses using the methodology recommending by the American Association of State Highway and Transportation Engineers (AASHTO) for the 35 mph speed limits on Ward Road and 25 mph on Outerview Road as City code states that a speed limit of 25 mph governs areas with no posted speed limit.

For 35 mph, AASHTO requires a minimum intersection sight distance of 390 feet and a stopping sight distance of 250 feet. The AASHTO required intersection site distance at 25 mph is 280 feet and 155 feet for stopping sight distance.

Ward Road and Summit Orchard Entrance/B Entrance
Based on field measurements, the available sight distance is approximately 420 feet and is adequate for the speed limit.

Ward Road and Donovan Road
No sight distance was measured as this is an existing intersection.

Ward Road and E2 (RIRO) Entrance
Based on field measurements, the available sight distance is greater than 400 feet and meets the AASHTO requirements.

Ward Road and Tudor Road
No sight distance was measured as this is an existing signalized intersection.

Ward Road and G2 (RIRO) Entrance
The available sight distance, based on field measurements, is greater than 400 feet and is adequate for the 35 mph speed limit.

Outerview Road and A Entrance
The measured sight distance is greater than 300 feet and meets the AASHTO requirements intersection and stopping sight distance requirements.

Outerview Road and C Entrance
Based on field measurements, the available sight distance is greater than 300 feet and meets the AASHTO requirements.

Outerview Road and E1 Entrance
The available sight distance, based on field measurements, is in excess of 300 feet and is adequate for the 25 mph speed limit.

Outerview Road and North Entrance/F1 Entrance
No sight distance was measured as this is an existing intersection.

Outerview Road and G1 Entrance
The measured intersection sight distance is in excess of 300 feet and the stopping sight distance is in excess of 160 feet and is adequate.

Crash Analysis

Crashes at the study intersections were analyzed over a five-year period (2017-2021) from City of Lee's Summit Police Department data to identify existing crash patterns. There were a total of 18 crashes reported during the crash study time period, and no fatal crashes within the study area.

The Chipman Road and Outerview Road, Ward Road and Summit Orchard Entrance, Ward Road and Donovan Road, and Outerview Road and North Entrance intersections had no crashes reported during the study period.

Chipman Road and Ward Road

There were 39 reported crashes at the intersection during the study period—averaging approximately eight crashes a year.

Based on the analysis of the 39 crashes, there were two run off-road/lost control crashes, one sideswipe crash, six right-angle crashes, and the remaining were rear-end crashes. Of the right-angle crashes, one resulted in injuries while the other five were property damage only—four of the crashes were inattentive drivers running red lights and two occurred when the intersection was stop controlled due to a vehicle hitting the signal pole. The remaining rear-end crashes were primarily due to inattentive drivers.

Chipman Road and Donovan Road

There were 11 total crashes over the five-year study period at the Chipman Road and Donovan Road intersection. Based on the analysis of the eleven crashes, there were five right-angle crashes (one prior to the signal being installed), two rear-end crashes, three lost control crashes (one was a DUI), and two rear-end crashes due to inattentive drivers.

Ward Road and Tudor Road

There were seven reported crashes at the intersection during the study period—four lost control crashes, two right-angle crashes, and one rear-end crash. The rear-end crash and two of the lost control crashes occurred during icy conditions.

Ward Road and Outerview Road

The one reported crash, during the study time period, was a lost control crash when a moped without headlights had to stop suddenly to avoid crashing into a police vehicle turning onto Ward Road. The moped driver was not injured.

No correctable crash patterns emerged as a result of the study and no recommendations are made to alter the study intersections based on crash data.

Detailed crash summaries are included in the Appendix.

Throat Length Analysis

The throat lengths for the proposed entrances into the site from Ward Road and were compared to City of Lee's Summit *Access Management Code*, March 2018 requirements for drives adjacent to arterial roadways based on vehicles per hour. As Outerview Road is a private roadway, there is no specific guidance provided for throat lengths however, all drives will have at least a 50-foot throat which exceeds the expected queue.

Throat lengths for entrances onto Ward Road are provided in Table 1.

Table 1 – Ward Road Driveway Throat Depths		
Intersection	**Recommended Throat Length (feet)**	**Site Plan Measured Throat Length (feet)**
Ward Road and Summit Orchard/B Entrance	125	125
Ward Road and Donovan Road	125	100
Ward Road and E2 (RIRO) Entrance	75	75
Ward Road and Tudor Road	75	110
Ward Road and G2 (RIRO) Entrance	75	75

While the Donovan Road access onto Ward Road is less than the required length, the longest expected queue length for eastbound traffic is 30 feet, so the storage provided by a 100-foot throat will be sufficient to prevent vehicles interfering with circulation or parking areas within the site. All other access onto Ward Road meet or exceed the recommended throat lengths.

Trip Generation

The expected trip generation for the development was estimated using the 11th Edition of the Trip Generation Handbook published by the Institute of Transportation Engineers. The trip generation was based on Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 AM along with Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 PM criteria.

Estimates for the expected trips generated by the development are provided in Table 2.

Table 2 – Trip Generation					
ITE Land Use Code	**Units**	**A.M.**		**P.M.**	
		Trips In (vph)	**Trips Out (vph)**	**Trips In (vph)**	**Trips Out (vph)**
220- Multifamily Housing (Low-Rise)	323 dwelling units	30	93	100	59
934- Fast Food Restaurant with Drive-Through Window	12,300 sq ft	280	269	211	195
Phase I Total		**310**	**362**	**311**	**254**
150- Warehousing	123,000 sq ft	29	9	11	30
Full Build Out Total		**339**	**371**	**322**	**284**

Trip Distribution

The trip distribution pattern was determined for the site based on the existing directional traffic pattern of the peak period and based on a general analysis of the surrounding area. The detailed distribution patterns can be found in the appendix. Based on the existing traffic patterns, the type of development, location of nearby schools, and the metropolitan population centers, the new trips were assigned onto the roadway network, as shown below for the morning and afternoon periods.

Trip distribution during the morning peak period:

- 15% to/from the north
- 5% to/from the south
- 35% to/40% from the east (Chipman Road)
- 5% to/from the east (Chipman Road)
- 40% to/35% from the west

Trip distribution during the afternoon peak period:

- 15% to/from the north
- 5% to/from the south
- 40% to/35% from the east (Chipman Road)
- 5% to/from the east (Chipman Road)
- 35% to/40% from the west

Existing Plus Site Traffic Volumes

The expected development site-generated traffic volumes were added to the existing plus approved traffic scenario. The volumes are shown on Figures 4, 5, 6, and 7.

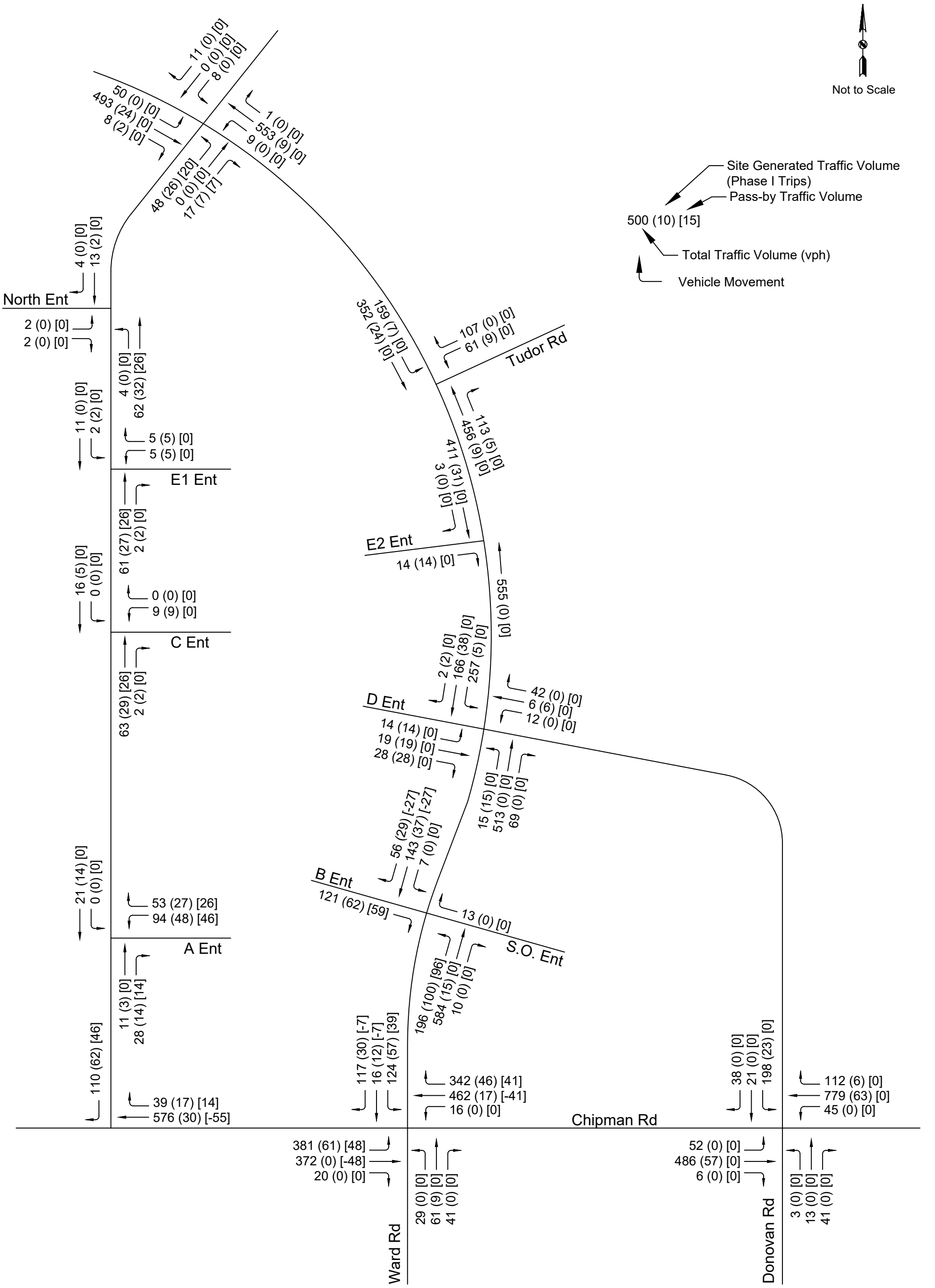

Figure 4 - Existing plus Phase I Site AM Peak Hour Volumes (Restaurant & Residential)

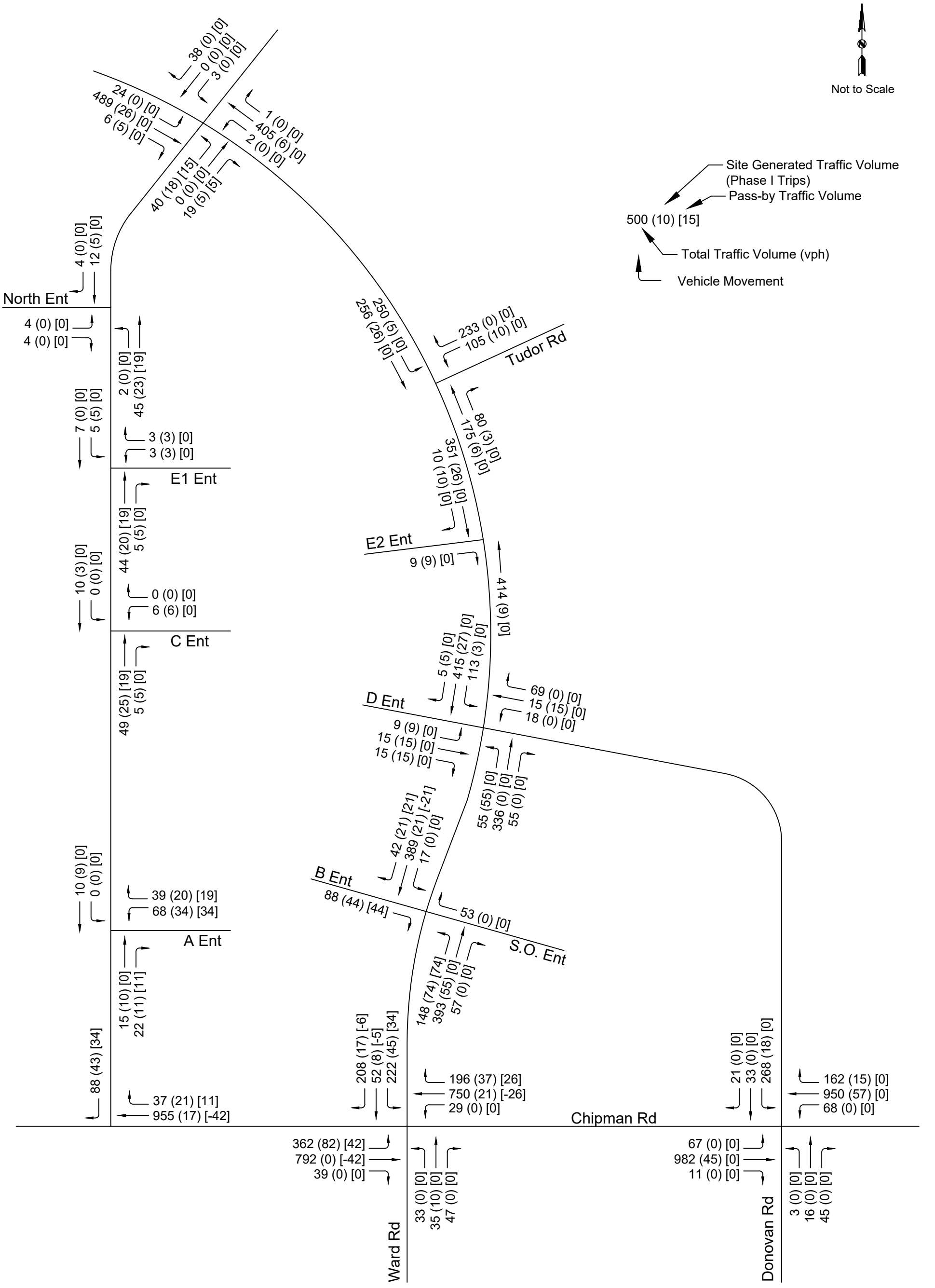

Figure 5 - Existing plus Phase I Site PM Peak Hour Volumes (Restaurant & Residential)

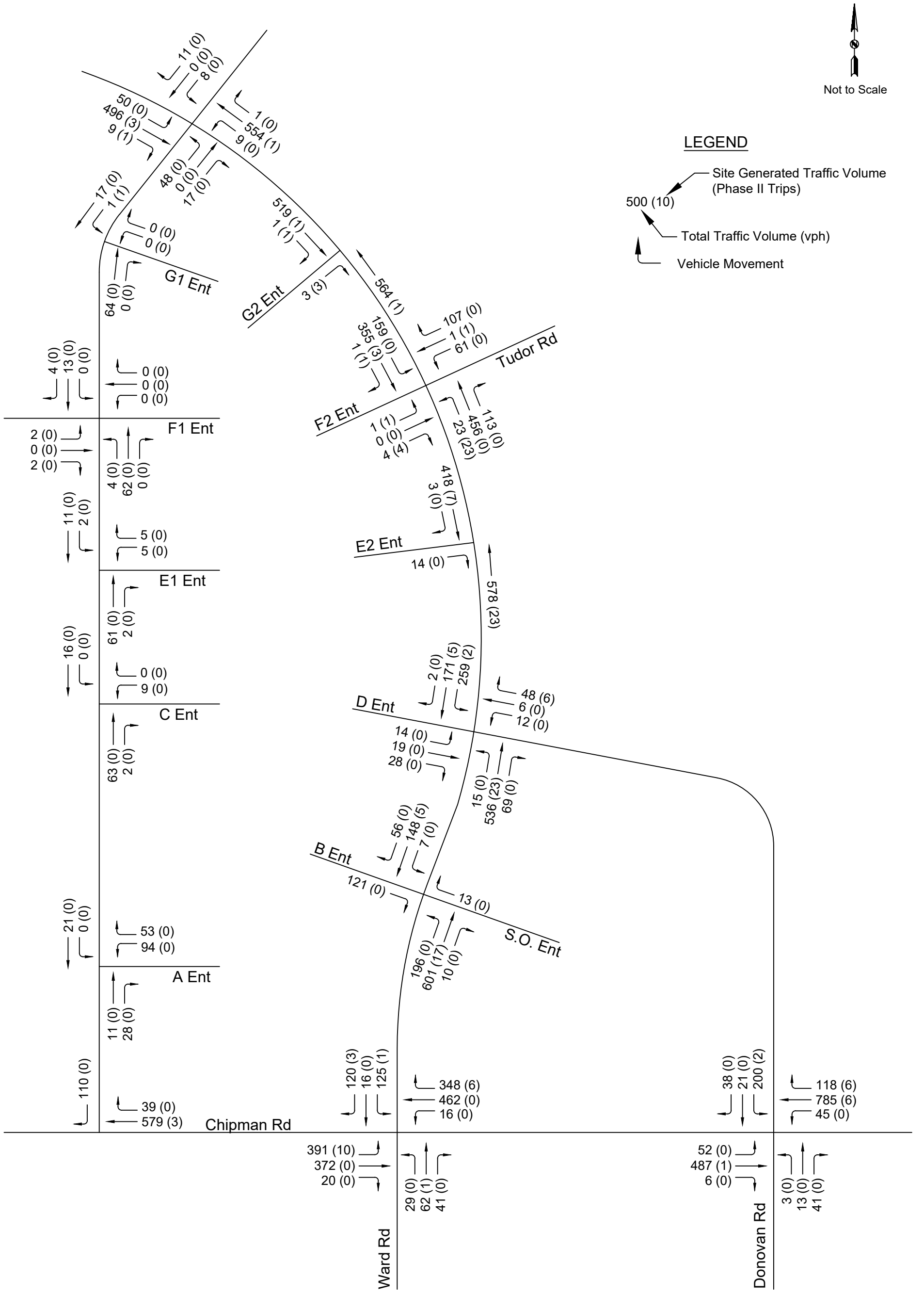

Figure 6 - Existing plus Phase I&II Site AM Peak Hour Volumes (Full Build-Out)

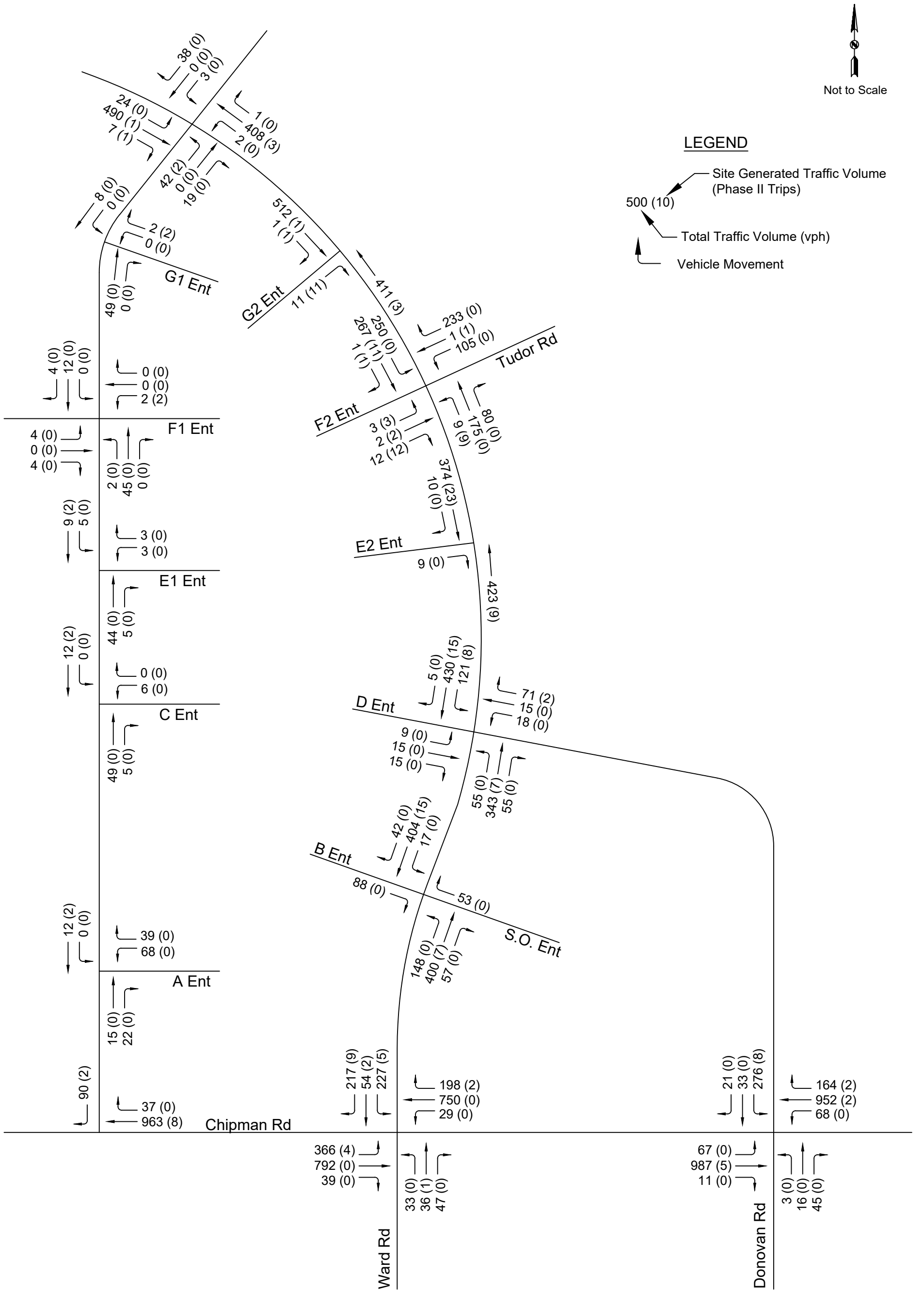

Figure 7 - Existing plus Phase I&II Site PM Peak Hour Volumes (Full Build-Out)

Signal Warrant Study

It may be considered justified to install a traffic signal at a location if one or more of the traffic signal warrants listed in the 2009 MUTCD is met. The traffic signal warrants are:

Warrant 1: Eight-Hour Vehicular Volume
Warrant 2: Four-Hour Vehicular Volume
Warrant 3: Peak Hour
Warrant 4: Pedestrian Volume
Warrant 5: School Crossing
Warrant 6: Coordinated Signal System
Warrant 7: Crash Experience
Warrant 8: Roadway Network
Warrant 9: Intersection Near at Grade Crossing

Warrant 3 was evaluated at Ward Road and Outerview Road and at Ward Road and Donovan Road as part of this study.

Warrant 3: Peak Hour

The peak hour warrant is satisfied if either of the two following conditions are met:

A: This condition is satisfied if any of the following conditions are met for a period of one hour during an average day:

1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a stop sign equals or exceeds: 4 vehicles-hours for a one-lane approach or five vehicle hours for a two-land approach and
2. The volume on the same minor-street approach (one directions only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes and
3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

(Condition A is not being examined in this study)

B: The peak hour warrant is satisfied if the vehicles per hour on both approaches of the major street and the vehicles on the higher volume approach of the minor street for one hour fall above the 2009 MUTCD Warrant 3 curve.

Warrant Analysis

The traffic volumes are not expected to warrant a traffic signal at the Ward Road and Outerview Road or at Ward Road and Donovan Road intersections. The raw data and curves from the 2009 MUTCD are included in the Appendix.

Right-Turn and Left-Turn Lane Warrants

The need for right and left-turn lanes into the site entrances was evaluated using the City of Lee's Summit *Access Management Code*, March 2018 turning lane guidelines as part of this study for the existing plus site (Phase I & II) condition.

Left-Turn Warrant

Left-turn lane guidelines per City of Lee's Summit *Access Management Code*:

> 16.1.E. Left-turn lanes shall be provided at all median openings on roadways with medians.
>
> 16.1.H. The minimum length of left-turn lane should be 250 feet plus taper on an arterial street intersecting another arterial street and 200 feet plus taper on an arterial street at other locations. The minimum length of left-turn lane on collectors should be 150 feet plus taper. The minimum length of left-turn lane on connectors should meet the driveway throat length requirements.

Left-turn lanes will be required northbound on Ward Road at the Summit Orchard/B Entrance, Donovan Road intersection, and Tudor Road intersection, as Ward Road is a median divided arterial roadway.

Right-Turn Warrant

Right-turn lane guidelines per City of Lee's Summit *Access Management Code*:

> 16.2.A. Required on arterial streets at each intersecting street or driveway where the right-turn volume on the major arterial street is or is projected to be at least 30 vehicles in any hour, or the right-turn volume on the minor arterial street is or is projected to be at least 60 vehicles in any hour. Minimum length should be 250 feet plus the taper on a major arterial at the intersection of another arterial street or 200 feet plus the taper on a minor arterial at the intersection with another arterial street or on a major arterial at the intersection of a collector and 150 feet plus the taper at other locations along arterial streets.

The traffic volumes are expected to meet the right-turning volume criteria southbound at the Ward Road and Summit Orchard/B Entrance.

The raw analysis data is included in the Appendix.

CAPACITY

The capacity analysis for the study intersections was completed using the methodology outlined in the Highway Capacity Manual, 6th Edition. The volume and capacity analysis was completed using Trafficware SYNCHRO software (latest version). The criteria for determining Level of Service (LOS) for signalized and unsignalized study intersections and access points are based on the average vehicle delay and is outlined in Table 3 below. Level of Service is defined as the measure of the quality of traffic flow and is graded from "A" to "F"—with "A" being the best situation and "F" being the worst.

Table 3 – Intersection Level of Service

Level of Service (LOS)	Average Control Delay (sec/veh)	
	Unsignalized	Signalized
A	< 10	< 10
B	< 15	< 20
C	< 25	< 35
D	< 35	< 55
E	< 50	< 80
F	≥ 50	≥ 80

Existing Conditions

Chipman Road and Ward Road

All approaches operate at a LOS D or above for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles. The overall LOS for the intersection is a LOS C during the morning peak period and a LOS D during the afternoon peak period.

Chipman Road and Outerview Road

The through movements of Chipman Road are not stop-controlled and are therefore operating in a free-flow condition. The southbound right-turn lane operates at a LOS B and has sufficient capacity for queuing vehicles.

Chipman Road and Donovan Road

All approaches operate at a LOS C or above for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles. The overall LOS for the signal is a LOS C during the morning and afternoon peak periods.

Ward Road and Summit Orchard Entrance

All approaches operate at a LOS B for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Ward Road and Donovan Road

The through movements (northbound and southbound) of Ward Road are not stop-controlled and are therefore operating in a free-flow condition. The southbound left-turn lane operates at a LOS B or better and has sufficient capacity for queuing vehicles.

The westbound left-turn lane operates at a LOS E during the morning peak period due to the traffic volumes on Ward Road.

Ward Road and Tudor Road

All approaches operate at a LOS D or above for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles. The overall LOS for the signal is a LOS B during the morning and afternoon peak periods.

Ward Road and Outerview Road

All approaches operate at a LOS D or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Outerview Road and North Entrance

All approaches operate at a LOS A for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

The results of the capacity analysis for the existing morning and afternoon peak hour conditions along with lane configuration and queue lengths are shown on Figures 8 and 9.

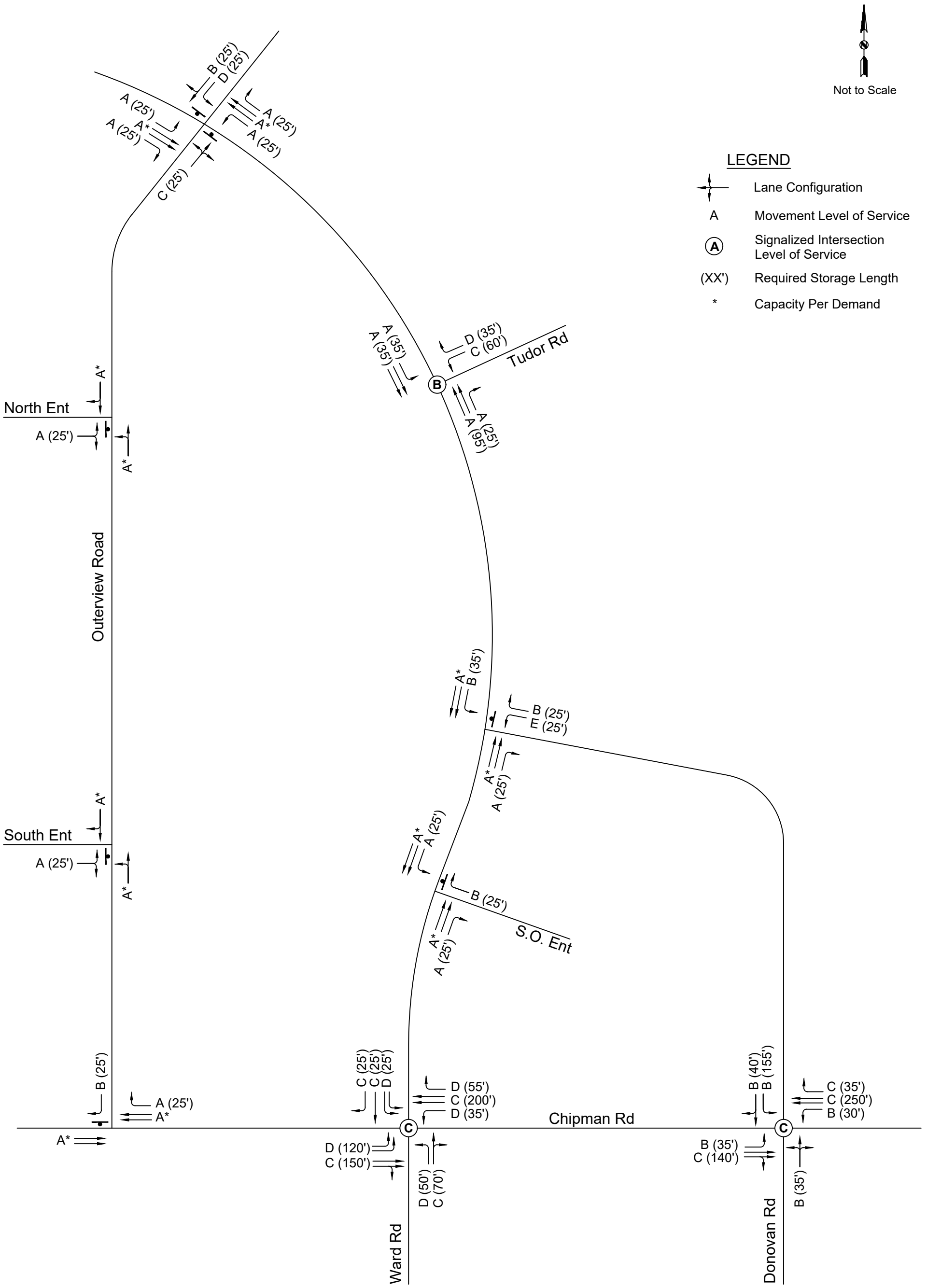

Figure 8 - Existing AM Level of Service

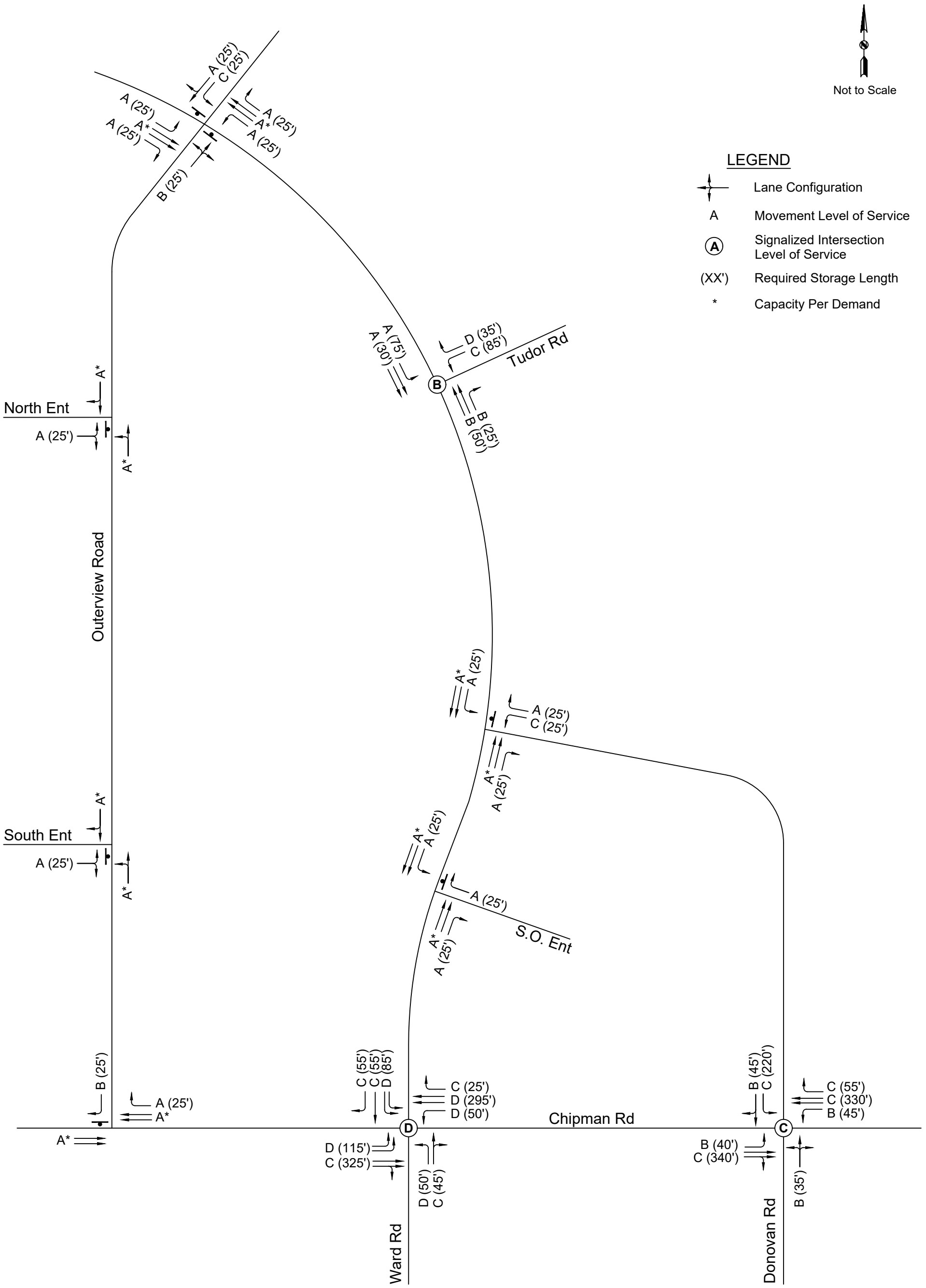

Figure 9 - Existing PM Level of Service

Existing Plus Phase I Site Conditions

Signal timings were optimized to account for the additional traffic.

Chipman Road and Ward Road

There is no significant change in the operations of this intersection from the existing conditions. All approaches continue to operate at a LOS D or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Chipman Road and Outerview Road

There is no significant change in operations of this intersection from the existing conditions. All approaches continue to operate at a LOS B or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Chipman Road and Donovan Road

There is no significant change in the operations of this intersection from the existing conditions. All approaches continue to operate at a LOS C or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Ward Road and Summit Orchard/B Entrance

All approaches operate at a LOS B for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

The proposed access for the northbound left-turn lane at this location does not fall within the spacing criteria of the City's *Access Management Guidelines*, therefore requires a formal waiver for a nonconforming situation based on existing conditions.

Per the City of Lee's Summit *Access Management Code*:

> 5.3. Waiver for Nonconforming Situations
>
> Where the existing configuration of properties and driveways in the vicinity of the subject site precludes spacing of an access point in accordance with the spacing standards of this policy, the City Lee's Summit Access Management Code 15 March 2018 Traffic Engineer, in consultation with appropriate City departments, shall be authorized to waive the spacing requirement if all of the following conditions have been met:
>
> 5.3.A. No other reasonable access to the property is available.
>
> 5.3.B. The connection does not create a potential safety or operational problem as reasonably determined by the City Traffic Engineer based on a review of a transportation impact study prepared by the applicant's professional engineer.

5.3.C. The access connection along the property line farthest from the intersection may be allowed. The construction of a median may be required on the street to restrict movements to right-in/right-out and only one drive shall be permitted along the roadway having the higher functional classification.

5.3.D. Joint access shall be considered with the property adjacent to the farthest property line. In these cases:

- A joint-use driveway with cross-access easements will be established to serve two abutting building sites,
- The building site is designed to provide cross access and unified circulation with abutting sites; and
- The property owner agrees to close any pre-existing curb cuts after the construction of both sides of the joint use driveway.

The northbound left-turn lane at the Summit Orchard/B Entrance will be the primary access into the restaurant site. The drive will be located off Ward Road, which is an arterial roadway, and has significantly higher existing traffic volumes and capacity than the private roadway referred to as Outerview Road. The additional Outerview Road access and shared access with the residential development to the north are designed to be secondary accesses. As fast-food restaurant sites have a high number of pass-by trips, it is essential for the businesses to have clear and direct access—without direct access, patrons will consider the development too difficult to access and the businesses will fail.

The Summit Orchard/B Entrance will be designed as a ¾ access and will mirror the existing southbound left-turn lane into the Summit Orchard development. The restaurant access is located as far north on the site as geometrically possible (five feet south of the property line) and will be the only access to the restaurant site from Ward Road.

Results of the Synchro analysis for queuing show the proposed northbound left-turn lane into the site will have sufficient queuing with 130 feet of storage (max expected northbound left-turn queue length is 25 feet). The southbound dual left-turn lane at Chipman Road is expected to need a maximum of 120 feet of storage and the proposed site plan will provide 170 feet of storage for the inner lane and 190 feet for the outer lane. The queues for the new northbound left-turn lane into the restaurant site will be substantially less than the storage provided and will not back onto Ward Road or into the Chipman Road intersection.

Joint access with the residential site to the north is provided at the secondary access at Outerview Road.

Ward Road and Donovan Road

During this phase the additional traffic on Ward Road and from the site will cause the westbound left-turn lane to drop to a LOS F from a LOS E, and the eastbound left-turn lane will operate at a LOS E during the morning peak period due to the traffic volumes on Ward Road. The volumes experiencing this unacceptable level of delay are less than 15 for each movement and there are alternative routes available during the peak periods—as this drive accesses the residential section of the development most of these trips would be vehicles that are familiar with peak hour characteristics and know to take an alternative route during the morning peak period.

As a signal is not expected to be warranted at this intersection; the installation of one to help with delays is not recommended.

Ward Road and E2 (RIRO) Entrance

All approaches operate at a LOS A for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Ward Road and Tudor Road

There is no significant change in the operations of this intersection from the existing conditions. All approaches continue to operate at a LOS C or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Ward Road and Outerview Road

During the morning peak period, the northeast movement drops from a LOS C to a LOS E. All other movements continue to operate at a LOS D or better and have sufficient capacity for queuing vehicles. The expected delay for the northeast movement is 38.2 seconds and the limit for LOS D is 35 seconds, so the movement is 3.2 seconds outside the LOS D criteria.

As a signal is not expected to be warranted at this intersection and, the installation of a signal to help with delays is not recommended.

Outerview Road and A Entrance

All approaches operate at a LOS A for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Outerview Road and C Entrance

All approaches operate at a LOS A for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Outerview Road and E1 Entrance

All approaches operate at a LOS A for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Outerview Road and North Entrance/F1 Entrance

There is no significant change in the operations of this intersection from the existing conditions. All approaches operate at a LOS A for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

The results of the capacity analysis for the existing plus phase I morning and afternoon peak hour conditions along with lane configuration and queue lengths are shown on Figures 10 and 11.

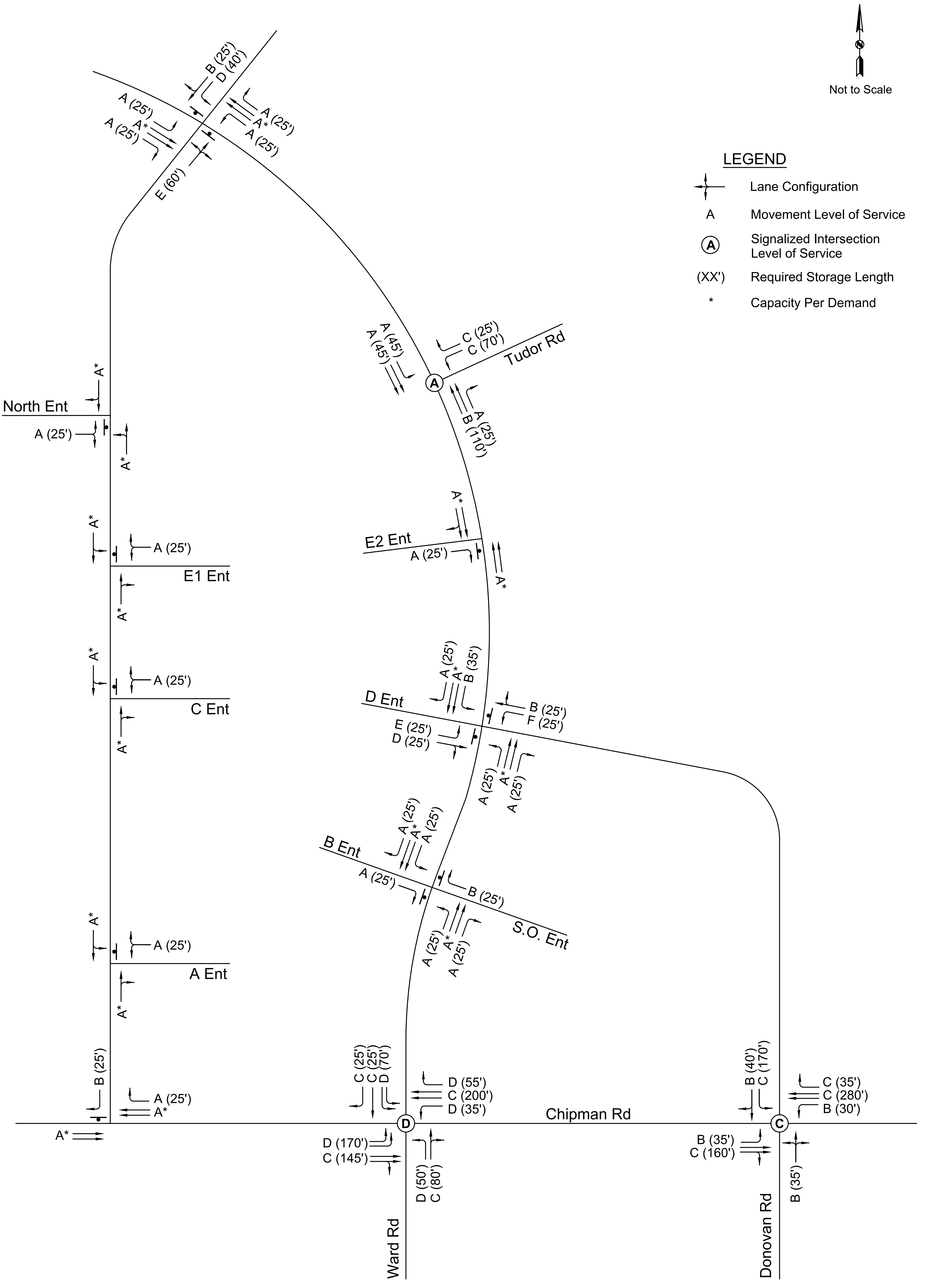

Figure 10 - Existing plus Phase I Site AM Level of Service (Restaurant & Residential)

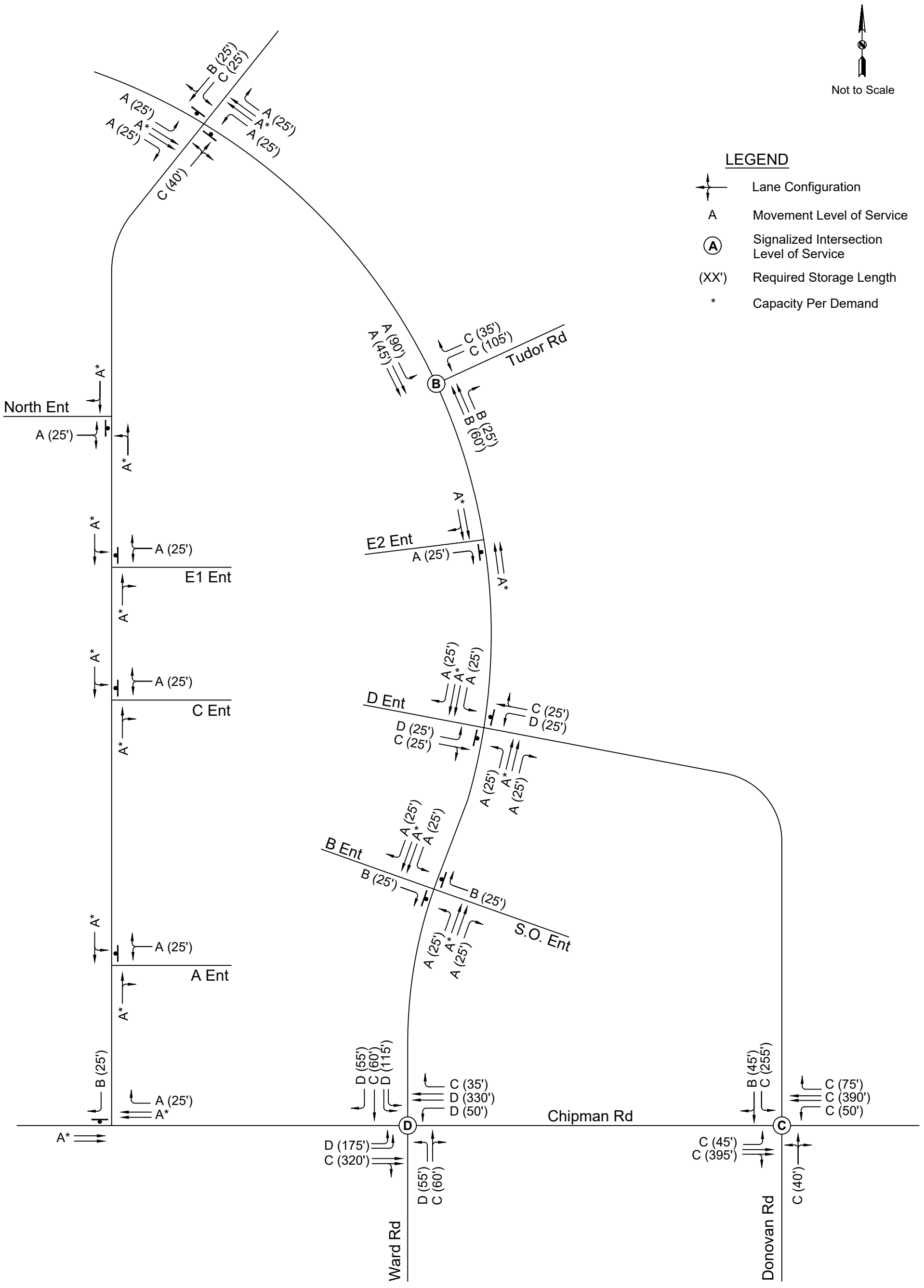

Figure 11 - Existing plus Phase I Site PM Level of Service (Restaurant & Residential)

Existing Plus Phase I & II Site Conditions

Signal timings were optimized to account for the additional traffic.

Chipman Road and Ward Road

There is no significant change in the operations of this intersection from the phase I conditions. All approaches continue to operate at a LOS D or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Chipman Road and Outerview Road

There is no significant change in the operations of this intersection from the phase I conditions. All approaches continue to operate at a LOS B or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Chipman Road and Donovan Road

There is no significant change in the operations of this intersection from the phase I conditions. All approaches operate at a LOS D or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Ward Road and Summit Orchard Entrance/B Entrance

All approaches operate at a LOS B for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

The northbound left-turn lane into the site will continue to have sufficient queuing with 130 feet of storage.

Ward Road and Donovan Road

There is no significant change in the operation of this intersection from the phase I conditions. The westbound left-turn lane continues to operate at a LOS F and the eastbound left-turn lane at a LOS E.

Ward Road and E2 (RIRO) Entrance

There is no significant change in the operations of this intersection from the phase I conditions. All approaches continue to operate at a LOS A or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Ward Road and Tudor Road

There is no significant change in the LOS operations of this intersection from the phase I conditions. All approaches operate at a LOS D or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Ward Road and G2 (RIRO) Entrance

All approaches operate at a LOS B for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Ward Road and Outerview Road

The northeast movement continues to operate at a LOS E. All other movements continue to operate at a LOS D or better and have sufficient capacity for queuing vehicles.

Outerview Road and A Entrance

There is no significant change in the operations of this intersection from the phase I conditions. All approaches continue to operate at a LOS A or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Outerview Road and C Entrance

There is no significant change in the operations of this intersection from the phase I conditions. All approaches continue to operate at a LOS A or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Outerview Road and E1 Entrance

There is no significant change in the operations of this intersection from the phase I conditions. All approaches continue to operate at a LOS A or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Outerview Road and North Entrance/F1 Entrance

There is no significant change in the operations of this intersection from the phase I conditions. All approaches continue to operate at a LOS A or better for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

Outerview Road and G1 Entrance

All approaches operate at a LOS A for the morning and afternoon peak periods and the intersection has sufficient capacity for queuing vehicles.

The results of the capacity analysis for the existing plus phase I & II morning and afternoon peak hour conditions along with lane configuration and queue lengths are shown on Figures 12 and 13.

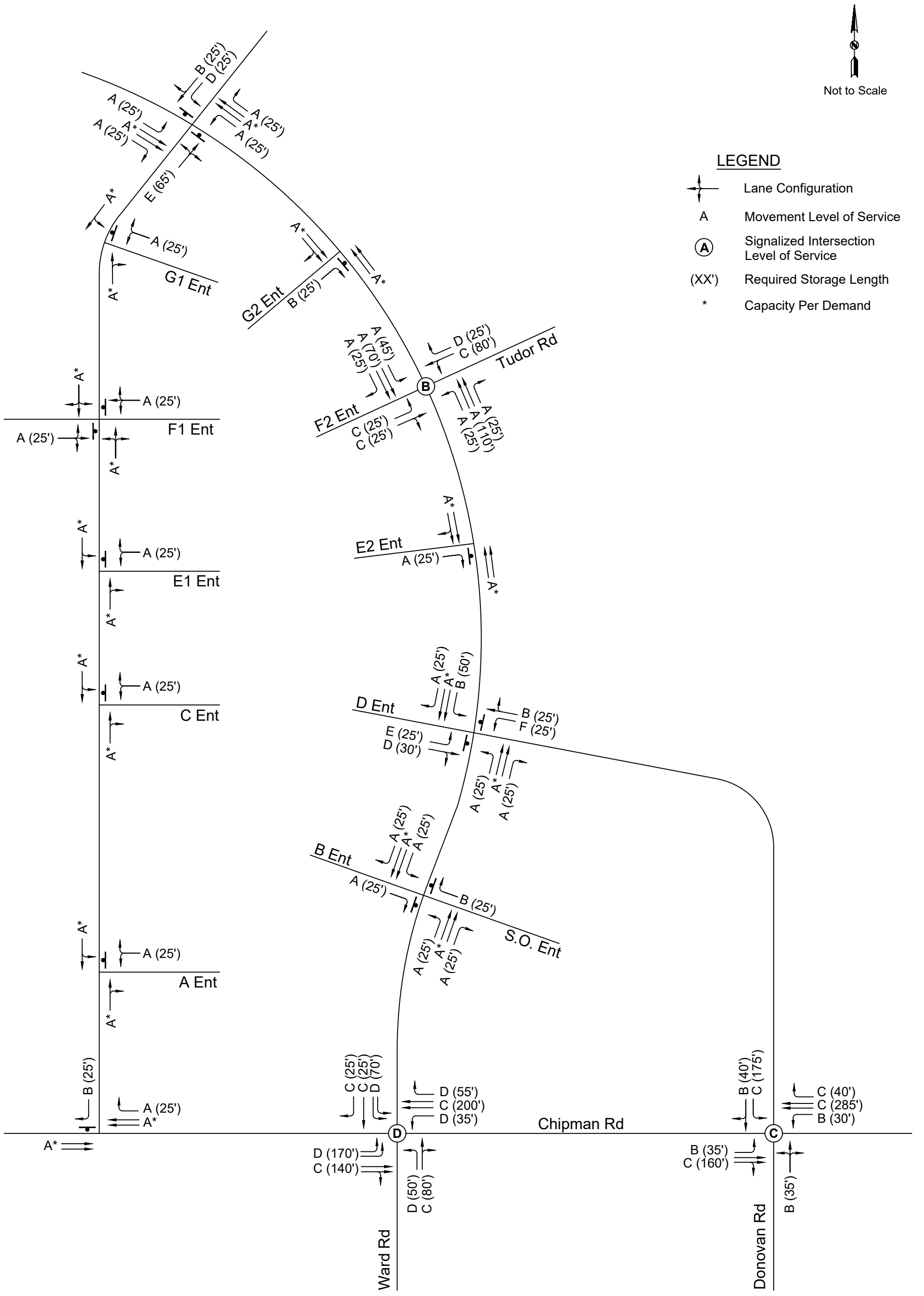

Figure 12 - Existing plus Phase I&II Site AM Level of Service (Full Build-Out)

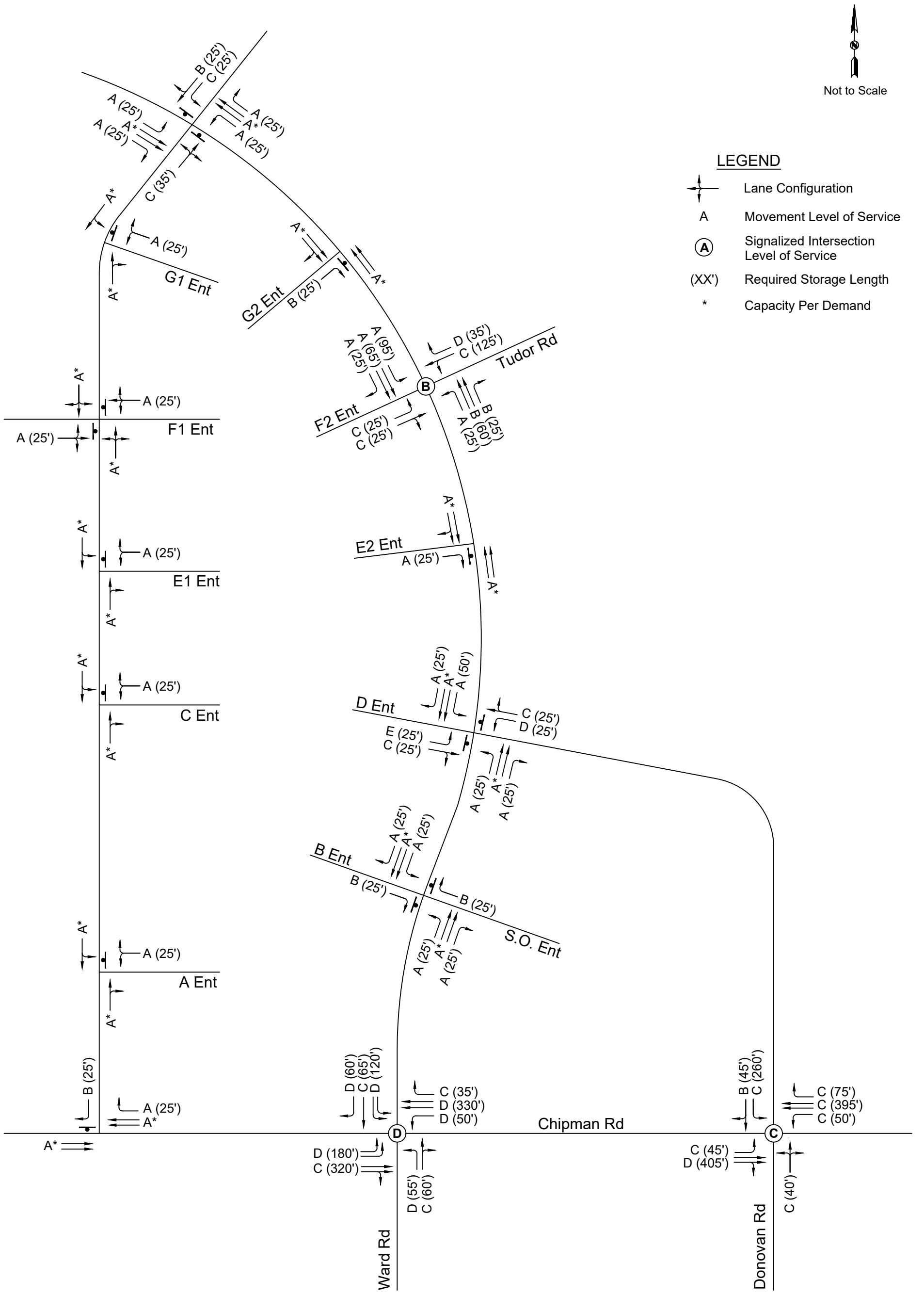

Figure 13- Existing plus Phase I&II Site PM Level of Service (Full Build-Out)

RECOMMENDATIONS

This study documents the findings of the traffic analysis of the expected traffic for the Summit Orchards West development in Lee's Summit, Missouri. The study includes an analysis of the existing conditions, existing plus Phase I site conditions, and existing plus Phase I & II site conditions.

Based on the results of the SYNCHRO analysis, observations from the field, and engineering judgment, the following recommendations are made:

When the Phase 1A residential development (center lot) is constructed:

- Install northbound left-turn lane (200 feet plus taper) at the intersection of Ward Road and Donovan Road.

