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Bent Grass Residential Filing No. 2
Traffic Impact Study
PCD File No.: SF-1914
(LSC #194460)
April 17, 2020

For File

By: Elizabeth Nijkamp
Date: 06/07/2020



El Paso County Planning & Community Development

Traffic Engineer's Statement

This traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.



Developer's Statement

I, the Developer, have read and will comply with all commitments made on my behalf within this report.

A handwritten signature in blue ink, appearing to be 'J. Nijkamp', written over a horizontal line.

4/20/2020
Date



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April 17, 2020

Jim Byers
VP of Community Development
Challenger Homes
8605 Explorer Dr, Suite 250
Colorado Springs, CO 80920

RE: Bent Grass Residential Filing No. 2
El Paso County, Colorado
Traffic Impact Analysis
LSC #194460

Dear Jim:

LSC Transportation Consultants, Inc. has prepared this updated traffic impact study for the Bent Grass Residential Filing No. 2. The site is located about one-half mile west of the intersection of Meridian Road and Bent Grass Meadows Drive in El Paso County, Colorado. Figure 1 shows the site location.

Note: A copy of the TIS Addendum Report submitted/dated March 3, 2020 is attached for reference.

LSC has completed the following studies in the vicinity of the site:

- *Bent Grass Subdivision PUD Traffic Impact Analysis* -- October 6, 2006
- *Bent Grass East Commercial – Preliminary Plan* -- January 25, 2013
- *Bent Grass East Commercial – Report Supplement #2* -- March 14, 2013
- *Bent Grass Subdivision Filing 1 Updated Traffic Impact Analysis* -- July 14, 2014
- *Bent Grass East Commercial Filing No. 2 Updated Traffic Impact Analysis* -- July 17, 2014
- *Falcon Dental East Commercial Filing No. 2A* -- March 7, 2016
- *Bent Grass Meadows Drive/Meridian Road Traffic Signal Warrant Analysis* -- October 2, 2017
- *Bent Grass East Commercial/Bent Grass Meadows Drive & Meridian Road Transportation Memorandum* March -- 21, 2019
- *Falcon Marketplace Traffic Impact Analysis* -- October 23, 2017 (September 5, 2018 Revision)

REPORT CONTENTS

The report contains the following:

- The existing roadway and traffic conditions in the site's vicinity including the roadway widths, surface conditions, lane geometries, traffic controls, and posted speed limits, etc.
- The existing traffic volumes on the study area roadways
- The projected average weekday and peak-hour vehicle-trips to be generated by the site at buildout
- The assignment of the projected additional site-generated traffic volumes to the study area roadways and intersections
- The projected short-term and long-term total traffic volumes on the study area roadway network
- The projected levels of service at the intersections of Meridian Road/Bent Grass Meadows Drive, Woodmen frontage road/Bent Grass Meadows Drive, and Woodmen Road/Golden Sage Drive and at the site access points to Bent Grass Meadows Drive
- A vehicle queueing analysis at the key study area intersections
- Recommendations for roadway improvements and phasing of these improvements

LAND USE

Figure 2 shows the existing, currently proposed, and future land uses in the vicinity of the site. The area south of Bent Grass Meadows Drive includes 104 existing single-family homes that are part of Bent Grass Residential Filing No 1 and the Bent Grass East Commercial development. The Bent Grass East Commercial development is partially developed with a veterinary clinic, a gas station with convenience store, and a dental clinic.

Bent Grass Residential Filing No. 2 is planned to include an additional 178 lots for single family homes just west of the existing Filing No. 1 lots. Bent Grass Meadows Drive is planned to be completed between the existing sections located north of the Woodmen frontage road and west of Meridian. Two full-movement access points are proposed to the new section of Bent Grass Meadows Drive. Figure 2 shows the location of the proposed access points.

EXISTING ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

The roadways in the study area are identified below, followed by a brief description of each. Figure 1 shows the roadway system.

- **Meridian Road** is shown on the *El Paso County 2040 Major Transportation Corridors Plan* and the *Preserved Corridor Network Plan* as a four-lane Principal Arterial. Meridian Road was recently expanded from two lanes to four lanes between Woodmen Road and Rolling Thunder and may soon be connected to US Highway 24. The posted speed limit is 55 miles per hour (mph).
- **Bent Grass Meadows Drive** is a Non-Residential Collector that currently extends north from the Woodmen North frontage road for about 2,000 feet and west from Meridian Road for about one-half mile. Bent Grass Meadows Drive will be extended further west and then curve south to connect to the existing section north of the Woodmen frontage road with this development. The Bent Grass Meadows Drive/Meridian Road intersection is planned to be signalized in the short-term future once warrants for signalization are satisfied. This is anticipated to occur with the development.
- **Woodmen Road** is shown on the *El Paso County 2040 Major Transportation Corridors Plan* and the *Preserved Corridor Network Plan* as a four-lane Expressway in the vicinity of the site. The posted speed limit on Woodmen Road in the vicinity of Golden Sage Road is 55 mph.
- **Woodmen Frontage Road** is a paved two-lane frontage road along the north side of Woodmen Road. The Woodmen frontage road extends from just west of Meridian Road to its current terminus west of Golden Sage Road. The posted speed limit on the Woodmen frontage road is 30 mph.

Existing Traffic Conditions

Figure 3 shows the existing morning and afternoon peak-hour traffic volumes at the intersections of Meridian Road/Bent Grass Meadows Drive, Woodmen frontage road/Bent Grass Meadows Drive and Woodmen Road/Golden Sage Road. The traffic volumes are from traffic counts conducted September 2018, May 2019 and January 2020. The traffic count reports are attached.

Existing Levels of Service

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from "A" to "F." LOS A represents control delay of less than 10 seconds for unsignalized and signalized intersections. LOS F represents

control delay of more than 50 seconds for unsignalized intersections and more than 80 seconds for signalized intersections. Table 1 shows the level of service delay ranges.

Table 1		
Intersection Levels of Service Delay Ranges		
Level of Service	Signalized Intersections	Unsignalized Intersections
	Average Control Delay (seconds per vehicle)	Average Control Delay (seconds per vehicle)⁽¹⁾
A	10.0 sec or less	10.0 sec or less
B	10.1-20.0 sec	10.1-15.0 sec
C	20.1-35.0 sec	15.1-25.0 sec
D	35.1-55.0 sec	25.1-35.0 sec
E	55.1-80.0 sec	35.1-50.0 sec
F	80.1 sec or more	50.1 sec or more
(1) For unsignalized intersections if V/C ratio is greater than 1.0 the level of service is LOS F regardless of the projected average control		

The intersections of Meridian Road/Bent Grass Meadows Drive and Woodmen frontage road/Bent Grass Meadows Drive were analyzed to determine the existing levels of service based on the unsignalized method of analysis procedures found in the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board. The intersection of Woodmen Road/Golden Sage Drive was analyzed using Synchro. Figure 3 shows the level of service analysis results. The level of service reports are attached.

The eastbound left-turn movement at the stop sign-controlled intersection of Meridian/Bent Grass Meadows is currently operating at LOS F during the morning peak hour and LOS E during the afternoon peak hour. The eastbound right-turn movement is currently operating at LOS D during the morning peak hour and LOS B during the afternoon peak hour.

All movements at the intersections of the Woodmen frontage road/Bent Grass Meadows Drive and the Woodmen frontage road/Golden Sage Road are currently operating at LOS B or better during the peak hours.

All movements at the signal-controlled intersection of Woodmen/Golden Sage are currently operating at LOS D or better during the peak hours.

TEMPORARY 7-ELEVEN ACCESS

The access to 7-Eleven on Bent Grass Meadows Drive was permitted and constructed as a temporary access and will be allowed to remain open with continued use subject to reevaluation should the following occur (from the deviation report submitted):

...traffic operational problems caused by increased traffic volumes begin to occur 2) crash experience of 5 or more crashes during a one-year time period of type that could be corrected through access closure or 3) the volume "trigger points" established in this deviation are reached. Should any of these occur, traffic engineering evaluation of the access would be conducted to determine if 1) the operational and/or problems either occurring or imminently likely with additional traffic volumes are caused by motorists turning in and out of the access 2) the problems can be remedied through design and modification of the access or 3) as a last resort, the access must be closed.

Volume trigger points proposed are peak-hour volumes using Bent Grass Meadows Drive just west of Meridian Road. A trigger volume of 200 entering and 200 exiting peak-hour trips is the point at which reevaluation should occur, as per the foregoing. This 200 is comprised of 89 entering and 89 exiting trips generated by the convenience store/gas station and 110 trips entering and 110 trips exiting to be generated by other commercial lots within the Preliminary Plan area.

To develop the triggers identified above, the SimTraffic traffic simulation model used in the Preliminary Plan traffic study was modified for short-term conditions with the proposed temporary access point. Traffic volumes, in addition to the projected convenience store traffic volumes, were loaded into the model and operations were simulated numerous times to identify the most logical volume trigger point. The trigger point has been based on 1) the point at which the eastbound left-turn queue, extending back from the Meridian/Bent Grass Meadows intersection, backed through the temporary access intersection and average of about five percent of the time during the afternoon peak hour and/or 2) the westbound left turn queue at the temporary site access exceeded one or two vehicles. Queues regularly backing through the site-access intersection have the potential to cause different operational and safety problems. Westbound queues at the site access extending back more than one or two vehicle lengths for a period of time can restrict the available distance for traffic turning from Meridian onto Bent Grass to maneuver to the right of these queued left-turning vehicles or stop safely at the back of the left-turn queue. This queue should be monitored more closely, however the simulation model indicated limited queue occurrence, as well as short queue length and duration, due to low opposing volumes arriving from the west along Bent Grass Meadows Drive. This analysis is based on several analysis parameters. These can be found in the attached Synchro analysis sheets. The results can be seen in the attached SimTraffic analysis results printouts. The analysis model used two-stage left turns from Bent Grass Meadows to northbound Meridian Road.

As shown on Figure 4, 402 vehicles were counted on Bent Grass Meadows Drive just west of Meridian Road (219 eastbound vehicles and 183 westbound vehicles) during the morning peak hour.

BACKGROUND TRAFFIC

Background traffic is the traffic estimated to be on the roadways without the Bent Grass Residential Filing No. 2 traffic. The short-term (Year 2020) background traffic volumes are shown in Figure 4. The background traffic volumes are based on the existing traffic volumes shown in Figure 3 with a portion of the volumes assumed to be rerouted with the construction of Bent Grass Meadows Drive between the existing sections located north of the Woodmen frontage road and west of Meridian Road. The short-term background traffic volumes also include additional traffic projected to be generated by **buildout of the Bent Grass East Commercial** development and **buildout of Falcon Marketplace** located northwest of the intersection of Woodmen Road/Meridian Road. As buildout of these projects has been assumed, these short-term volumes may be conservative if commercial buildout takes several years to occur. The short-term background traffic volumes also assume a right-in-only access to Woodmen Road just west of Meridian Road. Through traffic on Meridian Road was assumed to grow based on two percent growth per year.

Figure 5 shows the projected 2040 background traffic volumes. These volumes were estimated by LSC, based on previous work completed in the area by LSC, including other Bent Grass Meadows developments and the Falcon Marketplace. The 2040 background traffic volumes assume buildout of the area north of Woodmen Road and west of Meridian Road. Appendix Table 1 shows the trip generation estimates for all existing and future land uses assumed to be built out in this area by 2040.

TRIP GENERATION

Estimates of the vehicle-trips generated by Bent Grass Residential Filing No. 2 have been made using the nationally published trip generation rates found in *Trip Generation, 10th Edition* by the Institute of Transportation Engineers (ITE). The results of the trip generation estimate are shown in Table 2.

Bent Grass Residential Filing No. 2 can be expected to generate about 1,680 vehicle-trips on the average weekday, with about half entering and half exiting in a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 33 vehicles would enter, and 99 vehicles would exit the site. During the afternoon peak hour, which generally occurs for one hour between 4:15 and 6:15 p.m., about 111 vehicles would enter, and 65 vehicles would exit the site.

TRIP DISTRIBUTION AND ASSIGNMENT

The estimated directional distribution of the site-generated traffic volumes on the adjacent roadways is an important factor in determining the site's traffic impacts. Figure 6 shows the directional distribution estimates for the site-generated traffic. The estimates have been based on the following factors: the land use proposed for the site and its location; the existing and planned street and roadway system in the vicinity; and the existing/projected traffic volumes.

Trips with destination and/or origins with area bound by Woodmen Road on the south and Meridian Road on the east have been assigned separately. In the short term, a portion of the trips generated by Bent Grass Residential Filing No. 2 are estimated to travel to and from Bent Grass East Commercial development located on the southwest corner of Meridian Road and Bent Grass Meadows Drive. In the future, an additional portion of the trips by Bent Grass Residential Filing No. 2 are estimated to travel to and from the future elementary school located just east of the site, to and from the future retail development planned on the northwest corner of Meridian Road and Bent Grass Meadows Drive, and to and from the Falcon Marketplace to be located on the northwest corner of Woodmen Road and Meridian Road. Appendix Tables 1 and 2 show the internal trip assumptions and calculations.

When the external trip distribution percentages (from Figure 6) are applied to the trip generation estimates (from Table 2), the resulting site-generated traffic volumes can be determined. Figure 7 shows the short-term site-generated traffic volume estimates. The short-term site-generated traffic volumes assume Bent Grass Meadows Drive has been constructed between Meridian Road and the Woodmen frontage road.

Figure 8 shows the long-term site-generated traffic volumes. The long-term site-generated traffic volumes assume buildout of the areas north of Woodmen Road and west of Meridian Road.

TOTAL TRAFFIC

Figure 9 shows the projected short-term total traffic volumes at the site access points and key area intersections. The short-term total traffic volumes are the sum of the short-term background traffic volumes from Figure 4 plus the short-term site-generated traffic volumes from Figure 7.

Figure 10 shows the projected 2040 total traffic volumes at the site access points and key area intersections. The 2040 total traffic volumes are the sum of the 2040 background traffic volumes from Figure 5 plus the long-term site-generated traffic volumes from Figure 8.

PROJECTED LEVELS OF SERVICE

The site access points, and key area intersections were analyzed to determine the projected levels of service based on the unsignalized method of analysis procedures found in the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board or using Synchro. Figures 4, 5, 9, and 10 show the level of service analysis results. The level of service technical reports are attached.

Meridian/Bent Grass Meadows

The intersection of Meridian/Bent Grass Meadows is currently two-way, stop sign controlled. It is our understanding that this intersection will be required to be converted to traffic signal control with any additional development within Bent Grass East Commercial located southwest of this intersection. It is likely that this intersection would need to be converted to signal control, even

without additional development, once Bent Grass Meadows Drive is constructed between the two existing sections north of the Woodmen frontage road and west of Meridian Road. As a signal-controlled intersection, all movements are projected to operate at LOS D or better during the peak hours based on both short-term and 2040 total traffic volumes.

Per El Paso County requirement, the following are three potential alternatives to a conventional, signalized, full-movement intersection, for which analysis results are presented in the preceding paragraph. These include modern roundabout, unsignalized channelized T-type intersection, and a channelized T-type intersection with a directional traffic signal. Table 3 shows a comparison of the level of service for each of the options.

Modern Roundabout Intersection

A modern roundabout intersection at Bent Grass Meadows Drive/Meridian Road would be a multi-lane roundabout.

Advantages

- The delay for the side-street left turn (eastbound approach) would improve from LOS F to LOS C in the short term.
- Generally, modern roundabouts have safety advantages over signal-controlled intersections. This is because crashes tend to be lower speed, there are fewer conflict points, and the types (angle) of crashes tend to be those which generally result in less severe accidents. Granted, conventional T-intersections have significantly fewer conflict points than four-leg conventional intersections.
- A roundabout may be more aesthetically appealing than a traditional signal-controlled intersection and may have generally lower traffic noise levels.
- Long-term operation and maintenance cost is likely to be lower with a roundabout than a traffic signal.

Disadvantages

- It would likely be difficult, if not impossible, to fit a multi-lane roundabout at this location given the limited ROW available on the east side of the intersection.
- The projected afternoon level of service for the northbound through movement is projected to be worse with the roundabout than with signal control.
- The travel speed through the intersection compared with a signalized intersection during the signal green phase would be slower for through traffic on Meridian Road.

This may adversely affect travel times along the corridor. Also, if and when signalized intersections in the Meridian Road corridor are put into coordination, a roundabout would likely disrupt coordination.

Channelized-T Intersection

The channelized-T type intersection allows for an intersection with generally lower overall and side-street delay than with a conventional T-intersection and with fewer stops for the through traffic on the major roadway when compared to a conventional signalized T-intersection. An example of a channelized-T type intersection is at the intersection of US Highway 24 and Garrett Road near Falcon (El Paso County). That particular intersection is signalized with a “directional signal,” but a channelized-T at some locations can also operate as an unsignalized intersection with stop sign control on the minor street (Note: the analysis for this intersection indicates LOS F for the side-street left turn if not signalized). The raised median configuration would allow for “free” (no stopping) movement for the northbound through movement through the intersection. The eastbound left turn would cross the southbound lanes and into a channelized northbound left-turn acceleration lane for merging into northbound through traffic. This left-turn acceleration lane would need to be added on Meridian Road.

Advantages

- The intersection of Meridian/Bent Grass Meadows could likely operate at a satisfactory level of service as a stop sign-controlled intersection for longer as an unsignalized, channelized-T intersection than if it were to remain a conventional-T intersection.
- Signal control would be required to maintain an acceptable level of service, the channelized-T configuration would result in lower delay for through traffic, especially for the northbound traffic which would operate as a free movement. The overall intersection delay is projected to be better with a channelized-T intersection.
- There is the potential, depending on the time of day and traffic volumes, to allow for a longer side-street signal phase due to one-way signal progression and no red phase for northbound traffic.

Disadvantages

- The channelized-T configuration may only be viable until (and if) a dual eastbound left turn lane is needed and/or Meridian Road is widened to six lanes (however, either may not occur for many years).
- The channelized-T configuration may be confusing for some drivers and the merging movement into northbound traffic requires a more complex movement than with a

signal. However, most motorists entering the intersection from the west would be regular users and would quickly learn to navigate the intersection.

- A channelized-T intersection would require the construction of raised channelizing medians on Meridian Road and the ongoing maintenance of those medians. This would add significant cost to the project.
- The section of Meridian Road between this intersection and the Woodmen Hills Drive/Meridian Road intersection would need to be designed to accommodate a northbound left-turn acceleration lane from Bent Grass Meadows Drive with a taper and a northbound left-turn lane approaching Woodmen Hills Drive with a taper. Based on a posted speed limit of 55 mph, the El Paso County *Engineering Criteria Manual* (ECM) requires a 960-foot-long acceleration lane plus a 222-foot taper. Based on a design speed of 60 mph, the ECM requires a 290-foot-long left-turn deceleration lane approaching Woodmen Hills Drive plus storage length. The current lane length is about 700 feet plus a standard-length taper. The total length of the acceleration lane, lane tapers, and existing northbound left-turn lane for Woodmen Hills would be between 2,100 feet (1,880 if a continuous lane with a shared 222' taper length). The total distance between the intersections is about 2,000 feet (centerline to centerline).
- A channelized-T can be more difficult for pedestrians than a conventional signalized intersection. However, there may be ways to better accommodate pedestrians – such as adding a pedestrian-only phase for southbound traffic. More research would be needed regarding pedestrian accommodation.

Woodmen/Golden Sage

All movements at the intersection of Woodmen/Golden Sage are projected to operate at LOS D or better during the peak hours based on the projected short-term total traffic volumes. By 2040 the southbound and eastbound left-turn movements are projected to operate at LOS E during the morning peak hour. These movements have projected delays in the LOS E range simply because they arrive at the traffic signal at the beginning of the red phase at an intersection with many phases and a long cycle length. These movements would not be considered “failing” since their volume-to-capacity ratios are less than one. The justification is that to progress through traffic along an arterial corridor, the traffic signal offsets and left-turn phase times have been adjusted to favor the through band, which can result in higher delay for the left-turn movements even though there is sufficient capacity for them.

Woodmen North Frontage Road/Falcon Market Place (Proposed Roundabout)

The future intersection of Woodmen North Frontage Road/Falcon Market Place (Proposed Roundabout) has been included in the long-term analysis. Note: the southeast leg of this

intersection is the right-in connection from westbound Woodmen Road. The analysis indicates LOS A as shown in Figure 10.

Woodmen North Frontage Road/Golden Sage

The intersection of the Woodmen frontage road/Golden Sage is currently stop sign-controlled. All movements at this intersection are projected to operate at LOS B or better during the peak hours, based on the projected short-term total traffic volumes. By 2040 the westbound approach is projected to operate at LOS F during the morning and afternoon peak hours. All movements are projected to operate at LOS C or better, if this intersection is converted to either traffic signal control or reconstructed as a modern roundabout. Due to right-of-way and spacing constraints, the signal is most likely the primary future option. Table 4 shows a comparison of the level of service for each of the options. Due to the short spacing between the frontage road and Woodmen Road and the high volume of northbound right-turning vehicles at this intersection, LSC recommends a dual northbound right-turn to allow for better utilization of the dual eastbound left-turn lanes at the intersection of Woodmen/Golden Sage.

Possible Alternative to a Traffic Signal: A Modern Roundabout Intersection

Advantages

The delay for all movements is projected to be lower with a modern roundabout than with traffic signal control.

- Generally, modern roundabouts have safety advantages over signal-controlled intersections. This is because crashes tend to be lower speed, there are fewer conflict points, and the types (angle) of crashes tend to be those which generally result in less severe accidents. Granted, conventional T-intersections have significantly fewer conflict points than four-leg conventional intersections.

A roundabout may be more aesthetically appealing than a traditional signal-controlled intersection and may have generally lower traffic noise levels.

- Long-term operation and maintenance cost is likely to be lower with a roundabout than a traffic signal.

Disadvantages

- A roundabout could potentially require additional right-of-way and construction costs than a traffic signal. The required right-of-way may not be available.
- Due to the proximity to Woodmen Road, southbound queues extending from the signal at Woodmen Road have the potential to back into the circulating lanes of a roundabout.

Woodmen Frontage Road/Bent Grass Meadows

All movements at the stop sign-controlled intersection of the Woodmen frontage road/Bent Grass Meadows are projected to operate at LOS C or better during the peak hours, based on the projected short-term and 2040 total traffic volumes.

Site Access Points

Both full-movement site access points to Bent Grass Meadows Drive are projected to operate at LOS B or better for all movements as stop sign-controlled intersections based on the short-term and 2040 total traffic volumes.

VEHICLE QUEUING ANALYSIS

A queuing analysis was performed using Synchro/SimTraffic for the key approach turning movements at the key area intersections to determine the projected queue lengths, based on the projected total traffic volumes. The short-term and 2040 total peak-hour traffic volumes were entered into the Synchro model. The simulation was run five times. The queuing reports are attached.

The projected maximum northbound left-turn queue on Meridian Road approaching Bent Grass Meadows Drive is about 238 feet, based on the short-term total afternoon peak-hour volume and 496 feet, based on the 2040 total afternoon peak-hour volume. This queue could be accommodated by the existing 700-foot left-turn lane.

PEDESTRIAN & BICYCLE FACILITIES

- Woodmen & Meridian are shown as proposed bike routes on the MTCP Non-Motorized Plan. Also shown is a proposed secondary regional trail west of the site.
- Bent Grass Meadows Drive is sufficiently wide for bicycles with the paved shoulder.
- Developing pedestrian connections along the north side of the Woodmen North Frontage Road, Bent Grass Meadows Drive, and Meridian Park Drive. Other area sections of sidewalk/trail connections are being added as development occurs.
- Sidewalks will be added along Bent Grass Meadows Drive with the connection south to the north terminus of the existing section adjacent to the School District 49 headquarters.
- The subdivision streets will all have sidewalks to connect to the sidewalk along Bent Grass Meadows Drive.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

- Bent Grass Residential Filing No. 2 can be expected to generate about 1,680 vehicle-trips on the average weekday, with about half entering and half exiting in a 24-hour period. During the morning peak hour, about 33 vehicles would enter, and 99 vehicles would exit the site. During the afternoon peak hour about 111 additional vehicles would enter, and 65 vehicles would exit the site.

Level of Service

- The eastbound left-turn movement at the stop sign-controlled intersection of Meridian/Bent Grass Meadows is currently operating at LOS F during the morning peak hour and LOS E during the afternoon peak hour. If signalized, all movements are projected to operate at LOS D or better during the peak hours, based on the projected short-term and 2040 total traffic volumes. The Level of Service section above also discusses potential alternative traffic control options.
- All movements at the intersection of Woodmen/Golden Sage are projected to operate at LOS D or better during the peak hours, based on the projected short-term total traffic volumes. By 2040 the southbound and eastbound left-turn movements are projected to operate at LOS E during the morning peak hour.
- All movements at the stop sign-controlled intersection of the Woodmen frontage road/Golden Sage are projected to operate at LOS B or better during the peak hours, based on the projected short-term total traffic volumes. By 2040, alternate intersection control, such as a traffic signal or a modern roundabout, will likely be needed to maintain an acceptable level of service for this intersection.
- The intersection of the Woodmen frontage road/Bent Grass Meadows and the site access points to Bent Grass Meadows are projected to operate at LOS C or better for all movements during the peak hours at stop sign-controlled intersections, based on the projected short-term and 2040 total traffic volumes.

Temporary 7-Eleven Access Evaluation

- The access to 7-Eleven on Bent Grass Meadows Drive was permitted and constructed as a temporary access and will be allowed to remain open with continued use, subject to reevaluation. A trigger volume of 200 entering and 200 exiting peak-hour trips using Bent Grass Meadows Drive just west of Meridian Road was established as the point at which reevaluation should occur, as per the foregoing. As shown on Figure 4, 402 vehicles were counted on Bent Grass Meadows Drive just west of Meridian Road

(219 eastbound vehicles and 183 westbound vehicles) during the morning peak hour. The temporary access will likely need to be closed with either additional development within the Bent Grass East Commercial or the completion of Bent Grass Meadows Drive between the two existing sections.

Roadway Improvements

- Table 5 identifies the future roadway improvements that will be needed in the vicinity of the site. Table 5 also gives a recommended trigger for when each improvement will be needed.
- Table 6 shows the percentage of the projected 2040 total traffic due to Bent Grass Residential Filing No. 2. These percentages could be used to determine the pro-rata share of the cost of intersection improvements.
- There is currently a 700-foot long single northbound left-turn lane on Meridian Road approaching Bent Grass Meadows Drive. A vehicle queueing analysis indicates that this intersection could continue to operate with a single left-turn lane, based on the short-term and 2040 total traffic volumes.
- Regarding the future eastbound left-turn signal phase at Woodmen/Golden Sage: prior to the opening of the Bent Grass Meadows Boulevard to the public, signal modification plans should be prepared, and coordination with EPC DPW (and possibly the City of Colorado Springs) will be a necessary step(s) toward future implementation of this left turn phase. Steps should be taken such that the phase can be implemented shortly after it has been determined that it should be implemented. This determination would be made by monitoring the traffic volumes and operations once Bent Grass Meadows Drive connection is opened to traffic to determine if the phase should be added at that time.

* * * * *

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

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

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

JCH:KDF:jas

Enclosures: Tables 2-6
Appendix Tables 1 and 2
Figures 1-11
Traffic Count Reports
Level of Service Reports
Queuing Reports
Copy of TIS Addendum (March 3, 2020)

Tables

Table 2
Trip Generation Estimate
Bent Grass Residential Filing No. 2

Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾						Total Trips Generated					
			Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour			
				In	Out	In	Out		In	Out				
210	Single-Family Detached Housing	178 DU ⁽²⁾	9.44	0.19	0.56	0.62	0.37	1,680	33	99	111	65		
Notes:														
(1) Source: "Trip Generation, 10th Edition, 2017" by the Institute of Transportation Engineers (ITE)														
(2) DU = dwelling unit														
Source: LSC Transportation Consultants, Inc.														

Table 3
Level of Service Comparison⁽¹⁾
 Bent Grass Meadows Drive/Meridian Road

		Short-Term Total Traffic							2040 Total Traffic						
		AM Peak							AM Peak						
Scenario		Eastbound		Northbound		Southbound		Overall	Eastbound		Northbound		Southbound		Overall
		Left	Right	Left	Through	Through	Right		Left	Right	Left	Through	Through	Right	
Stop-Sign Control With Channelized "T" Configuration	Delay	1213.2	67.2	35.8	Free	Free	Free	---	>20000	193.9	214	Free	Free	Free	---
	LOS	F	F	E					F	F	F				
Modern Roundabout	Delay	17.2	37	5.9	6.4	15	20.9	16.6	35.1	107.9	7.3	8.1	31	56	40
	LOS	C	E	A	A	C	C	C	E	F	A	A	D	F	E
Conventional Signal Control	Delay	40.7	20	28.4	4.5	20.9	2.3	17	---	---	---	---	---	---	---
	LOS	D	B	C	A	C	A	B	---	---	---	---	---	---	---
Conventional Signal Control With Free Eastbound Right	Delay	41.6	0.3	28.5	4.4	20.4	2.2	15	54.1	0.4	53.7	3.3	31.2	3.5	24.5
	LOS	D	A	C	A	C	A	B	D	A	D	A	C	A	C
Signal Control With Channelized "T" Configuration	Delay	40.6	19.9	28.5	Free	20.9	2.3	16.1	54.1	0.4	53.7	Free	31.2	3.5	23.9
	LOS	D	B	C		C	A	B	D	A	D		C	A	C

		PM Peak							PM Peak						
Scenario		Eastbound		Northbound		Southbound		Overall	Eastbound		Northbound		Southbound		Overall
		Left	Right	Left	Through	Through	Right		Left	Right	Left	Through	Through	Right	
Stop-Sign Control With Channelized "T" Configuration	Delay	381.7	17.0	14.5	Free	Free	Free	---	13886.2	50.9	55.5	Free	Free	Free	---
	LOS	F	C	B					F	F	F				
Modern Roundabout	Delay	8.9	10.1	11.3	13.8	7.7	8.7	10.7	52.4	25.6	47.8	85.8	14	17.5	45.1
	LOS	A	B	B	B	A	A	B	F	D	E	F	B	C	E
Conventional Signal Control	Delay	46.4	8.1	11.5	7.5	13.9	2.5	12.2	---	---	---	---	---	---	---
	LOS	D	A	B	A	B	A	B	---	---	---	---	---	---	---
Conventional Signal Control With Free Eastbound Right	Delay	46.4	0.3	11.5	7.5	13.9	2.5	11.5	54.2	9	51	9.5	33.9	4.0	25.8
	LOS	D	A	B	A	B	A	B	D	A	D	A	C	A	C
Signal Control With Channelized "T" Configuration	Delay	46.4	8.1	11.1	Free	14.2	2.5	9.4	54.2	9	51	Free	33.9	4.0	22.6
	LOS	D	A	B		B	A	A	D	A	D		C	A	C

Note:
 (1) This table has not been updated from the October 14, 2019 TIS. The small decrease in the northbound left-turn movement and eastbound right-turn movement projected in the current TIS are not anticipated to have a significant impact.
 Source: LSC Transportation Consultants, Inc.

Table 4
Level of Service Comparison
Golden Sage Drive/Woodmen frontage road

Scenario		2040 Total Traffic									
		AM Peak					PM Peak				
		Eastbound	Westbound	Northbound		Overall	Eastbound	Westbound	Northbound		Overall
				Left	Right				Left	Right	
Stop-Sign Control	Delay	10.2	61.8	Free	Free	---	11.2	708.2	Free	Free	---
	LOS	B	F				B	F			
Modern Roundabout	Delay	7.7	5.7	3.4	Free	4.2	7.1	10.1	5	Free	5.5
	LOS	A	A	A		A	A	B	A		A
Traffic Signal Control With Single Northbound Right-Turn Lane	Delay	5	8.8	20.3	8.7	9.5	5.6	17.7	26.5	11.3	16.1
Traffic Signal Control With Dual Northbound Right-Turn Lane ⁽¹⁾	LOS	A	A	C	A	A	A	B	C	B	B
	Delay	5.3	10.4	15.3	8.9	9.8	6.0	21.8	26.9	11.9	18.3
	LOS	A	B	B	A	A	A	C	C	B	B
	Delay										

Note:
(1) Dual northbound right-turn lanes will allow for better utilization of the dual eastbound left-turn lanes at the intersection of Golden Sage/Woodmen

Source: LSC Transportation Consultants, Inc.

