

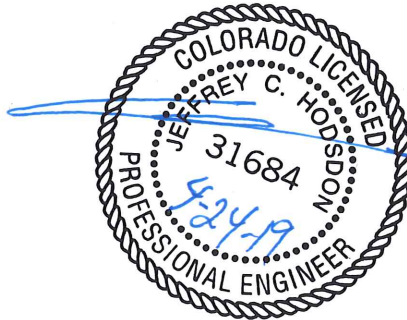


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Monument Academy  
Traffic Impact Study  
PCD File No. U192/PPR19009  
(LSC #184820)  
April 24, 2019

**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.

\_\_\_\_\_

\_\_\_\_\_  
Date



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April 24, 2019

Mr. Don Griffin  
Monument Academy  
1150 Village Ridge Point  
Monument, CO 80132

RE: Monument Academy  
El Paso County, Colorado  
Traffic Impact Study  
LSC #184820

Dear Mr. Griffin:

LSC Transportation Consultants, Inc. has prepared this updated traffic impact study for the proposed development to be located east of State Highway (SH) 83 and south of Walker Road in El Paso County, Colorado. The site location is shown in Figure 1.

## **REPORT CONTENTS**

The report contains the following:

- Recent/current street and traffic conditions in the vicinity of the site for identification of existing and planned street widths, lane geometries, traffic controls, posted speed limits, street classification, etc.
- Existing traffic volumes at the key intersections in the vicinity of the site and estimates of 2040 background traffic volumes.
- The projected average weekday and peak-hour vehicle trips to be generated by the proposed development.
- The assignment of the projected trips to the existing and planned street system.
- The resulting short-term and 2040 total traffic volumes on the street system.
- The resulting traffic impacts. The traffic impacts have been quantified by determining the future levels of service at the intersection of SH 83/Walker, the future intersection of Walker Road and a proposed Road A (north-south collector), and the proposed site access point intersections.
- Recommendations for street functional classification, traffic controls, and auxiliary turn lanes.

## **RECENT TRAFFIC STUDIES**

The Walden Preserve 2 development is located west of the currently proposed site. LSC prepared a traffic impact study (TIS) for the entire development dated September 14, 2014 and an addendum report for the Colorado Department of Transportation (CDOT) dated November 3, 2014. A transportation memorandum was prepared for Filing No. 4 dated March 14, 2019. The overall TIS assumed the currently proposed site would be developed with a middle school. The TIS also assumed Pinehurst Circle would extend northeast to Walker Road and did not assume direct access to SH 83 between Walden Way and Walker Road.

LSC also recently completed the traffic reports for the Rollin' Ridge development located southwest of Highway 83/Hodgen Road, and Settlers' View/Abert Ranch located generally northwest of Hodgen/Steppler.

## **SITE DEVELOPMENT, LAND USE, AND ACCESS**

The site is located south of Walker Road and east of SH 83. Access is proposed via an extension of Pinehurst Circle that will continue from the approved extension through the approved Walden development located east of the site to SH 83 about 1,675 feet south of Walker Road. This intersection would be restricted to right-in/right-out only. A new north-south Urban Non-Residential Collector (Road A) is planned to be extended north through the site to Walker Road about 700 feet east of SH 83.

### **Short -Term**

#### **Land Use**

The short-term development is planned to include a building that will house both a charter school and a YMCA. The short-term site plan is shown in Figure 2. At buildout the charter school is planned to support about 1,000 students. Phase 1 is planned to open in August 2020 and will comprise about 600 students in grades 6 to 9. Phase 2 is planned to open 2025 and will comprise an additional 400 students in grades 10-12.

The YMCA will also be opened in two phases. Phase 1 will be about 12,000 square feet of floor space and will include gyms, fitness centers, multi-purpose rooms, group exercise space, community meeting space, etc. The YMCA anticipates approximately 330 daily gate visits (members who scan in) with an additional 50-100 users such as community classes, school groups, etc. Phase 2 will be an additional 20,000 square feet comprising mostly a competitive aquatics center.

## **Access**

Two full-movement access points are proposed to Road A and one full-movement access point is proposed to Pinehurst Circle. Figure 2 shows the proposed spacing. The spacing of these access points will require a deviation to the El Paso County Engineering Criteria Manual (ECM).

## **Site Circulation**

Figure 3 shows the site circulation plan for the proposed school and YMCA. The north parking lot is planned for school staff and student parking. The southeast parking lot is planned for school staff and visitor parking. This parking area will also be the location of student pick-ups and drop-offs by private (parent) vehicles. As shown on Figure 3 the currently proposed plan provides for about 880 feet of on-site stacking length for vehicles plus 195 feet for active pick-up and drop-offs. The southwest lot will primarily be for the YMCA.

Exiting traffic at the southeast school access to Pinehurst Circle will likely need to be restricted to **right-out** traffic turning movements only to prevent a significant amount of cut-through traffic on Pinehurst Circle for motorists wishing to travel south. Pinehurst Circle is a Rural Local road through the Walden Preserve development to the south.

## **Pedestrian and Bicycle Plan**

Figure 4 shows the proposed pedestrian & bicycle plan. There are currently no pedestrian facilities on the adjacent roadways. Sidewalks will be constructed in phases on the east side of Road A from the YMCA access to Walker Road to provide for pedestrian access. A trail connection will be provided to the Walden trail to the southeast.

## **Sight Distance**

Figures 5 through 8 shows a sight distance analysis for the proposed access points and the intersection of Pinehurst Circle and Road A. The analysis for the access points to Road A is based on a posted speed of 35 miles per hour (mph) and a four-lane roadway (two through lanes plus right and left-turn auxiliary lanes). The analysis for the access point to Pinehurst Circle is based on a posted speed limit of 30 mph and a two-lane roadway.

As shown on Figure 6 the available sight distance at the YMCA access to the south is restricted to 283 feet. This is less than the required sight distance based on a posted speed limit of 35 mph. However, as the intersection of Road A and Pinehurst Circle is a "T" intersection all traffic approaching from the south will have either just made an eastbound left-turn or westbound right-turn. Based on a slower turning speed the available sight distance for the YMCA access would be adequate.



## Long-Term Land Use and Access

The areas west and south of the proposed school and YMCA are currently zoned RR-5. Based on this zoning it was assumed that about seven single family residential units on five-acre lots could potentially be constructed. Access to these lots would be determined at the time of development of these lots.

## ROADWAY AND TRAFFIC CONDITIONS

### Area Roadways

Figure 1 shows the roadways in the vicinity of the site. The major roadways are identified below followed by a brief description of each.