When the Phase 1B restaurant development (south lot) is constructed:

- Restripe the southbound lanes at Ward Road and Chipman Road to a right-turn lane, a through lane, and dual left-turn lanes (minimum 170 feet of storage for the inner lane and 190 feet for the outer lane plus taper). Install signing per MUTCD recommendations for the right-turn lane-drop. Optimize/adjust signal timings as necessary for the Ward Road and Chipman Road signal.
- Install a northbound left-turn lane (minimum 130 feet of storage plus taper) at the intersection of Ward Road and Summit Orchard/B Entrance with modifications to median.
- Install a southbound right-turn lane (200 feet plus taper) at the intersection of Ward Road and Summit Orchard/B Entrance.
- Construct an internal site connection between the residential and restaurant development near A Entrance and Outerview Road.

When the Phase 2 warehouse development (north lot) is constructed:

- Reconstruct the northbound u-turn lane at Ward Road and Tudor Road to a left-turn lane (200 feet plus taper). Restripe the westbound lanes to consist of a right-turn lane and a through/left-turn lane. Construct the eastbound signal mast arm and pole with pedestrian equipment and optimize/adjust signal timings as necessary.
- The need for future roadway improvements should be reevaluated as additional development occurs.

APPENDIX

City of Lee's Summit, MO

220 SE Green Street
Lee's Summit, Missouri 64063
Public Works Department

Default Comments
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Then Click the Comments Tab

File Name : ChWa041918
Site Code : 00000000
Start Date : 4/19/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	NW Ward Road From North					NW Chipman Road From East					NW Ward Road From South					NW Chipman Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	12	3	0	1	16	5	97	2	0	104	10	7	7	0	24	3	99	13	1	116	260
07:15 AM	8	1	1	0	10	4	119	2	0	125	8	11	8	0	27	2	91	8	0	101	263
07:30 AM	18	5	1	0	24	6	116	5	0	127	8	15	6	0	29	5	107	23	0	135	315
07:45 AM	7	2	2	0	11	6	132	5	0	143	10	22	9	0	41	8	112	17	0	137	332
Total	45	11	4	1	61	21	464	14	0	499	36	55	30	0	121	18	409	61	1	489	1170
08:00 AM	11	3	2	0	16	4	108	2	0	114	11	11	6	0	28	2	95	10	0	107	265
08:15 AM	19	9	1	0	29	4	111	3	0	118	10	2	7	0	19	4	90	12	0	106	272
*** BREAK ***																					
Total	30	12	3	0	45	8	219	5	0	232	21	13	13	0	47	6	185	22	0	213	537
*** BREAK ***																					
04:30 PM	14	5	8	0	27	2	176	12	0	190	7	11	11	0	29	10	176	4	0	190	436
04:45 PM	22	15	2	0	39	0	201	6	0	207	14	11	10	0	35	10	160	6	0	176	457
Total	36	20	10	0	66	2	377	18	0	397	21	22	21	0	64	20	336	10	0	366	893
05:00 PM	16	11	6	0	33	18	160	5	0	183	10	1	9	0	20	7	186	5	1	199	435
05:15 PM	11	11	2	2	26	2	218	8	0	228	15	7	7	2	31	20	181	5	6	212	497
05:30 PM	15	4	7	0	26	15	161	7	0	183	10	6	12	1	29	5	221	4	1	231	469
05:45 PM	23	5	4	0	32	2	187	8	0	197	10	10	4	0	24	5	213	7	1	226	479
Total	65	31	19	2	117	37	726	28	0	791	45	24	32	3	104	37	801	21	9	868	1880
Grand Total	176	74	36	3	289	68	1786	65	0	1919	123	114	96	3	336	81	1731	114	10	1936	4480
Apprch %	60.9	25.6	12.5	1		3.5	93.1	3.4	0		36.6	33.9	28.6	0.9		4.2	89.4	5.9	0.5		
Total %	3.9	1.7	0.8	0.1	6.5	1.5	39.9	1.5	0	42.8	2.7	2.5	2.1	0.1	7.5	1.8	38.6	2.5	0.2	43.2	
Unshifted	176	74	36	3	289	68	1786	65	0	1919	123	113	96	3	335	81	1731	114	10	1936	4479
% Unshifted	100	100	100	100	100	100	100	100	0	100	100	99.1	100	100	99.7	100	100	100	100	100	100
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0.9	0	0	0.3	0	0	0	0	0	0

City of Lee's Summit, MO

220 SE Green Street
Lee's Summit, Missouri 64063
Public Works Department

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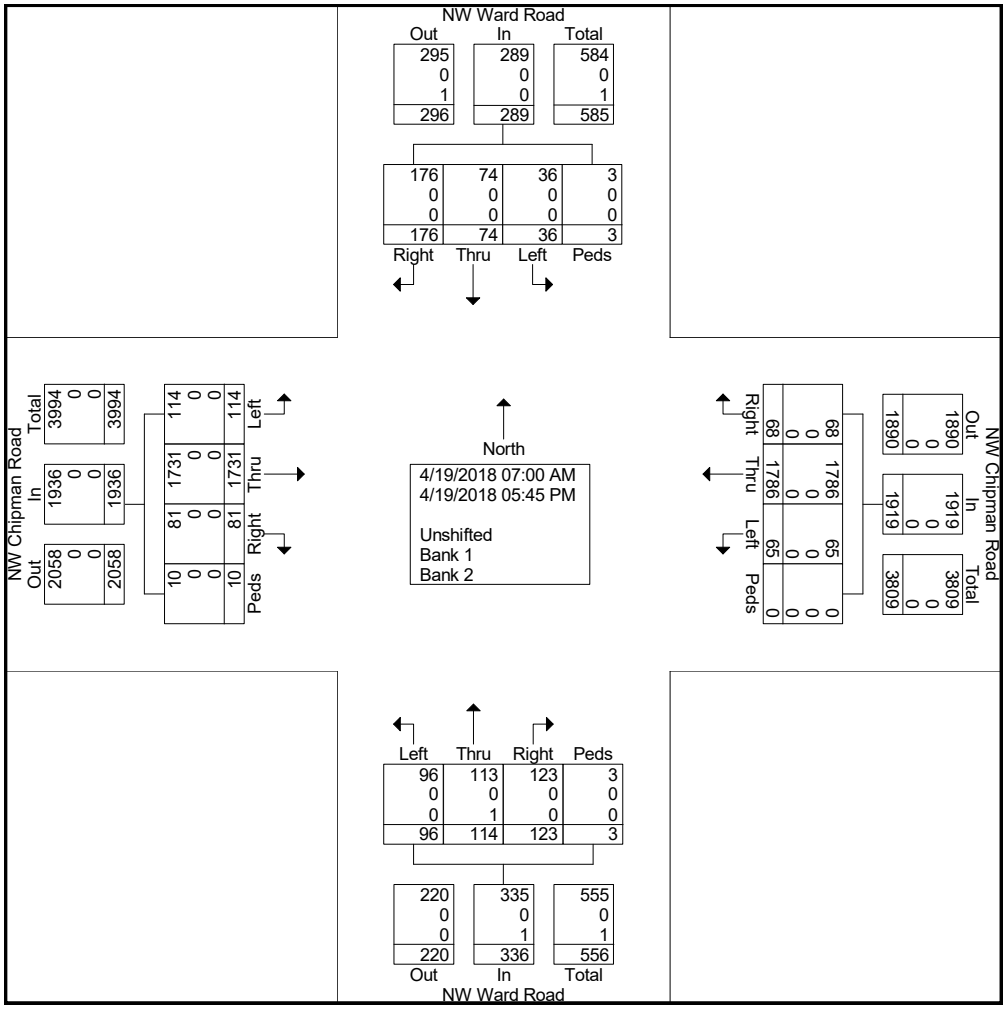
File Name : ChWa041918
Site Code : 00000000
Start Date : 4/19/2018
Page No : 2



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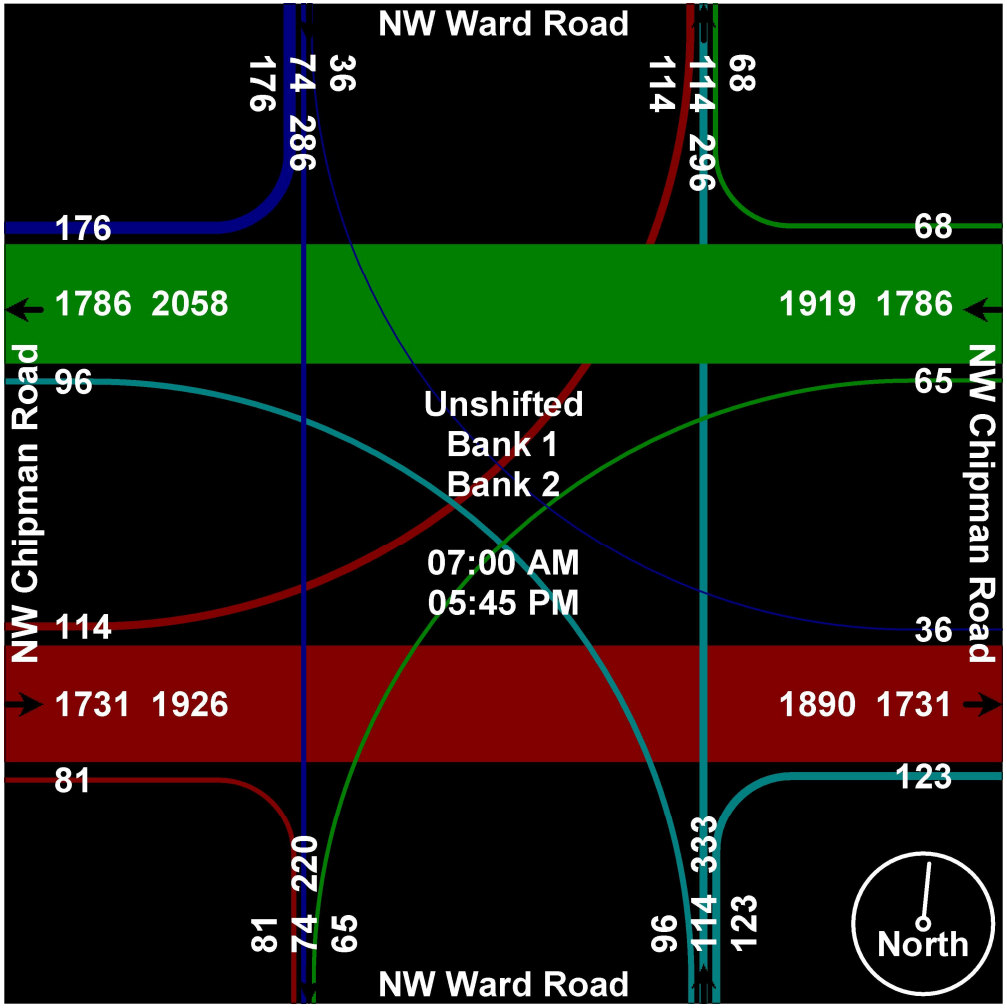
Site Code : 00000000
Start Date : 4/19/2018
Page No : 3



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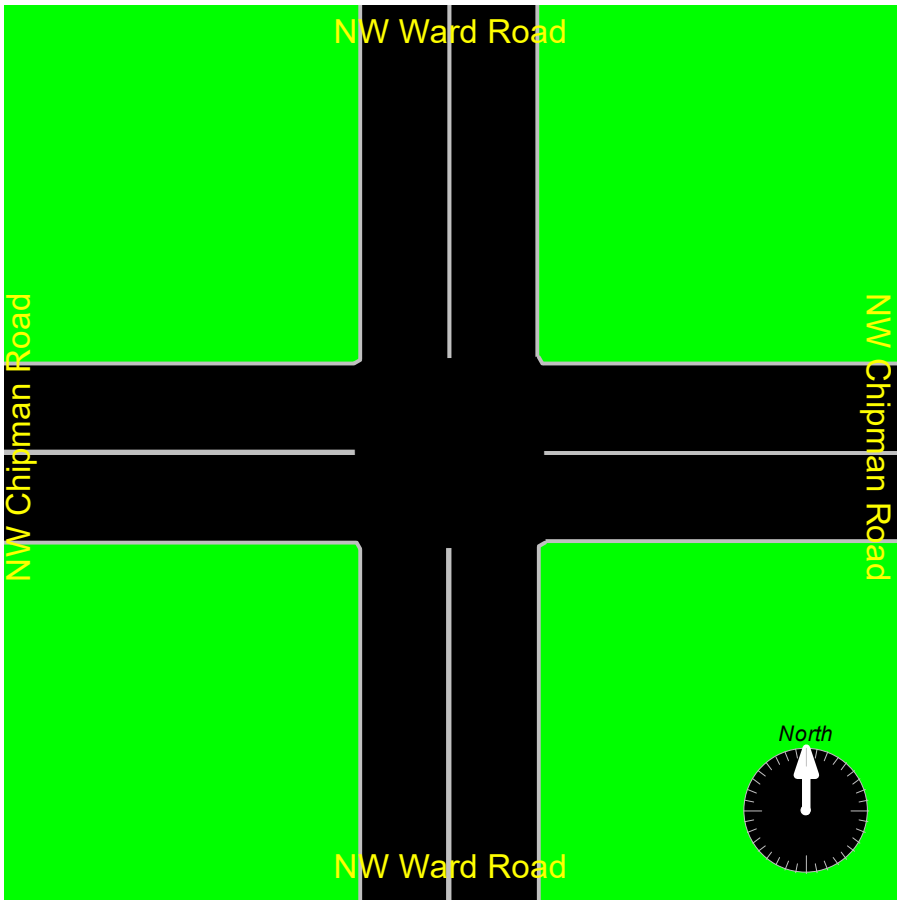
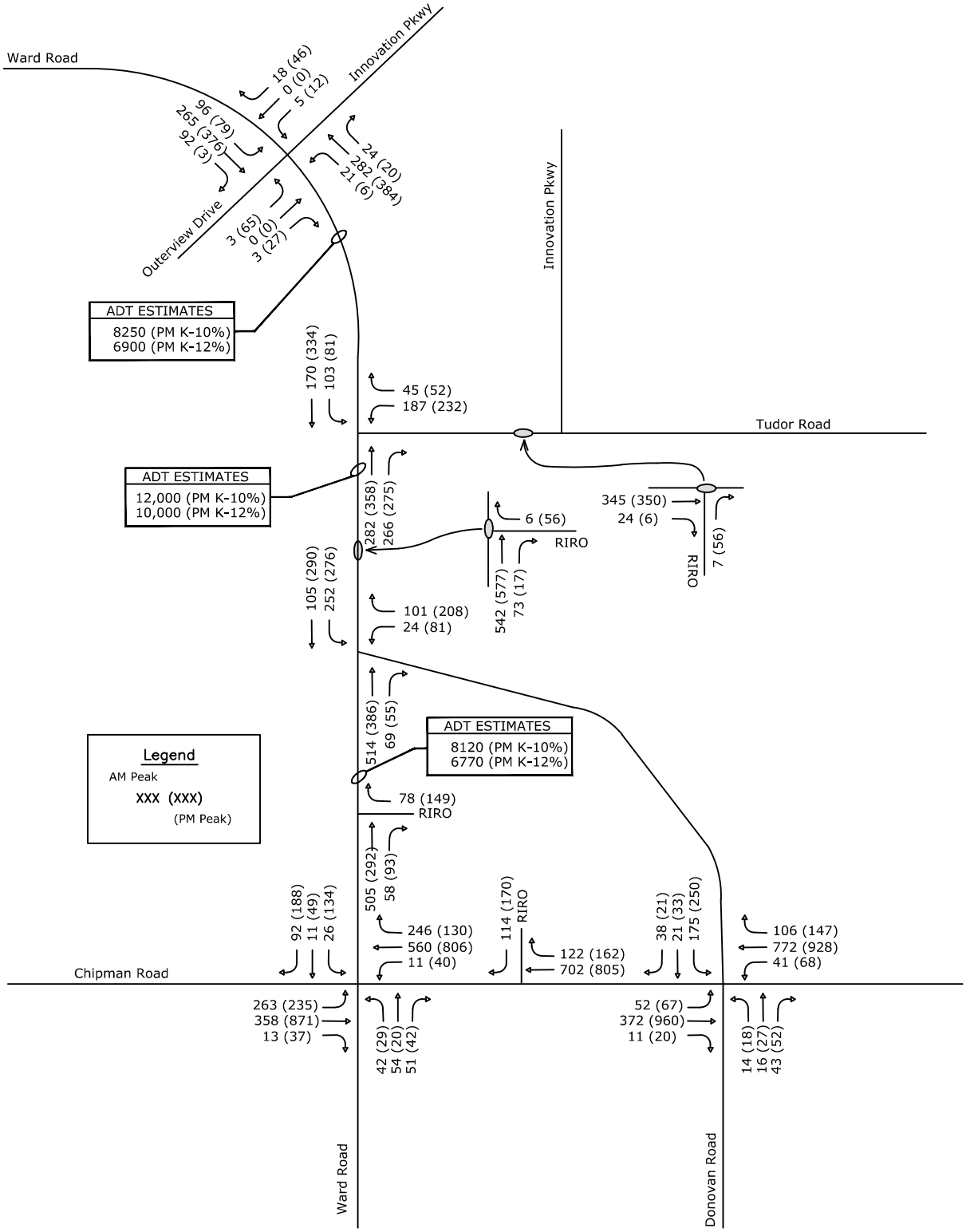
Site Code : 00000000
Start Date : 4/19/2018
Page No : 4





McCLURE ENGINEERING Co.
building strong communities.

Projected Volumes, Phases 1 & 2 & 3
Apartments, Commercial, Offices, Summit Orchards
Traffic Impact Study
Lee's Summit, MO

NORTH

FIGURE 2

Existing plus Approved Development Conditions
Peak Hour Volumes

Tudor Road Development
Lee's Summit, MO

LEGEND

AM (PM) Peak Hour Volume

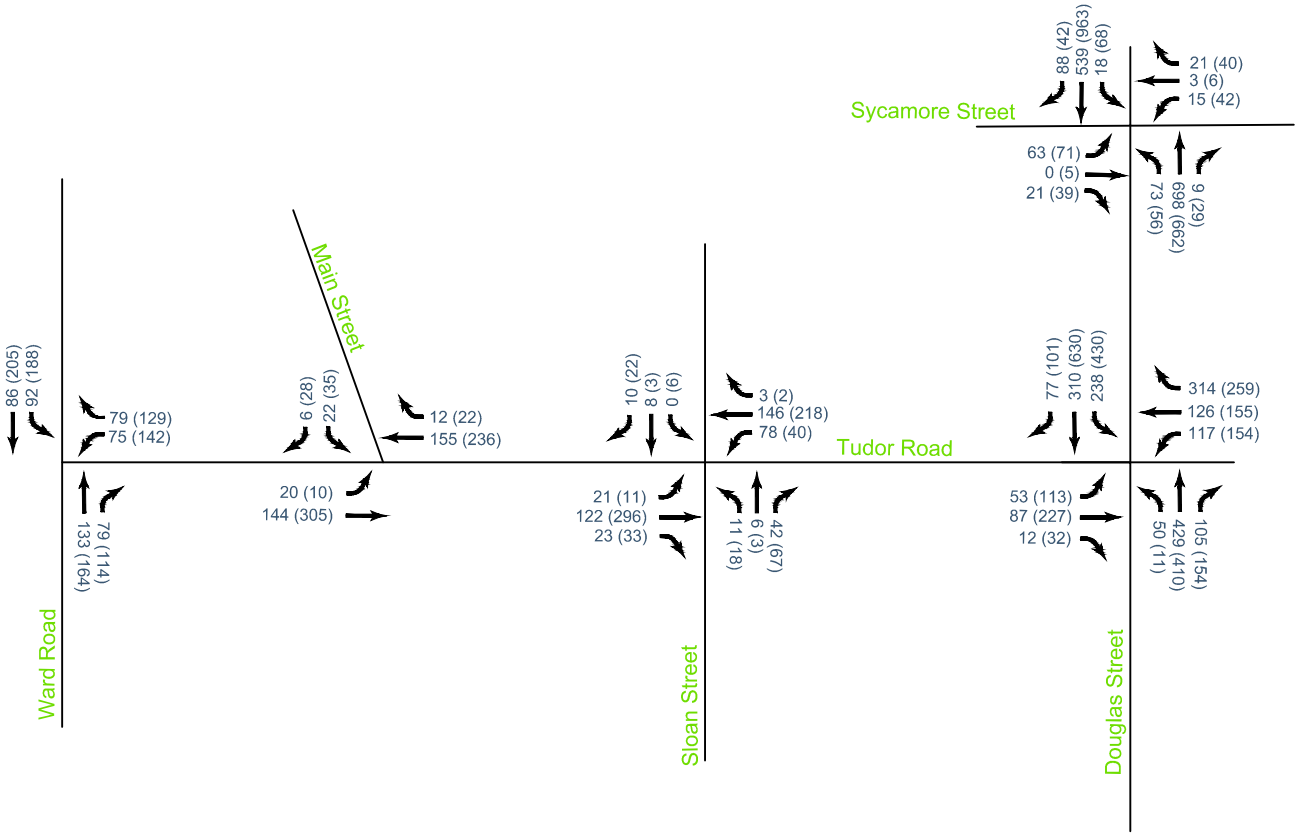


FIGURE 6

Phase 1
Trip Distribution
Tudor Road Development
Lee's Summit, MO

olsson

LEGEND

AM (PM) Peak Hour Vehicle Trips (Car)

[AM (PM)] Peak Hour Vehicle Trips (Truck)

XX% AM/PM Car Trip Distribution Percentages

XX% AM/PM Truck Trip Distribution Percentages

FIGURE 10

Phase 2
Trip Distribution
Tudor Road Development
Lee's Summit, MO

olsson

LEGEND

AM (PM) — AM (PM) Peak Hour Car Trips

[AM (PM)] — AM (PM) Peak Hour Truck Trips

XX% — AM/PM Car Trip Distribution Percentages

XX% — AM/PM Truck Trip Distribution Percentages

7/12/2022
Chipman & Ward Rd
AM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
7:00	3	13	1	17	7	17	6	30	1	6	8	15	3	6	1	10	72
7:15	7	15	2	24	8	29	12	49	6	20	8	34	7	5	2	14	121
7:30	5	26	4	35	4	25	9	38	3	18	7	28	5	7	7	19	120
7:45	5	29	2	36	12	31	7	50	3	22	15	40	9	10	2	21	147
8:00	9	34	4	47	7	27	5	39	6	24	9	39	2	7	6	15	140
8:15	5	38	0	43	11	33	8	52	8	23	18	49	6	12	5	23	167
8:30	4	27	4	35	5	35	9	49	4	17	18	39	4	16	8	28	151
8:45	14	39	1	54	10	30	4	44	5	18	12	35	6	10	6	22	155
Total	**52**	**221**	**18**	**291**	**64**	**227**	**60**	**351**	**36**	**148**	**95**	**279**	**42**	**73**	**37**	**152**	**1073**

					PHF					PHF					PHF					PHF	
Time	EB Left	EB Thru	EB Right	EB Total		WB Left	WB Thru	WB Right	WB Total		NB Left	NB Thru	NB Right	NB Total		SB Left	SB Thru	SB Right	SB Total		Int. Total
8:00	9	34	4	47	**0.83**	7	27	5	39	**0.88**	6	24	9	39	**0.83**	2	7	6	15	**0.79**	140
8:15	5	38	0	43		11	33	8	52		8	23	18	49		6	12	5	23		167
8:30	4	27	4	35		5	35	9	49		4	17	18	39		4	16	8	28		151
8:45	14	39	1	54		10	30	4	44		5	18	12	35		6	10	6	22		155
Total	32	138	9	179		33	125	26	184		23	82	57	162		18	45	25	88		613

Chipman & Donovan Rd
AM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
7:00	1	26	5	32	4	28	8	40	1	3	6	10	2	12	2	16	98
7:15	3	28	1	32	6	43	2	51	1	3	11	15	4	2	2	8	106
7:30	3	32	0	35	9	36	3	48	2	3	10	15	8	2	1	11	109
7:45	1	56	0	57	16	43	3	62	2	6	18	26	3	3	1	7	152
8:00	5	38	0	43	9	44	9	62	2	6	8	16	4	2	1	7	128
8:15	4	52	1	57	7	48	6	61	1	2	12	15	7	5	2	14	147
8:30	2	50	1	53	9	55	5	69	0	2	8	10	7	4	0	11	143
8:45	2	54	4	60	20	45	6	71	0	3	13	16	2	0	2	4	151
Total	**21**	**336**	**12**	**369**	**80**	**342**	**42**	**464**	**9**	**28**	**86**	**123**	**37**	**30**	**11**	**78**	**1034**

					PHF					PHF					PHF					PHF	
Time	EB Left	EB Thru	EB Right	EB Total		WB Left	WB Thru	WB Right	WB Total		NB Left	NB Thru	NB Right	NB Total		SB Left	SB Thru	SB Right	SB Total		Int. Total
8:00	5	38	0	43	**0.89**	9	44	9	62	**0.93**	2	6	8	16	**0.89**	4	2	1	7	**0.64**	128
8:15	4	52	1	57		7	48	6	61		1	2	12	15		7	5	2	14		147
8:30	2	50	1	53		9	55	5	69		0	2	8	10		7	4	0	11		143
8:45	2	54	4	60		20	45	6	71		0	3	13	16		2	0	2	4		151
Total	13	194	6	213		45	192	26	263		3	13	41	57		20	11	5	36		569

Ward & Tudor Rd
AM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
7:00	0	0	0	0	4	0	19	23	0	16	9	25	23	13	0	36	84
7:15	0	0	0	0	7	0	31	38	0	30	13	43	30	23	0	53	134
7:30	0	0	0	0	8	0	43	51	0	34	9	43	16	21	0	37	131
7:45	0	0	0	0	13	0	22	35	0	32	12	44	37	20	0	57	136
8:00	0	0	0	0	6	0	20	26	0	32	19	51	22	17	0	39	116
8:15	0	0	0	0	8	0	24	32	0	32	32	64	29	11	0	40	136
8:30	0	0	0	0	16	0	25	41	0	26	20	46	26	10	0	36	123
8:45	0	0	0	0	18	0	29	47	0	24	19	43	38	28	0	66	156
Total	**0**	**0**	**0**	**0**	**80**	**0**	**213**	**293**	**0**	**226**	**133**	**359**	**221**	**143**	**0**	**364**	**1016**

	PHF																			
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	Int. Total
8:00	0	0	0	0	#DIV/0!	6	0	20	26	0.78	0	32	19	51	0.8	22	17	0	39	0.69	116
8:15	0	0	0	0		8	0	24	32		0	32	32	64		29	11	0	40		136
8:30	0	0	0	0		16	0	25	41		0	26	20	46		26	10	0	36		123
8:45	0	0	0	0		18	0	29	47		0	24	19	43		38	28	0	66		156
Total	0	0	0	0		48	0	98	146		0	114	90	204		115	66	0	181		531

Ward & Outerview Rd
AM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
7:00	0	0	2	2	1	0	3	4	2	34	0	36	1	31	2	34	76
7:15	0	0	1	1	2	0	2	4	4	57	0	61	3	52	4	59	125
7:30	0	0	1	1	1	0	2	3	4	71	2	77	6	37	3	46	127
7:45	0	0	0	0	1	0	4	5	1	50	0	51	19	54	5	78	134
8:00	1	0	1	2	2	0	2	4	3	50	0	53	19	34	4	57	116
8:15	0	0	0	0	1	0	5	6	2	52	1	55	12	36	1	49	110
8:30	0	0	1	1	3	0	2	5	2	47	0	49	11	34	1	46	101
8:45	1	0	1	2	2	0	2	4	2	50	0	52	8	61	0	69	127
Total	**2**	**0**	**7**	**9**	**13**	**0**	**22**	**35**	**20**	**411**	**3**	**434**	**79**	**339**	**20**	**438**	**916**

	PHF																			
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	Int. Total
8:00	1	0	1	2	0.63	2	0	2	4	0.79	3	50	0	53	0.95	19	34	4	57	0.80	116
8:15	0	0	0	0		1	0	5	6		2	52	1	55		12	36	1	49		110
8:30	0	0	1	1		3	0	2	5		2	47	0	49		11	34	1	46		101
8:45	1	0	1	2		2	0	2	4		2	50	0	52		8	61	0	69		127
Total	2	0	3	5		8	0	11	19		9	199	1	209		50	165	6	221		454

Donovan & Ward Rd
AM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
7:00	0	0	0	0	0	0	17	17	0	0	1	1	6	0	0	6	24
7:15	0	0	0	0	0	0	11	11	0	0	2	2	7	0	0	7	20
7:30	0	0	0	0	0	0	24	24	1	0	1	2	9	0	0	9	35
7:45	0	0	0	0	4	0	15	19	0	0	3	3	6	0	0	6	28
8:00	0	0	0	0	4	0	15	19	0	0	0	0	1	0	0	1	20
8:15	0	0	0	0	5	0	11	16	0	0	0	0	3	0	0	3	19
8:30	0	0	0	0	2	0	15	17	0	0	3	3	6	0	0	6	26
8:45	0	0	0	0	1	0	1	2	0	0	1	1	8	0	0	8	11
Total	**0**	**0**	**0**	**0**	**16**	**0**	**109**	**125**	**1**	**0**	**11**	**12**	**46**	**0**	**0**	**46**	**183**

	PHF																			
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	Int. Total
8:00	0	0	0	0	#DIV/0!	4	0	15	19	0.71	0	0	0	0	0.33	1	0	0	1	0.56	20
8:15	0	0	0	0		5	0	11	16		0	0	0	0		3	0	0	3		19
8:30	0	0	0	0		2	0	15	17		0	0	3	3		6	0	0	6		26
8:45	0	0	0	0		1	0	1	2		0	0	1	1		8	0	0	8		11
Total	0	0	0	0		12	0	42	54		0	0	4	4		18	0	0	18		76

Chipman & Outerview Rd
AM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
7:00	0	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	6
7:15	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
7:30	0	0	0	0	0	0	2	2	0	0	0	0	0	0	1	1	3
7:45	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
8:00	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
8:15	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	2
8:30	0	0	0	0	0	0	3	3	0	0	0	0	0	0	1	1	4
8:45	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	3
Total	**0**	**0**	**0**	**0**	**0**	**0**	**18**	**18**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**3**	**21**

	PHF																			
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	Int. Total
8:00	0	0	0	0	#DIV/0!	0	0	1	1	0.67	0	0	0	0	#DIV/0!	0	0	0	0	0.50	1
8:15	0	0	0	0		0	0	1	1		0	0	0	0		0	0	1	1		2
8:30	0	0	0	0		0	0	3	3		0	0	0	0		0	0	1	1		4
8:45	0	0	0	0		0	0	3	3		0	0	0	0		0	0	0	0		3
Total	0	0	0	0		0	0	8	8		0	0	0	0		0	0	2	2		10

Ward & Summit Orchard Entrance
AM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
7:00	0	0	1	1	0	0	#REF!	#REF!	0	0	0	0	0	0	0	0	#REF!
7:15	0	0	2	2	0	0	#REF!	#REF!	0	0	3	3	1	0	0	1	#REF!
7:30	0	0	3	3	0	0	#REF!	#REF!	0	0	1	1	1	0	0	1	#REF!
7:45	0	0	1	1	0	0	#REF!	#REF!	0	0	1	1	2	0	0	2	#REF!
8:00	0	0	4	4	0	0	#REF!	#REF!	0	0	2	2	5	0	0	5	#REF!
8:15	0	0	2	2	0	0	#REF!	#REF!	0	0	3	3	0	0	0	0	#REF!
8:30	0	0	4	4	0	0	#REF!	#REF!	0	0	7	7	1	0	0	1	#REF!
8:45	0	0	3	3	0	0	#REF!	#REF!	0	0	6	6	1	0	0	1	#REF!
Total	**0**	**0**	**20**	**20**	**0**	**0**	**#REF!**	**#REF!**	**0**	**0**	**23**	**23**	**11**	**0**	**0**	**11**	**#REF!**

					PHF					PHF					PHF					PHF	
Time	EB Left	EB Thru	EB Right	EB Total		WB Left	WB Thru	WB Right	WB Total		NB Left	NB Thru	NB Right	NB Total		SB Left	SB Thru	SB Right	SB Total		Int. Total
8:00	0	0	4	4	**0.81**	0	0	#REF!	#REF!	**#REF!**	0	0	2	2	**0.64**	5	0	0	5	**0.35**	#REF!
8:15	0	0	2	2		0	0	#REF!	#REF!		0	0	3	3		0	0	0	0		#REF!
8:30	0	0	4	4		0	0	#REF!	#REF!		0	0	7	7		1	0	0	1		#REF!
8:45	0	0	3	3		0	0	#REF!	#REF!		0	0	6	6		1	0	0	1		#REF!
Total	0	0	13	13		0	0	#REF!	#REF!		0	0	18	18		7	0	0	7		#REF!

Outerview Rd & South Entrance
AM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
7:00	2	0	0	2	0	0	0	0	0	0	0	0	0	0	1	1	3
7:15	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	2
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
7:45	0	0	1	1	0	0	0	0	1	0	0	1	0	0	0	0	2
8:00	2	0	0	2	0	0	0	0	0	0	0	0	0	0	2	2	4
8:15	0	0	1	1	0	0	0	0	3	0	0	3	0	0	1	1	5
8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**5**	**0**	**2**	**7**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**5**	**0**	**0**	**8**	**8**	**20**

					PHF					PHF					PHF					PHF	
Time	EB Left	EB Thru	EB Right	EB Total		WB Left	WB Thru	WB Right	WB Total		NB Left	NB Thru	NB Right	NB Total		SB Left	SB Thru	SB Right	SB Total		Int. Total
8:00	2	0	0	2	**0.38**	0	0	0	0	**#DIV/0!**	0	0	0	0	**0.25**	0	0	2	2	**0.63**	4
8:15	0	0	1	1		0	0	0	0		3	0	0	3		0	0	1	1		5
8:30	0	0	0	0		0	0	0	0		0	0	0	0		0	0	2	2		2
8:45	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0
Total	2	0	1	3		0	0	0	0		3	0	0	3		0	0	5	5		11

Outerview Rd & North Entrance
AM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
7:00	1	0	1	2	0	0	0	0	0	0	0	0	0	0	1	1	3
7:15	0	0	1	1	0	0	0	0	1	0	0	1	0	0	0	0	2
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	1	1	0	0	0	0	1	0	0	1	0	0	1	1	3
8:00	1	0	0	1	0	0	0	0	1	0	0	1	0	0	1	1	3
8:15	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	2
8:30	1	0	2	3	0	0	0	0	1	0	0	1	0	0	1	1	5
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Total	**3**	**0**	**5**	**8**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**6**	**0**	**0**	**6**	**6**	**20**

					PHF					PHF					PHF					PHF	
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	Int. Total
8:00	1	0	0	1	**0.33**	0	0	0	0	**#DIV/0!**	1	0	0	1	**0.5**	0	0	1	1	**0.50**	3
8:15	0	0	0	0		0	0	0	0		2	0	0	2		0	0	0	0		2
8:30	1	0	2	3		0	0	0	0		1	0	0	1		0	0	1	1		5
8:45	0	0	0	0		0	0	0	0		0	0	0	0		0	0	2	2		2
Total	2	0	2	4		0	0	0	0		4	0	0	4		0	0	4	4		12

7/12/2022
Chipman & Ward Rd
PM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
4:00	14	60	2	76	14	66	11	91	9	9	13	31	10	13	7	30	228
4:15	15	46	7	68	13	44	9	66	4	16	19	39	14	16	6	36	209
4:30	13	64	3	80	13	59	3	75	13	27	17	57	20	25	7	52	264
4:45	24	74	9	107	19	44	10	73	7	12	17	36	26	35	6	67	283
5:00	17	61	4	82	16	47	9	72	4	27	16	47	11	33	7	51	252
5:15	8	59	0	67	18	59	7	84	5	13	14	32	15	29	2	46	229
5:30	15	75	6	96	11	38	11	60	9	23	10	42	18	24	6	48	246
5:45	15	48	3	66	11	42	12	65	3	16	14	33	17	27	4	48	212
Total	**121**	**487**	**34**	**642**	**115**	**399**	**72**	**586**	**54**	**143**	**120**	**317**	**131**	**202**	**45**	**378**	**1923**

					PHF					PHF					PHF					PHF	
Time	EB Left	EB Thru	EB Right	EB Total		WB Left	WB Thru	WB Right	WB Total		NB Left	NB Thru	NB Right	NB Total		SB Left	SB Thru	SB Right	SB Total		Int. Total
5:00	17	61	4	82	**0.81**	16	47	9	72	**0.84**	4	27	16	47	**0.82**	11	33	7	51	**0.95**	252
5:15	8	59	0	67		18	59	7	84		5	13	14	32		15	29	2	46		229
5:30	15	75	6	96		11	38	11	60		9	23	10	42		18	24	6	48		246
5:45	15	48	3	66		11	42	12	65		3	16	14	33		17	27	4	48		212
Total	55	243	13	311		56	186	39	281		21	79	54	154		61	113	19	193		939

Chipman & Donovan Rd
PM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
4:00	4	82	3	89	20	87	11	118	1	4	17	22	19	8	1	28	257
4:15	6	77	2	85	12	56	23	91	3	3	6	12	17	6	3	26	214
4:30	5	85	6	96	15	71	11	97	1	2	10	13	15	4	1	20	226
4:45	4	98	3	105	11	75	17	103	0	4	15	19	16	6	3	25	252
5:00	4	89	3	96	22	79	18	119	2	5	11	18	24	4	1	29	262
5:15	6	80	4	90	18	84	15	117	1	5	13	19	20	4	2	26	252
5:30	5	91	1	97	12	52	13	77	0	3	10	13	11	7	5	23	210
5:45	5	72	3	80	16	67	17	100	0	3	11	14	15	7	2	24	218
Total	**39**	**674**	**25**	**738**	**126**	**571**	**125**	**822**	**8**	**29**	**93**	**130**	**137**	**46**	**18**	**201**	**1891**

					PHF					PHF					PHF					PHF	
Time	EB Left	EB Thru	EB Right	EB Total		WB Left	WB Thru	WB Right	WB Total		NB Left	NB Thru	NB Right	NB Total		SB Left	SB Thru	SB Right	SB Total		Int. Total
5:00	4	89	3	96	**0.94**	22	79	18	119	**0.87**	2	5	11	18	**0.84**	24	4	1	29	**0.88**	262
5:15	6	80	4	90		18	84	15	117		1	5	13	19		20	4	2	26		252
5:30	5	91	1	97		12	52	13	77		0	3	10	13		11	7	5	23		210
5:45	5	72	3	80		16	67	17	100		0	3	11	14		15	7	2	24		218
Total	20	332	11	363		68	282	63	413		3	16	45	64		70	22	10	102		942

Ward & Tudor Rd
PM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
4:00	0	0	0	0	19	0	48	67	0	35	24	59	60	38	0	98	224
4:15	0	0	0	0	28	0	40	68	0	26	16	42	57	42	0	99	209
4:30	0	0	0	0	26	0	51	77	0	51	29	80	49	56	0	105	262
4:45	0	0	0	0	24	0	46	70	0	41	28	69	59	66	0	125	264
5:00	0	0	0	0	20	0	55	75	0	45	21	66	77	63	0	140	281
5:15	0	0	0	0	28	0	61	89	1	36	14	51	58	63	0	121	261
5:30	0	0	0	0	17	0	48	65	2	45	21	68	47	57	0	104	237
5:45	0	0	0	0	12	0	34	46	2	43	16	61	54	47	0	101	208
Total	**0**	**0**	**0**	**0**	**174**	**0**	**383**	**557**	**5**	**322**	**169**	**496**	**461**	**432**	**0**	**893**	**1946**

	PHF																			
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	Int. Total
5:00	0	0	0	0	#DIV/0!	20	0	55	75	0.77	0	45	21	66	0.9	77	63	0	140	0.83	281
5:15	0	0	0	0		28	0	61	89		1	36	14	51		58	63	0	121		261
5:30	0	0	0	0		17	0	48	65		2	45	21	68		47	57	0	104		237
5:45	0	0	0	0		12	0	34	46		2	43	16	61		54	47	0	101		208
Total	0	0	0	0		77	0	198	275		5	169	72	246		236	230	0	466		987

Ward & Outerview Rd
PM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
4:00	4	0	2	6	0	0	8	8	0	81	2	83	3	100	0	103	200
4:15	1	0	3	4	0	0	3	3	1	63	1	65	4	88	1	93	165
4:30	6	0	4	10	1	0	2	3	0	100	3	103	8	96	0	104	220
4:45	4	1	6	11	0	0	3	3	1	85	0	86	5	126	0	131	231
5:00	3	0	4	7	1	0	6	7	1	97	1	99	3	126	0	129	242
5:15	2	0	3	5	2	0	20	22	1	96	1	98	7	113	1	121	246
5:30	2	0	2	4	0	0	9	9	0	89	2	91	2	109	0	111	215
5:45	0	0	0	0	0	0	3	3	0	76	1	77	12	97	0	109	189
Total	**22**	**1**	**24**	**47**	**4**	**0**	**54**	**58**	**4**	**687**	**11**	**702**	**44**	**855**	**2**	**901**	**1708**

	PHF																			
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	Int. Total
5:00	3	0	4	7	0.57	1	0	6	7	0.47	1	97	1	99	0.92	3	126	0	129	0.91	242
5:15	2	0	3	5		2	0	20	22		1	96	1	98		7	113	1	121		246
5:30	2	0	2	4		0	0	9	9		0	89	2	91		2	109	0	111		215
5:45	0	0	0	0		0	0	3	3		0	76	1	77		12	97	0	109		189
Total	7	0	9	16		3	0	38	41		2	358	5	365		24	445	1	470		892

Donovan & Ward Rd
PM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
4:00	0	0	0	0	4	0	18	22	0	0	4	4	28	0	0	28	54
4:15	0	0	0	0	7	0	25	32	0	0	2	2	20	0	1	21	55
4:30	0	0	0	0	7	0	18	25	0	1	2	3	31	0	0	31	59
4:45	0	0	0	0	10	0	22	32	0	0	3	3	33	0	0	33	68
5:00	0	1	0	1	3	0	23	26	0	0	0	0	35	0	0	35	62
5:15	0	0	0	0	6	0	20	26	0	0	1	1	36	0	0	36	63
5:30	0	0	0	0	7	0	19	26	0	0	0	0	28	0	0	28	54
5:45	0	0	0	0	2	0	7	9	0	0	3	3	11	0	0	11	23
Total	**0**	**1**	**0**	**1**	**46**	**0**	**152**	**198**	**0**	**1**	**15**	**16**	**222**	**0**	**1**	**223**	**438**

	PHF																			
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	Int. Total
5:00	0	1	0	1	**0.25**	3	0	23	26	**0.84**	0	0	0	0	**0.33**	35	0	0	35	**0.76**	62
5:15	0	0	0	0		6	0	20	26		0	0	1	1		36	0	0	36		63
5:30	0	0	0	0		7	0	19	26		0	0	0	0		28	0	0	28		54
5:45	0	0	0	0		2	0	7	9		0	0	3	3		11	0	0	11		23
Total	0	1	0	1		18	0	69	87		0	0	4	4		110	0	0	110		202

Chipman & Outerview Rd
PM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15	0	0	0	0	0	0	1	1	0	0	0	0	0	0	3	3	4
4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7	7
4:45	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	2
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
Total	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**11**	**14**

	PHF																			
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	Int. Total
5:00	0	0	0	0	**#DIV/0!**	0	0	0	0	**0.25**	0	0	0	0	**#DIV/0!**	0	0	0	0	**#DIV/0!**	0
5:15	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0
5:30	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		0
5:45	0	0	0	0		0	0	1	1		0	0	0	0		0	0	0	0		1
Total	0	0	0	0		0	0	1	1		0	0	0	0		0	0	0	0		1

Ward & Summit Orchard Entrance
PM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
4:00	0	0	0	0	0	0	7	7	0	0	5	5	1	0	0	1	13
4:15	0	0	0	0	0	0	9	9	0	0	7	7	3	0	0	3	19
4:30	0	0	0	0	0	0	7	7	0	0	11	11	0	0	0	0	18
4:45	0	0	0	0	0	0	13	13	0	0	16	16	2	0	0	2	31
5:00	0	0	0	0	0	0	16	16	0	0	14	14	4	0	0	4	34
5:15	0	0	0	0	0	0	10	10	0	0	12	12	3	0	0	3	25
5:30	0	0	0	0	0	0	18	18	0	0	22	22	6	0	0	6	46
5:45	0	0	0	0	0	0	9	9	0	0	9	9	4	0	0	4	22
Total	**0**	**0**	**0**	**0**	**0**	**0**	**89**	**89**	**0**	**0**	**96**	**96**	**23**	**0**	**0**	**23**	**208**

					PHF					PHF					PHF					PHF	
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	Int. Total
5:00	0	0	0	0	#DIV/0!	0	0	16	16	0.74	0	0	14	14	0.65	4	0	0	4	0.71	34
5:15	0	0	0	0		0	0	10	10		0	0	12	12		3	0	0	3		25
5:30	0	0	0	0		0	0	18	18		0	0	22	22		6	0	0	6		46
5:45	0	0	0	0		0	0	9	9		0	0	9	9		4	0	0	4		22
Total	0	0	0	0		0	0	53	53		0	0	57	57		17	0	0	17		127

Outerview Rd & South Entrance
PM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
4:00	2	0	0	2	0	0	0	0	2	0	0	2	0	0	0	0	4
4:15	3	0	3	6	0	0	0	0	0	0	0	0	0	0	2	2	8
4:30	4	0	1	5	0	0	0	0	4	0	0	4	0	0	1	1	10
4:45	5	0	2	7	0	0	0	0	2	0	0	2	0	0	0	0	9
5:00	2	0	4	6	0	0	0	0	1	0	0	1	0	0	0	0	7
5:15	3	0	0	3	0	0	0	0	1	0	0	1	0	0	3	3	7
5:30	1	0	0	1	0	0	0	0	3	0	0	3	0	0	1	1	5
5:45	0	0	2	2	0	0	0	0	1	0	0	1	0	0	2	2	5
Total	**20**	**0**	**12**	**32**	**0**	**0**	**0**	**0**	**14**	**0**	**0**	**14**	**0**	**0**	**9**	**9**	**55**

					PHF					PHF					PHF					PHF	
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	Int. Total
5:00	2	0	4	6	0.5	0	0	0	0	#DIV/0!	1	0	0	1	0.5	0	0	0	0	0.50	7
5:15	3	0	0	3		0	0	0	0		1	0	0	1		0	0	3	3		7
5:30	1	0	0	1		0	0	0	0		3	0	0	3		0	0	1	1		5
5:45	0	0	2	2		0	0	0	0		1	0	0	1		0	0	2	2		5
Total	6	0	6	12		0	0	0	0		6	0	0	6		0	0	6	6		24

Outerview Rd & North Entrance
PM

	Eastbound				Westbound				Northbound				Southbound				
Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Int. Total
4:00	1	0	0	1	0	0	0	0	3	0	0	3	0	0	2	2	6
4:15	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	2	4
4:30	2	0	2	4	0	0	0	0	1	0	0	1	0	0	0	0	5
4:45	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	2	3
5:00	1	0	3	4	0	0	0	0	0	0	0	0	0	0	1	1	5
5:15	1	0	0	1	0	0	0	0	1	0	0	1	0	0	2	2	4
5:30	2	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
5:45	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	2
Total	**7**	**0**	**9**	**16**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**6**	**0**	**0**	**10**	**10**	**32**

	PHF																				
Time	EB Left	EB Thru	EB Right	EB Total	PHF	WB Left	WB Thru	WB Right	WB Total	PHF	NB Left	NB Thru	NB Right	NB Total	PHF	SB Left	SB Thru	SB Right	SB Total	PHF	Int. Total
5:00	1	0	3	4	**0.5**	0	0	0	0	**#DIV/0!**	0	0	0	0	**0.5**	0	0	1	1	**0.50**	5
5:15	1	0	0	1		0	0	0	0		1	0	0	1		0	0	2	2		4
5:30	2	0	1	3		0	0	0	0		0	0	0	0		0	0	0	0		3
5:45	0	0	0	0		0	0	0	0		1	0	0	1		0	0	1	1		2
Total	4	0	4	8		0	0	0	0		2	0	0	2		0	0	4	4		14

7/12/2022
Chipman & Ward Rd
AM

	Eastbound				Westbound				Northbound				Southbound				
Time	**Left**	**Thru**	**Right**	**Total**	**Left**	**Thru**	**Right**	**Total**	**Left**	**Thru**	**Right**	**Total**	**Left**	**Thru**	**Right**	**Total**	**Int. Total**
7:00	3	13	1	17	7	17	6	30	1	6	8	15	3	6	1	10	72
7:15	7	15	2	24	8	29	12	49	6	20	8	34	7	5	2	14	121
7:30	5	26	4	35	4	25	9	38	3	18	7	28	5	7	7	19	120
7:45	5	29	2	36	12	31	7	50	3	22	15	40	9	10	2	21	147
8:00	9	34	4	47	7	27	5	39	6	24	9	39	2	7	6	15	140
8:15	5	38	0	43	11	33	8	52	8	23	18	49	6	12	5	23	167
8:30	4	27	4	35	5	35	9	49	4	17	18	39	4	16	8	28	151
8:45	14	39	1	54	10	30	4	44	5	18	12	35	6	10	6	22	155
Total	**52**	**221**	**18**	**291**	**64**	**227**	**60**	**351**	**36**	**148**	**95**	**279**	**42**	**73**	**37**	**152**	**1073**

Time	**EB Left**	**EB Thru**	**EB Right**	**EB Total**	**WB Left**	**WB Thru**	**WB Right**	**WB Total**	**NB Left**	**NB Thru**	**NB Right**	**NB Total**	**SB Left**	**SB Thru**	**SB Right**	**SB Total**	**Int. Total**
8:00	9	34	4	47	7	27	5	39	6	24	9	39	2	7	6	15	140
8:15	5	38	0	43	11	33	8	52	8	23	18	49	6	12	5	23	167
8:30	4	27	4	35	5	35	9	49	4	17	18	39	4	16	8	28	151
8:45	14	39	1	54	10	30	4	44	5	18	12	35	6	10	6	22	155
Total	32	138	9	179	33	125	26	184	23	82	57	162	18	45	25	88	613

4/19/2018
Chipman & Ward Rd
AM

Time	**EB Left**	**EB Thru**	**EB Right**	**EB Total**	**WB Left**	**WB Thru**	**WB Right**	**WB Total**	**NB Left**	**NB Thru**	**NB Right**	**NB Total**	**SB Left**	**SB Thru**	**SB Right**	**SB Total**	**Int. Total**
7:30	23	107	5	135	5	116	6	127	6	15	8	29	1	5	18	24	315
7:45	17	112	8	137	5	132	6	143	9	22	10	41	2	2	7	11	332
8:00	10	95	2	107	2	108	4	114	6	11	11	28	2	3	11	16	265
8:15	12	90	4	106	3	111	4	118	7	2	10	19	1	9	19	29	272
Total	62	404	19	485	15	467	20	502	28	50	39	117	6	19	55	80	1184

	EB Left	**EB Thru**	**EB Right**	**EB Total**	**WB Left**	**WB Thru**	**WB Right**	**WB Total**	**NB Left**	**NB Thru**	**NB Right**	**NB Total**	**SB Left**	**SB Thru**	**SB Right**	**SB Total**
2022 Summary	32	138	9	179	33	125	26	184	23	82	57	162	18	45	25	88
2018 Summary	62	404	19	485	15	467	20	502	28	50	39	117	6	19	55	80
Numerical Diff	-30	-266	-10	-306	18	-342	6	-318	-5	32	18	45	12	26	-30	8

2018 vs 2018 w 1% over 4 years																
2018 Summary	62	404	19	485	15	467	20	502	28	50	39	117	6	19	55	80
2018 w 1% 4 yrs	65	420	20	505	16	486	21	522	29	52	41	122	6	20	57	83
Numerical Diff	-3	-16	-1	-20	-1	-19	-1	-20	-1	-2	-2	-5	0	-1	-2	-3

7/12/2022
Chipman & Ward Rd
PM

	Eastbound				Westbound				Northbound				Southbound				
Time	**Left**	**Thru**	**Right**	**Total**	**Left**	**Thru**	**Right**	**Total**	**Left**	**Thru**	**Right**	**Total**	**Left**	**Thru**	**Right**	**Total**	**Int. Total**
4:00	14	60	2	76	14	66	11	91	9	9	13	31	10	13	7	30	228
4:15	15	46	7	68	13	44	9	66	4	16	19	39	14	16	6	36	209
4:30	13	64	3	80	13	59	3	75	13	27	17	57	20	25	7	52	264
4:45	24	74	9	107	19	44	10	73	7	12	17	36	26	35	6	67	283
5:00	17	61	4	82	16	47	9	72	4	27	16	47	11	33	7	51	252
5:15	8	59	0	67	18	59	7	84	5	13	14	32	15	29	2	46	229
5:30	15	75	6	96	11	38	11	60	9	23	10	42	18	24	6	48	246
5:45	15	48	3	66	11	42	12	65	3	16	14	33	17	27	4	48	212
Total	**121**	**487**	**34**	**642**	**115**	**399**	**72**	**586**	**54**	**143**	**120**	**317**	**131**	**202**	**45**	**378**	**1923**

Time	**EB Left**	**EB Thru**	**EB Right**	**EB Total**	**WB Left**	**WB Thru**	**WB Right**	**WB Total**	**NB Left**	**NB Thru**	**NB Right**	**NB Total**	**SB Left**	**SB Thru**	**SB Right**	**SB Total**	**Int. Total**
5:00	17	61	4	82	16	47	9	72	4	27	16	47	11	33	7	51	252
5:15	8	59	0	67	18	59	7	84	5	13	14	32	15	29	2	46	229
5:30	15	75	6	96	11	38	11	60	9	23	10	42	18	24	6	48	246
5:45	15	48	3	66	11	42	12	65	3	16	14	33	17	27	4	48	212
Total	55	243	13	311	56	186	39	281	21	79	54	154	61	113	19	193	939

4/19/2018
Chipman & Ward Rd
PM

Time	**EB Left**	**EB Thru**	**EB Right**	**EB Total**	**WB Left**	**WB Thru**	**WB Right**	**WB Total**	**NB Left**	**NB Thru**	**NB Right**	**NB Total**	**SB Left**	**SB Thru**	**SB Right**	**SB Total**	**Int. Total**
5:00	5	186	7	198	5	160	18	183	9	1	10	20	6	11	16	33	434
5:15	5	181	20	206	8	218	2	228	7	7	15	29	2	11	11	24	487
5:30	4	221	5	230	7	161	15	183	12	6	10	28	7	4	15	26	467
5:45	7	213	5	225	8	187	2	197	4	10	10	24	4	5	23	32	478
Total	21	801	37	859	28	726	37	791	32	24	45	101	19	31	65	115	1866

	EB Left	**EB Thru**	**EB Right**	**EB Total**	**WB Left**	**WB Thru**	**WB Right**	**WB Total**	**NB Left**	**NB Thru**	**NB Right**	**NB Total**	**SB Left**	**SB Thru**	**SB Right**	**SB Total**
2022 Summary	55	243	13	311	56	186	39	281	21	79	54	154	61	113	19	193
2018 Summary	21	801	37	859	28	726	37	791	32	24	45	101	19	31	65	115
Numerical Diff	34	-558	-24	-548	28	-540	2	-510	-11	55	9	53	42	82	-46	78

2018 vs 2018 w 1% over 4 years																
2018 Summary	21	801	37	859	28	726	37	791	32	24	45	101	19	31	65	115
2018 w 1% 4 yrs	22	834	39	894	29	755	39	823	33	25	47	105	20	32	68	120
Numerical Diff	-1	-33	-2	-35	-1	-29	-2	-32	-1	-1	-2	-4	-1	-1	-3	-5