Table 5 Roadway System Improvements Bent Grass Residential Filing No. 2					
Description			Trigger	Timing	Reponsibility
Meridian Road/Bent Grass Meadows Road					
A	Signalize Meridian/Bent Grass Meadows	Remove existing stop-sign and replace with traffic signal control.	When warrant(s) are met -- 2 of the 3 conditions of the "Crash Experience" warrant are currently met. The current number of reported crashes (susceptible to correction with a signal) exceeds the threshold as do the associated traffic volume thresholds.	With opening of the approved expansion of the veterinary clinic or Once El Paso County determines that the remaining condition within the Crash Experience Warrant has been met (determines that alternatives have failed to reduce crash frequency) and determines that a signal should be installed.	Bent Grass Metro District
B	Right-turn acceleration lane on Meridian at Bent Grass Meadows	ECM criteria indicates the acceleration lane would need to be 960 feet long plus a 222-foot taper based on the design speed of 60 mph. Note that Owl Lane is located approximately 925 feet south of Bent Grass Meadows Drive. Therefore, the lane would be a continuous acceleration/deceleration lane between Bent Grass Meadows Drive and Owl Lane.	ECM criteria has been exceeded. A deviation was previously approved waiving this requirement with the development of Bent Grass Residential Filing 1 and Bent Grass East Commercial Filing 2A. Additional development will either require the submittal and approval of a new deviation or construction of this improvement. (Notes: The installation of the traffic signal will regularly stop southbound traffic allowing eastbound right turns to enter southbound Meridian Road without an acceleration lane. The LOS analysis indicates significant improvement of the LOS with the signal. The crash data does not indicate a safety issue with the current eastbound right movement without the accel lane. Several costly improvements may be needed to build the accel lane -- including burying the overhead power lines south to Owl Place, reconstructing the ditch section along the west side of Meridian Road, and reworking the radius at Meridian Road. This intersection is similar to the Meridian/Woodmen Hills, Meridian/Stapleton, and Meridian/Londonderry intersections to the north in that [or "to the extent that"] southbound right acceleration lanes have not been added. If the County ultimately wants a raised right-turn island on this southwest corner of the Bent Grass Meadows/Meridian Road intersection in conjunction with an accel lane, this would likely need to be accomplished later with the overall widening of Bent Grass Meadows just west of Meridian Road.	Accel lane construction or a deviation -- with any development beyond the approved expansion of the veterinary clinic and expansion of parking for the dental clinic.	Bent Grass Metro District
Bent Grass Meadows Dr					
C	Construct Bent Grass Meadows Drive between the existing sections located north of the Woodmen frontage road and west of Meridian Road	Construct Bent Grass Meadows Drive as a Non-Residential Collector	With any development west of Bent Grass Residential Filing No. 1	With the currently proposed Bent Grass Residential Filing No. 2	Bent Grass Metro District
D	Restrict westbound left-turn at 7-Eleven access	Remove the striping for the left-turn bay at the 7-Eleven access, restripe for two sets of dual yellow lines as shown in Figure 9. If trigger for closure of westbound left-in is reached prior to the trigger for access closure, install No Left Turn signs and reflective, plastic delineators within the painted center median across the 7-Eleven access.	When westbound left-turn queue exceeds the length of the existing lane.	"With 50% percent development of the remaining vacant parcels within Bent Grass East Commercial beyond the approved expansion of the veterinary clinic and expansion of parking for the dental clinic. or With the completion of Bent Grass Meadows Dr between the Woodmen frontage road and Meridian Road	Bent Grass Metro District
E	Close 7-Eleven Access	Remove the existing curb cut.	When the eastbound right-turn queue approaching Meridian Road blocks the access and/or if motorists exiting from the 7-Eleven access and turning into the eastbound left-turn lane approaching Meridian Road regularly impede/block the adjacent eastbound right-turn lane approaching Meridian Road.	With 50% percent development of the remaining vacant parcels within Bent Grass East Commercial beyond the approved expansion of the veterinary clinic and expansion of parking for the dental clinic. or With the completion of Bent Grass Meadows Dr between the Woodmen frontage road and Meridian Road	Bent Grass Metro District
Woodmen frontage road/Bent Grass Meadows Dr					
F	Eastbound left-turn lane on Woodmen frontage road approaching Bent Grass Meadows Dr.	ECM criteria indicates the left-turn lane would need to be 315 feet long (155 feet of deceleration length plus 160 feet of storage length) plus a 160-foot taper based on the design speed of 40 mph.	When the eastbound left-turn volume exceeds 25 vehicles per hour	With the completion of Bent Grass Meadows Dr between the Woodmen frontage road and Meridian Road	Bent Grass Metro District*
Woodmen/Golden Sage					
G	Add protected/permitted phasing for left-turn movements	Prepare a traffic signal modification plan and furnish/install new traffic signal heads for protected-permissive phasing and other necessary hardware, software needed to implement this phase; modify existing signal timing plan.	If/when needed to maintain acceptable level of service/traffic operations and/or to control vehicle queues. .	--Prior to the opening of the Bent Grass Meadows Boulevard to the public, signal modification plans should be prepared, and coordination with EPC DPW (and possibly the City of Colorado Springs) will be a necessary step(s) toward future implementation of this left turn phase. Steps should be taken such that the phase can be implemented shortly after it has been determined that it should be implemented. This determination would be made by monitoring the traffic volumes and operations once Bent Grass Meadows Drive connection is opened to traffic to determine if the phase should be added at that time.	Bent Grass Metro District* - pro-rata share (based on total traffic volumes) of the cost of the improvement. ⁽¹⁾ Note: Other potential responsibility for participation: In addition to the yet-to-be developed properties within the Bent Grass Metro District service area and the Falcon Marketplace development, other future developers of currently vacant lane within the "travel shed" of the north leg (and potentially the south leg) of the Golden Sage/Woodmen and Golden Sage/Woodmen N. Frontage Road intersection may also be assigned as responsible participants in future or completed (if a cost recovery agreement is put in place) traffic/roadway improvements.
H	Lengthening of the current eastbound single left-turn deceleration lane on Woodmen approaching Golden Sage Road	Provide a 240-foot transition taper (20:1 taper ratio), 290 feet of deceleration distance plus sufficient vehicle stacking distance. CURRENT: 175-foot taper plus a 465-foot left-turn lane which translates to a 175-foot taper, 290-foot deceleration distance, and 175 feet of stacking distance. SHORT TERM: Adequate stacking is available in the current turn lane - calculated queue length 204 feet. LONG TERM: Lengthen single left-turn lane and/or future implementation of dual left-turn lanes (if capacity needs dictate). If a dual left is implemented in the future, consideration will need to be given to the configuration on Golden Sage and at the Golden Sage/Woodmen Frontage Road intersection to receive the dual left-turn movement.	The estimated "trigger" of 40 PM peak hour eastbound left turns above the estimated short term total volume (from Figure 16a of the TIS) approximately translates to and additional 589 directional ADT for residential trips making this turning movement (based on the ITE single family trip ratio). This estimated threshold may be reached with a combination of site-generated trips and background trips.	AS NEEDED TO MAINTAIN ADEQUATE LEVEL OF SERVICE AND VEHICLE STACKING DISTANCE. " This is estimated to be when the eastbound left turn turning volume reaches approximately 200 vehicles per hour during the PM peak. This translates to about 40 vehicles per hour over the estimated short term total volume from Figure 16a of the Falcon Marketplace TIS. Note: Short term total volumes assume the Meridian extension to Highway 24 to be open.	Bent Grass Metro District*- pro-rata share (based on total traffic volumes) of the cost of the improvement. ⁽¹⁾ Note: Other potential responsibility for participation: In addition to the yet-to-be developed properties within the Bent Grass Metro District service area and the Falcon Marketplace development, other future developers of currently vacant lane within the "travel shed" of the north leg (and potentially the south leg) of the Golden Sage/Woodmen and Golden Sage/Woodmen N. Frontage Road intersection may also be assigned as responsible participants in future or completed (if a cost recovery agreement is put in place) traffic/roadway improvements.
I	Southbound exclusive right-turn lane on Golden Sage Road approaching Woodmen Road	A continuous right-turn lane within the 150 feet between the Woodmen Frontage Road and Woodmen Road	The estimated "trigger" of 5-30 AM peak hour southbound right turns above the estimated short term total volume (from Figure 16a of the Falcon Marketplace TIS) approximately translates to an additional 85-510 directional ADT for residential trips making this turning movement (based on the ITE single family trip ratio). This estimated threshold may be reached with a combination of site-generated trips and background trips.	AS NEEDED TO MAINTAIN ADEQUATE LEVEL OF SERVICE AND VEHICLE STACKING DISTANCE. " A preliminary trigger could be a southbound right turn volume of about 150-175 vehicles per hour. This translates to about 5 to 30 vehicles per hour over the projected short term volume from Figure 16a of the Falcon Marketplace TIS. This may be conservative due to the westbound right turn acceleration lane on Woodmen Road. Additional study may indicate a higher threshold based on empirical data collection and analysis.	Bent Grass Metro District - pro-rata share (based on total traffic volumes) of the cost of the improvement. ⁽¹⁾ Note: Other potential responsibility for participation: In addition to the yet-to-be developed properties within the Bent Grass Metro District service area and the Falcon Marketplace development, other future developers of currently vacant lane within the "travel shed" of the north leg (and potentially the south leg) of the Golden Sage/Woodmen and Golden Sage/Woodmen N. Frontage Road intersection may also be assigned as responsible participants in future or completed (if a cost recovery agreement is put in place) traffic/roadway improvements
J	Signalization of Golden Sage Road/Woodmen Frontage Road or reconstruction as a modern roundabout; Future additional laneage may be necessary at this intersection to accommodate vehicle queues and for traffic operations.	Remove existing stop-signs and replace with traffic signal control or reconstruct as modern roundabout	If/when needed to maintain acceptable level of service/traffic operations and/or to control vehicle queues. Fair-share participation by the development or the district on behalf of the district members.	If/when needed to maintain acceptable level of service/traffic operations and/or to control vehicle queues.	Bent Grass Metro District* - pro-rata share (based on total traffic volumes) of the cost of the improvement. ⁽¹⁾ Note: Other potential responsibility for participation: In addition to the yet-to-be developed properties within the Bent Grass Metro District service area and the Falcon Marketplace development, other future developers of currently vacant lane within the "travel shed" of the north leg (and potentially the south leg) of the Golden Sage/Woodmen and Golden Sage/Woodmen N. Frontage Road intersection may also be assigned as responsible participants in future or completed (if a cost recovery agreement is put in place) traffic/roadway improvements.
Notes:	*Note: It is our understanding that the specifics of the district participation will need to be included in the SIA/revised development agreement to be completed and finalized prior to the development of lots beyond the initial 49 lots. If for some reason the District is unable or unwilling to participate, or if determination by the district is delayed, the applicant would be responsible. In this case, an escrow agreement between the applicant and the County would be prepared and finalized). We understand that staff would like for that the applicant to understand the estimated/approximate costs associated with their fair share of future improvements at Golden Sage/Woodmen. LSC will provide preliminary fair share cost estimates utilizing available information from the Falcon Marketplace SIA. This will be provided by March 31st to the applicant and staff.				
(1) See Table 6 for pro-rata percentage calculations					
Source: LSC Transportation Consultants, Inc. (3-18-2020 w/formatting only 4-19-2020)					

Table 6						
Prorata Share Contribution Calculations						
Bent Grass Residential Filing No. 2						
Item	Improvement Description and Estimated Cost		AM	PM	AM + PM	
G	Add protected/permitted phasing at Woodmen/Golden Sage		Site-Generated Traffic ⁽¹⁾ (vehicles per hour)	12	52	64
			2040 Total Traffic ⁽¹⁾ (vehicles per hour)	374	442	816
			%	3.21%	11.76%	7.84%
	Estimated Improvement Cost:	\$ 33,750	Estimated Fair-Share Portion for this project based on calculated AM + PM percentage:		\$ 2,647	
H	Lengthening of the current eastbound single left-turn deceleration lane on Woodmen approaching Golden Sage Road		Site-Generated Traffic ⁽¹⁾ (vehicles per hour)	12	52	64
			2040 Total Traffic ⁽¹⁾ (vehicles per hour)	374	442	816
			%	3.21%	11.76%	7.84%
	Estimated Improvement Cost:	\$ 200,000	Estimated Fair-Share Portion for this project based on calculated AM + PM percentage:		\$ 15,686	
I	Southbound exclusive right-turn lane on Golden Sage Road approaching Woodmen Road		Site-Generated Traffic ⁽²⁾ (vehicles per hour)	39	30	69
			2040 Total Traffic ⁽²⁾ (vehicles per hour)	366	430	796
			%	10.66%	6.98%	8.67%
	Estimated Improvement Cost:	\$ 100,000	Estimated Fair-Share Portion for this project based on calculated AM + PM percentage:		\$ 8,668	
J	Signalization of Golden Sage Road/Woodmen Frontage Road or reconstruction as a modern roundabout; Future additional laneage may be necessary at this intersection to accommodate vehicle queues and for traffic operations.		Site-Generated Traffic ⁽³⁾ (vehicles per hour)	51	84	135
			2040 Total Traffic ⁽³⁾ (vehicles per hour)	1124	1401	2525
			%	4.54%	6.00%	5.35%
	Estimated Improvement Cost:	\$ 350,000	Estimated Fair-Share Portion for this project based on calculated AM + PM percentage:		\$ 18,713	
Notes:						
(1) Eastbound left-turn volume at the intersection of Woodmen/Golden Sage						
(2) Southbound right-turn volume at the intersection of Woodmen/Golden Sage						
(3) Sum of all traffic volumes at the intersection of Golden Sage/Woodmen frontage road						
Source: LSC Transportation Consultants, Inc.						
5/26/2020						

Appendix Tables

Bent Grass Residential Filing No. 2 Study Area Trip Generation Estimate

TAZ Name		Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾					Total Trips Generated					TAZ Internal Trips	Total Trips Internal to The TAZ					Total Trips Internal to The Study Area					New External Trips Generated		
					Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour			Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Pass-By Trips ⁽²⁾	Average New Weekday Traffic	
						In	Out	In	Out		In	Out	In	Out			In	Out	In	Out		In	Out	In	Out			
	Bent Grass Residential Fil 2 South	210	Single-Family Detached Housing	121 DU ⁽³⁾	9.44	0.19	0.56	0.62	0.37	1,142	22	67	75	44	0%	0	0	0	0	0	123	7	15	5	3	0%	1,019	
	Bent Grass Residential Fil 2 North	57 DU	Single-Family Detached Housing	57 DU	9.44	0.19	0.56	0.62	0.37	538	11	32	36	21	0%	0	0	0	0	0	58	3	7	3	2	0%	480	
1	Bent Grass Residential Future Filings East	210	Single-Family Detached Housing	57 DU	9.44	0.19	0.56	0.62	0.37	538	11	32	36	21	0%	0	0	0	0	0	58	3	7	3	2	0%	480	
	Bent Grass Residential Future Filings Middle	210	Single-Family Detached Housing	25 DU	9.44	0.19	0.56	0.62	0.37	236	5	14	16	9	0%	0	0	0	0	0	25	1	3	2	0	0%	211	
	Bent Grass Residential Future Filings West	210	Single-Family Detached Housing	49 DU	9.44	0.19	0.56	0.62	0.37	463	9	27	31	18	0%	0	0	0	0	0	50	2	6	2	2	0%	413	
2	Bent Grass School	520	Elementary School	500 Students	1.89	0.36	0.31	0.08	0.09	945	181	154	41	44	0%	0	0	0	0	0	473	91	39	10	22	0%	472	
		54 DU	Single-Family Detached Housing	54 DU	9.44	0.19	0.56	0.62	0.37	510	10	30	34	20	0%	0	0	0	0	0	55	3	7	2	2	0%	455	
3	Single Family/Retail/Office	210	Shopping Center	115 KSF ⁽⁴⁾	83.44	2.93	1.80	3.40	3.69	960	34	21	39	42	2%	19	1	0	1	1	10	0	0	0	0	34%	614	
		710	General Office Building	17 KSF	10.74	1.15	0.19	0.19	0.98	183	20	3	3	17	8%	19	0	1	1	1	2	0	0	0	0	0%	162	
4	Retail/Office	820	Shopping Center	24.4 KSF	83.44	2.93	1.80	3.40	3.69	2,036	72	44	83	90	2%	41	1	1	2	2	20	1	0	1	1	34%	1,303	
		710	General Office Building	50 KSF	10.74	1.15	0.19	0.19	0.98	537	57	9	9	49	8%	41	1	1	2	2	5	0	0	0	0	0%	491	
5	Bent Grass Residential Filing 1	210	Single-Family Detached Housing	102 DU	9.44	0.19	0.56	0.62	0.37	963	19	57	64	37	0%	0	0	0	0	0	104	6	12	5	3	0%	859	
	Bent Grass East Commercial Existing	---	Gas Station/Vet/Clinic/Dental Clinic	---	---	---	---	---	---	2,670	184	150	130	137	5%	134	9	8	7	27	1	1	1	1	1	50%	1,254	
		640	Animal Hospital/Veterinary Clinic	4.171 KSF	21.50	2.72	1.34	1.89	2.83	90	11	6	8	12	5%	5	1	0	0	1	1	0	0	0	0	0%	84	
		932	Fast-Turnover Sit-Down Restaurant	4.8 KSF	112.18	5.47	4.47	6.06	3.71	538	26	21	29	18	5%	27	1	1	1	1	5	0	0	0	0	43%	288	
		930	Fast Casual Restaurant	5 KSF	315.17	1.39	0.68	7.77	6.36	1,576	7	3	39	32	5%	79	0	0	2	2	16	0	0	1	1	43%	844	
		770	Business Park	10.8 KSF	76.88	1.29	0.23	0.48	1.36	830	14	2	5	15	5%	42	1	0	0	0	1	0	0	0	0	0%	780	
		820	Shopping Center	42 KSF	79.40	2.55	1.57	3.27	3.54	3,329	107	66	137	149	5%	166	5	3	7	7	33	1	1	1	2	34%	2,066	
7	Bent Grass Industrial	110	General Light Industrial	54 KSF	4.96	0.62	0.08	0.08	0.55	268	33	5	4	30	0%	0	0	0	0	0	0	0	0	0	0	0%	268	
	Bent Grass Multi-Family	220	Multifamily Housing Low-Rise	153 DU	7.32	0.11	0.35	0.35	0.21	1,120	16	54	54	32	0%	0	0	0	0	0	121	7	14	5	3	0%	966	
	Falcon Mini-Storage	151	Mini-Warehouse	3.74 Storage Units (100s)	17.77	0.49	0.47	1.03	1.03	66	2	2	4	1	0%	0	0	0	0	0	0	0	0	0	0	0%	69	
	Latigo Business Center	110	General Light Industrial	243 KSF	4.96	0.62	0.08	0.08	0.55	1,205	150	20	20	133	0%	0	0	0	0	0	0	0	0	0	0	0%	1,205	
11	Mountain View Electric	---	Mountain View Electric ⁽⁵⁾	---	---	---	---	---	---	650	105	50	36	98	0%	0	0	0	0	0	0	0	0	0	0	0%	650	
		110	General Light Industrial	218 KSF	4.96	0.62	0.08	0.08	0.55	1,081	134	18	18	119	0%	0	0	0	0	0	0	0	0	0	0	0%	1,081	
		820	Shopping Center	318 KSF	41.52	0.61	0.37	1.93	2.09	1,931	118	614	665	0%	0	0	0	0	0	132	4	3	5	6	20%	10,457		
12	Owl Lane Redevelopment	140 DU	Single-Family Detached Housing	140 DU	9.44	0.19	0.56	0.62	0.37	1,322	26	78	87	51	0%	0	0	0	0	0	143	8	18	7	5	0%	1,179	
		220	Multifamily Housing Low-Rise	120 DU	7.32	0.11	0.35	0.35	0.21	878	13	43	42	25	0%	0	0	0	0	0	95	5	11	5	3	0%	783	
13	Falcon School District 49 ⁽⁶⁾	---	Administration Office/Bus Barn	---	---	---	---	---	---	779	3	29	5	24	0%	0	0	0	0	0	0	0	0	0	0	0%	779	
14	Latigo	140	Manufacturing	29.34 Acres	33.92	3.95	0.44	1.95	2.59	995	116	13	57	76	0%	0	0	0	0	0	0	0	0	0	0	0%	995	
15	Courtyards at Woodmen Hills West	210	Single-Family Detached Housing	210 DU	9.44	0.19	0.56	0.62	0.37	2,058	40	121	136	80	0%	0	0	0	0	0	96	2	3	4	4	0%	1,962	
		866	Pet Supply Superstore	15 KSF ⁽⁷⁾	38.24	0.53	0.33	1.69	1.69	574	8	5	25	25	0%	54	1	2	3	2	6	0	0	0	0	10%	463	
		850	Supermarket	123 KSF	78.26	2.11	1.29	3.76	3.62	9,626	259	159	463	445	0%	909	17	26	48	37	96	3	2	4	4	36%	5517	
		944	Gasoline/Service Station	18 VFP ⁽⁸⁾	168.56	6.20	5.96	6.94	6.94	3,034	112	107	125	125	0%	286	5	8	15	12	30	1	1	1	1	56%	1196	
		934	Fast-Food Restaurant with Drive-Through Window	2.5 KSF ⁽⁹⁾	496.12	0.42	0.39	16.98	15.67	1,240	1	1	42	39	0%	380	0	0	12	17	12	0	0	1	1	50%	424	
		820	Shopping Center	5 KSF	55.14	0.77	0.47	2.36	2.51	276	4	2	12	13	26	1	0	1	1	3	3	0	0	0	0	34%	163	
		848	Tire Store	7.72 KSF	24.87	1.82	1.07	1.78	2.37	192	14	8	14	18	0%	18	0	1	1	1	2	0	0	0	0	28%	124	
		934	Fast-Food Restaurant with Drive-Through Window	3.5 KSF	496.12	23.16	22.26	16.98	15.67	1,736	81	78	59	55	0%	532	26	12	17	24	17	0	0	1	1	50%	593	
		934	Fast-Food Restaurant with Drive-Through Window	2.5 KSF ⁽⁹⁾	496.12	0.42	0.39	16.98	15.67	1,240	1	1	42	39	0%	380	0	0	12	17	12	0	0	1	1	50%	424	
		610	Coffee	7.8 KSF	31.45	2.19	2.19	2.12	3.06	245	17	17	17	24	0%	40	3	16	10	5	2	0	0	0	0	20%	203	
		820	Shopping Center	9 KSF	55.14	0.77	0.47	2.36	2.51	276	4	2	12	13	26	1	0	1	2	4	4	0	0	0	0	34%	163	
		937	Coffee/Donut Shop With Drive-Through Window	1.3 KSF	818.58	51.30	49.28	21.40	21.40	1,064	67	64	28	28	0%	326	21	10	9	12	11	0	0	0	0	89%	80	
TOTAL											61,377	2,201	1,735	2,738	2,943		3,566	95	91	153	155	1,855	149	150	70	70		42,147
Notes:																												
(1) Source: "Trip Generation, 10th Edition, 2017" by the Institute of Transportation Engineers (ITE)																												
(2) Source: "Trip Generation Handbook - An ITE Proposed Recommended Practice, Second Edition" by ITE																												
(3) DU = dwelling unit																												
(4) KSF = thousand square feet																												
(5) Trip generation based on peak-hour intersection turning movement counts by LSC in May 2019																												
(6) Trip generation based on information based on peak-hour intersection turning movement counts by LSC May 2019																												
(7) Daily and morning peak-hour trip generation rates for Pet Supply Superstore are estimates by LSC																												
(8) VFP = vehicle fueling position																												
(9) The AM peak-hour trip generation rates have been reduced by LSC as the proposed fast-food restaurant does not serve breakfast																												
(10) Based on the NCHRP 684 Internal Trip Capture Estimate Tool																												
Source: LSC Transportation Consultants, Inc.																												

**Appendix Table 2
Bent Grass Residential Fil No. 2
Internal Trip Estimate**

Land Use	Raw ITE Trip Generation (Individual Driveway)						Percent Internal Trips					Total Internal Trips					
	Daily	AM Peak Hour		PM Peak Hour			Daily	AM Peak Hour		PM Peak Hour		Daily	AM Peak Hour		PM Peak Hour		
		In	Out	In	Out			In	Out	In	Out		In	Out			
Single-Family Detached Housing	7,770	153	458	515	301	School Other Total	5%	21%	16%	4%	3%	473	39	91	22	10	
Multifamily Housing (Low-Rise)	1,998	29	97	96	57		5%	5%	2%	3%	5%	456	9	13	21	19	
							10%	26%	19%	7%	8%	929	48	104	43	29	
	9,768	182	555	611	358												
Elementary School	945	181	154	41	44		50%	50%	25%	25%	50%	473	91	39	10	22	
Retail/Office	45,620	1,295	889	1,942	2,057		1%	1%	1%	1%	1%	456	13	9	19	21	
Industrial/Manufacturing	5,044	543	137	144	484		0%	0%	0%	0%	0%	0	0	0	0	0	
TOTAL Non-Residential	51,609	2,019	1,180	2,127	2,585							929	104	48	29	43	
TOTAL	61,377	2,201	1,735	2,738	2,943							1,858	152	152	72	72	

Notes:

Figures

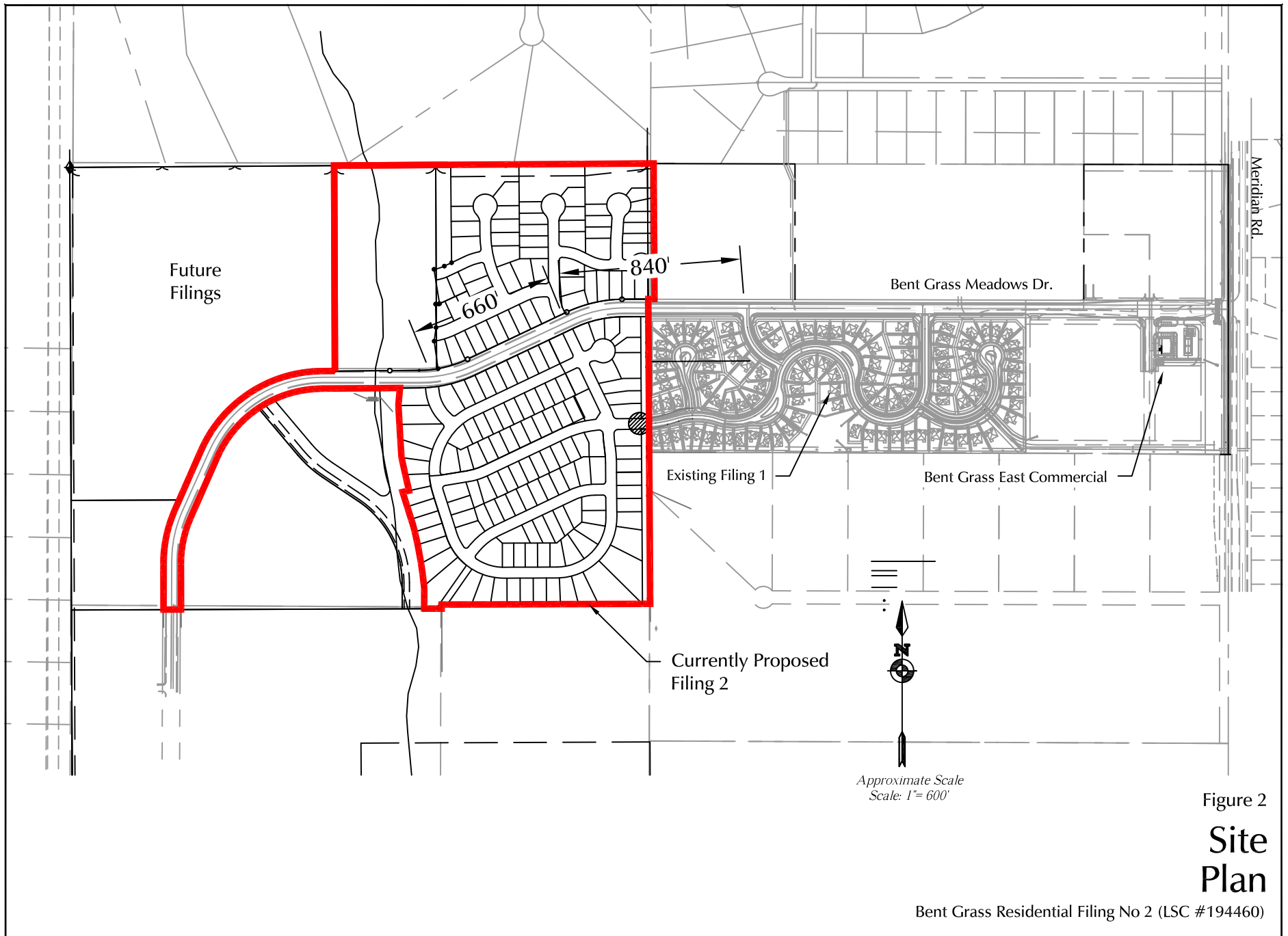


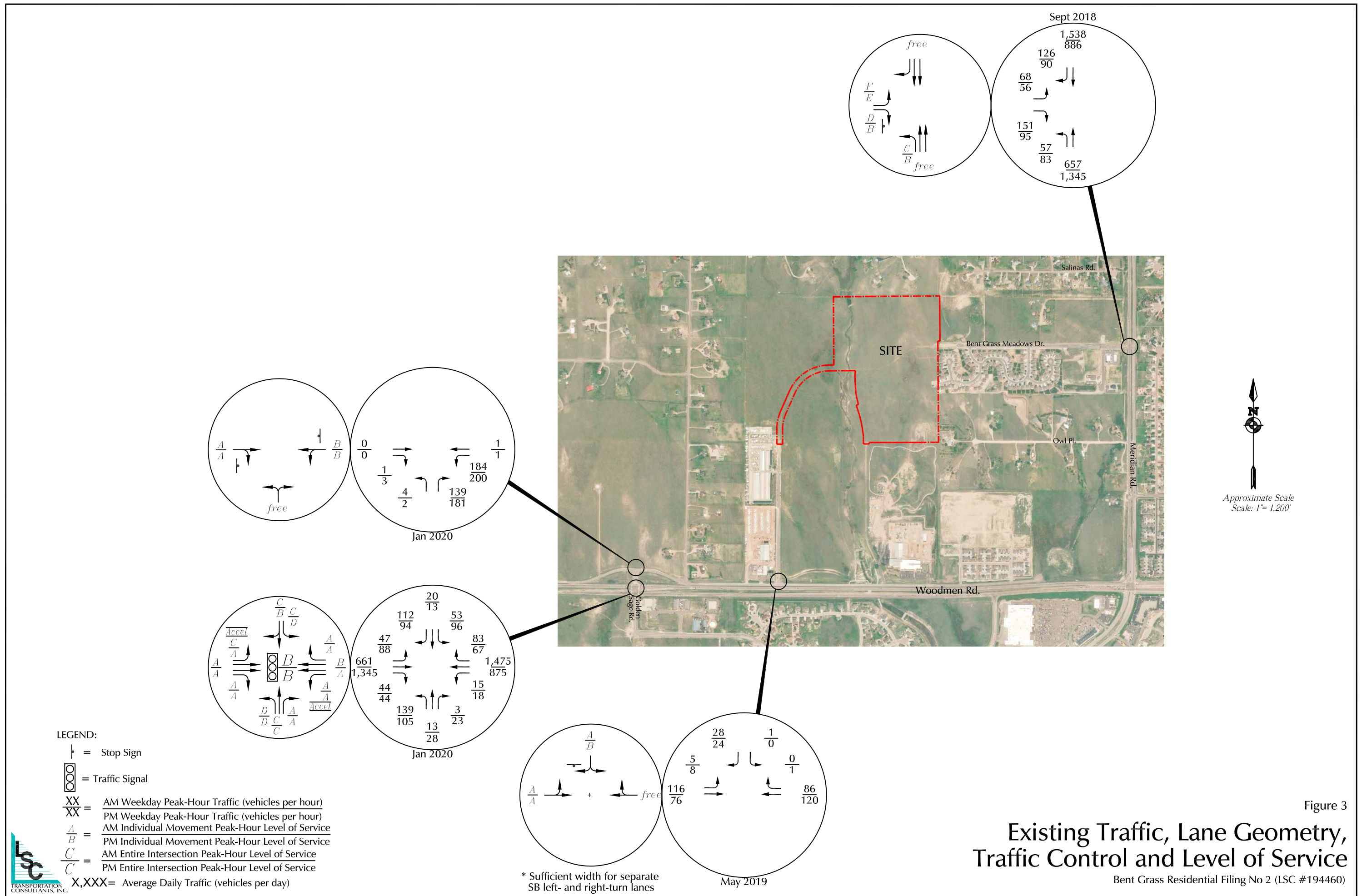
Approximate Scale
Scale: 1"= 1,200'

Figure 1

Vicinity Map

Bent Grass Residential Filing No 2 (LSC #194460)





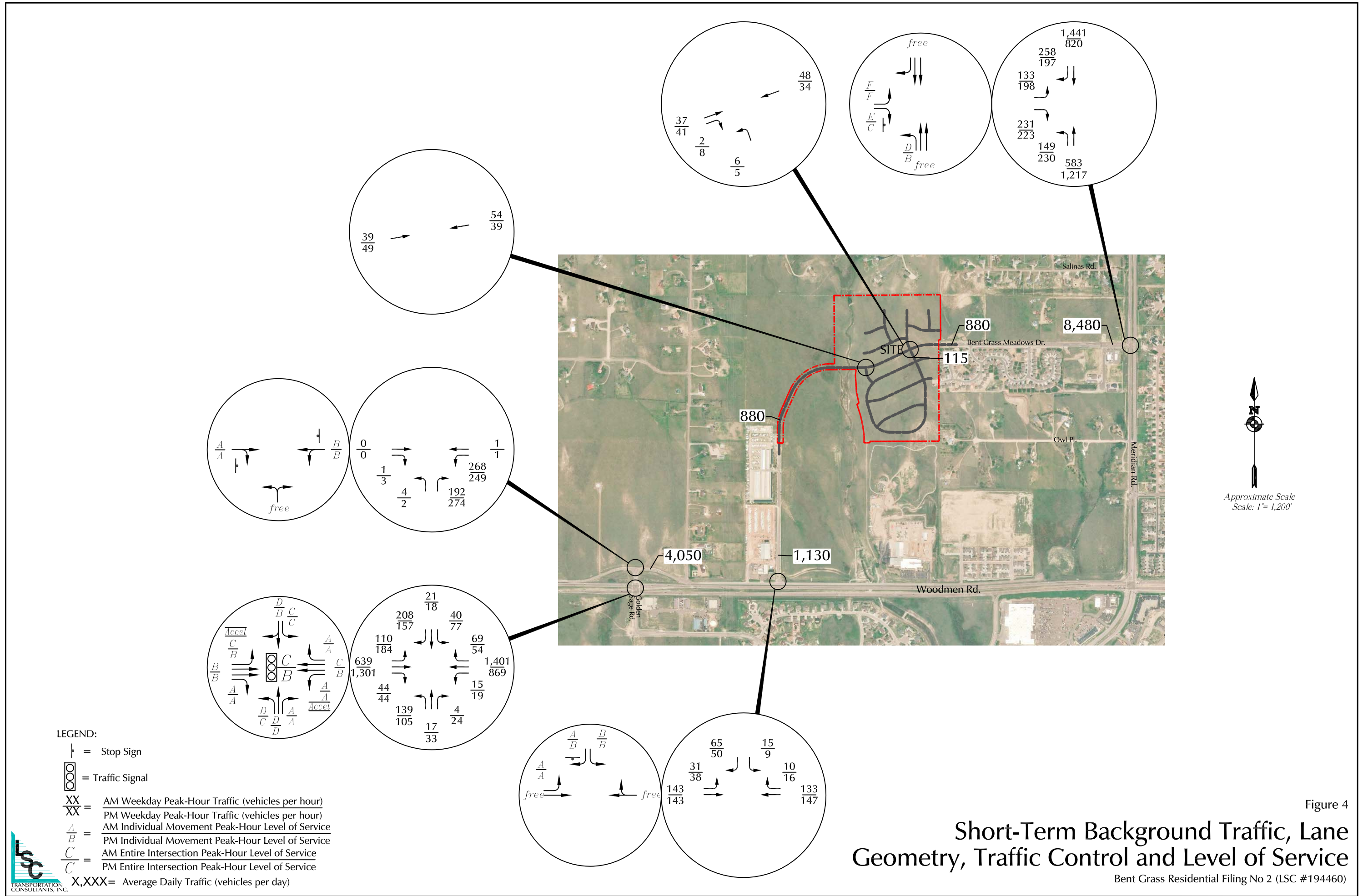


Figure 4
Short-Term Background Traffic, Lane Geometry, Traffic Control and Level of Service
 Bent Grass Residential Filing No 2 (LSC #194460)