- **State Highway 83** extends from Colorado Springs north to Parker and areas of southeast Denver. In the vicinity of the site, SH 83 is classified as a Regional Highway (R-A). At this location SH 83 is a two-lane rural highway with two- to four-foot shoulders and a speed limit of 60 miles per hour (mph). The intersection with Walker Road is signalized.
- **Highway 105** is a Principal Arterial that extends east from Interstate 25 to State Highway 83. Highway 105 is currently a two-lane roadway but the *Major Transportation Corridors Plan* (MTCP) shows a future four-lane cross section.
- **Walker Road** is a paved, “unimproved” rural roadway that extends east from Highway 83. Walker Road currently is a two-lane roadway. Walker Road is shown as a 4-lane Minor Arterial roadway on the *MTCP 2040 Roadway Plan*. LSC and the applicant have requested that County staff investigate the reasons behind the MTCP classification as a four-lane roadway and a potential revision to the MTCP to change Walker Road to a two-lane roadway rather than a four-lane roadway in the future.

### Existing Traffic Volumes

Figure 9 shows the recent traffic volumes at the intersection of SH 83/Walker. In addition to the typical morning and afternoon peak hours, Figure 4 also shows the existing traffic volumes during the typical school dismissal time (2:00 to 3:00 pm). These traffic volumes were based on traffic counts conducted by LSC in August 2018. 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.

<b>Table 1</b>			
<b>Intersection Levels of Service Delay Ranges</b>			
<b>Level of Service</b>	<b>Signalized Intersections</b>		<b>Unsignalized Intersections</b>
	<b>Average Control Delay (seconds per vehicle)</b>	<b>V/C<sup>(1)</sup></b>	<b>Average Control Delay (seconds per vehicle)<sup>(2)</sup></b>
A	10.0 sec or less	less than 0.60	10.0 sec or less
B	10.1-20.0 sec	0.60-0.69	10.1-15.0 sec
C	20.1-35.0 sec	0.70-0.79	15.1-25.0 sec
D	35.1-55.0 sec	0.80-0.89	25.1-35.0 sec
E	55.1-80.0 sec	0.90-0.99	35.1-50.0 sec
F	80.1 sec or more	1.00 and greater	50.1 sec or more
(1) Source: <i>Transportation Research Circular 212</i>			
(2) 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 intersection of SH 83/Highway 105/Walker was analyzed to determine the existing levels of service using Synchro. Figure 9 shows the level of service analysis results. As shown on the figure, all movements this intersection are level of service D or better during the peak hours. The level of service (LOS) reports are attached.

### BACKGROUND TRAFFIC

Background traffic is the traffic estimated to be on the adjacent roadways and at adjacent intersections without the proposed development's trip generation of site-generated traffic volumes. Background traffic includes the through traffic and the traffic generated by nearby developments but assumes zero traffic generated by the site.

Figure 10 shows the short-term (year 2025) background traffic volumes. The background volumes are estimate by LSC based on the existing traffic volumes shown in Figure 9 with a yearly growth rate of two percent per year.

Figure 11a shows the projected 2040 background traffic volumes. The 2040 background traffic volumes are estimates by LSC based on the Colorado Department of Transportation (CDOT) twenty-year growth factor on SH 83 adjacent to the site and previous work completed by LSC in

the area including work done for the Walden development. The 2040 background volumes assume full buildout of the street network within the site including the extension of Pinehurst Circle to a right-in/right-out-only intersection with SH 83 and Road A from Pinehurst Circle to Walden Road.

Figure 11b shows the lane geometry, traffic control, and level of service at the key area intersections based on the 2040 background traffic volumes.

## **TRIP GENERATION**

Estimates of the traffic volumes expected to be generated by the site have been made using the nationally published trip generation rates found in *Trip Generation, 10<sup>th</sup> Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 2 shows the results of the trip generation estimates. Off-peak trip generation rates are based on hourly distribution tables published by ITE in August 2018.

As shown in Table 1, in the short term, with development of the school and YMCA only, the site is projected to generate about 3,392 new vehicle-trips on the average weekday, with about one-half of the vehicles entering and one-half of the vehicles exiting in a 24-hour period. During the morning peak hour, which was assumed to occur between 7:45 and 8:45 a.m., about 551 vehicles would enter and 344 vehicles would exit the site. During the afternoon peak hour of the school, which was assumed to occur for one hour between 2:00 to 3:00 p.m., about 228 vehicles would enter and 309 vehicles would exit the site. During the afternoon peak hour of the adjacent street traffic, which generally occurs for one hour between 4:30 and 6:30 p.m., about 121 vehicles would enter and 151 vehicles would exit the site.

If the remaining area of the site is developed based on the current RR-5 zoning, it is projected to generate an additional 66 new vehicle-trips on the average weekday, with about one-half of the vehicles entering and one-half of the vehicles exiting in a 24-hour period. During the morning peak hour about one additional vehicle would enter and four additional vehicles would exit the site. During the afternoon peak hour of the school, which was assumed to occur for one hour between 2:00 to 3:00 p.m., about two additional vehicles would enter and two additional vehicles would exit the site. During the afternoon peak hour of the adjacent street traffic about four additional vehicles would enter and three additional vehicles would exit the site.

## **TRIP DISTRIBUTION AND ASSIGNMENT**

The directional distribution of the site-generated traffic volumes on the street and roadway system serving the site is one of the most important factors in determining the site's traffic impacts. Figure 12 shows the directional distribution estimates for the Phase 1 and 2 site-generated traffic volumes. Figure 13 shows the long-term directional distribution estimates for the future residential land uses. The estimates have been based on the following factors: the recent traffic count data; the site's location with respect to the nearby residential, employment,

commercial, and activity centers; the site's proposed land use; the site's proposed access points; and the phasing of the existing and future roadway system serving the site. The short-term distribution estimate assumes the new section of Pinehurst Circle has been constructed east from SH 83 to the east boundary of the site but does not connect to the Walden development. The long-term distribution estimate assumes Pinehurst Circle has been completed from Walden Way to the east boundary of the site.

When the distribution percentages (from Figures 12 and 13) were applied to the trip generation estimates (from Table 1), the site-generated traffic volumes on the area roadways were determined. Figure 14 shows the short-term Phases 1 and 2 only site-generated traffic volumes. These volumes assume buildout of the school and the YMCA only. Figure 15 shows the long-term site-generated traffic volumes. These volumes assume buildout of the site based on the existing RR-5 zoning for the areas west and south of the proposed school and YMCA. These lots are not associated with the school/YMCA site location and development application.