Case #	Date	Location	Summary (from Crash Reports)	Comments
17-1605	2/28/2017	Commerce & Chipman		NA
17-2225	3/21/2017	Donovan & Chipman	D2 stated he was traveling EB NW Chipman Rd. in the #1 lane of traffic approaching the intersection of NW DonovanRd. He stated V1 was traveling NB NW Donovan Rd. and pulled out in front of him. D2 had 2 Passengers in the back of his marked patrol vehicle. They were both transported to the hospital for kneepain. The passengers didn't have anything to add to this report. V2 had damage to the front bumper, passenger side front fender, hood, and engine. It was towed due to the damage.D1 stated he was stopped at the stop sign on NB NW Donovan Rd. at the intersection of NW Chipman Rd. He thoughtthe intersection was clear so he entered the intersection. He didn't see V2 traveling EB NW Chipman Rd and hit V2 inthe intersection.P1 stated he was not paying attention and didn't witness anything.V1 had damage to the front bumper, hood, driver's side fender, drivers side front wheel, and engine. It was towed dueto the damage.	Right angle / Didn't see vehicle on Chipman / Before signal was added
17-2220	3/21/2017	Ward & Chipman	D1 stated she was stopped on NW Chipman Rd. at the red light at NW Ward Rd. D1 advised that she wasbehind V2 in the left lane. D1 stated she observed the left turn lane turned green and she thought it was her light andbegan to accelerate,striking V2.D2 stated she was stopped at the red light when she was struck from behind by V1.	Rear End / Inattentive
17-2921	4/14/2017	Ward & Chipman	V1 was westbound on NW Chipman Road before NW Ward Road in the right lane. V2 was in front of V1. D1said V2 slammed on her brakes and she also slammed on her brakes but was unable to stop before striking the back ofV2. D2 said that the vehicle slammed on it's brakes due to the vehicle in front of it braking. D2 said when she slammedon her brakes she was unable to stop before striking the back of the vehicle in front of her. D2 said she was thenstruck from behind by V1. D2 said the other vehicle in front of her stopped and they determined there was no damageto the vehicle in front so they did not wait for police arrival. D2 said she did not need a report but didn't leave becauseD1 was wanting a police report.	Rear End
17-3658	5/9/2017	Donovan & Chipman		Sideswipe
17-4193	5/28/2017	Ward & Chipman	V2 was facing eastbound on CST Chipman in the eastbound, outer lane. V1 was stopped behind anuninvolved vehicle for a red signal light at the intersection of CST Ward Rd. V2 was initially stopped behind V1.D2 said she saw the signal light turn green, saw the vehicle ahead of V1 begin to move and prepared to move forwardherself. D1 said she briefly looked down toward a cup holder in her car as she started to go and said, when she lookedback up, she noted that V1 had not yet started to move. D1 said she then struck V2.D2 and P2 gave an account of the incident consistent with D1. D2 and P2 also reported to have soreness in theirnecks/backs and both were eventually transported to St. Luke's Hospital (East) in Lee's Summit, for treatment. D2 alsoindicated prior injury. D1 claimed no injury.V1 had a lightly-bent license plate and no other visible damage. V2 has a small scratch to the rear bumper. Neithervehicle required tow.	Inattention / Rear end
17-4781	6/15/2017	Ward & Chipman	D1 stated that she was stopped behind V2 at the signal light on Chipman Road (eastbound) at Ward Road. D1 saidthat the light turned green and V2 went forward. D1 said that she also went forward however V2 stopped in theintersection where V1 hit the rear of V2.D2 said that she was eastbound on Chipman Road and stopped at the signal light at the intersection. D2 said that thelight turned green and she went forward but stopped because she was going to make a U-Turn to head backwestbound on Chipman Road. It should be noted that there are two lanes for eastbound traffic and two lanes formaking left turns (northbound on Ward). One of the two left turn only lanes on Chipman Road was closed due to roadconstruction leaving only one left turn lane. V2 was attempting her U-Turn from one of the eastbound straight onlylanes rather than the left turn lane.	Rear End / Inattentive
17-5195	6/28/2017	Ward & Chipman	V2 was stopped at a red light on westbound NW Chipman Road at NW Ward Road. V1 was directly behindV2, also westbound. The traffic light turned green and V1 began to pull forward and struck V2. Both vehicles sufferedvery minor damage. It appeared the only contact was that the front license plate of V1 struck the rear license plate ofV2. Both vehicles were drivable. D1 stated that she was stopped at the traffic light. She said it turned green and she began to pull forward. Her vehiclethen struck V2. D2 stated that she was stopped at the traffic light. She said her light turned green but there was a car in theintersection. She said she was waiting for it to clear when her vehicle was struck from behind.	Rear End / Inattentive
17-5653	7/12/2017	Ward & Chipman	D2 was traveling WB on NW Chipman Rd approaching NW Ward Rd. D2 observed the light at NW Ward Rdturn red and stopped for the light. V1 then crashed into the rear of V2.D1 believed V2 was going to continue through the light as it turned yellow. D1 was unable to stop in time and crashedinto the rear of V2. D1 was unable to provide proof of insurance other than a policy number with ProgressiveInsurance. D1 was identified as Tyler Brooks and his Missouri driver license showed to be suspended.I observed moderate damage to the rear of V2 but it was still in a condition to drive.V1 had moderate damage to the front of the vehicle and the driver side airbag in the steering wheel as well as underthe dash board had deployed. V1 was not disabled from the crash and was able to be driven as well. Both vehicle'swere moved off the roadway onto NW Ward Rd.	Rear End / Following too closely

17-6097	7/26/2017	Ward & Outerview	He was stopped eastbound on NW Outerview Rd at NW Ward Rd. He looked both ways before turning right. About 45'into traveling southbound, he heard a grinding noise behind his vehicle. He checked his rearview mirrors and observeda subject lying in the intersection partially under a moped. He stopped to check on the subject,under the belief he [thesubject] had just crashed, but knew his [Officer Ethington's] vehicle was not struck. As the subject lifted his moped up,he observed it to not have its headlights on.I then contacted D1. D1 advised he was not injured. He also stated the following:He was traveling southbound on NW Ward Rd before NW Outerview Rd. He saw Officer Ethington stopped at the stopsign. He then observed Officer Ethington begin to pull into the intersection. He did not stop because he thought OfficerEthington had seen him. Officer Ethington completed his turn,now traveling in the same direction (southbound) in frontof him. He began to brake and the back tire began to fish tail beside him. He and the moped tipped over and continuedto slide a short distance. He did not strike Officer Ethington's vehicle.I observed V1 to be a red moped with minor cosmetic damage all over. It had electrical tape holding multiple parts on,missed a rearview mirror, and had broken off pieces of its plastic body. D1 advised this was all old and the only thinghe believed to be a result of this crash was an electrical issue now prohibiting his moped from starting. Due to OfficerEthington's statement and the overall poor condition of the moped,I inquired if the headlights on the moped indeedworked. D1 advised the right side illuminated the brights and the left side illuminated the standard headlamps. D1advised because of the curve he traveled in the road prior to the intersection,Officer Ethington probably couldn't seehis only illuminating light. I asked D1 if he could turn his key one notch and illuminate his headlamps so I could seewhat he meant. When he did so,only one blinker and his dash readings illuminated. The only two street lights on the north side of the intersection were not illuminating light. It was raining and standingwater could be observed on different parts of the intersection.	Lost Control
17-7027	8/24/2017	Ward & Chipman	V2 was on CST Chipman Road in the right-hand lane, facing east, stopped for a red stop light at theintersection of CST Ward Rd. V1 was stopped behind V2. D1 said he bent down to get something from the floor of thevehicle and his foot slipped from the brake. D1 said V1 struck V2 before he could prevent the collision.None of the involved parties claimed injury and neither V1 nor V2 required tow.	Rear End / Foot slipped from brake
17-07355	9/5/2017	Outerview & South Entrance	D2 stated she was north on NW Outerview Rd and was approaching a speed bump. D2 advised that sheslowed down for the bump and was struck from behind by V1.D1 stated V2 stopped in the middle of the roadway when V1 collided with V2.	Rear End / not really at intersection
17-8500	10/13/2017	Ward & Chipman	V3 had been traveling west on CST Chipman Rd and had stopped behind other traffic for a red signal light atCST Ward Rd. V2 stopped behind V3. V1 was approaching the rear of V2. D1 said as he prepared to stop,his footslipped from the brake and onto the gas pedal. D1 said V1 then struck V2. D2 said as her vehicle was struck, it was pushed into V3. V3 had minor damage to the rear. V2 had minor damage tothe front and significant damage to the rear. V1 had significant damage to the front. D2 said she was experiencing painin her neck and back but declined an ambulance. D2 said she would seek medical treatment on her own when shecleared the scene.	Rear End / Foot slipped from brake onto gas
17-8730	10/20/2017	Ward & Chipman	D2 stated she was traveling NB NW Ward Rd. approaching the intersection of NW Chipman Rd. She stated she wasslowing down/stopping when V1 hit the back of her vehicle.V2 had damage to the rear bumper.D1 stated the same as D2. She further added that she thinks her brakes might be going bad.V1 had damage to the front bumper.	Rear End / Following too closely
17-9986	11/29/2017	Ward & Chipman	Vehicle 1 was traveling west on NW Chipman Rd before NW Ward Rd, in the inside straight lane. Vehicle 1crossed through the left turn lane and collided with the curb of the positive median. Vehicle 1 continued over themedian until it came to a stop facing west in the east bound lanes of traffic. Driver 1 advised he was traveling west on NW Chipman Rd before NW Ward Rd. Driver 1 stated he was traveling "alittle fast," and was unsure of the exact speed, but estimated it to be "50-55mph." Driver 1 looked over his rightshoulder to merge into the outside lane of traffic and shortly after he lost control of the wheel and collided with the curbof the positive center median. Driver 1 advised he continued over the median and into the opposite lanes of traffic. Hewas able to drive the vehicle back to the correct lanes of traffic and waited there until he was contacted by MSHPSergeant Smith.	Lost control / hit median / Speeding
17-10464	12/14/2017	Donovan & Chipman	V1 was a black GMC Terrain traveling east on NW Chipman RD past Donovan RD in the left hand lane. V2was a gold Chevrolet TrailBlazer also traveling east directly in front of V1. V2 braked heavily as traffic ahead of it also braked for a controlled intersection ahead. V1 braked, but did not stopbefore colliding with the rear of V2. V1 sustained heavy front end damage requiring it to be towed from the scene, Ron's Towing responded. V2 sustainedmoderate damage to the rear bumper and lift gate, but did not require towing. Driver 1 Amy Nichols told me she saw traffic in front of her braking hard and she also hit her brakes hard. She said shewas not able to stop before striking the vehicle ahead of her. Driver 2 Elizabeth Jennings said traffic in front of her suddenly slowed heavily (presumably for a controlled intersectionabout a block further east). She said she hit her brakes hard and was struck from behind. Each vehicle had a young child as a passenger and LSFD medics responded to evaluate the children. No injuries werereported.	Rear End

17-10623	12/19/2017	Ward & Chipman	I contacted D3 who advised the following. He was westbound in the area of NW Chipman Rd. and NW Ward Rd.stopped in traffic. While stopped V3 was struck in the rear by V2. I observed damage to the rear bumper of V3.I contacted D2 who advised the following. She was westbound in the area of NW Chipman Rd. and NW Ward Rd. andwas slowing down due to traffic stopped at the traffic light. V2 was almost to a complete stop when it was struck in therear by V1,which pushed V2 into the rear of V3. I observed damage to the front and rear bumper of V2. V2 was moved to a nearby parking lot where D2 was makingarrangements for a tow through her insurance company.I contacted D1 who advise the following. She was westbound in the area of NW Chipman Rd. and NW Ward Rd. whenshe had to slam on her brakes, and V1 struck the rear of V2. I observed moderate damage to the front bumper and hood of V1, which was towed from the scene using a requestednon preference tow (Ron's Tow).	Rear End
17-10669	12/20/2017	Ward & Chipman	D2 stated he was traveling WB NW Chipman Rd. approaching the intersection of NW Ward Rd. He stated while hewas there V1 hit the back of his vehicle.V2 had damage to the rear bumper.D1 didn't speak English. He handed me his El Salvador Passport and a valid proof of insurance.It should be noted that KCKS PD has had contact with D1 and at that time he had an address of 15096 W 144th TerrOlathe, KS 66062. It also should be noted that KCMO PD has had contact with D1 and at that time he had an address of 6738 N MadisonAve,Kansas City, MO 64118.Both of these prior contact were because D1 didn't have a driver's license.V1 had damage to the front bumper.D1 was given UTT # 170432592 (following too closely and causing a crash) and UTT # 170432593 (not having adrivers license). His court date is 02/21/2018 at 2 pm.	Rear End / Following too closely
18-0008	1/1/2018	Ward & Chipman	I responded to a vehicle crash in the area of Chipman Road and Ward Road. It involved two vehicles andwhen I arrived I made contact with both drivers. The vehicles had moved from the area of impact to the side of WardRoad before I arrived.Both vehicles were eastbound on Chipman Road in the left straight lane. D1 stated that while approaching V2 in thelane of traffic he did not stop in time and V1 hit the rear of V2.D2 stated that she was slowing to a stop at a red signal on eastbound Chipman Road. While slowing or when stoppedher vehicle was struck in the rear by V1.	Rear End / Inattentive
18-00182	1/8/2018	Tudor & Ward	V1 was traveling north on NW Ward road from NW Tudor Road. V1 began to slide sideways, towards theoncoming lane of traffic. V1 continued sliding due to the icy conditions. The passenger side of V1 traveled over the curband struck a light pole. The light pole fell onto the hood of V1 and into the roadway. A public works employee movedthe light pole off the roadway prior to my arrival.	Lost control / Icy conditions
18-00468	1/18/2018	Ward & Chipman	I made contact with D1. D1 stated while he was traveling West bound on Chipman approaching the stoplight at Ward,he dropped his hat on the floor board of V1. When he looked back up, he realized the light was red andthere was a vehicle stopped in front of him. The front end of V1 struck the rear end of V2 which was sitting at the stoplight. Both vehicles pulled over onto Ward. I then spoke with D2 who stated while he was sitting at the stop light on Chipman at Ward, V1 struck into his stoppedvehicle.I observed damage on both vehicles consistent with the statements I received.	Rear End / Inattentive
18-00936	2/2/2018	Ward & Chipman	V1 was westbound on NW Chipman Road before NW Ward Road in the left lane. V2 was in front of V1. D1said she believed the light was green and that V2 stopped in the roadway and she was unable to stop before strikingthe back of V2. D1 said she may have been following a little too close. D2 said the light turned yellow and if he didn'tstop he would have ran a red light. D2 said he came to a stop and was struck from behind by V1. D2 said he felt D1was following him a little too closely.	Rear End / Following too closely

18-2663	3/30/2018	Ward & Chipman	On 04-30-2018 at approximately 1422 Hours, Officers were dispatched to the area of NW Chipman Roadand Ward Road on an injury Hit-and-Run MVC. CMS advised that a white Ford Expedition had struck another vehicleand had left the scene.CMS also advised a pregnant woman was in one of the vehicles. A calling party, later revealedto be D3, followed the suspect vehicle, V1, to a residence in the area of NW Olive Street and Orchard Street. Iresponded to that area as other officers responded to the crash scene.D3 advised me that the occupants of V1 had gone inside the residence at 109 NW Orchard Street. V1 was parked outfront of the residence and had apparent fresh damage to the front of the vehicle. I also noted that it had an expiredtemporary tag. V1 was later photographed by me and the photos were uploaded to the Evidence File at Headquarters. I went to the front door of the residence and knocked several times with no one coming to the door. I began to walkaway and the front door was opened by a W/F,who identified herself only as "Gina's sister". I saw a W/F, lateridentified as Hoenshell, a passenger in V1, sitting on a couch near the front door. She was visibly shaken and crying. Iasked if she had been the driver of the vehicle involved in the crash. She said she was a passenger and I had her stepoutside of the house,where she had a seat in a chair. I asked her who was driving and she said "Gina". She also toldme that she had told Gina they needed to stay and that she shouldn't have left the scene. I told "Gina's sister" that I needed Gina to come speak to me. She went into another room on the west side of thehouse and came back. She said Gina would be out in a minute. I waited for a few minutes and told "Gina's sister" to goget her. She started to walk back towards the same room she went into inirtially and I followed her. I saw GinaNewman,D1, standing in a back room. She too was visibly shaking and crying. I told her that she needed to comespeak with me,which she did. We walked outside, where Hoenshell was still seated. At approximately 1429 Hours, I advised D1 of her Miranda Rightsand asked her about the crash. She told me that she was driving and that traffic had come to a stop in front of her. Shesaid that she tried to stop in time but was unable to do so. She said that she then left the scene because she has aRevoked driver's license and didn't have insurance on the vehicle. A computer check revealed that D1 had a RevokedDriver's License through the State of Missouri.D1 was placed under arrest for Leaving the Scene of a Motor Vehicle Crash and for Driving While Revoked. She wasplaced in properly fitted and double-locked handcuffs by MPO L. Jones, who was on scene to assist me. He securedD1 in the back of his patrol vehicle. Both D1 and Hoenshell complained of pain and I had the LSFD respond to the scene. Before they arrived, Hoenshelltold me that her leg hurt but that she didn't want any medical treatment. I advised her that she was free to go and shewas released with no action taken against her. D1 advised that she had facial pain and was examined by the LSFD. She requested to be taken to the hospital forfurther medical treatment. MPO Jones transported her to St. Luke's East,where she was treated and later released.She was then brought back to Detention for booking and bonding procedures. I cleared the scene at the residence and then responded to the crash scene. SGT A. Evans and MPO Hennig were onscene and had conducted the investigation at that location. I contacted APA Michael Hunt by telephone. I advised him of the circumstances of the crash,to include D2'spreganancy.	Rear End / Inattentive
18-05232	6/11/2018	Tudor & Ward	I was on Patrol and drove up to the crash after it happened. The vehicles were stopped in a the right lane of trafficon southbound NW Ward Rd.D1 stated she was stopped at the stop sign on NW Tudor Rd. at the intersection of NW Ward Rd. She noticed V2in the roadway and thought she had enough time to turn south on NW Ward Rd. She hit V2 in the intersection.V1 had damage to the rear bumper and quarter panel.D2 stated she was SB NW Ward Rd. and V1 turned in front of her. She was unable to avoid the crash.V2 had damage to the drivers side fender and front bumper.	Right Angle / Turned in front of someone / Misjudged distance
18-5805	6/29/2018	Ward & Chipman	D1 stated she was east on NW Chipman Rd. D1 advised that as she entered the intersection at NW Ward Rd, she observed V2 start from a stop and she struck V2. D2 stated he was stopped at a red light on NW Ward Rd, at NW Chipman. D2 advised his signal light turned green and he began to cross NW Chipman Rd. D2 advised V1 came through the intersection and both vehicles collided. W1 stated he was on NW Ward, behind V2. W1 stated they had a green light and as V2 pulled out, V1 came through the intersection and both vehicles collided. W2 stated she was east on NW Chipman Rd and had a red signal light. W2 stated that V1 continued through the red light and struck V2.	Right Angle / ran red light
18-7048	8/9/2018	Donovan & Chipman	On 08/09/2018, at 0206 hours, I was dispatched to the area of NW Chipman RD and NW Donovan RD inregard to a reported vehicle crash. CMS advised a passerby had observed a truck, parked against the guardrail with it'slights off blocking the #1 lane of traffic. Upon arrival I observed V1 with no occupant resting against the guardrail separating EB NW Chipman RD from WBNW Chipman RD before the bridge. I observed approximately 30' of guardrail had been damaged with at least fourposts sheered at the base. I further observed V1 to have continued along the remaining guardrail section forapproximately 124' before it came to a stop. The driver's side doors were pinned against the guard rail with the frontdriver's side tire, which was a spare tire, folded under the front driver's side suspension.	Lost control

18-7885	9/5/2018	Ward & Chipman	Vehicle #1 was westbound on NW Chipman Road in the outside through lane. Vehicle #2 was stopped for a redtraffic signal in the outside lane of NW Chipman Road at Ward Road. V1 overtook and struck V2 from behind.Driver #1 stated she was approaching the intersection and obseved V2 stopped. D1 said she attempted to stop,but her vehicle began to slide on the wet pavement. She then tried to steer right to avoid the collision, but hervehicle struck V2 from behind. D1 also told me she was planning on having her brakes worked on, but had nothad a chance to do so yet. D1 did not complain of injuries and none were observed.Driver #2 advised she was stopped at the intersection of NW Chipman and Ward for a red traffic signal. Whilestopped D2 at the intersection D2 said her vehicle was struck from behind by V1. D2 did not complain of anyinjuries and none were observed.Witness #1 explained she was stopped in the inside lane of NW Chipman Road a little behind V2. W1 said sheheard V1 skidding on the wet pavement and then observed V1 strike V2 from behind.V1 sustained moderate damage to the entire front end, and had dual front airbag deployment causing damage tothe windshield. D1 said she was going to move V1 to a nearby parking lot and have AAA tow her vehicle. V2sustained minor damage to the rear-end and was driveable. During my investigation I noted the damage wasconsistent with the drivers' and witness statements. I also noted that V1 had expired North Carolina registration. Atthe time of the collision there was a light rain, and the roads were very wet from rain most of the day.D1 was issued a citation for speed too fast for conditions, and expired vehicle registration. D1 was given a courtdate of 10-11-2018 at 1500 hours.	Rear End / Raining
18-8830	10/3/2018	Donovan & Chipman	V1 was northbound on NW Donovan Road at NW Chipman Road and had stopped for a stopped sign. V1made a right turn to go eastbound on NW Chipman Road. V2 was southbound on NW Donovan Road at NW ChipmanRoad and had stopped for a stop sign. V2 was making a left turn to go eastbound on NW Chipman Road.D1 said she looked and did not see anyone coming and made her right turn when V2 came from no where and shestruck V2. I asked D1 which lane she had turned into and she initially said she did not know. Several minutes later D1said she knew she had turned into the right lane because she had been driving for so long and knew that was the laneshe was suppose to turn into. D2 said she came up to the intersection and observed V1 sitting at the stop sign across from her. D2 said sheobserved V1 was not moving when the way was clear for the vehicle to go. D2 said she proceeded through theintersection and as she was making her left turn V1 started making a right turn. D2 said even though she observed V1was making the right turn after she had already started making her left turn she believed V1 would stay in the rightclosest lane. D2 said when V1 made her right turn she came into the left lane, striking her vehicle.All parties refused medical attention at the scene.Both vehicles had minor damage and did not require a tow service.	Right Angle
18-10941	12/9/2018	Ward & Chipman	V1 was traveling southbound on NW Ward Rd approaching the traffic light at the NW Chipman Rd intersection.V2 was stopped in the right turn lane, stopped at the red light. V1 struck V2 from the rear causing minor damage.Neither vehicle required a tow from the scene.D1 stated she was traveling south on NW Ward Rd approaching the NW Chipman Rd intersection. D1 stated shewas not paying attention and when she looked up she saw V2 stopped at the red light. D1 stated she tried to hitthe brake pedal, but her foot slipped causing her to hit the rear of V2.D2 stated he was stopped at the traffic light in the right turn lane at the NW Ward Rd and NW Chipman Rdintersection. D2 stated V1 struck him from behind.	Rear End / Inattentive
18-11177	12/17/2018	Tudor & Ward	D1 stated she was approaching a green traffic light and a vehicle was stopped in front of her so she swerved toavoid it and ran off the road. She was disoriented and did not know what road she was on. It should be noted thatthe intersection of NW Tudor and NW Ward is not controlled by a traffic light.I observed V1 to be down an in embankment to the west of the intersection of NW Tudor and NW Ward. Iobserved tire marks in the grass at the northwest end of the intersection, that were consistent with V1 leaving theroadway.W1 stated he observed V1 traveling WB on NW Tudor at a high rate of speed, drive through the stop sign at theintersection of NW Tudor and NW Ward, and then leave the roadway.W2 stated he was SB on NW Ward, attempting to turn E on NW Tudor, when V1 drove SB through theintersection from NW Tudor. He further stated V1 did not stop at the stop sign at the intersection and almost struckhis vehicle before going off the roadway. W2 stated he believed V1 was traveling at least 50 mph.	Lost Control / Medical situation
19-00008	1/1/2019	Tudor & Ward	D1 stated he was traveling northbound NE Ward Rd. approaching the intersection of NE Tudor Rd. He thenstarted to make the right turn on to NE Tudor Rd. and slid on the ice. He slid off the roadway and up on to a raisedmedian on NE Tudor Rd.V1 had damage to the front tire/rim.It should be noted that there was a lot of ice on the roadway at this intersection.	Lost control / Icy conditions

19-3335	4/22/2019	Ward & Chipman	On 04/22/2019, at 1836 hours, I was dispatched to the intersection of NW Ward Rd and NW Chipman Rdregarding a vehicle crash where the vehicle struck a light pole.When I arrived on scene I observed a silver SUV under a light pole North of the intersection of Ward Rd and ChipmanRd. The pole appeared to be broken at the base and had fallen on top of a traffic signal and was touching power linesabove the signal. The front driver side tire of the SUV appeared to begin to melt due to the electrical current travelingthrough the SUV. I observed damage to the driver side of the SUV and also on the top of the SUV. The SUV wasfacing West with the front 2 tires on the Southbound lanes and the rear tires in the Northbound lanes. I contacted the W1 who stated she observed V1 drive over the East median before traveling North across Chipman inthe Westbound lanes in front of her vehicle. W1 stated V1 possibly hit the Northeast curb before turning sharply to theWest and striking the North median where the light pole was located. The witness was unsure where V1 was originallycoming from but said he was "crawling". When I asked for a more exact speed she estimated 5 mph. I contacted D1 who stated the following information: He was driving Southbound on Ward Rd when he entered thenumber 2 lane which was a turn lane to turn Eastbound onto Chipman Rd. D1 attempted to make a wide left turn andwhile turning struck the Southeast curb and couldn't remember what happened after that. When asked if D1remembers braking prior to the crash he stated he had "no recollection of braking" and also stated he his speed was25-30 mph when he attempted to turn Eastbound. D1 stated there were multiple issues with the front passenger sideof his vehicle and it was difficult for him to turn the vehicle. D1 stated when he moved into the left turn lane on Ward heheard abnormal noises coming from the front passenger side of his vehicle. D1 also stated the front driver side tirerubbed against the wheel well of the vehicle. PO Hunter took photos of the scene and uploaded them into evidence.	Lost Control / Ran into Signal
19-3362	4/23/2019	Ward & Chipman	D1 stated she was east bound on chipman approaching Ward. She stated she did not see the stop sign untilshe was entering the intersection and her mother yelled for her to stop. She stated she saw V2 pull out NB on Wardfrom the south and tried to miss it but struck the front bumper of V2D2 stated he was NB on Ward and stopped at the temporary stop sign. He stated he started to pull out and was struckby V1.Intersection is normally a signal controlled intersection. No red lights were flashing EB but were flashing red NB. Stopsigns were placed but were closer to ground than normal stop signs.No tickets issued. Both cars driven from the scene.	Right angle / Stop signs were up instead of signal
19-3345	4/23/2019	Ward & Chipman	D1 stated he was west on NW Chipman at NW Ward Rd. D1 advised that he thought the signal light was red sohe stopped. D1 advised that the vehicle next to him began to go, so he did too. D1 stated he never observed V2and collided with the side of it as it made a left turn.D2 stated she was stopped on eastbound NW Chipman Rd at NW Ward Rd. D2 advised that it was her turn to goand she began making her left turn. D2 stated that she was almost completely through the intersection when V1accelerated and struck the side of her vehicle.It should be noted that the intersection is normally controlled by a traffic signal light. The intersection was withoutpower due to a previous accident. Stop signs were set up in each direction of travel, making the intersection a "4way stop".No independent witness	Right angle / Stop signs were up instead of signal
19-6421	7/27/2019	Donovan & Chipman	Upon arrival, D1 was contacted by Officers and he advised he was not injured. D1 further advised he was travelingwestbound at the intersection and was paying attention to his cell phone rather than the roadway causing him to strikethe curb a few times with V1.I observed the right side airbags of the vehicle to have been deployed. I observed damage to both right side wheelsand the right front tire was blown out. There was also damage along the lower right side of the vehicle reaching fromthe front to the rear. I also observed damage to both left side wheels and from the front to the rear lower part of thevehicle. I observed damage to the right side curb shortly after the intersection consistent with damage to vehicle 1. Iobserved a skid marks traveling to the left side curb and back to the right side curb before the vehicle came to rest.D1 was subsequently arrested and later charged with excessive blood alcohol content (see report #2019-006422 forfurther). Nothing further.	Lost Control / DUI
19-6982	8/13/2019	Chipman		Not at intersection
19-9951	11/11/2019	Tudor & Ward	Both vehicles were northbound on NW Ward RD and both vehicles were intending to make a right turn to gowest on NW Tudor RD. As V2 began to make the right turn, V2 was struck in the rear by V1. The impact pushed V2onto a raised center median. No injuries reported. Moderate damage to V1. V2 appeared to have minor damage. Noinjuries were reported. The damage to V1 did not disable the vehicle at the scene and it was able to move to a nearbyparking lot, however, the vehicle did sustain significant damage to the engine compartment area. V2 was also able todrive away from the scene.D1 stated that as he was northbound and attempted to make a right turn onto Tudor RD., his vehicle began to slide onthe snowy roadway. D1 stated that his brakes would not stop his vehicle and he was unable to turn the car prior tohitting the rear of V1.D2 stated that he was in the process of making his right turn from Ward RD on to Tudor RD when his vehicle was hitfrom behind by V1.	Rear End / Icy conditions
19-9552	11/11/2019	Ward & Chipman	D1 stated she was west on NW Chipman Rd, approaching NW Ward. D1 advised that V2 was stopped at the redlight at Ward Rd. D1 stated she applied her brakes to stop and began sliding. D1 stated she was unable to stopand collided with the rear of V2.D2 stated she was stopped at the red signal light on westbound NW Chipman at NW Ward Rd. D2 stated as shesat stopped, V1 struck the rear of her vehicle.I issued D1 UTT for traveling too fast for conditions with a court date of 12-19-19 at 1500 hours.	Rear End / Too fast for conditions

19-10343	11/23/2019	Ward & Chipman	V2 was stopped at the traffic light east bound NW Chipman at NW Ward RD. V1 was stopped behind V2. V1 thenstruck the rear of V2.D2 stated she was stopped behind a car at the red light at NW Chipman RD and NW Ward RD. V1 then struck therear of V2.D1 stated she was stopped behind V2 when the light turned green. D1 then stepped on the accelerator and struckthe rear of V2.V2 had damage to the rear bumper. V1 and V2 were drivable.D1 and D2 stated they had no injuries.	Rear End / Inattentive
19-10647	12/3/2019	Donovan		Not at intersection
19-10691	12/4/2019	Ward & Chipman	On 12/04/19 at approximately 1220 hours while on patrol I came upon a two vehicle crash on NW Chipman at NWWard.D1 stated he was traveling eastbound NW Chipman in the number two lane when he rear-ended V2 west of theintersection of NW Ward. D1 stated the light was green, but D2 stopped for a pedestrian. D1 stated he wasdistracted by "messing" with items in his pocket. D1 reported no injuries.I observed non-disabling damage to front bumper of V1.D2 was not fluent in English, and was unable to give particulars about the crash, but stated she was uninjured.Based on the vehicle damage, and D1's statement I did not overly inquire the minute details preceding the crash.D2 was identified by her Mexican CID card.I observed non-disabling damage to the rear of V2.D1 was issued UTT #180709269 for following too closely, and D2 was issued UTT #180709270 for operator'slicense required.	Rear End / Inattentive
19-10847	12/8/2019	Ward & Chipman	Vehicle #1 was stopped in traffic in the right, left-turn lane of eastbound NW Chipman Road at Ward Road. Vehicle#2 was stopped directly in front of V1. V1 then rolled forward and struck V2. At the time of this collision, alleastbound NW Chipman Road traffic was directed into the two left turn lanes due to a serious crash blocking theintersection and eastbound lanes.Driver #1 stated she was distracted by her large dog in the back seat, and she turned around to tend to the dogwhile waiting for the traffic signal to turn green. As she did so, D1 said her foot slipped off the brake pedal and V1rolled forward striking V2. D1 did not have any visible injuries and none were claimed.Driver #2 advised she was stopped in traffic for the red signal. While waiting V1 struck her vehicle from behind. D2did not have any visible injuries and none were claimed.During my investigation I observed minor indentations on the rear bumper of V2. The indentations appeared tomatch up with the front license plate screws of V1. There was no other damage observed on V2. When examiningV1 there did not appear to be any damage.Due to the minimal damage no citations were issued.	Rear End / Lanes already closed due to collision
19-10847 R	12/8/2019	Ward & Chipman	V1 was traveling southbound on NW Ward and V2 was traveling eastbound on NW Chipman. The area of impactwas located in the intersection of NW Ward and NW Chipman. V1 was located in the eastbound lanes ofChipman, to the East of NW Ward, facing East. V2 was located in the front yard of 611 NW, facing southeast.All involved parties were transported to hospitals. D1 and P1 were transported to Lee's Summit Medical Centerwith probable injuries. D2 was transported to Centerpoint Hospital with disabling injuries.At the hospital, D1 told PO Warner her statement. D1 said she was stopped at the red traffic light on southboundNW Ward at NW Chipman. D1 said her light to continue southbound on NW Ward turned green. D1 said as shewas proceeding through the intersection, a vehicle from her right, crashed into her vehicle. D1 said the next thingshe knew, her vehicle was facing eastbound on NW Chipman.W1 said she was eastbound on NW Chipman, stopped at the red light at NW Penny. W1 said V2 was in the leftlane on eastbound Chipman and almost ran the red light at NW Penny. W1 said V2 stopped in the middle of theintersection. W1 said when the light turned green, traffic continued eastbound on Chipman. W1 said as theyapproached NW Ward, the light turned red. W1 said she was stopped at the red traffic light in the right lane. W1said V2 then ran the red light in the left lane. W1 said as V2 ran the red light, V1 was driving south through theintersection. W1 said the vehicles then crashed into each other. W1 said she does not believe D2 attempted toslow down, prior to going through the intersection.See additional supplemental reports for further.	Right Angle / Injuries / Ran Red Light
19-11477	12/28/2019	Ward & Chipman	V2 was traveling westbound in the right lane on NW Chipman Rd approaching the green light at NW Ward Rd.V1 was traveling behind V2.Traffic in front of V2 came to a sudden stop, forcing V2 to stop suddenly.V1 attempted to stop but collided with the back of V2.D2 stated the traffic ahead of her came to a sudden stop but she did not see any reason why.D1 was issued UTT #180710018 for Following Too Closely, Ord #29-239, with a court date of 2/11/20 at 1500 hrsat the Lee's Summit court house.	Rear End / Inattentive
20-0151	1/6/2020	Ward & Chipman	D1 stated he was traveling west on NW Chipman Rd, behind V2. D1 advised that as they were pulling up to thesignal light at NW Ward Rd, he struck the rear of V2. I asked D2 if those accounts were correct and she statedthey were.I issued D1 UTT for expired insurance and for following too close with a court date of 02-20-2020 at 1500 hours.	Rear End
20-0191	1/7/2020	Chipman		Not at intersection
20-3178	5/6/2020	Donovan & Chipman	V1 was traveling eastbound NW Chipman in the number two lane at NW Donovan. V1 struck the rear of V2 within the intersection. V1 had minor damage to the front passenger side. D1 stated she had a green light, and did not see V2. V2 was traveling westbound on NW Chipman, and turned south (left) onto NW Donovan, when struck by V1. V2 had minor damage the rear passenger side. D2 stated she had a solid green light, not an arrow. D2 stated her vision was blocked by a white box van attempting to turn north on NW Donovan from NW Chipman, and did not see V1. Due to the minor damage, no citation was issued to D2 for failing to yield. D1 was cited UTT#180713232 for failure to provide insurance with a court date of 09/01/2020 at 1500 hours.	Right Angle / Failed to yield

20-5913	8/20/2020	Ward & Chipman	On 09/02/2020 at approximately 1608 hours, I was requested to contact Brianna McCowan (D3) in regard to amotor vehicle accident that occurred on 08/20/2020 at approximately 1530 hours at NW Chipman Road and NWWard Road.Brianna advised she was in the number two (right) lane stopped at the red light signal in her blue 2016 HyundaiSonata (NA4J2H MO). She also had her nephew, Malik Saggett (P1), who was in a car seat in the rear passengerseat. Before the light turned green, she was struck from behind by a silver 2019 Honda Fit (NB9S3S MO), whichwas driven by Ruth Drummond (D2). Once Brianna exited her vehicle, she realized that Ruth had been struckfrom behind by Jennifer Faulkner (D1), who was in a black 2007 Nissan Frontier (4HAC37 MO). Brianna advisedthat Jennifer was trying to tell Ruth that she didn't see any damage to her vehicle nor Brianna's, and tried to leavewithout providing any information to either of them. Eventually Brianna was able to obtain Jennifer's name, phonenumber, and insurance information, but she refused to provide anything further. Brianna stated she also tookdigital photographs of the vehicles and license plates prior to leaving.Brianna advised she had contacted Jennifer's insurance company, but they refused to provide assistance dueto being unable to contact Jennifer about the incident. Due to not having a police report, they were telling Briannathey were unable to determine if the event actually occurred.I later contacted Ruth by phone in regard to the incident who stated she was driving westbound on NWChipman Road and stopping at the light at NW Ward Road, when she happened to look in her rearview mirror andobserved a black truck driving up quickly behind her. Ruth stated it went through her mind that the driver wasgoing to hit her, as it appeared the driver was distracted; she was then struck. Ruth stated she should havecontacted police when the incident happened, but it appeared that Jennifer was attempting to minimize thesituation without getting police involved. She also provided claim # PA0002614357 through the General with agentAnthony Sherman (1-800-280-1466 ext. 1321).	Rear End / Inattentive
20-05907	9/2/2020	Ward Rd		Not at intersection
20-8609	10/17/2020	Donovan & Chipman	V1 was traveling eastbound on NE Chipman road when he turned north onto Dovovan Rd, into oncoming traffic. V2 was travelingwestbound on NE Chipman Rd, when V1 failed to yield, and causing the collision.D1 stated he was traveling eastbound on NE Chipman Rd and entered in to the left turn lane. (facing north) As he approached theintersection he stated he a green light and although saw oncoming traffic, proceeded into the intersection believing he had the right ofway.D2 stated she was traveling westbound on NE Chipman Rd and approached the intersection located at NE Donovan Rd. She stated she hada green light and while proceeding through the intersection V1 turned left in front of her vehicle. She stated she attempted to stop butcould not in time.	Right Angle / Failed to yield
20-9149	11/11/2020	Ward & Chipman	Driver # 1 stated she had just pulled out of Lion Choice on Chipman Rd. and was heading west. She said she thought she was in the turnlane to make a right turn. She said she didn't know where vehicle # 2 came from and the vehicles hit. Driver # 1 was unsure of what hadhappened when speaking with her. She initially told me that she was making a right turn and didn't know where vehicle # 2 came fromthen told me that she was making a right turn and noticed the median and tried to over correct her turn when the vehicles struck eachother.Driver # 2 stated that he was stopped at the traffic light to go north on Ward Rd. from Chipman Rd. He said the light turned to a greenarrow and he began to make his turn when his vehicle was struck by vehicle # 1 that was traveling west on Chipman Rd.Witness # 1 and 2 were behind vehicle # 2 turning north onto Ward Rd. from Chipman Rd. They both said that vehicle # 1 ran the light asit was traveling west on Chipman Rd. They confirmed that vehicle # 2 had a green turn arrow.My investigation revealed that driver # 1 failed to stop at a red light causing the crash. I observed damage to the left front bumper and leftfront fender of vehicle # 1. I observed damage to the right side bumper and fender of vehicle # 2. Driver # 1 was transported by EMS forinjuries related to the crash and driver # 2 refused treatment at the scene but stated he was going to respond to the hospital to get his kneeslooked at due to him striking them on the dash. Both vehicles were towed from the scene. Driver # 1 was issued citation # 180716785 forfail to stop at a red traffic signal (ord. 29-321) and was given a court date in Lee s Summit Municipal Court.	Right Angle / ran red light
20-9396	11/21/2020	Tudor & Ward	D2 stated she was stopped in traffic on NW Tudor Rd. in the south bound turning lane when her traffic light turned green. D2 stated sheturned to go south bound on NW Ward Rd. and V1 ran the red light traveling north bound on NW Ward Rd. colliding with V2. D2 statedV1 left the scene without exchanging any information.	Right Angle / ran red light
20-9663	12/3/2020	Donovan & Chipman	D1 stated she was driving south on Donovan at Chipman Rd with V2 in front of her. She stated they started to turn east onto Chipmanwhen V2 yielded to oncoming traffic and she struck the rear of his truck.D2 stated he was driving south on Donovan at Chipman Rd and started to make a left turn onto eastbound Chipman Rd. He stated heslowed to yield to oncoming traffic from the south and was rear ended by V1.	Rear End
20-9809	12/9/2020	Ward & Chipman	D2 stated he was stopped at the signal light on NW Chipman Rd at NW Ward. D2 advised that a vehicle next to him started to accelerate,but the signal light was red, so that vehicle stopped. D2 stated that he believed V1 saw that vehicle move and then V1 accelerated,striking the rear of his vehicle.D1 stated she was unsure of what actually happened. D1 advised that she has a bug in her car that was attacking her, possibly a wasp. D1stated that her foot must have slipped off of the brake and caused V1 to strike V2.	Rear End / Inattentive

20-9970	12/16/2020	Ward & Chipman	D1 was traveling EB on NW Chipman Rd. behind V2. D1 said D2 "slammed on her brakes" and D1 could not avoid her and then crashedinto the rear of V2.D2 was traveling EB on NW Chipman Rd. before NW Ward Rd. D2 said the traffic light was red so she was slowing down to stop. D2said she came to a stop and observed V1 in her mirror approaching very quickly. D2 said she knew V1 was going to crash into her so shebraced herself and pushed hard on the brake pedal in an attempt to keep V2 from moving too far forward after the crash. D2 said V1 thencrashed into the rear of V2.I observed minor damage to the rear of V2 and minor damage to the front of V1.	Rear End
21-0409	1/20/2021	Donovan & Chipman	Driver # 1 stated two different stories. First to an officer who arrived on scene before me he stated that he was cut off by a vehicletraveling fast making him go off the road and strike the guard rail. The second story he stated was he slid on some snow and lost control ofhis vehicle.PO Pace contacted the driver and eventually placed driver # 1 under arrest for driving while intoxicated. For more information see POPace's DWI report # 21-416.My investigation of the crash revealed that driver # 1 was making a left turn from Donovan Rd. traveling south, lost control of his vehicleand struck the guard rail. I observed skid marks indicating the vehicle was turning left. The skids indicate the direction of travel into theguard rail of vehicle # 1. I observed damage to the front bumper, fenders, and hood of vehicle # 1. I observed approximately 15 feet ofdamage to the guard rail. Due to the extensive damage of the guard rail and the length of skid it appeared the vehicle was traveling at ahigh rate of speed. Driver # 1 was transported to the hospital by EMS and vehicle # 1 was towed from the scene due to disabling damage.Driver # 1 was issued citation # 180718148 for careless and imprudent driving (ord. 29-114) and was given a court date in Lee's SummitMunicipal Court.	Lost Control
21-1919	3/25/2021	Ward & Chipman	D2 was eastbound on NW Chipman road, approaching NW Ward road. D2 said as she was about to proceed through the intersection, sheobserved a red vehicle driving westbound in the eastbound lanes of NW Chipman, approaching her location. D2 said she had to brakesuddenly to avoid crashing into the wrong way driver. D2 stated as she was braking, V1 crashed into the rear of her vehicle.D1 was eastbound on NW Chipman road, approaching NW Ward road. D1 said she was behind V2 and both vehicles were about toproceed through the intersection at SW Ward. D1 said she also observed the red vehicle driving the wrong way on NW Chipman road.D1 said this caused V2 to brake suddenly to avoid a head on collision. D1 said she attempted to stop, however was unable to and crashedinto the rear of V2.	Rear End / A vehicle stopped to avoid a crash and was rear ended
21-2842	5/5/2021	Ward & Chipman	Vehicle 1 was driving westbound on NE Chipman Road when it entered the intersection at NW Ward Road and struck Vehicle 2 in thepassenger side. Vehicle 2 was turning north onto NW Ward Road from eastbound NW Chipman Road when it was struck by Vehicle 1.Driver 1 was not on-scene when Police arrived and witnesses said they believed the Driver and a possible Passenger ran from the scene.Driver 2 stated she had the green turn arrow indicating she had the right-of-way to turn north onto NW Ward Road from eastbound NWChipman Road. As she made her turn, Driver 2 said her car was struck by Vehicle 1. Due to her airbags deploying and generaldisorientation from the crash, she pulled off the roadway and didn't see who was driving Vehicle 1. When she exited her car, she statedshe saw a white male with blonde hair, a white shirt and khaki shorts standing near Vehicle 1. Driver 2 said she didn't know Driver 1 leftthe scene, until officers told her. Driver 2 also stated she wasn't sure if she could identify the male she saw.Witness 1 stated he was behind Vehicle 2 in the turn lane from eastbound NW Chipman Road onto Northbound NW Ward Road and sawthe green turn arrow indicating Vehicle 2 had the right-of-way to turn onto NW Ward Road. According to Witness 1, Vehicle 1 ran thered light and struck Vehicle 2. When Witness 1 pulled in behind Vehicle 2, he said he looked at vehicle 1 and saw a white male standingnear the car and possibly a white female. Witness 1 didn't realize these people left the scene until told by officers.A passerby stated he saw two people running near McDonald's. The passerby wasn't sure if they were involved with the crash and justsaw them running down the street.Driver 2 stated her shoulder was sore possibly due to the seatbelt but uninjured and I did not observe any apparent injuries.	Right Angle
21-3087	5/17/2021	Chipman		Not at intersection
21-3530	6/5/2021	Ward & Chipman	V1 was traveling south on NW Donovan RD at the NW Chipman RD intersection. V2 was traveling east on NW Chipman RD at the NWDonovan RD intersection. V2 was traveling through the intersection when V1 entered the intersection to turn left on NW Chipman RD.The front of V1 sideswiped the front of V2 resulting in minor damage. Neither vehicle required a tow from the scene.D1 stated he was following three cars through the NW Donovan RD and NW Chipman RD intersection to turn left onto NW ChipmanRD. D1 advised he had a green arrow to turn. D1 stated V2 turned right off of NW Donovan RD to turn right onto NW Chipman RDwhile he was proceeding through the intersection causing V2 to sideswipe V1.D2 stated she was traveling east on NW Chipman RD through the NW Donovan RD intersection. D2 stated she had a green light. D2advised V1 entered the intersection as she was traveling through it. D2 tried to stop but was unable to avoid a collision. V1 sideswipedV2.	Sideswipe
21-4561	7/20/2021	Ward & Chipman	V2 WAS IN THE RIGHT LANE ON NW CHIPMAN RD, STOPPED AT THE RED LIGHT TO NW WARD RD.V1 WAS STOPPED BEHIND V2.THE LEFT TURN ARROW TURNED GREEN TO GO NORTH ON NW WARD RD AND V1 STARTED TO GO BUT COLLIDEDWITH THE BACK OF V2.	Rear End
21-4984	8/7/2021	Chipman		Not at intersection
21-5080	8/11/2021	Ward & Chipman	D1 advised he was stopped at the light NB on NW Ward Rd. at NW Chipman Rd. when V2 crashed into the rear of V1.D2 stated she was stopped at the light behind V1 when D1 put V1 in reverse and quickly backed up into V2. D1 denied this action andsaid D2 crashed into V1.W1 stated she was on Chipman Rd. at the light and observed D1 put V1 in reverse and back up quickly into the front of V2.	Rear End / Vehicle backed into another vehicle

21-05743	9/9/2021	Tudor & Ward	Vehicle #1 was southbound on NW Ward Rd. at Tudor Rd. Vehicle #1 left the roadway to the left, striking the raised median/curb. Theimpact caused significant damage to the driver's front wheel. Vehicle #1 traveled on the edge of the median for a short distance, and thencrossed over to the right lane of traffic and stopped.Driver #1 advised he had just left his hotel nearby, and realized he had forgotten to put his seatbelt on. As he was pulling his seatbelt on,he bumped the arm holding the steering wheel causing Vehicle #1 to strike the median/curb. Driver #1 did not complain of injury andnone were observed. Driver #1 arranged for Jim's Towing to remove Vehicle #1.During my investigation I observed the impact location on the raised median/curb. There were tire and scrap marks along the right (West)side of the raised median for about 25-30 feet, before the tire marks from Vehicle #1 showed it crossed over to the right lane of Ward Rd.and stopped. While examining Vehicle #1 I noted the driver's front wheel had been completely broken from the control arms causing thewheel to turn nearly perpendicular to the car while being jammed against the rear portion of the wheel well. There was also minor damageto the rear wheel well/quarter panel area.	Lost Control
21-5961	9/17/2021	Donovan & Chipman	V1 WAS TRAVELING EAST BOUND ON NW CHIPMAN RD IN THE #2 LANE WHEN IT STRUCK V2. V2 WAS TRAVELINGWESTBOUND ON NW CHIPMAN RD. V2 WAS MAKING A LEFT TURN SOUTHBOUND ON NW DONOVAN RD WHEN ITWAS STRUCK BY V2.D1 STATED HE WAS TRAVELING EASTBOUND ON NW CHIPMAN RD AND HE HAD A GREEN LIGHT AT THEINTERSECTION. WHEN HE ENTERED THE INTERSECTION HE STRUCK V2.D2 STATED HE HAD A GREEN ARROW AT THE INTERSECTION OF NW CHIPMAN RD & NW DONOVAN RD. AS HE WASMAKING A LEFT TURN HE WAS STRUCK BY V1.W1 STATED HE WAS STOPPED IN THE #1 LANE AT THE STOPLIGHT AT NW CHIPMAN RD & NW DONOVAN RD FACINGEASTBOUND. V1 WAS TRAVELING EASTBOUND AT A HIGH RATE OF SPEED. AS V1 APPROACHED THE INTERSECTIONTHE LIGHT TURNED GREEN. V1 NEVER SLOWED DOWN DURING APPROACH TO THE INTERSECTION. V1 ENTEREDTHE INTERSECTION AND STRUCK V2.I OBSERVED HEAVY DAMAGE TO THE FRONT END OF V1. I OBSERVED HEAVY DAMAGE TO THE FRONT PASSENGERSIDE OF V2. BOTH VEHICLES WERE TOWED FROM THE SCENE.	Right Angle
21-6990	10/27/2021	Ward & Chipman	V1 was stopped behind V2 at a red light at the NW Chipman RD and NW Ward RD intersection in the left turn lane. V2 was stoppedbehind V3. The light turned green and V3 began turning north onto NW Ward RD. V2 did not begin to move yet. V1 did not realize V2was not moving and began to accelerate. The front of V1 struck the rear of V2. Both vehicles suffered minor damage. Neither vehiclerequired a tow.D1 stated she was stopped behind V2 at a red light at the NW Chipman RD and NW Ward RD intersection in the left turn lane. V2 wasstopped behind V3. The light turned green and V3 began turning north onto NW Ward RD. D1 did not realize V2 was not moving andbegan to accelerate. The front of V1 struck the rear of V2.D2 stated she was stopped behind V3 preparing to turn north onto NW ward RD. The light turned green and she had not accelerated yetwhen she was hit from behind by V1.	Rear End / Inattentive

Summit Orchard West Trip Generation

ITE Trip Generation Manual - 11th Edition

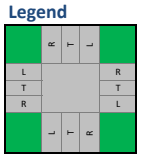
Highlighted text indicates trips used in Synchro and Warrant Analysis

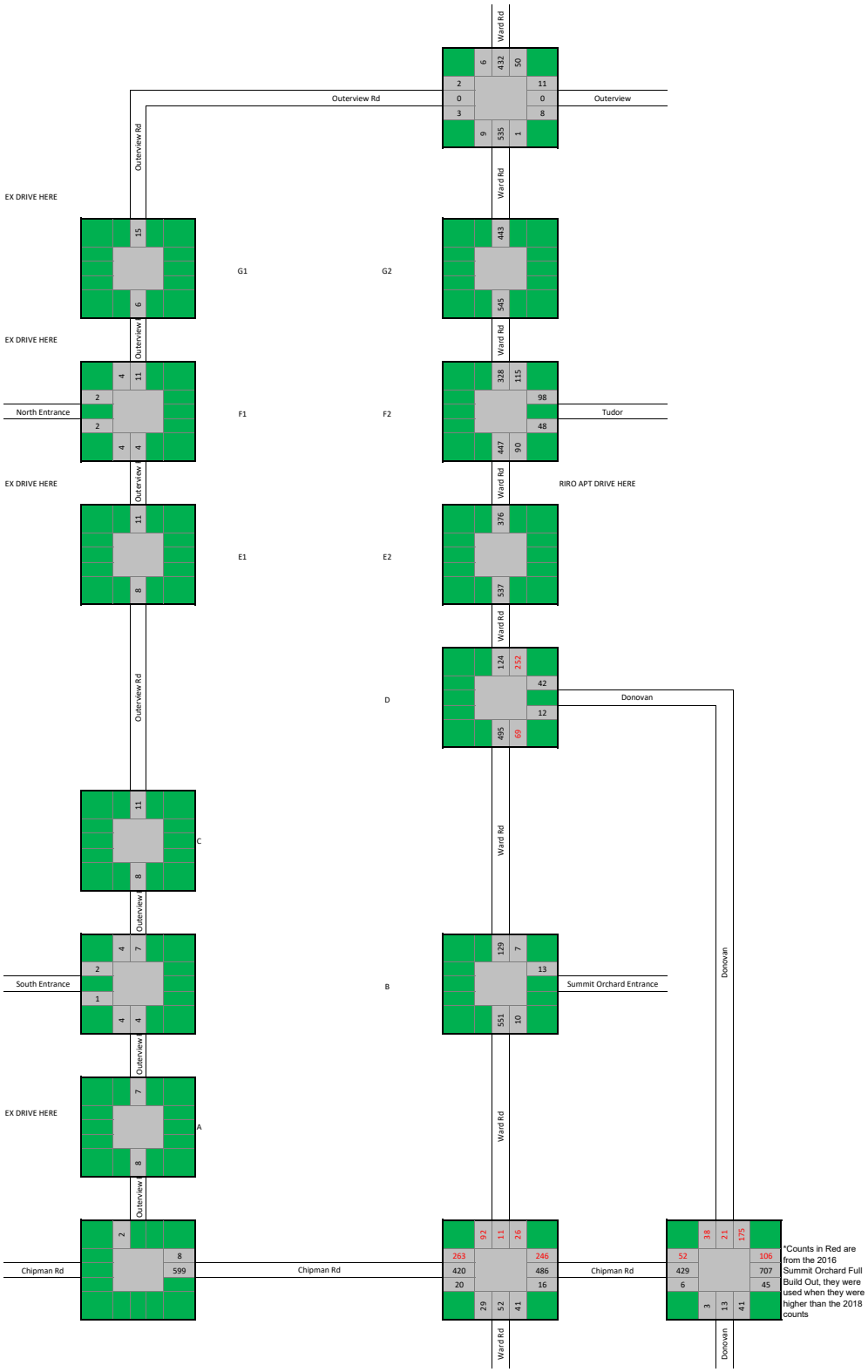
														Primary		Pass-by	
Land Use	**ITE Code**	**Size**	**Units**	**Equation**	**Trips (Eq.)**	**Av. Rate**	**Trips (Av. Rate)**	**In%**	**Out%**	**Trips In**	**Trips Out**	**Primary%**	**Passby%**	**Trips In**	**Trips Out**	**Trips In**	**Trips Out**
PHASE I																	
Multifamily Housing (Low-Rise) **(Weekday)**	220	323	Dwelling Units	T=6.41(X)+75.31	2146	6.74	2177	50%	50%	1073	1073						
Fast-Food Restaurant with Drive-Through Window	934	12.3	1000 Sq Ft	n/a	n/a	467.48	5750	50%	50%	2875	2875						
										3948	3948						
Multifamily Housing (Low-Rise) **(AM)**	220	323	Dwelling Units	T=0.31(X)+22.85	123	0.4	129	24%	76%	30	93						
Fast-Food Restaurant with Drive-Through Window **(AM)**	934	12.3	1000 Sq Ft	n/a	n/a	44.61	549	51%	49%	280	269	51%	49%	143	137	137	132
										310	362						
Multifamily Housing (Low-Rise) **(PM)**	220	323	Dwelling Units	T=0.43(X)+20.55	159	0.51	165	63%	37%	100	59						
Fast-Food Restaurant with Drive-Through Window **(PM)**	934	12.3	1000 Sq Ft	n/a	n/a	33.03	406	52%	48%	211	195	50%	50%	106	98	105	97
										311	254						
PHASE II																	
Warehousing **(Weekday)**	150	123	1000 Sq Ft	T=1.58(X)+38.29	233	1.71	210	50%	50%	117	116						
Warehousing **(AM)**	150	123	1000 Sq Ft	T=0.12(X)+23.62	38	0.17	21	77%	23%	29	9						
Warehousing **(PM)**	150	123	1000 Sq Ft	T=0.12(X)+26.48	41	0.18	22	28%	72%	11	30						
Summit Orchard Trip Gen																	
Drive-In Bank **(Weekday)**	912	5	1000 Sq Ft	n/a	n/a	100.35	502	50%	50%	251	251						
Fine Dining Restaurant	931	5	1000 Sq Ft	n/a	n/a	83.84	419	50%	50%	210	209						
High-Turnover (Sit-Down) Restaurant	932	4.5	1000 Sq Ft	n/a	n/a	107.2	482	50%	50%	241	241						
Coffee/Donut Shop with Drive-Through Window	937	1.4	1000 Sq Ft	n/a	n/a	533.57	747	50%	50%	374	373						
										1076	1074						
Drive-In Bank **(AM)**	912	5	1000 Sq Ft	n/a	n/a	9.95	50	50%	50%	25	25						
High-Turnover (Sit-Down) Restaurant	932	4.5	1000 Sq Ft	n/a	n/a	11.61	52	55%	45%	29	23						
Coffee/Donut Shop with Drive-Through Window	937	1.4	1000 Sq Ft	n/a	n/a	85.88	120	51%	49%	61	59						
										115	107						
Drive-In Bank **(PM)**	912	5	1000 Sq Ft	n/a	n/a	21.01	105	50%	50%	53	52						
Fine Dining Restaurant	931	5	1000 Sq Ft	n/a	n/a	7.8	39	67%	33%	26	13						
High-Turnover (Sit-Down) Restaurant	932	4.5	1000 Sq Ft	n/a	n/a	6.81	31	61%	39%	19	12						
Coffee/Donut Shop with Drive-Through Window	937	1.4	1000 Sq Ft	n/a	n/a	38.99	55	50%	50%	28	27						
										126	104						

AM Peak Hour Traffic

2022 Counts plus increased 2018 counts at Chipman and Ward, intersections balanced

Legend





*Counts in Red are from the 2016 Summit Orchard Full Build Out, they were used when they were higher than the 2018 counts

AM Lee's Summit Logistics Traffic

2021 Lee's Summit Logistics TIS (includes Phase I and Phase II)

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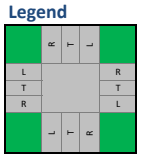