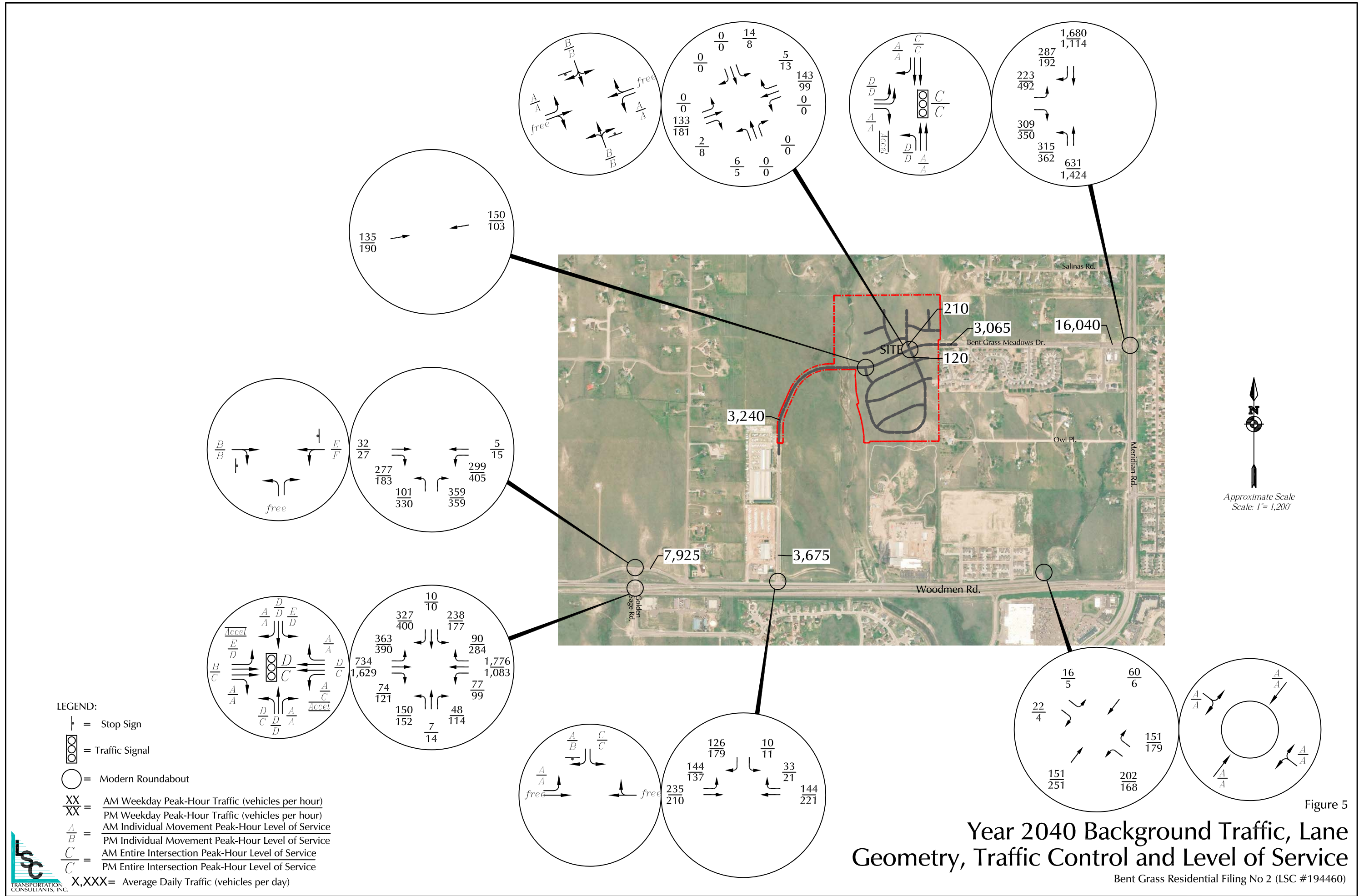




Figure 6

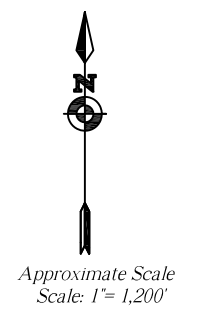
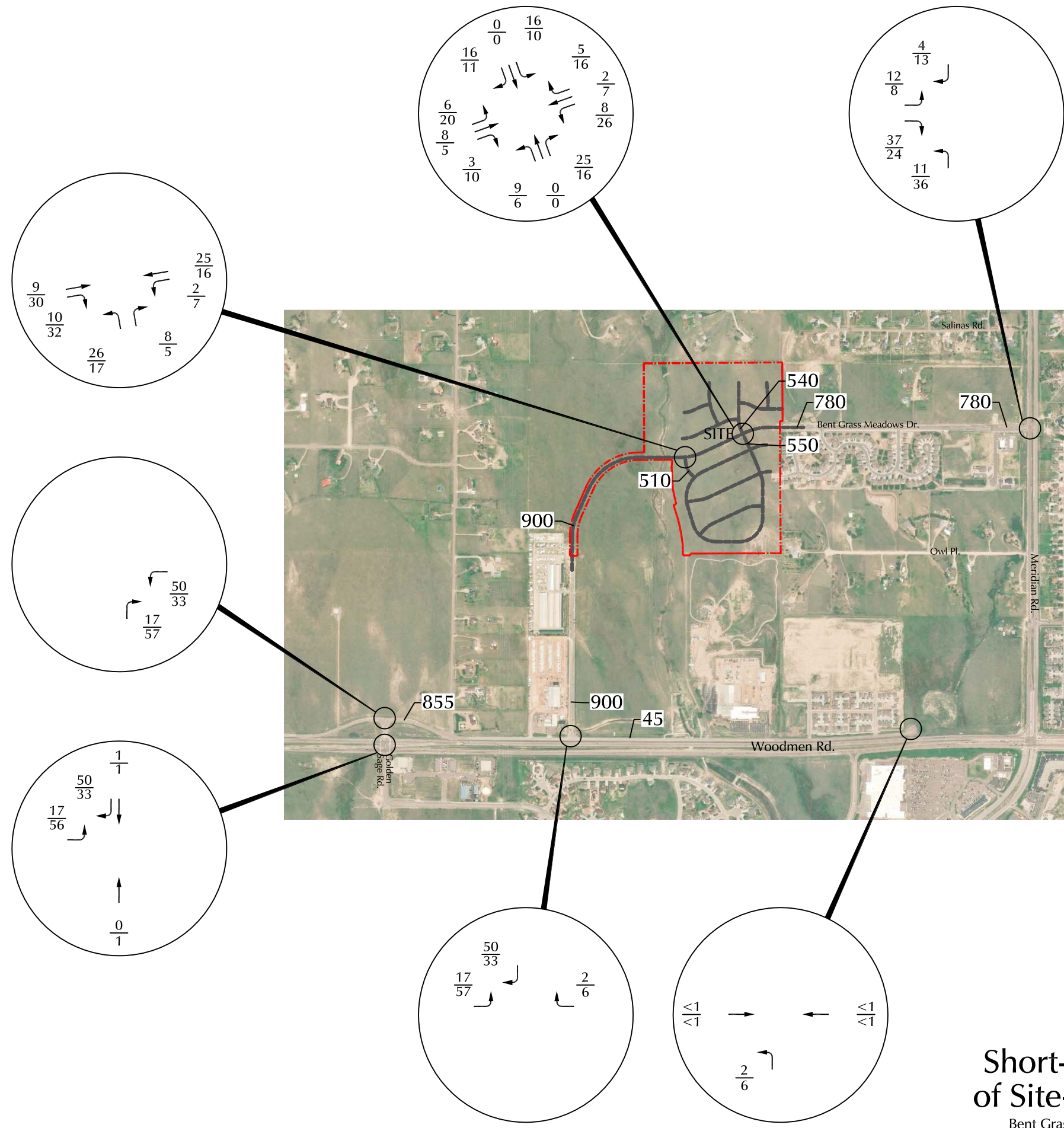
Directional Distribution of Site-Generated Traffic

Bent Grass Residential Filing No 2 (LSC #194460)



LEGEND:

XX% = Percent Directional Distribution



LEGEND:

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
 X,XXX= Average Daily Traffic (vehicles per day)

Figure 7

Short-Term Assignment of Site-Generated Traffic

Bent Grass Residential Filing No 2 (LSC #194460)

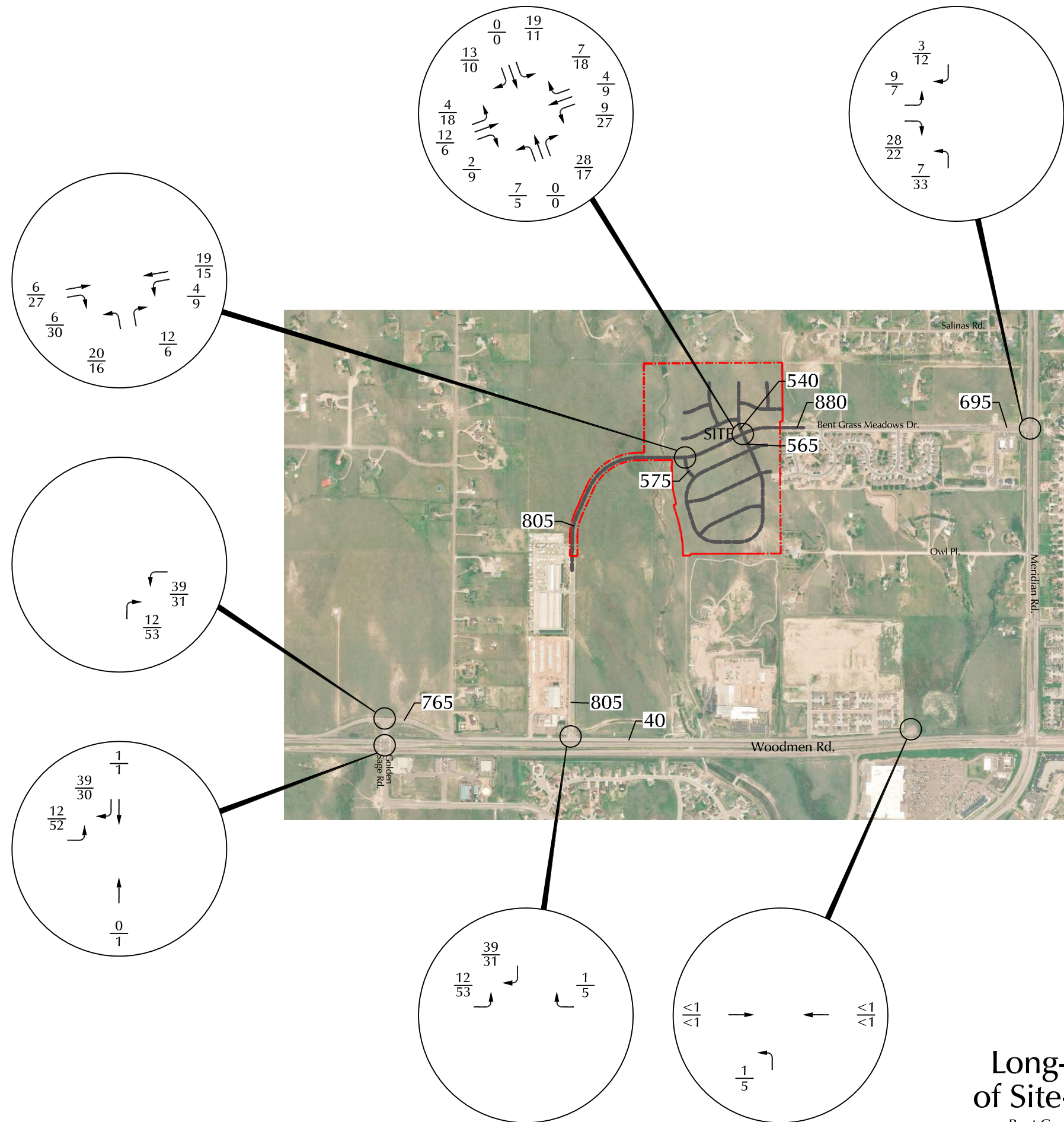
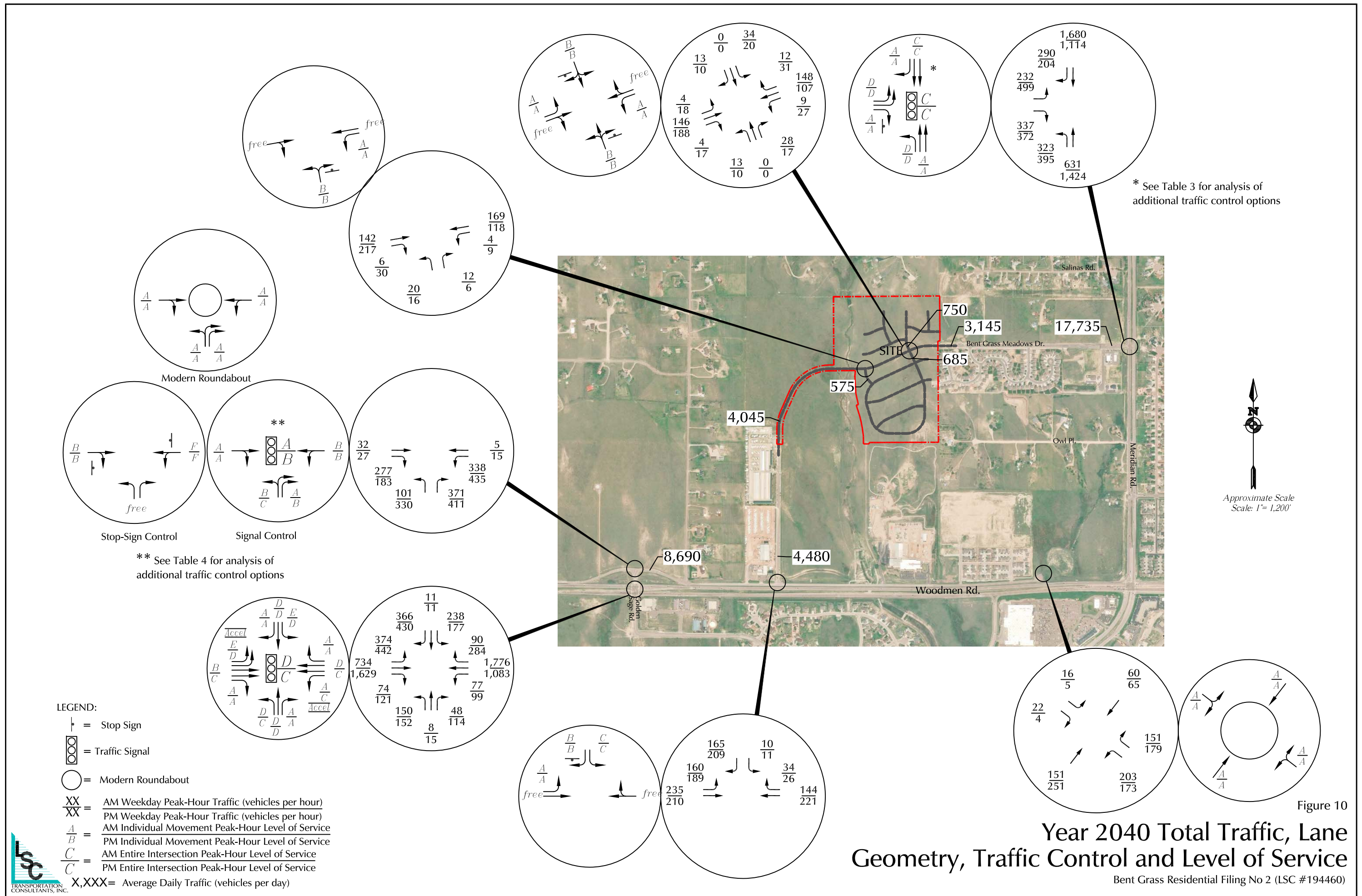
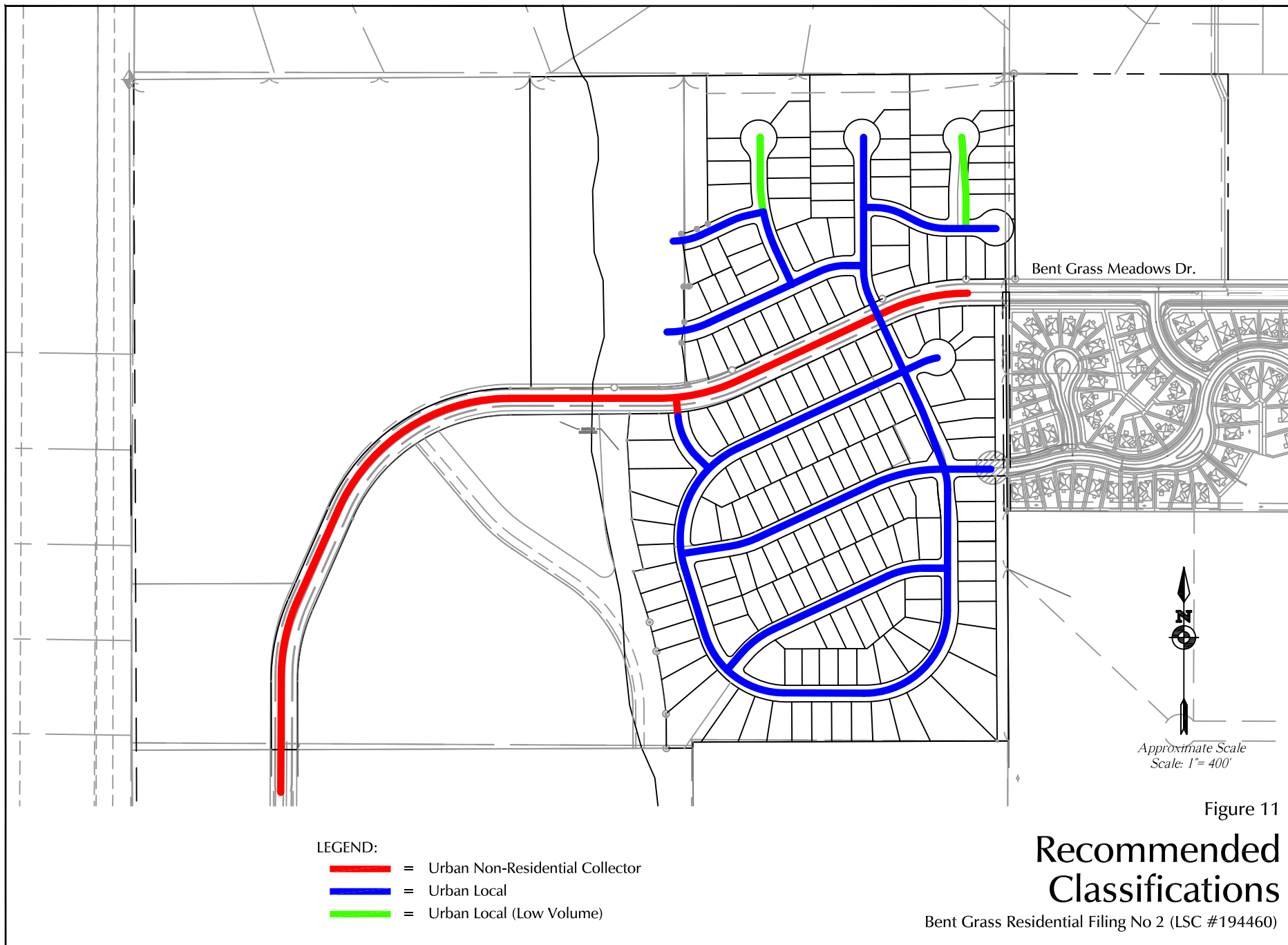


Figure 8
**Long-Term Assignment
 of Site-Generated Traffic**
 Bent Grass Residential Filing No 2 (LSC #194460)





Traffic Counts

LSC Transportation Consultants, Inc.

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Colorado Springs, CO 80905

719-633-2868

File Name : Meridian Rd - Bent Grass Meadows Dr AM 9-18

Site Code : 154561

Start Date : 9/12/2018

Page No : 1

Groups Printed- Unshifted

	Meridian Rd Southbound				Westbound				Meridian Rd Northbound				Bent Grass Meadows Dr Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30	0	286	26	0	0	0	0	0	10	71	0	0	7	0	32	0	432
06:45	0	319	36	1	0	0	0	0	15	137	0	0	10	0	38	0	556
Total	0	605	62	1	0	0	0	0	25	208	0	0	17	0	70	0	988
07:00	0	426	24	0	0	0	0	0	9	121	0	0	13	0	37	0	630
07:15	0	443	29	0	0	0	0	0	13	195	0	0	16	0	41	0	737
07:30	0	372	33	0	0	0	0	0	19	179	0	0	17	0	30	0	650
07:45	0	297	40	0	0	0	0	0	16	162	0	0	22	0	43	0	580
Total	0	1538	126	0	0	0	0	0	57	657	0	0	68	0	151	0	2597
08:00	0	256	19	0	0	0	0	0	21	154	0	0	17	0	21	0	488
08:15	0	284	25	0	0	0	0	0	10	136	0	0	21	0	27	0	503
Grand Total	0	2683	232	1	0	0	0	0	113	1155	0	0	123	0	269	0	4576
Apprch %	0	92	8	0	0	0	0	0	8.9	91.1	0	0	31.4	0	68.6	0	
Total %	0	58.6	5.1	0	0	0	0	0	2.5	25.2	0	0	2.7	0	5.9	0	

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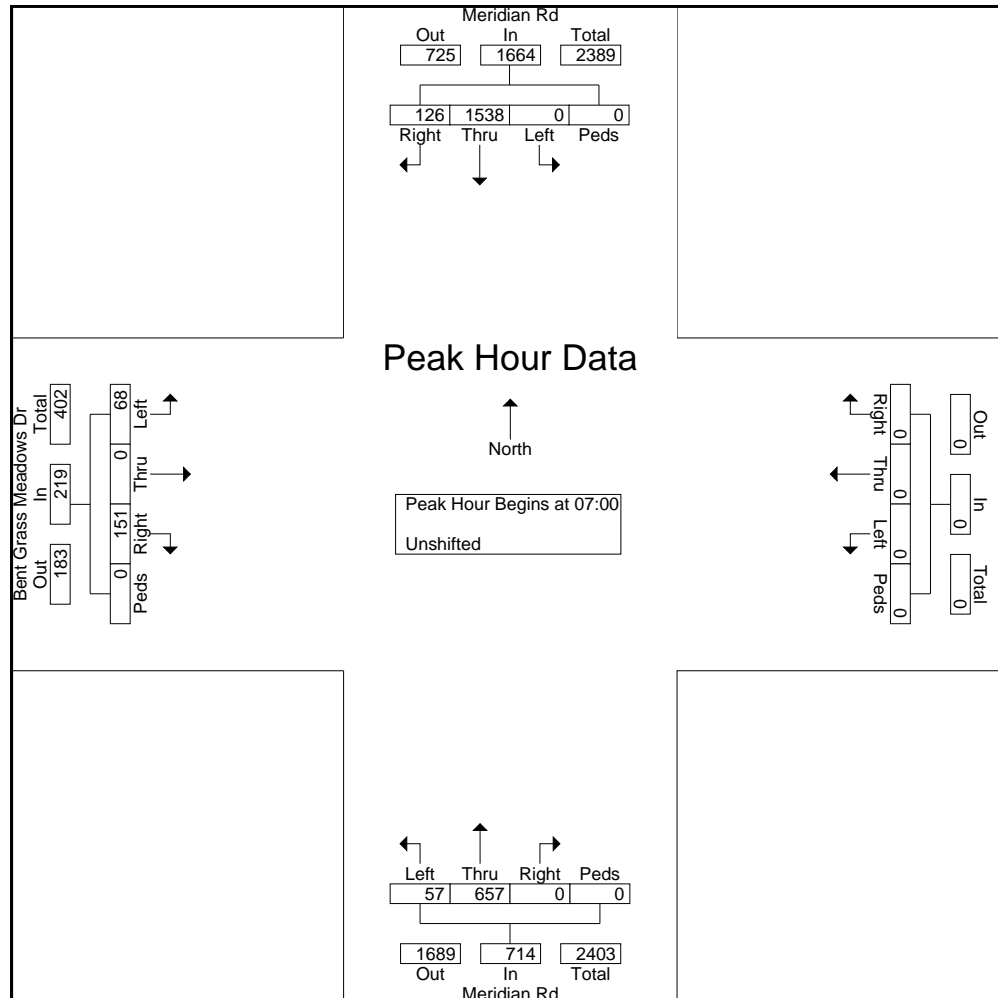
File Name : Meridian Rd - Bent Grass Meadows Dr AM 9-18

Site Code : 154561

Start Date : 9/12/2018

Page No : 2

	Meridian Rd Southbound					Westbound					Meridian Rd Northbound					Bent Grass Meadows Dr Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 to 08:15 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00																					
07:00	0	426	24	0	450	0	0	0	0	0	9	121	0	0	130	13	0	37	0	50	630
07:15	0	443	29	0	472	0	0	0	0	0	13	195	0	0	208	16	0	41	0	57	737
07:30	0	372	33	0	405	0	0	0	0	0	19	179	0	0	198	17	0	30	0	47	650
07:45	0	297	40	0	337	0	0	0	0	0	16	162	0	0	178	22	0	43	0	65	580
Total Volume	0	1538	126	0	1664	0	0	0	0	0	57	657	0	0	714	68	0	151	0	219	2597
% App. Total	0	92.4	7.6	0		0	0	0	0		8	92	0	0		31.1	0	68.9	0		
PHF	.000	.868	.788	.000	.881	.000	.000	.000	.000	.000	.750	.842	.000	.000	.858	.773	.000	.878	.000	.842	.881



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File Name : Meridian Rd - Bent Grass Meadows PM 9-18

Site Code : 154561

Start Date : 9/12/2018

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	Meridian Rd Southbound				Westbound				Meridian Rd Northbound				Bent Grass Meadows Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
16:15	0	192	21	0	0	0	0	0	20	295	0	0	15	0	25	0	568
16:30	0	213	19	0	0	0	0	0	22	344	0	0	12	0	15	0	625
16:45	0	197	19	0	0	0	0	0	19	332	0	0	20	0	23	0	610
Total	0	602	59	0	0	0	0	0	61	971	0	0	47	0	63	0	1803
17:00	0	223	27	0	0	0	0	0	16	347	0	0	11	0	25	0	649
17:15	0	214	19	0	0	0	0	0	25	348	0	0	16	0	28	0	650
17:30	0	252	25	0	0	0	0	0	23	318	0	0	9	0	19	0	646
17:45	0	179	27	0	0	0	0	0	19	328	0	0	15	0	22	0	590
Total	0	868	98	0	0	0	0	0	83	1341	0	0	51	0	94	0	2535
18:00	0	169	25	0	0	0	0	0	18	321	0	0	11	0	28	0	572
Grand Total	0	1639	182	0	0	0	0	0	162	2633	0	0	109	0	185	0	4910
Apprch %	0	90	10	0	0	0	0	0	5.8	94.2	0	0	37.1	0	62.9	0	
Total %	0	33.4	3.7	0	0	0	0	0	3.3	53.6	0	0	2.2	0	3.8	0	

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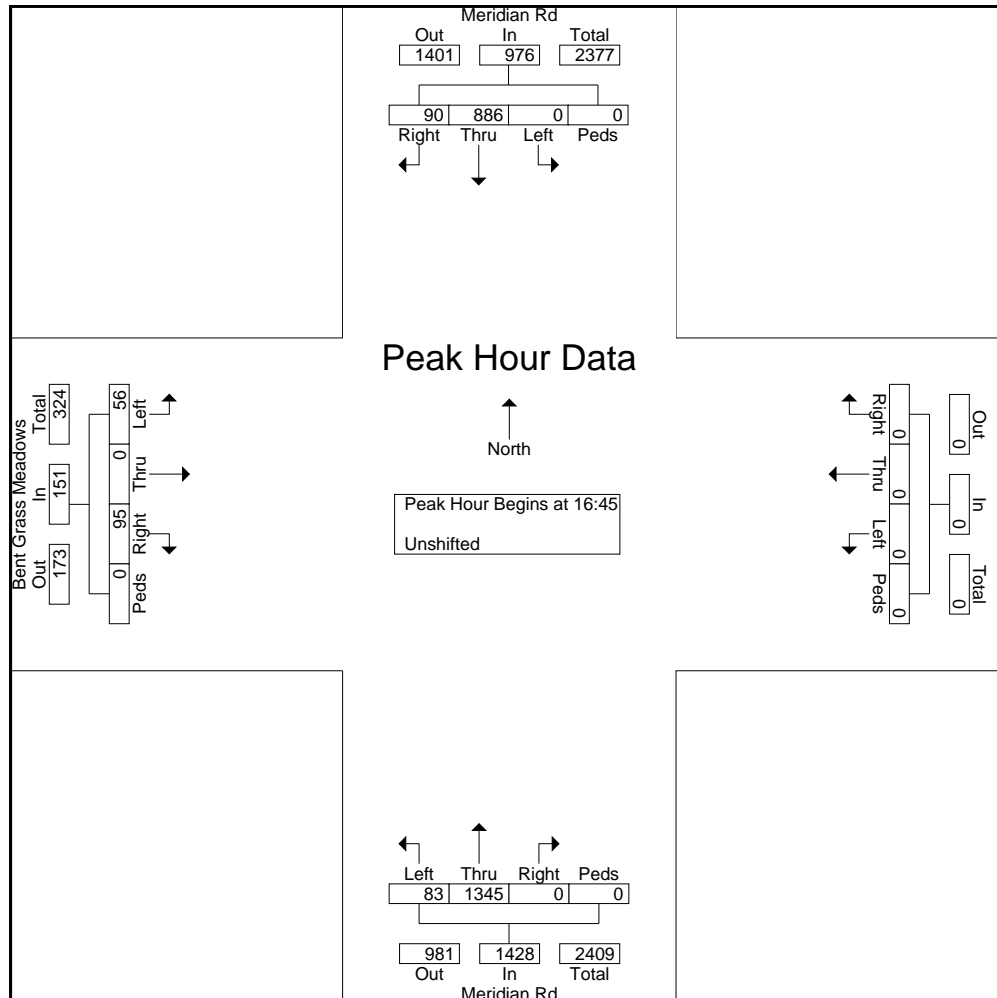
File Name : Meridian Rd - Bent Grass Meadows PM 9-18

Site Code : 154561

Start Date : 9/12/2018

Page No : 2

	Meridian Rd Southbound					Westbound					Meridian Rd Northbound					Bent Grass Meadows Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:15 to 18:00 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:45																					
16:45	0	197	19	0	216	0	0	0	0	0	19	332	0	0	351	20	0	23	0	43	610
17:00	0	223	27	0	250	0	0	0	0	0	16	347	0	0	363	11	0	25	0	36	649
17:15	0	214	19	0	233	0	0	0	0	0	25	348	0	0	373	16	0	28	0	44	650
17:30	0	252	25	0	277	0	0	0	0	0	23	318	0	0	341	9	0	19	0	28	646
Total Volume	0	886	90	0	976	0	0	0	0	0	83	1345	0	0	1428	56	0	95	0	151	2555
% App. Total	0	90.8	9.2	0		0	0	0	0		5.8	94.2	0	0		37.1	0	62.9	0		
PHF	.000	.879	.833	.000	.881	.000	.000	.000	.000	.000	.830	.966	.000	.000	.957	.700	.000	.848	.000	.858	.983





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Groups Printed- Unshifted

	Bent Grass Meadows Southbound					Woodmen Frontage Rd Westbound					Northbound					Woodmen Frontage Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
06:30 AM	1	0	20	0	21	0	14	0	0	14	0	0	0	0	0	0	37	0	0	37	72
06:45 AM	0	0	6	0	6	0	15	0	0	15	0	0	0	0	0	1	49	0	0	50	71
Total	1	0	26	0	27	0	29	0	0	29	0	0	0	0	0	1	86	0	0	87	143
07:00 AM	0	0	0	0	0	0	24	0	0	24	0	0	0	0	0	0	14	0	0	14	38
07:15 AM	0	0	2	0	2	0	33	0	0	33	0	0	0	0	0	4	16	0	0	20	55
07:30 AM	0	0	3	0	3	0	24	0	0	24	0	0	0	0	0	2	6	0	0	8	35
07:45 AM	0	0	2	0	2	0	23	0	0	23	0	0	0	0	0	0	8	0	0	8	33
Total	0	0	7	0	7	0	104	0	0	104	0	0	0	0	0	6	44	0	0	50	161
08:00 AM	0	0	1	0	1	0	12	0	0	12	0	0	0	0	0	2	9	0	0	11	24
08:15 AM	0	0	13	0	13	0	14	0	0	14	0	0	0	0	0	0	11	0	0	11	38