### **PROJECTED TOTAL TRAFFIC**

Figure 16a shows the short-term total (Phases 1 and 2 only) traffic volumes. These volumes are the sum of the short-term background traffic volumes (from Figure 10) plus the short-term (Phases 1 and 2 only) site-generated traffic volumes (from Figure 14). These volumes assume the section of Pinehurst Circle has been constructed from SH 83 through the site to the school access only and does not connect to the existing section south of Walden Way.

Figure 16b shows the projected level of service based on the short-term total volumes for the key intersections in the vicinity of the site.

Figure 17a shows the 2040 total traffic volumes. These volumes are the sum of the 2040 background traffic volumes (from Figure 11a) plus the long-term buildout site-generated traffic volumes (from Figure 15). These volumes assume Pinehurst Circle has been extended from its current terminus through the approved Walden development and the currently proposed development to SH 83.

Figure 17b shows the projected level of service based on the 2040 total volumes for the key intersections in the vicinity of the site.

### **PROJECTED LEVELS OF SERVICE**

The intersection of SH 83/Walker, the proposed intersections of the new north-south Collector with Walker Road and Pinehurst Circle and the Phase 1 and 2 site access points have been analyzed to determine the projected levels of service for the short-term and 2040 background and total traffic volumes based on the signalized method of analysis from Synchro and the unsignalized method of analysis procedures outlined in the *Highway Capacity Manual, 2010 Edition* by the Transportation Research Board. The level of service reports are attached. The results of the analysis are shown in Figures 10, 11, 16b and 17b.

### **SH 83/Walker/Highway 105**

All movements at the signal-controlled SH 83/Walden/Highway 106 intersection are projected to operate at a level of service D or better based on the short-term total traffic conditions. This analysis assumes the addition of eastbound and westbound left-turn lanes approaching this intersection and protected phasing for those movements. By 2040 the westbound left-turn movements is projected to operate at LOS E during the morning peak hour. This movement has projected delays in the LOS E range simply because of the likelihood of arrival at the traffic signal at the beginning of the red phase at an intersection with many phases and a long cycle length. This movement would not be considered “failing” since the volume-to-capacity ratio is less than one. The justification is that to progress through traffic along an arterial corridor, the traffic signal offsets and left-turn and side street phase times have been adjusted to favor the through traffic band, which can often result in higher delay for the left-turn movements even though there is sufficient capacity for them. **Note: The LOS analysis results are based on signal timing assumptions within the model – specifically the allowable signal phase time for the side street. CDOT would need to find these assumptions acceptable for use in the field.**

### **Walker/Road A**

Due to limited available sight distance along Walker Road the proposed intersection of Walker Road and Road A is proposed to be signed for all-way Stop-sign control. All movements at this intersection are projected to operate at LOS D or better during the peak hours based on the projected short-term and 2040 total traffic volumes.

### **Pinehurst/Road A**

The intersection of Pinehurst Circle and Road A is projected to operate at LOS D or better for all movements during the peak hours based on the projected short-term total traffic volumes as a stop-sign-controlled intersection.

By 2040, if this intersection remains stop-sign controlled, the southbound left-turn movement is projected to operate at LOS F during the morning peak hour and LOS B or better during the school afternoon peak hour and the afternoon peak hour of the adjacent street traffic. If this intersection is converted to all-way stop-sign control, all movements are projected to operate at LOS C or better during the peak hours. If this intersection were reconstructed as a one-lane modern roundabout all movements are projected to operate at LOS A.

### **Site Access Points**

The site access points to Pinehurst Circle and Road A are projected to operate at LOS B or better for all movements during the peak hours based on the projected short-term and 2040 total traffic volumes as stop-sign-controlled intersections.

## **VEHICLE QUEUING ANALYSIS**

A queuing analysis was performed using Synchro/SimTraffic for Walker Road between SH 83 and Road A. The 2040 total morning, school afternoon peak and afternoon peak-hour of the adjacent street traffic volumes were entered into the Synchro model. The simulation was run five times and the results were averaged. The queuing reports are attached.

The projected 95<sup>th</sup> percentile queue length for the westbound left-turn on Walker road approaching SH 83 is 239 feet based on the 2040 morning peak hour traffic volumes.

## **Street Classifications**

Figure 18 shows the recommended street classifications in the vicinity of the site.

Walker Road is currently shown as a Four-Lane Minor Arterial on the MTCP 2040 Roadway Plan. As shown on Figure 17a the projected average weekday traffic volume (ADT) on Walker Road just east of SH 83 is 5,550 vehicles per day. The design ADT for an Urban Four-Lane Minor Arterial is 20,000 vehicles per day. The design ADT for an Urban Residential Collector, which provides on lane in each direction is 10,000 vehicles per day. As the projected volume on Walker Road is well below 10,000 vehicles per day LSC and the applicant are proposing a two-through-lane facility plus auxiliary turn lanes as shown in the attached exhibit in leu of a two-through lanes in each direction.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Trip Generation**

- Following Phases 1 and 2 only with development of the proposed school and YMCA only, the site is projected to generate about 3,392 new vehicle-trips on the average weekday, with about one-half of the vehicles entering and one-half of the vehicles 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 551 vehicles would enter and 344 vehicles would exit the site. During the afternoon peak hour of the school, which was assumed to occur for one hour between 2:00 and 3:00 p.m., about 228 vehicles would enter and 309 vehicles would exit the site. During the afternoon peak hour of the adjacent street traffic, which generally occurs for one hour between 4:30 and 6:30 p.m., about 121 vehicles would enter and 151 vehicles would exit the site.
- If the remaining area of the site is developed based on the current RR-5 zoning, it is projected to generate an additional 66 new vehicle-trips on the average weekday, with about one-half of the vehicles entering and one-half of the vehicles exiting in a 24-hour period. During the morning peak hour about one additional vehicle would enter and four additional vehicles would exit the site. During the afternoon peak hour of the school, which was assumed to occur for one hour between 2:00 to 3:00 p.m., about two additional vehicles would enter and two additional vehicles would exit the site. During the afternoon peak hour of the adjacent

street traffic about four additional vehicles would enter and three additional vehicles would exit the site.

### Deviations

- The following deviations to the El Paso County Engineering Criteria will be required with the Phase 1 development:
  - Spacing of the intersection of Walker Road and Road A.
  - Spacing of the south access point to Road A and sight distance for a driveway at the south access point to Road A
  - LSC considers the addition of eastbound and westbound left-turn lanes on Walker Road and Highway 105 approaching SH 83 to be part of the CDOT controlled intersection and as such is not planning to submit a county deviation request.
  - LSC considers the existing shared westbound through and right-turn lane on Walker Road approaching SH 83 to be part of the CDOT controlled intersection and as such is not planning to submit a county deviation request.