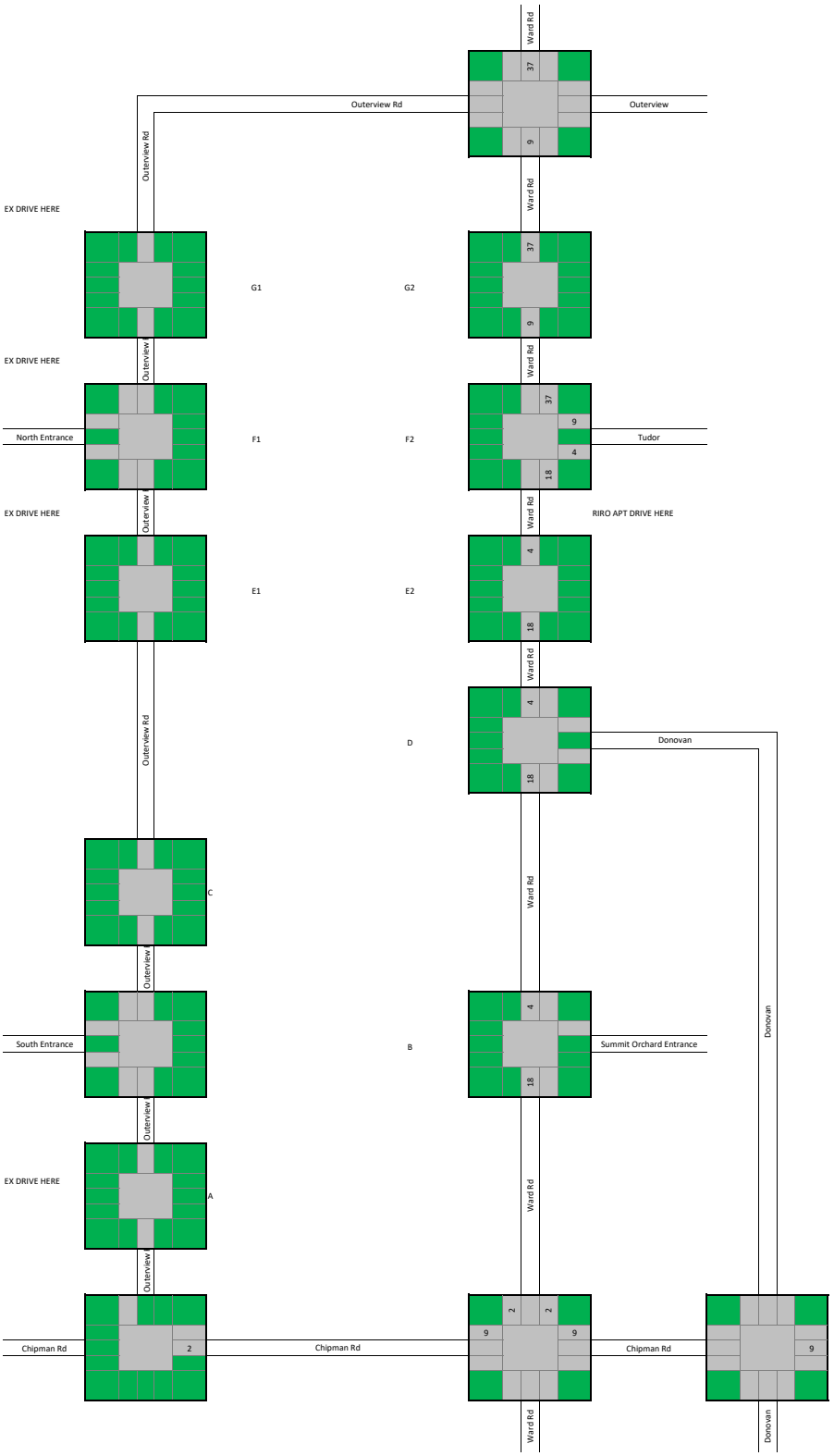

AM Peak Hour Traffic Trips + Approved Developments

Includes 2022, 2018 with 1% increase, Lee's Summit Logistics, and Summit Orchard

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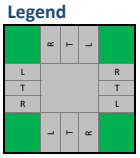

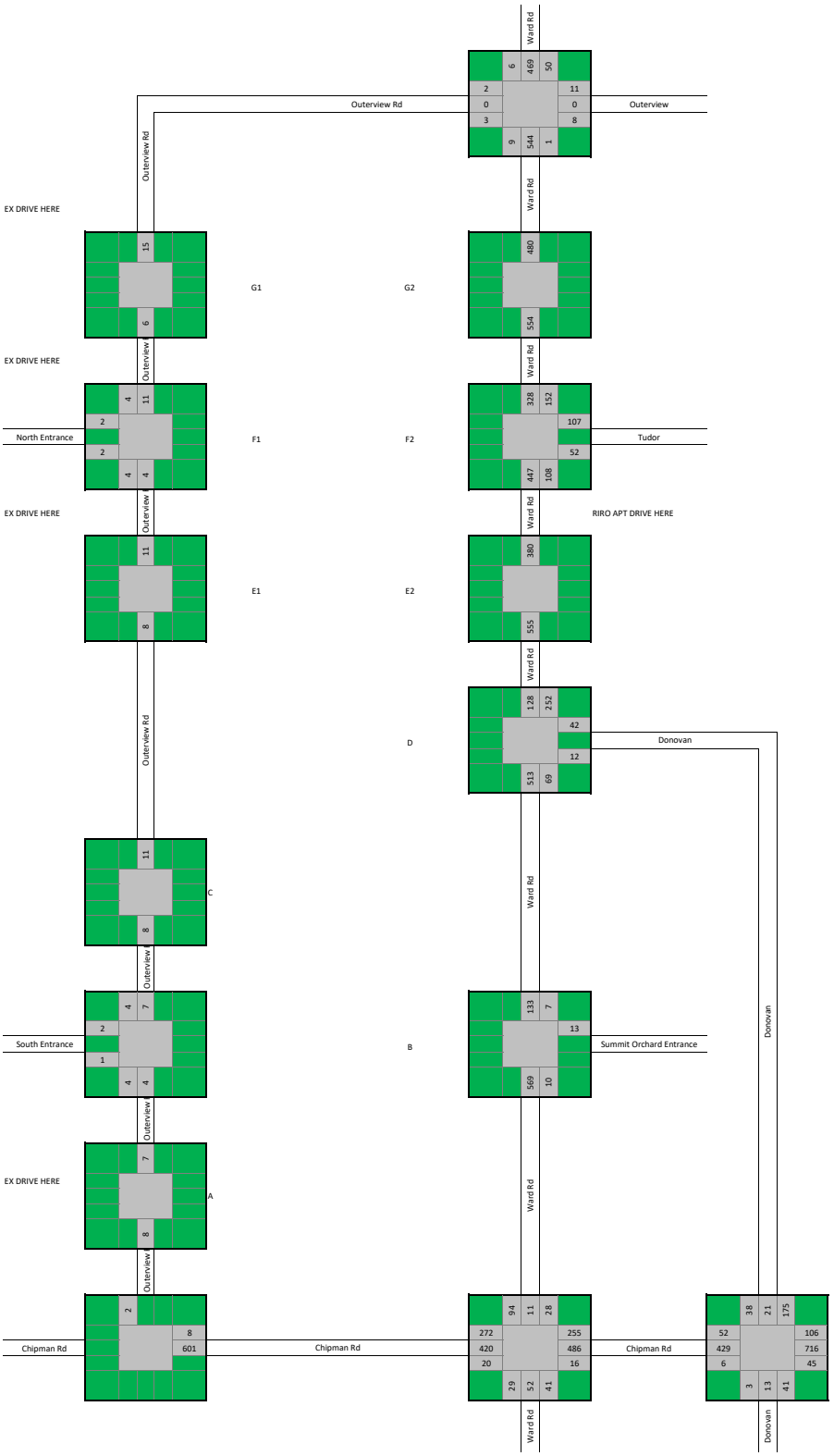

AM Distribution In - Restaurant (Phase I) PRIMARY

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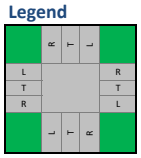

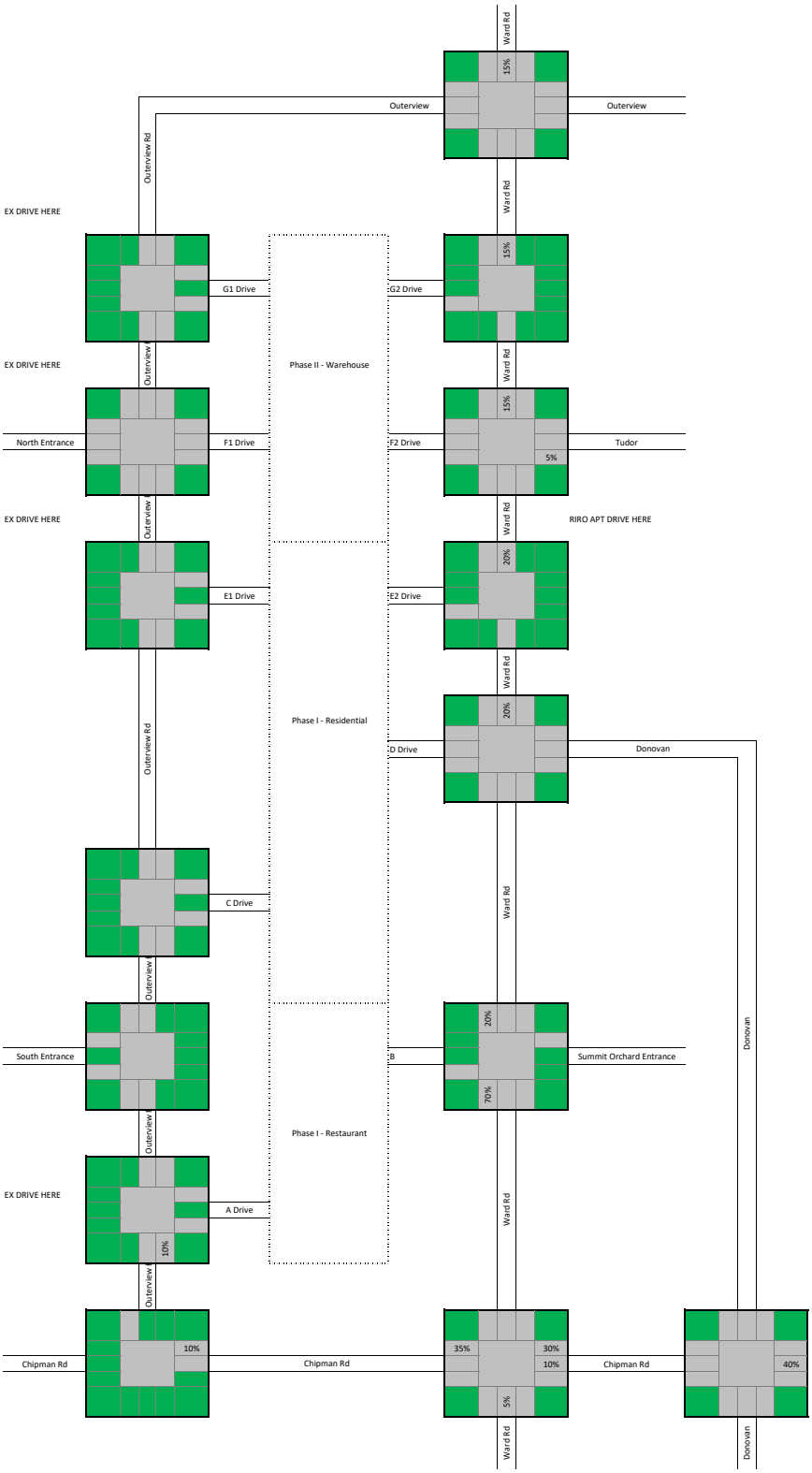

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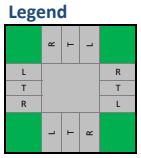

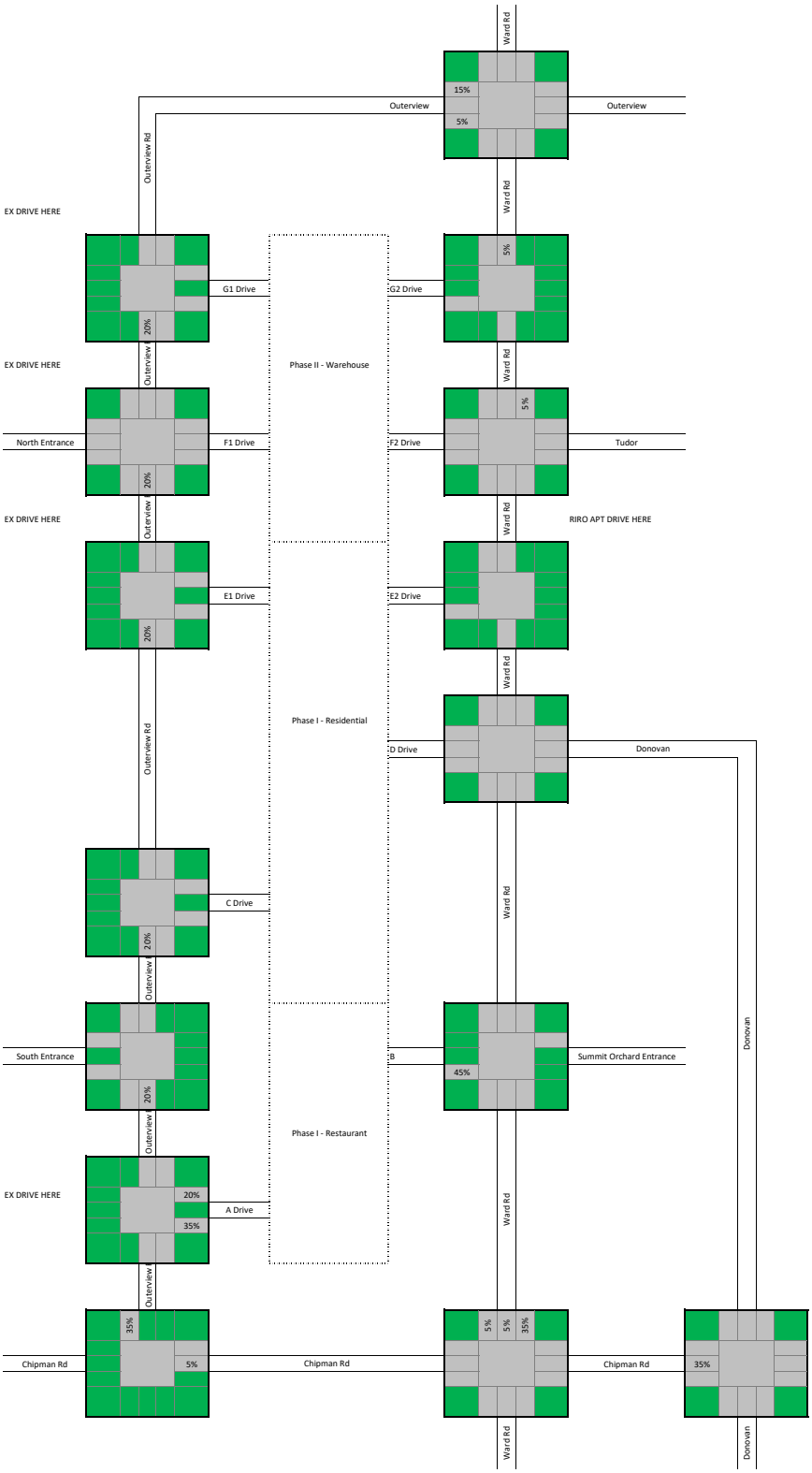

AM Distribution In - Restaurant (Phase I) PASS-BY

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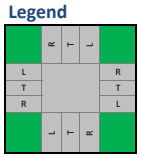

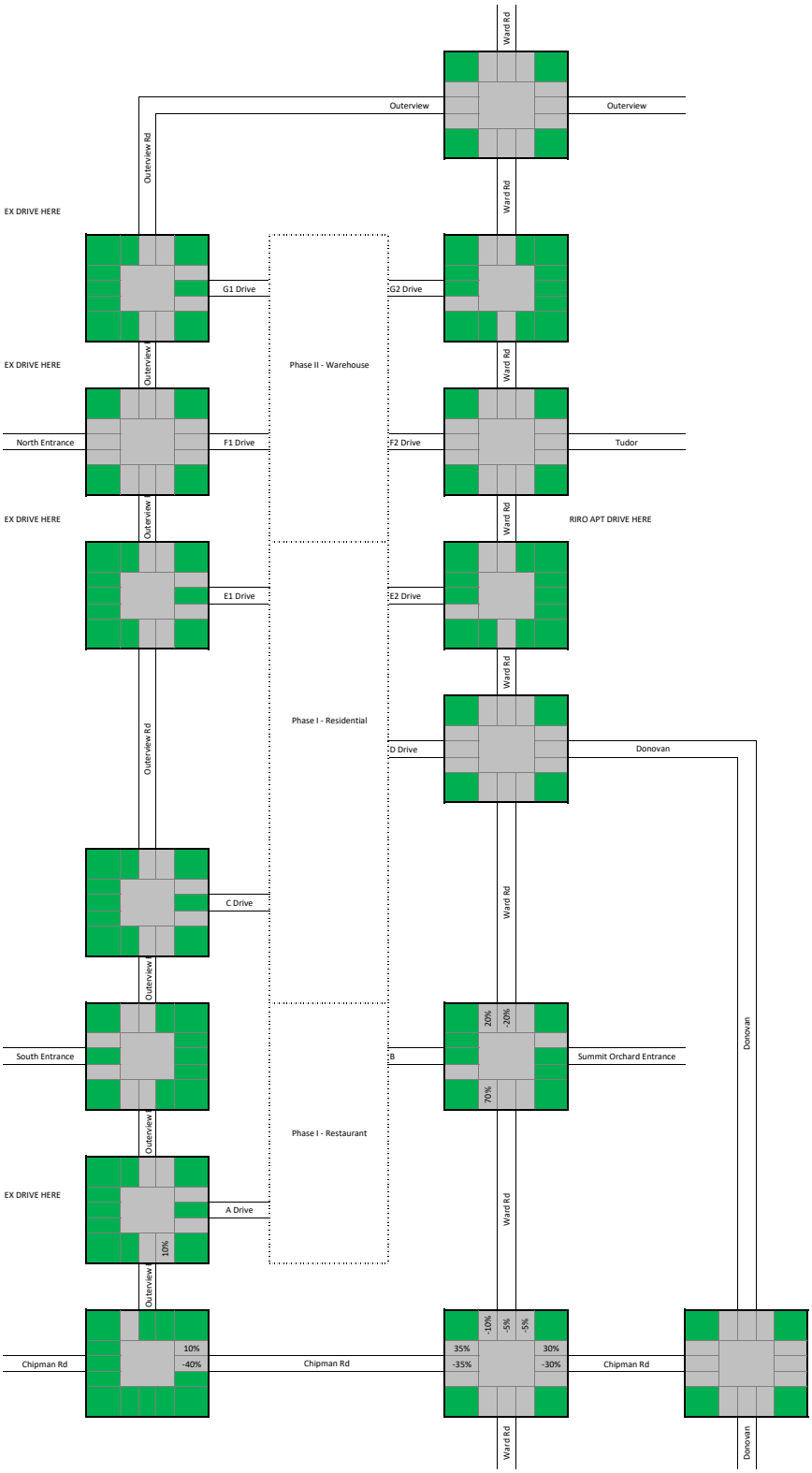

AM Distribution Out - Restaurant (Phase I) PASS-BY

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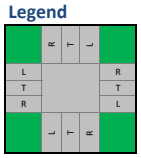

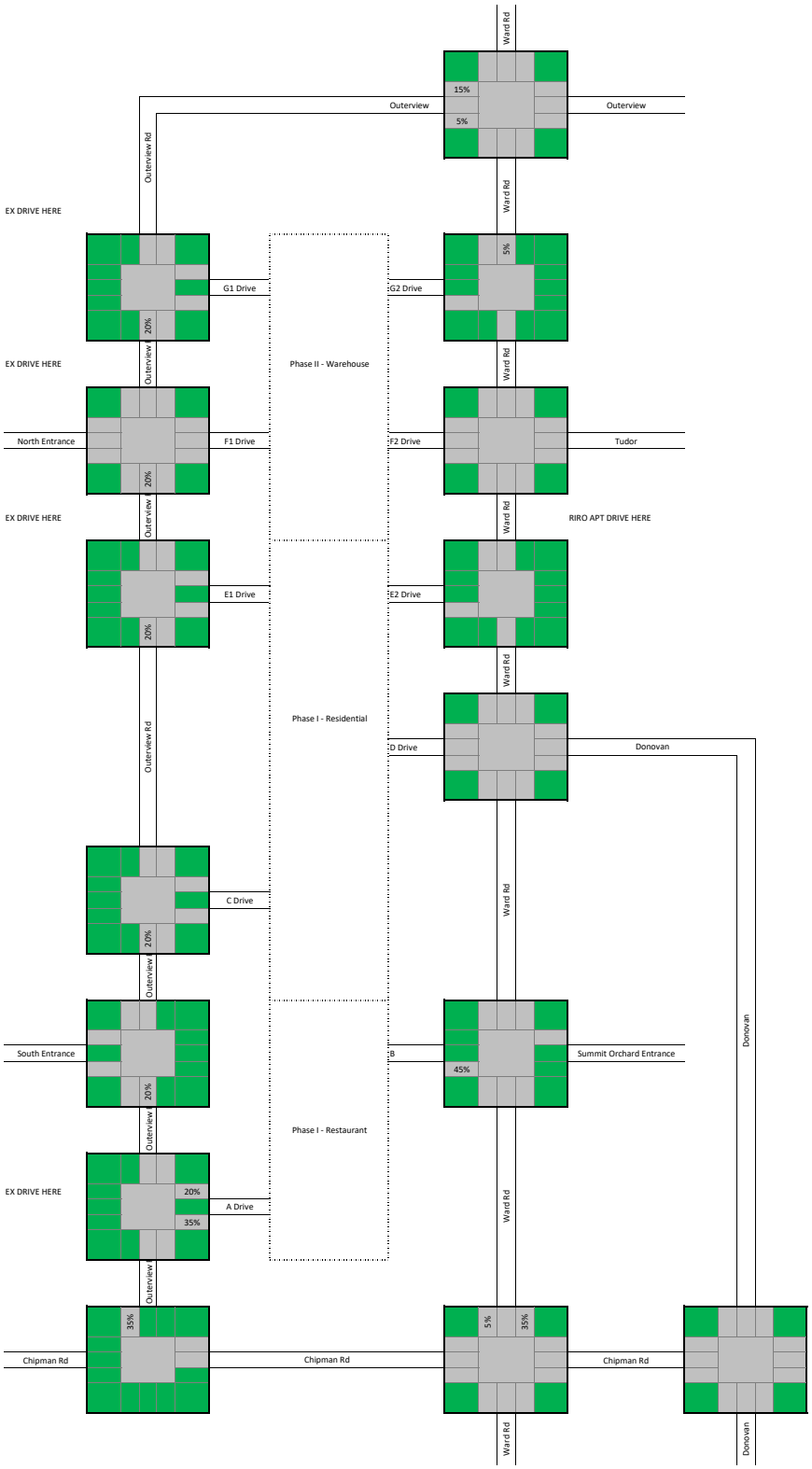

AM Trips In - Restaurant (Phase I)
PRIMARY

Trips
143

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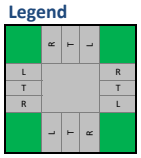

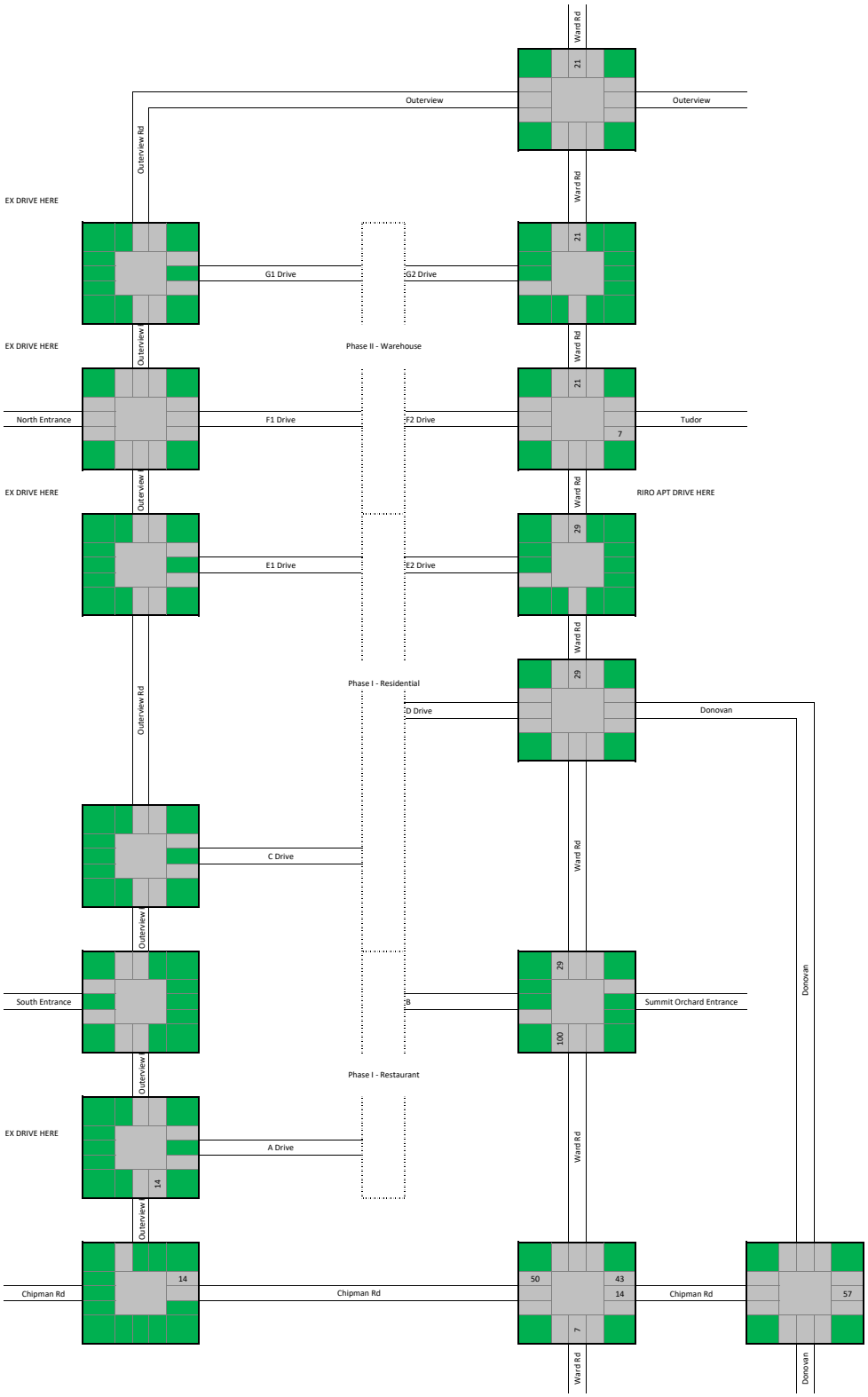

AM Trips Out - Restaurant (Phase I)
PRIMARY

Trips
137

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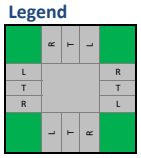

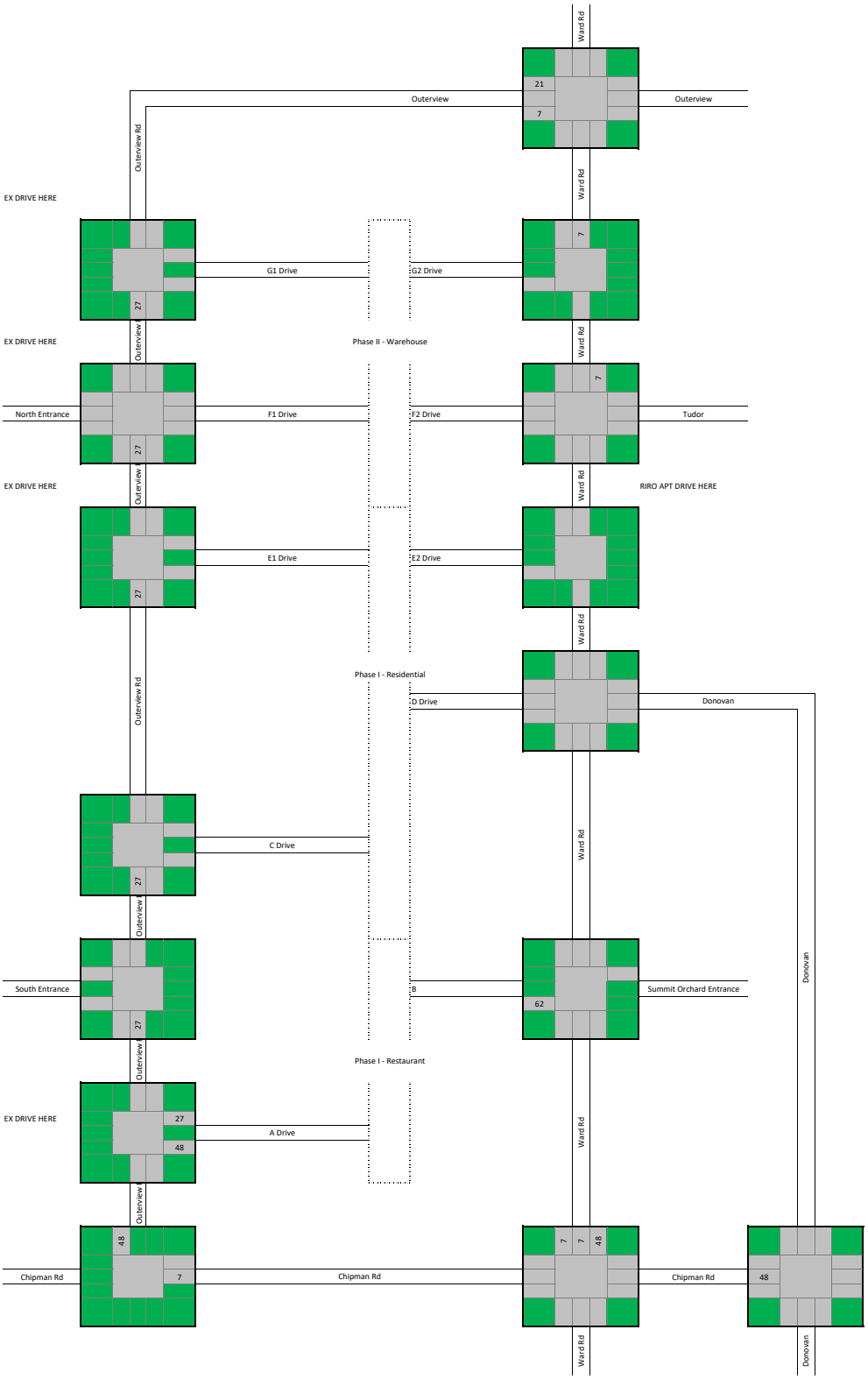

AM Trips In - Restaurant (Phase I)
PASS-BY

Trips
137

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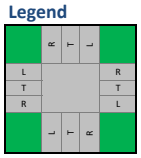

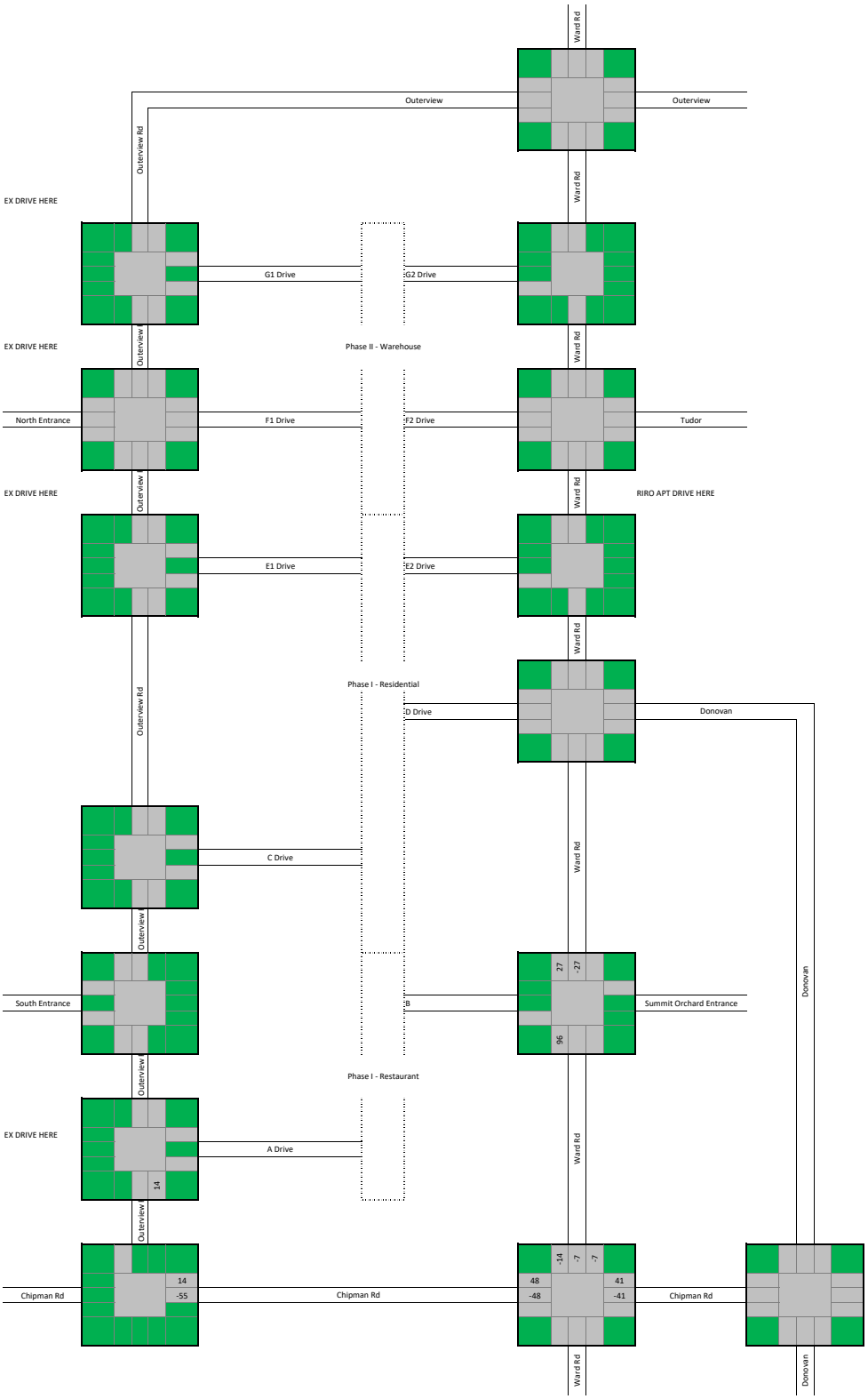

AM Trips Out - Restaurant (Phase I)
PASS-BY

Trips
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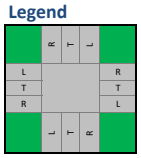

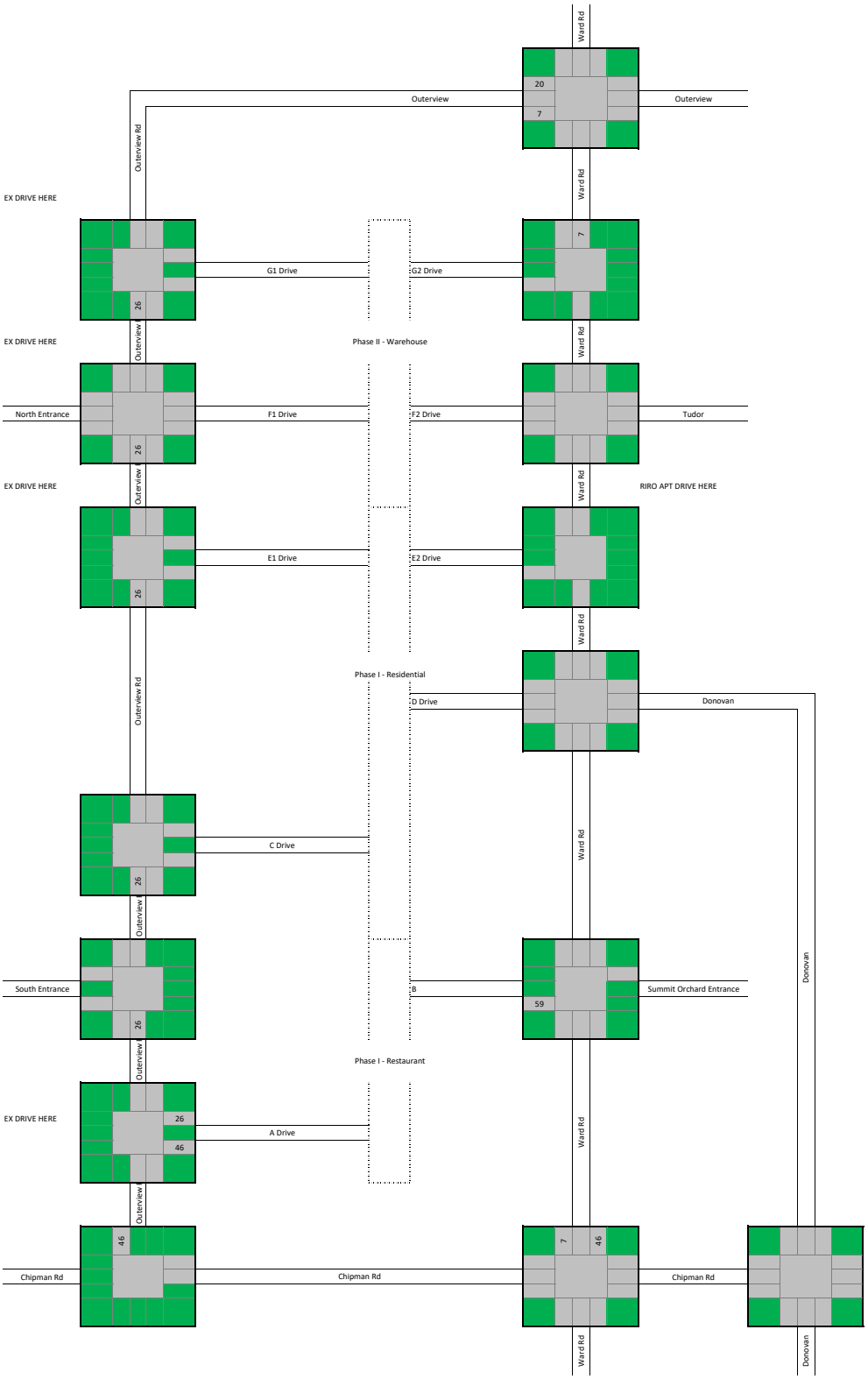

AM Distribution In - Residential (Phase I)

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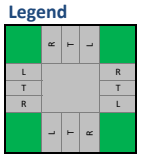
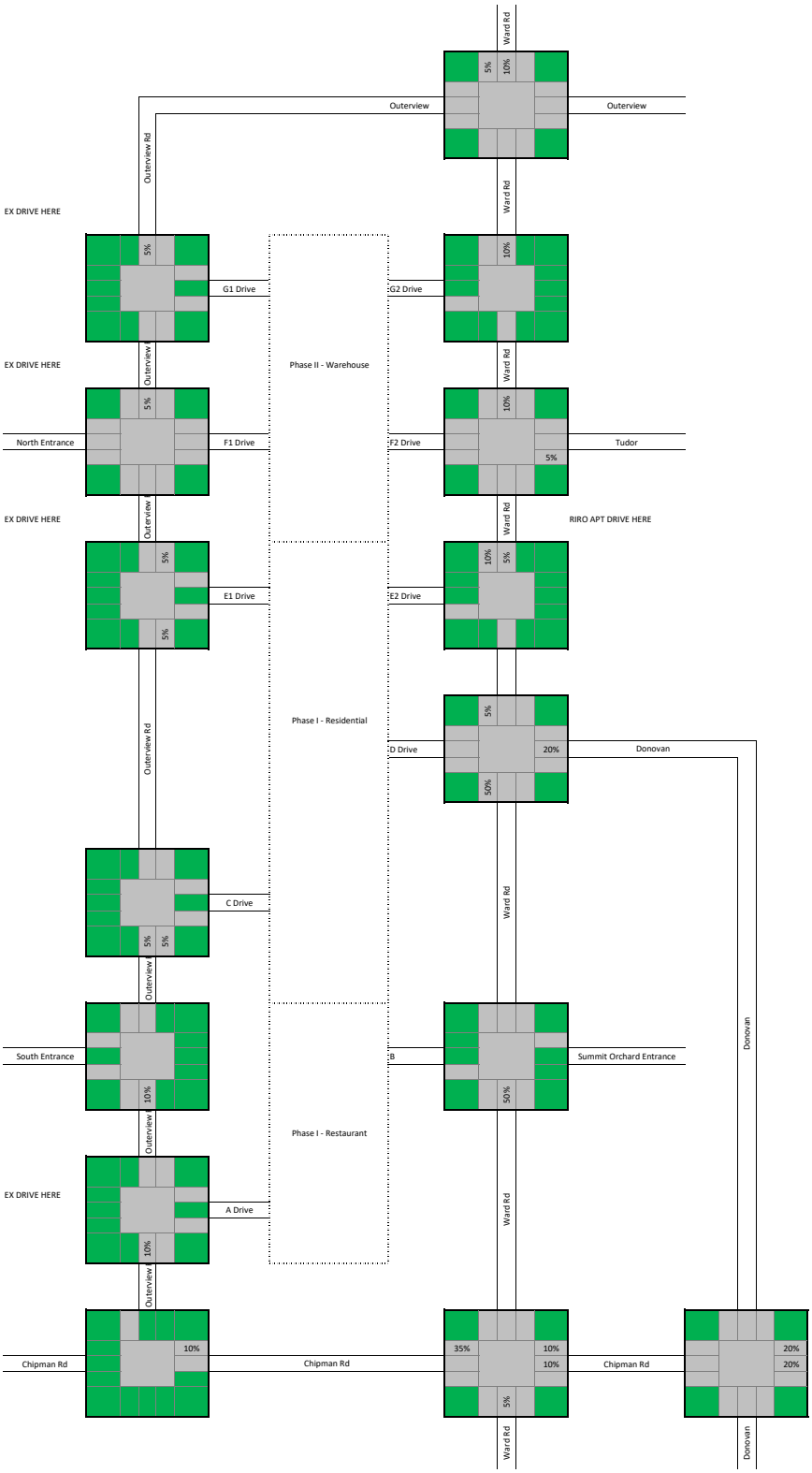
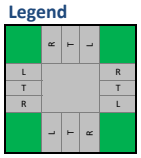
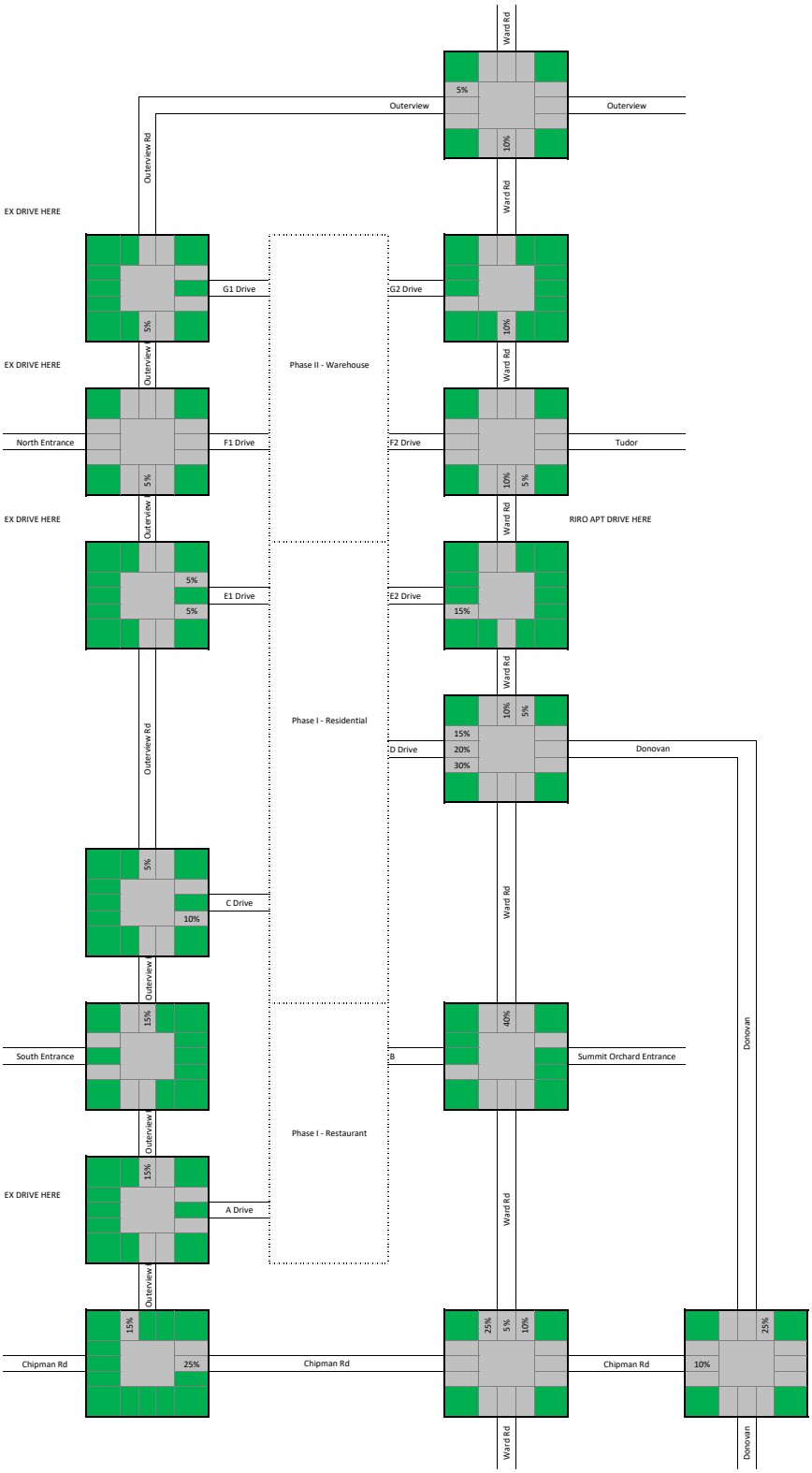




AM Distribution Out - Residential (Phase I)

Legend

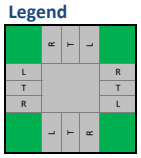


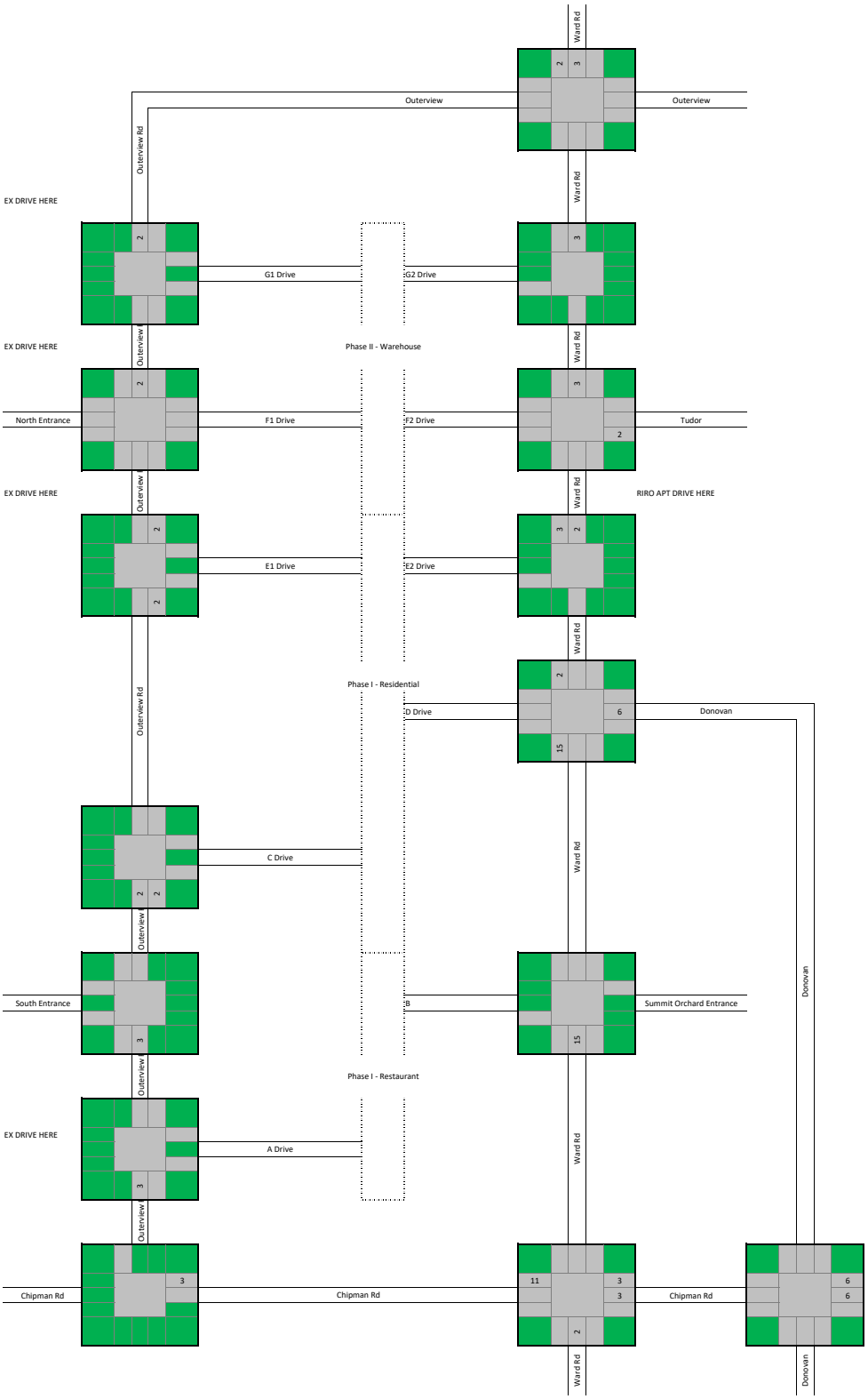


AM Trips In - Residential (Phase I)

Trips
30

Legend

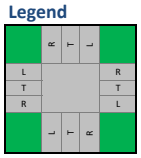


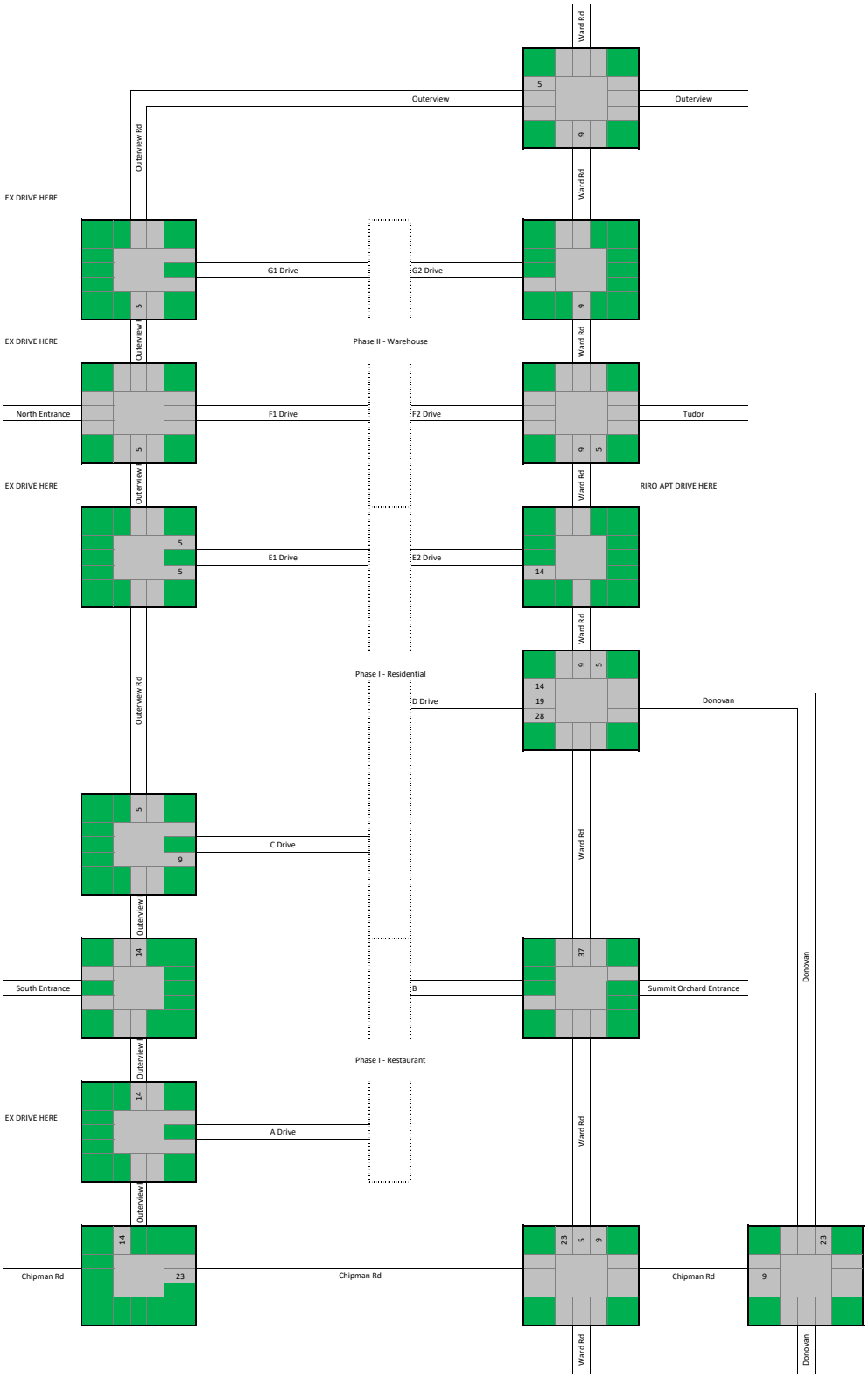


AM Trips Out - Residential (Phase I)