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File Name

Site Code

Start Date

Page #

Groups Printed- Unshifted

	Bent Grass Meadows Southbound					Woodmen Frontage Rd Westbound					Northbound					Woodmen Frontage Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
04:00 PM	0	0	2	0	2	0	13	0	0	13	0	0	0	0	0	3	14	0	0	17	32
04:15 PM	0	0	4	0	4	0	11	0	0	11	0	0	0	0	0	1	21	0	0	22	37
04:30 PM	0	0	20	0	20	0	10	0	0	10	0	0	0	0	0	3	16	0	0	19	49
04:45 PM	0	0	12	0	12	0	10	1	0	11	0	0	0	0	0	2	24	0	0	26	49
Total	0	0	38	0	38	0	44	1	0	45	0	0	0	0	0	9	75	0	0	84	167
05:00 PM	0	0	7	0	7	0	10	0	0	10	0	0	0	0	0	0	18	0	0	18	35
05:15 PM	0	0	3	0	3	0	17	0	0	17	0	0	0	0	0	3	17	0	0	20	40
05:30 PM	0	0	2	0	2	0	83	1	0	84	0	0	0	0	0	3	17	0	0	20	106
05:45 PM	0	0	3	0	3	0	25	0	0	25	0	0	0	0	0	1	16	0	0	17	45
Total	0	0	15	0	15	0	135	1	0	136	0	0	0	0	0	7	68	0	0	75	226

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File Name : Golden Sage Rd - Woodmen Rd AM 1-20

Site Code : 00194460

Start Date : 1/21/2020

Page No : 1

Groups Printed- Unshifted

	Golden Sage Rd Southbound					Woodmen Rd Westbound					Golden Sage Rd Northbound					Woodmen Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
06:30 AM	5	1	25	0	31	0	195	48	1	244	20	2	0	0	22	10	107	0	0	117	414
06:45 AM	12	5	28	0	45	4	355	30	0	389	24	4	0	0	28	14	151	9	0	174	636
Total	17	6	53	0	76	4	550	78	1	633	44	6	0	0	50	24	258	9	0	291	1050
07:00 AM	17	7	29	0	53	2	340	25	0	367	42	2	1	0	45	13	158	13	0	184	649
07:15 AM	8	4	30	0	42	3	424	16	0	443	44	3	1	0	48	12	171	11	0	194	727
07:30 AM	16	4	25	1	46	6	356	12	0	374	29	4	1	0	34	8	181	11	0	200	654
07:45 AM	7	1	7	0	15	2	293	17	0	312	13	5	0	0	18	16	209	20	0	245	590
Total	48	16	91	1	156	13	1413	70	0	1496	128	14	3	0	145	49	719	55	0	823	2620
08:00 AM	9	1	14	0	24	3	239	12	1	255	18	0	0	0	18	16	165	13	1	195	492
08:15 AM	13	2	12	0	27	2	267	19	1	289	18	3	2	0	23	28	142	6	1	177	516
Grand Total	87	25	170	1	283	22	2469	179	3	2673	208	23	5	0	236	117	1284	83	2	1486	4678
Apprch %	30.7	8.8	60.1	0.4		0.8	92.4	6.7	0.1		88.1	9.7	2.1	0		7.9	86.4	5.6	0.1		
Total %	1.9	0.5	3.6	0	6	0.5	52.8	3.8	0.1	57.1	4.4	0.5	0.1	0	5	2.5	27.4	1.8	0	31.8	

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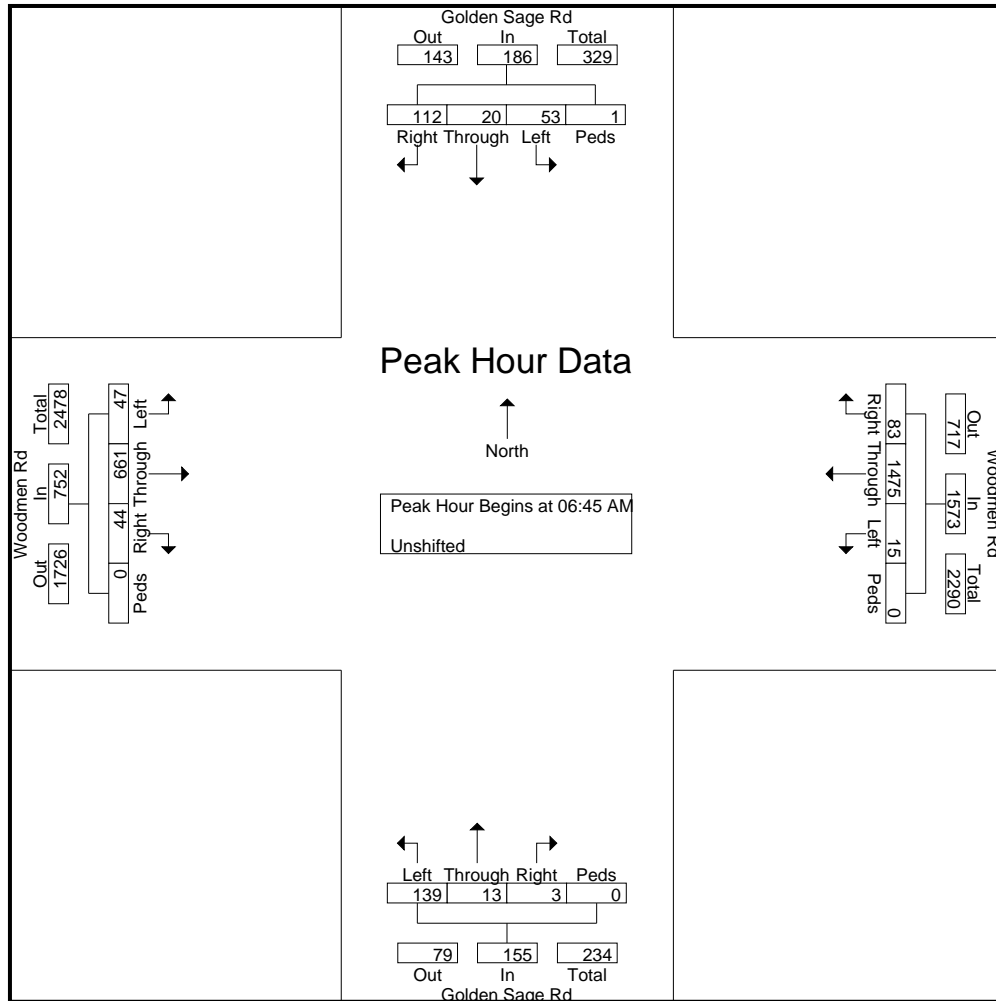
File Name : Golden Sage Rd - Woodmen Rd AM 1-20

Site Code : 00194460

Start Date : 1/21/2020

Page No : 2

	Golden Sage Rd Southbound					Woodmen Rd Westbound					Golden Sage Rd Northbound					Woodmen Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 6:45:00 AM																					
6:45:00 AM	12	5	28	0	45	4	355	30	0	389	24	4	0	0	28	14	151	9	0	174	636
7:00:00 AM	17	7	29	0	53	2	340	25	0	367	42	2	1	0	45	13	158	13	0	184	649
7:15:00 AM	8	4	30	0	42	3	424	16	0	443	44	3	1	0	48	12	171	11	0	194	727
7:30:00 AM	16	4	25	1	46	6	356	12	0	374	29	4	1	0	34	8	181	11	0	200	654
Total Volume	53	20	112	1	186	15	1475	83	0	1573	139	13	3	0	155	47	661	44	0	752	2666
% App. Total	28.5	10.8	60.2	0.5		1	93.8	5.3	0		89.7	8.4	1.9	0		6.2	87.9	5.9	0		
PHF	.779	.714	.933	.250	.877	.625	.870	.692	.000	.888	.790	.813	.750	.000	.807	.839	.913	.846	.000	.940	.917



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719-633-2868

File Name : Golden Sage Rd - Woodmen Rd AM 1-20

Site Code : 00194460

Start Date : 1/21/2020

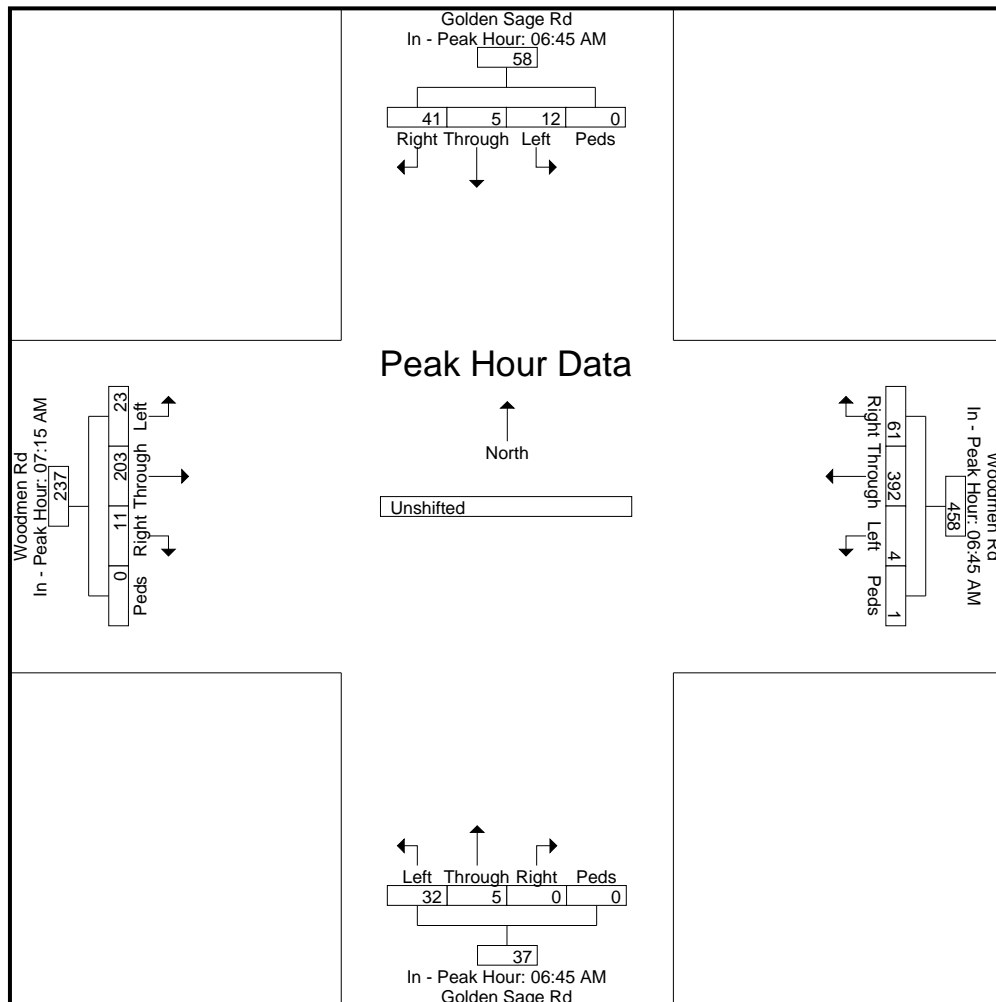
Page No : 3

	Golden Sage Rd Southbound					Woodmen Rd Westbound					Golden Sage Rd Northbound					Woodmen Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total

Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	6:45:00 AM					6:45:00 AM					6:45:00 AM					7:15:00 AM				
+0 mins.	12	5	28	0	45	4	355	30	0	389	24	4	0	0	28	12	171	11	0	194
+5 mins.	17	7	29	0	53	2	340	25	0	367	42	2	1	0	45	8	181	11	0	200
+10 mins.	8	4	30	0	42	3	424	16	0	443	44	3	1	0	48	16	209	20	0	245
+15 mins.	16	4	25	1	46	6	356	12	0	374	29	4	1	0	34	16	165	13	1	195
Total Volume	53	20	112	1	186	15	1475	83	0	1573	139	13	3	0	155	52	726	55	1	834
% App. Total	28.5	10.8	60.2	0.5		1	93.8	5.3	0		89.7	8.4	1.9	0		6.2	87.1	6.6	0.1	
PHF	.779	.714	.933	.250	.877	.625	.870	.692	.000	.888	.790	.813	.750	.000	.807	.813	.868	.688	.250	.851



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Colorado Springs, CO 80905
719-633-2868

File Name : Golden Sage Rd - Woodmen Rd PM 1-20

Site Code : 00194460

Start Date : 1/21/2020

Page No : 1

Groups Printed- Unshifted

	Golden Sage Rd Southbound					Woodmen Rd Westbound					Golden Sage Rd Northbound					Woodmen Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
04:00 PM	17	2	26	0	45	7	205	16	0	228	23	9	5	0	37	21	272	23	2	318	628
04:15 PM	7	1	22	0	30	5	241	26	0	272	26	5	6	0	37	28	325	12	1	366	705
04:30 PM	21	4	24	0	49	1	241	20	1	263	26	8	4	0	38	24	313	3	1	341	691
04:45 PM	29	3	19	2	53	1	202	24	0	227	16	4	0	0	20	18	341	10	1	370	670
Total	74	10	91	2	177	14	889	86	1	990	91	26	15	0	132	91	1251	48	5	1395	2694
05:00 PM	18	1	27	0	46	2	254	11	2	269	27	7	1	0	35	19	328	11	0	358	708
05:15 PM	7	2	6	0	15	8	192	9	1	210	32	10	12	0	54	23	340	17	0	380	659
05:30 PM	42	7	42	1	92	7	227	23	0	257	30	7	10	0	47	28	336	6	0	370	766
05:45 PM	21	1	18	0	40	1	180	12	1	194	19	5	5	0	29	18	326	9	0	353	616
Total	88	11	93	1	193	18	853	55	4	930	108	29	28	0	165	88	1330	43	0	1461	2749
Grand Total	162	21	184	3	370	32	1742	141	5	1920	199	55	43	0	297	179	2581	91	5	2856	5443
Apprch %	43.8	5.7	49.7	0.8		1.7	90.7	7.3	0.3		67	18.5	14.5	0		6.3	90.4	3.2	0.2		
Total %	3	0.4	3.4	0.1	6.8	0.6	32	2.6	0.1	35.3	3.7	1	0.8	0	5.5	3.3	47.4	1.7	0.1	52.5	

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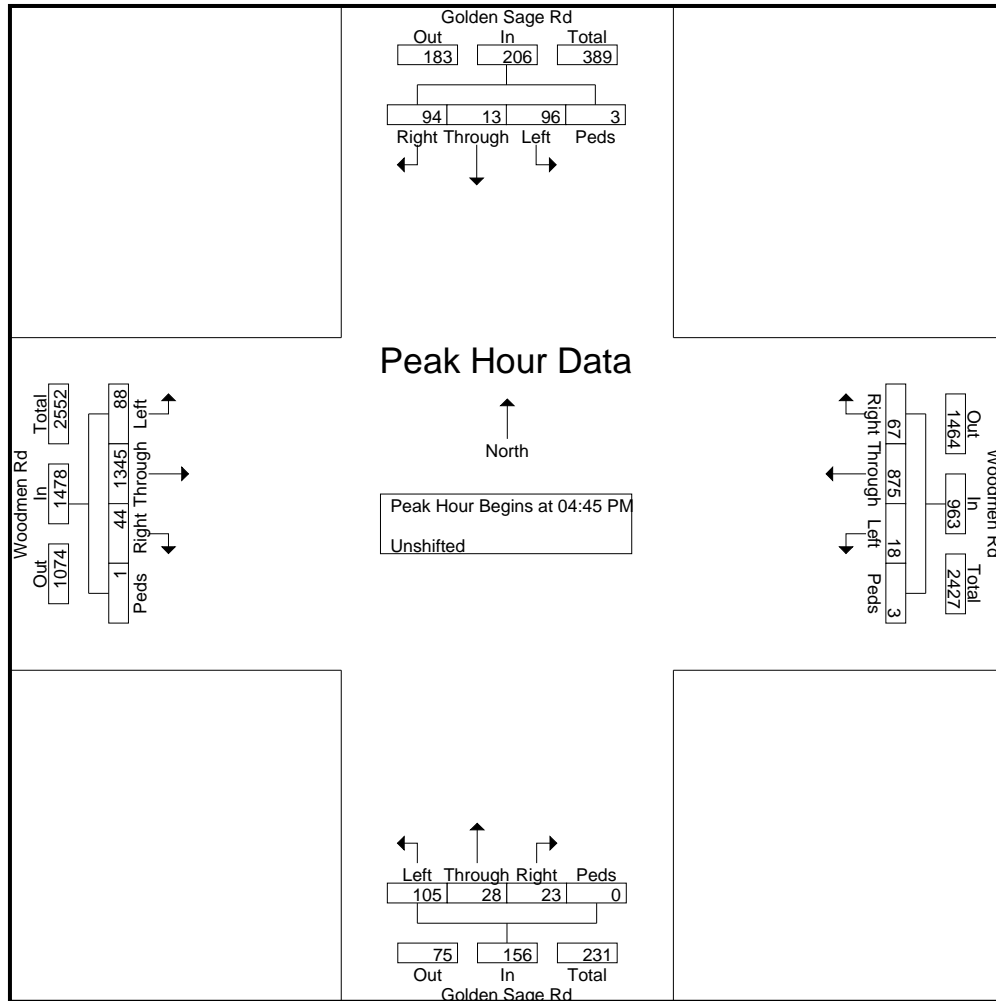
File Name : Golden Sage Rd - Woodmen Rd PM 1-20

Site Code : 00194460

Start Date : 1/21/2020

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	Golden Sage Rd Southbound					Woodmen Rd Westbound					Golden Sage Rd Northbound					Woodmen Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:45:00 PM																					
4:45:00 PM	29	3	19	2	53	1	202	24	0	227	16	4	0	0	20	18	341	10	1	370	670
5:00:00 PM	18	1	27	0	46	2	254	11	2	269	27	7	1	0	35	19	328	11	0	358	708
5:15:00 PM	7	2	6	0	15	8	192	9	1	210	32	10	12	0	54	23	340	17	0	380	659
5:30:00 PM	42	7	42	1	92	7	227	23	0	257	30	7	10	0	47	28	336	6	0	370	766
Total Volume	96	13	94	3	206	18	875	67	3	963	105	28	23	0	156	88	1345	44	1	1478	2803
% App. Total	46.6	6.3	45.6	1.5		1.9	90.9	7	0.3		67.3	17.9	14.7	0		6	91	3	0.1		
PHF	.571	.464	.560	.375	.560	.563	.861	.698	.375	.895	.820	.700	.479	.000	.722	.786	.986	.647	.250	.972	.915



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File Name : Golden Sage Rd - Woodmen Rd PM 1-20

Site Code : 00194460

Start Date : 1/21/2020

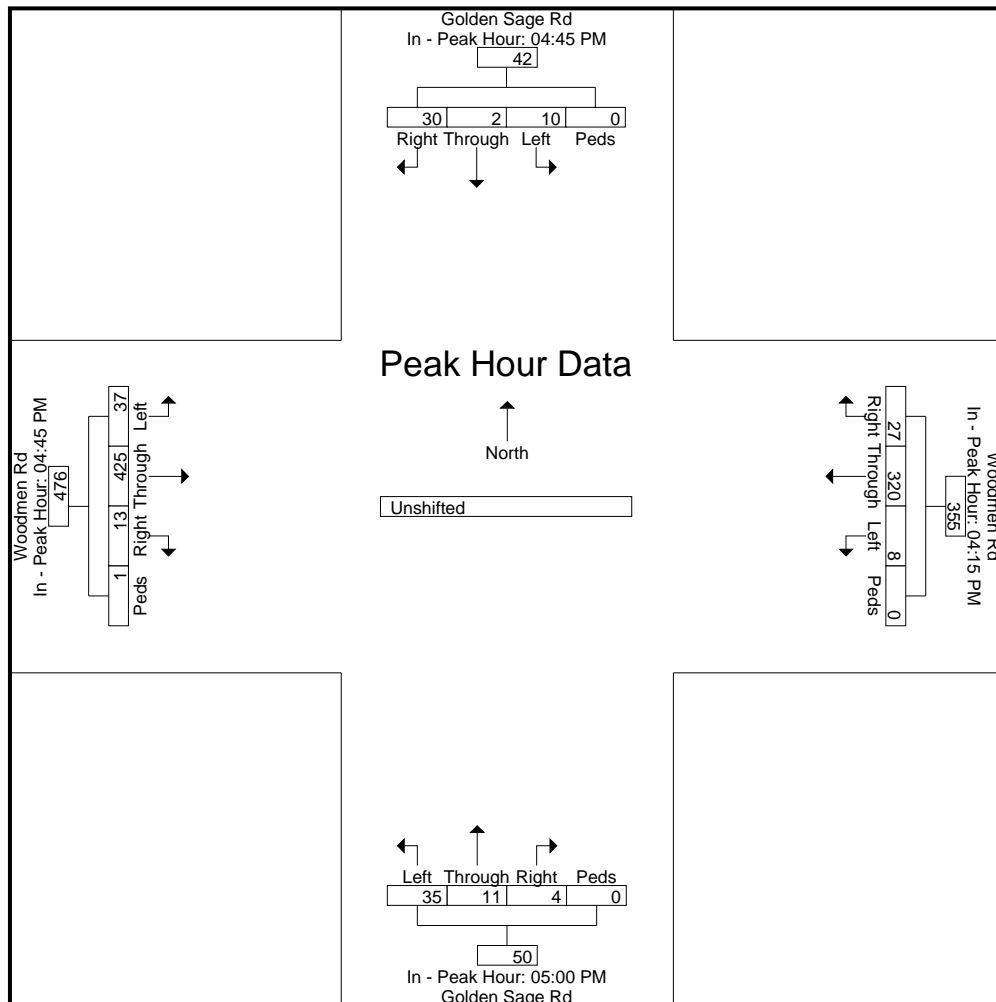
Page No : 3

	Golden Sage Rd Southbound					Woodmen Rd Westbound					Golden Sage Rd Northbound					Woodmen Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total

Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	4:45:00 PM					4:15:00 PM					5:00:00 PM					4:45:00 PM				
+0 mins.	29	3	19	2	53	5	241	26	0	272	27	7	1	0	35	18	341	10	1	370
+5 mins.	18	1	27	0	46	1	241	20	1	263	32	10	12	0	54	19	328	11	0	358
+10 mins.	7	2	6	0	15	1	202	24	0	227	30	7	10	0	47	23	340	17	0	380
+15 mins.	42	7	42	1	92	2	254	11	2	269	19	5	5	0	29	28	336	6	0	370
Total Volume	96	13	94	3	206	9	938	81	3	1031	108	29	28	0	165	88	1345	44	1	1478
% App. Total	46.6	6.3	45.6	1.5		0.9	91	7.9	0.3		65.5	17.6	17	0		6	91	3	0.1	
PHF	.571	.464	.560	.375	.560	.450	.923	.779	.375	.948	.844	.725	.583	.000	.764	.786	.986	.647	.250	.972



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File Name : Golden Sage Rd - Woodmen Frontage Rd AM 1-20

Site Code : 00194460

Start Date : 1/21/2020

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Groups Printed- Bank 1

	Southbound					Woodmen Frontage Rd Westbound					Golden Sage Rd Northbound					Woodmen Frontage Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
06:30 AM	0	0	0	0	0	19	0	0	0	19	0	0	21	0	21	1	0	0	0	1	41
06:45 AM	0	0	2	0	2	41	0	1	0	42	4	0	47	0	51	0	0	0	0	0	95
Total	0	0	2	0	2	60	0	1	0	61	4	0	68	0	72	1	0	0	0	1	136
07:00 AM	0	0	0	0	0	49	1	0	0	50	0	0	19	0	19	0	0	0	0	0	69
07:15 AM	0	0	0	0	0	34	0	0	0	34	0	0	31	0	31	0	0	0	0	0	65
07:30 AM	0	0	0	0	0	45	0	0	0	45	0	0	22	0	22	0	0	1	0	1	68
07:45 AM	0	0	0	0	0	19	0	0	0	19	0	0	36	0	36	0	0	0	0	0	55
Total	0	0	0	0	0	147	1	0	0	148	0	0	108	0	108	0	0	1	0	1	257
08:00 AM	0	0	0	0	0	27	0	0	0	27	0	0	24	0	24	0	0	0	0	0	51
08:15 AM	0	0	0	0	0	26	0	0	0	26	0	0	48	1	49	0	0	1	0	1	76
Grand Total	0	0	2	0	2	260	1	1	0	262	4	0	248	1	253	1	0	2	0	3	520
Apprch %	0	0	100	0		99.2	0.4	0.4	0		1.6	0	98	0.4		33.3	0	66.7	0		
Total %	0	0	0.4	0	0.4	50	0.2	0.2	0	50.4	0.8	0	47.7	0.2	48.7	0.2	0	0.4	0	0.6	

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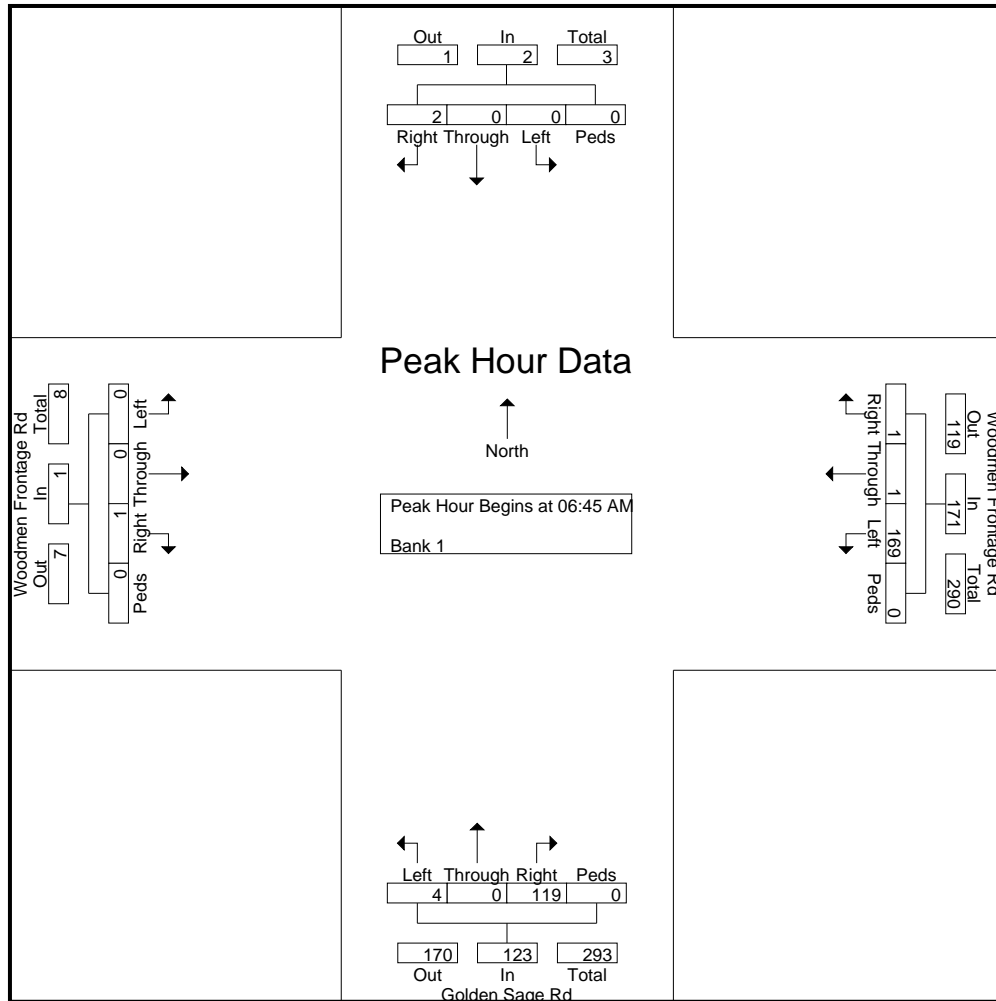
File Name : Golden Sage Rd - Woodmen Frontage Rd AM 1-20

Site Code : 00194460

Start Date : 1/21/2020

Page No : 2

	Southbound					Woodmen Frontage Rd Westbound					Golden Sage Rd Northbound					Woodmen Frontage Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 6:45:00 AM																					
6:45:00 AM	0	0	2	0	2	41	0	1	0	42	4	0	47	0	51	0	0	0	0	0	95
7:00:00 AM	0	0	0	0	0	49	1	0	0	50	0	0	19	0	19	0	0	0	0	0	69
7:15:00 AM	0	0	0	0	0	34	0	0	0	34	0	0	31	0	31	0	0	0	0	0	65
7:30:00 AM	0	0	0	0	0	45	0	0	0	45	0	0	22	0	22	0	0	1	0	1	68
Total Volume	0	0	2	0	2	169	1	1	0	171	4	0	119	0	123	0	0	1	0	1	297
% App. Total	0	0	100	0		98.8	0.6	0.6	0		3.3	0	96.7	0		0	0	100	0		
PHF	.000	.000	.250	.000	.250	.862	.250	.250	.000	.855	.250	.000	.633	.000	.603	.000	.000	.250	.000	.250	.782



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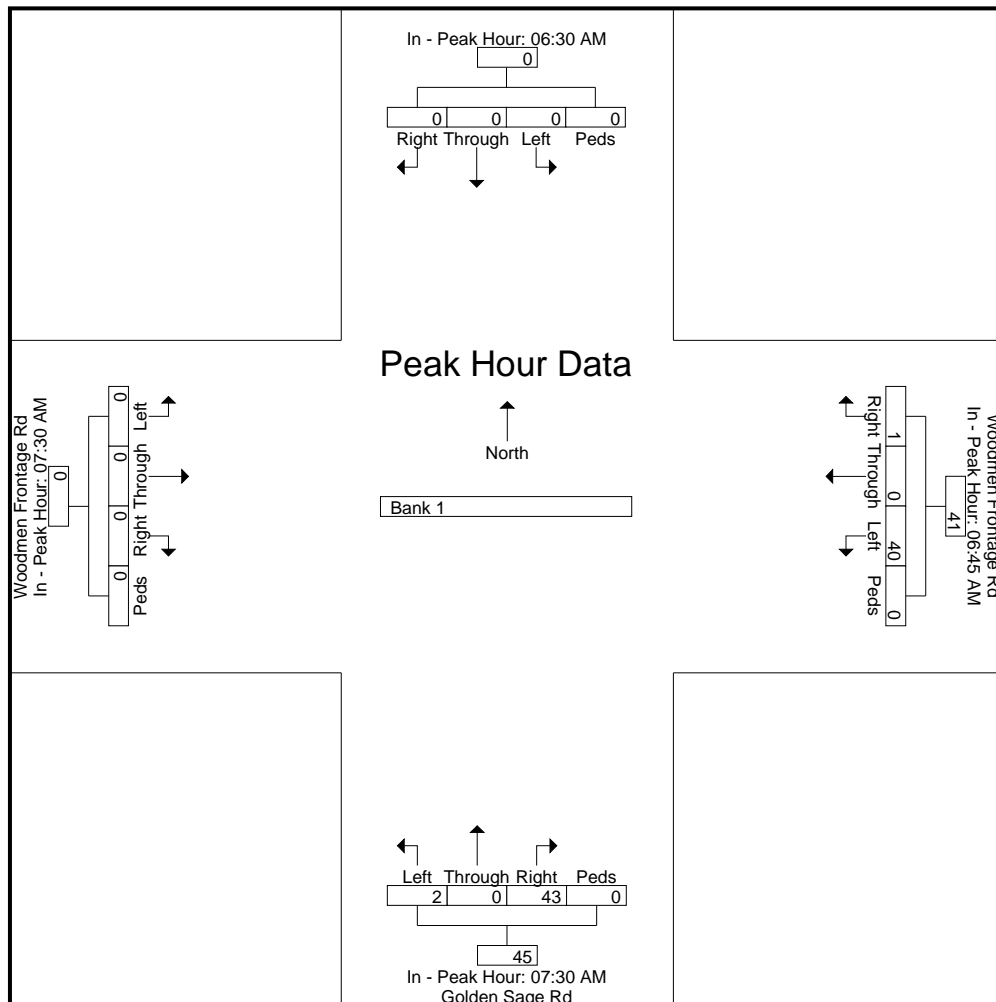
File Name : Golden Sage Rd - Woodmen Frontage Rd AM 1-20

Site Code : 00194460

Start Date : 1/21/2020

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	Southbound					Woodmen Frontage Rd Westbound					Golden Sage Rd Northbound					Woodmen Frontage Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	6:30:00 AM					6:45:00 AM					7:30:00 AM					7:30:00 AM					
+0 mins.	0	0	0	0	0	41	0	1	0	42	0	0	22	0	22	0	0	1	0	1	
+5 mins.	0	0	2	0	2	49	1	0	0	50	0	0	36	0	36	0	0	0	0	0	
+10 mins.	0	0	0	0	0	34	0	0	0	34	0	0	24	0	24	0	0	0	0	0	
+15 mins.	0	0	0	0	0	45	0	0	0	45	0	0	48	1	49	0	0	1	0	1	
Total Volume	0	0	2	0	2	169	1	1	0	171	0	0	130	1	131	0	0	2	0	2	
% App. Total	0	0	100	0		98.8	0.6	0.6	0		0	0	99.2	0.8		0	0	100	0		
PHF	.000	.000	.250	.000	.250	.862	.250	.250	.000	.855	.000	.000	.677	.250	.668	.000	.000	.500	.000	.500	