### Colorado Department of Transportation Approval

- CDOT approval will constitute “acceptance/approval” of the TIS report then issuance of access permits for both Walker Road and the proposed Pinehurst connection. A Notice-to-Proceed is then required to be issued by CDOT before any use of the access points or work in the CDOT ROW. It is our understanding that Access Permit Process is 45 days, however if within the first 20 days following the application submittal, CDOT may issue comments and/or request additional information that may extend the 45 day time period for offering an access permit (or denying the application).

### Projected Levels of Service

- All movements at the signal-controlled SH 83/Walden/Highway 105 intersection are projected to operate at a level of service D or better based on the short-term total traffic conditions. This analysis assumes the addition of eastbound and westbound left-turn lanes approaching this intersection and protected-permissive phasing for those movements. By 2040 the westbound left-turn movement is projected to operate at LOS E during the morning peak hour. **Note: The LOS analysis results are based on signal timing assumptions within the model – specifically the allowable signal phase time for the side street. CDOT would need to find these assumptions acceptable for use in the field.**
- Due to limited available sight distance, the intersection of Walker Road and Road A is planned to be signed for all-way stop-sign control. Based on this traffic control it is projected to operate at a satisfactory level of service during the peak hours based on the projected short-term and 2040 total traffic volumes. The previous submittal showed a roundabout at this location. The applicant still considers the roundabout as the preferred long-term traffic control, and the site has been designed to accommodate a Potential future roundabout.

However, at the present time, there is not sufficient right-of-way on the north side of Walker Road to construct the roundabout. The roundabout may be feasible with redevelopment of the property on the north side of Walker Road.

- The site access points to Pinehurst Circle and Road A and the intersection of Pinehurst Circle and Road A are projected to operate at a satisfactory level of service as stop-sig-controlled intersections based on the projected short-term and 2040 total traffic volumes.

### **Traffic Circulation**

- Figure 3 shows the circulation plan for the proposed school and YMCA. The plan provides for about 880 feet of on-site stacking length for vehicles plus 195 feet for active pick-up and drop-offs.
- Exiting traffic at the southeast school access to Pinehurst Circle will likely need to be restricted to right-out traffic turning movements only to prevent cut-through traffic on Pinehurst Circle to the South by motorists wishing to travel generally south and southwest (beyond the Walden area). Pinehurst Circle is a Rural Local road through the Walden Preserve 2 development to the south.

### **MTCP Improvements or Other Approved Corridor Studies**

- The MTCP 2040 Roadway Plan currently shows Walker Road as a Four-Lane Minor Arterial, however, LSC is not aware of any current plans for this improvement. Walker Road west of Road A to SH 83 is proposed a two-through-lane facility plus auxiliary turn lanes (as shown in the attached exhibit) in lieu of two-through lanes in each direction.
- LSC is not aware of any other approved corridor studies or planned improvements in the vicinity of the site.

### **Recommendations**

- Table 3 shows a summary of the off-site improvements needed in the vicinity of the site. Table 3 also identifies the time frame each improvement will likely be needed and the party responsible for that improvement.
- The new internal roads will be constructed to public standards, and the roads will be formally dedicated as public during the upcoming subdivision process. There is no need for ROW acquisition for the initial phase of roadway improvements.



- The proposed future access point to SH 83 and any improvements to the intersection of SH 83/Walker/Highway 105 will require a Colorado Department of Transportation (CDOT) Access permit. Any design features or elements needed for these improvements including those needed to prohibit left turns at the proposed access will be addressed through the access permit process.
- Based on the existing traffic volumes and the criteria contained in the *El Paso County Engineering Criteria Manual (ECM)* eastbound and westbound left-turn lanes and a westbound right-turn lane are currently required on Walker Road and Highway 105 approaching SH 83. This is an existing deficiency based on the turning volume thresholds requiring turn lanes. Based on the projected short-term total traffic volumes and the criteria contained in the *State of Colorado Highway Access Code*, a northbound right-turn deceleration lane would be required on SH 83 approaching Pinehurst Circle. Based on a posted speed limit of 60 miles per hour, the prescribed lane length for the deceleration lane is 400 feet long plus a 300-foot taper.
- Based on the projected short-term total traffic volumes and the criteria contained in the *State of Colorado Highway Access Code*, a northbound right-turn acceleration lane would be required on SH 83 at Pinehurst Circle. Based on a posted speed limit of 60 miles per hour, the prescribed lane length for the acceleration lane is 870 feet long plus a 300-foot taper. This lane would be constructed to connect to the existing northbound right-turn deceleration lane approaching Walker Road and, as such, the lane would be a continuous acceleration/deceleration lane between Pinehurst Circle and Walker Road.
- Based on the projected short-term total traffic volumes and the criteria contained in the *ECM*, an eastbound right-turn deceleration lane would be required on Walker Road approaching Road A. Based on a design speed of 50 miles per hour, the prescribed lane length for the deceleration lane is 235 feet long (less adjustment for grade) plus a 200-foot taper, however, LSC recommends a continuous acceleration/deceleration lane be constructed between SH 83 and the north-south Collector.
- Based on the projected short-term total traffic volumes and the criteria contained in the *ECM*, a westbound left-turn lane would be required on Walker Road approaching Road A. Based on a design limit of 50 miles per hour, the prescribed lane length for this lane is 285 feet long (( less adjustment for grade) plus a 200-foot taper. However, due to the proposed All-way stop sign control and based on the LOS analysis, this speed-change lane is not necessary.
- See the attached exhibit for the recommended lane geometry on Highway 105/Walker Road from just west of SH 83 to just east of Shannon Drive.