Trips 93

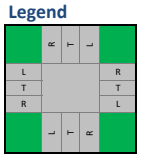
Legend

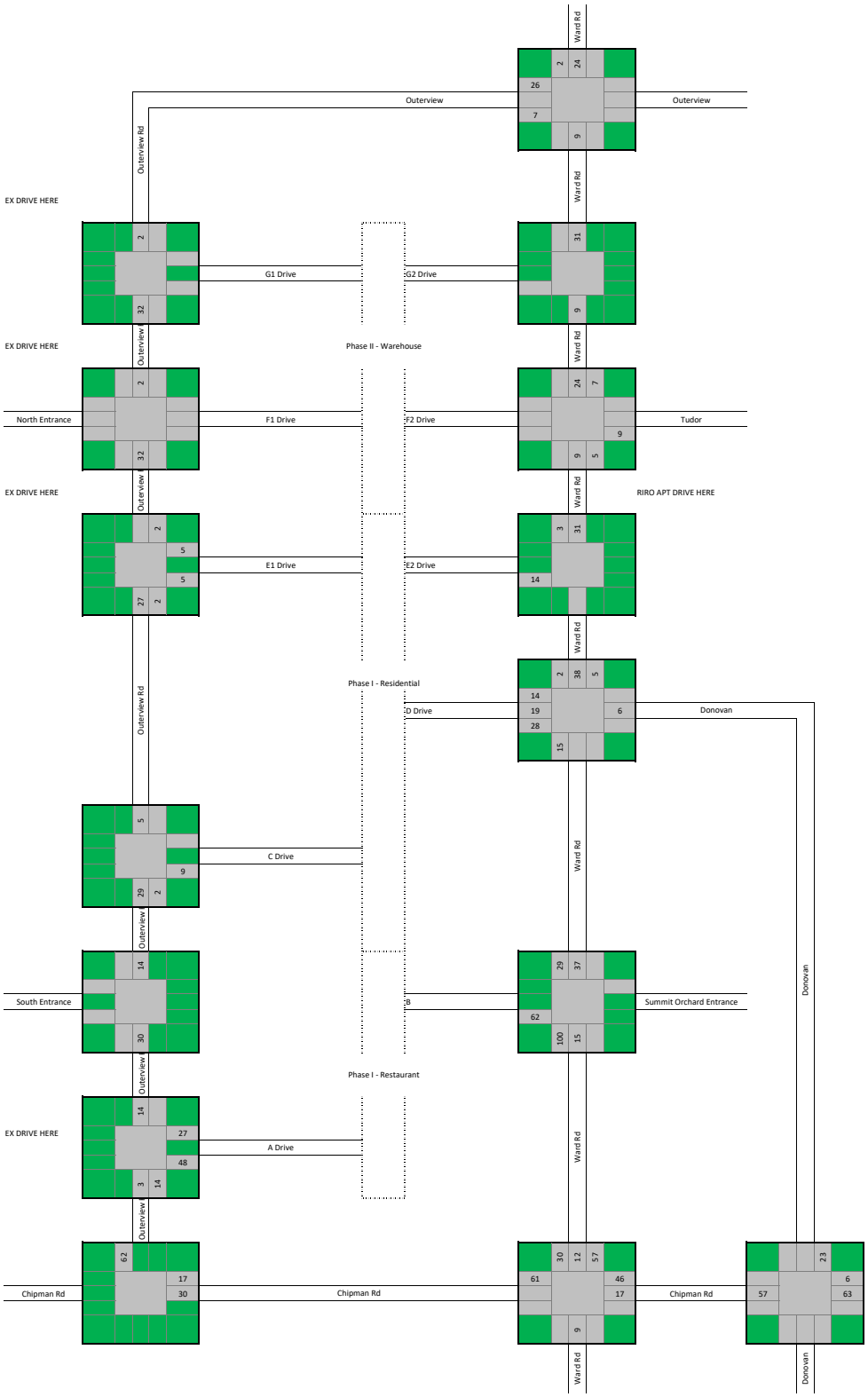




AM Trips (Phase I)
PRIMARY

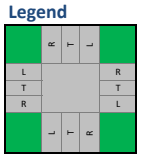
Legend

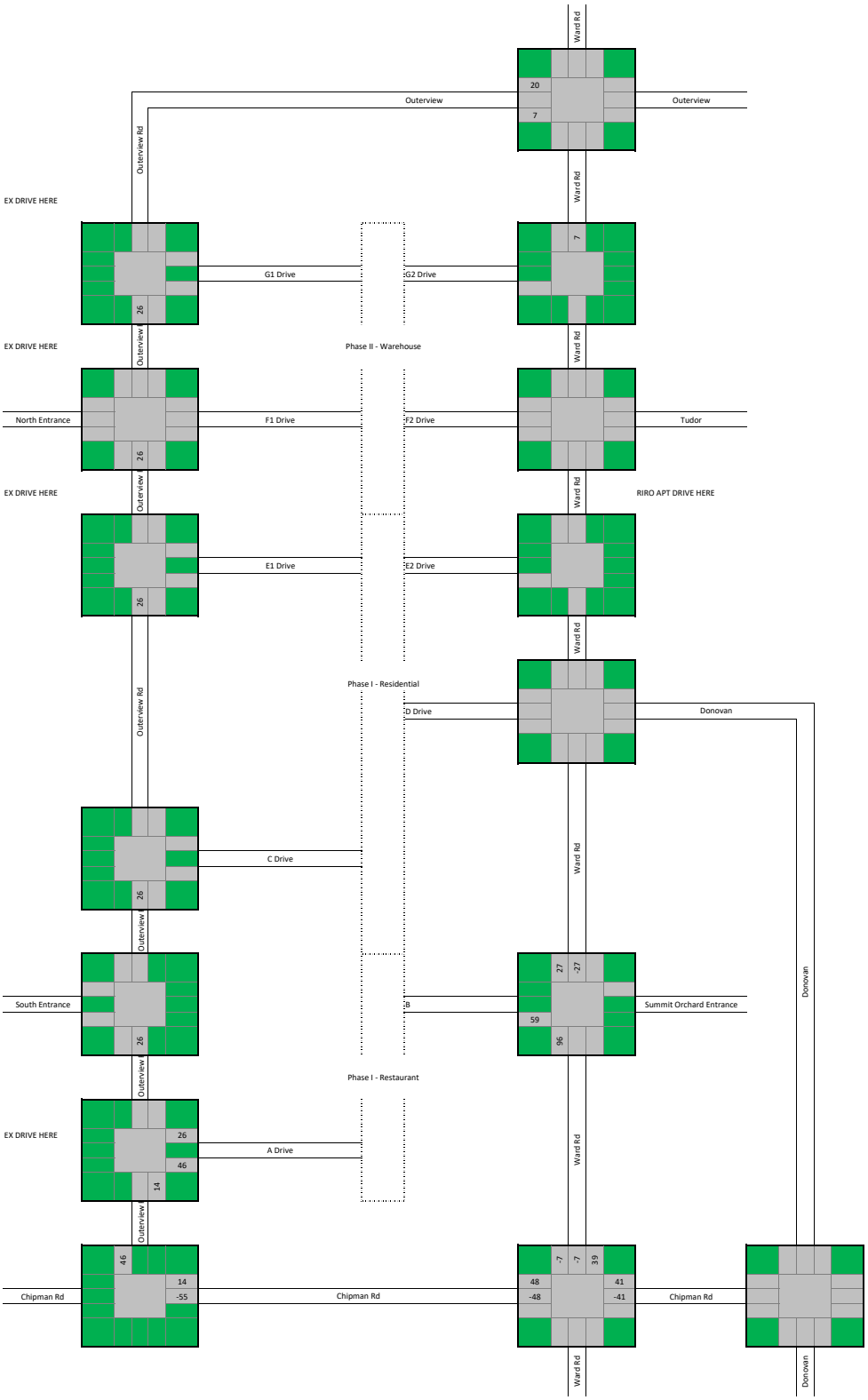




AM Trips (Phase I)
PASS-BY

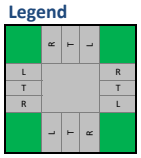
Legend

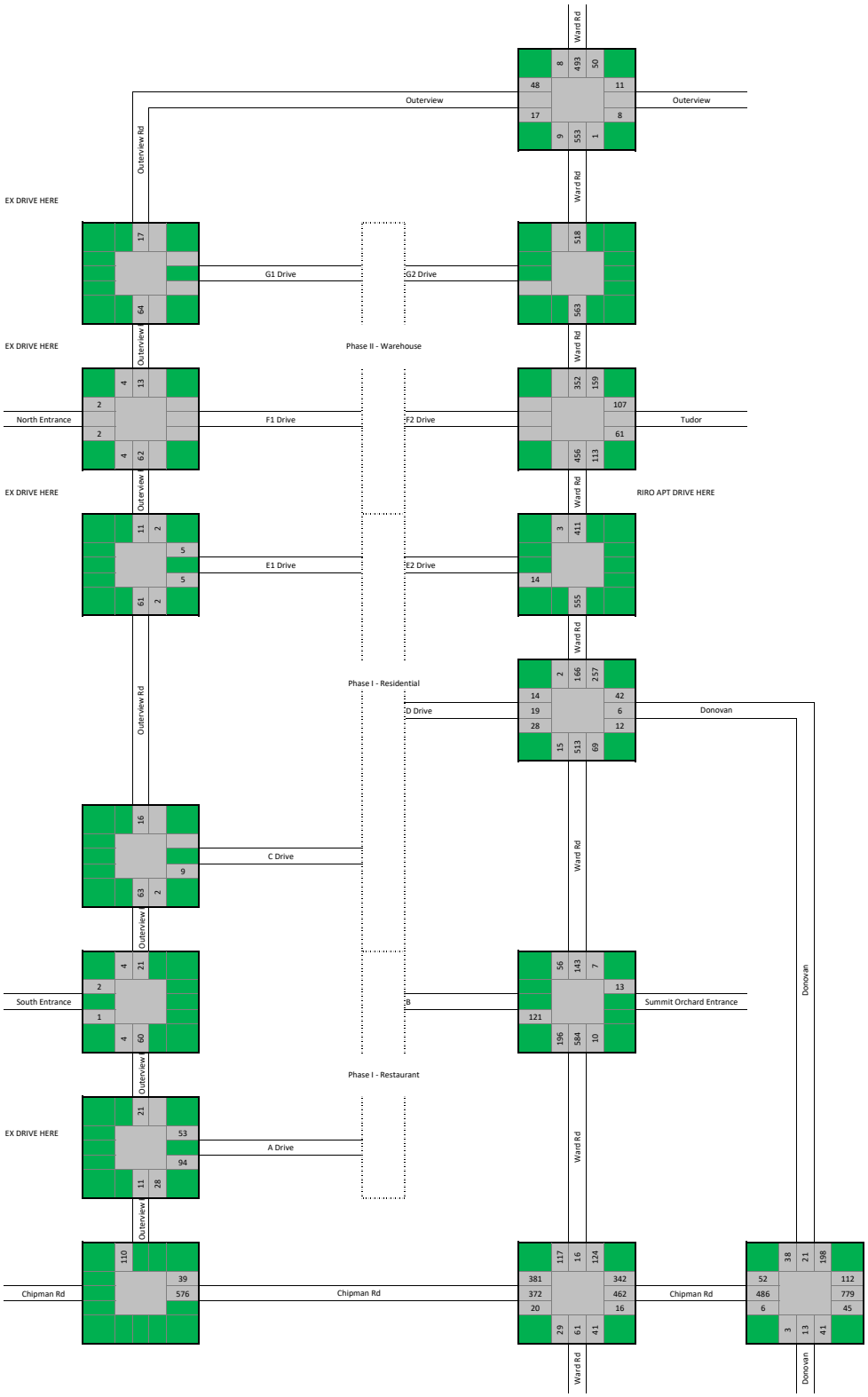




AM Existing + Approved + Phase I Trips

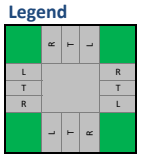
Legend

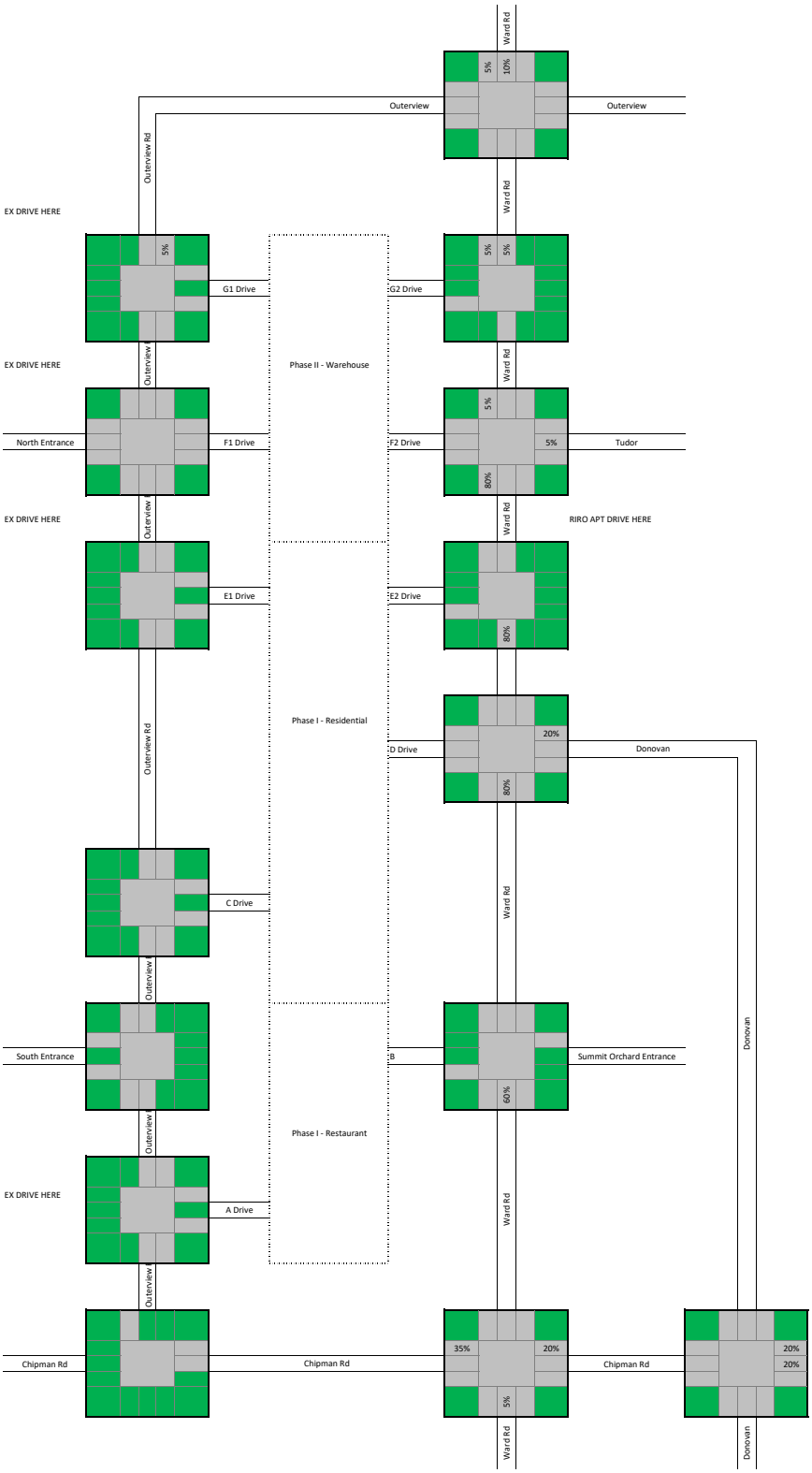




AM Distribution In - Warehouse (Phase II)

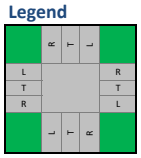
Legend

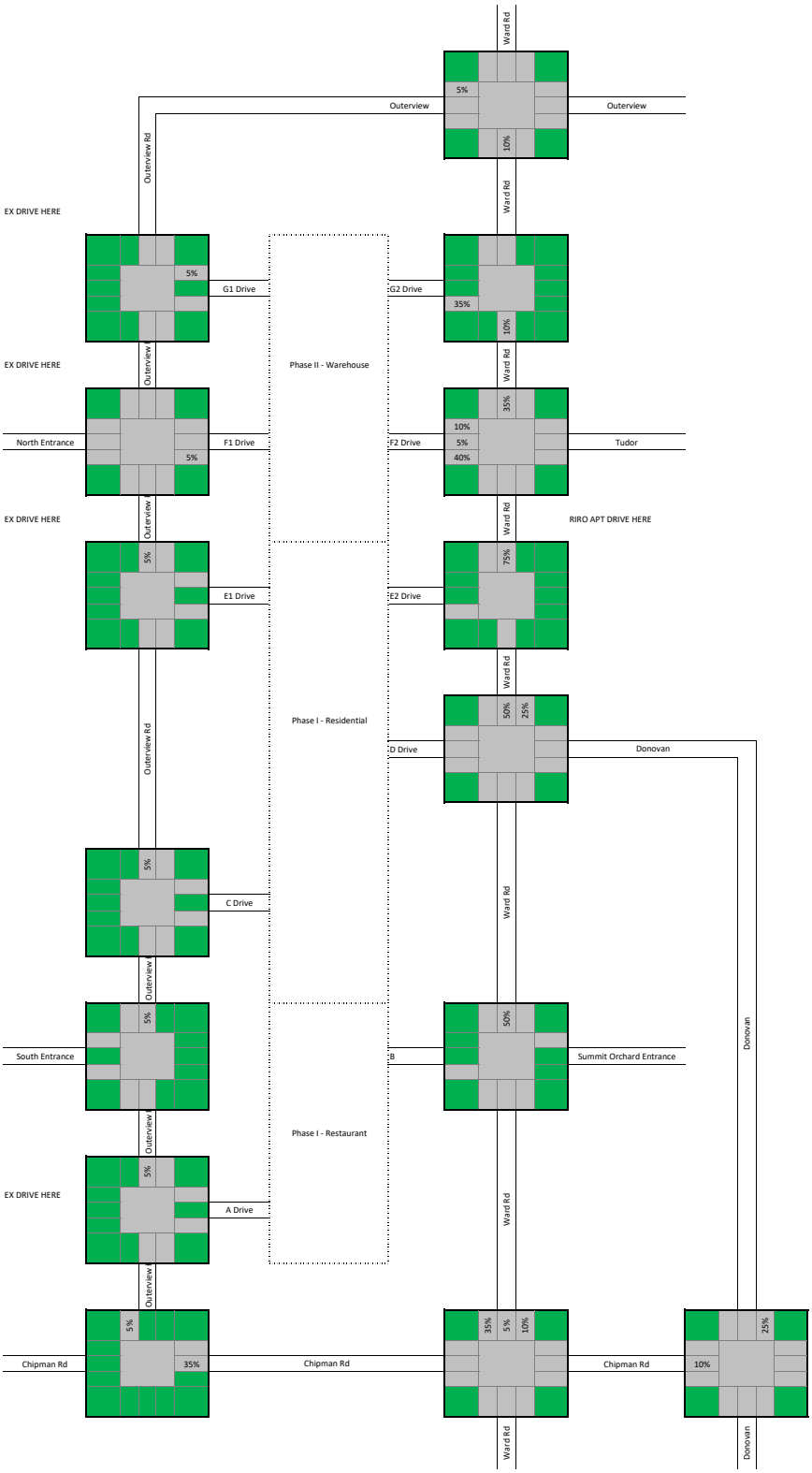




AM Distribution Out - Warehouse (Phase II)

Legend

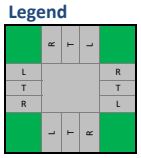


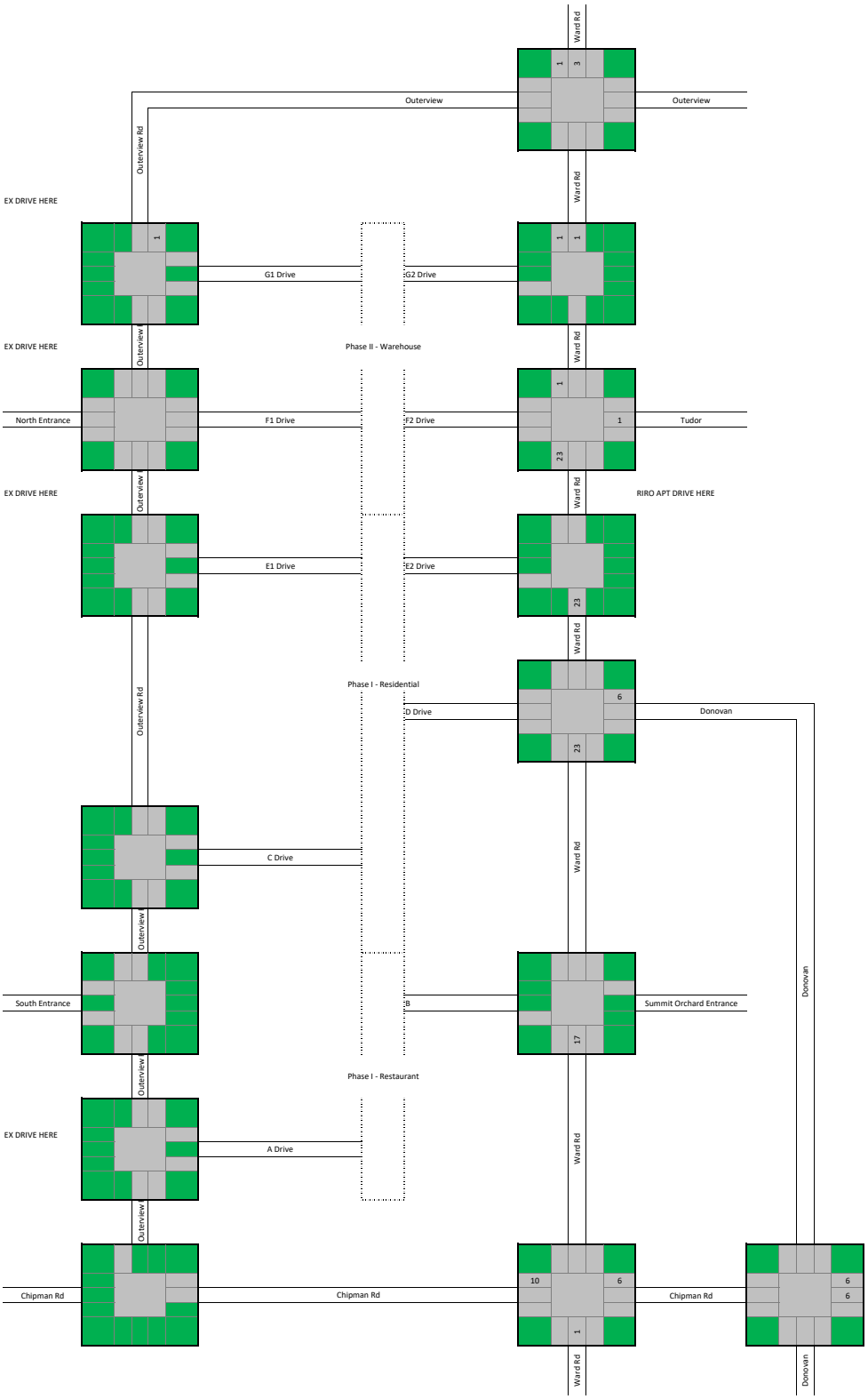


AM Trips In - Warehouse (Phase 2)

Trips
29

Legend

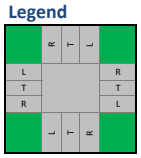


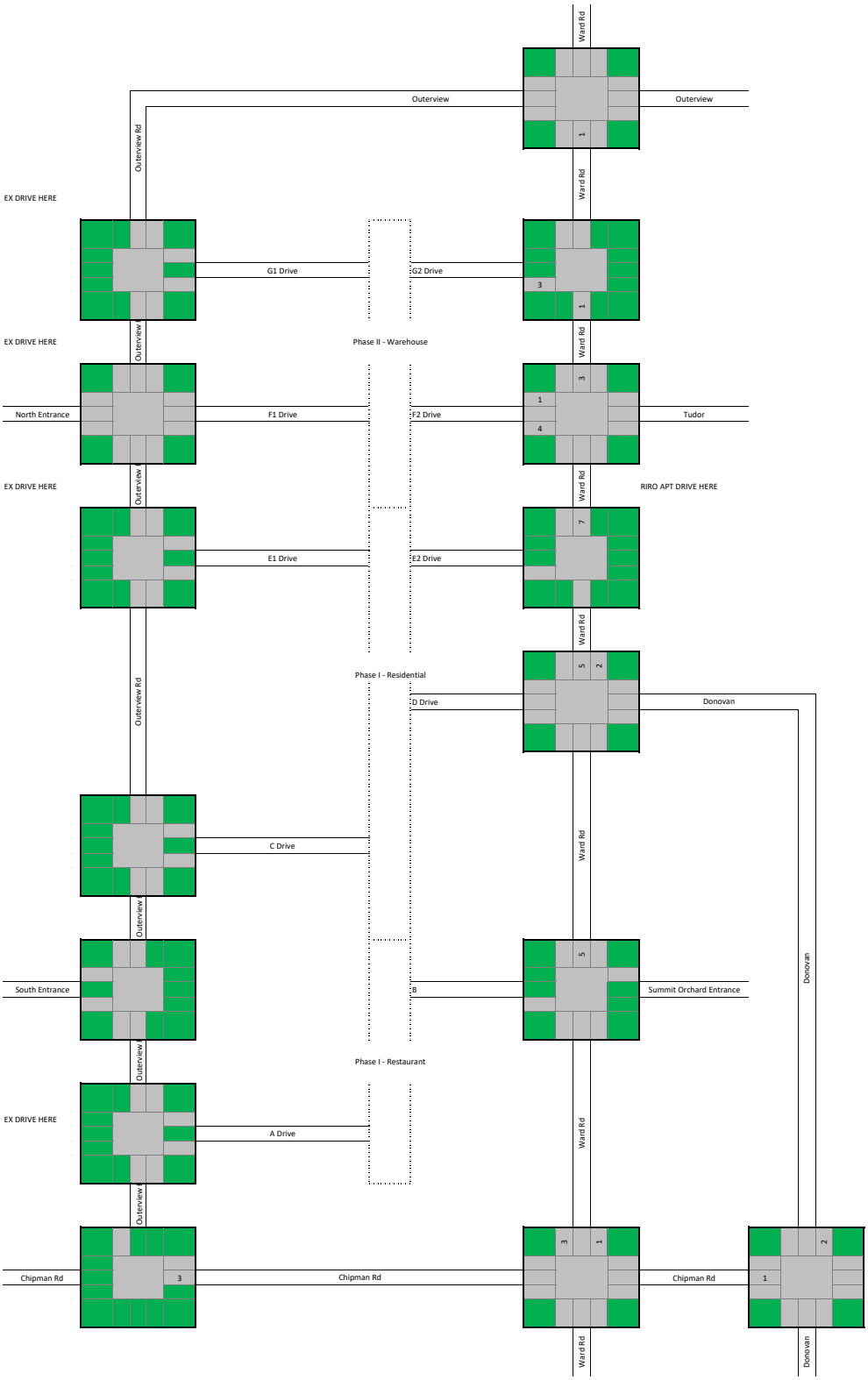


AM Trips Out - Warehouse (Phase 2)

Trips
9

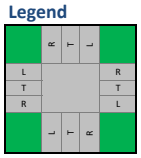
Legend

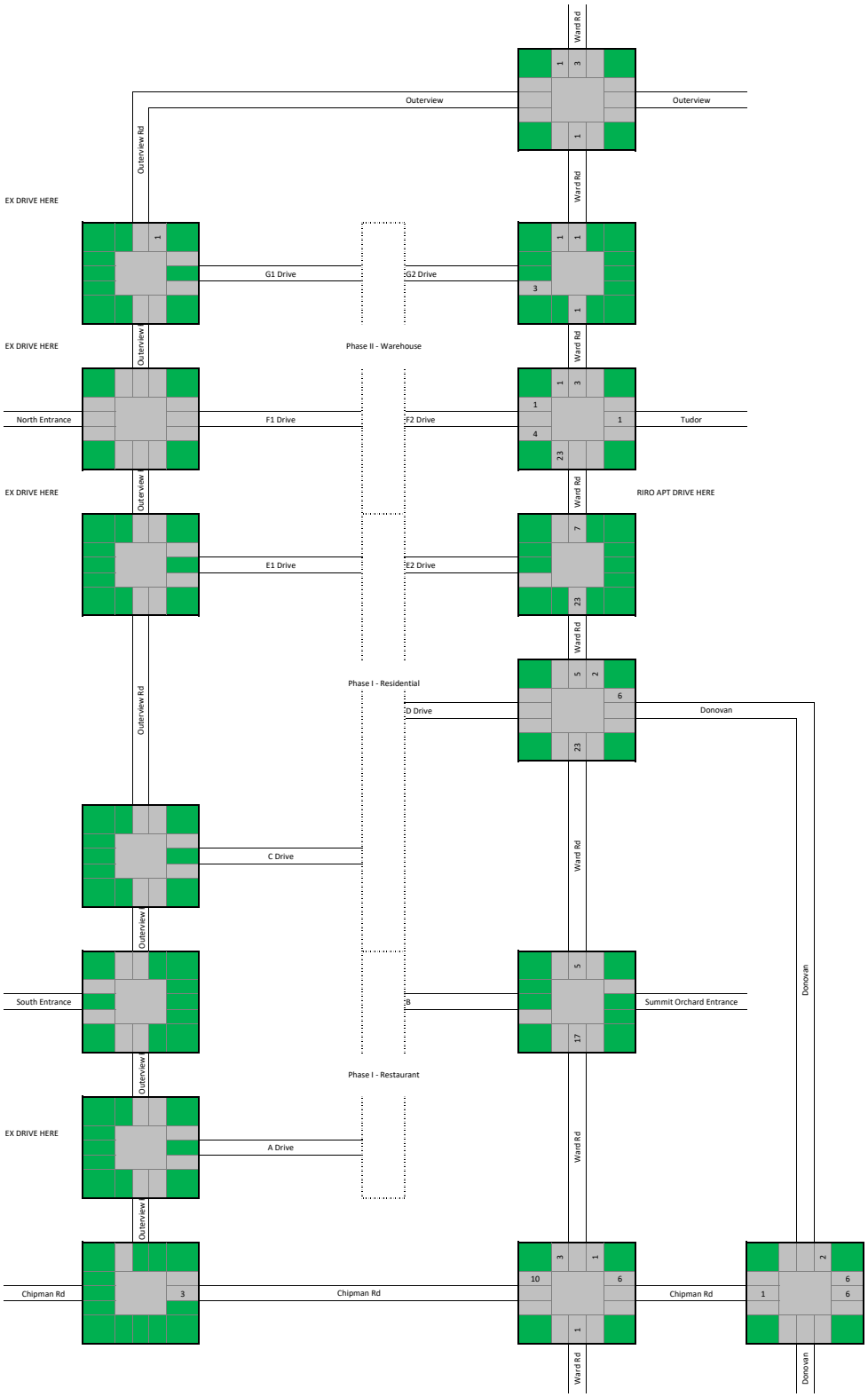




AM Trips (Phase 2)