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Groups Printed- Bank 1

	Southbound					Woodmen Frontage Rd Westbound					Golden Sage Rd Northbound					Woodmen Frontage Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	43	1	0	0	44	0	0	45	0	45	0	0	0	0	0	89
04:15 PM	0	0	0	0	0	33	0	0	0	33	0	0	52	0	52	0	1	0	0	0	86
04:30 PM	0	0	0	0	0	44	0	0	0	44	0	0	52	0	52	0	0	0	0	0	96
04:45 PM	0	0	0	0	0	60	0	0	0	60	0	0	44	0	44	0	0	0	0	0	104
Total	0	0	0	0	0	180	1	0	0	181	0	0	193	0	193	0	1	0	0	1	375
05:00 PM	0	0	0	0	0	45	0	0	0	45	0	0	33	0	33	0	0	2	0	2	80
05:15 PM	0	0	0	0	0	13	0	0	0	13	2	0	41	1	44	0	0	1	0	1	58
05:30 PM	0	0	0	0	0	89	0	1	0	90	0	0	35	0	35	0	0	0	0	0	125
05:45 PM	0	0	0	0	0	43	0	1	0	44	0	0	31	0	31	0	0	0	0	0	75
Total	0	0	0	0	0	190	0	2	0	192	2	0	140	1	143	0	0	3	0	3	338
Grand Total	0	0	0	0	0	370	1	2	0	373	2	0	333	1	336	0	1	3	0	4	713
Apprch %	0	0	0	0		99.2	0.3	0.5	0		0.6	0	99.1	0.3		0	25	75	0		
Total %	0	0	0	0	0	51.9	0.1	0.3	0	52.3	0.3	0	46.7	0.1	47.1	0	0.1	0.4	0	0.6	

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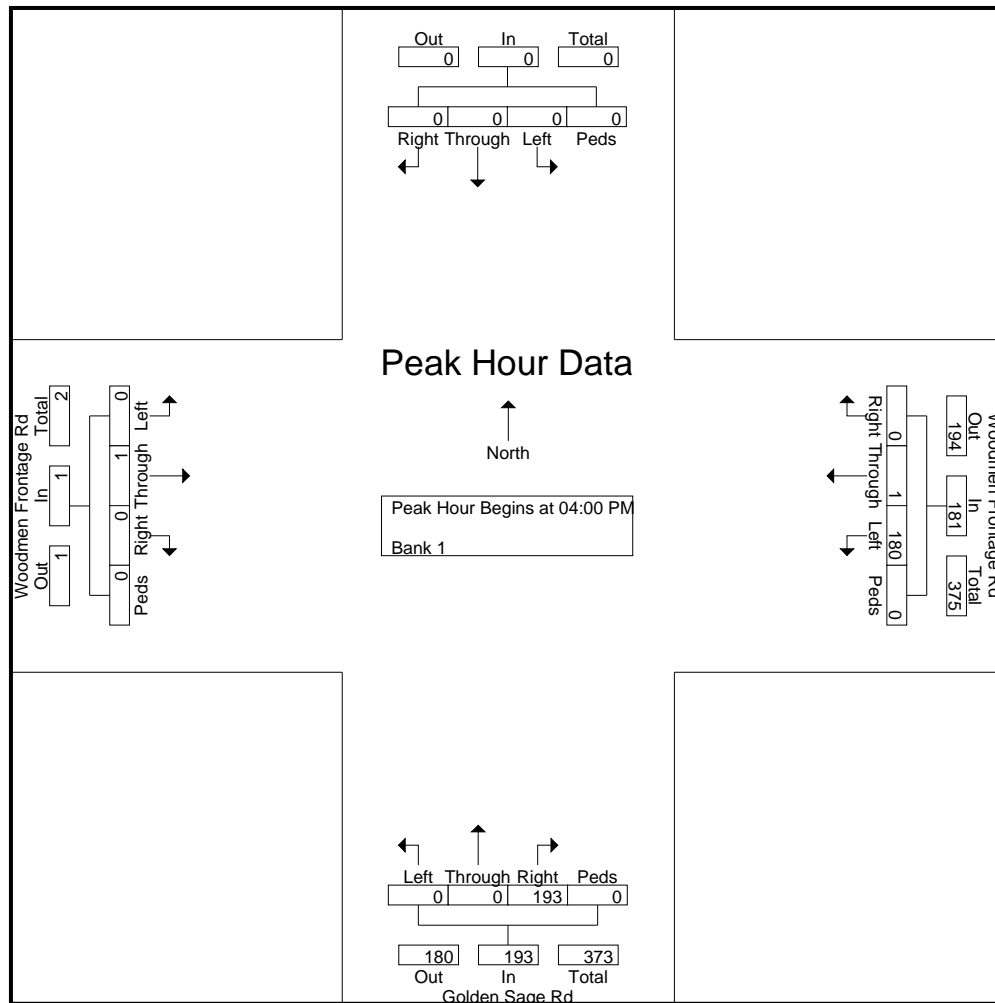
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Site Code : 00194460

Start Date : 1/21/2020

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	Southbound					Woodmen Frontage Rd Westbound					Golden Sage Rd Northbound					Woodmen Frontage Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:00:00 PM																					
4:00:00 PM	0	0	0	0	0	43	1	0	0	44	0	0	45	0	45	0	0	0	0	0	89
4:15:00 PM	0	0	0	0	0	33	0	0	0	33	0	0	52	0	52	0	1	0	0	1	86
4:30:00 PM	0	0	0	0	0	44	0	0	0	44	0	0	52	0	52	0	0	0	0	0	96
4:45:00 PM	0	0	0	0	0	60	0	0	0	60	0	0	44	0	44	0	0	0	0	0	104
Total Volume	0	0	0	0	0	180	1	0	0	181	0	0	193	0	193	0	1	0	0	1	375
% App. Total	0	0	0	0	0	99.4	0.6	0	0		0	0	100	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.750	.250	.000	.000	.754	.000	.000	.928	.000	.928	.000	.250	.000	.000	.250	.901



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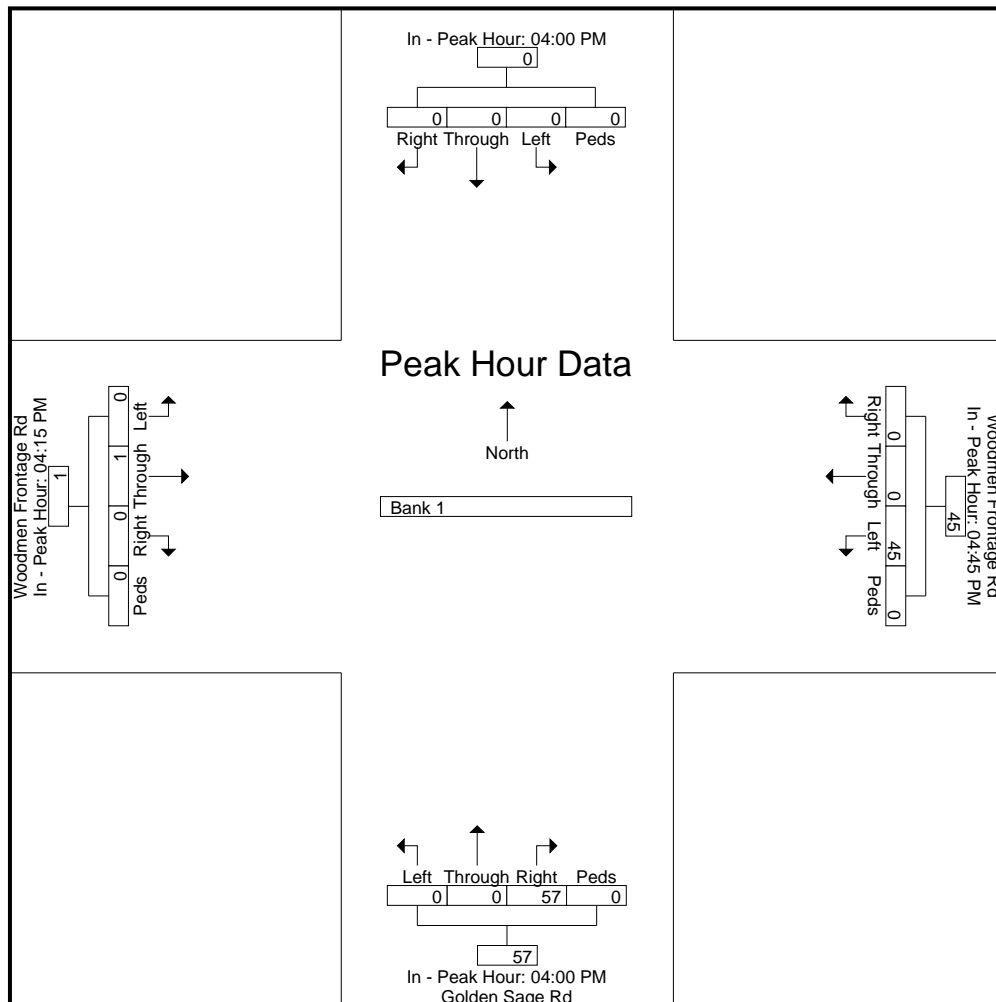
File Name : Golden Sage Rd - Woodmen Frontage Rd PM 1-20

Site Code : 00194460

Start Date : 1/21/2020

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	Southbound					Woodmen Frontage Rd Westbound					Golden Sage Rd Northbound					Woodmen Frontage Rd Eastbound					
Start Time	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Left	Through	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	4:00:00 PM					4:45:00 PM					4:00:00 PM					4:15:00 PM					
+0 mins.	0	0	0	0	0	60	0	0	0	60	0	0	45	0	45	0	1	0	0	0	1
+5 mins.	0	0	0	0	0	45	0	0	0	45	0	0	52	0	52	0	0	0	0	0	0
+10 mins.	0	0	0	0	0	13	0	0	0	13	0	0	52	0	52	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	89	0	1	0	90	0	0	44	0	44	0	0	2	0	0	2
Total Volume	0	0	0	0	0	207	0	1	0	208	0	0	193	0	193	0	1	2	0	0	3
% App. Total	0	0	0	0	0	99.5	0	0.5	0		0	0	100	0		0	33.3	66.7	0		
PHF	.000	.000	.000	.000	.000	.581	.000	.250	.000	.578	.000	.000	.928	.000	.928	.000	.250	.250	.000		.375



Levels of Service

HCM 6th TWSC
3: Meridian Rd & Bent Grass Meadows Dr

Existing Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	5.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	68	151	57	657	1538	126
Future Vol, veh/h	68	151	57	657	1538	126
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	700	-	-	330
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	86	86	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	157	66	764	1748	143

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2262	874	1891	0	-	0
Stage 1	1748	-	-	-	-	-
Stage 2	514	-	-	-	-	-
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	~ 35	293	312	-	-	-
Stage 1	125	-	-	-	-	-
Stage 2	565	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 28	293	312	-	-	-
Mov Cap-2 Maneuver	82	-	-	-	-	-
Stage 1	99	-	-	-	-	-
Stage 2	565	-	-	-	-	-























Approach	EB	NB	SB
HCM Control Delay, s	68.5	1.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	312	-	82	293	-	-
HCM Lane V/C Ratio	0.212	-	0.864	0.537	-	-
HCM Control Delay (s)	19.6	-	152.4	30.7	-	-
HCM Lane LOS	C	-	F	D	-	-
HCM 95th %tile Q(veh)	0.8	-	4.5	3	-	-

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

Timings 25: Golden Sage & Woodmen

Existing Traffic
AM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	47	661	44	15	1475	83	134	13	3	53	20
Future Volume (vph)	47	661	44	15	1475	83	134	13	3	53	20
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		2			6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	2	2	2	6	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	21.5	21.5	21.5	21.5	21.5
Total Split (s)	63.0	63.0	63.0	63.0	63.0	63.0	27.0	27.0	27.0	27.0	27.0
Total Split (%)	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.5	5.5	5.5	5.5	5.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None	None
Act Effect Green (s)	56.2	56.2	56.2	56.2	56.2	56.2	16.4	16.4	16.4	16.4	16.4
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66	0.66	0.19	0.19	0.19	0.19	0.19
v/c Ratio	0.44	0.31	0.05	0.04	0.71	0.09	0.76	0.04	0.01	0.24	0.47
Control Delay	23.6	7.1	2.2	6.6	12.2	1.8	54.1	27.1	0.0	30.7	28.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	7.1	2.2	6.6	12.2	1.8	54.1	27.1	0.0	30.7	28.9
LOS	C	A	A	A	B	A	D	C	A	C	C
Approach Delay		7.9			11.6			50.6			29.4
Approach LOS		A			B			D			C

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 85.1

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 14.3

Intersection LOS: B

Intersection Capacity Utilization 71.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 25: Golden Sage & Woodmen



HCM 6th TWSC
26: Golden Sage Rd & Woodmen Frontage Rd

Existing Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	5.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱			↱			↱	
Traffic Vol, veh/h	0	0	1	184	1	0	4	0	139	0	0	0
Future Vol, veh/h	0	0	1	184	1	0	4	0	139	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	83	83	83	65	65	65	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	1	222	1	0	6	0	214	0	0	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	227	1	121	120	-	1	0	0	214	0	0
Stage 1	-	1	-	119	119	-	-	-	-	-	-	-
Stage 2	-	226	-	2	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	672	1084	854	770	0	1622	-	-	1356	-	-
Stage 1	0	895	-	885	797	0	-	-	-	-	-	-
Stage 2	0	717	-	1021	895	0	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	669	1084	851	767	-	1622	-	-	1356	-	-
Mov Cap-2 Maneuver	-	669	-	851	767	-	-	-	-	-	-	-
Stage 1	-	895	-	881	794	-	-	-	-	-	-	-
Stage 2	-	714	-	1020	895	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.3	10.7	0.2	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1622	-	-	1084	850	1356	-	-
HCM Lane V/C Ratio	0.004	-	-	0.001	0.262	-	-	-
HCM Control Delay (s)	7.2	0	-	8.3	10.7	0	-	-
HCM Lane LOS	A	A	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	1.1	0	-	-





HCM 6th TWSC
40: frontage rd & Bent Grass Meadows Dr

Existing Traffic
AM Peak Hour

Intersection

Int Delay, s/veh 2.4

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	5	116	86	0	1	28
Future Vol, veh/h	5	116	86	0	1	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	83	83	35	35
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	141	104	0	3	80

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	104	0	-	0	257	104
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	153	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1488	-	-	-	732	951
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	875	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1488	-	-	-	729	951
Mov Cap-2 Maneuver	-	-	-	-	729	-
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	875	-

Approach EB WB SB







HCM Control Delay, s	0.3	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1488	-	-	-	941
HCM Lane V/C Ratio	0.004	-	-	-	0.088
HCM Control Delay (s)	7.4	-	-	-	9.2
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3

HCM 6th TWSC
3: Meridian Rd & Bent Grass Meadows Dr

Existing Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	56	95	83	1345	886	90
Future Vol, veh/h	56	95	83	1345	886	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	700	-	-	330
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	96	96	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	110	86	1401	886	90























Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1759	443	976	0	-	0
Stage 1	886	-	-	-	-	-
Stage 2	873	-	-	-	-	-
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	76	562	703	-	-	-
Stage 1	363	-	-	-	-	-
Stage 2	369	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	67	562	703	-	-	-
Mov Cap-2 Maneuver	167	-	-	-	-	-
Stage 1	319	-	-	-	-	-
Stage 2	369	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.9	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	703	-	167	562	-	-
HCM Lane V/C Ratio	0.123	-	0.39	0.197	-	-
HCM Control Delay (s)	10.8	-	39.7	13	-	-
HCM Lane LOS	B	-	E	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.7	0.7	-	-

Timings
25: Golden Sage & Woodmen

Existing Traffic
PM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	88	1345	44	18	875	67	105	28	23	96	13
Future Volume (vph)	88	1345	44	18	875	67	105	28	23	96	13
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA
Protected Phases		2			6			8			4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	2	2	2	6	6	6	8	8	8	4	4
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	11.0	11.0	11.0	11.0	11.0	11.0	21.5	21.5	21.5	21.5	21.5
Total Split (s)	65.0	65.0	65.0	65.0	65.0	65.0	25.0	25.0	25.0	25.0	25.0
Total Split (%)	72.2%	72.2%	72.2%	72.2%	72.2%	72.2%	27.8%	27.8%	27.8%	27.8%	27.8%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	-1.0	-3.0	-3.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	4.0	6.0	4.0	4.0	4.5	5.5	5.5	5.5	5.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Max	Max	Max	Max	Max	Max	None	None	None	None	None
Act Effect Green (s)	58.1	61.1	61.1	59.1	61.1	61.1	16.2	15.2	15.2	15.2	15.2
Actuated g/C Ratio	0.68	0.71	0.71	0.69	0.71	0.71	0.19	0.18	0.18	0.18	0.18
v/c Ratio	0.25	0.58	0.04	0.11	0.37	0.06	0.69	0.10	0.09	0.71	0.45
Control Delay	8.5	7.7	1.6	7.3	5.8	1.4	52.4	29.6	4.7	49.6	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.5	7.7	1.6	7.3	5.8	1.4	52.4	29.6	4.7	49.6	10.6
LOS	A	A	A	A	A	A	D	C	A	D	B
Approach Delay		7.6			5.5			41.2			29.0
Approach LOS		A			A			D			C

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 85.8

Natural Cycle: 55

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 11.3

Intersection LOS: B

Intersection Capacity Utilization 65.9%

ICU Level of Service C





Analysis Period (min) 15

Splits and Phases: 25: Golden Sage & Woodmen







HCM 6th TWSC
26: Golden Sage Rd & Woodmen Frontage Rd

Existing Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	7.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	3	200	1	0	2	0	181	0	0	0
Future Vol, veh/h	0	0	3	200	1	0	2	0	181	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	58	58	58	83	83	83	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	4	345	2	0	2	0	218	0	0	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	223	1	116	114	-	1	0	0	218	0	0
Stage 1	-	1	-	113	113	-	-	-	-	-	-	-
Stage 2	-	222	-	3	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	676	1084	861	776	0	1622	-	-	1352	-	-
Stage 1	0	895	-	892	802	0	-	-	-	-	-	-
Stage 2	0	720	-	1020	895	0	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	675	1084	858	775	-	1622	-	-	1352	-	-
Mov Cap-2 Maneuver	-	675	-	858	775	-	-	-	-	-	-	-
Stage 1	-	895	-	891	801	-	-	-	-	-	-	-
Stage 2	-	719	-	1016	895	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	8.3		12		0.1		0					
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1622	-	-	1084	858	1352	-	-				
HCM Lane V/C Ratio	0.001	-	-	0.004	0.404	-	-	-				
HCM Control Delay (s)	7.2	0	-	8.3	12	0	-	-				
HCM Lane LOS	A	A	-	A	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	2	0	-	-				

HCM 6th TWSC
40: frontage rd & Bent Grass Meadows Dr

Existing Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	76	120	1	0	24
Future Vol, veh/h	8	76	120	1	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	78	78	36	36	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	97	333	3	0	31







Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	336	0	0 452 335
Stage 1	-	-	- - 335 -
Stage 2	-	-	- - 117 -
Critical Hdwy	4.12	-	- - 6.42 6.22
Critical Hdwy Stg 1	-	-	- - 5.42 -
Critical Hdwy Stg 2	-	-	- - 5.42 -
Follow-up Hdwy	2.218	-	- - 3.518 3.318
Pot Cap-1 Maneuver	1223	-	- - 565 707
Stage 1	-	-	- - 725 -
Stage 2	-	-	- - 908 -
Platoon blocked, %		-	- -
Mov Cap-1 Maneuver	1223	-	- - 560 707
Mov Cap-2 Maneuver	-	-	- - 560 -
Stage 1	-	-	- - 719 -
Stage 2	-	-	- - 908 -

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1223	-	-	-	707
HCM Lane V/C Ratio	0.008	-	-	-	0.044
HCM Control Delay (s)	8	-	-	-	10.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1























HCM 6th TWSC
3: Meridian Rd & Bent Grass Meadows Dr

Short-Term Background Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	49					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	133	231	149	583	1441	258
Future Vol, veh/h	133	231	149	583	1441	258
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	700	-	-	330
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	86	86	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	139	241	173	678	1638	293
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2323	819	1931	0	-	0
Stage 1	1638	-	-	-	-	-
Stage 2	685	-	-	-	-	-
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	~ 31	319	301	-	-	-
Stage 1	144	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 13	319	301	-	-	-
Mov Cap-2 Maneuver	~ 49	-	-	-	-	-
Stage 1	~ 61	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	\$ 394	6.5		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	301	-	49	319	-	-
HCM Lane V/C Ratio	0.576	-	2.827	0.754	-	-
HCM Control Delay (s)	32	-	\$ 1002	44	-	-
HCM Lane LOS	D	-	F	E	-	-
HCM 95th %tile Q(veh)	3.4	-	14.7	5.8	-	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Timings 25: Golden Sage & Woodmen

Short-Term Background Traffic
AM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	110	639	44	15	1401	69	139	17	4	40	21
Future Volume (vph)	110	639	44	15	1401	69	139	17	4	40	21
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Minimum Split (s)	10.0	11.0	11.0	10.0	11.0	11.0	10.0	21.0	21.0	10.0	21.0
Total Split (s)	11.0	54.0	54.0	10.0	53.0	53.0	15.0	21.0	21.0	15.0	21.0
Total Split (%)	11.0%	54.0%	54.0%	10.0%	53.0%	53.0%	15.0%	21.0%	21.0%	15.0%	21.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	-1.0	-3.0	-3.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None
Act Effect Green (s)	57.6	56.3	56.3	55.1	49.1	49.1	23.0	17.1	17.1	20.9	12.0
Actuated g/C Ratio	0.60	0.59	0.59	0.58	0.51	0.51	0.24	0.18	0.18	0.22	0.13
v/c Ratio	0.65	0.33	0.05	0.04	0.87	0.09	0.68	0.06	0.01	0.13	0.81
Control Delay	32.0	12.2	0.1	8.2	27.9	0.7	44.2	36.5	0.0	26.1	38.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	12.2	0.1	8.2	27.9	0.7	44.2	36.5	0.0	26.1	38.6
LOS	C	B	A	A	C	A	D	D	A	C	D
Approach Delay		14.3			26.4			42.3			36.7
Approach LOS		B			C			D			D

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 95.8

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 25.0

Intersection LOS: C

Intersection Capacity Utilization 81.5%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 25: Golden Sage & Woodmen

			
10 s	54 s	15 s	21 s
			
11 s	53 s	15 s	21 s

HCM 6th TWSC
26: Golden Sage Rd & Woodmen Frontage Rd

Short-Term Background Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	6.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱			↱			↱	
Traffic Vol, veh/h	0	0	1	268	1	0	4	0	192	0	0	0
Future Vol, veh/h	0	0	1	268	1	0	4	0	192	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	87	87	87	87	87	87	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	1	308	1	0	5	0	221	0	0	0






Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	232	1	123	122	-	1	0	0	221	0	0
Stage 1	-	1	-	121	121	-	-	-	-	-	-	-
Stage 2	-	231	-	2	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	668	1084	852	768	0	1622	-	-	1348	-	-
Stage 1	0	895	-	883	796	0	-	-	-	-	-	-
Stage 2	0	713	-	1021	895	0	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	665	1084	849	765	-	1622	-	-	1348	-	-
Mov Cap-2 Maneuver	-	665	-	849	765	-	-	-	-	-	-	-
Stage 1	-	895	-	879	793	-	-	-	-	-	-	-
Stage 2	-	710	-	1020	895	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.3	11.6	0.1	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1622	-	-	1084 849	1348	-	-
HCM Lane V/C Ratio	0.003	-	-	0.001 0.364	-	-	-
HCM Control Delay (s)	7.2	0	-	8.3 11.6	0	-	-
HCM Lane LOS	A	A	-	A B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 1.7	0	-	-















HCM 6th TWSC
40: frontage rd & Bent Grass Meadows Dr

Short-Term Background Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	143	133	10	15	65
Future Vol, veh/h	31	143	133	10	15	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	174	160	12	18	78
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	172	0	-	0	416	166
Stage 1	-	-	-	-	166	-
Stage 2	-	-	-	-	250	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1405	-	-	-	593	878
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	792	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1405	-	-	-	577	878
Mov Cap-2 Maneuver	-	-	-	-	577	-
Stage 1	-	-	-	-	840	-
Stage 2	-	-	-	-	792	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.4	0		9.9		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1405	-	-	-	577	878
HCM Lane V/C Ratio	0.027	-	-	-	0.031	0.089
HCM Control Delay (s)	7.6	-	-	-	11.4	9.5
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0.3

Timings 3: Meridian Rd & Bent Grass Meadows Dr

Short-Term Background Traffic
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (vph)	198	223	230	1217	820	197
Future Volume (vph)	198	223	230	1217	820	197
Turn Type	pm+pt	Perm	pm+pt	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases	4	4	2			6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.0	23.0	23.0	23.0
Total Split (s)	25.0	25.0	15.0	65.0	50.0	50.0
Total Split (%)	27.8%	27.8%	16.7%	72.2%	55.6%	55.6%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Max	Max	Max
Act Effect Green (s)	15.7	15.7	60.1	60.1	46.2	46.2
Actuated g/C Ratio	0.18	0.18	0.70	0.70	0.54	0.54
v/c Ratio	0.71	0.52	0.51	0.51	0.43	0.21
Control Delay	45.5	8.0	9.0	7.3	13.5	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	8.0	9.0	7.3	13.5	2.5
LOS	D	A	A	A	B	A
Approach Delay	25.7			7.6	11.4	
Approach LOS	C			A	B	

Intersection Summary























Cycle Length: 90
 Actuated Cycle Length: 85.8
 Natural Cycle: 60
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 11.8
 Intersection LOS: B
 Intersection Capacity Utilization 58.9%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 3: Meridian Rd & Bent Grass Meadows Dr



Timings 25: Golden Sage & Woodmen

Short-Term Background Traffic
PM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	189	1301	44	19	869	54	105	33	24	77	18
Future Volume (vph)	189	1301	44	19	869	54	105	33	24	77	18
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Minimum Split (s)	10.0	11.0	11.0	10.0	11.0	11.0	10.0	21.0	21.0	10.0	21.0
Total Split (s)	11.0	54.0	54.0	10.0	53.0	53.0	15.0	21.0	21.0	15.0	21.0
Total Split (%)	11.0%	54.0%	54.0%	10.0%	53.0%	53.0%	15.0%	21.0%	21.0%	15.0%	21.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	-1.0	-3.0	-3.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None
Act Effect Green (s)	57.6	56.3	56.3	55.1	49.1	49.1	20.7	11.2	11.2	16.7	8.2
Actuated g/C Ratio	0.63	0.62	0.62	0.60	0.54	0.54	0.23	0.12	0.12	0.18	0.09
v/c Ratio	0.55	0.65	0.05	0.09	0.49	0.06	0.48	0.18	0.09	0.31	0.65
Control Delay	14.3	14.9	0.1	7.5	15.0	0.1	33.2	40.1	0.5	30.2	19.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	14.9	0.1	7.5	15.0	0.1	33.2	40.1	0.5	30.2	19.1
LOS	B	B	A	A	B	A	C	D	A	C	B
Approach Delay		14.4			14.0			29.8			22.5
Approach LOS		B			B			C			C

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 91.5

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 16.0

Intersection LOS: B

Intersection Capacity Utilization 70.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 25: Golden Sage & Woodmen



HCM 6th TWSC
26: Golden Sage Rd & Woodmen Frontage Rd






Short-Term Background Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱			↱			↱	
Traffic Vol, veh/h	0	0	3	249	1	0	2	0	274	0	0	0
Future Vol, veh/h	0	0	3	249	1	0	2	0	274	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	87	87	87	87	87	87	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	4	286	1	0	2	0	315	0	0	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	320	1	165	163	-	1	0	0	315	0	0
Stage 1	-	1	-	162	162	-	-	-	-	-	-	-
Stage 2	-	319	-	3	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	597	1084	800	729	0	1622	-	-	1245	-	-
Stage 1	0	895	-	840	764	0	-	-	-	-	-	-
Stage 2	0	653	-	1020	895	0	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	596	1084	796	728	-	1622	-	-	1245	-	-
Mov Cap-2 Maneuver	-	596	-	796	728	-	-	-	-	-	-	-
Stage 1	-	895	-	838	762	-	-	-	-	-	-	-
Stage 2	-	652	-	1016	895	-	-	-	-	-	-	-













Approach	EB	WB	NB	SB
HCM Control Delay, s	8.3	12.1	0.1	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1622	-	-	1084 796	1245	-	-
HCM Lane V/C Ratio	0.001	-	-	0.004 0.361	-	-	-
HCM Control Delay (s)	7.2	0	-	8.3 12.1	0	-	-
HCM Lane LOS	A	A	-	A B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 1.7	0	-	-

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	38	143	147	16	9	50
Future Vol, veh/h	38	143	147	16	9	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	83	83	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	164	177	19	12	64
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	196	0	-	0	439	187
Stage 1	-	-	-	-	187	-
Stage 2	-	-	-	-	252	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1377	-	-	-	575	855
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1377	-	-	-	557	855
Mov Cap-2 Maneuver	-	-	-	-	557	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	790	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.6	0		9.9		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1377	-	-	-	557	855
HCM Lane V/C Ratio	0.032	-	-	-	0.021	0.075
HCM Control Delay (s)	7.7	-	-	-	11.6	9.6
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0.2

Timings 3: Meridian Rd & Bent Grass Meadows Dr

Short-Term Total Traffic
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	145	268	160	583	1441	262
Future Volume (vph)	145	268	160	583	1441	262
Turn Type	pm+pt	Perm	pm+pt	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases	4	4	2			6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.0	23.0	23.0	23.0
Total Split (s)	25.0	25.0	15.0	65.0	50.0	50.0
Total Split (%)	27.8%	27.8%	16.7%	72.2%	55.6%	55.6%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Max	Max	Max
Act Effect Green (s)	12.4	12.4	60.1	60.1	46.5	46.5
Actuated g/C Ratio	0.15	0.15	0.73	0.73	0.56	0.56
v/c Ratio	0.57	0.68	0.68	0.26	0.82	0.29
Control Delay	41.2	18.3	27.0	4.4	20.4	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	18.3	27.0	4.4	20.4	2.2
LOS	D	B	C	A	C	A
Approach Delay	26.3			9.3	17.6	
Approach LOS	C			A	B	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 82.5

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 16.6

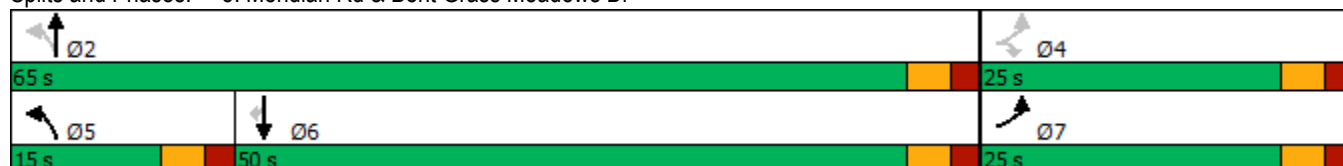
Intersection LOS: B

Intersection Capacity Utilization 69.2%

ICU Level of Service C

Analysis Period (min) 15























Splits and Phases: 3: Meridian Rd & Bent Grass Meadows Dr



Timings

25: Golden Sage & Woodmen

Short-Term Total Traffic
AM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	127	639	44	15	1401	69	139	17	4	40	22
Future Volume (vph)	127	639	44	15	1401	69	139	17	4	40	22
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Minimum Split (s)	10.0	11.0	11.0	10.0	11.0	11.0	10.0	21.0	21.0	10.0	21.0
Total Split (s)	11.0	54.0	54.0	10.0	53.0	53.0	15.0	21.0	21.0	15.0	21.0
Total Split (%)	11.0%	54.0%	54.0%	10.0%	53.0%	53.0%	15.0%	21.0%	21.0%	15.0%	21.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	-1.0	-3.0	-3.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None
Act Effect Green (s)	57.5	56.1	56.1	55.1	49.1	49.1	29.0	21.5	21.5	22.1	14.7
Actuated g/C Ratio	0.58	0.57	0.57	0.56	0.50	0.50	0.29	0.22	0.22	0.22	0.15
v/c Ratio	0.77	0.34	0.05	0.04	0.89	0.09	0.67	0.05	0.01	0.14	0.90
Control Delay	44.5	13.0	0.1	8.5	30.8	0.7	40.5	34.6	0.0	25.9	53.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.5	13.0	0.1	8.5	30.8	0.7	40.5	34.6	0.0	25.9	53.0
LOS	D	B	A	A	C	A	D	C	A	C	D
Approach Delay		17.2			29.2			38.8			49.6
Approach LOS		B			C			D			D

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 98.5

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 28.8

Intersection LOS: C

Intersection Capacity Utilization 85.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 25: Golden Sage & Woodmen



HCM 6th TWSC
26: Golden Sage Rd & Woodmen Frontage Rd

Short-Term Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	7.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱			↱			↱	
Traffic Vol, veh/h	0	0	1	318	1	0	4	0	209	0	0	0
Future Vol, veh/h	0	0	1	318	1	0	4	0	209	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	87	87	87	87	87	87	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	1	366	1	0	5	0	240	0	0	0






Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	-	251	1	132	131	-	1	0	0	240	0	0
Stage 1	-	1	-	130	130	-	-	-	-	-	-	-
Stage 2	-	250	-	2	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	652	1084	840	760	0	1622	-	-	1327	-	-
Stage 1	0	895	-	874	789	0	-	-	-	-	-	-
Stage 2	0	700	-	1021	895	0	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	649	1084	837	757	-	1622	-	-	1327	-	-
Mov Cap-2 Maneuver	-	649	-	837	757	-	-	-	-	-	-	-
Stage 1	-	895	-	871	786	-	-	-	-	-	-	-
Stage 2	-	697	-	1020	895	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.3	12.6	0.1	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1622	-	-	1084 837	1327	-	-
HCM Lane V/C Ratio	0.003	-	-	0.001 0.438	-	-	-
HCM Control Delay (s)	7.2	0	-	8.3 12.6	0	-	-
HCM Lane LOS	A	A	-	A B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 2.3	0	-	-