- Based on the projected short-term total traffic volumes and the criteria contained in the ECM, an eastbound left-turn lane would be required on Pinehurst Circle approaching Road A. Based on a design speed of 40 miles per hour, the prescribed lane length for the deceleration lane is 455 feet long (including 300 feet of stacking distance) plus a 160-foot taper. This turn lane would not be needed if this intersection is constructed as a one-lane modern roundabout.
- Based on the projected short-term total traffic volumes and the criteria contained in the *El Paso County Engineering Criteria Manual* (ECM), a westbound right-turn deceleration lane would be required on Pinehurst Circle approaching Road A. Based on a design speed of 40 miles per hour, the prescribed lane length for the deceleration lane is 155 feet long plus a 160-foot taper. This turn lane would not be needed if this intersection is constructed as a one-lane modern roundabout.
- Based on the projected 2040 total traffic volumes and the criteria contained in the ECM, an eastbound left-turn lane would be required on Pinehurst Circle approaching the site access point. Based on a design speed of 40 miles per hour, the prescribed lane length for the deceleration lane is 465 feet long (including 310 feet of stacking distance) plus a 160-foot taper.
- Based on the projected 2040 total traffic volumes and the criteria contained in the ECM, westbound right-turn lanes would **not** be required on Pinehurst Circle approaching the site access point.
- Based on the projected short-term total traffic volumes and the criteria contained in the ECM, a southbound left-turn lane would be required on Road A approaching the north (school) site access point. Based on a design speed of 40 miles per hour, the prescribed lane length for the lane is 255 feet long (including 100 feet of stacking distance) plus a 160-foot taper.
- Based on the projected short-term total traffic volumes and the criteria contained in the ECM, a southbound left-turn lane would be required on Road A approaching the south (YMCA) site access point. Based on a design speed of 40 miles per hour, the prescribed lane length for the lane is 205 feet long (including 50 feet of stacking distance) plus a 160-foot taper.
- Based on the projected short-term total traffic volumes and the criteria contained in the ECM, a northbound right-turn deceleration lane would be required on Road A approaching the north (school) but not the south (YMCA) site access points. Based on a design speed of 40 miles per hour, the prescribed lane length for the lane approaching the north (school) access is 155 feet long plus a 160-foot taper.

**Transportation Improvement Fee Program**

- The proposed Phase 1 and Phase 2 development will be required to participate in the Countywide Transportation Improvement Fee Program.
- Any future development of the areas west and south of Phases 1 and 2 will also be required to participate in the Countywide Transportation Improvement Fee Program. These fees should be determined when the final plats are submitted.

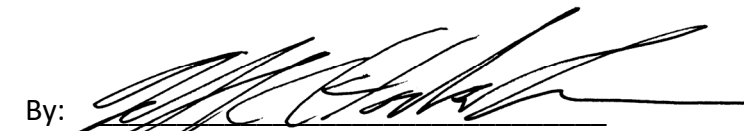
\* \* \* \* \*

Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By:

  
Jeffrey C. Hodsdon, P.E.  
Principal

JCH:KDF:bjwb

Enclosures: Tables 1 and 3  
Figures 1-18  
Highway 105/Walker Road Improvements Exhibit  
Traffic Count Reports  
Level of Service Reports  
Queuing Reports



Table 3 Monument Academy Roadway Improvements			
Item #	Improvement	Timing	Responsibility
Roadway Segment Improvements			
1	Construct Road A from Pinehurst Circle to Walker Road as an Urban Non-Residential Collector <sup>(1)</sup> .	Phase 1	Monument Academy
2	Construct Pinehurst Circle from SH 83 to Road A as a Rural Minor Collector roadway.	Phase 1	Monument Academy
3	Construct Pinehurst Circle from Road A to the east boundary of the Monument Academy site as an Urban Local roadway <sup>(2)</sup>	Phase 1	Monument Academy
4	Construct Pinehurst Circle from its current terminus to the east boundary of the Monument Academy site as a Rural Local roadway.	Long Term	Walden
SH 83/Walker/Highway 105			
5	Add eastbound and westbound left-turn lanes as shown in the attached Exhibit.	Phase 1	Monument Academy
6	Modify the traffic signal. Modification may include adding signal heads for protected-permissive phasing for the eastbound and westbound left-turn movements and modifying the traffic signal timing plan. Additional mast-arm mounted signs may also be required.	Phase 1	Monument Academy
SH 83/Pinehurst Circle			
7	Construct new intersection as a restricted right-in/right-out access (right-turn island as designed may require a waiver to the <i>State of Colorado Highway Access Code</i> ).	Phase 1	Monument Academy
8	Construct northbound right-turn deceleration lane on SH 83 approaching Pinehurst Circle.	Phase 1	Monument Academy
9	Construct northbound right-turn acceleration lane on SH 83 at Pinehurst Circle. Note: This would result in a "continuous" northbound acceleration/deceleration lane between Pinehurst Circle and Walker Road.	Phase 1	Monument Academy
Walker/New North-South Collector			
10	Install All-Way Stop sign control at this intersection. Construct a raised channelizing right turn island with Yield control for the eastbound right turn movement. Install necessary Stop-sign ahead warning signs, pavement markings, etc. as needed. Temporary measures such as warning-sign-mounted temporary orange flags and variable message signs should be utilized for a period of time as per MUTCD and County Standards.	Phase 1	Monument Academy
11	Construct a continous right-turn acceleration/deceleration lane on Walker Road between SH 83 and Road A	Phase 1	Monument Academy
12	LSC recommends that the redirect tapers on Walker Road associated with the westbound left turn lane at Walker/SH 83 be constructed east of the Walker/Shannon intersection. Stripe the new center median width on Walker between Road A and Shannon for a short eastbound left-turn bay on Walker Road approaching the Shannon intersection.	Phase 1	Monument Academy
Pinehurst/Road A			
13	Construct an eastbound left-turn lane on Pinehurst approacing Road A.	Phase 1	Monument Academy
14	Construct a westbound right-turn deceleration lane on Pinehurst approacing Road A.	Phase 1	Monument Academy
15	Potential future one-Lane roundabout (if needed for acceptable southbound left turn level of service in the future).	Long Term (to be determined with development plans for the areas west and south of the school or the extension of Pinehurst Circle to the east)	Future Developer
Pinehurst/School Access			
16	Construct an eastbound left-turn lane on Pinehurst approacing the school site access.	Phase 1	Monument Academy
17	Implement measures to effectively force a right-turn only for southbound traffic (exiting the school). If the school can effectively allow left turns only by residents north of Hodgen Road (and east of SH 83) while prohibiting all other left turning traffic, that would be acceptable.	With Pinehurst Circle connection to its north terminus within Walden Preserve.	Monument Academy
New North-South Collector/North (School) Access			
18	Construct a southbound left-turn lane <sup>(3)</sup> on Road A approaching the north (school) access.	Phase 1	Monument Academy
19	Construct a northbound right-turn deceleration lane on Road A approaching the north (school) access.	Phase 1	Monument Academy
Road A/South (YMCA) Access			
20	Construct a southbound left-turn lane <sup>(3)</sup> on Road A approaching the south (YMCA) access.	Phase 1	Monument Academy
Notes: (1) In the short-term curb and gutter and sidewalks would only be constructed on the east side of Road A (phased sidewalks locations shown in Figure 4). (2) Curb and gutter would only be constructed on the north side of Pinehurst. The south side would include a paved shoulder and a roadside ditch. The need for curb, gutter and/or sidewalk would be evaluated with future development on the south side of the road. (3) The Standard Urban Non-Residential Collector cross-section includes a 12' striped median			
Source: LSC Transportation Consultants, Inc.			