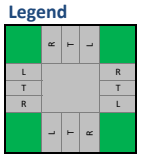
Legend

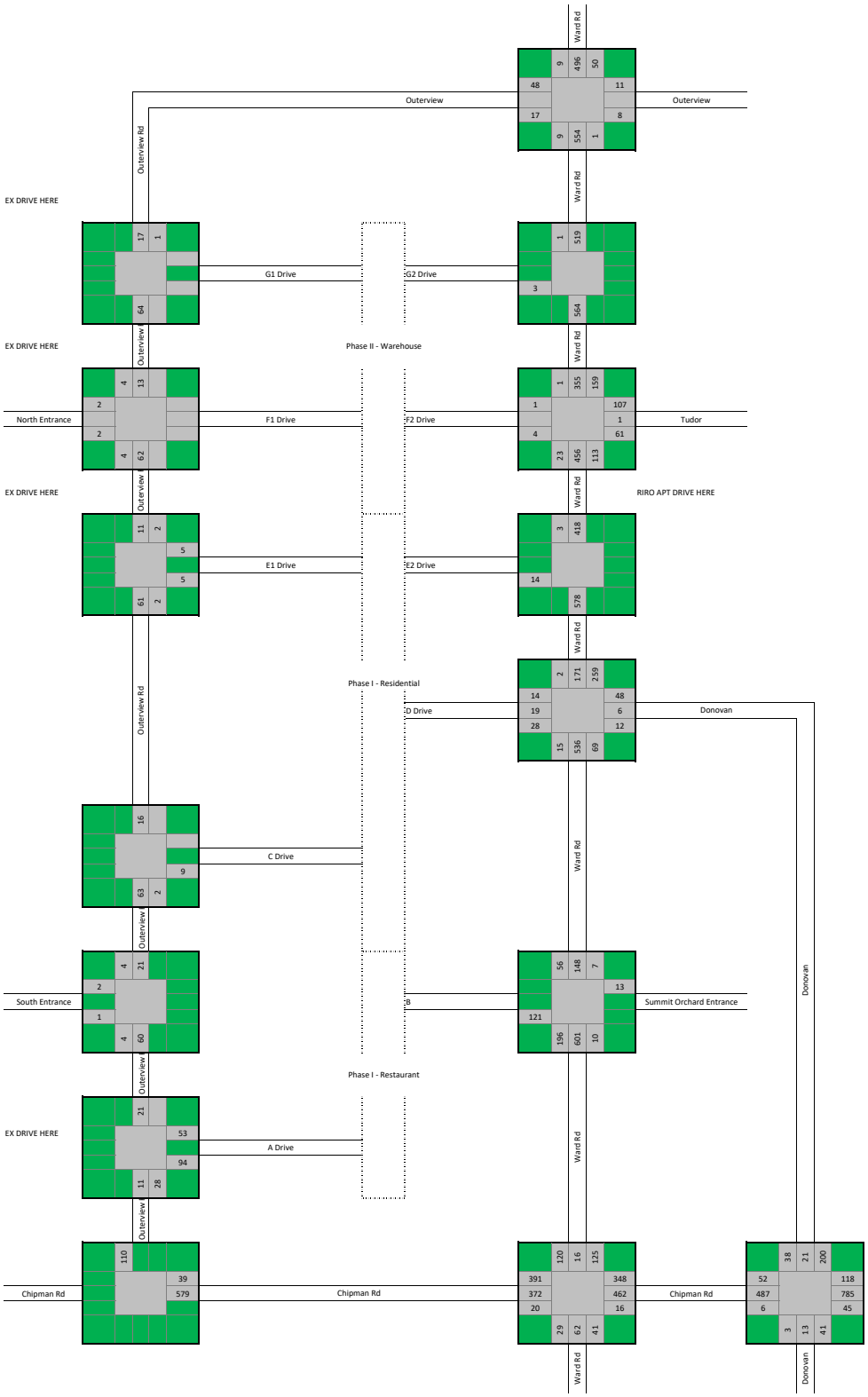




AM Existing + Approved + Phase I&II Trips

Legend

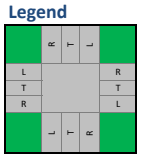


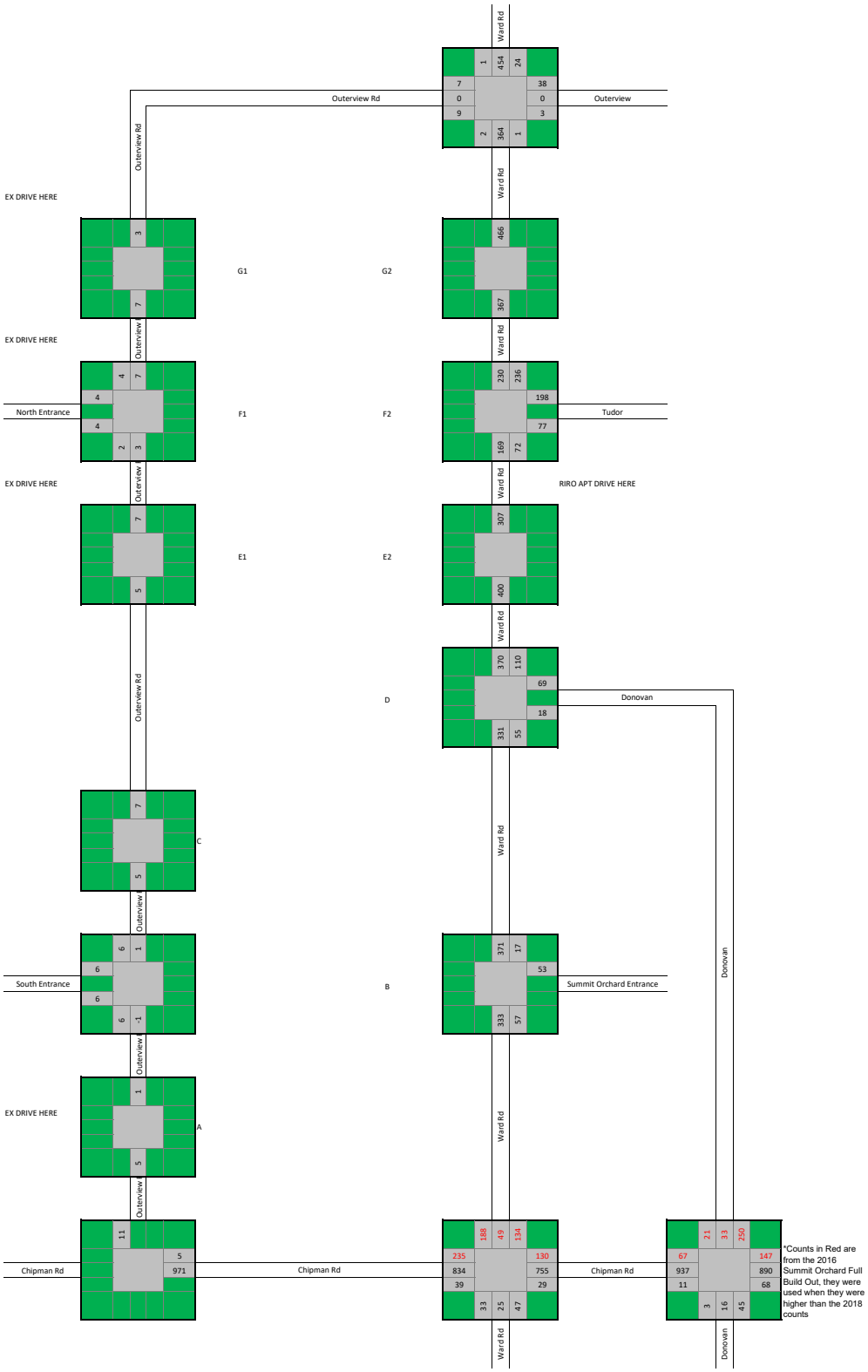


PM Peak Hour Traffic

2022 Counts plus increased 2018 counts at Chipman and Ward, intersections balanced

Legend

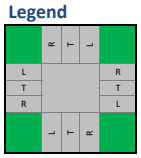


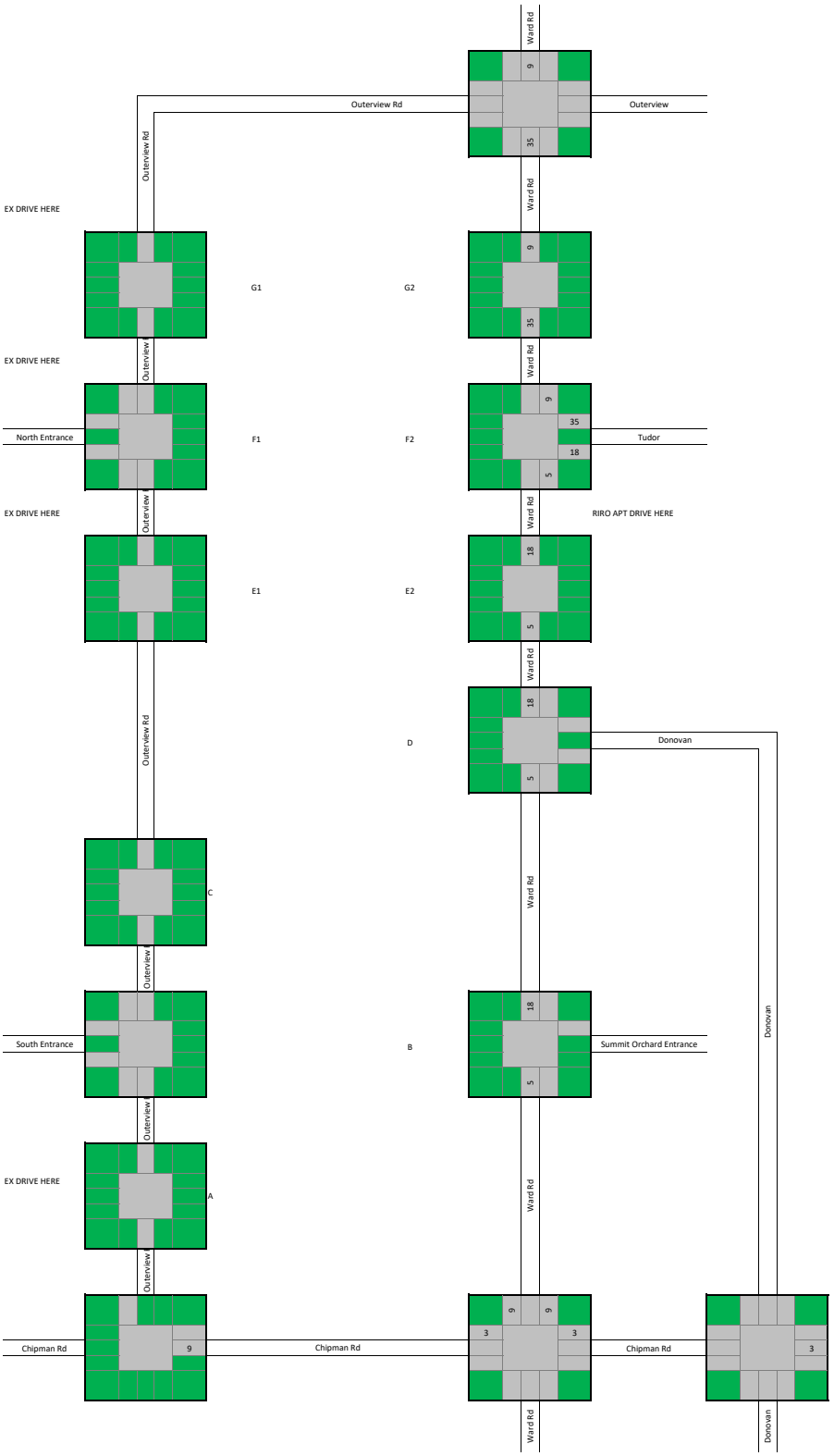


PM Lee's Summit Logistics Traffic

2021 Lee's Summit Logistics TIS (includes Phase I and Phase II)

Legend

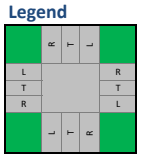


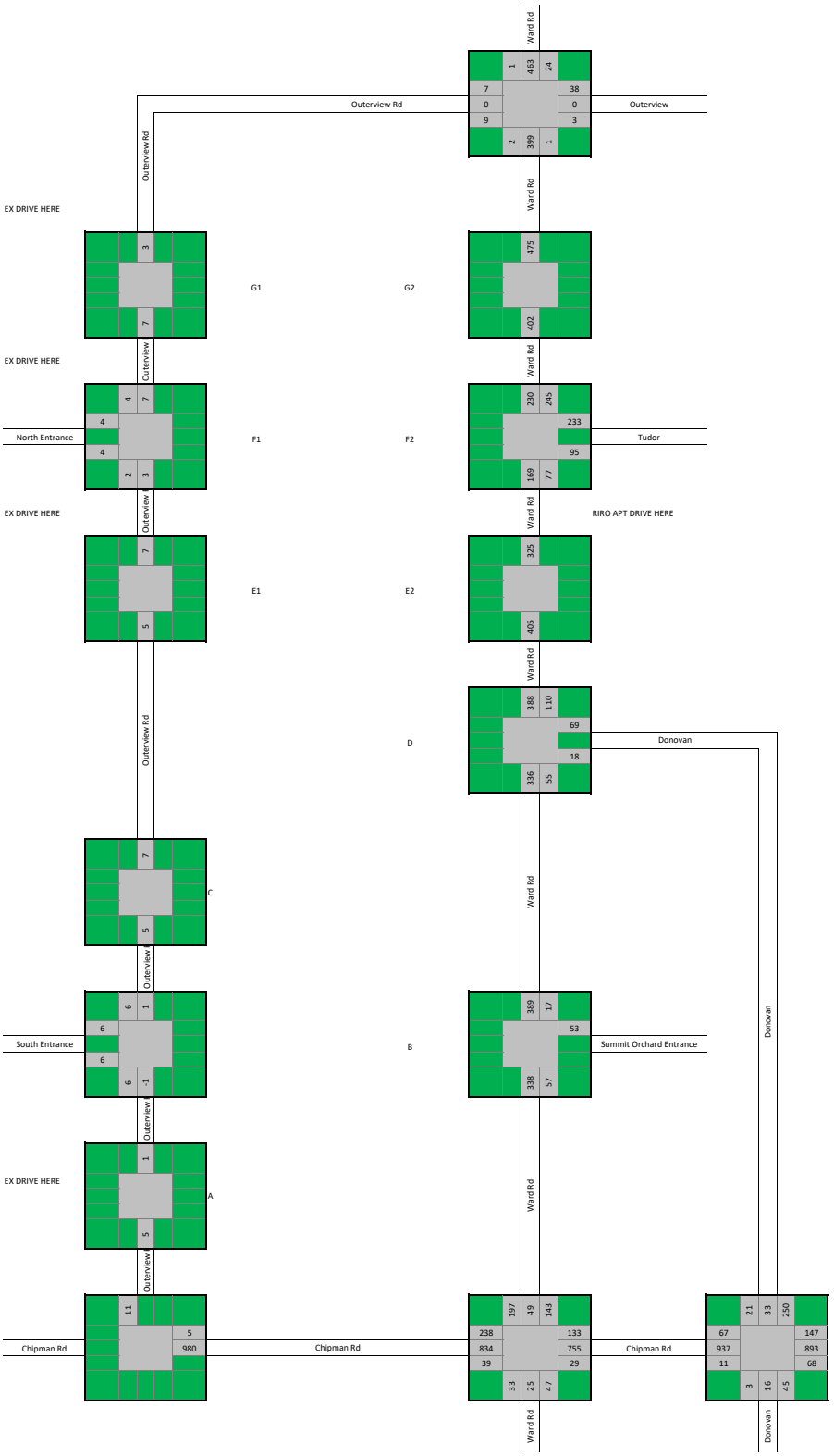


PM Peak Hour Traffic Trips + Approved Developments

Includes 2022, 2018 with 1% increase, Lee's Summit Logistics, and Summit Orchard

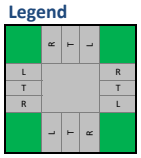
Legend

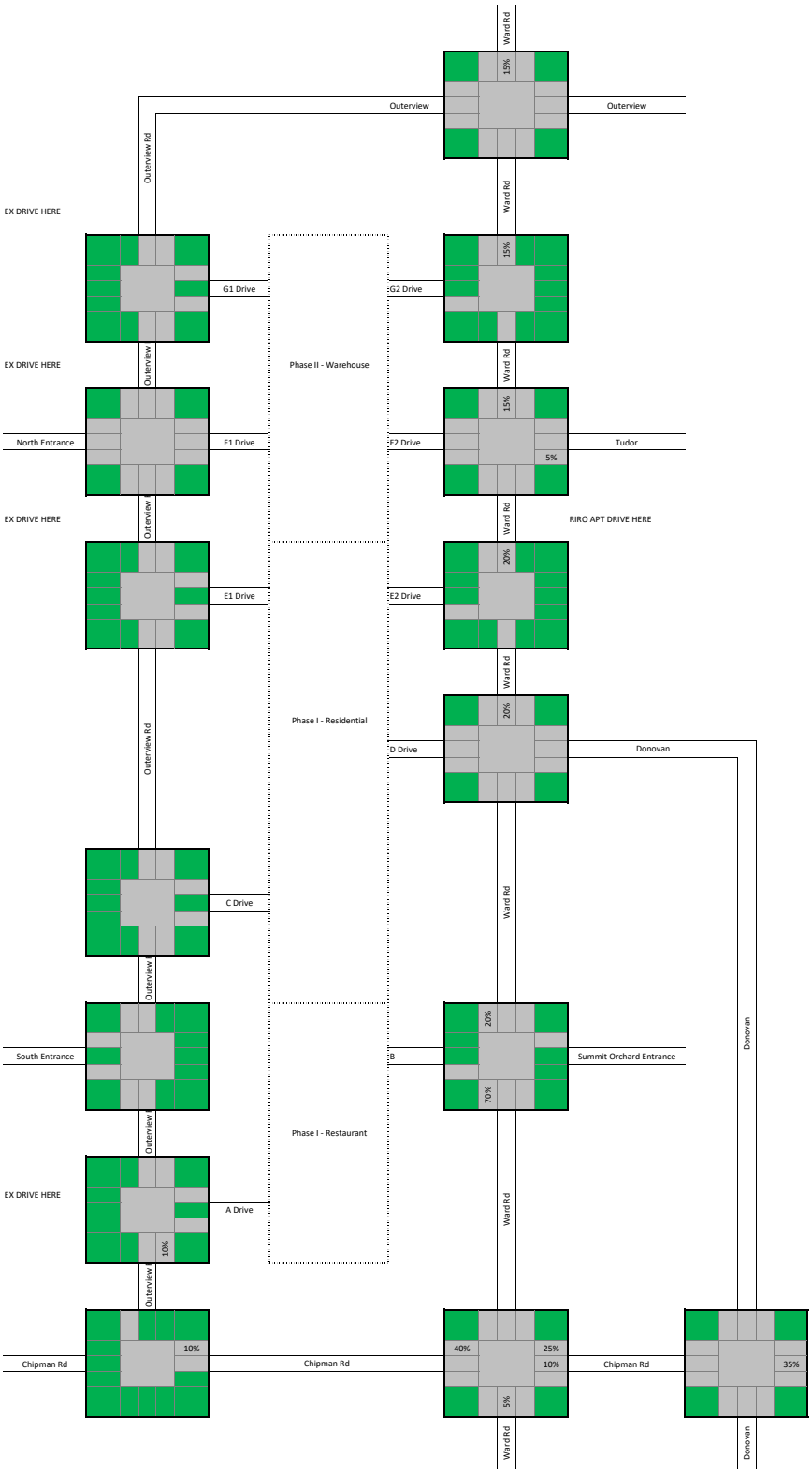




PM Distribution In - Restaurant (Phase I) PRIMARY

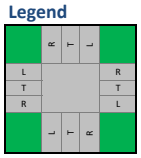
Legend

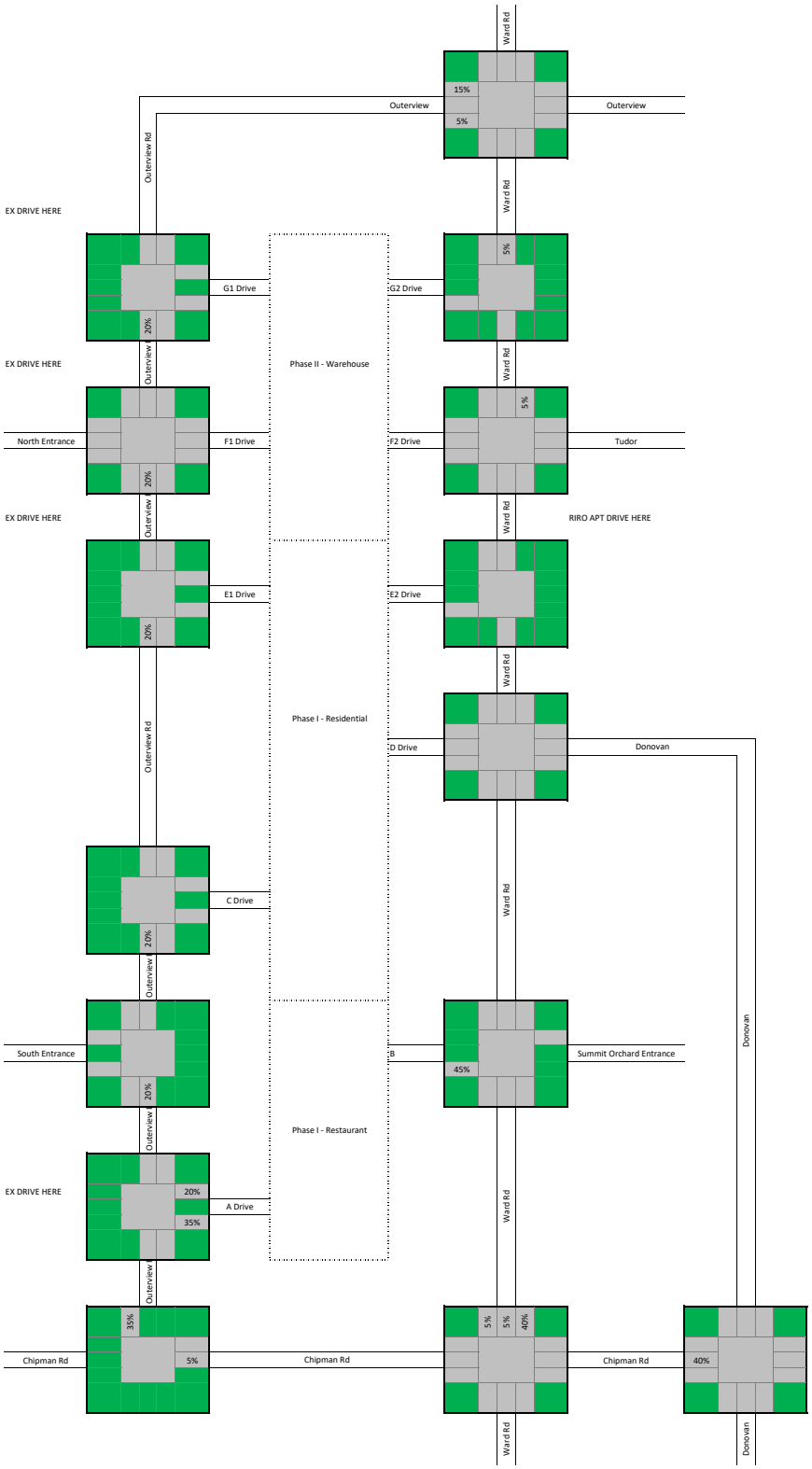




PM Distribution Out - Restaurant (Phase I) PRIMARY

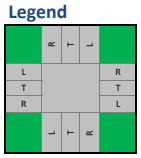
Legend

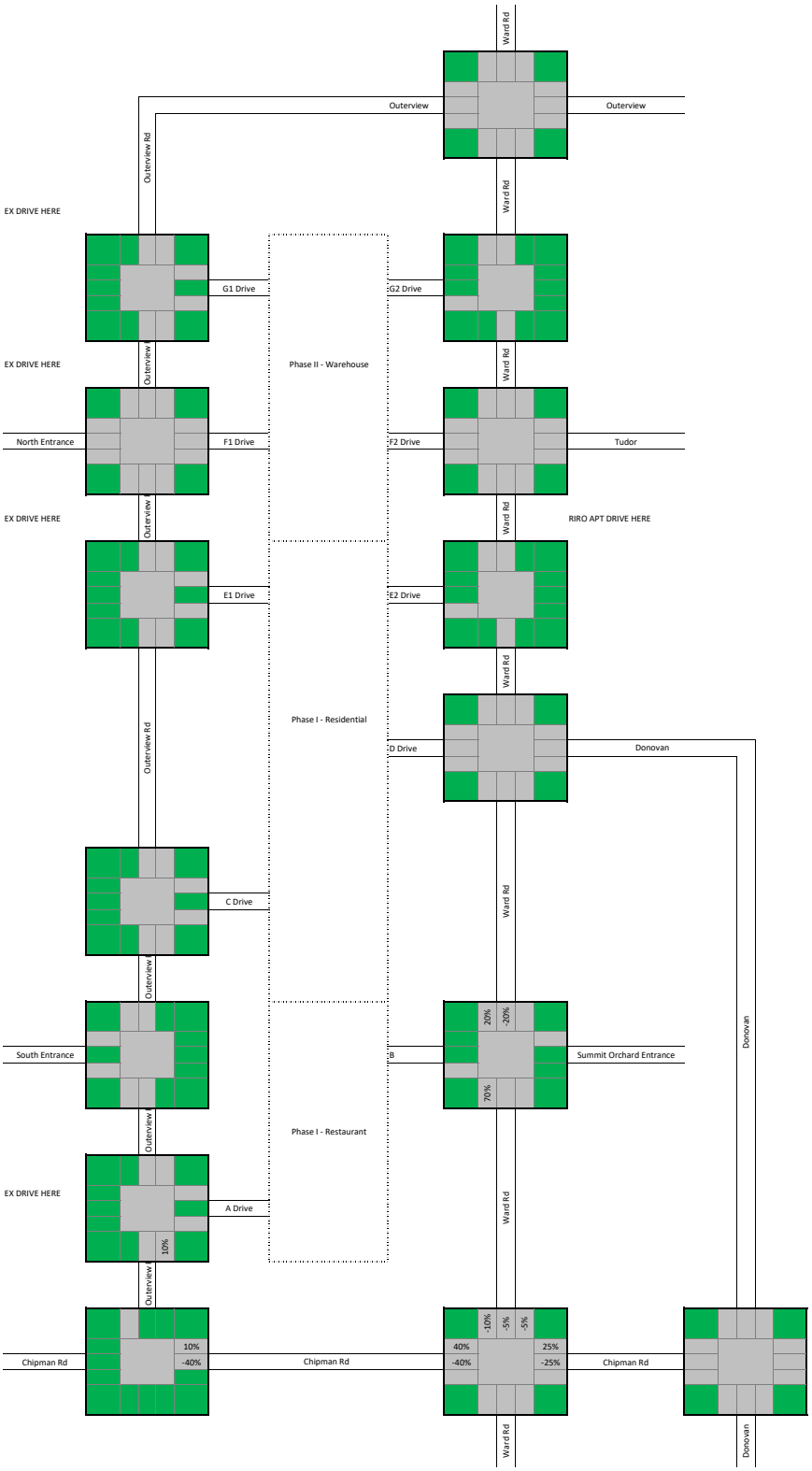




PM Distribution In - Restaurant (Phase I) PASS-BY

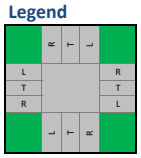
Legend

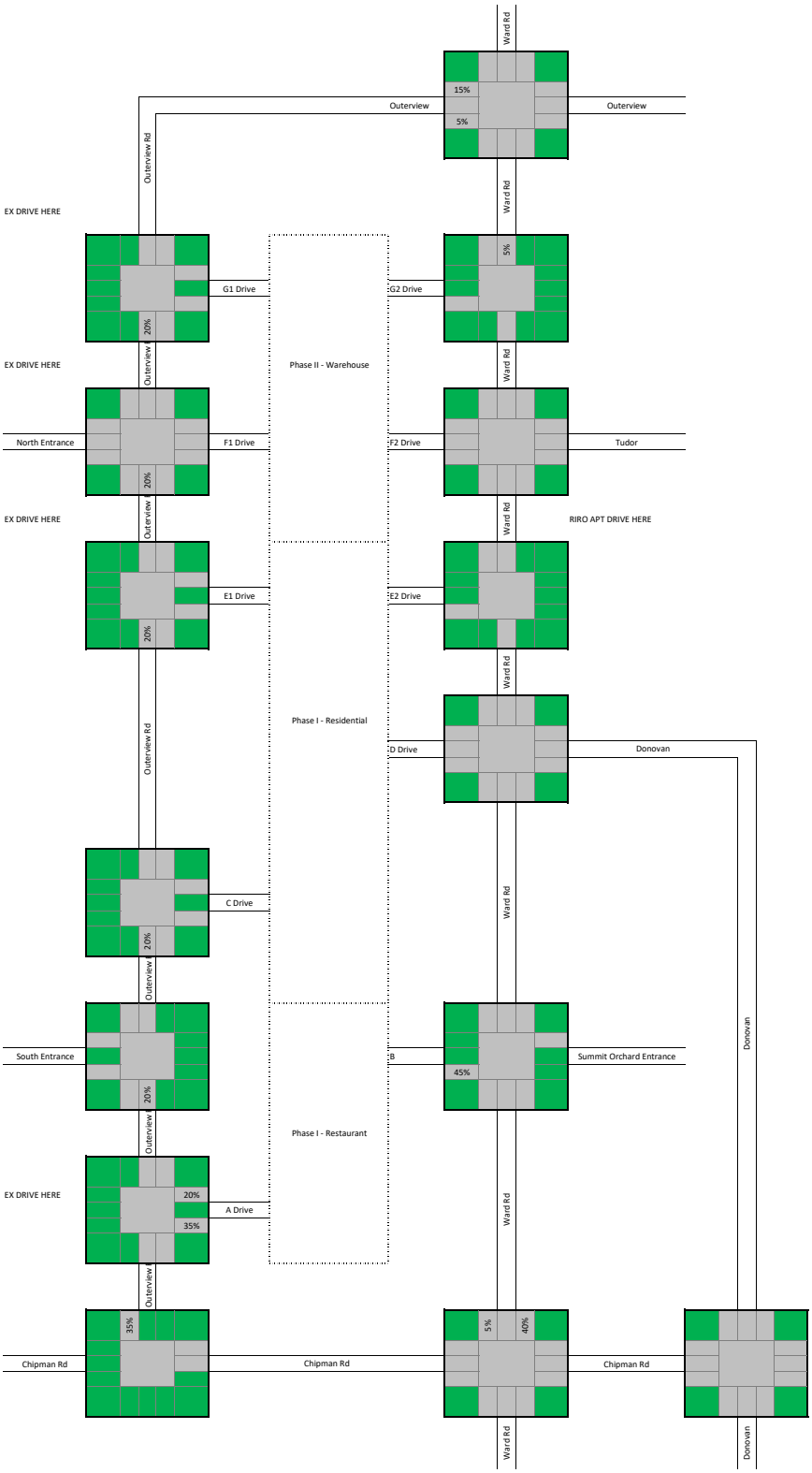




PM Distribution Out - Restaurant (Phase I) PASS-BY

Legend

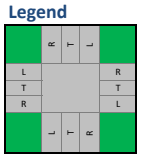


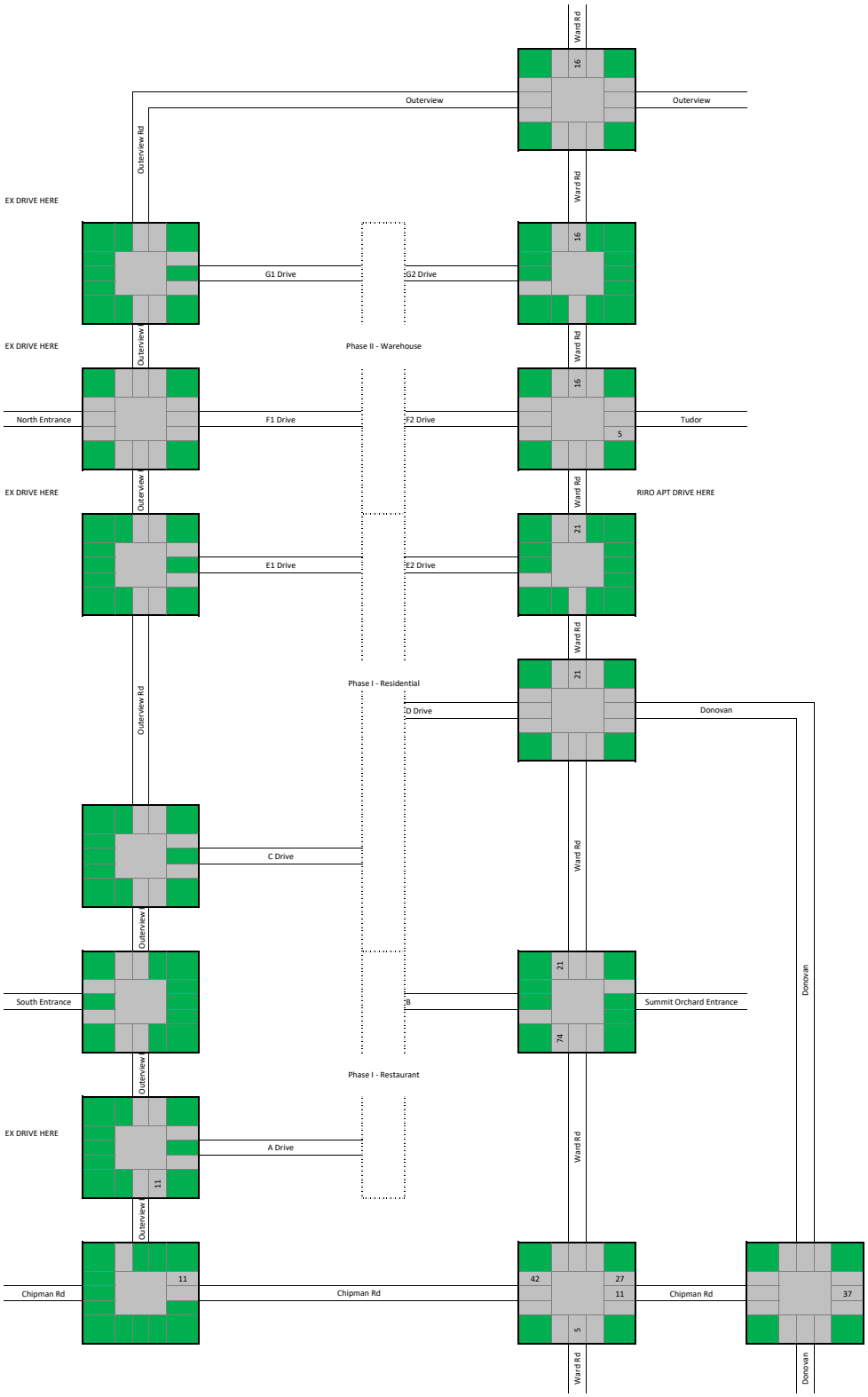


PM Trips In - Restaurant (Phase I)
PRIMARY

Trips
106

Legend

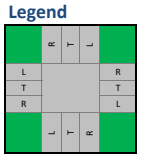


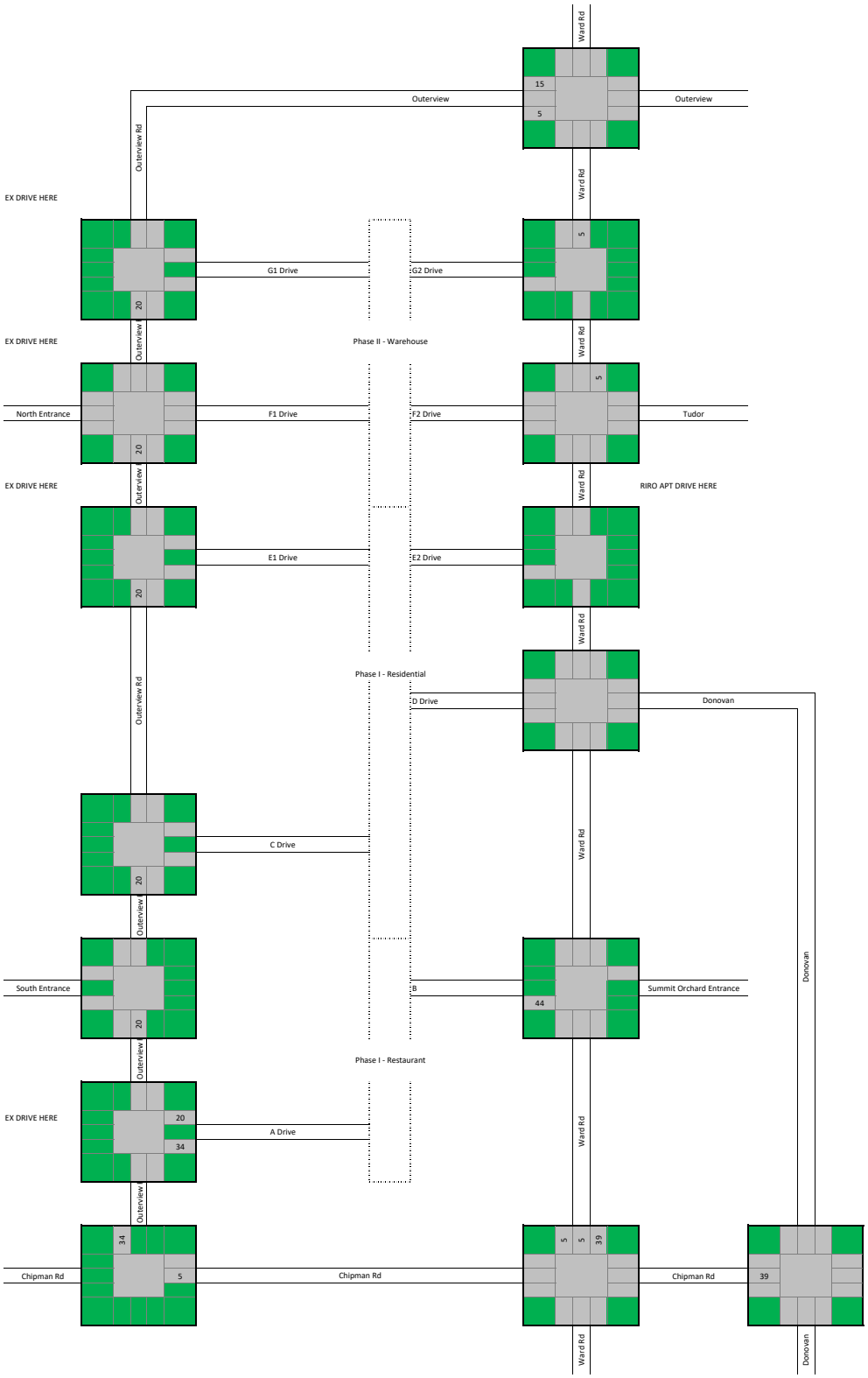


PM Trips Out - Restaurant (Phase I)
PRIMARY

Trips
98

Legend

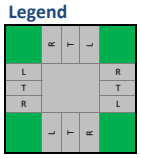


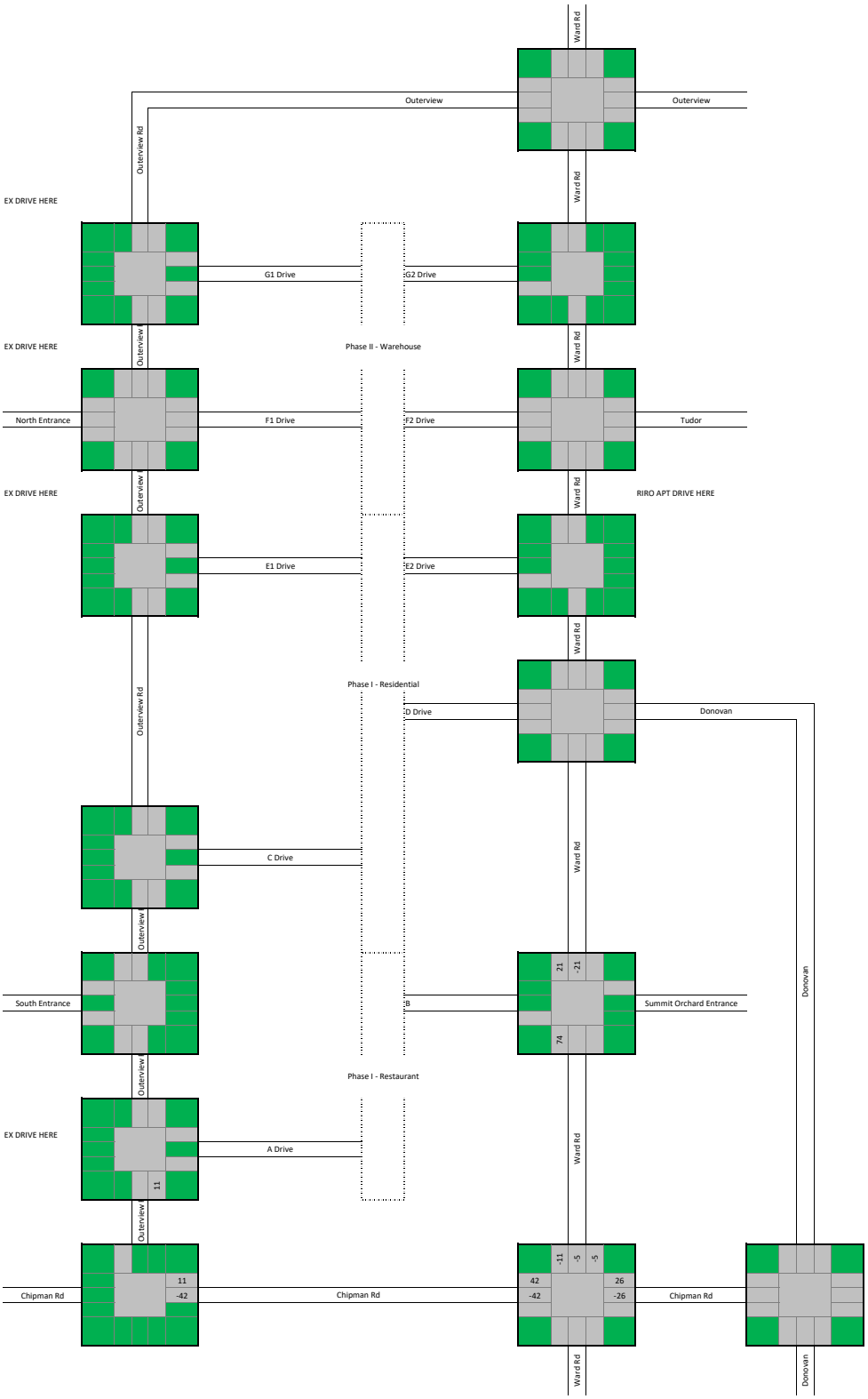


PM Trips In - Restaurant (Phase I)
PASS-BY

Trips
105

Legend

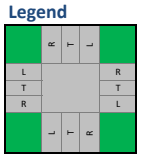


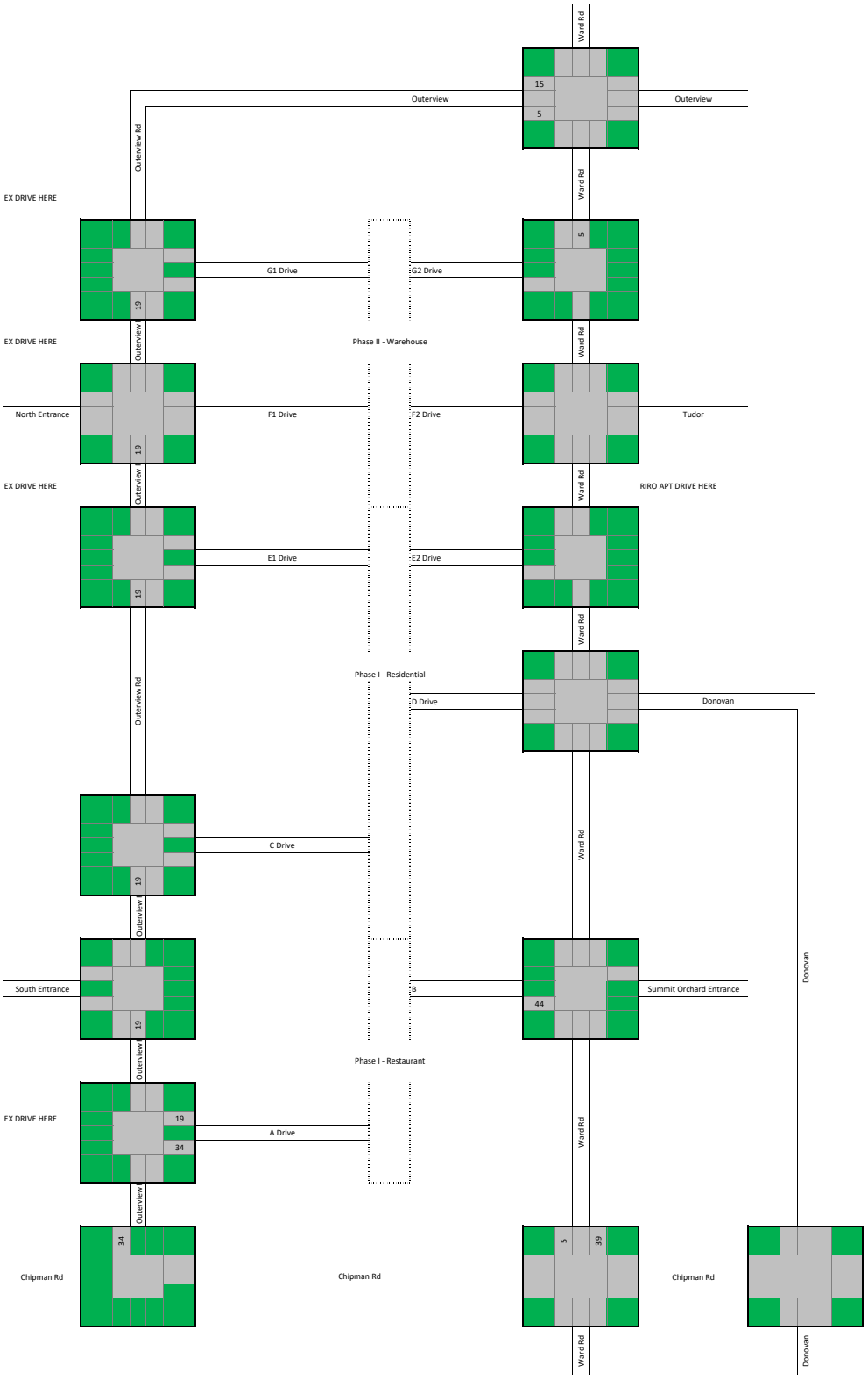


PM Trips Out - Restaurant (Phase I)
PASS-BY

Trips
97

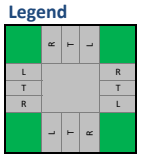
Legend

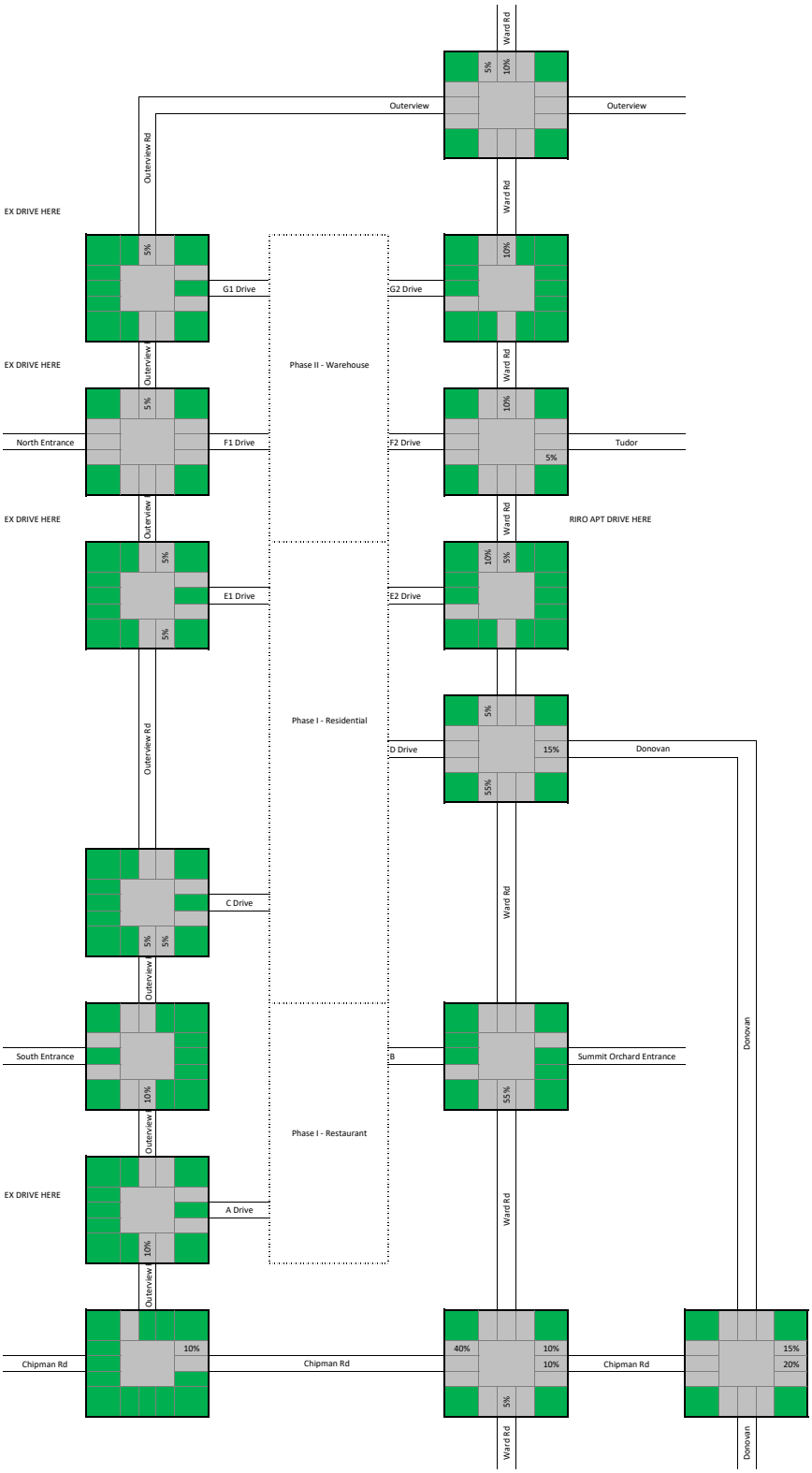




PM Distribution In - Residential (Phase I)

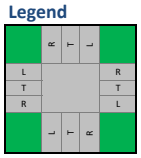
Legend

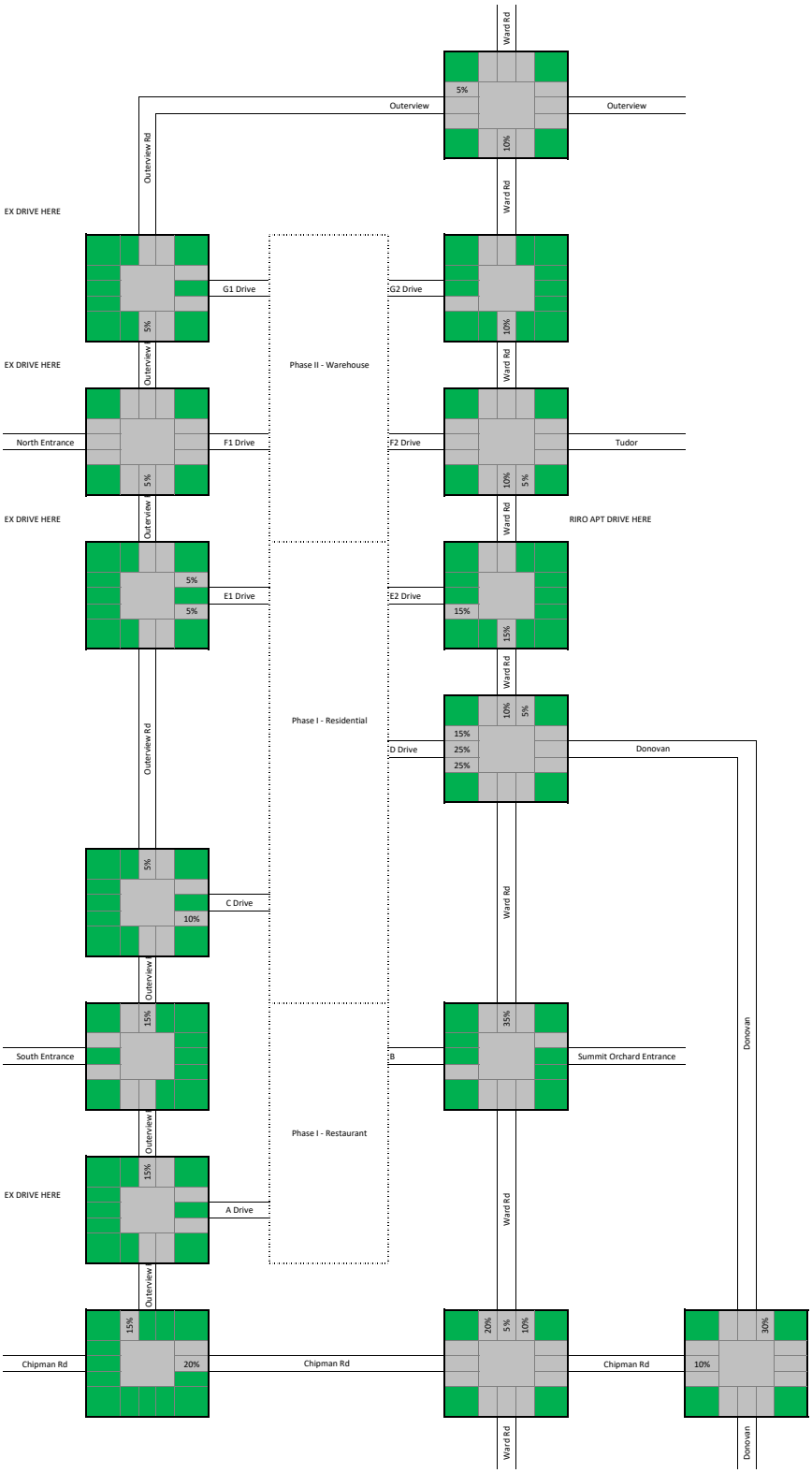




PM Distribution Out - Residential (Phase I)

Legend

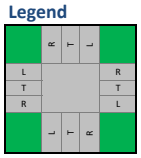


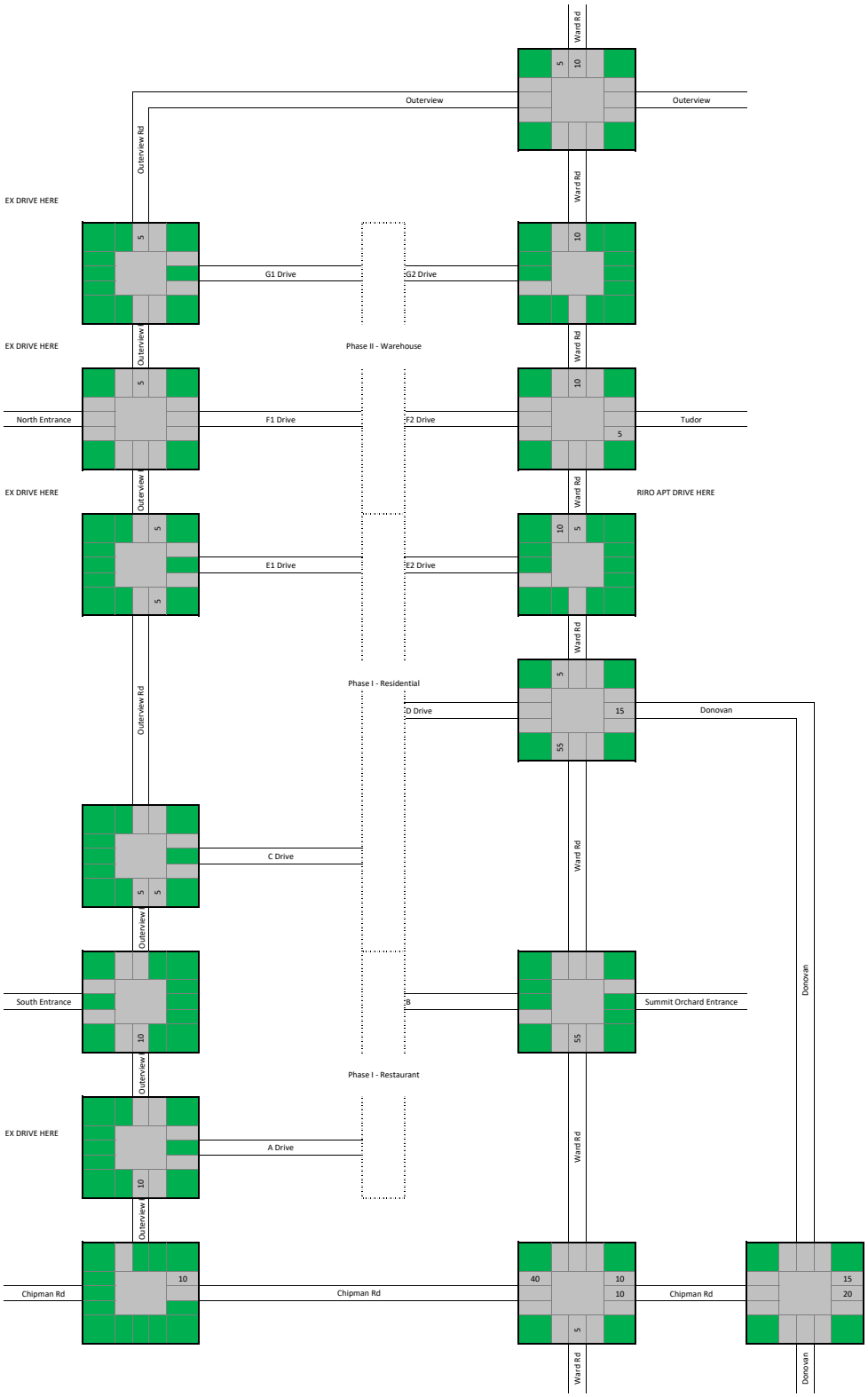


PM Trips In - Residential (Phase I)

Trips
100

Legend

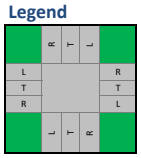


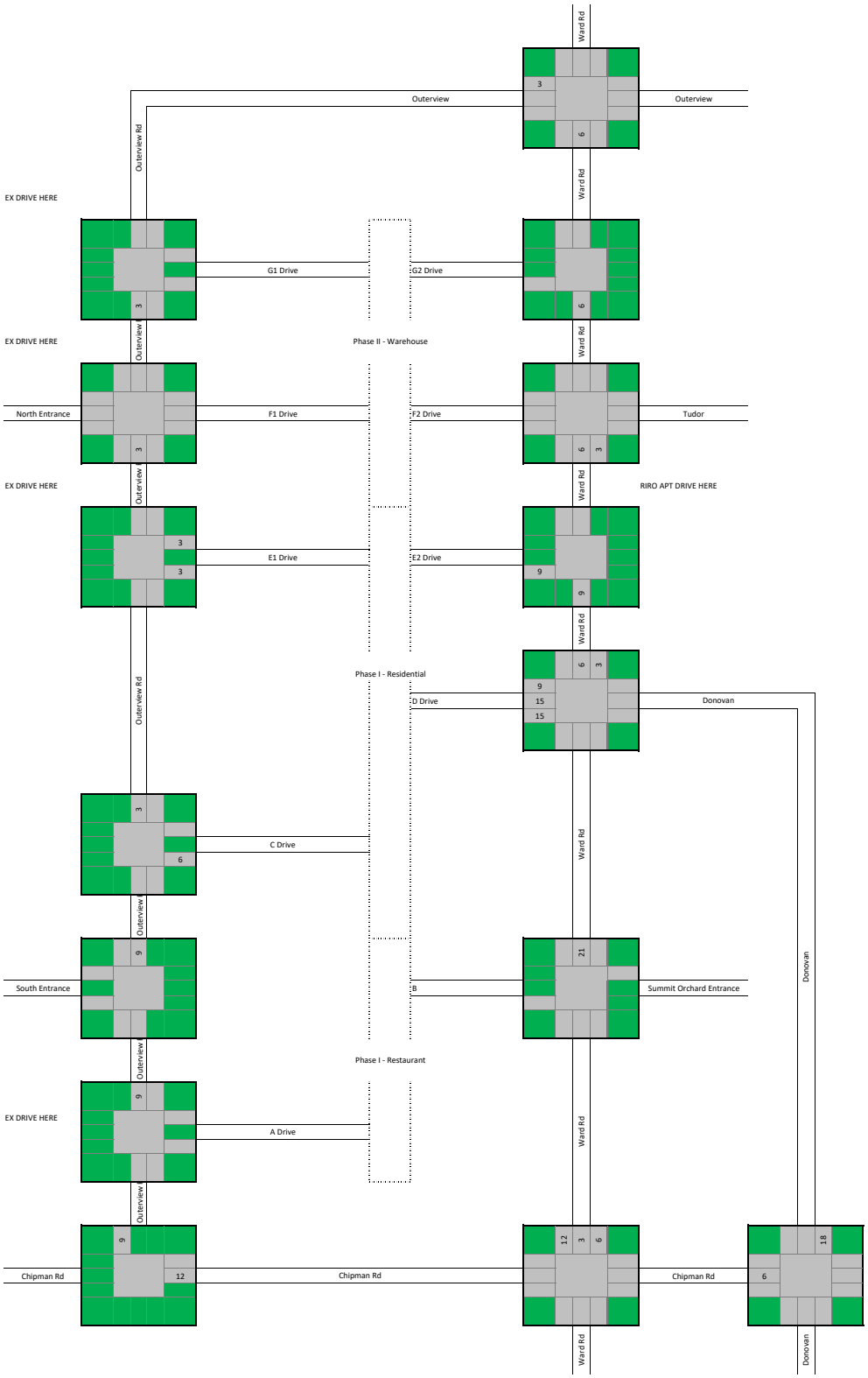


PM Trips Out - Residential (Phase I)

Trips 59

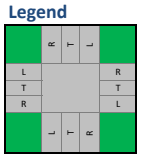
Legend

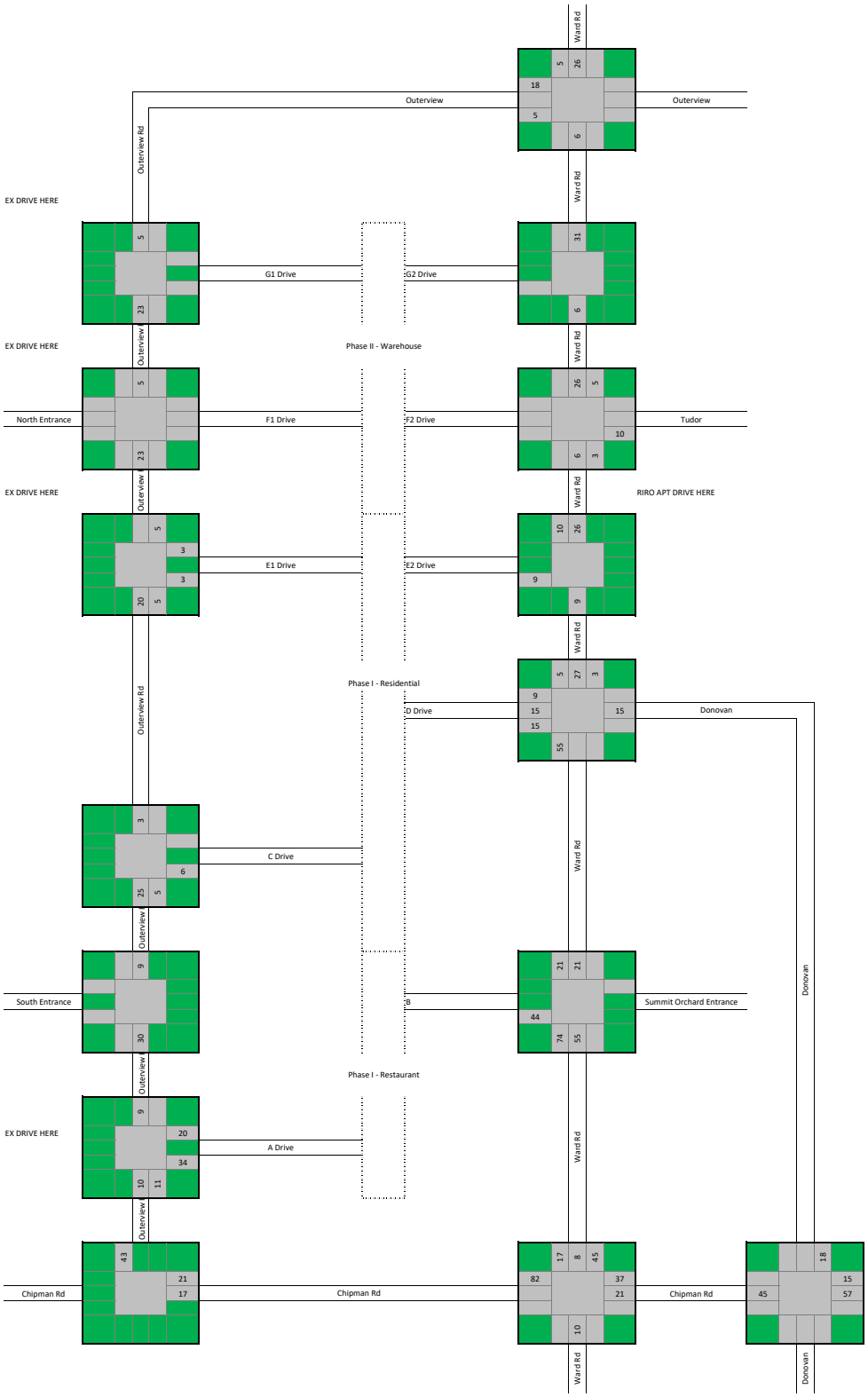




PM Trips (Phase I)
PRIMARY

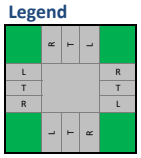
Legend

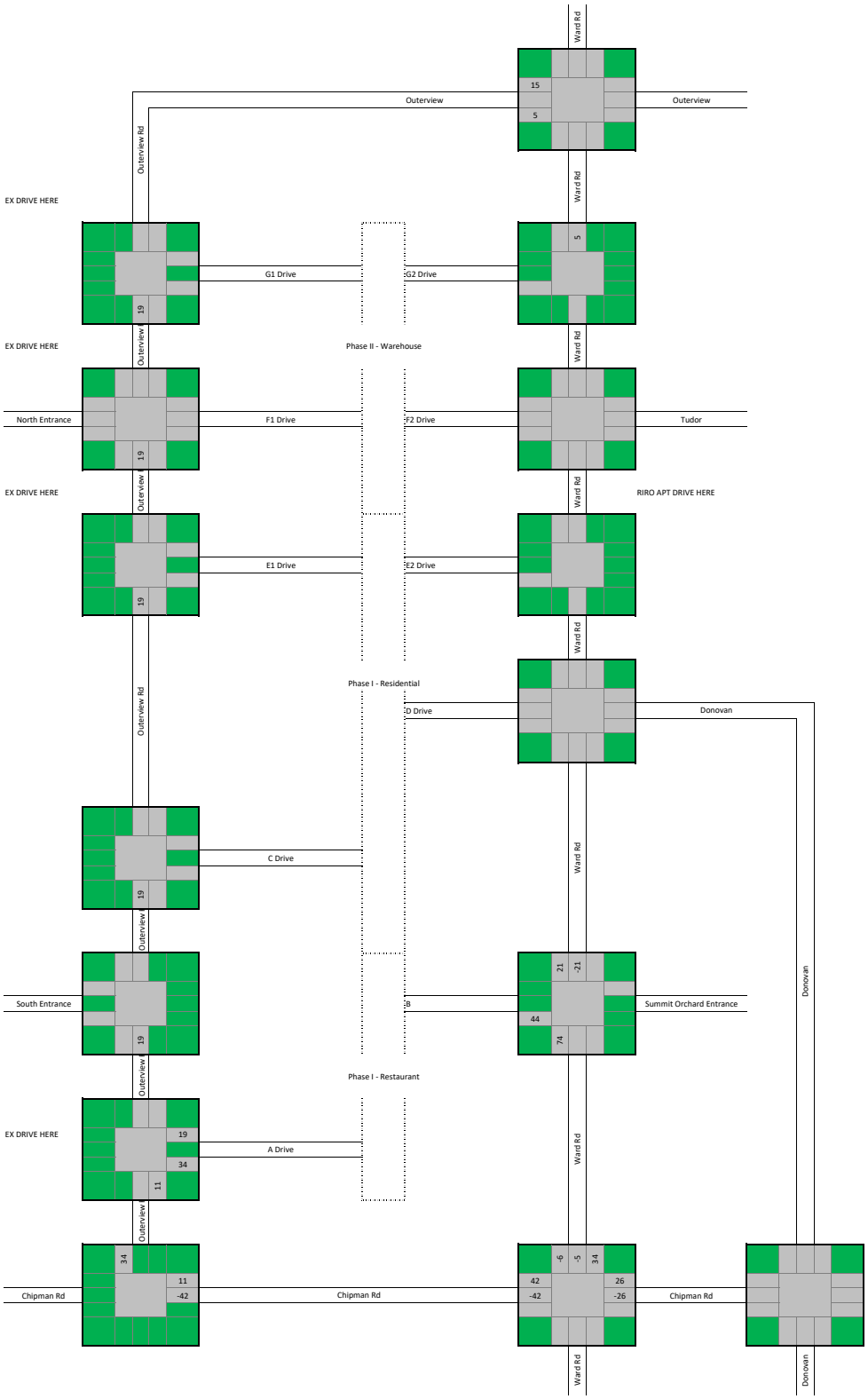




PM Trips (Phase I)
PASS-BY

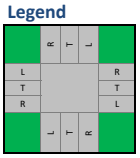
Legend

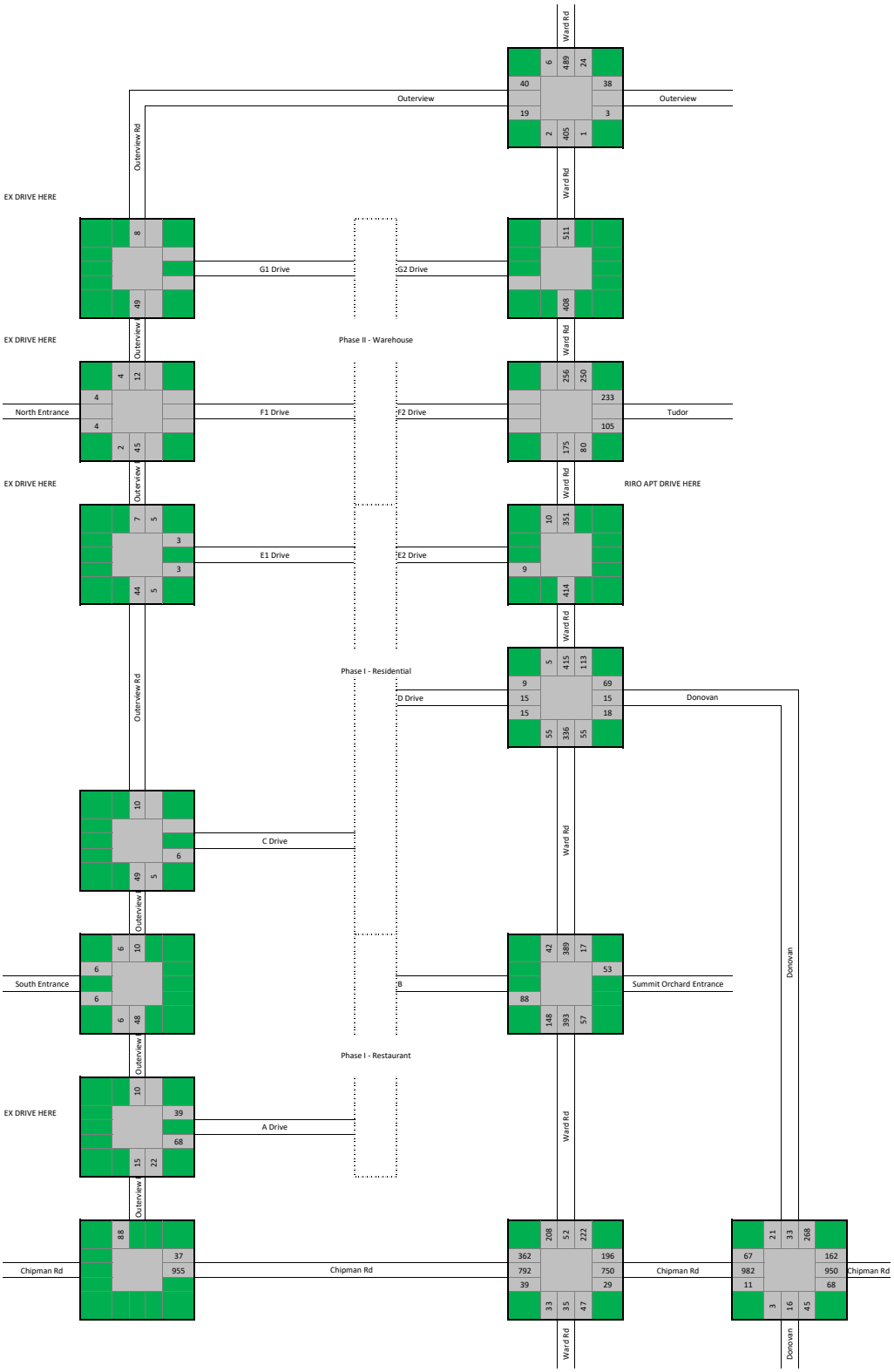




PM Existing + Approved + Phase I Trips

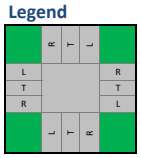
Legend

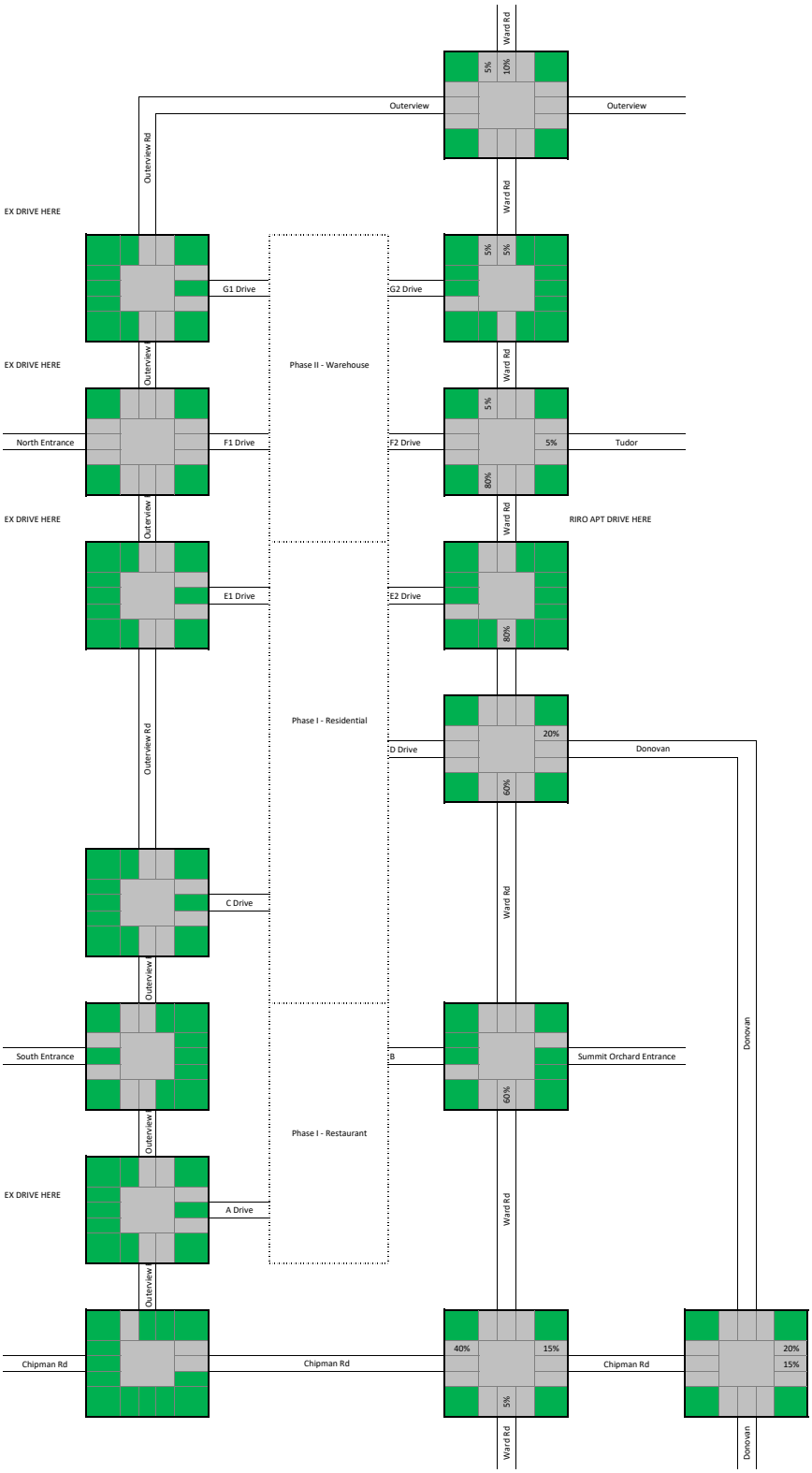




PM Distribution In - Warehouse (Phase II)

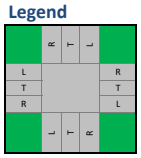
Legend

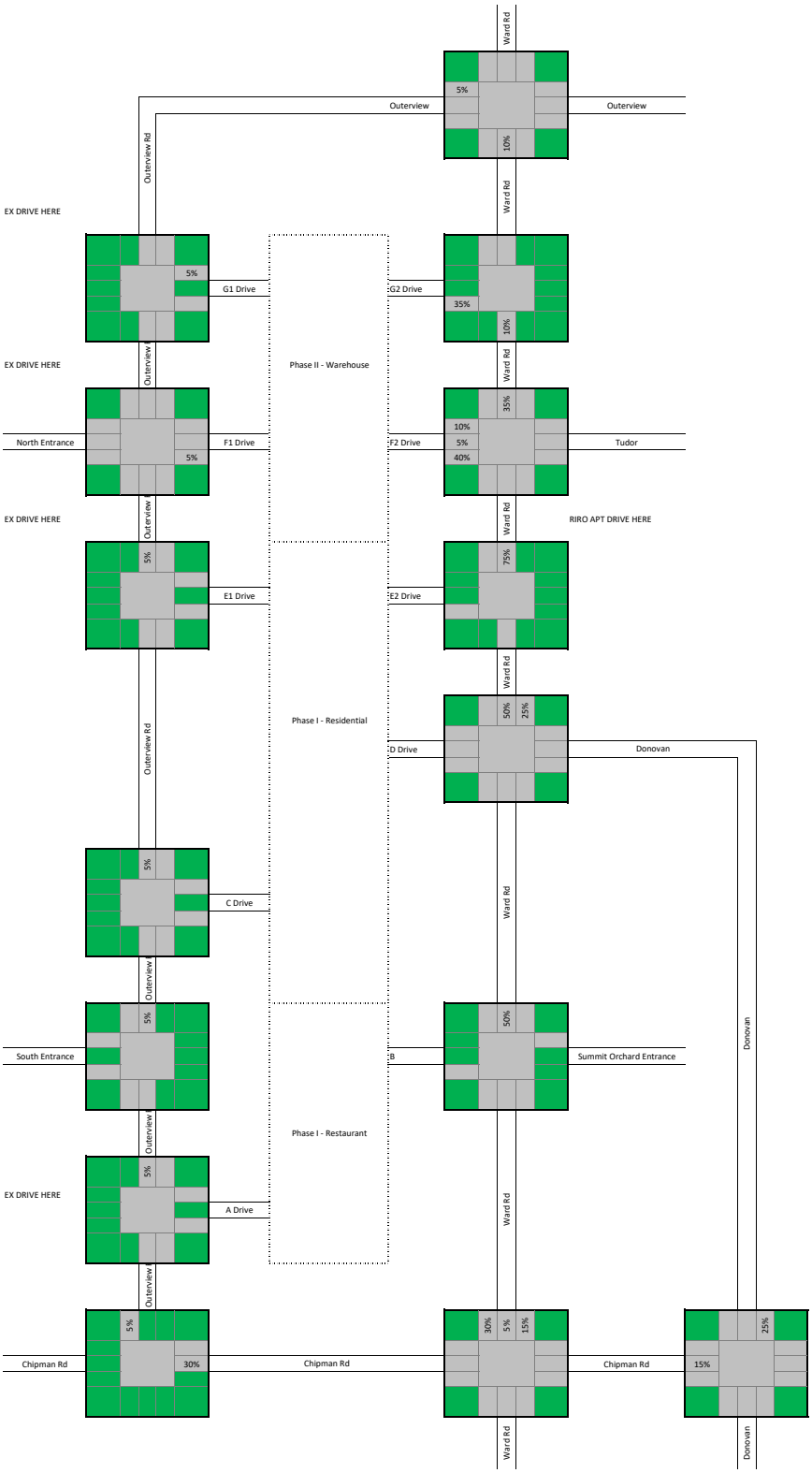




PM Distribution Out - Warehouse (Phase II)

Legend

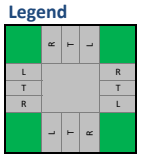


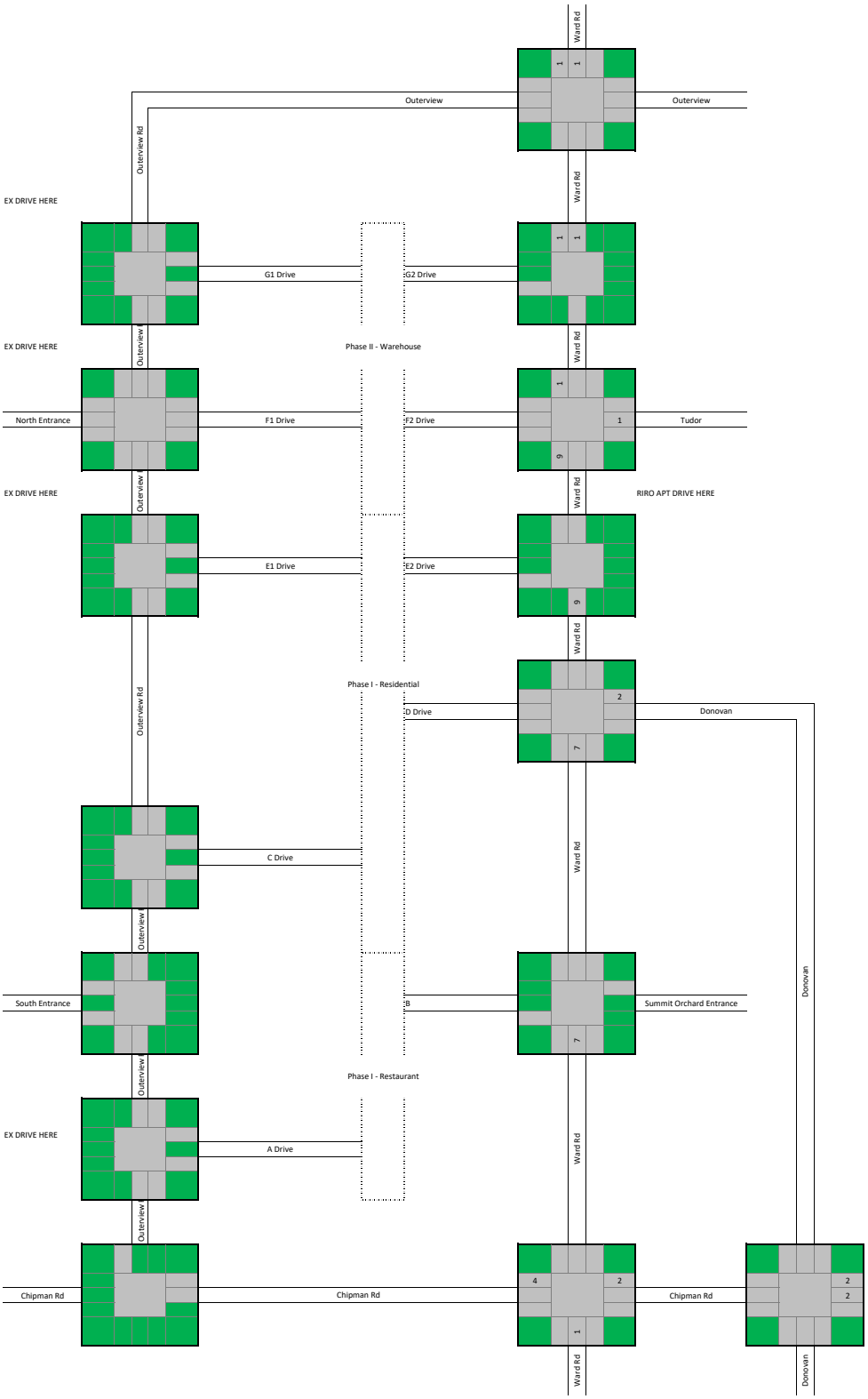


PM Trips In - Warehouse (Phase 2)

Trips
11

Legend

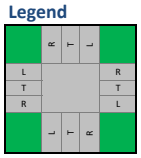


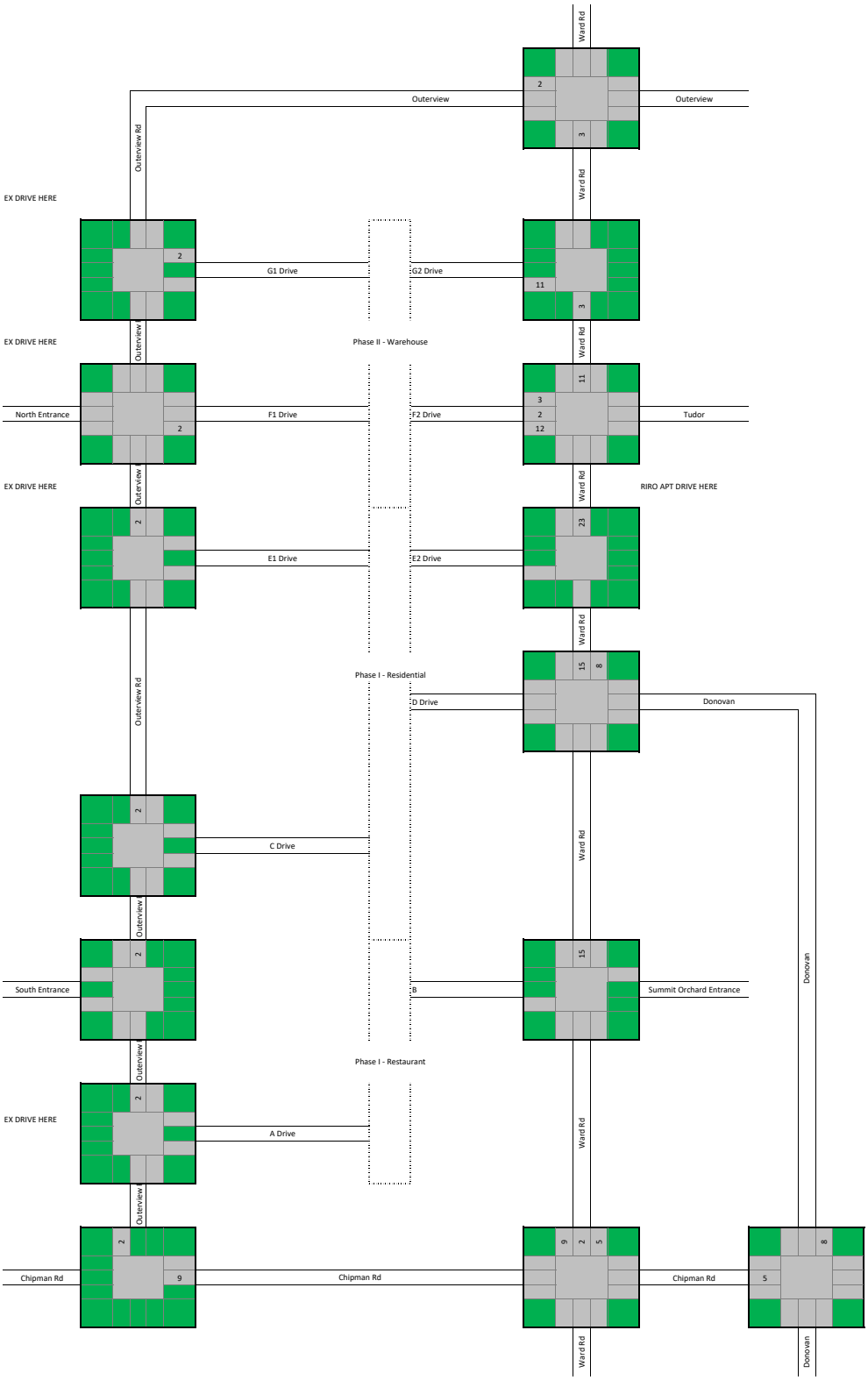


PM Trips Out - Warehouse (Phase 2)