HCM 6th TWSC
40: frontage rd & Bent Grass Meadows Dr

Short-Term Total Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	48	143	133	12	15	115
Future Vol, veh/h	48	143	133	12	15	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	59	174	160	14	18	139
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	174	0	-	0	459	167
Stage 1	-	-	-	-	167	-
Stage 2	-	-	-	-	292	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1403	-	-	-	560	877
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	758	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1403	-	-	-	536	877
Mov Cap-2 Maneuver	-	-	-	-	536	-
Stage 1	-	-	-	-	827	-
Stage 2	-	-	-	-	758	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.9	0		10.1		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1403	-	-	-	536	877
HCM Lane V/C Ratio	0.042	-	-	-	0.034	0.158
HCM Control Delay (s)	7.7	-	-	-	12	9.9
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0.6

Intersection







Int Delay, s/veh 1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	48	10	2	79	26	8
Future Vol, veh/h	48	10	2	79	26	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	155	-	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	52	11	2	86	28	9

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	63
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1540
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1540
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	854	-	-	1540	-
HCM Lane V/C Ratio	0.043	-	-	0.001	-
HCM Control Delay (s)	9.4	-	-	7.3	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

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	6	45	5	8	50	5	15	0	25	16	0	16
Future Vol, veh/h	6	45	5	8	50	5	15	0	25	16	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	155	-	-	-	-	-	-	-	-
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	7	49	5	9	54	5	16	0	27	17	0	17















Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	59	0	0	54	0	0	149	143	52	154	143	57
Stage 1	-	-	-	-	-	-	66	66	-	75	75	-
Stage 2	-	-	-	-	-	-	83	77	-	79	68	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1545	-	-	1551	-	-	819	748	1016	813	748	1009
Stage 1	-	-	-	-	-	-	945	840	-	934	833	-
Stage 2	-	-	-	-	-	-	925	831	-	930	838	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1545	-	-	1551	-	-	799	740	1016	785	740	1009
Mov Cap-2 Maneuver	-	-	-	-	-	-	799	740	-	785	740	-
Stage 1	-	-	-	-	-	-	940	836	-	929	828	-
Stage 2	-	-	-	-	-	-	904	826	-	901	834	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			0.9			9.1			9.2		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	922	1545	-	-	1551	-	-	883
HCM Lane V/C Ratio	0.047	0.004	-	-	0.006	-	-	0.039
HCM Control Delay (s)	9.1	7.3	-	-	7.3	-	-	9.2
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Timings 3: Meridian Rd & Bent Grass Meadows Dr

Short-Term Total Traffic
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				 	 	
Traffic Volume (vph)	206	247	266	1217	820	210
Future Volume (vph)	206	247	266	1217	820	210
Turn Type	pm+pt	Perm	pm+pt	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases	4	4	2			6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.0	23.0	23.0	23.0
Total Split (s)	25.0	25.0	15.0	65.0	50.0	50.0
Total Split (%)	27.8%	27.8%	16.7%	72.2%	55.6%	55.6%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Max	Max	Max
Act Effect Green (s)	16.1	16.1	60.1	60.1	45.9	45.9
Actuated g/C Ratio	0.19	0.19	0.70	0.70	0.53	0.53
v/c Ratio	0.73	0.54	0.59	0.51	0.44	0.22
Control Delay	46.4	8.0	10.6	7.5	13.9	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.4	8.0	10.6	7.5	13.9	2.5
LOS	D	A	B	A	B	A
Approach Delay	25.5			8.1	11.5	
Approach LOS	C			A	B	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 86.2
Natural Cycle: 60
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 12.2
Intersection Capacity Utilization 61.3%
Analysis Period (min) 15























Intersection LOS: B
ICU Level of Service B

Splits and Phases: 3: Meridian Rd & Bent Grass Meadows Dr



Timings 25: Golden Sage & Woodmen

Short-Term Total Traffic
PM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	245	1301	44	19	869	54	105	34	24	77	19
Future Volume (vph)	245	1301	44	19	869	54	105	34	24	77	19
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Minimum Split (s)	10.0	11.0	11.0	10.0	11.0	11.0	10.0	21.0	21.0	10.0	21.0
Total Split (s)	11.0	54.0	54.0	10.0	53.0	53.0	15.0	21.0	21.0	15.0	21.0
Total Split (%)	11.0%	54.0%	54.0%	10.0%	53.0%	53.0%	15.0%	21.0%	21.0%	15.0%	21.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	-1.0	-3.0	-3.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None
Act Effect Green (s)	57.6	56.4	56.4	55.2	49.1	49.1	21.0	11.5	11.5	17.0	8.5
Actuated g/C Ratio	0.63	0.61	0.61	0.60	0.53	0.53	0.23	0.13	0.13	0.18	0.09
v/c Ratio	0.71	0.65	0.05	0.09	0.49	0.06	0.48	0.18	0.09	0.31	0.69
Control Delay	23.5	15.2	0.1	7.8	15.3	0.1	33.1	39.8	0.5	29.9	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	15.2	0.1	7.8	15.3	0.1	33.1	39.8	0.5	29.9	18.8
LOS	C	B	A	A	B	A	C	D	A	C	B
Approach Delay		15.9			14.2			29.7			21.8
Approach LOS		B			B			C			C

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 91.9

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 16.8

Intersection LOS: B

Intersection Capacity Utilization 72.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 25: Golden Sage & Woodmen



HCM 6th TWSC
26: Golden Sage Rd & Woodmen Frontage Rd

Short-Term Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	6.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱			↱			↱	
Traffic Vol, veh/h	0	0	3	282	1	0	2	0	331	0	0	0
Future Vol, veh/h	0	0	3	282	1	0	2	0	331	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	87	87	87	87	87	87	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	4	324	1	0	2	0	380	0	0	0

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	-	385	1	197	195	-	1	0	0	380	0	0
Stage 1	-	1	-	194	194	-	-	-	-	-	-	-
Stage 2	-	384	-	3	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	549	1084	762	700	0	1622	-	-	1178	-	-
Stage 1	0	895	-	808	740	0	-	-	-	-	-	-
Stage 2	0	611	-	1020	895	0	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	548	1084	758	699	-	1622	-	-	1178	-	-
Mov Cap-2 Maneuver	-	548	-	758	699	-	-	-	-	-	-	-
Stage 1	-	895	-	806	739	-	-	-	-	-	-	-
Stage 2	-	610	-	1016	895	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.3	13.3	0	0
HCM LOS	A	B		






Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1622	-	-	1084 758	1178	-	-
HCM Lane V/C Ratio	0.001	-	-	0.004 0.429	-	-	-
HCM Control Delay (s)	7.2	0	-	8.3 13.3	0	-	-
HCM Lane LOS	A	A	-	A B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 2.2	0	-	-

HCM 6th TWSC
40: frontage rd & Bent Grass Meadows Dr

Short-Term Total Traffic
PM Peak Hour

Intersection





Int Delay, s/veh 3.4








Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	95	143	147	22	9	83
Future Vol, veh/h	95	143	147	22	9	83
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	83	83	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	109	164	177	27	12	106

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	204	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1368	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1368	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1368	-	-	-	443	851
HCM Lane V/C Ratio	0.08	-	-	-	0.026	0.125
HCM Control Delay (s)	7.9	-	-	-	13.3	9.8
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.3	-	-	-	0.1	0.4

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	79	32	7	55	17	5
Future Vol, veh/h	79	32	7	55	17	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	155	-	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	86	35	8	60	18	5
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	121	0	180	104
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	76	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1467	-	810	951
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	947	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1467	-	806	951
Mov Cap-2 Maneuver	-	-	-	-	791	-
Stage 1	-	-	-	-	915	-
Stage 2	-	-	-	-	947	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.8		9.5		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	822	-	-	1467	-	
HCM Lane V/C Ratio	0.029	-	-	0.005	-	
HCM Control Delay (s)	9.5	-	-	7.5	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	46	18	26	41	16	11	0	16	10	0	11
Future Vol, veh/h	20	46	18	26	41	16	11	0	16	10	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	155	-	-	155	-	-	-	-	-	-	-	-
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	22	50	20	28	45	17	12	0	17	11	0	12








Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	62	0	0	70	0	0	220	222	60	223	224	54
Stage 1	-	-	-	-	-	-	104	104	-	110	110	-
Stage 2	-	-	-	-	-	-	116	118	-	113	114	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1541	-	-	1531	-	-	736	677	1005	733	675	1013
Stage 1	-	-	-	-	-	-	902	809	-	895	804	-
Stage 2	-	-	-	-	-	-	889	798	-	892	801	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1541	-	-	1531	-	-	710	655	1005	702	653	1013
Mov Cap-2 Maneuver	-	-	-	-	-	-	710	655	-	702	653	-
Stage 1	-	-	-	-	-	-	889	798	-	882	790	-
Stage 2	-	-	-	-	-	-	862	784	-	864	790	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.8			2.3			9.3			9.4		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	860	1541	-	-	1531	-	-	837
HCM Lane V/C Ratio	0.034	0.014	-	-	0.018	-	-	0.027
HCM Control Delay (s)	9.3	7.4	-	-	7.4	-	-	9.4
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0.1

Timings 3: Meridian Rd & Bent Grass Meadows Dr

2040 Background Traffic
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	223	309	315	631	1680	287
Future Volume (vph)	223	309	315	631	1680	287
Turn Type	Prot	Free	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		Free	2			6
Detector Phase	4		5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	10.0		10.0	10.0	10.0	10.0
Total Split (s)	25.0		31.0	95.0	64.0	64.0
Total Split (%)	20.8%		25.8%	79.2%	53.3%	53.3%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None		None	Max	Max	Max
Act Effect Green (s)	13.2	113.3	90.1	90.1	63.8	63.8
Actuated g/C Ratio	0.12	1.00	0.80	0.80	0.56	0.56
v/c Ratio	0.60	0.21	0.86	0.24	0.92	0.31
Control Delay	54.1	0.3	52.4	3.4	32.5	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	0.3	52.4	3.4	32.5	3.7
LOS	D	A	D	A	C	A
Approach Delay	22.8			19.7	28.3	
Approach LOS	C			B	C	

Intersection Summary





























Cycle Length: 120
Actuated Cycle Length: 113.3
Natural Cycle: 75
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 25.1
Intersection LOS: C
Intersection Capacity Utilization 82.8%
ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: Meridian Rd & Bent Grass Meadows Dr



Timings
25: Golden Sage Rd & Woodmen Rd

2040 Background Traffic
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 						 	
Traffic Volume (vph)	363	734	74	77	1776	90	150	7	48	238	10	327
Future Volume (vph)	363	734	74	77	1776	90	150	7	48	238	10	327
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		Free
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.0	12.0	12.0	10.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	
Total Split (s)	18.0	71.0	71.0	10.0	63.0	63.0	24.0	15.0	15.0	24.0	15.0	
Total Split (%)	15.0%	59.2%	59.2%	8.3%	52.5%	52.5%	20.0%	12.5%	12.5%	20.0%	12.5%	
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	
Act Effect Green (s)	14.1	67.6	67.6	65.3	57.3	57.3	26.7	7.2	7.2	20.3	7.3	112.8
Actuated g/C Ratio	0.12	0.60	0.60	0.58	0.51	0.51	0.24	0.06	0.06	0.18	0.06	1.00
v/c Ratio	0.89	0.35	0.08	0.18	1.01	0.11	0.39	0.06	0.19	0.79	0.09	0.22
Control Delay	73.6	13.5	1.1	8.6	52.5	0.5	37.8	52.3	1.6	61.2	52.9	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.6	13.5	1.1	8.6	52.5	0.5	37.8	52.3	1.6	61.2	52.9	0.3
LOS	E	B	A	A	D	A	D	D	A	E	D	A
Approach Delay		31.7			48.2			29.7			26.5	
Approach LOS		C			D			C			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 112.8

Natural Cycle: 90

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 39.0

Intersection LOS: D

Intersection Capacity Utilization 91.0%

ICU Level of Service E






Analysis Period (min) 15

Splits and Phases: 25: Golden Sage Rd & Woodmen Rd

 Ø1	 Ø2	 Ø3	 Ø4
10 s	71 s	24 s	15 s
 Ø5	 Ø6	 Ø7	 Ø8
18 s	63 s	24 s	15 s

HCM 6th TWSC
26: Golden Sage Rd & Woodmen Frontage Rd

2040 Background Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	24.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	32	277	299	5	0	101	0	359	0	0	0
Future Vol, veh/h	0	32	277	299	5	0	101	0	359	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	95	95	95	95	92	95	92	95	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	34	292	315	5	0	106	0	378	0	0	0






Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	213	1	376	213	-	1	0	-	0	0	0
Stage 1	-	1	-	212	212	-	-	-	-	-	-	-
Stage 2	-	212	-	164	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	684	1084	581	684	0	1622	-	0	-	-	-
Stage 1	0	895	-	790	727	0	-	-	0	-	-	-
Stage 2	0	727	-	838	895	0	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	-	640	1084	388	640	-	1622	-	-	-	-	-
Mov Cap-2 Maneuver	-	640	-	388	640	-	-	-	-	-	-	-
Stage 1	-	895	-	739	680	-	-	-	-	-	-	-
Stage 2	-	680	-	590	895	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.2		44.5		7.4		0	
HCM LOS	B		E					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1622	-	1011	391	-	-	-
HCM Lane V/C Ratio	0.066	-	0.322	0.818	-	-	-
HCM Control Delay (s)	7.4	0	10.2	44.5	0	-	-
HCM Lane LOS	A	A	B	E	A	-	-
HCM 95th %tile Q(veh)	0.2	-	1.4	7.4	-	-	-

Intersection







Int Delay, s/veh 3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	149	235	144	33	10	126
Future Vol, veh/h	149	235	144	33	10	126
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	155	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	162	255	157	36	11	137

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	193	0	0 754 175
Stage 1	-	-	- 175 -
Stage 2	-	-	- 579 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1380	-	- 377 868
Stage 1	-	-	- 855 -
Stage 2	-	-	- 560 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1380	-	- 333 868
Mov Cap-2 Maneuver	-	-	- 333 -
Stage 1	-	-	- 755 -
Stage 2	-	-	- 560 -

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1380	-	-	-	333	868
HCM Lane V/C Ratio	0.117	-	-	-	0.033	0.158
HCM Control Delay (s)	8	-	-	-	16.2	9.9
HCM Lane LOS	A	-	-	-	C	A
HCM 95th %tile Q(veh)	0.4	-	-	-	0.1	0.6

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	0	133	2	0	143	5	6	0	0	14	0	0
Future Vol, veh/h	0	133	2	0	143	5	6	0	0	14	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	155	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	145	2	0	155	5	7	0	0	15	0	0
















Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	160	0	0	147	0	0	304	306	146	304	305	158
Stage 1	-	-	-	-	-	-	146	146	-	158	158	-
Stage 2	-	-	-	-	-	-	158	160	-	146	147	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1419	-	-	1435	-	-	648	608	901	648	608	887
Stage 1	-	-	-	-	-	-	857	776	-	844	767	-
Stage 2	-	-	-	-	-	-	844	766	-	857	775	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1419	-	-	1435	-	-	648	608	901	648	608	887
Mov Cap-2 Maneuver	-	-	-	-	-	-	648	608	-	648	608	-
Stage 1	-	-	-	-	-	-	857	776	-	844	767	-
Stage 2	-	-	-	-	-	-	844	766	-	857	775	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	10.6	10.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	648	1419	-	-	1435	-	-	648
HCM Lane V/C Ratio	0.01	-	-	-	-	-	-	0.023
HCM Control Delay (s)	10.6	0	-	-	0	-	-	10.7
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Timings
3: Bent Grass Meadows Dr./Meridian Road

2040 Background Traffic
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	 			 	 	
Traffic Volume (vph)	492	350	362	1424	1114	192
Future Volume (vph)	492	350	362	1424	1114	192
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	31.0	31.0	37.0	89.0	52.0	52.0
Total Split (%)	25.8%	25.8%	30.8%	74.2%	43.3%	43.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Max	Max	Max
Act Effect Green (s)	23.0	23.0	84.0	84.0	54.0	54.0
Actuated g/C Ratio	0.20	0.20	0.72	0.72	0.46	0.46
v/c Ratio	0.79	0.62	0.84	0.61	0.74	0.25
Control Delay	54.3	8.7	43.1	9.9	31.2	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.3	8.7	43.1	9.9	31.2	3.9
LOS	D	A	D	A	C	A
Approach Delay	35.4			16.6	27.2	
Approach LOS	D			B	C	

Intersection Summary

























Cycle Length: 120
 Actuated Cycle Length: 117
 Natural Cycle: 70
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 24.1
 Intersection LOS: C
 Intersection Capacity Utilization 77.4%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 3: Bent Grass Meadows Dr



Timings
25: Golden Sage Rd & Woodmen Rd

2040 Background Traffic
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	1629	121	99	1083	284	152	14	114	177	10	400
Future Volume (vph)	390	1629	121	99	1083	284	152	14	114	177	10	400
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		Free
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.0	12.0	12.0	10.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	
Total Split (s)	23.0	64.0	64.0	10.0	51.0	51.0	31.0	15.0	15.0	31.0	15.0	
Total Split (%)	19.2%	53.3%	53.3%	8.3%	42.5%	42.5%	25.8%	12.5%	12.5%	25.8%	12.5%	
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	
Act Effect Green (s)	17.4	56.2	56.2	52.9	44.9	44.9	27.2	7.4	7.4	19.0	7.8	104.7
Actuated g/C Ratio	0.17	0.54	0.54	0.51	0.43	0.43	0.26	0.07	0.07	0.18	0.07	1.00
v/c Ratio	0.72	0.87	0.14	0.59	0.73	0.35	0.36	0.11	0.44	0.58	0.08	0.27
Control Delay	50.1	28.3	2.8	30.9	29.2	3.8	33.3	49.9	7.2	45.7	48.1	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.1	28.3	2.8	30.9	29.2	3.8	33.3	49.9	7.2	45.7	48.1	0.4
LOS	D	C	A	C	C	A	C	D	A	D	D	A
Approach Delay		30.9			24.3			23.6			14.9	
Approach LOS		C			C			C			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 104.7

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 26.1

Intersection LOS: C

Intersection Capacity Utilization 78.7%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 25: Golden Sage Rd & Woodmen Rd



HCM 6th TWSC
26: Golden Sage Rd & Woodmen Frontage Rd

2040 Background Traffic
PM Peak Hour






Intersection												
Int Delay, s/veh	283											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱			↱	↱		↱	
Traffic Vol, veh/h	0	27	183	405	15	0	330	0	359	0	0	0
Future Vol, veh/h	0	27	183	405	15	0	330	0	359	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	95	95	95	95	92	95	92	95	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	28	193	426	16	0	347	0	378	0	0	0







Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	695	1	806	695	-	1	0	-	0	0	0
Stage 1	-	1	-	694	694	-	-	-	-	-	-	-
Stage 2	-	694	-	112	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	366	1084	~ 300	366	0	1622	-	0	-	-	-
Stage 1	0	895	-	433	444	0	-	-	0	-	-	-
Stage 2	0	444	-	893	895	0	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	-	288	1084	~ 191	288	-	1622	-	-	-	-	-
Mov Cap-2 Maneuver	-	288	-	~ 191	288	-	-	-	-	-	-	-
Stage 1	-	895	-	~ 340	349	-	-	-	-	-	-	-
Stage 2	-	349	-	711	895	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.2	\$ 635.9	7.8	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1622	-	800	193	-	-	-
HCM Lane V/C Ratio	0.214	-	0.276	2.291	-	-	-
HCM Control Delay (s)	7.8	0	11.2	\$ 635.9	0	-	-
HCM Lane LOS	A	A	B	F	A	-	-
HCM 95th %tile Q(veh)	0.8	-	1.1	35.8	-	-	-

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

Intersection						
Int Delay, s/veh	4.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	137	210	221	21	11	179
Future Vol, veh/h	137	210	221	21	11	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	155	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	149	228	240	23	12	195
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	263	0	-	0	778	252
Stage 1	-	-	-	-	252	-
Stage 2	-	-	-	-	526	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1301	-	-	-	365	787
Stage 1	-	-	-	-	790	-
Stage 2	-	-	-	-	593	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1301	-	-	-	323	787
Mov Cap-2 Maneuver	-	-	-	-	323	-
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	593	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.2	0		11.4		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1301	-	-	-	323	787
HCM Lane V/C Ratio	0.114	-	-	-	0.037	0.247
HCM Control Delay (s)	8.1	-	-	-	16.6	11.1
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.4	-	-	-	0.1	1

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	181	8	0	99	13	5	0	0	8	0	0
Future Vol, veh/h	0	181	8	0	99	13	5	0	0	8	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	155	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	197	9	0	108	14	5	0	0	9	0	0













Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	122	0	0	206	0	0	317	324	202	317	321	115
Stage 1	-	-	-	-	-	-	202	202	-	115	115	-
Stage 2	-	-	-	-	-	-	115	122	-	202	206	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1465	-	-	1365	-	-	636	594	839	636	596	937
Stage 1	-	-	-	-	-	-	800	734	-	890	800	-
Stage 2	-	-	-	-	-	-	890	795	-	800	731	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1465	-	-	1365	-	-	636	594	839	636	596	937
Mov Cap-2 Maneuver	-	-	-	-	-	-	636	594	-	636	596	-
Stage 1	-	-	-	-	-	-	800	734	-	890	800	-
Stage 2	-	-	-	-	-	-	890	795	-	800	731	-

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

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	636	1465	-	-	1365	-	-	636
HCM Lane V/C Ratio	0.009	-	-	-	-	-	-	0.014
HCM Control Delay (s)	10.7	0	-	-	0	-	-	10.7
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Timings 3: Meridian Rd & Bent Grass Meadows Dr

2040 Total Traffic
AM Peak Hour

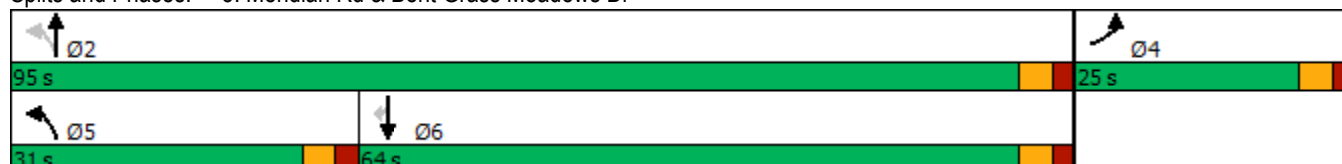
						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	232	337	323	631	1680	290
Future Volume (vph)	232	337	323	631	1680	290
Turn Type	Prot	Free	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		Free	2			6
Detector Phase	4		5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	10.0		10.0	10.0	10.0	10.0
Total Split (s)	25.0		31.0	95.0	64.0	64.0
Total Split (%)	20.8%		25.8%	79.2%	53.3%	53.3%
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None		None	Max	Max	Max
Act Effect Green (s)	13.6	113.6	90.0	90.0	63.3	63.3
Actuated g/C Ratio	0.12	1.00	0.79	0.79	0.56	0.56
v/c Ratio	0.61	0.23	0.87	0.24	0.93	0.31
Control Delay	54.3	0.3	53.3	3.5	34.0	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.3	0.3	53.3	3.5	34.0	3.8
LOS	D	A	D	A	C	A
Approach Delay	22.3			20.3	29.5	
Approach LOS	C			C	C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 113.6
Natural Cycle: 80
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 25.8
Intersection Capacity Utilization 83.5%
Analysis Period (min) 15





























Intersection LOS: C
ICU Level of Service E

Splits and Phases: 3: Meridian Rd & Bent Grass Meadows Dr



Timings
25: Golden Sage Rd & Woodmen Rd

2040 Total Traffic
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			 						 	
Traffic Volume (vph)	374	734	74	77	1776	90	150	8	48	238	11	366
Future Volume (vph)	374	734	74	77	1776	90	150	8	48	238	11	366
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		Free
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.0	12.0	12.0	10.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	
Total Split (s)	18.0	71.0	71.0	10.0	63.0	63.0	24.0	15.0	15.0	24.0	15.0	
Total Split (%)	15.0%	59.2%	59.2%	8.3%	52.5%	52.5%	20.0%	12.5%	12.5%	20.0%	12.5%	
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	
Act Effect Green (s)	14.1	67.5	67.5	65.3	57.2	57.2	26.7	7.2	7.2	20.3	7.4	112.8
Actuated g/C Ratio	0.12	0.60	0.60	0.58	0.51	0.51	0.24	0.06	0.06	0.18	0.07	1.00
v/c Ratio	0.92	0.35	0.08	0.18	1.01	0.11	0.39	0.07	0.19	0.79	0.10	0.24
Control Delay	78.0	13.6	1.1	8.6	52.6	0.6	37.8	52.4	1.6	61.1	53.0	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.0	13.6	1.1	8.6	52.6	0.6	37.8	52.4	1.6	61.1	53.0	0.4
LOS	E	B	A	A	D	A	D	D	A	E	D	A
Approach Delay		33.5			48.3			29.8			24.9	
Approach LOS		C			D			C			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 112.8

Natural Cycle: 90

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 1.01

Intersection Signal Delay: 39.2

Intersection LOS: D

Intersection Capacity Utilization 91.3%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 25: Golden Sage Rd & Woodmen Rd

 Ø1	 Ø2	 Ø3	 Ø4
10 s	71 s	24 s	15 s
 Ø5	 Ø6	 Ø7	 Ø8
18 s	63 s	24 s	15 s

HCM 6th TWSC
26: Golden Sage Rd & Woodmen Frontage Rd

2040 Total Traffic
AM Peak Hour

Intersection												
Int Delay, s/veh	33.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰			↱			↱	↱		↰	
Traffic Vol, veh/h	0	32	277	338	5	0	101	0	371	0	0	0
Future Vol, veh/h	0	32	277	338	5	0	101	0	371	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	95	95	95	95	92	95	92	95	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	34	292	356	5	0	106	0	391	0	0	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	213	1	376	213	-	1	0	-	0	0	0
Stage 1	-	1	-	212	212	-	-	-	-	-	-	-
Stage 2	-	212	-	164	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	684	1084	581	684	0	1622	-	0	-	-	-
Stage 1	0	895	-	790	727	0	-	-	0	-	-	-
Stage 2	0	727	-	838	895	0	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	-	640	1084	388	640	-	1622	-	-	-	-	-
Mov Cap-2 Maneuver	-	640	-	388	640	-	-	-	-	-	-	-
Stage 1	-	895	-	739	680	-	-	-	-	-	-	-
Stage 2	-	680	-	590	895	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.2		61.8		7.4		0	
HCM LOS	B		F					






Minor Lane/Major Mvmt	NBL	NBT	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1622	-	1011	390	-	-	-
HCM Lane V/C Ratio	0.066	-	0.322	0.926	-	-	-
HCM Control Delay (s)	7.4	0	10.2	61.8	0	-	-
HCM Lane LOS	A	A	B	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	1.4	10	-	-	-

HCM 6th TWSC
40: frontage rd & Bent Grass Meadows Dr

2040 Total Traffic
AM Peak Hour

Intersection

Int Delay, s/veh 4.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	160	235	144	34	10	165
Future Vol, veh/h	160	235	144	34	10	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	155	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	174	255	157	37	11	179






Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	194	0	0 779 176
Stage 1	-	-	- 176 -
Stage 2	-	-	- 603 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1379	-	- 364 867
Stage 1	-	-	- 855 -
Stage 2	-	-	- 546 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1379	-	- 318 867
Mov Cap-2 Maneuver	-	-	- 318 -
Stage 1	-	-	- 747 -
Stage 2	-	-	- 546 -







Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1379	-	-	-	318	867
HCM Lane V/C Ratio	0.126	-	-	-	0.034	0.207
HCM Control Delay (s)	8	-	-	-	16.7	10.2
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.4	-	-	-	0.1	0.8

HCM 6th TWSC
203: Lynch Rd & Bent Grass Meadows Dr

2040 Total Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	142	6	4	169	20	12
Future Vol, veh/h	142	6	4	169	20	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	155	-	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	154	7	4	184	22	13
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	161	0	350	158
Stage 1	-	-	-	-	158	-
Stage 2	-	-	-	-	192	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1418	-	647	887
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	841	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1418	-	645	887
Mov Cap-2 Maneuver	-	-	-	-	683	-
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	841	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.2		10.1	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	747	-	-	1418	-	
HCM Lane V/C Ratio	0.047	-	-	0.003	-	
HCM Control Delay (s)	10.1	-	-	7.5	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

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	4	146	4	9	148	12	13	0	28	34	0	13
Future Vol, veh/h	4	146	4	9	148	12	13	0	28	34	0	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	155	-	-	-	-	-	-	-	-
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	159	4	10	161	13	14	0	30	37	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	174	0	0	163	0	0	364	363	161	372	359	168
Stage 1	-	-	-	-	-	-	169	169	-	188	188	-
Stage 2	-	-	-	-	-	-	195	194	-	184	171	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1403	-	-	1416	-	-	592	565	884	585	568	876
Stage 1	-	-	-	-	-	-	833	759	-	814	745	-
Stage 2	-	-	-	-	-	-	807	740	-	818	757	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1403	-	-	1416	-	-	578	559	884	560	562	876
Mov Cap-2 Maneuver	-	-	-	-	-	-	578	559	-	560	562	-
Stage 1	-	-	-	-	-	-	831	757	-	812	740	-
Stage 2	-	-	-	-	-	-	788	735	-	788	755	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.4			10.1			11.3		
HCM LOS							B			B		
















Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	757	1403	-	-	1416	-	-	622
HCM Lane V/C Ratio	0.059	0.003	-	-	0.007	-	-	0.082
HCM Control Delay (s)	10.1	7.6	-	-	7.6	-	-	11.3
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.3

Timings

3: Bent Grass Meadows Dr./Meridian Rd.