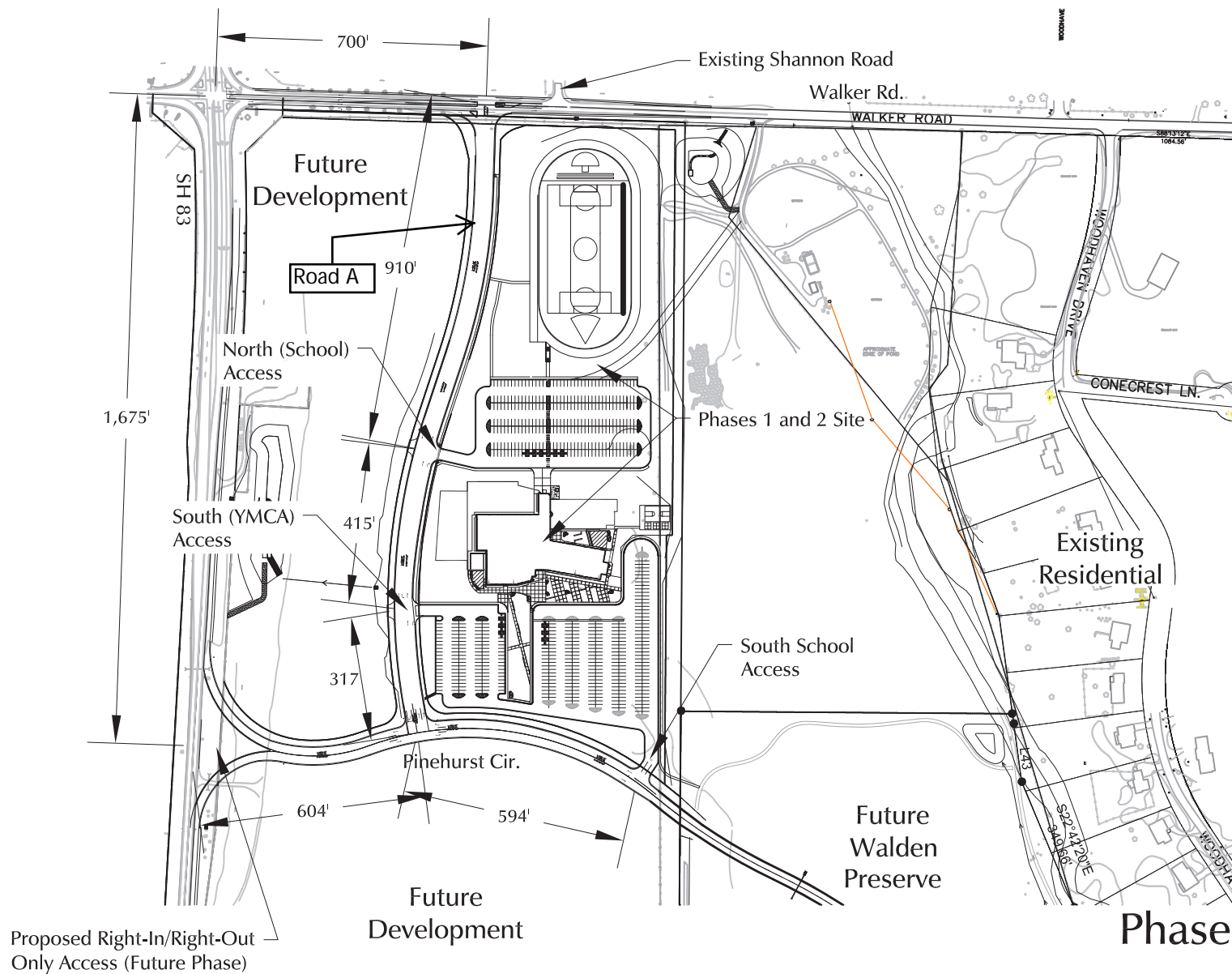


Figure 1

## Vicinity Map

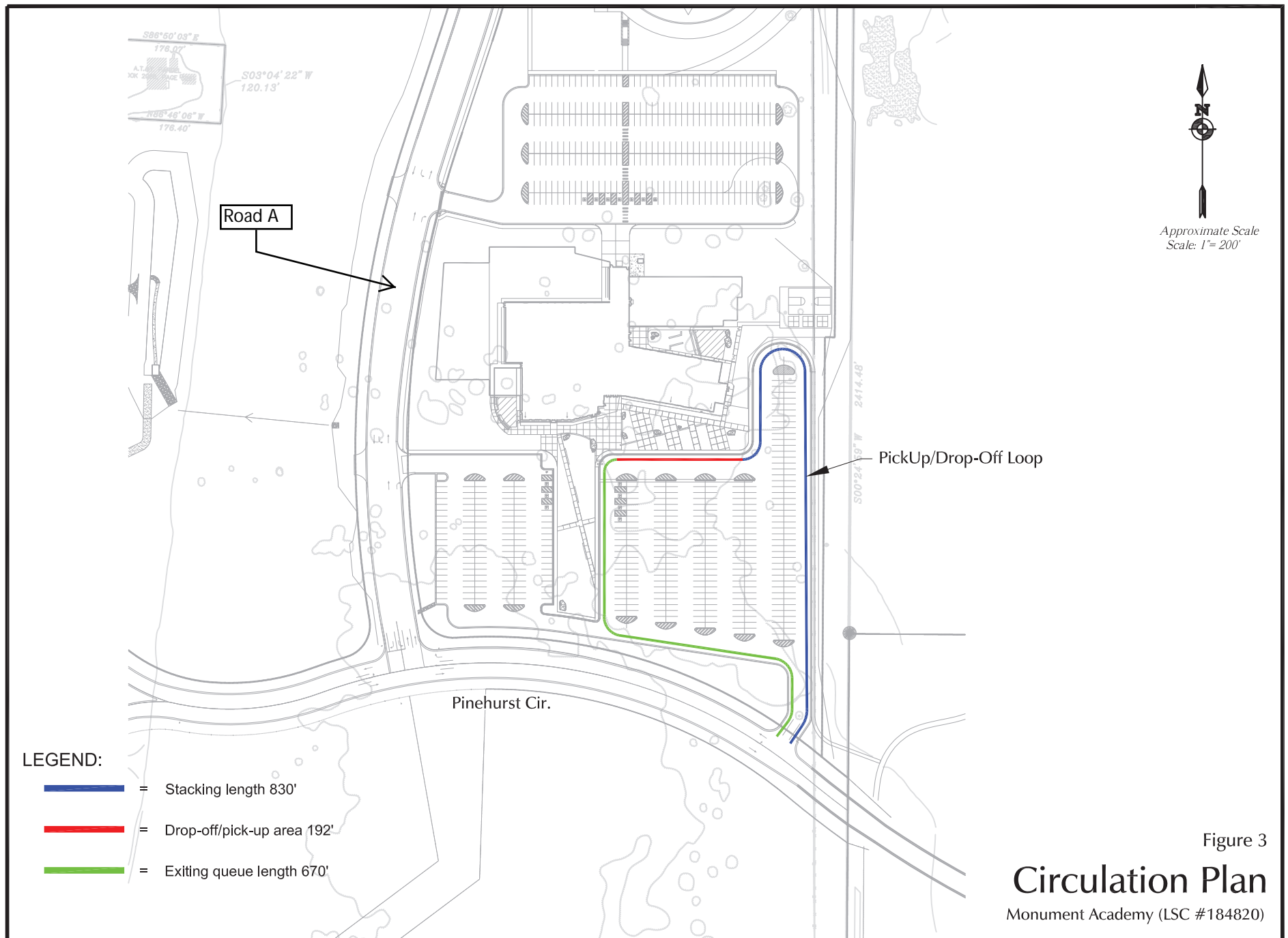
Monument Academy (LSC #184820)