Trips
30

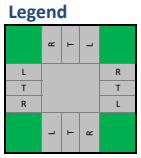
Legend

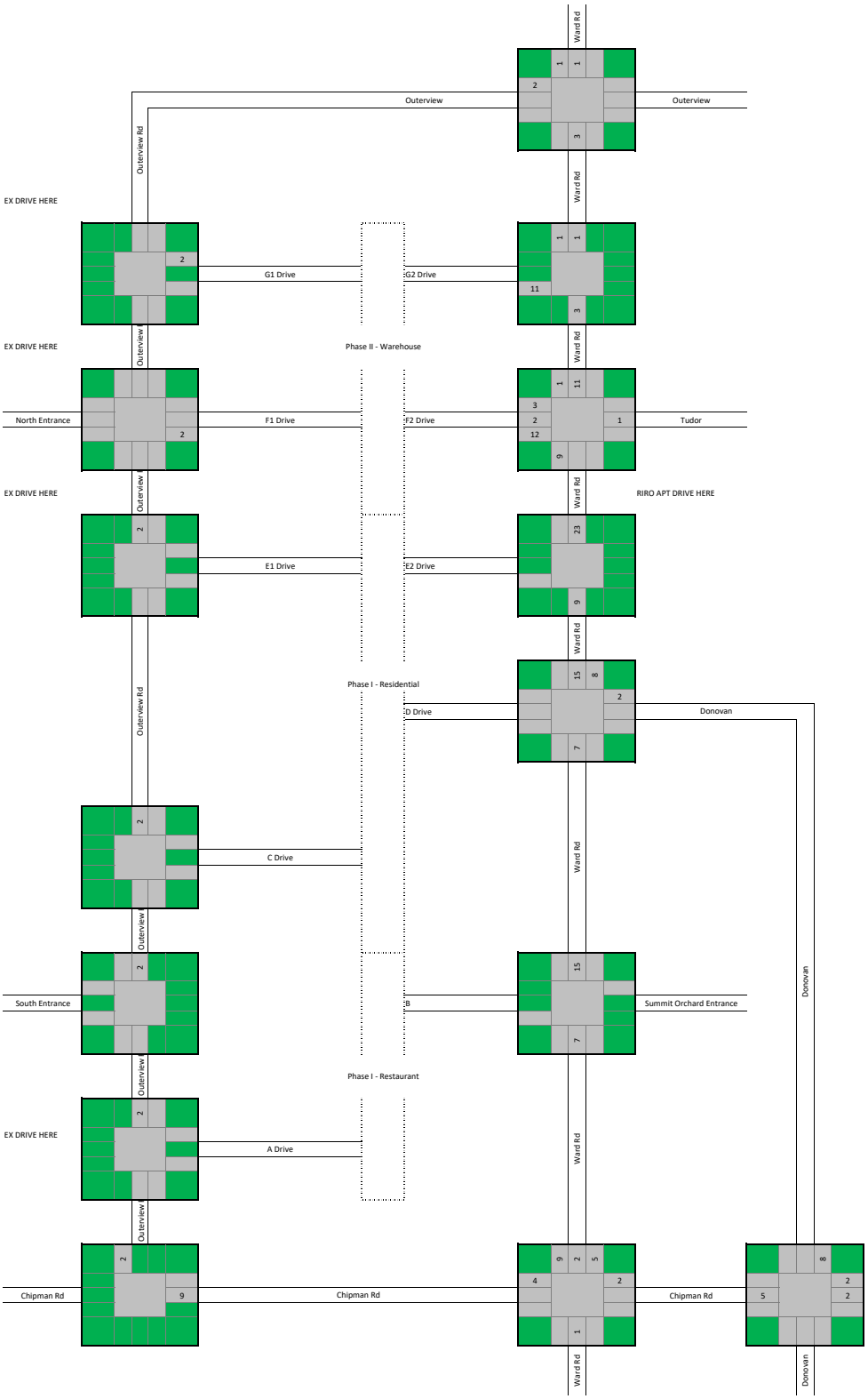




PM Trips (Phase 2)

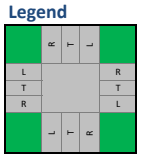
Legend

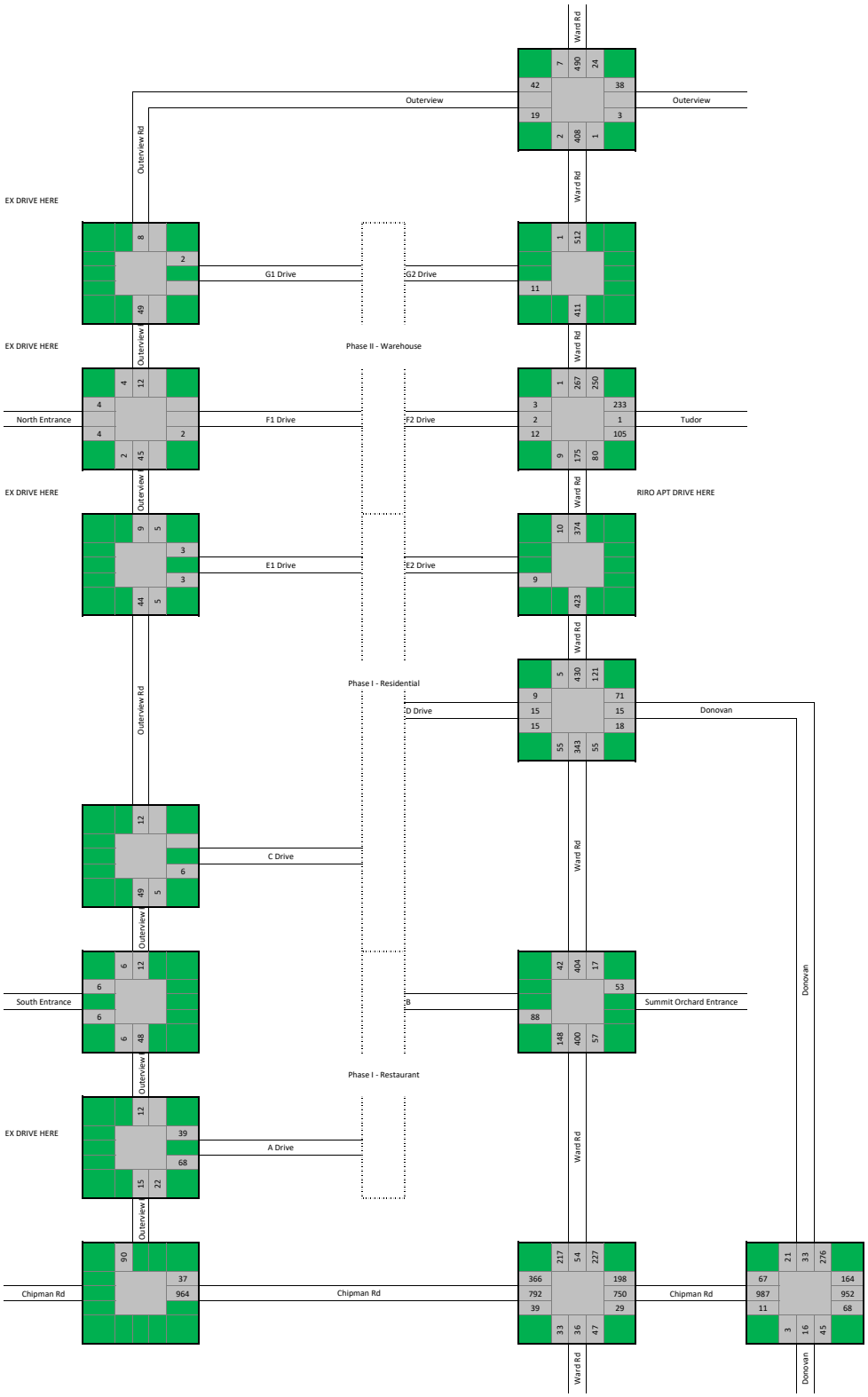




PM Existing + Approved + Phase I&II Trips

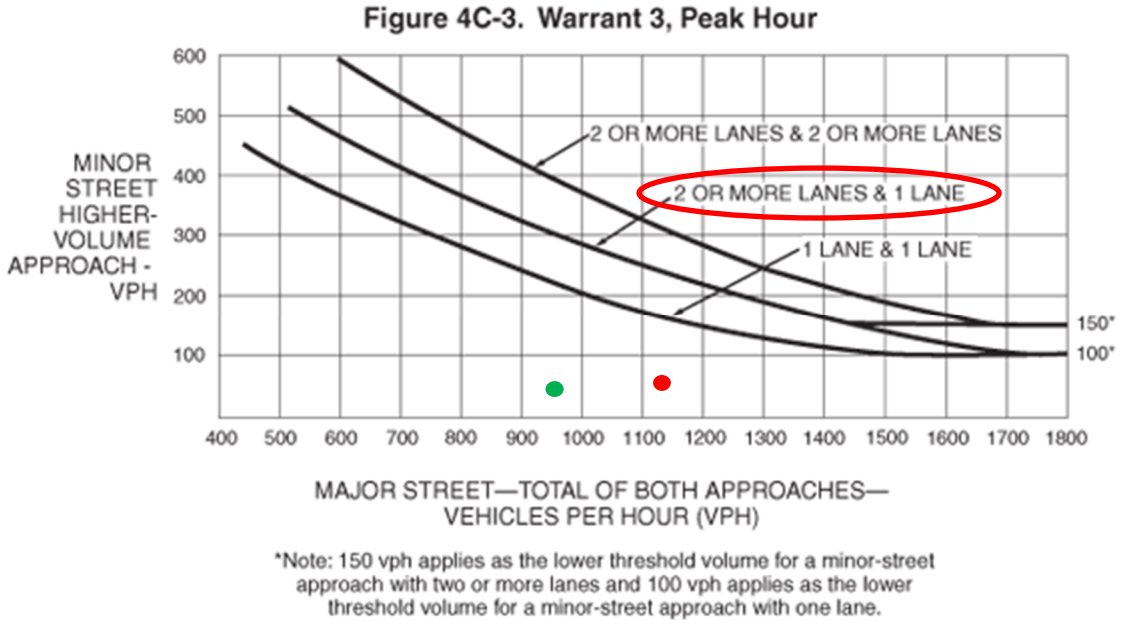
Legend





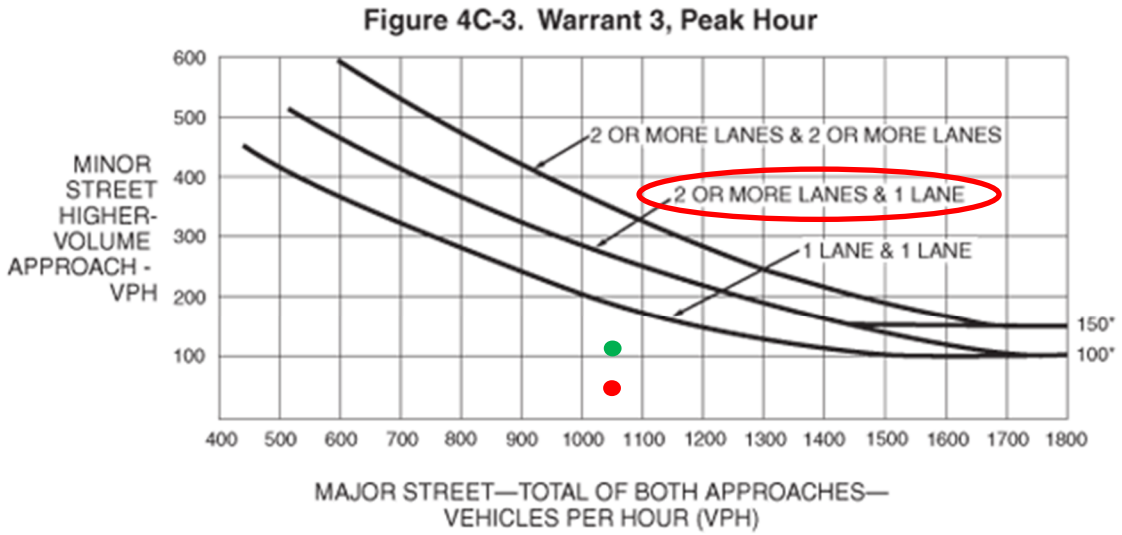
EXISTING PLUS SITE

Ward Road and Outerview Road – AM & PM

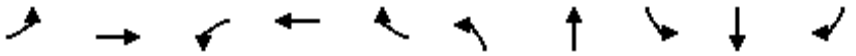


*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Ward Road and Donovan Road – AM & PM



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	328	530	18	552	290	35	112	35	14	119
v/c Ratio	0.60	0.36	0.13	0.68	0.49	0.25	0.24	0.13	0.03	0.19
Control Delay	37.2	18.3	41.4	33.3	6.7	43.6	20.6	39.7	28.0	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	18.3	41.4	33.3	6.7	43.6	20.6	39.7	28.0	0.7
Queue Length 50th (ft)	87	90	9	143	0	18	32	9	6	0
Queue Length 95th (ft)	120	149	31	197	55	46	70	22	19	0
Internal Link Dist (ft)		424		1156			2315		414	
Turn Bay Length (ft)	310		270		300	140		310		310
Base Capacity (vph)	685	1532	141	1028	667	141	475	270	479	625
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.35	0.13	0.54	0.43	0.25	0.24	0.13	0.03	0.19

Intersection Summary

HCM 6th Signalized Intersection Summary
3: Ward Rd & Chipman Rd

AM Existing

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	272	420	20	16	486	255	29	52	41	28	11	94
Future Volume (veh/h)	272	420	20	16	486	255	29	52	41	28	11	94
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	328	506	24	18	552	290	35	63	49	35	14	119
Peak Hour Factor	0.83	0.83	0.83	0.88	0.88	0.88	0.83	0.83	0.83	0.79	0.79	0.79
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	433	1136	54	44	817	364	73	247	192	142	467	396
Arrive On Green	0.13	0.33	0.33	0.02	0.23	0.23	0.04	0.25	0.25	0.04	0.25	0.25
Sat Flow, veh/h	3456	3454	164	1781	3554	1585	1781	975	759	3456	1870	1585
Grp Volume(v), veh/h	328	260	270	18	552	290	35	0	112	35	14	119
Grp Sat Flow(s),veh/h/ln	1728	1777	1841	1781	1777	1585	1781	0	1734	1728	1870	1585
Q Serve(g_s), s	7.1	8.9	9.0	0.8	11.0	13.4	1.5	0.0	4.0	0.8	0.4	4.7
Cycle Q Clear(g_c), s	7.1	8.9	9.0	0.8	11.0	13.4	1.5	0.0	4.0	0.8	0.4	4.7
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.44	1.00		1.00
Lane Grp Cap(c), veh/h	433	584	606	44	817	364	73	0	440	142	467	396
V/C Ratio(X)	0.76	0.44	0.45	0.41	0.68	0.80	0.48	0.00	0.25	0.25	0.03	0.30
Avail Cap(c_a), veh/h	676	714	740	140	1011	451	140	0	440	267	467	396
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	20.5	20.5	37.3	27.3	28.2	36.4	0.0	23.1	36.1	22.0	23.6
Incr Delay (d2), s/veh	2.7	0.5	0.5	5.9	1.3	7.8	4.8	0.0	1.4	0.9	0.1	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.6	3.8	0.4	4.4	5.4	0.7	0.0	1.7	0.3	0.2	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.6	21.0	21.0	43.2	28.6	36.0	41.2	0.0	24.5	37.0	22.1	25.6
LnGrp LOS	D	C	C	D	C	D	D	A	C	D	C	C
Approach Vol, veh/h		858			860			147			168	
Approach Delay, s/veh		26.6			31.4			28.5			27.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	26.6	8.8	32.4	10.1	26.3	16.5	24.7
Change Period (Y+Rc), s	* 6.6	6.9	* 6.9	* 6.9	6.9	* 6.9	* 6.8	* 6.9
Max Green Setting (Gmax), s	* 6	19.5	* 6.1	* 31	6.1	* 19	* 15	* 22
Max Q Clear Time (g_c+I1), s	2.8	6.0	2.8	11.0	3.5	6.7	9.1	15.4
Green Ext Time (p_c), s	0.0	0.4	0.0	3.1	0.0	0.3	0.6	2.5

Intersection Summary	
HCM 6th Ctrl Delay	28.8
HCM 6th LOS	C

Notes

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

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	712	601	8	0	2
Future Vol, veh/h	0	712	601	8	0	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	-	-	-	110	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	88	88	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	858	683	9	0	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	342
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	654
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	654
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	654
HCM Lane V/C Ratio	-	-	-	0.003
HCM Control Delay (s)	-	-	-	10.5
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0

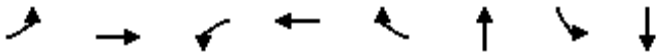
Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	1	4	4	7	4
Future Vol, veh/h	2	1	4	4	7	4
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	1	4	4	8	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	22	10	12	0	-	0
Stage 1	10	-	-	-	-	-
Stage 2	12	-	-	-	-	-
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	995	1071	1607	-	-	-
Stage 1	1013	-	-	-	-	-
Stage 2	1011	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	993	1071	1607	-	-	-
Mov Cap-2 Maneuver	993	-	-	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	1011	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	3.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1607	-	1018	-	-
HCM Lane V/C Ratio	0.003	-	0.003	-	-
HCM Control Delay (s)	7.2	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

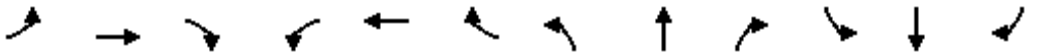


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	55	462	52	823	122	68	199	67
v/c Ratio	0.19	0.40	0.12	0.72	0.21	0.10	0.38	0.10
Control Delay	12.7	21.1	11.9	26.9	5.0	9.7	23.0	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	21.1	11.9	26.9	5.0	9.7	23.0	10.7
Queue Length 50th (ft)	14	96	13	196	0	6	77	8
Queue Length 95th (ft)	32	136	29	250	31	32	151	37
Internal Link Dist (ft)		1156		2871		1038		1471
Turn Bay Length (ft)	210		170		130		100	
Base Capacity (vph)	307	1645	418	1604	784	690	527	694
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.28	0.12	0.51	0.16	0.10	0.38	0.10

Intersection Summary

HCM 6th Signalized Intersection Summary
9: Donovan Rd & Chipman Rd

AM Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	429	6	45	716	106	3	13	41	175	21	38
Future Volume (veh/h)	52	429	6	45	716	106	3	13	41	175	21	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	456	6	52	823	122	4	15	49	199	24	43
Peak Hour Factor	0.94	0.94	0.94	0.87	0.87	0.87	0.84	0.84	0.84	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	275	1093	14	407	1069	477	62	160	445	609	226	405
Arrive On Green	0.07	0.30	0.30	0.07	0.30	0.30	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	1781	3591	47	1781	3554	1585	34	425	1184	1338	601	1076
Grp Volume(v), veh/h	55	225	237	52	823	122	68	0	0	199	0	67
Grp Sat Flow(s),veh/h/ln	1781	1777	1862	1781	1777	1585	1644	0	0	1338	0	1677
Q Serve(g_s), s	1.5	7.8	7.8	1.5	16.2	4.5	0.0	0.0	0.0	5.5	0.0	2.0
Cycle Q Clear(g_c), s	1.5	7.8	7.8	1.5	16.2	4.5	2.1	0.0	0.0	7.6	0.0	2.0
Prop In Lane	1.00		0.03	1.00		1.00	0.06		0.72	1.00		0.64
Lane Grp Cap(c), veh/h	275	541	566	407	1069	477	668	0	0	609	0	631
V/C Ratio(X)	0.20	0.42	0.42	0.13	0.77	0.26	0.10	0.00	0.00	0.33	0.00	0.11
Avail Cap(c_a), veh/h	353	784	821	468	1526	681	668	0	0	609	0	631
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.5	21.3	21.3	16.1	24.4	20.3	15.6	0.0	0.0	17.2	0.0	15.6
Incr Delay (d2), s/veh	0.4	0.5	0.5	0.1	1.5	0.3	0.3	0.0	0.0	1.4	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	3.2	3.3	0.5	6.3	1.5	0.8	0.0	0.0	2.6	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.8	21.8	21.8	16.2	26.0	20.6	15.9	0.0	0.0	18.6	0.0	15.9
LnGrp LOS	B	C	C	B	C	C	B	A	A	B	A	B
Approach Vol, veh/h		517			997			68			266	
Approach Delay, s/veh		21.4			24.8			15.9			17.9	
Approach LOS		C			C			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		36.0	11.4	29.5		36.0	11.6	29.2				
Change Period (Y+Rc), s		7.1	* 6	* 6.1		7.1	* 6.1	* 6.1				
Max Green Setting (Gmax), s		28.9	* 8	* 34		28.9	* 8.9	* 33				
Max Q Clear Time (g_c+I1), s		4.1	3.5	9.8		9.6	3.5	18.2				
Green Ext Time (p_c), s		0.3	0.0	2.8		0.9	0.0	4.9				

Intersection Summary												
HCM 6th Ctrl Delay			22.5									
HCM 6th LOS			C									

Notes

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

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	13	569	10	7	133
Future Vol, veh/h	0	13	569	10	7	133
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	-	140	160	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	16	632	11	8	148

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	316	0	0	643	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	680	-	-	938	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	680	-	-	938	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	680	938	-
HCM Lane V/C Ratio	-	-	0.024	0.008	-
HCM Control Delay (s)	-	-	10.4	8.9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	42	513	69	252	128
Future Vol, veh/h	12	42	513	69	252	128
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	85	0	-	230	210	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	71	71	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	59	570	77	280	142

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1201	285	0	0	647	0
Stage 1	570	-	-	-	-	-
Stage 2	631	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	177	712	-	-	934	-
Stage 1	529	-	-	-	-	-
Stage 2	492	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	124	712	-	-	934	-
Mov Cap-2 Maneuver	124	-	-	-	-	-
Stage 1	529	-	-	-	-	-
Stage 2	344	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.7	0	7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	124	712	934	-
HCM Lane V/C Ratio	-	-	0.136	0.083	0.3	-
HCM Control Delay (s)	-	-	38.6	10.5	10.5	-
HCM Lane LOS	-	-	E	B	B	-
HCM 95th %tile Q(veh)	-	-	0.5	0.3	1.3	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	67	137	559	135	220	475
v/c Ratio	0.33	0.45	0.29	0.14	0.34	0.18
Control Delay	35.5	11.2	9.9	2.5	4.9	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	11.2	9.9	2.5	4.9	3.3
Queue Length 50th (ft)	30	0	65	1	23	26
Queue Length 95th (ft)	57	32	95	19	35	33
Internal Link Dist (ft)	1567		790			1216
Turn Bay Length (ft)				90	150	
Base Capacity (vph)	520	562	1956	934	826	2617
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.24	0.29	0.14	0.27	0.18

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	52	107	447	108	152	328
Future Volume (veh/h)	52	107	447	108	152	328
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	67	137	559	135	220	475
Peak Hour Factor	0.78	0.78	0.80	0.80	0.69	0.69
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	205	182	2007	895	642	2633
Arrive On Green	0.11	0.11	0.56	0.56	0.10	0.74
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	67	137	559	135	220	475
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	2.6	6.4	6.2	3.1	3.6	3.0
Cycle Q Clear(g_c), s	2.6	6.4	6.2	3.1	3.6	3.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	205	182	2007	895	642	2633
V/C Ratio(X)	0.33	0.75	0.28	0.15	0.34	0.18
Avail Cap(c_a), veh/h	526	468	2007	895	889	2633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	32.7	8.6	7.9	5.1	3.0
Incr Delay (d2), s/veh	0.9	6.2	0.3	0.4	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.7	2.2	1.0	1.0	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.0	38.9	8.9	8.2	5.4	3.1
LnGrp LOS	C	D	A	A	A	A
Approach Vol, veh/h	204		694			695
Approach Delay, s/veh	36.6		8.8			3.8
Approach LOS	D		A			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	13.4	48.6			62.0	14.3
Change Period (Y+Rc), s	5.5	5.5			5.5	5.5
Max Green Setting (Gmax), s	18.5	32.5			56.5	22.5
Max Q Clear Time (g_c+I1), s	5.6	8.2			5.0	8.4
Green Ext Time (p_c), s	0.5	4.4			3.4	0.5

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	50	469	6	9	544	1	2	0	3	8	0	11
Future Vol, veh/h	50	469	6	9	544	1	2	0	3	8	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	190	200	-	145	-	-	-	25	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	95	95	95	63	63	63	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	63	586	8	9	573	1	3	0	5	10	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	574	0	0	594	0	0	1017	1304	293	1010	1311	287
Stage 1	-	-	-	-	-	-	712	712	-	591	591	-
Stage 2	-	-	-	-	-	-	305	592	-	419	720	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	995	-	-	978	-	-	192	159	703	194	158	710
Stage 1	-	-	-	-	-	-	389	434	-	460	493	-
Stage 2	-	-	-	-	-	-	680	492	-	582	430	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	995	-	-	978	-	-	178	148	703	182	147	710
Mov Cap-2 Maneuver	-	-	-	-	-	-	178	148	-	182	147	-
Stage 1	-	-	-	-	-	-	364	407	-	431	489	-
Stage 2	-	-	-	-	-	-	661	488	-	541	403	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.8	0.1	16.4	16.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1	SWLn2
Capacity (veh/h)	323	978	-	-	995	-	-	182	710
HCM Lane V/C Ratio	0.025	0.01	-	-	0.063	-	-	0.056	0.02
HCM Control Delay (s)	16.4	8.7	-	-	8.9	-	-	25.9	10.2
HCM Lane LOS	C	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0.2	-	-	0.2	0.1

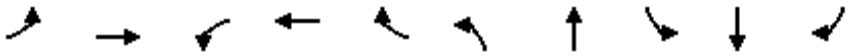
Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	2	4	4	11	4
Future Vol, veh/h	2	2	4	4	11	4
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	2	4	4	12	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	26	14	16	0	-	0
Stage 1	14	-	-	-	-	-
Stage 2	12	-	-	-	-	-
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	989	1066	1602	-	-	-
Stage 1	1009	-	-	-	-	-
Stage 2	1011	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	986	1066	1602	-	-	-
Mov Cap-2 Maneuver	986	-	-	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	1011	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	3.6	0
HCM LOS	A		

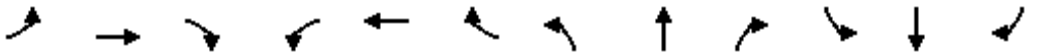
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1602	-	1024	-	-
HCM Lane V/C Ratio	0.003	-	0.004	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	294	1078	35	899	158	40	87	151	52	207
v/c Ratio	0.75	0.77	0.29	0.86	0.26	0.33	0.21	0.63	0.10	0.35
Control Delay	51.6	28.8	46.7	39.6	2.4	47.8	14.6	53.2	28.6	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	28.8	46.7	39.6	2.4	47.8	14.6	53.2	28.6	6.2
Queue Length 50th (ft)	85	295	19	250	0	22	14	43	24	0
Queue Length 95th (ft)	113	325	46	295	13	50	45	#81	55	53
Internal Link Dist (ft)		424		1156			2315		414	
Turn Bay Length (ft)	310		270		300	140		310		310
Base Capacity (vph)	399	1409	120	1091	634	121	405	240	513	589
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.77	0.29	0.82	0.25	0.33	0.21	0.63	0.10	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	238	834	39	29	755	133	33	25	47	143	49	197
Future Volume (veh/h)	238	834	39	29	755	133	33	25	47	143	49	197
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	294	1030	48	35	899	158	40	30	57	151	52	207
Peak Hour Factor	0.81	0.81	0.81	0.84	0.84	0.84	0.82	0.82	0.82	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	371	1238	58	70	1035	462	76	127	241	233	450	381
Arrive On Green	0.11	0.36	0.36	0.04	0.29	0.29	0.04	0.22	0.22	0.07	0.24	0.24
Sat Flow, veh/h	3456	3457	161	1781	3554	1585	1781	577	1096	3456	1870	1585
Grp Volume(v), veh/h	294	529	549	35	899	158	40	0	87	151	52	207
Grp Sat Flow(s),veh/h/ln	1728	1777	1841	1781	1777	1585	1781	0	1673	1728	1870	1585
Q Serve(g_s), s	7.2	23.6	23.6	1.7	20.8	6.8	1.9	0.0	3.7	3.7	1.9	9.9
Cycle Q Clear(g_c), s	7.2	23.6	23.6	1.7	20.8	6.8	1.9	0.0	3.7	3.7	1.9	9.9
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.66	1.00		1.00
Lane Grp Cap(c), veh/h	371	636	660	70	1035	462	76	0	367	233	450	381
V/C Ratio(X)	0.79	0.83	0.83	0.50	0.87	0.34	0.52	0.00	0.24	0.65	0.12	0.54
Avail Cap(c_a), veh/h	411	649	672	123	1121	500	126	0	367	248	450	381
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	25.4	25.4	40.7	29.1	24.1	40.6	0.0	27.8	39.4	25.7	28.7
Incr Delay (d2), s/veh	9.3	8.9	8.6	5.4	7.1	0.4	5.5	0.0	1.5	5.3	0.5	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	11.0	11.4	0.8	9.1	2.4	0.9	0.0	1.6	1.7	0.9	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.0	34.3	34.0	46.1	36.2	24.6	46.0	0.0	29.3	44.7	26.2	34.2
LnGrp LOS	D	C	C	D	D	C	D	A	C	D	C	C
Approach Vol, veh/h		1372			1092			127			410	
Approach Delay, s/veh		36.9			34.8			34.6			37.0	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.4	25.9	10.3	37.9	10.6	27.7	16.1	32.1
Change Period (Y+Rc), s	* 6.6	6.9	* 6.9	* 6.9	6.9	* 6.9	* 6.8	* 6.9
Max Green Setting (Gmax), s	* 6.2	19.0	* 6	* 32	6.1	* 19	* 10	* 27
Max Q Clear Time (g_c+I1), s	5.7	5.7	3.7	25.6	3.9	11.9	9.2	22.8
Green Ext Time (p_c), s	0.0	0.3	0.0	3.4	0.0	0.5	0.1	2.4

Intersection Summary	
HCM 6th Ctrl Delay	36.1
HCM 6th LOS	D

Notes

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

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1111	980	5	0	11
Future Vol, veh/h	0	1111	980	5	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	110	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1208	1065	5	0	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	533
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	491
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	491
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	491
HCM Lane V/C Ratio	-	-	-	0.024
HCM Control Delay (s)	-	-	-	12.5
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

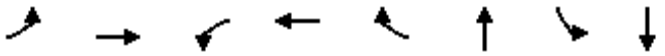
Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	6	6	1	1	6
Future Vol, veh/h	6	6	6	1	1	6
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	7	7	1	1	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	20	5	8	0	-	0
Stage 1	5	-	-	-	-	-
Stage 2	15	-	-	-	-	-
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	997	1078	1612	-	-	-
Stage 1	1018	-	-	-	-	-
Stage 2	1008	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	993	1078	1612	-	-	-
Mov Cap-2 Maneuver	993	-	-	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	1008	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	6.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1612	-	1034	-	-
HCM Lane V/C Ratio	0.004	-	0.013	-	-
HCM Control Delay (s)	7.2	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

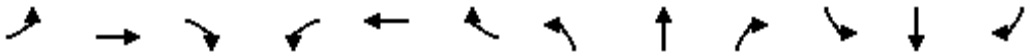


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	71	1009	78	1026	169	77	284	62
v/c Ratio	0.28	0.81	0.31	0.82	0.27	0.12	0.60	0.10
Control Delay	14.0	31.0	14.5	31.6	7.9	9.8	30.7	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	31.0	14.5	31.6	7.9	9.8	30.7	14.8
Queue Length 50th (ft)	19	263	21	269	17	9	136	15
Queue Length 95th (ft)	40	340	42	330	55	35	220	41
Internal Link Dist (ft)		1156		2871		1038		1471
Turn Bay Length (ft)	210		170		130		100	
Base Capacity (vph)	254	1416	254	1418	708	638	476	650
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.71	0.31	0.72	0.24	0.12	0.60	0.10

Intersection Summary

HCM 6th Signalized Intersection Summary
9: Donovan Rd & Chipman Rd

PM Existing



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	937	11	68	893	147	3	16	45	250	33	21
Future Volume (veh/h)	67	937	11	68	893	147	3	16	45	250	33	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	71	997	12	78	1026	169	4	19	54	284	38	24
Peak Hour Factor	0.94	0.94	0.94	0.87	0.87	0.87	0.84	0.84	0.84	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	257	1227	15	276	1218	543	55	164	408	567	378	238
Arrive On Green	0.08	0.34	0.34	0.08	0.34	0.34	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1781	3596	43	1781	3554	1585	28	465	1158	1327	1072	677
Grp Volume(v), veh/h	71	493	516	78	1026	169	77	0	0	284	0	62
Grp Sat Flow(s),veh/h/ln	1781	1777	1863	1781	1777	1585	1651	0	0	1327	0	1749
Q Serve(g_s), s	2.0	21.4	21.4	2.2	22.6	6.6	0.0	0.0	0.0	11.1	0.0	2.0
Cycle Q Clear(g_c), s	2.0	21.4	21.4	2.2	22.6	6.6	2.7	0.0	0.0	13.8	0.0	2.0
Prop In Lane	1.00		0.02	1.00		1.00	0.05		0.70	1.00		0.39
Lane Grp Cap(c), veh/h	257	606	636	276	1218	543	626	0	0	567	0	616
V/C Ratio(X)	0.28	0.81	0.81	0.28	0.84	0.31	0.12	0.00	0.00	0.50	0.00	0.10
Avail Cap(c_a), veh/h	289	693	727	303	1386	618	626	0	0	567	0	616
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.4	25.4	25.4	18.0	25.7	20.4	18.6	0.0	0.0	21.9	0.0	18.4
Incr Delay (d2), s/veh	0.6	6.5	6.2	0.6	4.4	0.3	0.4	0.0	0.0	3.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	9.7	10.1	0.9	9.3	2.3	1.1	0.0	0.0	4.9	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.0	31.9	31.6	18.5	30.1	20.8	19.0	0.0	0.0	25.1	0.0	18.7
LnGrp LOS	B	C	C	B	C	C	B	A	A	C	A	B
Approach Vol, veh/h		1080			1273			77			346	
Approach Delay, s/veh		30.9			28.1			19.0			23.9	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	36.9	12.7	35.0	36.9	12.6	35.1
Change Period (Y+Rc), s	7.1	* 6	* 6.1	7.1	* 6.1	* 6.1
Max Green Setting (Gmax), s	29.8	* 8	* 33	29.8	* 8	* 33
Max Q Clear Time (g_c+I1), s	4.7	4.2	23.4	15.8	4.0	24.6
Green Ext Time (p_c), s	0.4	0.0	4.5	1.1	0.0	4.4

Intersection Summary	
HCM 6th Ctrl Delay	28.4
HCM 6th LOS	C

Notes

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

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	53	338	57	17	389
Future Vol, veh/h	0	53	338	57	17	389
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	-	140	160	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	72	376	63	19	432

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	188	0	0	439	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	0	822	-	-	1117	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	822	-	-	1117	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	822	1117	-
HCM Lane V/C Ratio	-	-	0.087	0.017	-
HCM Control Delay (s)	-	-	9.8	8.3	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	69	336	55	110	388
Future Vol, veh/h	18	69	336	55	110	388
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	85	0	-	230	210	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	82	373	61	122	431

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	833	187	0	0	434	0
Stage 1	373	-	-	-	-	-
Stage 2	460	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	307	823	-	-	1122	-
Stage 1	666	-	-	-	-	-
Stage 2	602	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	274	823	-	-	1122	-
Mov Cap-2 Maneuver	274	-	-	-	-	-
Stage 1	666	-	-	-	-	-
Stage 2	536	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.8	0	1.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	274	823	1122	-
HCM Lane V/C Ratio	-	-	0.078	0.1	0.109	-
HCM Control Delay (s)	-	-	19.3	9.9	8.6	-
HCM Lane LOS	-	-	C	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0.3	0.4	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	123	303	188	86	295	277
v/c Ratio	0.48	0.62	0.11	0.10	0.36	0.11
Control Delay	35.2	9.9	11.3	3.7	5.8	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	9.9	11.3	3.7	5.8	3.9
Queue Length 50th (ft)	52	0	22	0	38	16
Queue Length 95th (ft)	84	34	47	24	71	30
Internal Link Dist (ft)	1567		790			1216
Turn Bay Length (ft)				90	150	
Base Capacity (vph)	665	784	1736	820	1012	2493
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.39	0.11	0.10	0.29	0.11

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	95	233	169	77	245	230
Future Volume (veh/h)	95	233	169	77	245	230
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	123	303	188	86	295	277
Peak Hour Factor	0.77	0.77	0.90	0.90	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	396	352	1613	720	769	2278
Arrive On Green	0.22	0.22	0.45	0.45	0.12	0.64
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	123	303	188	86	295	277
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	4.6	14.8	2.5	2.5	6.8	2.4
Cycle Q Clear(g_c), s	4.6	14.8	2.5	2.5	6.8	2.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	396	352	1613	720	769	2278
V/C Ratio(X)	0.31	0.86	0.12	0.12	0.38	0.12
Avail Cap(c_a), veh/h	610	542	1613	720	1056	2278
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	30.1	12.6	12.7	8.9	5.6
Incr Delay (d2), s/veh	0.4	8.5	0.1	0.3	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	6.2	1.0	0.9	2.3	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.6	38.6	12.8	13.0	9.2	5.7
LnGrp LOS	C	D	B	B	A	A
Approach Vol, veh/h	426		274			572
Approach Delay, s/veh	35.1		12.9			7.5
Approach LOS	D		B			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	15.0	42.0			57.0	23.4
Change Period (Y+Rc), s	5.5	5.5			5.5	5.5
Max Green Setting (Gmax), s	22.5	23.5			51.5	27.5
Max Q Clear Time (g_c+I1), s	8.8	4.5			4.4	16.8
Green Ext Time (p_c), s	0.7	1.3			1.9	1.1

Intersection Summary	
HCM 6th Ctrl Delay	17.9
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.4

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	24	463	1	2	399	1	7	0	9	3	0	38
Future Vol, veh/h	24	463	1	2	399	1	7	0	9	3	0	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	190	200	-	145	-	-	-	25	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	92	92	92	57	57	57	47	47	47
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	509	1	2	434	1	12	0	16	6	0	81

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	435	0	0	510	0	0	782	1000	255	745	1000	217
Stage 1	-	-	-	-	-	-	561	561	-	438	438	-
Stage 2	-	-	-	-	-	-	221	439	-	307	562	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1121	-	-	1051	-	-	284	242	744	302	242	787
Stage 1	-	-	-	-	-	-	480	508	-	567	577	-
Stage 2	-	-	-	-	-	-	761	576	-	678	508	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1121	-	-	1051	-	-	250	236	744	290	236	787
Mov Cap-2 Maneuver	-	-	-	-	-	-	250	236	-	290	236	-
Stage 1	-	-	-	-	-	-	469	496	-	554	576	-
Stage 2	-	-	-	-	-	-	682	575	-	648	496	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.4	0	14.7	10.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1	SWLn2
Capacity (veh/h)	399	1051	-	-	1121	-	-	290	787
HCM Lane V/C Ratio	0.07	0.002	-	-	0.024	-	-	0.022	0.103
HCM Control Delay (s)	14.7	8.4	-	-	8.3	-	-	17.7	10.1
HCM Lane LOS	B	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0.1	0.3

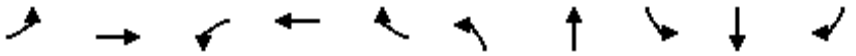
Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	4	2	3	7	4
Future Vol, veh/h	4	4	2	3	7	4
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	2	3	8	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	17	10	12	0	-	0
Stage 1	10	-	-	-	-	-
Stage 2	7	-	-	-	-	-
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	1001	1071	1607	-	-	-
Stage 1	1013	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1000	1071	1607	-	-	-
Mov Cap-2 Maneuver	1000	-	-	-	-	-
Stage 1	1012	-	-	-	-	-
Stage 2	1016	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	2.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1607	-	1034	-	-
HCM Lane V/C Ratio	0.001	-	0.008	-	-
HCM Control Delay (s)	7.2	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

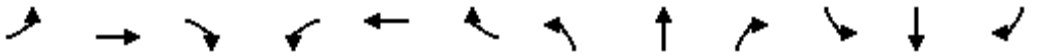


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	459	472	18	525	389	35	122	157	20	148
v/c Ratio	0.81	0.36	0.15	0.78	0.48	0.29	0.26	0.54	0.03	0.21
Control Delay	47.8	21.7	42.6	43.1	4.4	46.4	21.5	46.7	24.8	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	21.7	42.6	43.1	4.4	46.4	21.5	46.7	24.8	0.6
Queue Length 50th (ft)	130	86	10	148	0	19	40	44	8	0
Queue Length 95th (ft)	167	142	31	199	52	46	77	66	23	0
Internal Link Dist (ft)		424		1156			2315		414	
Turn Bay Length (ft)	310		270		300	140		170		
Base Capacity (vph)	594	1327	121	730	812	121	463	297	608	716
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.36	0.15	0.72	0.48	0.29	0.26	0.53	0.03	0.21

Intersection Summary

HCM 6th Signalized Intersection Summary
3: Ward Rd & Chipman Rd

AM Existing plus Site (Phase 1)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	381	372	20	16	462	342	29	61	41	124	16	117
Future Volume (veh/h)	381	372	20	16	462	342	29	61	41	124	16	117
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	459	448	24	18	525	389	35	73	49	157	20	148
Peak Hour Factor	0.83	0.83	0.83	0.88	0.88	0.88	0.83	0.83	0.83	0.79	0.79	0.79
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	542	1167	62	43	742	438	70	264	177	234	519	440
Arrive On Green	0.16	0.34	0.34	0.02	0.21	0.21	0.04	0.25	0.25	0.07	0.28	0.28
Sat Flow, veh/h	3456	3431	183	1781	3554	1585	1781	1044	701	3456	1870	1585
Grp Volume(v), veh/h	459	231	241	18	525	389	35	0	122	157	20	148
Grp Sat Flow(s),veh/h/ln	1728	1777	1837	1781	1777	1585	1781	0	1744	1728	1870	1585
Q Serve(g_s), s	11.2	8.6	8.6	0.9	11.9	18.1	1.7	0.0	4.9	3.8	0.7	6.4
Cycle Q Clear(g_c), s	11.2	8.6	8.6	0.9	11.9	18.1	1.7	0.0	4.9	3.8	0.7	6.4
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	542	604	625	43	742	438	70	0	441	234	519	440
V/C Ratio(X)	0.85	0.38	0.38	0.42	0.71	0.89	0.50	0.00	0.28	0.67	0.04	0.34
Avail Cap(c_a), veh/h	606	604	625	123	742	438	123	0	441	303	519	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	21.7	21.7	41.7	31.8	30.0	40.8	0.0	26.0	39.4	22.9	24.9
Incr Delay (d2), s/veh	10.0	0.4	0.4	6.2	3.1	19.3	5.4	0.0	1.6	3.7	0.1	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	3.5	3.7	0.4	5.1	9.5	0.8	0.0	2.1	1.7	0.3	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.5	22.1	22.1	47.9	34.9	49.3	46.1	0.0	27.6	43.2	23.0	27.0
LnGrp LOS	D	C	C	D	C	D	D	A	C	D	C	C
Approach Vol, veh/h		931			932			157			325	
Approach Delay, s/veh		33.6			41.2			31.7			34.6	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	28.8	9.0	36.4	10.3	30.9	20.4	25.0
Change Period (Y+Rc), s	* 6.6	6.9	* 6.9	* 6.9	6.9	* 6.9	* 6.8	* 6.9
Max Green Setting (Gmax), s	* 7.6	21.9	* 6	* 27	6.0	* 24	* 15	* 18
Max Q Clear Time (g_c+I1), s	5.8	6.9	2.9	10.6	3.7	8.4	13.2	20.1
Green Ext Time (p_c), s	0.1	0.5	0.0	2.6	0.0	0.4	0.4	0.0

Intersection Summary	
HCM 6th Ctrl Delay	36.6
HCM 6th LOS	D

Notes

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

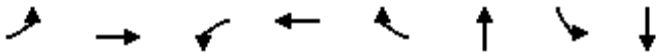
Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	773	576	39	0	110
Future Vol, veh/h	0	773	576	39	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	110	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	88	88	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	931	655	44	0	120

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	328
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	668
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	668
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

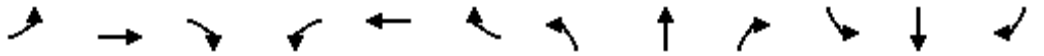
Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	668
HCM Lane V/C Ratio	-	-	-	0.179
HCM Control Delay (s)	-	-	-	11.6
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.6



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	55	523	52	895	129	68	225	67
v/c Ratio	0.20	0.44	0.13	0.76	0.21	0.10	0.43	0.10
Control Delay	13.1	21.6	12.0	28.0	5.5	9.7	24.4	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	21.6	12.0	28.0	5.5	9.7	24.4	10.7
Queue Length 50th (ft)	15	113	14	222	3	7	94	8
Queue Length 95th (ft)	33	157	30	278	35	32	170	36
Internal Link Dist (ft)		1156		2871		1038		1471
Turn Bay Length (ft)	210		170		130		100	
Base Capacity (vph)	277	1571	398	1559	765	685	523	689
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.33	0.13	0.57	0.17	0.10	0.43	0.10

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	486	6	45	779	112	3	13	41	198	21	38
Future Volume (veh/h)	52	486	6	45	779	112	3	13	41	198	21	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	517	6	52	895	129	4	15	49	225	24	43
Peak Hour Factor	0.94	0.94	0.94	0.87	0.87	0.87	0.84	0.84	0.84	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	264	1153	13	394	1127	503	60	157	438	597	222	398
Arrive On Green	0.07	0.32	0.32	0.07	0.32	0.32	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1781	3598	42	1781	3554	1585	34	425	1184	1338	601	1076
Grp Volume(v), veh/h	55	255	268	52	895	129	68	0	0	225	0	67
Grp Sat Flow(s),veh/h/ln	1781	1777	1863	1781	1777	1585	1643	0	0	1338	0	1677
Q Serve(g_s), s	1.6	9.1	9.1	1.5	18.3	4.8	0.0	0.0	0.0	7.1	0.0	2.1
Cycle Q Clear(g_c), s	1.6	9.1	9.1	1.5	18.3	4.8	2.2	0.0	0.0	9.3	0.0	2.1
Prop In Lane	1.00		0.02	1.00		1.00	0.06		0.72	1.00		0.64
Lane Grp Cap(c), veh/h	264	569	597	394	1127	503	656	0	0	597	0	620
V/C Ratio(X)	0.21	0.45	0.45	0.13	0.79	0.26	0.10	0.00	0.00	0.38	0.00	0.11
Avail Cap(c_a), veh/h	324	742	778	451	1471	656	656	0	0	597	0	620
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.8	21.5	21.5	16.0	24.8	20.2	16.5	0.0	0.0	18.6	0.0	16.5
Incr Delay (d2), s/veh	0.4	0.6	0.5	0.1	2.3	0.3	0.3	0.0	0.0	1.8	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	3.7	3.9	0.6	7.3	1.7	0.8	0.0	0.0	3.2	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	22.0	22.0	16.2	27.2	20.5	16.8	0.0	0.0	20.4	0.0	16.8
LnGrp LOS	B	C	C	B	C	C	B	A	A	C	A	B
Approach Vol, veh/h		578			1076			68			292	
Approach Delay, s/veh		21.7			25.8			16.8			19.6	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	36.6	11.5	31.7	36.6	11.7	31.4
Change Period (Y+Rc), s	7.1	* 6	* 6.1	7.1	* 6.1	* 6.1
Max Green Setting (Gmax), s	29.5	* 8	* 33	29.5	* 8.3	* 33
Max Q Clear Time (g_c+I1), s	4.2	3.5	11.1	11.3	3.6	20.3
Green Ext Time (p_c), s	0.3	0.0	3.2	1.0	0.0	5.0

Intersection Summary	
HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

Notes

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

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	121	0	0	13	196	584	10	7	143	56
Future Vol, veh/h	0	0	121	0	0	13	196	584	10	7	143	56
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	-	-	0	-	-	0	130	-	140	160	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	81	92	81	92	90	90	90	90	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	132	0	0	16	213	649	11	8	159	61

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	80	-	-	325	220	0	0	660	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	964	0	0	671	1346	-	-	924	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	964	-	-	671	1346	-	-	924	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	10.5	2	0.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1346	-	-	964	671	924	-	-
HCM Lane V/C Ratio	0.158	-	-	0.136	0.024	0.008	-	-
HCM Control Delay (s)	8.2	-	-	9.3	10.5	8.9	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0.6	-	-	0.5	0.1	0	-	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	19	28	12	6	42	15	513	69	257	166	2
Future Vol, veh/h	14	19	28	12	6	42	15	513	69	257	166	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	200	-	230	210	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	71	92	71	92	90	90	90	90	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	21	30	17	7	59	16	570	77	286	184	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1077	1435	92	1277	1360	285	186	0	0	647	0	0
Stage 1	756	756	-	602	602	-	-	-	-	-	-	-
Stage 2	321	679	-	675	758	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	173	133	947	123	147	712	1386	-	-	934	-	-
Stage 1	366	414	-	453	487	-	-	-	-	-	-	-
Stage 2	665	449	-	410	413	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	114	91	947	75	101	712	1386	-	-	934	-	-
Mov Cap-2 Maneuver	114	91	-	75	101	-	-	-	-	-	-	-
Stage 1	362	287	-	448	481	-	-	-	-	-	-	-
Stage 2	595	444	-	256	287	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.3	25.1	0.2	6.4
HCM LOS	D	D		

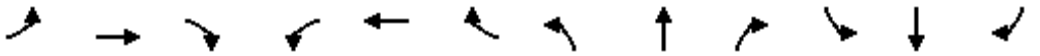
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1386	-	-	114	197	75	445	934	-	-
HCM Lane V/C Ratio	0.012	-	-	0.133	0.259	0.225	0.148	0.306	-	-
HCM Control Delay (s)	7.6	-	-	41.4	29.6	66.4	14.5	10.5	-	-
HCM Lane LOS	A	-	-	E	D	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	1	0.8	0.5	1.3	-	-

Lane Group	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	78	137	570	141	230	510
v/c Ratio	0.39	0.38	0.34	0.17	0.38	0.21
Control Delay	32.6	7.7	12.2	2.6	6.1	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	7.7	12.2	2.6	6.1	4.1
Queue Length 50th (ft)	30	0	70	0	26	30
Queue Length 95th (ft)	69	23	107	18	42	41
Internal Link Dist (ft)	1567		312			650
Turn Bay Length (ft)				90	150	
Base Capacity (vph)	468	627	1697	838	810	2458
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.22	0.34	0.17	0.28	0.21

Intersection Summary

HCM 6th Signalized Intersection Summary
15: Ward Rd & Tudor Rd

AM Existing plus Site (Phase 1)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	61	0	107	0	456	113	159	352	0
Future Volume (veh/h)	0	0	0	61	0	107	0	456	113	159	352	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	78	0	137	0	570	141	230	510	0
Peak Hour Factor	0.92	0.92	0.92	0.78	0.92	0.78	0.92	0.80	0.80	0.69	0.69	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	111	228	0	284	0	193	560	1783	795	628	2517	0
Arrive On Green	0.00	0.00	0.00	0.12	0.00	0.12	0.00	0.50	0.50	0.12	0.71	0.00
Sat Flow, veh/h	1418	1870	0	1418	0	1585	1781	3554	1585	1781	3647	0
Grp Volume(v), veh/h	0	0	0	78	0	137	0	570	141	230	510	0
Grp Sat Flow(s),veh/h/ln	1418	1870	0	1418	0	1585	1781	1777	1585	1781	1777	0
Q Serve(g_s), s	0.0	0.0	0.0	3.3	0.0	5.4	0.0	6.2	3.2	3.6	3.2	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.3	0.0	5.4	0.0	6.2	3.2	3.6	3.2	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	111	228	0	284	0	193	560	1783	795	628	2517	0
V/C Ratio(X)	0.00	0.00	0.00	0.27	0.00	0.71	0.00	0.32	0.18	0.37	0.20	0.00
Avail Cap(c_a), veh/h	453	679	0	604	0	551	736	1783	795	920	2517	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	26.4	0.0	27.3	0.0	9.6	8.8	5.7	3.2	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.5	0.0	4.7	0.0	0.5	0.5	0.4	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	1.1	0.0	2.2	0.0	2.2	1.0	1.0	0.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	26.9	0.0	32.1	0.0	10.0	9.3	6.1	3.4	0.0
LnGrp LOS	A	A	A	C	A	C	A	B	A	A	A	A
Approach Vol, veh/h		0			215			711			740	
Approach Delay, s/veh		0.0			30.2			9.9			4.2	
Approach LOS					C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.4	38.0		13.4	0.0	51.4		13.4				
Change Period (Y+Rc), s	5.5	5.5		* 5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	18.5	32.5		* 24	6.5	45.5		22.5				
Max Q Clear Time (g_c+I1), s	5.6	8.2		0.0	0.0	5.2		7.4				
Green Ext Time (p_c), s	0.5	4.5		0.0	0.0	3.7		0.7				

Intersection Summary	
HCM 6th Ctrl Delay	10.0
HCM 6th LOS	B

Notes

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

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	50	493	8	9	553	1	48	0	17	8	0	11
Future Vol, veh/h	50	493	8	9	553	1	48	0	17	8	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	190	200	-	145	-	-	-	25	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	95	95	95	63	63	63	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	63	616	10	9	582	1	76	0	27	10	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	583	0	0	626	0	0	1051	1343	308	1034	1352	291
Stage 1	-	-	-	-	-	-	742	742	-	600	600	-
Stage 2	-	-	-	-	-	-	309	601	-	434	752	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	987	-	-	952	-	-	181	151	688	186	149	706
Stage 1	-	-	-	-	-	-	374	420	-	455	488	-
Stage 2	-	-	-	-	-	-	676	488	-	570	416	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	987	-	-	952	-	-	168	140	688	169	138	706
Mov Cap-2 Maneuver	-	-	-	-	-	-	168	140	-	169	138	-
Stage 1	-	-	-	-	-	-	350	393	-	426	484	-
Stage 2	-	-	-	-	-	-	656	484	-	513	389	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.8	0.1	37.9	17.6
HCM LOS			E	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1	SWLn2
Capacity (veh/h)	209	952	-	-	987	-	-	169	706
HCM Lane V/C Ratio	0.494	0.01	-	-	0.063	-	-	0.06	0.02
HCM Control Delay (s)	37.9	8.8	-	-	8.9	-	-	27.7	10.2
HCM Lane LOS	E	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	2.5	0	-	-	0.2	-	-	0.2	0.1

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	0	2	0	0	0	4	62	0	0	13	4
Future Vol, veh/h	2	0	2	0	0	0	4	62	0	0	13	4
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	2	0	2	0	0	0	4	67	0	0	14	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	91	91	16	92	93	67	18	0	0	67	0	0
Stage 1	16	16	-	75	75	-	-	-	-	-	-	-
Stage 2	75	75	-	17	18	-	-	-	-	-	-	-
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	893	799	1063	892	797	997	1599	-	-	1535	-	-
Stage 1	1004	882	-	934	833	-	-	-	-	-	-	-
Stage 2	934	833	-	1002	880	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	891	797	1063	888	795	997	1599	-	-	1535	-	-
Mov Cap-2 Maneuver	891	797	-	888	795	-	-	-	-	-	-	-
Stage 1	1001	882	-	931	831	-	-	-	-	-	-	-
Stage 2	931	831	-	1000	880	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.7	0	0.4	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1599	-	-	969	-	1535	-	-
HCM Lane V/C Ratio	0.003	-	-	0.004	-	-	-	-
HCM Control Delay (s)	7.3	0	-	8.7	0	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	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	14	0	555	411	3
Future Vol, veh/h	0	14	0	555	411	3
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	15	0	603	447	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	225	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	778	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	778	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	778	-	-
HCM Lane V/C Ratio	-	0.02	-	-
HCM Control Delay (s)	-	9.7	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	61	2	2	11
Future Vol, veh/h	5	5	61	2	2	11
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	5	66	2	2	12