2040 Total Traffic

PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	 			 	 	
Traffic Volume (vph)	499	372	395	1424	1114	204
Future Volume (vph)	499	372	395	1424	1114	204
Turn Type	Prot	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	31.0	31.0	37.0	89.0	52.0	52.0
Total Split (%)	25.8%	25.8%	30.8%	74.2%	43.3%	43.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Max	Max	Max
Act Effect Green (s)	22.7	22.7	84.1	84.1	52.7	52.7
Actuated g/C Ratio	0.19	0.19	0.72	0.72	0.45	0.45
v/c Ratio	0.79	0.63	0.85	0.59	0.73	0.26
Control Delay	53.8	8.8	43.0	9.5	31.6	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	8.8	43.0	9.5	31.6	4.0
LOS	D	A	D	A	C	A
Approach Delay	34.6			16.8	27.3	
Approach LOS	C			B	C	

Intersection Summary

























Cycle Length: 120	
Actuated Cycle Length: 116.8	
Natural Cycle: 60	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 24.1	Intersection LOS: C
Intersection Capacity Utilization 79.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Bent Grass Meadows Dr



Timings
25: Golden Sage Rd & Woodmen Rd

2040 Total Traffic
PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	442	1629	121	99	1083	284	152	15	114	177	11	430
Future Volume (vph)	442	1629	121	99	1083	284	152	15	114	177	11	430
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6	8		8	4		Free
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	10.0	12.0	12.0	10.0	12.0	12.0	10.0	10.0	10.0	10.0	10.0	
Total Split (s)	23.0	64.0	64.0	10.0	51.0	51.0	31.0	15.0	15.0	31.0	15.0	
Total Split (%)	19.2%	53.3%	53.3%	8.3%	42.5%	42.5%	25.8%	12.5%	12.5%	25.8%	12.5%	
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	
Act Effect Green (s)	18.3	56.3	56.3	52.1	44.0	44.0	27.2	7.5	7.5	19.0	7.8	104.8
Actuated g/C Ratio	0.17	0.54	0.54	0.50	0.42	0.42	0.26	0.07	0.07	0.18	0.07	1.00
v/c Ratio	0.78	0.87	0.14	0.59	0.74	0.36	0.36	0.12	0.44	0.58	0.09	0.29
Control Delay	52.1	28.3	2.9	30.4	30.1	3.8	33.3	49.9	7.2	45.6	48.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	28.3	2.9	30.4	30.1	3.8	33.3	49.9	7.2	45.6	48.2	0.5
LOS	D	C	A	C	C	A	C	D	A	D	D	A
Approach Delay		31.8			24.9			23.6			14.2	
Approach LOS		C			C			C			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 104.8

Natural Cycle: 70

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 26.7

Intersection LOS: C

Intersection Capacity Utilization 78.7%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 25: Golden Sage Rd & Woodmen Rd



HCM 6th TWSC
26: Golden Sage Rd & Woodmen Frontage Rd

2040 Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	326.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰			↱			↱	↱		↰	
Traffic Vol, veh/h	0	27	183	435	15	0	330	0	411	0	0	0
Future Vol, veh/h	0	27	183	435	15	0	330	0	411	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	95	95	95	95	92	95	92	95	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	28	193	458	16	0	347	0	433	0	0	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	695	1	806	695	-	1	0	-	0	0	0
Stage 1	-	1	-	694	694	-	-	-	-	-	-	-
Stage 2	-	694	-	112	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	366	1084	~ 300	366	0	1622	-	0	-	-	-
Stage 1	0	895	-	~ 433	444	0	-	-	0	-	-	-
Stage 2	0	444	-	893	895	0	-	-	0	-	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	-	288	1084	~ 191	288	-	1622	-	-	-	-	-
Mov Cap-2 Maneuver	-	288	-	~ 191	288	-	-	-	-	-	-	-
Stage 1	-	895	-	~ 340	349	-	-	-	-	-	-	-
Stage 2	-	349	-	711	895	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.2	\$ 708.2	7.8	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1622	-	800 193	-	-	-
HCM Lane V/C Ratio	0.214	-	0.276 2.454	-	-	-
HCM Control Delay (s)	7.8	0	11.2\$ 708.2	0	-	-
HCM Lane LOS	A	A	B F	A	-	-
HCM 95th %tile Q(veh)	0.8	-	1.1 39.6	-	-	-






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

HCM 6th TWSC
40: frontage rd & Bent Grass Meadows Dr

2040 Total Traffic
PM Peak Hour

Intersection

Int Delay, s/veh 4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	189	210	221	26	11	209
Future Vol, veh/h	189	210	221	26	11	209
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	155	-	-	-	155	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	205	228	240	28	12	227

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	268	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1296	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1296	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	3.9	0	11.8
HCM LOS			B






Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1296	-	-	-	263	785
HCM Lane V/C Ratio	0.159	-	-	-	0.045	0.289
HCM Control Delay (s)	8.3	-	-	-	19.3	11.4
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.6	-	-	-	0.1	1.2

HCM 6th TWSC
203: Lynch Rd & Bent Grass Meadows Dr

2040 Total Traffic
PM Peak Hour

Intersection

Int Delay, s/veh 0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	217	30	9	118	16	6
Future Vol, veh/h	217	30	9	118	16	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	155	-	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	236	33	10	128	17	7







Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	269
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1295
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1295
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	680	-	-	1295	-
HCM Lane V/C Ratio	0.035	-	-	0.008	-
HCM Control Delay (s)	10.5	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-






HCM 6th TWSC
204: Berwyn Dr & Bent Grass Meadows Dr

2040 Total Traffic
PM Peak Hour

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	188	17	27	107	31	10	0	17	20	0	10
Future Vol, veh/h	18	188	17	27	107	31	10	0	17	20	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	155	-	-	-	-	-	-	-	-
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	20	204	18	29	116	34	11	0	18	22	0	11
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	150	0	0	222	0	0	450	461	213	453	453	133
Stage 1	-	-	-	-	-	-	253	253	-	191	191	-
Stage 2	-	-	-	-	-	-	197	208	-	262	262	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1431	-	-	1347	-	-	519	497	827	517	503	916
Stage 1	-	-	-	-	-	-	751	698	-	811	742	-
Stage 2	-	-	-	-	-	-	805	730	-	743	691	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1431	-	-	1347	-	-	499	479	827	492	485	916
Mov Cap-2 Maneuver	-	-	-	-	-	-	499	479	-	492	485	-
Stage 1	-	-	-	-	-	-	740	688	-	800	726	-
Stage 2	-	-	-	-	-	-	778	714	-	716	681	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			1.3			10.7			11.6		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	665	1431	-	-	1347	-	-	582				
HCM Lane V/C Ratio	0.044	0.014	-	-	0.022	-	-	0.056				
HCM Control Delay (s)	10.7	7.6	-	-	7.7	-	-	11.6				
HCM Lane LOS	B	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0.2				

HCM 6th TWSC
3: Meridian Rd & Bent Grass Meadows Dr

2040 Total Traffic (With Channelized "T")
PM Peak Hour

Intersection						
Int Delay, s/veh	25					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	232	357	339	0	1680	290
Future Vol, veh/h	232	357	339	0	1680	290
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	330
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	244	376	357	0	1768	305
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2482	884	2073	0	-	0
Stage 1	1768	-	-	-	-	-
Stage 2	714	-	-	-	-	-
Critical Hdwy	6.63	6.93	4.13	-	-	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	~ 28	~ 289	~ 266	-	-	-
Stage 1	~ 123	-	-	-	-	-
Stage 2	484	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	0	~ 289	~ 266	-	-	-
Mov Cap-2 Maneuver	0	-	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	484	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s		214		0		
HCM LOS	-					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	~ 266	-	-	289	-	-
HCM Lane V/C Ratio	1.342	-	-	1.3	-	-
HCM Control Delay (s)	214	0	-	193.9	-	-
HCM Lane LOS	F	A	-	F	-	-
HCM 95th %tile Q(veh)	18.6	-	-	18.5	-	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

HCM 6th Roundabout
3: Meridian Rd & Bent Grass Meadows Dr

Short-Term Total Traffic
AM Peak Hour

Intersection						
Intersection Delay, s/veh	40.0					
Intersection LOS	E					
Approach	EB		NB		SB	
Entry Lanes	2		2		2	
Conflicting Circle Lanes	2		2		2	
Adj Approach Flow, veh/h	620		1021		2073	
Demand Flow Rate, veh/h	633		1041		2114	
Vehicles Circulating, veh/h	1803		249		364	
Vehicles Exiting, veh/h	675		2187		926	
Ped Vol Crossing Leg, #/h	0		0		0	
Ped Cap Adj	1.000		1.000		1.000	
Approach Delay, s/veh	79.2		7.7		44.2	
Approach LOS	F		A		E	
Lane	Left	Right	Left	Right	Left	Right
Designated Moves	L	TR	LT	TR	LT	TR
Assumed Moves	L	TR	LT	TR	LT	TR
RT Channelized						
Lane Util	0.393	0.607	0.470	0.530	0.470	0.530
Follow-Up Headway, s	2.500	2.500	2.500	2.500	2.500	2.500
Critical Headway, s	4.050	4.050	4.050	4.050	4.050	4.050
Entry Flow, veh/h	249	384	489	552	994	1120
Cap Entry Lane, veh/h	354	354	1186	1186	1085	1085
Entry HV Adj Factor	0.980	0.979	0.981	0.980	0.980	0.981
Flow Entry, veh/h	244	376	480	541	974	1099
Cap Entry, veh/h	347	347	1164	1163	1063	1064
V/C Ratio	0.703	1.084	0.412	0.465	0.916	1.032
Control Delay, s/veh	35.1	107.9	7.3	8.1	31.0	56.0
LOS	E	F	A	A	D	F
95th %tile Queue, veh	5	14	2	3	14	23

Timings

2040 Total Traffic (With Signalized Channelized T)

3: Meridian Rd & Bent Grass Meadows Dr

AM Peak Hour



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2
Lane Configurations	↔↔	↔	↔	↕↕	↕↕	↔	
Traffic Volume (vph)	232	357	339	631	1680	290	
Future Volume (vph)	232	357	339	631	1680	290	
Turn Type	Prot	Free	custom	NA	NA	Perm	
Protected Phases	4!		5	Free!	6		2
Permitted Phases		Free	2			6	
Detector Phase	4		5		6	6	
Switch Phase							
Minimum Initial (s)	5.0		5.0		5.0	5.0	5.0
Minimum Split (s)	10.0		10.0		10.0	10.0	10.0
Total Split (s)	25.0		31.0		64.0	64.0	95.0
Total Split (%)	20.8%		25.8%		53.3%	53.3%	79%
Yellow Time (s)	3.0		3.0		3.0	3.0	3.0
All-Red Time (s)	2.0		2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	
Total Lost Time (s)	5.0		5.0		5.0	5.0	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None		None		Max	Max	Max
Act Effect Green (s)	13.3	113.4	90.1	113.4	63.1	63.1	
Actuated g/C Ratio	0.12	1.00	0.79	1.00	0.56	0.56	
v/c Ratio	0.61	0.24	0.87	0.19	0.90	0.30	
Control Delay	54.1	0.4	53.7	0.1	31.2	3.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	54.1	0.4	53.7	0.1	31.2	3.5	
LOS	D	A	D	A	C	A	
Approach Delay	21.5			18.9	27.2		
Approach LOS	C			B	C		

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 113.4

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 23.9

Intersection LOS: C

Intersection Capacity Utilization 83.5%

ICU Level of Service E

Analysis Period (min) 15






! Phase conflict between lane groups.

Splits and Phases: 3: Meridian Rd & Bent Grass Meadows Dr



HCM 6th TWSC
3: Meridian Rd & Bent Grass Meadows Dr

2040 Total Traffic (With Channelized "T")
PM Peak Hour

Intersection						
Int Delay, s/veh	2640.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	499	387	437	0	1114	204
Future Vol, veh/h	499	387	437	0	1114	204
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	330
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	525	407	460	0	1173	215
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2093	587	1388	0	-	0
Stage 1	1173	-	-	-	-	-
Stage 2	920	-	-	-	-	-
Critical Hdwy	6.63	6.93	4.13	-	-	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	~ 51	454	491	-	-	-
Stage 1	~ 257	-	-	-	-	-
Stage 2	~ 387	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 3	454	491	-	-	-
Mov Cap-2 Maneuver	~ 17	-	-	-	-	-
Stage 1	~ 16	-	-	-	-	-
Stage 2	~ 387	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	\$ 7843	55.5		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	491	-	17	454	-	-
HCM Lane V/C Ratio	0.937	-	30.898	0.897	-	-
HCM Control Delay (s)	55.5	\$ 13886.2	50.9	-	-	-
HCM Lane LOS	F	A	F	F	-	-
HCM 95th %tile Q(veh)	11.3	-	66.5	9.8	-	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						













HCM 6th Roundabout
3: Meridian Rd & Bent Grass Meadows Dr

Short-Term Total Traffic
PM Peak Hour

Intersection						
Intersection Delay, s/veh	45.1					
Intersection LOS	E					
Approach	EB		NB		SB	
Entry Lanes	2		2		2	
Conflicting Circle Lanes	2		2		2	
Adj Approach Flow, veh/h	932		1959		1388	
Demand Flow Rate, veh/h	951		1998		1415	
Vehicles Circulating, veh/h	1196		535		469	
Vehicles Exiting, veh/h	688		1611		2064	
Ped Vol Crossing Leg, #/h	0		0		0	
Ped Cap Adj	1.000		1.000		1.000	
Approach Delay, s/veh	40.7		67.9		15.9	
Approach LOS	E		F		C	
Lane	Left	Right	Left	Right	Left	Right
Designated Moves	L	TR	LT	TR	LT	TR
Assumed Moves	L	TR	LT	TR	LT	TR
RT Channelized						
Lane Util	0.564	0.436	0.470	0.530	0.470	0.530
Follow-Up Headway, s	2.500	2.500	2.500	2.500	2.500	2.500
Critical Headway, s	4.050	4.050	4.050	4.050	4.050	4.050
Entry Flow, veh/h	536	415	939	1059	665	750
Cap Entry Lane, veh/h	568	568	950	950	1000	1000
Entry HV Adj Factor	0.979	0.981	0.981	0.980	0.981	0.981
Flow Entry, veh/h	525	407	921	1038	652	735
Cap Entry, veh/h	556	557	931	931	981	980
V/C Ratio	0.944	0.731	0.989	1.115	0.665	0.750
Control Delay, s/veh	52.4	25.6	47.8	85.8	14.0	17.5
LOS	F	D	E	F	B	C
95th %tile Queue, veh	12	6	18	28	5	7

Timings
3: Meridian Rd & Bent Grass Meadows Dr

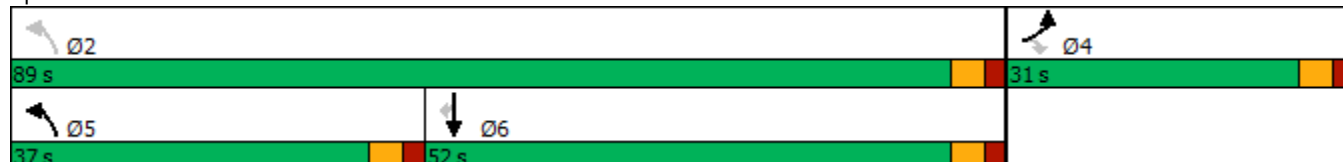
2040 Total Traffic (With Signalized T)
PM Peak Hour

							
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	499	387	437	1424	1114	204	
Future Volume (vph)	499	387	437	1424	1114	204	
Turn Type	Prot	Perm	custom	NA	NA	Perm	
Protected Phases	4!		5	Free!	6		2
Permitted Phases		4	2			6	
Detector Phase	4	4	5		6	6	
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0		10.0	10.0	10.0
Total Split (s)	31.0	31.0	37.0		52.0	52.0	89.0
Total Split (%)	25.8%	25.8%	30.8%		43.3%	43.3%	74%
Yellow Time (s)	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None		Max	Max	Max
Act Effct Green (s)	22.7	22.7	84.1	116.8	50.4	50.4	
Actuated g/C Ratio	0.19	0.19	0.72	1.00	0.43	0.43	
v/c Ratio	0.79	0.64	0.90	0.42	0.77	0.27	
Control Delay	53.8	8.9	51.0	0.4	33.9	4.0	
Queue Delay	0.3	0.0	0.0	0.0	0.0	0.0	
Total Delay	54.2	9.0	51.0	0.4	33.9	4.0	
LOS	D	A	D	A	C	A	
Approach Delay	34.4			12.3	29.2		
Approach LOS	C			B	C		

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 116.8
 Natural Cycle: 65
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 22.6
 Intersection LOS: C
 Intersection Capacity Utilization 81.7%
 ICU Level of Service D
 Analysis Period (min) 15
 ! Phase conflict between lane groups.

Splits and Phases: 3: Meridian Rd & Bent Grass Meadows Dr



Timings
26: Golden Sage Rd & Woodmen Frontage Rd

2040 Total Traffic
AM Peak Hour

	→	↖	←	↗	↘
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱
Traffic Volume (vph)	32	338	5	101	371
Future Volume (vph)	32	338	5	101	371
Turn Type	NA	pm+pt	NA	Prot	Over
Protected Phases	4	3	8	2	3
Permitted Phases		8			
Detector Phase	4	3	8	2	3
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	30.0	40.0	80.0	30.0
Total Split (%)	8.3%	25.0%	33.3%	66.7%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes			Yes
Recall Mode	None	None	None	Min	None
Act Effect Green (s)	16.9		28.9	11.1	7.8
Actuated g/C Ratio	0.35		0.60	0.23	0.16
v/c Ratio	0.44		0.63	0.54	0.54
Control Delay	5.3		10.4	15.3	8.9
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	5.3		10.4	15.3	8.9
LOS	A		B	B	A
Approach Delay	5.3		10.4	12.2	
Approach LOS	A		B	B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 48.4
 Natural Cycle: 45
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 9.8
 Intersection Capacity Utilization 61.0%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 26: Golden Sage Rd & Woodmen Frontage Rd

↰ Ø2	↰ Ø3	→ Ø4
80 s	30 s	10 s
	↰ Ø8	
	40 s	

Timings
26: Golden Sage Rd & Woodmen Frontage Rd

2040 Total Traffic
AM Peak Hour

	→	↖	←	↗	↘
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↱	↱
Traffic Volume (vph)	32	338	5	101	371
Future Volume (vph)	32	338	5	101	371
Turn Type	NA	pm+pt	NA	Prot	Over
Protected Phases	4	3	8	2	3
Permitted Phases		8			
Detector Phase	4	3	8	2	3
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	30.0	40.0	80.0	30.0
Total Split (%)	8.3%	25.0%	33.3%	66.7%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes			Yes
Recall Mode	None	None	None	Min	None
Act Effect Green (s)	16.2		28.4	9.4	8.0
Actuated g/C Ratio	0.35		0.61	0.20	0.17
v/c Ratio	0.43		0.60	0.29	0.65
Control Delay	5.0		8.8	20.3	8.7
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	5.0		8.8	20.3	8.7
LOS	A		A	C	A
Approach Delay	5.0		8.8	11.1	
Approach LOS	A		A	B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 46.2
 Natural Cycle: 40
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 8.7
 Intersection LOS: A
 Intersection Capacity Utilization 53.4%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 26: Golden Sage Rd & Woodmen Frontage Rd

↰ Ø2	↱ Ø3	→ Ø4
80 s	30 s	10 s
	↰ Ø8	
	40 s	

HCM 6th Roundabout
26: Golden Sage Rd & Woodmen Frontage Rd

2040 Total Traffic
AM Peak Hour

Intersection				
Intersection Delay, s/veh	4.2			
Intersection LOS	A			
Approach	EB	WB	NB	
Entry Lanes	1	1	1	
Conflicting Circle Lanes	1	1	1	
Adj Approach Flow, veh/h	326	361	497	
Demand Flow Rate, veh/h	333	368	507	
Vehicles Circulating, veh/h	363	108	35	
Vehicles Exiting, veh/h	113	35	661	
Ped Vol Crossing Leg, #/h	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	
Approach Delay, s/veh	7.7	5.7	0.7	
Approach LOS	A	A	A	
Lane	Left	Left	Left	Bypass
Designated Moves	TR	LT	L	R
Assumed Moves	TR	LT	L	R
RT Channelized				Free
Lane Util	1.000	1.000	1.000	
Follow-Up Headway, s	2.609	2.609	2.609	
Critical Headway, s	4.976	4.976	4.976	399
Entry Flow, veh/h	333	368	108	1938
Cap Entry Lane, veh/h	953	1236	1331	0.980
Entry HV Adj Factor	0.980	0.981	0.981	391
Flow Entry, veh/h	326	361	106	1900
Cap Entry, veh/h	934	1212	1307	0.206
V/C Ratio	0.349	0.298	0.081	0.0
Control Delay, s/veh	7.7	5.7	3.4	A
LOS	A	A	A	1
95th %tile Queue, veh	2	1	0	

Timings
26: Golden Sage Rd & Woodmen Frontage Rd

2040 Total Traffic
PM Peak Hour

	→	↖	←	↗	↘
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↰		↱	↰	↱
Traffic Volume (vph)	27	435	15	330	411
Future Volume (vph)	27	435	15	330	411
Turn Type	NA	pm+pt	NA	Prot	Over
Protected Phases	4	3	8	2	3
Permitted Phases		8			
Detector Phase	4	3	8	2	3
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	30.0	40.0	80.0	30.0
Total Split (%)	8.3%	25.0%	33.3%	66.7%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes			Yes
Recall Mode	None	None	None	Min	None
Act Effect Green (s)	23.7		36.2	20.5	8.5
Actuated g/C Ratio	0.37		0.56	0.32	0.13
v/c Ratio	0.31		0.79	0.72	0.72
Control Delay	6.0		21.8	26.8	11.9
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	6.0		21.8	26.9	11.9
LOS	A		C	C	B
Approach Delay	6.0		21.8	19.7	
Approach LOS	A		C	B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 64.7
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 18.3
 Intersection LOS: B
 Intersection Capacity Utilization 74.3%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 26: Golden Sage Rd & Woodmen Frontage Rd

↰ Ø2	↰ Ø3	→ Ø4
80 s	30 s	10 s
	↰ Ø8	
	40 s	

Timings
26: Golden Sage Rd & Woodmen Frontage Rd

2040 Total Traffic
PM Peak Hour

	→	↖	←	↙	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↗		↖	↙	↗
Traffic Volume (vph)	27	435	15	330	411
Future Volume (vph)	27	435	15	330	411
Turn Type	NA	pm+pt	NA	Prot	Over
Protected Phases	4	3	8	2	3
Permitted Phases		8			
Detector Phase	4	3	8	2	3
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	30.0	40.0	80.0	30.0
Total Split (%)	8.3%	25.0%	33.3%	66.7%	25.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lead			Lead
Lead-Lag Optimize?	Yes	Yes			Yes
Recall Mode	None	None	None	Min	None
Act Effect Green (s)	23.7		36.1	18.1	8.5
Actuated g/C Ratio	0.38		0.58	0.29	0.14
v/c Ratio	0.30		0.75	0.68	0.74
Control Delay	5.6		17.7	26.5	11.3
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	5.6		17.7	26.5	11.3
LOS	A		B	C	B
Approach Delay	5.6		17.7	18.1	
Approach LOS	A		B	B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 62.3
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 16.1
 Intersection LOS: B
 Intersection Capacity Utilization 65.9%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 26: Golden Sage Rd & Woodmen Frontage Rd

↙ Ø2	↖ Ø3	→ Ø4
80 s	30 s	10 s
	↙ Ø8	
	40 s	

HCM 6th Roundabout
26: Golden Sage Rd & Woodmen Frontage Rd

2040 Total Traffic
PM Peak Hour

Intersection				
Intersection Delay, s/veh	5.5			
Intersection LOS	A			
Approach	EB	WB	NB	
Entry Lanes	1	1	1	
Conflicting Circle Lanes	1	1	1	
Adj Approach Flow, veh/h	221	474	780	
Demand Flow Rate, veh/h	226	483	796	
Vehicles Circulating, veh/h	467	354	29	
Vehicles Exiting, veh/h	370	29	664	
Ped Vol Crossing Leg, #/h	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	
Approach Delay, s/veh	7.1	10.1	2.2	
Approach LOS	A	B	A	
Lane	Left	Left	Left	Bypass
Designated Moves	TR	LT	L	R
Assumed Moves	TR	LT	L	R
RT Channelized				Free
Lane Util	1.000	1.000	1.000	
Follow-Up Headway, s	2.609	2.609	2.609	
Critical Headway, s	4.976	4.976	4.976	442
Entry Flow, veh/h	226	483	354	1938
Cap Entry Lane, veh/h	857	962	1340	0.980
Entry HV Adj Factor	0.980	0.981	0.980	433
Flow Entry, veh/h	221	474	347	1900
Cap Entry, veh/h	840	943	1313	0.228
V/C Ratio	0.264	0.502	0.264	0.0
Control Delay, s/veh	7.1	10.1	5.0	A
LOS	A	B	A	1
95th %tile Queue, veh	1	3	1	

Queuing Reports

Queuing and Blocking Report

Intersection: 3: Meridian Rd & Bent Grass Meadows Dr

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	T	T	R
Maximum Queue (ft)	175	217	190	119	99	396	377	193
Average Queue (ft)	77	100	85	51	36	241	195	54
95th Queue (ft)	140	178	154	98	81	367	336	123
Link Distance (ft)	277	277		1650	1650	723	723	
Upstream Blk Time (%)		0						
Queuing Penalty (veh)		0						
Storage Bay Dist (ft)			700					330
Storage Blk Time (%)							0	0
Queuing Penalty (veh)							1	0

Intersection: 25: Golden Sage & Woodmen

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	185	127	132	35	17	217	224	27	149	89	21	77
Average Queue (ft)	75	72	54	5	4	116	101	4	81	8	3	23
95th Queue (ft)	156	118	108	23	14	195	196	16	136	47	14	57
Link Distance (ft)		1641	1641			1652	1652			392		151
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	460			400	465			375	130		185	
Storage Blk Time (%)									2			
Queuing Penalty (veh)									0			

Intersection: 25: Golden Sage & Woodmen

Movement	SB
Directions Served	TR
Maximum Queue (ft)	142
Average Queue (ft)	70
95th Queue (ft)	128
Link Distance (ft)	151
Upstream Blk Time (%)	1
Queuing Penalty (veh)	1
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 2

Queuing and Blocking Report

Intersection: 3: Meridian Rd & Bent Grass Meadows Dr

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	T	T	R
Maximum Queue (ft)	209	153	238	162	187	245	218	101
Average Queue (ft)	106	58	118	84	77	146	97	44
95th Queue (ft)	176	113	195	150	146	223	193	81
Link Distance (ft)	277	277		1650	1650	723	723	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			700					330
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 25: Golden Sage & Woodmen

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	204	220	205	43	48	137	116	17	131	65	35	83
Average Queue (ft)	102	107	96	14	10	67	42	3	62	12	9	35
95th Queue (ft)	194	183	176	36	33	118	88	12	112	48	29	74
Link Distance (ft)		1641	1641			1652	1652			392		151
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	460			400	465			375	130		185	
Storage Blk Time (%)									1			
Queuing Penalty (veh)									0			

Intersection: 25: Golden Sage & Woodmen

Movement	SB
Directions Served	TR
Maximum Queue (ft)	101
Average Queue (ft)	43
95th Queue (ft)	80
Link Distance (ft)	151
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 0

Queuing and Blocking Report

Intersection: 3: Meridian Rd & Bent Grass Meadows Dr

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	L	T	T	T	T	R
Maximum Queue (ft)	135	150	331	101	85	695	635	355
Average Queue (ft)	73	83	191	40	33	417	369	163
95th Queue (ft)	121	132	301	83	72	635	585	392
Link Distance (ft)	274	274		1658	1658	714	714	
Upstream Blk Time (%)						0	0	
Queuing Penalty (veh)						0	0	
Storage Bay Dist (ft)			700					330
Storage Blk Time (%)							8	0
Queuing Penalty (veh)							23	1

Queuing and Blocking Report

Intersection: 3: Meridian Rd & Bent Grass Meadows Dr

Movement	EB	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	R	L	T	T	T	T	R
Maximum Queue (ft)	264	281	59	496	315	233	450	407	181
Average Queue (ft)	160	173	2	262	138	129	298	250	60
95th Queue (ft)	235	255	43	467	244	208	424	377	123
Link Distance (ft)	277	277	277		1660	1660	712	712	
Upstream Blk Time (%)	0	1	0						
Queuing Penalty (veh)	1	2	0						
Storage Bay Dist (ft)				700					330
Storage Blk Time (%)								1	0
Queuing Penalty (veh)								1	0

TIS Report Addendum (March 3, 2020)





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March 3, 2020

Jim Byers
VP of Community Development
Challenger Homes
8605 Explorer Dr, Suite 250
Colorado Springs, CO 80920

RE: Bent Grass Residential Filing No. 2
El Paso County, Colorado
TIS Report Addendum
LSC #194460

Dear Jim:

(Notes added for clarification)

LSC Transportation Consultants, Inc. completed a traffic impact study (TIS) for the Bent Grass Residential Filing No. 2 dated January 24, 2020. This memorandum is an addendum to that report to address a County comment about the initial impact of the Bent Grass Meadows Drive connection and the first 48 lots of the proposed Filing No. 2 development at intersection of the Woodmen north frontage road and Bent Grass Meadows Boulevard.

REPORT CONTENTS

(2020)

The report contains the following as a supplement/addendum to the TIS Report:

Supplemental

- Updated short-term background traffic volumes based on development of approved land uses only.
- The projected average weekday and peak-hour vehicle-trips to be generated by the site following buildout of the first 48 lots.
- The assignment of the projected Phase 1 site-generated traffic volumes to the study area roadways and intersections
- The projected Phase 1 short-term traffic volumes on the study area roadway network
- The projected levels of service at the key area intersections.
- A vehicle queueing analysis at the intersection of Woodmen north frontage road/Bent Grass Meadows Drive.

BACKGROUND TRAFFIC

Background traffic is the traffic estimated to be on the roadways without the Bent Grass Residential Filing No. 2 traffic. The short-term (Year 2020) background traffic volumes are shown in Figure 1. The background traffic volumes are based on the existing traffic volumes shown in Figure 3 of the January 24, 2020 TIS with a portion of the volumes assumed to be rerouted with the construction of Bent Grass Meadows Drive between the existing sections located north of the Woodmen frontage road and west of Meridian Road. The short-term background traffic volumes also include additional traffic projected to be generated **buildout of Falcon Marketplace** located northwest of the intersection of Woodmen Road/Meridian Road. As buildout of Falcon Marketplace has been assumed, these short-term volumes may be conservative if commercial buildout takes several years to occur.

(2020)

The short-term background traffic volumes shown in Figure 1 **do not** include additional traffic projected to be generated by buildout of the Bent Grass East Commercial development (as was assumed in the January 24, 2020 TIS). The short-term background traffic volumes also assume a right-in-only access to Woodmen Road just west of Meridian Road. Through traffic on Meridian Road was assumed to grow based on two percent growth per year.

TRIP GENERATION

Estimates of the vehicle-trips generated by the first phase of Bent Grass Residential Filing No. 2 have been made using the nationally published trip generation rates found in *Trip Generation, 10th Edition* by the Institute of Transportation Engineers (ITE). The results of the trip generation estimate are shown in Table 2.

Following buildout of the first 48 lots of the Bent Grass Residential Filing No. 2 the site can be expected to generate about 453 vehicle-trips on the average weekday, with about half entering and half exiting in a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about nine vehicles would enter, and 27 vehicles would exit the site. During the afternoon peak hour, which generally occurs for one hour between 4:15 and 6:15 p.m., about 30 vehicles would enter, and 18 vehicles would exit the site.

TRIP DISTRIBUTION AND ASSIGNMENT

When the external trip distribution percentages (from Figure 6 of the January 24, 2020 TIS) are applied to the trip generation estimates (from Table 1), the resulting Phase 1 site-generated traffic volumes can be determined. Figure 2 shows the short-term Phase 1 only site-generated traffic volume estimates. The short-term site-generated traffic volumes assume Bent Grass Meadows Drive has been constructed between Meridian Road and the Woodmen frontage road.

TOTAL TRAFFIC

(2020)

Figure 3 shows the projected short-term total traffic volumes at the site access points and key area intersections. The short-term total traffic volumes are the sum of the short-term background traffic volumes from Figure 1 plus the short-term Phase 1 site-generated traffic volumes from Figure 2.

PROJECTED LEVELS OF SERVICE

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from "A" to "F." LOS A represents control delay of less than 10 seconds for unsignalized and signalized intersections. LOS F represents control delay of more than 50 seconds for unsignalized intersections and more than 80 seconds for signalized intersections. Table 2 shows the level of service delay ranges.

Table 2 Intersection Levels of Service Delay Ranges		
Level of Service	Signalized Intersections	Unsignalized Intersections
	Average Control Delay (seconds per vehicle)	Average Control Delay (seconds per vehicle) ⁽¹⁾
A	10.0 sec or less	10.0 sec or less
B	10.1-20.0 sec	10.1-15.0 sec
C	20.1-35.0 sec	15.1-25.0 sec
D	35.1-55.0 sec	25.1-35.0 sec
E	55.1-80.0 sec	35.1-50.0 sec
F	80.1 sec or more	50.1 sec or more
(1) For unsignalized intersections if V/C ratio is greater than 1.0 the level of service is LOS F regardless of the projected average control delay per vehicle.		

The site access points and key area intersections were analyzed to determine the projected short-term levels of service based on the unsignalized method of analysis procedures found in the *Highway Capacity Manual, 6th Edition* by the Transportation Research Board or using Synchro. Figures 2 and 3 show the level of service analysis results. The level of service technical reports are attached.

Meridian/Bent Grass Meadows

The intersection of Meridian/Bent Grass Meadows is currently two-way, stop sign controlled. It is our understanding that this intersection will be required to be converted to traffic signal control with any additional development within Bent Grass East Commercial located southwest of this

intersection. It is likely that this intersection would need to be converted to signal control, even without additional development, once Bent Grass Meadows Drive is constructed between the two existing sections north of the Woodmen frontage road and west of Meridian Road. As a signal-controlled intersection, all movements are projected to operate at LOS D or better during the peak hours based on the Phase 1 short-term total traffic volumes.

Per El Paso County requirement alternatives to a conventional, signalized, full-movement intersection were analyzed as part of the January 24, 2020 TIS.

Woodmen/Golden Sage

All movements at the intersection of Woodmen/Golden Sage are projected to operate at LOS D or better during the peak hours based on the projected Phase 1 short-term total traffic volumes.

Woodmen Frontage Road/Golden Sage

The intersection of the Woodmen frontage road/Golden Sage is currently stop sign-controlled. All movements at this intersection are projected to operate at LOS B or better during the peak hours, based on the projected Phase 1 short-term total traffic volumes.

Woodmen Frontage Road/Bent Grass Meadows

All movements at the stop sign-controlled intersection of the Woodmen frontage road/Bent Grass Meadows are projected to operate at LOS B or better during the peak hours, based on the projected short-term and 2040 total traffic volumes.

Site Access Points

Both full-movement site access points to Bent Grass Meadows Drive are projected to operate at LOS A for all movements as stop sign-controlled intersections based on the Phase 1 short-term total traffic volumes.

VEHICLE QUEUING ANALYSIS

A queuing analysis was performed using Synchro/SimTraffic at the intersection of the Woodmen north frontage road and Bent Grass Meadows Drive. The Phase 1 short-term total peak-hour traffic volumes were entered into the Synchro model. The simulation was run five times. The queuing reports are attached.

The projected maximum eastbound approach queue on the Woodmen north frontage road approaching Bent Grass Meadows Drive is about 61 feet based on the Phase 1 short-term total morning peak-hour volume. There is about 135 feet of stacking distance Bent Grass Meadows Drive and the first access point to the west.

IMPROVEMENTS – PHASING AND TIMING

Per the applicant, the following is a phasing schedule for the roadway improvements:

Bent Grass Meadows extension

- *Phase 1 - County Approval of Construction Drawings for Bent Grass Filing 2. March 2020*
- *Phase 2 - Complete Bent Grass Meadows Drive extension (west of channel crossing) wet utilities, curb gutter, and pave (by August 1, 2020)*
- *Phase 3 - Complete Bent Grass Meadows Drive extension (east of channel crossing) wet utilities, curb gutter, and pave (mid-July, 2020)*

Bent Grass Meadows and Meridian Intersection

- *Phase 1 - County Approval of Intersection plans. June 1, 2020*
- *Phase 2 - Construct Meridian south bound acceleration lane, order culverts if pre-fab. (+/- 3 weeks) Start June 8th*
- *Phase 3 - Construction of right-turn lane from Bent Grass Meadows Drive, east-bound lane closure, add lane, and southside culvert construction (1 Month)*
- *Phase 4 - Construction of northern lane west bound Bent Grass Meadows Drive, west-bound lane closure, add lane, and northside culvert construction (1 Month)*
- *Phase 5 - Installation of Span Wire Traffic Signal for Intersection (projected start 1st week Sept.)*
- *Phase 6 - Install signal loop wire, final lane striping, and pave. (10 days)*
- *Phase 7 - Remove Traffic Control and open Intersection. (by October 1, 2020)*

Regarding the eastbound left-turn lane improvement on the Woodmen North Frontage Road at the Bent Grass Meadows Drive intersection, it is our understanding that this will be the responsibility of the Bent Grass Metropolitan District and this left-turn lane will be constructed as part of future improvements.

* * * * *

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Please contact me if you have any questions.