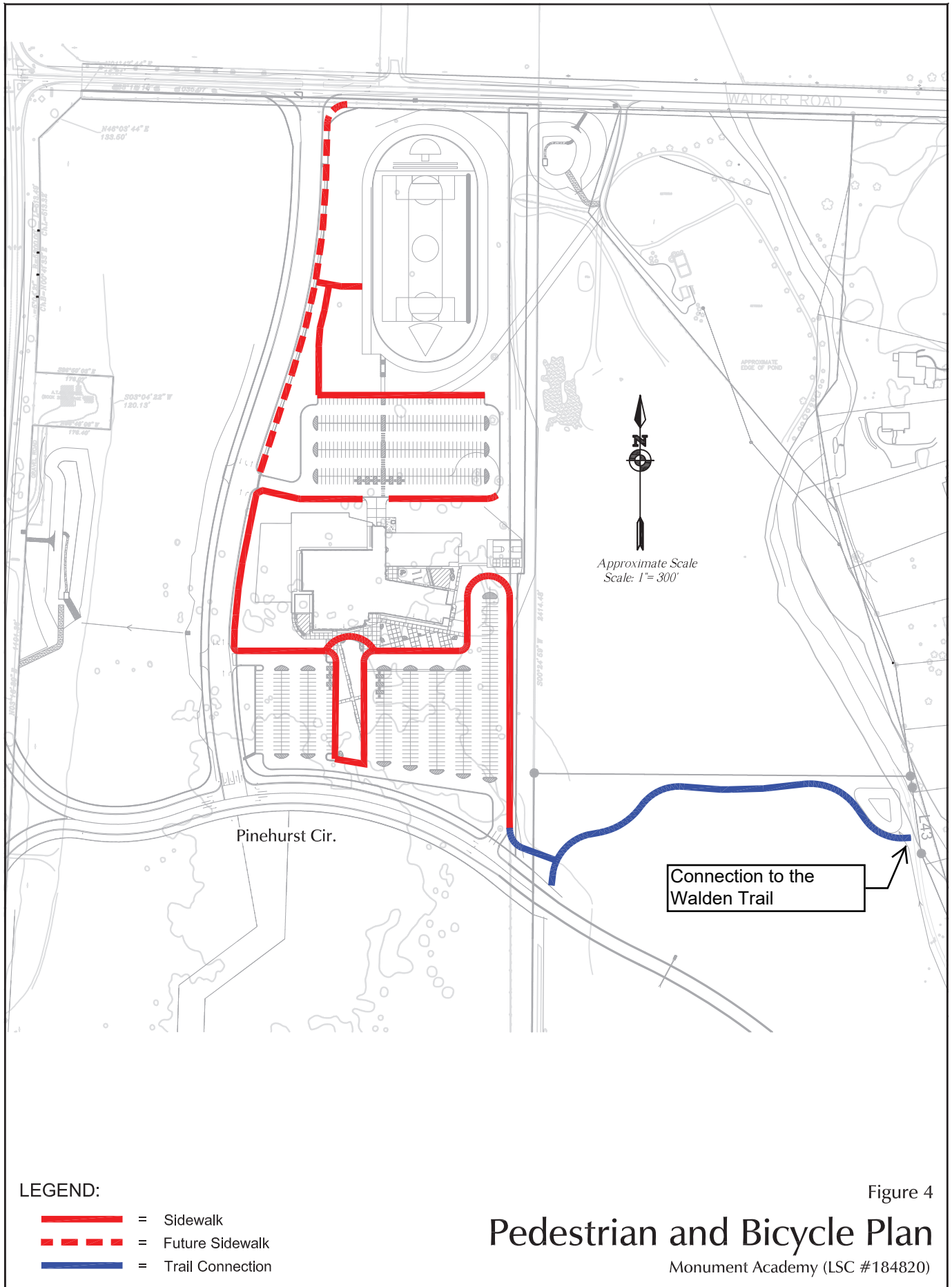


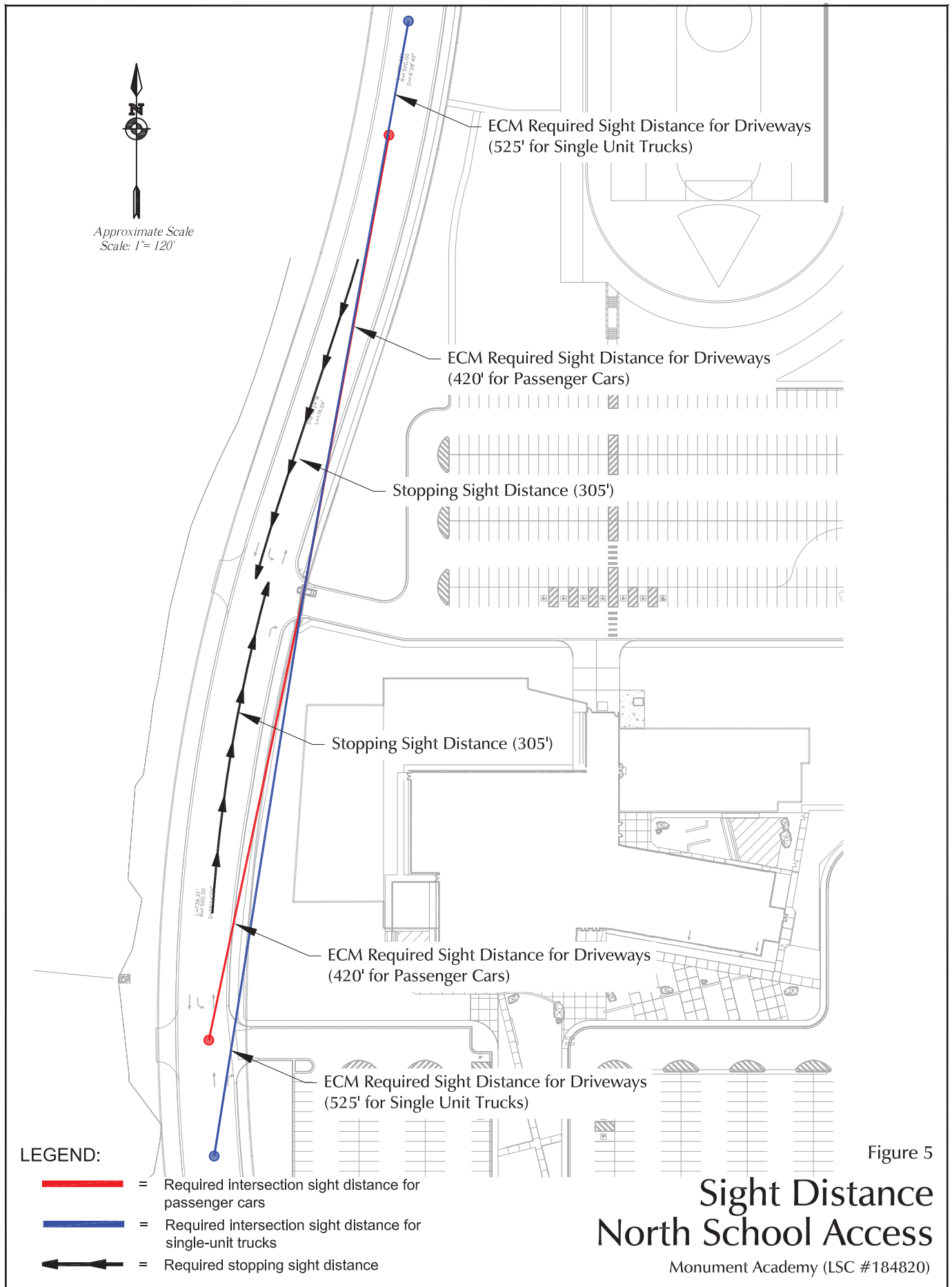
Approximate Scale  
Scale: 1" = 400'