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	83	67	0	0	68	0
Stage 1	67	-	-	-	-	-
Stage 2	16	-	-	-	-	-
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	919	997	-	-	1533	-
Stage 1	956	-	-	-	-	-
Stage 2	1007	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	918	997	-	-	1533	-
Mov Cap-2 Maneuver	918	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	1006	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	1.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	956	1533	-
HCM Lane V/C Ratio	-	-	0.011	0.001	-
HCM Control Delay (s)	-	-	8.8	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	0	63	2	0	16
Future Vol, veh/h	9	0	63	2	0	16
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	0	68	2	0	17

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	86	69	0	0	70	0
Stage 1	69	-	-	-	-	-
Stage 2	17	-	-	-	-	-
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	915	994	-	-	1531	-
Stage 1	954	-	-	-	-	-
Stage 2	1006	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	915	994	-	-	1531	-
Mov Cap-2 Maneuver	915	-	-	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	1006	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	915	1531	-
HCM Lane V/C Ratio	-	-	0.011	-	-
HCM Control Delay (s)	-	-	9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

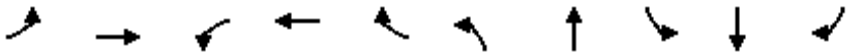
Intersection	
Int Delay, s/veh	6.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	68	39	15	22	0	10
Future Vol, veh/h	68	39	15	22	0	10
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	74	42	16	24	0	11

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	39	28	0	0	40	0
Stage 1	28	-	-	-	-	-
Stage 2	11	-	-	-	-	-
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	973	1047	-	-	1570	-
Stage 1	995	-	-	-	-	-
Stage 2	1012	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	973	1047	-	-	1570	-
Mov Cap-2 Maneuver	973	-	-	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	1012	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	999	1570	-
HCM Lane V/C Ratio	-	-	0.116	-	-
HCM Control Delay (s)	-	-	9.1	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

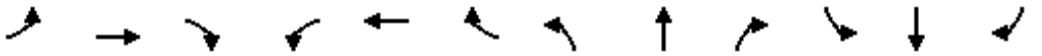


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	447	1026	35	893	233	40	100	234	55	219
v/c Ratio	0.81	0.68	0.29	0.88	0.27	0.34	0.28	0.62	0.10	0.36
Control Delay	52.1	26.1	50.5	44.4	3.0	53.2	19.7	49.8	30.4	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	26.1	50.5	44.4	3.0	53.2	19.7	49.8	30.4	5.7
Queue Length 50th (ft)	142	291	22	282	0	25	23	74	28	0
Queue Length 95th (ft)	174	316	49	328	32	54	60	113	60	53
Internal Link Dist (ft)		424		1156			2315		414	
Turn Bay Length (ft)	310		270		300	140		170		
Base Capacity (vph)	584	1519	129	1069	860	118	362	403	532	616
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.68	0.27	0.84	0.27	0.34	0.28	0.58	0.10	0.36

Intersection Summary

HCM 6th Signalized Intersection Summary
3: Ward Rd & Chipman Rd

PM Existing plus Site (Phase 1)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	362	792	39	29	750	196	33	35	47	222	52	208
Future Volume (veh/h)	362	792	39	29	750	196	33	35	47	222	52	208
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	447	978	48	35	893	233	40	43	57	234	55	219
Peak Hour Factor	0.81	0.81	0.81	0.84	0.84	0.84	0.82	0.82	0.82	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	528	1382	68	68	1030	602	74	147	194	311	460	390
Arrive On Green	0.15	0.40	0.40	0.04	0.29	0.29	0.04	0.20	0.20	0.09	0.25	0.25
Sat Flow, veh/h	3456	3448	169	1781	3554	1585	1781	729	967	3456	1870	1585
Grp Volume(v), veh/h	447	504	522	35	893	233	40	0	100	234	55	219
Grp Sat Flow(s),veh/h/ln	1728	1777	1840	1781	1777	1585	1781	0	1696	1728	1870	1585
Q Serve(g_s), s	11.7	22.1	22.1	1.8	22.2	9.9	2.0	0.0	4.7	6.2	2.1	11.2
Cycle Q Clear(g_c), s	11.7	22.1	22.1	1.8	22.2	9.9	2.0	0.0	4.7	6.2	2.1	11.2
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.57	1.00		1.00
Lane Grp Cap(c), veh/h	528	713	738	68	1030	602	74	0	341	311	460	390
V/C Ratio(X)	0.85	0.71	0.71	0.51	0.87	0.39	0.54	0.00	0.29	0.75	0.12	0.56
Avail Cap(c_a), veh/h	613	739	765	136	1119	642	124	0	341	423	460	390
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	23.3	23.3	43.9	31.3	21.0	43.7	0.0	31.6	41.3	27.2	30.7
Incr Delay (d2), s/veh	9.5	3.0	2.9	5.8	7.0	0.4	6.0	0.0	2.2	5.0	0.5	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	9.5	9.8	0.9	9.8	3.5	1.0	0.0	2.1	2.8	1.0	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	26.3	26.2	49.7	38.3	21.4	49.7	0.0	33.7	46.4	27.8	36.4
LnGrp LOS	D	C	C	D	D	C	D	A	C	D	C	D
Approach Vol, veh/h		1473			1161			140			508	
Approach Delay, s/veh		32.8			35.3			38.3			40.1	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	25.6	9.4	43.1	10.8	29.8	19.7	32.8
Change Period (Y+Rc), s	* 6.6	6.9	* 5.8	* 5.8	6.9	* 6.9	5.5	* 5.8
Max Green Setting (Gmax), s	* 11	18.0	* 7.1	* 39	6.5	* 23	16.5	* 29
Max Q Clear Time (g_c+I1), s	8.2	6.7	3.8	24.1	4.0	13.2	13.7	24.2
Green Ext Time (p_c), s	0.2	0.3	0.0	5.9	0.0	0.7	0.5	2.8

Intersection Summary	
HCM 6th Ctrl Delay	35.0
HCM 6th LOS	D

Notes

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

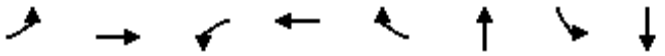
Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1197	955	37	0	88
Future Vol, veh/h	0	1197	955	37	0	88
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	110	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1301	1038	40	0	96

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	519
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	502
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	502
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

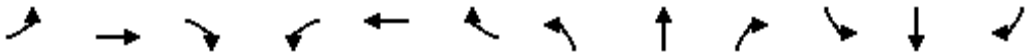
Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.9
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	502
HCM Lane V/C Ratio	-	-	-	0.191
HCM Control Delay (s)	-	-	-	13.9
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.7



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	71	1057	78	1092	186	77	305	62
v/c Ratio	0.31	0.82	0.34	0.85	0.29	0.12	0.61	0.09
Control Delay	16.1	33.3	16.7	34.7	10.0	10.1	32.6	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.1	33.3	16.7	34.7	10.0	10.1	32.6	15.5
Queue Length 50th (ft)	22	308	24	323	29	10	163	16
Queue Length 95th (ft)	44	391	46	387	71	36	254	43
Internal Link Dist (ft)		1156		2871		1038		1471
Turn Bay Length (ft)	210		170		130		100	
Base Capacity (vph)	228	1459	228	1462	722	665	498	679
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.72	0.34	0.75	0.26	0.12	0.61	0.09

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	982	11	68	950	162	3	16	45	268	33	21
Future Volume (veh/h)	67	982	11	68	950	162	3	16	45	268	33	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	71	1045	12	78	1092	186	4	19	54	305	38	24
Peak Hour Factor	0.94	0.94	0.94	0.87	0.87	0.87	0.84	0.84	0.84	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	1284	15	257	1272	567	51	170	425	577	393	248
Arrive On Green	0.07	0.36	0.36	0.07	0.36	0.36	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1781	3598	41	1781	3554	1585	31	462	1157	1327	1072	677
Grp Volume(v), veh/h	71	516	541	78	1092	186	77	0	0	305	0	62
Grp Sat Flow(s),veh/h/ln	1781	1777	1863	1781	1777	1585	1650	0	0	1327	0	1749
Q Serve(g_s), s	2.3	25.0	25.0	2.5	27.0	8.1	0.0	0.0	0.0	13.7	0.0	2.2
Cycle Q Clear(g_c), s	2.3	25.0	25.0	2.5	27.0	8.1	2.9	0.0	0.0	16.6	0.0	2.2
Prop In Lane	1.00		0.02	1.00		1.00	0.05		0.70	1.00		0.39
Lane Grp Cap(c), veh/h	235	634	665	257	1272	567	646	0	0	577	0	642
V/C Ratio(X)	0.30	0.81	0.81	0.30	0.86	0.33	0.12	0.00	0.00	0.53	0.00	0.10
Avail Cap(c_a), veh/h	258	712	747	276	1424	635	646	0	0	577	0	642
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.7	27.6	27.6	19.9	28.2	22.1	19.9	0.0	0.0	23.9	0.0	19.7
Incr Delay (d2), s/veh	0.7	6.5	6.3	0.7	5.0	0.3	0.4	0.0	0.0	3.4	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	11.4	11.9	1.0	11.4	2.9	1.2	0.0	0.0	5.9	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.4	34.2	33.9	20.6	33.3	22.5	20.3	0.0	0.0	27.4	0.0	20.0
LnGrp LOS	C	C	C	C	C	C	C	A	A	C	A	B
Approach Vol, veh/h		1128			1356			77			367	
Approach Delay, s/veh		33.2			31.0			20.3			26.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		41.9	13.0	39.9		41.9	12.9	40.0				
Change Period (Y+Rc), s		7.1	* 6	* 6.1		7.1	* 6.1	* 6.1				
Max Green Setting (Gmax), s		34.8	* 8	* 38		34.8	* 8	* 38				
Max Q Clear Time (g_c+I1), s		4.9	4.5	27.0		18.6	4.3	29.0				
Green Ext Time (p_c), s		0.4	0.0	5.1		1.2	0.0	4.9				

Intersection Summary	
HCM 6th Ctrl Delay	31.0
HCM 6th LOS	C

Notes

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

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	88	0	0	53	148	393	57	17	389	42
Future Vol, veh/h	0	0	88	0	0	53	148	393	57	17	389	42
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	-	-	0	-	-	0	130	-	140	160	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	74	74	74	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	96	0	0	72	164	437	63	19	432	47

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	216	-	-	219	479	0	0	500	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	789	0	0	785	1080	-	-	1060	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	789	-	-	785	1080	-	-	1060	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	10	2.2	0.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1080	-	-	789	785	1060	-	-
HCM Lane V/C Ratio	0.152	-	-	0.121	0.091	0.018	-	-
HCM Control Delay (s)	8.9	-	-	10.2	10	8.5	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	0.4	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	15	15	18	15	69	55	336	55	113	415	5
Future Vol, veh/h	9	15	15	18	15	69	55	336	55	113	415	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	200	-	230	210	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	84	84	84	92	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	16	16	21	18	82	60	373	61	126	461	6

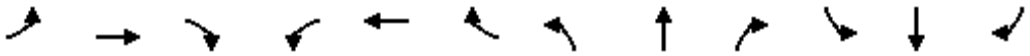
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1029	1267	231	984	1212	187	467	0	0	434	0	0
Stage 1	713	713	-	493	493	-	-	-	-	-	-	-
Stage 2	316	554	-	491	719	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	188	168	771	203	181	823	1091	-	-	1122	-	-
Stage 1	389	434	-	526	545	-	-	-	-	-	-	-
Stage 2	670	512	-	528	431	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	135	141	771	159	152	823	1091	-	-	1122	-	-
Mov Cap-2 Maneuver	135	141	-	159	152	-	-	-	-	-	-	-
Stage 1	368	385	-	497	515	-	-	-	-	-	-	-
Stage 2	550	484	-	439	383	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.1	17.8	1	1.8
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1091	-	-	135	238	159	460	1122	-	-
HCM Lane V/C Ratio	0.055	-	-	0.072	0.137	0.135	0.217	0.112	-	-
HCM Control Delay (s)	8.5	-	-	33.7	22.5	31.1	15	8.6	-	-
HCM Lane LOS	A	-	-	D	C	D	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.5	0.5	0.8	0.4	-	-

Lane Group	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	136	303	194	89	301	319
v/c Ratio	0.54	0.57	0.13	0.12	0.39	0.14
Control Delay	34.0	7.9	14.2	1.3	7.3	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	7.9	14.2	1.3	7.3	5.1
Queue Length 50th (ft)	53	0	24	0	42	21
Queue Length 95th (ft)	103	31	56	9	88	42
Internal Link Dist (ft)	1567		312			650
Turn Bay Length (ft)				90	150	
Base Capacity (vph)	660	902	1510	760	1005	2345
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.34	0.13	0.12	0.30	0.14

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	105	0	233	0	175	80	250	265	0
Future Volume (veh/h)	0	0	0	105	0	233	0	175	80	250	265	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	0	0	136	0	303	0	194	89	301	319	0
Peak Hour Factor	0.92	0.92	0.92	0.77	0.92	0.77	0.92	0.90	0.90	0.83	0.83	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	97	432	0	424	0	366	718	1481	661	748	2206	0
Arrive On Green	0.00	0.00	0.00	0.23	0.00	0.23	0.00	0.42	0.42	0.13	0.62	0.00
Sat Flow, veh/h	1076	1870	0	1418	0	1585	1781	3554	1585	1781	3647	0
Grp Volume(v), veh/h	0	0	0	136	0	303	0	194	89	301	319	0
Grp Sat Flow(s),veh/h/ln	1076	1870	0	1418	0	1585	1781	1777	1585	1781	1777	0
Q Serve(g_s), s	0.0	0.0	0.0	6.0	0.0	13.5	0.0	2.5	2.6	6.8	2.8	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	6.0	0.0	13.5	0.0	2.5	2.6	6.8	2.8	0.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	97	432	0	424	0	366	718	1481	661	748	2206	0
V/C Ratio(X)	0.00	0.00	0.00	0.32	0.00	0.83	0.00	0.13	0.13	0.40	0.14	0.00
Avail Cap(c_a), veh/h	321	820	0	719	0	695	836	1481	661	1154	2206	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	24.2	0.0	27.1	0.0	13.3	13.4	9.2	5.9	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.4	0.0	4.8	0.0	0.2	0.4	0.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	2.0	0.0	5.3	0.0	1.0	0.9	2.3	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	0.0	24.7	0.0	31.9	0.0	13.5	13.8	9.6	6.0	0.0
LnGrp LOS	A	A	A	C	A	C	A	B	B	A	A	A
Approach Vol, veh/h		0			439			283			620	
Approach Delay, s/veh		0.0			29.7			13.6			7.7	
Approach LOS					C			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.1	36.4		22.6	0.0	51.5		22.6				
Change Period (Y+Rc), s	5.5	5.5		5.5	5.5	5.5		5.5				
Max Green Setting (Gmax), s	26.5	24.5		32.5	5.0	46.0		32.5				
Max Q Clear Time (g_c+I1), s	8.8	4.6		0.0	0.0	4.8		15.5				
Green Ext Time (p_c), s	0.8	1.4		0.0	0.0	2.2		1.6				

Intersection Summary												
HCM 6th Ctrl Delay			16.2									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	2.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	24	489	6	2	405	1	40	0	19	3	0	38
Future Vol, veh/h	24	489	6	2	405	1	40	0	19	3	0	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	190	200	-	145	-	-	-	25	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	92	92	92	57	57	57	47	47	47
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	537	7	2	440	1	70	0	33	6	0	81

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	441	0	0	544	0	0	813	1034	269	765	1040	220
Stage 1	-	-	-	-	-	-	589	589	-	444	444	-
Stage 2	-	-	-	-	-	-	224	445	-	321	596	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1115	-	-	1021	-	-	270	231	729	293	229	784
Stage 1	-	-	-	-	-	-	461	494	-	563	574	-
Stage 2	-	-	-	-	-	-	758	573	-	665	490	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1115	-	-	1021	-	-	238	225	729	274	223	784
Mov Cap-2 Maneuver	-	-	-	-	-	-	238	225	-	274	223	-
Stage 1	-	-	-	-	-	-	450	483	-	550	573	-
Stage 2	-	-	-	-	-	-	678	572	-	620	479	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.4	0	22.8	10.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1	SWLn2
Capacity (veh/h)	304	1021	-	-	1115	-	-	274	784
HCM Lane V/C Ratio	0.34	0.002	-	-	0.024	-	-	0.023	0.103
HCM Control Delay (s)	22.8	8.5	-	-	8.3	-	-	18.5	10.1
HCM Lane LOS	C	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	1.5	0	-	-	0.1	-	-	0.1	0.3

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	0	4	0	0	0	2	45	0	0	12	4
Future Vol, veh/h	4	0	4	0	0	0	2	45	0	0	12	4
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	4	0	4	0	0	0	2	49	0	0	13	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	68	68	15	70	70	49	17	0	0	49	0	0
Stage 1	15	15	-	53	53	-	-	-	-	-	-	-
Stage 2	53	53	-	17	17	-	-	-	-	-	-	-
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	925	823	1065	922	821	1020	1600	-	-	1558	-	-
Stage 1	1005	883	-	960	851	-	-	-	-	-	-	-
Stage 2	960	851	-	1002	881	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	924	822	1065	917	820	1020	1600	-	-	1558	-	-
Mov Cap-2 Maneuver	924	822	-	917	820	-	-	-	-	-	-	-
Stage 1	1004	883	-	959	850	-	-	-	-	-	-	-
Stage 2	959	850	-	998	881	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.7	0	0.3	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1600	-	-	990	-	1558	-	-
HCM Lane V/C Ratio	0.001	-	-	0.009	-	-	-	-
HCM Control Delay (s)	7.3	0	-	8.7	0	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	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	9	0	414	351	10
Future Vol, veh/h	0	9	0	414	351	10
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	10	0	450	382	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	197	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	811	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	811	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	811	-	-
HCM Lane V/C Ratio	-	0.012	-	-
HCM Control Delay (s)	-	9.5	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	3	44	5	5	7
Future Vol, veh/h	3	3	44	5	5	7
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	3	48	5	5	8

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	69	51	0	0	53	0
Stage 1	51	-	-	-	-	-
Stage 2	18	-	-	-	-	-
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	936	1017	-	-	1553	-
Stage 1	971	-	-	-	-	-
Stage 2	1005	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	933	1017	-	-	1553	-
Mov Cap-2 Maneuver	933	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	1002	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	3.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	973	1553	-
HCM Lane V/C Ratio	-	-	0.007	0.003	-
HCM Control Delay (s)	-	-	8.7	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	0	49	5	0	10
Future Vol, veh/h	6	0	49	5	0	10
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	0	53	5	0	11

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	67	56	0	0	58	0
Stage 1	56	-	-	-	-	-
Stage 2	11	-	-	-	-	-
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	938	1011	-	-	1546	-
Stage 1	967	-	-	-	-	-
Stage 2	1012	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	938	1011	-	-	1546	-
Mov Cap-2 Maneuver	938	-	-	-	-	-
Stage 1	967	-	-	-	-	-
Stage 2	1012	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	938	1546	-
HCM Lane V/C Ratio	-	-	0.007	-	-
HCM Control Delay (s)	-	-	8.9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

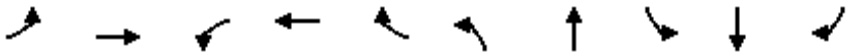
Intersection	
Int Delay, s/veh	6.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	68	39	15	22	0	12
Future Vol, veh/h	68	39	15	22	0	12
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	74	42	16	24	0	13

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	41	28	0	0	40	0
Stage 1	28	-	-	-	-	-
Stage 2	13	-	-	-	-	-
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	970	1047	-	-	1570	-
Stage 1	995	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	970	1047	-	-	1570	-
Mov Cap-2 Maneuver	970	-	-	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	1010	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	997	1570	-
HCM Lane V/C Ratio	-	-	0.117	-	-
HCM Control Delay (s)	-	-	9.1	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

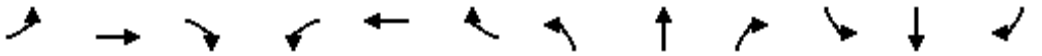


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	471	472	18	525	395	35	124	158	20	152
v/c Ratio	0.79	0.35	0.15	0.78	0.48	0.29	0.28	0.54	0.03	0.22
Control Delay	45.5	20.9	42.6	42.9	4.4	46.3	22.5	46.6	25.6	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	20.9	42.6	42.9	4.4	46.3	22.5	46.6	25.6	0.7
Queue Length 50th (ft)	132	84	10	148	0	19	42	45	9	0
Queue Length 95th (ft)	169	139	31	199	53	46	80	67	23	0
Internal Link Dist (ft)		424		1156			2315		414	
Turn Bay Length (ft)	310		270		300	140		170		
Base Capacity (vph)	636	1358	121	733	818	121	445	298	590	704
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.35	0.15	0.72	0.48	0.29	0.28	0.53	0.03	0.22

Intersection Summary

HCM 6th Signalized Intersection Summary
3: Ward Rd & Chipman Rd

AM Existing plus Site (Full Build Out)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	391	372	20	16	462	348	29	62	41	125	16	120
Future Volume (veh/h)	391	372	20	16	462	348	29	62	41	125	16	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	471	448	24	18	525	395	35	75	49	158	20	152
Peak Hour Factor	0.83	0.83	0.83	0.88	0.88	0.88	0.83	0.83	0.83	0.79	0.79	0.79
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	559	1190	64	43	748	442	70	257	168	236	502	425
Arrive On Green	0.16	0.35	0.35	0.02	0.21	0.21	0.04	0.24	0.24	0.07	0.27	0.27
Sat Flow, veh/h	3456	3431	183	1781	3554	1585	1781	1056	690	3456	1870	1585
Grp Volume(v), veh/h	471	231	241	18	525	395	35	0	124	158	20	152
Grp Sat Flow(s),veh/h/ln	1728	1777	1837	1781	1777	1585	1781	0	1746	1728	1870	1585
Q Serve(g_s), s	11.4	8.4	8.5	0.9	11.8	18.1	1.7	0.0	5.0	3.8	0.7	6.7
Cycle Q Clear(g_c), s	11.4	8.4	8.5	0.9	11.8	18.1	1.7	0.0	5.0	3.8	0.7	6.7
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	559	616	637	43	748	442	70	0	424	236	502	425
V/C Ratio(X)	0.84	0.38	0.38	0.41	0.70	0.89	0.50	0.00	0.29	0.67	0.04	0.36
Avail Cap(c_a), veh/h	651	616	637	124	748	442	124	0	424	305	502	425
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	21.1	21.1	41.3	31.4	29.8	40.4	0.0	26.5	39.1	23.3	25.5
Incr Delay (d2), s/veh	8.7	0.4	0.4	6.2	2.9	20.2	5.3	0.0	1.7	3.7	0.1	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	3.4	3.6	0.4	5.0	9.7	0.8	0.0	2.2	1.7	0.3	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.6	21.5	21.5	47.5	34.4	49.9	45.8	0.0	28.3	42.8	23.4	27.8
LnGrp LOS	D	C	C	D	C	D	D	A	C	D	C	C
Approach Vol, veh/h		943			938			159			330	
Approach Delay, s/veh		32.5			41.2			32.1			34.7	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	27.8	9.0	36.7	10.3	30.0	20.7	25.0
Change Period (Y+Rc), s	* 6.6	6.9	* 6.9	* 6.9	6.9	* 6.9	* 6.8	* 6.9
Max Green Setting (Gmax), s	* 7.6	20.9	* 6	* 28	6.0	* 23	* 16	* 18
Max Q Clear Time (g_c+I1), s	5.8	7.0	2.9	10.5	3.7	8.7	13.4	20.1
Green Ext Time (p_c), s	0.1	0.5	0.0	2.6	0.0	0.4	0.5	0.0

Intersection Summary	
HCM 6th Ctrl Delay	36.2
HCM 6th LOS	D

Notes

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

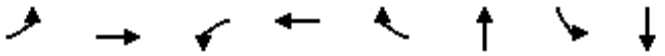
Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	782	579	39	0	110
Future Vol, veh/h	0	782	579	39	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	110	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	88	88	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	942	658	44	0	120

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	329
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	667
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	667
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	667
HCM Lane V/C Ratio	-	-	-	0.179
HCM Control Delay (s)	-	-	-	11.6
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.6

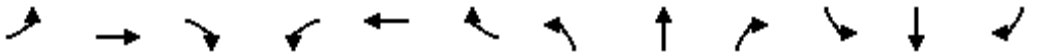


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	55	524	52	902	136	68	227	67
v/c Ratio	0.20	0.44	0.13	0.76	0.22	0.10	0.43	0.10
Control Delay	13.2	21.7	12.0	28.1	6.0	9.7	24.4	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	21.7	12.0	28.1	6.0	9.7	24.4	10.7
Queue Length 50th (ft)	15	114	14	225	5	7	95	9
Queue Length 95th (ft)	33	157	30	281	39	32	171	36
Internal Link Dist (ft)		1156		2871		1038		1471
Turn Bay Length (ft)	210		170		130		100	
Base Capacity (vph)	271	1553	397	1551	762	686	524	690
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.34	0.13	0.58	0.18	0.10	0.43	0.10

Intersection Summary

HCM 6th Signalized Intersection Summary
9: Donovan Rd & Chipman Rd

AM Existing plus Site (Full Build Out)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	487	6	45	785	118	3	13	41	200	21	38
Future Volume (veh/h)	52	487	6	45	785	118	3	13	41	200	21	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	518	6	52	902	136	4	15	49	227	24	43
Peak Hour Factor	0.94	0.94	0.94	0.87	0.87	0.87	0.84	0.84	0.84	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	262	1158	13	394	1132	505	60	157	439	597	222	398
Arrive On Green	0.07	0.32	0.32	0.07	0.32	0.32	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1781	3598	42	1781	3554	1585	34	425	1184	1338	601	1076
Grp Volume(v), veh/h	55	256	268	52	902	136	68	0	0	227	0	67
Grp Sat Flow(s),veh/h/ln	1781	1777	1863	1781	1777	1585	1643	0	0	1338	0	1677
Q Serve(g_s), s	1.6	9.1	9.2	1.5	18.6	5.1	0.0	0.0	0.0	7.3	0.0	2.1
Cycle Q Clear(g_c), s	1.6	9.1	9.2	1.5	18.6	5.1	2.2	0.0	0.0	9.5	0.0	2.1
Prop In Lane	1.00		0.02	1.00		1.00	0.06		0.72	1.00		0.64
Lane Grp Cap(c), veh/h	262	572	600	394	1132	505	656	0	0	597	0	621
V/C Ratio(X)	0.21	0.45	0.45	0.13	0.80	0.27	0.10	0.00	0.00	0.38	0.00	0.11
Avail Cap(c_a), veh/h	317	733	769	450	1462	652	656	0	0	597	0	621
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.8	21.5	21.5	16.0	25.0	20.4	16.6	0.0	0.0	18.7	0.0	16.6
Incr Delay (d2), s/veh	0.4	0.5	0.5	0.1	2.4	0.3	0.3	0.0	0.0	1.8	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	3.7	3.9	0.6	7.4	1.8	0.8	0.0	0.0	3.3	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.2	22.1	22.1	16.2	27.4	20.7	16.9	0.0	0.0	20.5	0.0	16.9
LnGrp LOS	B	C	C	B	C	C	B	A	A	C	A	B
Approach Vol, veh/h		579			1090			68			294	
Approach Delay, s/veh		21.7			26.0			16.9			19.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		36.8	11.5	31.9		36.8	11.8	31.7				
Change Period (Y+Rc), s		7.1	* 6	* 6.1		7.1	* 6.1	* 6.1				
Max Green Setting (Gmax), s		29.7	* 8	* 33		29.7	* 8.1	* 33				
Max Q Clear Time (g_c+I1), s		4.2	3.5	11.2		11.5	3.6	20.6				
Green Ext Time (p_c), s		0.3	0.0	3.1		1.0	0.0	5.0				

Intersection Summary	
HCM 6th Ctrl Delay	23.6
HCM 6th LOS	C

Notes

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

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	121	0	0	13	196	601	10	7	148	56
Future Vol, veh/h	0	0	121	0	0	13	196	601	10	7	148	56
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	-	-	0	-	-	0	130	-	140	160	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	81	92	81	92	90	90	90	90	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	132	0	0	16	213	668	11	8	164	61

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	82	-	-	334	225	0	0	679	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	961	0	0	662	1341	-	-	909	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	961	-	-	662	1341	-	-	909	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	10.6	2	0.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1341	-	-	961	662	909	-	-
HCM Lane V/C Ratio	0.159	-	-	0.137	0.024	0.009	-	-
HCM Control Delay (s)	8.2	-	-	9.3	10.6	9	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0.6	-	-	0.5	0.1	0	-	-

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	19	28	12	6	48	15	536	69	259	171	2
Future Vol, veh/h	14	19	28	12	6	48	15	536	69	259	171	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	200	-	230	210	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	71	92	71	92	90	90	90	90	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	21	30	17	7	68	16	596	77	288	190	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1100	1471	95	1310	1396	298	192	0	0	673	0	0
Stage 1	766	766	-	628	628	-	-	-	-	-	-	-
Stage 2	334	705	-	682	768	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	167	126	943	117	140	698	1379	-	-	914	-	-
Stage 1	361	410	-	437	474	-	-	-	-	-	-	-
Stage 2	653	437	-	406	409	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	108	85	943	70	95	698	1379	-	-	914	-	-
Mov Cap-2 Maneuver	108	85	-	70	95	-	-	-	-	-	-	-
Stage 1	357	281	-	432	468	-	-	-	-	-	-	-
Stage 2	575	432	-	249	280	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	34.3	25.3	0.2	6.4
HCM LOS	D	D		

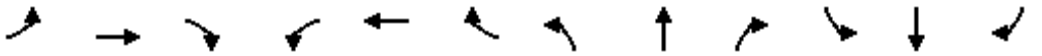
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1379	-	-	108	186	70	448	914	-	-
HCM Lane V/C Ratio	0.012	-	-	0.141	0.275	0.241	0.165	0.315	-	-
HCM Control Delay (s)	7.6	-	-	43.7	31.5	72.1	14.6	10.7	-	-
HCM Lane LOS	A	-	-	E	D	F	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	1.1	0.8	0.6	1.4	-	-

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1	4	79	137	25	570	141	230	515
v/c Ratio	0.00	0.01	0.42	0.39	0.04	0.32	0.16	0.37	0.22
Control Delay	27.0	0.0	36.3	8.1	4.0	11.7	2.3	6.0	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	0.0	36.3	8.1	4.0	11.7	2.3	6.0	6.6
Queue Length 50th (ft)	0	0	30	0	2	70	0	26	31
Queue Length 95th (ft)	5	0	76	24	9	108	17	43	68
Internal Link Dist (ft)		211	1567			312			650
Turn Bay Length (ft)					200		90	150	
Base Capacity (vph)	436	795	430	607	603	1761	864	807	2298
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.01	0.18	0.23	0.04	0.32	0.16	0.29	0.22

Intersection Summary

HCM 6th Signalized Intersection Summary
15: Ward Rd & Tudor Rd

AM Existing plus Site (Full Build Out)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	4	61	1	107	23	456	113	159	355	1
Future Volume (veh/h)	1	0	4	61	1	107	23	456	113	159	355	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1	0	4	78	1	137	25	570	141	230	514	1
Peak Hour Factor	0.92	0.92	0.92	0.78	0.92	0.78	0.92	0.80	0.80	0.69	0.69	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	289	0	189	264	3	189	627	1916	855	631	2316	5
Arrive On Green	0.12	0.00	0.12	0.12	0.12	0.12	0.03	0.54	0.54	0.11	0.64	0.64
Sat Flow, veh/h	1416	0	1585	1373	23	1585	1781	3554	1585	1781	3639	7
Grp Volume(v), veh/h	1	0	4	79	0	137	25	570	141	230	251	264
Grp Sat Flow(s),veh/h/ln	1416	0	1585	1396	0	1585	1781	1777	1585	1781	1777	1869
Q Serve(g_s), s	0.0	0.0	0.2	3.7	0.0	6.0	0.4	6.3	3.2	3.7	4.3	4.3
Cycle Q Clear(g_c), s	0.0	0.0	0.2	3.9	0.0	6.0	0.4	6.3	3.2	3.7	4.3	4.3
Prop In Lane	1.00		1.00	0.99		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	289	0	189	267	0	189	627	1916	855	631	1131	1190
V/C Ratio(X)	0.00	0.00	0.02	0.30	0.00	0.72	0.04	0.30	0.16	0.36	0.22	0.22
Avail Cap(c_a), veh/h	586	0	521	544	0	499	740	1916	855	895	1131	1190
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.7	0.0	27.8	29.5	0.0	30.3	6.8	9.0	8.3	5.4	5.5	5.5
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.6	0.0	5.2	0.0	0.4	0.4	0.4	0.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	1.3	0.0	2.4	0.1	2.2	1.1	1.1	1.3	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	0.0	27.8	30.1	0.0	35.5	6.8	9.4	8.7	5.8	6.0	5.9
LnGrp LOS	C	A	C	C	A	D	A	A	A	A	A	A
Approach Vol, veh/h		5			216			736			745	
Approach Delay, s/veh		27.8			33.5			9.2			5.9	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.4	44.0		14.0	6.5	51.0		14.0				
Change Period (Y+Rc), s	5.5	5.5		* 5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	18.5	32.5		* 24	6.5	45.5		22.5				
Max Q Clear Time (g_c+I1), s	5.7	8.3		2.2	2.4	6.3		8.0				
Green Ext Time (p_c), s	0.5	4.5		0.0	0.0	3.2		0.7				

Intersection Summary	
HCM 6th Ctrl Delay	10.9
HCM 6th LOS	B

Notes

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

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	50	496	9	9	554	1	48	0	17	8	0	11
Future Vol, veh/h	50	496	9	9	554	1	48	0	17	8	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	190	200	-	145	-	-	-	25	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	95	95	95	63	63	63	79	79	79
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	63	620	11	9	583	1	76	0	27	10	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	584	0	0	631	0	0	1056	1348	310	1037	1358	292
Stage 1	-	-	-	-	-	-	746	746	-	601	601	-
Stage 2	-	-	-	-	-	-	310	602	-	436	757	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	987	-	-	947	-	-	180	150	686	185	148	704
Stage 1	-	-	-	-	-	-	372	419	-	454	488	-
Stage 2	-	-	-	-	-	-	675	487	-	569	414	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	987	-	-	947	-	-	167	139	686	168	137	704
Mov Cap-2 Maneuver	-	-	-	-	-	-	167	139	-	168	137	-
Stage 1	-	-	-	-	-	-	348	392	-	425	483	-
Stage 2	-	-	-	-	-	-	655	482	-	512	388	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.8	0.1	38.2	17.6
HCM LOS			E	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1	SWLn2
Capacity (veh/h)	208	947	-	-	987	-	-	168	704
HCM Lane V/C Ratio	0.496	0.01	-	-	0.063	-	-	0.06	0.02
HCM Control Delay (s)	38.2	8.8	-	-	8.9	-	-	27.8	10.2
HCM Lane LOS	E	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	2.5	0	-	-	0.2	-	-	0.2	0.1

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	0	2	0	0	0	4	62	0	0	13	4
Future Vol, veh/h	2	0	2	0	0	0	4	62	0	0	13	4
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	2	0	2	0	0	0	4	67	0	0	14	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	91	91	16	92	93	67	18	0	0	67	0	0
Stage 1	16	16	-	75	75	-	-	-	-	-	-	-
Stage 2	75	75	-	17	18	-	-	-	-	-	-	-
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	893	799	1063	892	797	997	1599	-	-	1535	-	-
Stage 1	1004	882	-	934	833	-	-	-	-	-	-	-
Stage 2	934	833	-	1002	880	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	891	797	1063	888	795	997	1599	-	-	1535	-	-
Mov Cap-2 Maneuver	891	797	-	888	795	-	-	-	-	-	-	-
Stage 1	1001	882	-	931	831	-	-	-	-	-	-	-
Stage 2	931	831	-	1000	880	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.7	0	0.4	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1599	-	-	969	-	1535	-	-
HCM Lane V/C Ratio	0.003	-	-	0.004	-	-	-	-
HCM Control Delay (s)	7.3	0	-	8.7	0	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	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	14	0	578	418	3
Future Vol, veh/h	0	14	0	578	418	3
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	15	0	628	454	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	229	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	774	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	774	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	774	-	-
HCM Lane V/C Ratio	-	0.02	-	-
HCM Control Delay (s)	-	9.7	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	3	0	564	519	1
Future Vol, veh/h	0	3	0	564	519	1
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	3	0	613	564	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	283	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	714	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	714	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	714	-	-
HCM Lane V/C Ratio	-	0.005	-	-
HCM Control Delay (s)	-	10.1	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	64	0	1	17
Future Vol, veh/h	0	0	64	0	1	17
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	70	0	1	18

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	90	70	0	0	70	0
Stage 1	70	-	-	-	-	-
Stage 2	20	-	-	-	-	-
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	910	993	-	-	1531	-
Stage 1	953	-	-	-	-	-
Stage 2	1003	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	909	993	-	-	1531	-
Mov Cap-2 Maneuver	909	-	-	-	-	-
Stage 1	953	-	-	-	-	-
Stage 2	1002	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1531	-
HCM Lane V/C Ratio	-	-	-	0.001	-
HCM Control Delay (s)	-	-	0	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	5	61	2	2	11
Future Vol, veh/h	5	5	61	2	2	11
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	5	66	2	2	12

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	83	67	0	0	68	0
Stage 1	67	-	-	-	-	-
Stage 2	16	-	-	-	-	-
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	919	997	-	-	1533	-
Stage 1	956	-	-	-	-	-
Stage 2	1007	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	918	997	-	-	1533	-
Mov Cap-2 Maneuver	918	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	1006	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	1.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	956	1533	-
HCM Lane V/C Ratio	-	-	0.011	0.001	-
HCM Control Delay (s)	-	-	8.8	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	0	63	2	0	16
Future Vol, veh/h	9	0	63	2	0	16
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	0	68	2	0	17

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	86	69	0	0	70	0
Stage 1	69	-	-	-	-	-
Stage 2	17	-	-	-	-	-
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	915	994	-	-	1531	-
Stage 1	954	-	-	-	-	-
Stage 2	1006	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	915	994	-	-	1531	-
Mov Cap-2 Maneuver	915	-	-	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	1006	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	915	1531	-
HCM Lane V/C Ratio	-	-	0.011	-	-
HCM Control Delay (s)	-	-	9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

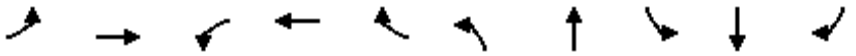
Intersection	
Int Delay, s/veh	6.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	94	53	11	28	0	21
Future Vol, veh/h	94	53	11	28	0	21
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	102	58	12	30	0	23

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	50	27	0	0	42	0
Stage 1	27	-	-	-	-	-
Stage 2	23	-	-	-	-	-
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	959	1048	-	-	1567	-
Stage 1	996	-	-	-	-	-
Stage 2	1000	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	959	1048	-	-	1567	-
Mov Cap-2 Maneuver	959	-	-	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	1000	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	989	1567	-
HCM Lane V/C Ratio	-	-	0.162	-	-
HCM Control Delay (s)	-	-	9.3	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0	-

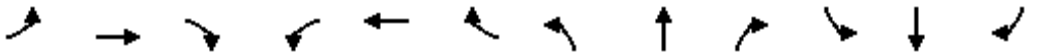


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	452	1026	35	893	236	40	101	239	57	228
v/c Ratio	0.81	0.68	0.29	0.88	0.28	0.34	0.28	0.64	0.11	0.37
Control Delay	52.5	26.1	50.6	44.5	3.0	53.2	19.9	50.2	30.4	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	26.1	50.6	44.5	3.0	53.2	19.9	50.2	30.4	6.3
Queue Length 50th (ft)	144	291	22	282	0	25	24	76	29	0
Queue Length 95th (ft)	176	316	49	328	31	54	60	116	63	58
Internal Link Dist (ft)		424		1156			2315		414	
Turn Bay Length (ft)	310		270		300	140		170		
Base Capacity (vph)	583	1519	129	1068	861	118	362	403	532	616
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.68	0.27	0.84	0.27	0.34	0.28	0.59	0.11	0.37

Intersection Summary

HCM 6th Signalized Intersection Summary
3: Ward Rd & Chipman Rd

PM Existing plus Site (Full Build Out)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	366	792	39	29	750	198	33	36	47	227	54	217
Future Volume (veh/h)	366	792	39	29	750	198	33	36	47	227	54	217
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	452	978	48	35	893	236	40	44	57	239	57	228
Peak Hour Factor	0.81	0.81	0.81	0.84	0.84	0.84	0.82	0.82	0.82	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	532	1386	68	68	1029	604	74	147	191	315	459	389
Arrive On Green	0.15	0.40	0.40	0.04	0.29	0.29	0.04	0.20	0.20	0.09	0.25	0.25
Sat Flow, veh/h	3456	3448	169	1781	3554	1585	1781	740	958	3456	1870	1585
Grp Volume(v), veh/h	452	504	522	35	893	236	40	0	101	239	57	228
Grp Sat Flow(s),veh/h/ln	1728	1777	1840	1781	1777	1585	1781	0	1698	1728	1870	1585
Q Serve(g_s), s	11.9	22.1	22.1	1.8	22.2	10.1	2.1	0.0	4.7	6.3	2.2	11.8
Cycle Q Clear(g_c), s	11.9	22.1	22.1	1.8	22.2	10.1	2.1	0.0	4.7	6.3	2.2	11.8
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.56	1.00		1.00
Lane Grp Cap(c), veh/h	532	714	740	68	1029	604	74	0	338	315	459	389
V/C Ratio(X)	0.85	0.71	0.71	0.51	0.87	0.39	0.54	0.00	0.30	0.76	0.12	0.59
Avail Cap(c_a), veh/h	612	738	764	136	1117	643	124	0	338	423	459	389
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.4	23.3	23.3	44.0	31.4	21.0	43.8	0.0	31.8	41.4	27.4	31.0
Incr Delay (d2), s/veh	9.9	3.0	2.9	5.8	7.0	0.4	6.0	0.0	2.3	5.4	0.6	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	9.5	9.8	0.9	9.8	3.5	1.0	0.0	2.1	2.9	1.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.2	26.2	26.1	49.8	38.4	21.4	49.8	0.0	34.0	46.8	27.9	37.3
LnGrp LOS	D	C	C	D	D	C	D	A	C	D	C	D
Approach Vol, veh/h		1478			1164			141			524	
Approach Delay, s/veh		32.9			35.3			38.5			40.6	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.1	25.5	9.4	43.3	10.8	29.8	19.9	32.8
Change Period (Y+Rc), s	* 6.6	6.9	* 5.8	* 5.8	6.9	* 6.9	5.5	* 5.8
Max Green Setting (Gmax), s	* 11	18.0	* 7.1	* 39	6.5	* 23	16.5	* 29
Max Q Clear Time (g_c+I1), s	8.3	6.7	3.8	24.1	4.1	13.8	13.9	24.2
Green Ext Time (p_c), s	0.2	0.3	0.0	5.9	0.0	0.7	0.5	2.8

Intersection Summary	
HCM 6th Ctrl Delay	35.2
HCM 6th LOS	D

Notes

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

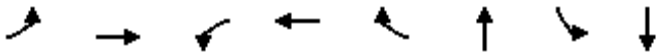
Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1197	964	37	0	90
Future Vol, veh/h	0	1197	964	37	0	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	110	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1301	1048	40	0	98

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	524
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0	498
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	498
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

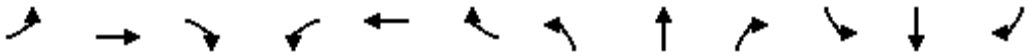
Approach	EB	WB	SB
HCM Control Delay, s	0	0	14
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	498
HCM Lane V/C Ratio	-	-	-	0.196
HCM Control Delay (s)	-	-	-	14
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.7



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	71	1062	78	1094	189	77	314	62
v/c Ratio	0.31	0.83	0.35	0.86	0.29	0.11	0.62	0.09
Control Delay	16.7	34.7	17.3	36.1	10.5	9.8	32.3	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.7	34.7	17.3	36.1	10.5	9.8	32.3	15.0
Queue Length 50th (ft)	22	316	24	329	30	9	167	16
Queue Length 95th (ft)	45	401	47	395	75	36	258	42
Internal Link Dist (ft)		1156		2871		1038		1471
Turn Bay Length (ft)	210		170		130		100	
Base Capacity (vph)	226	1405	226	1407	699	675	506	689
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.76	0.35	0.78	0.27	0.11	0.62	0.09

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	987	11	68	952	164	3	16	45	276	33	21
Future Volume (veh/h)	67	987	11	68	952	164	3	16	45	276	33	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	71	1050	12	78	1094	189	4	19	54	314	38	24
Peak Hour Factor	0.94	0.94	0.94	0.87	0.87	0.87	0.84	0.84	0.84	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	230	1268	14	251	1256	560	51	172	433	585	401	253
Arrive On Green	0.07	0.35	0.35	0.07	0.35	0.35	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1781	3599	41	1781	3554	1585	32	461	1157	1327	1072	677
Grp Volume(v), veh/h	71	518	544	78	1094	189	77	0	0	314	0	62
Grp Sat Flow(s),veh/h/ln	1781	1777	1863	1781	1777	1585	1650	0	0	1327	0	1749
Q Serve(g_s), s	2.3	25.5	25.5	2.5	27.5	8.4	0.0	0.0	0.0	14.4	0.0	2.2
Cycle Q Clear(g_c), s	2.3	25.5	25.5	2.5	27.5	8.4	2.9	0.0	0.0	17.3	0.0	2.2
Prop In Lane	1.00		0.02	1.00		1.00	0.05		0.70	1.00		0.39
Lane Grp Cap(c), veh/h	230	626	656	251	1256	560	656	0	0	585	0	654
V/C Ratio(X)	0.31	0.83	0.83	0.31	0.87	0.34	0.12	0.00	0.00	0.54	0.00	0.09
Avail Cap(c_a), veh/h	252	687	720	270	1374	613	656	0	0	585	0	654
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.3	28.3	28.3	20.5	28.9	22.7	19.7	0.0	0.0	23.8	0.0	19.4
Incr Delay (d2), s/veh	0.8	7.7	7.4	0.7	6.0	0.4	0.4	0.0	0.0	3.5	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	11.8	12.3	1.0	11.8	3.0	1.2	0.0	0.0	6.1	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.0	36.1	35.8	21.2	34.9	23.1	20.0	0.0	0.0	27.3	0.0	19.7
LnGrp LOS	C	D	D	C	C	C	C	A	A	C	A	B
Approach Vol, veh/h		1133			1361			77			376	
Approach Delay, s/veh		35.1			32.4			20.0			26.1	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	2	3	4	6	7	8
Phs Duration (G+Y+Rc), s	42.9	13.0	39.8	42.9	12.9	39.9
Change Period (Y+Rc), s	7.1	* 6	* 6.1	7.1	* 6.1	* 6.1
Max Green Setting (Gmax), s	35.8	* 8	* 37	35.8	* 8	* 37
Max Q Clear Time (g_c+I1), s	4.9	4.5	27.5	19.3	4.3	29.5
Green Ext Time (p_c), s	0.4	0.0	4.7	1.2	0.0	4.3

Intersection Summary	
HCM 6th Ctrl Delay	32.3
HCM 6th LOS	C

Notes

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

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	88	0	0	53	148	400	57	17	404	42
Future Vol, veh/h	0	0	88	0	0	53	148	400	57	17	404	42
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	-	-	0	-	-	0	130	-	140	160	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	74	74	74	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	96	0	0	72	164	444	63	19	449	47

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	225	-	-	222	496	0	0	507	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	0	0	778	0	0	782	1064	-	-	1054	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	778	-	-	782	1064	-	-	1054	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	10.1	2.2	0.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1064	-	-	778	782	1054	-	-
HCM Lane V/C Ratio	0.155	-	-	0.123	0.092	0.018	-	-
HCM Control Delay (s)	9	-	-	10.3	10.1	8.5	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	0.4	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	15	15	18	15	71	55	343	55	121	430	5
Future Vol, veh/h	9	15	15	18	15	71	55	343	55	121	430	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	85	-	-	200	-	230	210	-	200
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	84	84	84	92	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	16	16	21	18	85	60	381	61	134	478	6

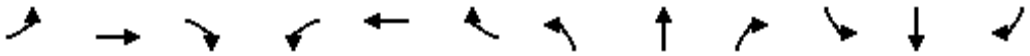
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1066	1308	239	1016	1253	191	484	0	0	442	0	0
Stage 1	746	746	-	501	501	-	-	-	-	-	-	-
Stage 2	320	562	-	515	752	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	177	158	762	192	171	818	1075	-	-	1114	-	-
Stage 1	372	419	-	521	541	-	-	-	-	-	-	-
Stage 2	666	508	-	511	416	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	125	131	762	148	142	818	1075	-	-	1114	-	-
Mov Cap-2 Maneuver	125	131	-	148	142	-	-	-	-	-	-	-
Stage 1	351	369	-	492	511	-	-	-	-	-	-	-
Stage 2	544	480	-	420	366	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.7	18.5	1	1.9
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1075	-	-	125	224	148	447	1114	-	-
HCM Lane V/C Ratio	0.056	-	-	0.078	0.146	0.145	0.229	0.121	-	-
HCM Control Delay (s)	8.5	-	-	36.2	23.8	33.4	15.4	8.7	-	-
HCM Lane LOS	A	-	-	E	C	D	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.5	0.5	0.9	0.4	-	-

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	3	15	137	303	10	194	89	301	323
v/c Ratio	0.01	0.05	0.57	0.57	0.01	0.12	0.11	0.38	0.14
Control Delay	25.0	14.8	37.7	8.2	5.0	13.9	1.4	7.3	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	14.8	37.7	8.2	5.0	13.9	1.4	7.3	6.6
Queue Length 50th (ft)	1	1	55	0	1	25	0	44	22
Queue Length 95th (ft)	8	16	122	32	7	57	11	93	64
Internal Link Dist (ft)		211	1567			312			650
Turn Bay Length (ft)					200		90	150	
Base Capacity (vph)	543	714	582	861	763	1561	774	1003	2280
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.02	0.24	0.35	0.01	0.12	0.11	0.30	0.14

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	2	12	105	1	233	9	175	80	250	267	1
Future Volume (veh/h)	3	2	12	105	1	233	9	175	80	250	267	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	2	13	136	1	303	10	194	89	301	322	1
Peak Hour Factor	0.92	0.92	0.92	0.77	0.92	0.77	0.92	0.90	0.90	0.83	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	233	49	318	393	3	359	670	1597	712	763	2074	6
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.01	0.45	0.45	0.12	0.57	0.57
Sat Flow, veh/h	1075	216	1402	1346	11	1585	1781	3554	1585	1781	3634	11
Grp Volume(v), veh/h	3	0	15	137	0	303	10	194	89	301	157	166
Grp Sat Flow(s),veh/h/ln	1075	0	1618	1358	0	1585	1781	1777	1585	1781	1777	1868
Q Serve(g_s), s	0.2	0.0	0.6	6.9	0.0	14.9	0.2	2.6	2.7	7.1	3.4	3.4
Cycle Q Clear(g_c), s	7.7	0.0	0.6	7.5	0.0	14.9	0.2	2.6	2.7	7.1	3.4	3.4
Prop In Lane	1.00		0.87	0.99		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	233	0	366	396	0	359	670	1597	712	763	1014	1066
V/C Ratio(X)	0.01	0.00	0.04	0.35	0.00	0.84	0.01	0.12	0.12	0.39	0.16	0.16
Avail Cap(c_a), veh/h	406	0	626	620	0	613	790	1597	712	1126	1014	1066
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	0.0	24.6	27.5	0.0	30.1	7.2	13.1	13.1	9.1	8.2	8.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.5	0.0	5.4	0.0	0.2	0.4	0.3	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.2	2.3	0.0	5.9	0.1	1.0	1.0	2.4	1.2	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.6	0.0	24.6	28.0	0.0	35.6	7.2	13.2	13.4	9.4	8.6	8.5
LnGrp LOS	C	A	C	C	A	D	A	B	B	A	A	A
Approach Vol, veh/h		18			440			293			624	
Approach Delay, s/veh		25.6			33.2			13.1			9.0	
Approach LOS		C			C			B			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.4	42.1		24.0	5.5	52.0		24.0				
Change Period (Y+Rc), s	5.5	5.5		5.5	4.5	5.5		5.5				
Max Green Setting (Gmax), s	26.5	25.5		31.5	6.5	46.5		31.5				
Max Q Clear Time (g_c+I1), s	9.1	4.7		9.7	2.2	5.4		16.9				
Green Ext Time (p_c), s	0.8	1.4		0.0	0.0	1.9		1.6				

Intersection Summary												
HCM 6th Ctrl Delay			17.8									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	24	490	7	2	408	1	42	0	19	3	0	38
Future Vol, veh/h	24	490	7	2	408	1	42	0	19	3	0	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	190	200	-	145	-	-	-	25	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	92	92	92	57	57	57	47	47	47
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	538	8	2	443	1	74	0	33	6	0	81

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	444	0	0	546	0	0	816	1038	269	768	1045	222
Stage 1	-	-	-	-	-	-	590	590	-	447	447	-
Stage 2	-	-	-	-	-	-	226	448	-	321	598	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1112	-	-	1019	-	-	269	229	729	291	227	782
Stage 1	-	-	-	-	-	-	461	493	-	560	572	-
Stage 2	-	-	-	-	-	-	756	571	-	665	489	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1112	-	-	1019	-	-	236	223	729	272	221	782
Mov Cap-2 Maneuver	-	-	-	-	-	-	236	223	-	272	221	-
Stage 1	-	-	-	-	-	-	450	482	-	547	571	-
Stage 2	-	-	-	-	-	-	677	570	-	620	478	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.4	0	23.6	10.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1	SWLn2
Capacity (veh/h)	299	1019	-	-	1112	-	-	272	782
HCM Lane V/C Ratio	0.358	0.002	-	-	0.024	-	-	0.023	0.103
HCM Control Delay (s)	23.6	8.5	-	-	8.3	-	-	18.6	10.1
HCM Lane LOS	C	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	1.6	0	-	-	0.1	-	-	0.1	0.3

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	0	4	2	0	0	2	45	0	0	12	4
Future Vol, veh/h	4	0	4	2	0	0	2	45	0	0	12	4
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	4	0	4	2	0	0	2	49	0	0	13	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	68	68	15	70	70	49	17	0	0	49	0	0
Stage 1	15	15	-	53	53	-	-	-	-	-	-	-
Stage 2	53	53	-	17	17	-	-	-	-	-	-	-
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	925	823	1065	922	821	1020	1600	-	-	1558	-	-
Stage 1	1005	883	-	960	851	-	-	-	-	-	-	-
Stage 2	960	851	-	1002	881	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	924	822	1065	917	820	1020	1600	-	-	1558	-	-
Mov Cap-2 Maneuver	924	822	-	917	820	-	-	-	-	-	-	-
Stage 1	1004	883	-	959	850	-	-	-	-	-	-	-
Stage 2	959	850	-	998	881	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.7	8.9	0.3	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1600	-	-	990	917	1558	-	-
HCM Lane V/C Ratio	0.001	-	-	0.009	0.002	-	-	-
HCM Control Delay (s)	7.3	0	-	8.7	8.9	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	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	9	0	423	374	10
Future Vol, veh/h	0	9	0	423	374	10
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	10	0	460	407	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	209	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	797	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	797	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	797	-	-
HCM Lane V/C Ratio	-	0.012	-	-
HCM Control Delay (s)	-	9.6	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	11	0	411	512	1
Future Vol, veh/h	0	11	0	411	512	1
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	0	447	557	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	279	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	718	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	718	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	718	-	-
HCM Lane V/C Ratio	-	0.017	-	-
HCM Control Delay (s)	-	10.1	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	49	0	0	8
Future Vol, veh/h	0	2	49	0	0	8
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	53	0	0	9

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	62	53	0	0	53	0
Stage 1	53	-	-	-	-	-
Stage 2	9	-	-	-	-	-
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	944	1014	-	-	1553	-
Stage 1	970	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	944	1014	-	-	1553	-
Mov Cap-2 Maneuver	944	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	1014	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1014	1553	-
HCM Lane V/C Ratio	-	-	0.002	-	-
HCM Control Delay (s)	-	-	8.6	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	3	44	5	5	9
Future Vol, veh/h	3	3	44	5	5	9
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	3	48	5	5	10

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	71	51	0	0	53	0
Stage 1	51	-	-	-	-	-
Stage 2	20	-	-	-	-	-
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	933	1017	-	-	1553	-
Stage 1	971	-	-	-	-	-
Stage 2	1003	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	930	1017	-	-	1553	-
Mov Cap-2 Maneuver	930	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	1000	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	2.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	972	1553	-
HCM Lane V/C Ratio	-	-	0.007	0.003	-
HCM Control Delay (s)	-	-	8.7	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	0	49	5	0	12
Future Vol, veh/h	6	0	49	5	0	12
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	0	53	5	0	13

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	69	56	0	0	58	0
Stage 1	56	-	-	-	-	-
Stage 2	13	-	-	-	-	-
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	936	1011	-	-	1546	-
Stage 1	967	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	936	1011	-	-	1546	-
Mov Cap-2 Maneuver	936	-	-	-	-	-
Stage 1	967	-	-	-	-	-
Stage 2	1010	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	936	1546	-
HCM Lane V/C Ratio	-	-	0.007	-	-
HCM Control Delay (s)	-	-	8.9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	6.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	68	39	15	22	0	12
Future Vol, veh/h	68	39	15	22	0	12
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	74	42	16	24	0	13

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	41	28	0	0	40	0
Stage 1	28	-	-	-	-	-
Stage 2	13	-	-	-	-	-
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	970	1047	-	-	1570	-
Stage 1	995	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	970	1047	-	-	1570	-
Mov Cap-2 Maneuver	970	-	-	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	1010	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	997	1570	-
HCM Lane V/C Ratio	-	-	0.117	-	-
HCM Control Delay (s)	-	-	9.1	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-