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

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

JCH:KDF:jas

Enclosures: Table 1
Figures 1-3
Level of Service Reports
Queuing Reports

Tables and Figures

(for the March 2020 Addendum Memo)



Table 1
Trip Generation Estimate
Bent Grass Residential Filing No. 2

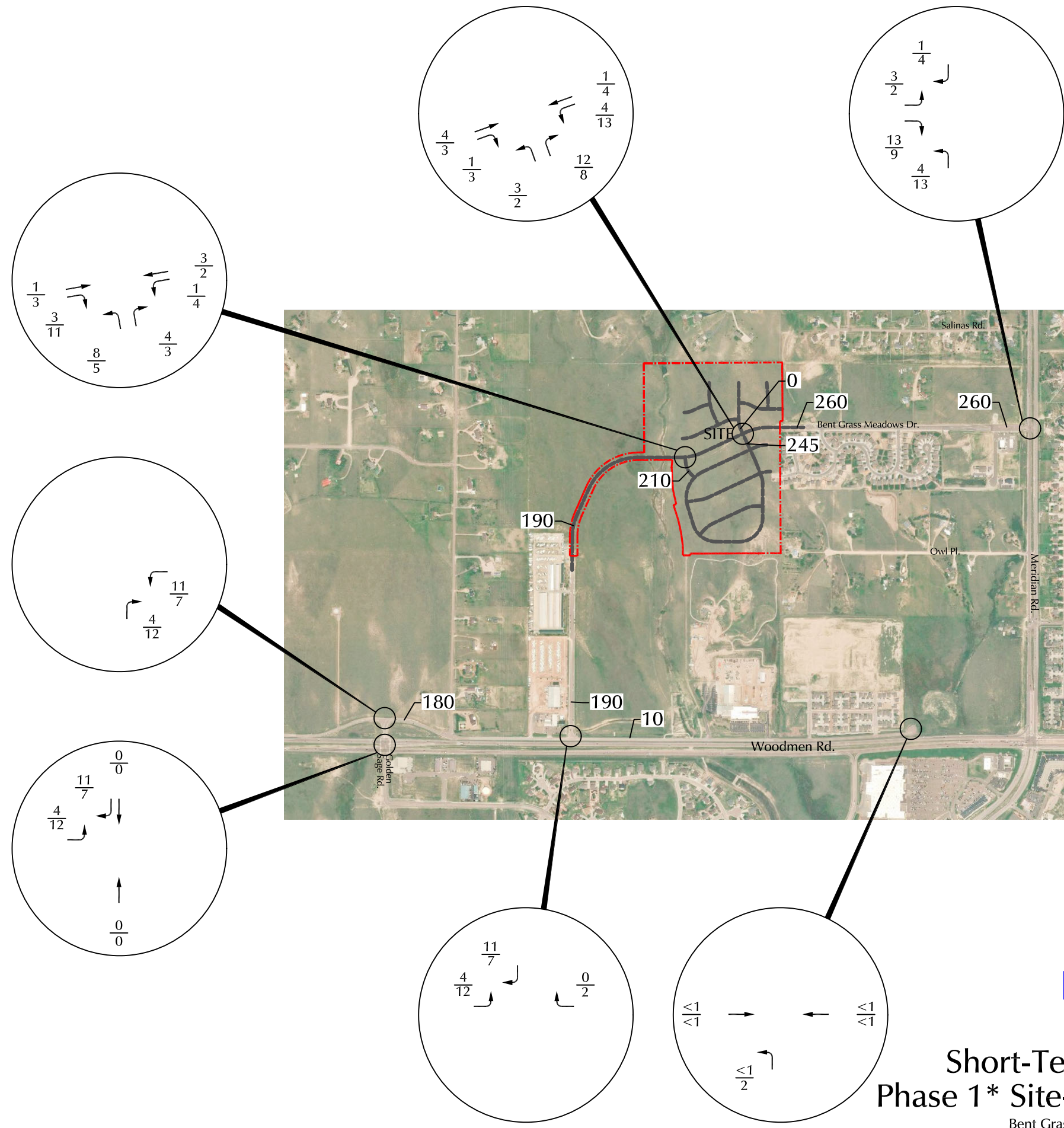
Phase	Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾						Total Trips Generated			
				Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour	
					In	Out	In	Out		In	Out	In	Out
1	210	Single-Family Detached Housing	48 DU ⁽²⁾	9.44	0.19	0.56	0.62	0.37	453	9	27	30	18
2	210	Single-Family Detached Housing	131 DU	9.44	0.19	0.56	0.62	0.37	1,237	24	73	82	48
			179 DU						1,690	33	100	112	66


Notes:

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

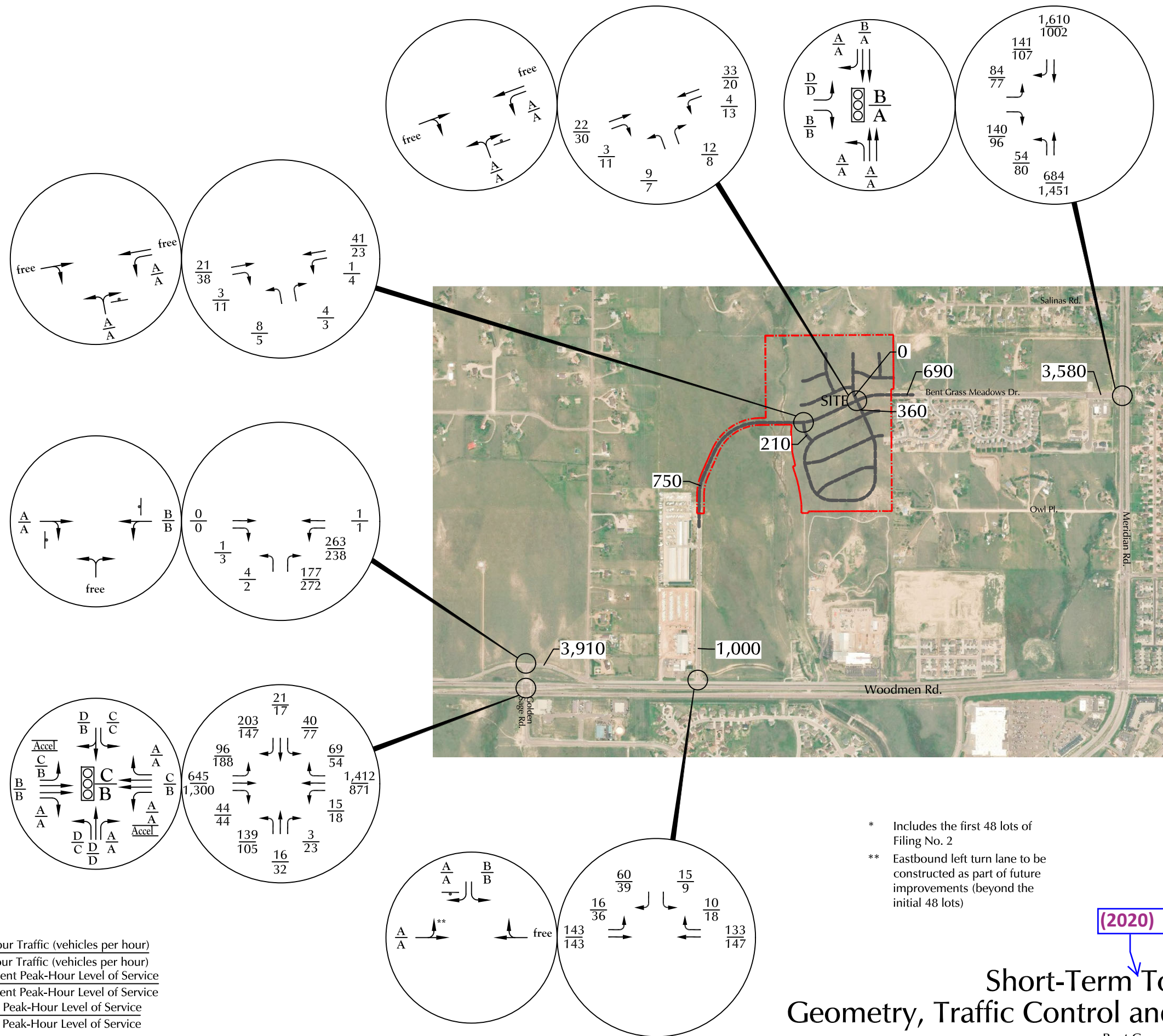
(2) DU = dwelling unit

Source: LSC Transportation Consultants, Inc.




LEGEND:
 $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)
 X,XXX = Average Daily Traffic (vehicles per day)

*Includes the first 48 lots of Filing No. 2
 (2020)
 (March 2020 Addendum Memo)
 Figure 2
Short-Term Assignment of Phase 1* Site-Generated Traffic
 Bent Grass Residential Filing No. 2 (LSC #194460)



LEGEND:

⊥ = Stop Sign

⊞ = Traffic Signal

XX = AM Weekday Peak-Hour Traffic (vehicles per hour)

XX = PM Weekday Peak-Hour Traffic (vehicles per hour)

A/B = AM Individual Movement Peak-Hour Level of Service

B/C = PM Individual Movement Peak-Hour Level of Service

C = AM Entire Intersection Peak-Hour Level of Service

C = PM Entire Intersection Peak-Hour Level of Service

X,XXX = Average Daily Traffic (vehicles per day)

* Includes the first 48 lots of Filing No. 2

** Eastbound left turn lane to be constructed as part of future improvements (beyond the initial 48 lots)

(2020)

(March 2020 Addendum Memo)

Figure 3

Short-Term Total Traffic*, Lane Geometry, Traffic Control and Level of Service

Bent Grass Residential Filing No. 2 (LSC #194460)

Levels of Service (for the March 2020 Addendum Memo)









HCM 6th TWSC

3: Meridian Rd & Bent Grass Meadows Dr

Short-Term Background Traffic

AM Peak Hour























Intersection						
Int Delay, s/veh	8.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	81	127	50	684	1610	140
Future Vol, veh/h	81	127	50	684	1610	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	700	-	-	330
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	86	86	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	84	132	58	795	1830	159
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2344	915	1989	0	-	0
Stage 1	1830	-	-	-	-	-
Stage 2	514	-	-	-	-	-
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	~ 30	275	286	-	-	-
Stage 1	113	-	-	-	-	-
Stage 2	565	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 24	275	286	-	-	-
Mov Cap-2 Maneuver	~ 75	-	-	-	-	-
Stage 1	90	-	-	-	-	-
Stage 2	565	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	111.4	1.4		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	286	-	75	275	-	-
HCM Lane V/C Ratio	0.203	-	1.125	0.481	-	-
HCM Control Delay (s)	20.8	-	239.5	29.7	-	-
HCM Lane LOS	C	-	F	D	-	-
HCM 95th %tile Q(veh)	0.7	-	6.2	2.4	-	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Timings

25: Golden Sage & Woodmen

Short-Term Background Traffic

AM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	92	645	44	15	1412	69	139	16	3	40	21
Future Volume (vph)	92	645	44	15	1412	69	139	16	3	40	21
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Minimum Split (s)	10.0	11.0	11.0	10.0	11.0	11.0	10.0	21.0	21.0	10.0	21.0
Total Split (s)	11.0	54.0	54.0	10.0	53.0	53.0	15.0	21.0	21.0	15.0	21.0
Total Split (%)	11.0%	54.0%	54.0%	10.0%	53.0%	53.0%	15.0%	21.0%	21.0%	15.0%	21.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	-1.0	-3.0	-3.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None
Act Effect Green (s)	55.6	54.4	54.4	54.3	49.7	49.7	22.5	16.7	16.7	20.1	11.2
Actuated g/C Ratio	0.60	0.58	0.58	0.58	0.53	0.53	0.24	0.18	0.18	0.22	0.12
v/c Ratio	0.52	0.34	0.05	0.04	0.84	0.09	0.65	0.06	0.01	0.13	0.77
Control Delay	22.1	12.0	0.1	8.1	25.5	0.7	42.1	36.5	0.0	26.2	33.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	12.0	0.1	8.1	25.5	0.7	42.1	36.5	0.0	26.2	33.9
LOS	C	B	A	A	C	A	D	D	A	C	C
Approach Delay		12.6			24.1			40.6			32.7
Approach LOS		B			C			D			C

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 93.1

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 22.8

Intersection LOS: C

Intersection Capacity Utilization 79.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 25: Golden Sage & Woodmen



HCM 6th TWSC

26: Golden Sage Rd & Woodmen Frontage Rd

Short-Term Background Traffic

AM Peak Hour

Intersection												
Int Delay, s/veh	6.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱			↱			↱	
Traffic Vol, veh/h	0	0	1	252	1	0	4	0	173	0	0	0
Future Vol, veh/h	0	0	1	252	1	0	4	0	173	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	87	87	87	87	87	87	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	1	290	1	0	5	0	199	0	0	0





Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	210	1	112	111	-	1	0	0	199	0	0
Stage 1	-	1	-	110	110	-	-	-	-	-	-	-
Stage 2	-	209	-	2	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	687	1084	866	779	0	1622	-	-	1373	-	-
Stage 1	0	895	-	895	804	0	-	-	-	-	-	-
Stage 2	0	729	-	1021	895	0	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	684	1084	863	776	-	1622	-	-	1373	-	-
Mov Cap-2 Maneuver	-	684	-	863	776	-	-	-	-	-	-	-
Stage 1	-	895	-	891	801	-	-	-	-	-	-	-
Stage 2	-	726	-	1020	895	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.3	11.3	0.2	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1622	-	-	1084 863	1373	-	-
HCM Lane V/C Ratio	0.003	-	-	0.001 0.337	-	-	-
HCM Control Delay (s)	7.2	0	-	8.3 11.3	0	-	-
HCM Lane LOS	A	A	-	A B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0 1.5	0	-	-

HCM 6th TWSC
40: frontage rd & Bent Grass Meadows Dr

Short-Term Background Traffic
AM Peak Hour







Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	143	133	10	15	49
Future Vol, veh/h	12	143	133	10	15	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	174	160	12	18	59
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	172	0	-	0	370	166
Stage 1	-	-	-	-	166	-
Stage 2	-	-	-	-	204	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1405	-	-	-	630	878
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	830	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1405	-	-	-	622	878
Mov Cap-2 Maneuver	-	-	-	-	622	-
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	830	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.6	0		9.8		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1405	-	-	-	622	878
HCM Lane V/C Ratio	0.01	-	-	-	0.029	0.067
HCM Control Delay (s)	7.6	0	-	-	11	9.4
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.2

HCM 6th TWSC

3: Meridian Rd & Bent Grass Meadows Dr

Short-Term Background Traffic

PM Peak Hour























Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	75	87	67	1451	1002	103
Future Vol, veh/h	75	87	67	1451	1002	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	700	-	-	330
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	96	96	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	87	101	70	1511	1002	103
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1898	501	1105	0	-	0
Stage 1	1002	-	-	-	-	-
Stage 2	896	-	-	-	-	-
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	~ 61	515	628	-	-	-
Stage 1	316	-	-	-	-	-
Stage 2	359	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 54	515	628	-	-	-
Mov Cap-2 Maneuver	155	-	-	-	-	-
Stage 1	281	-	-	-	-	-
Stage 2	359	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	32.6	0.5		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	628	-	155	515	-	-
HCM Lane V/C Ratio	0.111	-	0.563	0.196	-	-
HCM Control Delay (s)	11.4	-	54.6	13.7	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.4	-	2.9	0.7	-	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Timings

25: Golden Sage & Woodmen

Short-Term Background Traffic

PM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	176	1300	44	18	871	54	105	32	23	77	17
Future Volume (vph)	176	1300	44	18	871	54	105	32	23	77	17
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Minimum Split (s)	10.0	11.0	11.0	10.0	11.0	11.0	10.0	21.0	21.0	10.0	21.0
Total Split (s)	11.0	54.0	54.0	10.0	53.0	53.0	15.0	21.0	21.0	15.0	21.0
Total Split (%)	11.0%	54.0%	54.0%	10.0%	53.0%	53.0%	15.0%	21.0%	21.0%	15.0%	21.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	-1.0	-3.0	-3.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None
Act Effect Green (s)	57.6	56.3	56.3	55.1	49.1	49.1	20.5	11.0	11.0	16.5	8.0
Actuated g/C Ratio	0.63	0.62	0.62	0.60	0.54	0.54	0.22	0.12	0.12	0.18	0.09
v/c Ratio	0.51	0.65	0.05	0.08	0.49	0.06	0.48	0.17	0.09	0.31	0.63
Control Delay	12.9	14.8	0.1	7.4	14.9	0.1	33.3	40.2	0.5	30.3	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	14.8	0.1	7.4	14.9	0.1	33.3	40.2	0.5	30.3	19.2
LOS	B	B	A	A	B	A	C	D	A	C	B
Approach Delay		14.1			13.9			29.9			22.9
Approach LOS		B			B			C			C

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 91.3

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 15.8

Intersection LOS: B

Intersection Capacity Utilization 69.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 25: Golden Sage & Woodmen



HCM 6th TWSC

26: Golden Sage Rd & Woodmen Frontage Rd





Short-Term Background Traffic

PM Peak Hour

Intersection												
Int Delay, s/veh	5.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱			↱			↱	
Traffic Vol, veh/h	0	0	3	231	1	0	2	0	260	0	0	0
Future Vol, veh/h	0	0	3	231	1	0	2	0	260	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	87	87	87	87	87	87	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	4	266	1	0	2	0	299	0	0	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	304	1	157	155	-	1	0	0	299	0	0
Stage 1	-	1	-	154	154	-	-	-	-	-	-	-
Stage 2	-	303	-	3	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	609	1084	809	737	0	1622	-	-	1262	-	-
Stage 1	0	895	-	848	770	0	-	-	-	-	-	-
Stage 2	0	664	-	1020	895	0	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	608	1084	805	736	-	1622	-	-	1262	-	-
Mov Cap-2 Maneuver	-	608	-	805	736	-	-	-	-	-	-	-
Stage 1	-	895	-	846	768	-	-	-	-	-	-	-
Stage 2	-	663	-	1016	895	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	8.3		11.7		0.1		0					
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1622	-	-	1084	805	1262	-	-				
HCM Lane V/C Ratio	0.001	-	-	0.004	0.331	-	-	-				
HCM Control Delay (s)	7.2	0	-	8.3	11.7	0	-	-				
HCM Lane LOS	A	A	-	A	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	1.5	0	-	-				

HCM 6th TWSC
40: frontage rd & Bent Grass Meadows Dr

Short-Term Background Traffic
PM Peak Hour













Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	143	147	16	9	32
Future Vol, veh/h	24	143	147	16	9	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	83	83	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	164	177	19	12	41
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	196	0	-	0	407	187
Stage 1	-	-	-	-	187	-
Stage 2	-	-	-	-	220	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1377	-	-	-	600	855
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	817	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1377	-	-	-	587	855
Mov Cap-2 Maneuver	-	-	-	-	587	-
Stage 1	-	-	-	-	826	-
Stage 2	-	-	-	-	817	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.1	0		9.8		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1377	-	-	-	587	855
HCM Lane V/C Ratio	0.02	-	-	-	0.02	0.048
HCM Control Delay (s)	7.7	0	-	-	11.3	9.4
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0.2

Timings

3: Meridian Rd & Bent Grass Meadows Dr

Short-Term Phase 1 Total Traffic

AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	84	140	54	684	1610	141
Future Volume (vph)	84	140	54	684	1610	141
Turn Type	pm+pt	Perm	pm+pt	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases	4	4	2			6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.0	23.0	23.0	23.0
Total Split (s)	25.0	25.0	15.0	65.0	50.0	50.0
Total Split (%)	27.8%	27.8%	16.7%	72.2%	55.6%	55.6%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Max	Max	Max
Act Effect Green (s)	9.4	9.4	62.9	62.9	53.5	53.5
Actuated g/C Ratio	0.11	0.11	0.76	0.76	0.65	0.65
v/c Ratio	0.44	0.47	0.29	0.29	0.80	0.15
Control Delay	39.5	11.3	6.4	3.5	15.6	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	11.3	6.4	3.5	15.6	1.7
LOS	D	B	A	A	B	A
Approach Delay	21.9			3.7	14.5	
Approach LOS	C			A	B	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 82.3

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 12.1

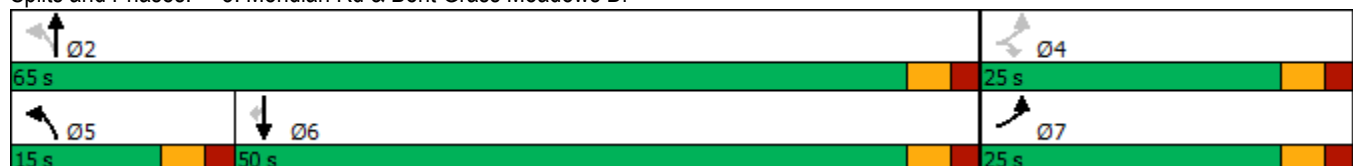
Intersection LOS: B

Intersection Capacity Utilization 61.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Meridian Rd & Bent Grass Meadows Dr

























Timings

25: Golden Sage & Woodmen

Short-Term Phase 1 Total Traffic

AM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	96	645	44	15	1412	69	139	16	3	40	21
Future Volume (vph)	96	645	44	15	1412	69	139	16	3	40	21
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Minimum Split (s)	10.0	11.0	11.0	10.0	11.0	11.0	10.0	21.0	21.0	10.0	21.0
Total Split (s)	11.0	54.0	54.0	10.0	53.0	53.0	15.0	21.0	21.0	15.0	21.0
Total Split (%)	11.0%	54.0%	54.0%	10.0%	53.0%	53.0%	15.0%	21.0%	21.0%	15.0%	21.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	-1.0	-3.0	-3.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None
Act Effect Green (s)	55.6	54.4	54.4	54.3	49.7	49.7	22.9	17.1	17.1	20.6	11.8
Actuated g/C Ratio	0.59	0.58	0.58	0.58	0.53	0.53	0.24	0.18	0.18	0.22	0.13
v/c Ratio	0.55	0.34	0.05	0.04	0.85	0.09	0.66	0.06	0.01	0.13	0.79
Control Delay	23.8	12.3	0.1	8.2	26.0	0.7	42.8	36.5	0.0	26.1	36.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	12.3	0.1	8.2	26.0	0.7	42.8	36.5	0.0	26.1	36.5
LOS	C	B	A	A	C	A	D	D	A	C	D
Approach Delay		13.0			24.6			41.3			34.9
Approach LOS		B			C			D			C

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 93.6

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 23.5

Intersection LOS: C

Intersection Capacity Utilization 80.7%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 25: Golden Sage & Woodmen



HCM 6th TWSC

26: Golden Sage Rd & Woodmen Frontage Rd





Short-Term Phase 1 Total Traffic

AM Peak Hour

Intersection												
Int Delay, s/veh	6.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱			↱			↱			↱	
Traffic Vol, veh/h	0	0	1	263	1	0	4	0	177	0	0	0
Future Vol, veh/h	0	0	1	263	1	0	4	0	177	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	87	87	87	87	87	87	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	1	302	1	0	5	0	203	0	0	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	214	1	114	113	-	1	0	0	203	0	0
Stage 1	-	1	-	112	112	-	-	-	-	-	-	-
Stage 2	-	213	-	2	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	684	1084	863	777	0	1622	-	-	1369	-	-
Stage 1	0	895	-	893	803	0	-	-	-	-	-	-
Stage 2	0	726	-	1021	895	0	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	681	1084	860	774	-	1622	-	-	1369	-	-
Mov Cap-2 Maneuver	-	681	-	860	774	-	-	-	-	-	-	-
Stage 1	-	895	-	889	800	-	-	-	-	-	-	-
Stage 2	-	723	-	1020	895	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	8.3		11.5		0.2		0					
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1622	-	-	1084	860	1369	-	-				
HCM Lane V/C Ratio	0.003	-	-	0.001	0.353	-	-	-				
HCM Control Delay (s)	7.2	0	-	8.3	11.5	0	-	-				
HCM Lane LOS	A	A	-	A	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	1.6	0	-	-				






HCM 6th TWSC
40: frontage rd & Bent Grass Meadows Dr

Short-Term Phase 1 Total Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	143	133	10	15	60
Future Vol, veh/h	16	143	133	10	15	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	174	160	12	18	72
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	172	0	-	0	380	166
Stage 1	-	-	-	-	166	-
Stage 2	-	-	-	-	214	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1405	-	-	-	622	878
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	822	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1405	-	-	-	612	878
Mov Cap-2 Maneuver	-	-	-	-	612	-
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	822	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.8	0		9.8		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1405	-	-	-	612	878
HCM Lane V/C Ratio	0.014	-	-	-	0.03	0.082
HCM Control Delay (s)	7.6	0	-	-	11.1	9.5
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.3






HCM 6th TWSC
203: Lynch Rd & Bent Grass Meadows Dr

Short-Term Phase 1 Total Traffic
AM Peak Hour

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	21	3	1	41	8	4
Future Vol, veh/h	21	3	1	41	8	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	155	-	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	23	3	1	45	9	4
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	26	0	72	25
Stage 1	-	-	-	-	25	-
Stage 2	-	-	-	-	47	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1588	-	932	1051
Stage 1	-	-	-	-	998	-
Stage 2	-	-	-	-	975	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1588	-	931	1051
Mov Cap-2 Maneuver	-	-	-	-	874	-
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	975	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.2		8.9		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	926	-	-	1588	-	
HCM Lane V/C Ratio	0.014	-	-	0.001	-	
HCM Control Delay (s)	8.9	-	-	7.3	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0	-	-	0	-	

HCM 6th TWSC
204: Berwyn Dr & Bent Grass Meadows Dr

Short-Term Phase 1 Total Traffic
AM Peak Hour













Intersection						
Int Delay, s/veh	2.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	22	3	4	33	9	12
Future Vol, veh/h	22	3	4	33	9	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	155	-	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	24	3	4	36	10	13
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	27	0	70	26
Stage 1	-	-	-	-	26	-
Stage 2	-	-	-	-	44	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1587	-	934	1050
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	978	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1587	-	931	1050
Mov Cap-2 Maneuver	-	-	-	-	873	-
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	978	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.8		8.8		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	966	-	-	1587	-	
HCM Lane V/C Ratio	0.024	-	-	0.003	-	
HCM Control Delay (s)	8.8	-	-	7.3	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

Timings

3: Meridian Rd & Bent Grass Meadows Dr

Short-Term Phase 1 Total Traffic

PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	77	96	80	1451	1002	107
Future Volume (vph)	77	96	80	1451	1002	107
Turn Type	pm+pt	Perm	pm+pt	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases	4	4	2			6
Detector Phase	7	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.0	23.0	10.0	23.0	23.0	23.0
Total Split (s)	25.0	25.0	15.0	65.0	50.0	50.0
Total Split (%)	27.8%	27.8%	16.7%	72.2%	55.6%	55.6%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Max	Max	Max
Act Effect Green (s)	9.4	9.3	63.0	64.0	54.6	54.6
Actuated g/C Ratio	0.12	0.12	0.79	0.80	0.68	0.68
v/c Ratio	0.44	0.40	0.19	0.53	0.42	0.10
Control Delay	39.2	11.2	3.8	4.9	8.6	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	11.2	3.8	4.9	8.6	2.0
LOS	D	B	A	A	A	A
Approach Delay	23.7			4.8	8.0	
Approach LOS	C			A	A	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 80.2

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 7.3

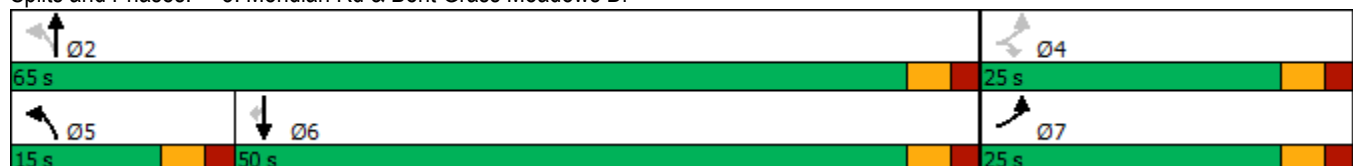
Intersection LOS: A

Intersection Capacity Utilization 52.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Meridian Rd & Bent Grass Meadows Dr

























Timings

25: Golden Sage & Woodmen

Short-Term Phase 1 Total Traffic

PM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	188	1300	44	18	871	54	105	32	23	77	17
Future Volume (vph)	188	1300	44	18	871	54	105	32	23	77	17
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	5	2		1	6		3	8		7	4
Permitted Phases	2		2	6		6	8		8	4	
Detector Phase	5	2	2	1	6	6	3	8	8	7	4
Switch Phase											
Minimum Initial (s)	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0	4.0	5.0	4.0
Minimum Split (s)	10.0	11.0	11.0	10.0	11.0	11.0	10.0	21.0	21.0	10.0	21.0
Total Split (s)	11.0	54.0	54.0	10.0	53.0	53.0	15.0	21.0	21.0	15.0	21.0
Total Split (%)	11.0%	54.0%	54.0%	10.0%	53.0%	53.0%	15.0%	21.0%	21.0%	15.0%	21.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	-3.0	-3.0	-1.0	-3.0	-3.0	-1.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	None
Act Effect Green (s)	57.6	56.3	56.3	55.1	49.1	49.1	20.6	11.1	11.1	16.6	8.0
Actuated g/C Ratio	0.63	0.62	0.62	0.60	0.54	0.54	0.23	0.12	0.12	0.18	0.09
v/c Ratio	0.55	0.65	0.05	0.08	0.49	0.06	0.47	0.17	0.09	0.31	0.64
Control Delay	14.2	14.8	0.1	7.4	15.0	0.1	33.2	40.1	0.5	30.2	19.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	14.8	0.1	7.4	15.0	0.1	33.2	40.1	0.5	30.2	19.1
LOS	B	B	A	A	B	A	C	D	A	C	B
Approach Delay		14.3			14.0			29.9			22.7
Approach LOS		B			B			C			C

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 91.4

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 15.9

Intersection LOS: B

Intersection Capacity Utilization 70.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 25: Golden Sage & Woodmen



HCM 6th TWSC

26: Golden Sage Rd & Woodmen Frontage Rd





Short-Term Phase 1 Total Traffic

PM Peak Hour

Intersection												
Int Delay, s/veh	5.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻			↻			↻	
Traffic Vol, veh/h	0	0	3	238	1	0	2	0	272	0	0	0
Future Vol, veh/h	0	0	3	238	1	0	2	0	272	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	87	87	87	87	87	87	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	4	274	1	0	2	0	313	0	0	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	318	1	164	162	-	1	0	0	313	0	0
Stage 1	-	1	-	161	161	-	-	-	-	-	-	-
Stage 2	-	317	-	3	1	-	-	-	-	-	-	-
Critical Hdwy	-	6.52	6.22	7.12	6.52	-	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	-	4.018	3.318	3.518	4.018	-	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	0	598	1084	801	730	0	1622	-	-	1247	-	-
Stage 1	0	895	-	841	765	0	-	-	-	-	-	-
Stage 2	0	654	-	1020	895	0	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	597	1084	797	729	-	1622	-	-	1247	-	-
Mov Cap-2 Maneuver	-	597	-	797	729	-	-	-	-	-	-	-
Stage 1	-	895	-	839	763	-	-	-	-	-	-	-
Stage 2	-	653	-	1016	895	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	8.3		11.9		0.1		0					
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1622	-	-	1084	797	1247	-	-				
HCM Lane V/C Ratio	0.001	-	-	0.004	0.345	-	-	-				
HCM Control Delay (s)	7.2	0	-	8.3	11.9	0	-	-				
HCM Lane LOS	A	A	-	A	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	1.5	0	-	-				





HCM 6th TWSC
40: frontage rd & Bent Grass Meadows Dr

Short-Term Phase 1 Total Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	143	147	18	9	39
Future Vol, veh/h	36	143	147	18	9	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	83	83	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	164	177	22	12	50
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	199	0	-	0	434	188
Stage 1	-	-	-	-	188	-
Stage 2	-	-	-	-	246	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1373	-	-	-	579	854
Stage 1	-	-	-	-	844	-
Stage 2	-	-	-	-	795	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1373	-	-	-	560	854
Mov Cap-2 Maneuver	-	-	-	-	560	-
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	795	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.5	0		9.9		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1373	-	-	-	560	854
HCM Lane V/C Ratio	0.03	-	-	-	0.021	0.059
HCM Control Delay (s)	7.7	0	-	-	11.6	9.5
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0.2





HCM 6th TWSC
203: Lynch Rd & Bent Grass Meadows Dr

Short-Term Phase 1 Total Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	1.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	38	11	4	23	5	3
Future Vol, veh/h	38	11	4	23	5	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	155	-	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	41	12	4	25	5	3
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	53	0	80	47
Stage 1	-	-	-	-	47	-
Stage 2	-	-	-	-	33	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1553	-	922	1022
Stage 1	-	-	-	-	975	-
Stage 2	-	-	-	-	989	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1553	-	919	1022
Mov Cap-2 Maneuver	-	-	-	-	866	-
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	989	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	1.1		9		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	919	-	-	1553	-	
HCM Lane V/C Ratio	0.009	-	-	0.003	-	
HCM Control Delay (s)	9	-	-	7.3	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0	-	-	0	-	

HCM 6th TWSC
204: Berwyn Dr & Bent Grass Meadows Dr

Short-Term Phase 1 Total Traffic
PM Peak Hour

Intersection						
Int Delay, s/veh	2.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	30	11	13	20	7	8
Future Vol, veh/h	30	11	13	20	7	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	155	-	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	33	12	14	22	8	9
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	45	0	89	39
Stage 1	-	-	-	-	39	-
Stage 2	-	-	-	-	50	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1563	-	912	1033
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	972	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1563	-	904	1033
Mov Cap-2 Maneuver	-	-	-	-	853	-
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	972	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.9		8.9	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1		EBT	EBR	WBL	WBT
Capacity (veh/h)	940		-	-	1563	-
HCM Lane V/C Ratio	0.017		-	-	0.009	-
HCM Control Delay (s)	8.9		-	-	7.3	-
HCM Lane LOS	A		-	-	A	-
HCM 95th %tile Q(veh)	0.1		-	-	0	-

Queuing Reports

Queuing and Blocking Report

Intersection: 40: frontage rd & Bent Grass Meadows Dr

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	61	45	60
Average Queue (ft)	8	13	35
95th Queue (ft)	36	39	53
Link Distance (ft)	1221	1889	1889
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report

Intersection: 40: frontage rd & Bent Grass Meadows Dr

Movement	EB	SB	SB
Directions Served	LT	L	R
Maximum Queue (ft)	39	35	34
Average Queue (ft)	5	5	22
95th Queue (ft)	26	25	41
Link Distance (ft)	1221	1889	1889
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			