Figure 2  
**Phases 1 and 2  
Site Plan**  
Monument Academy (LSC #184820)









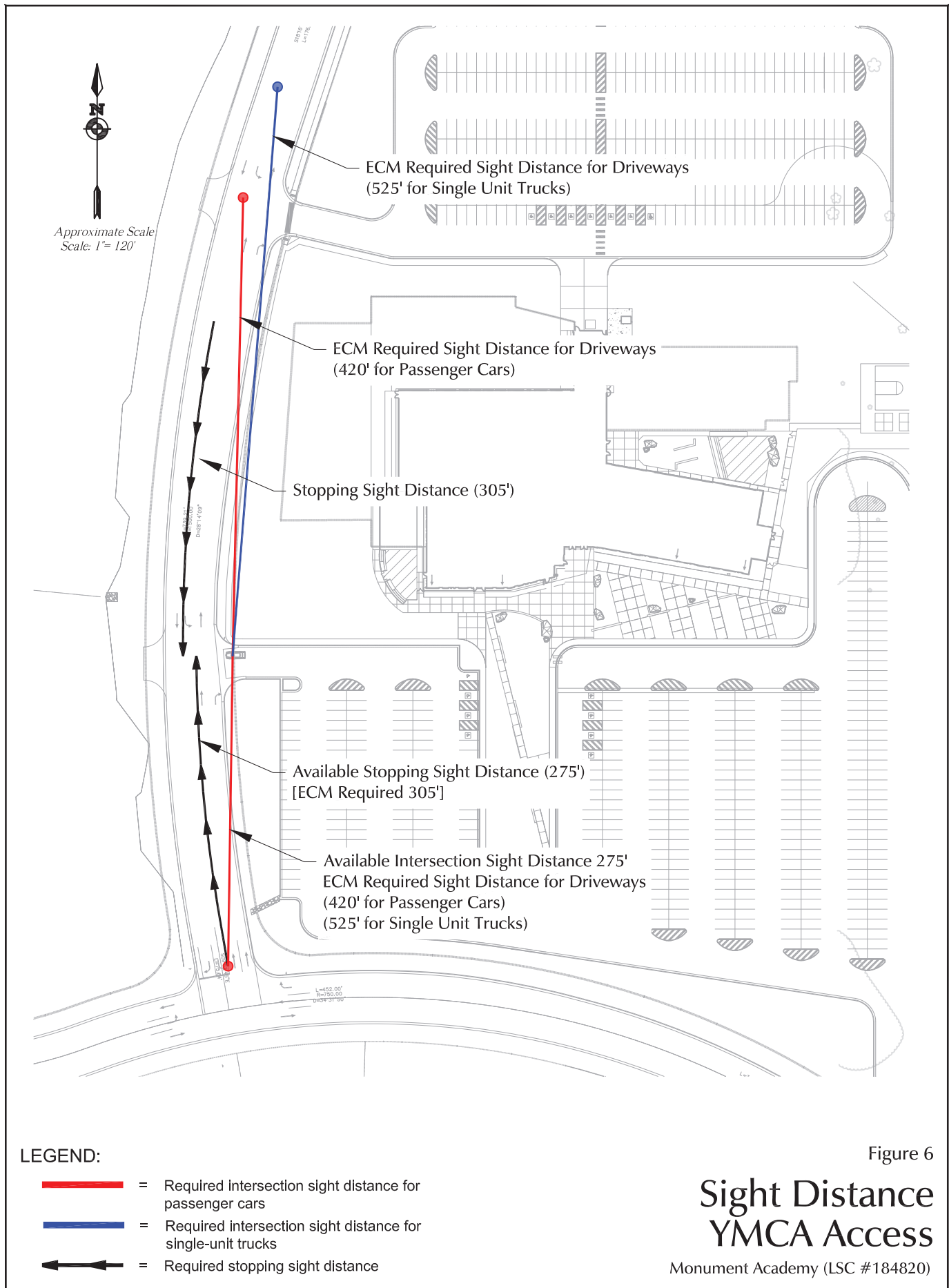
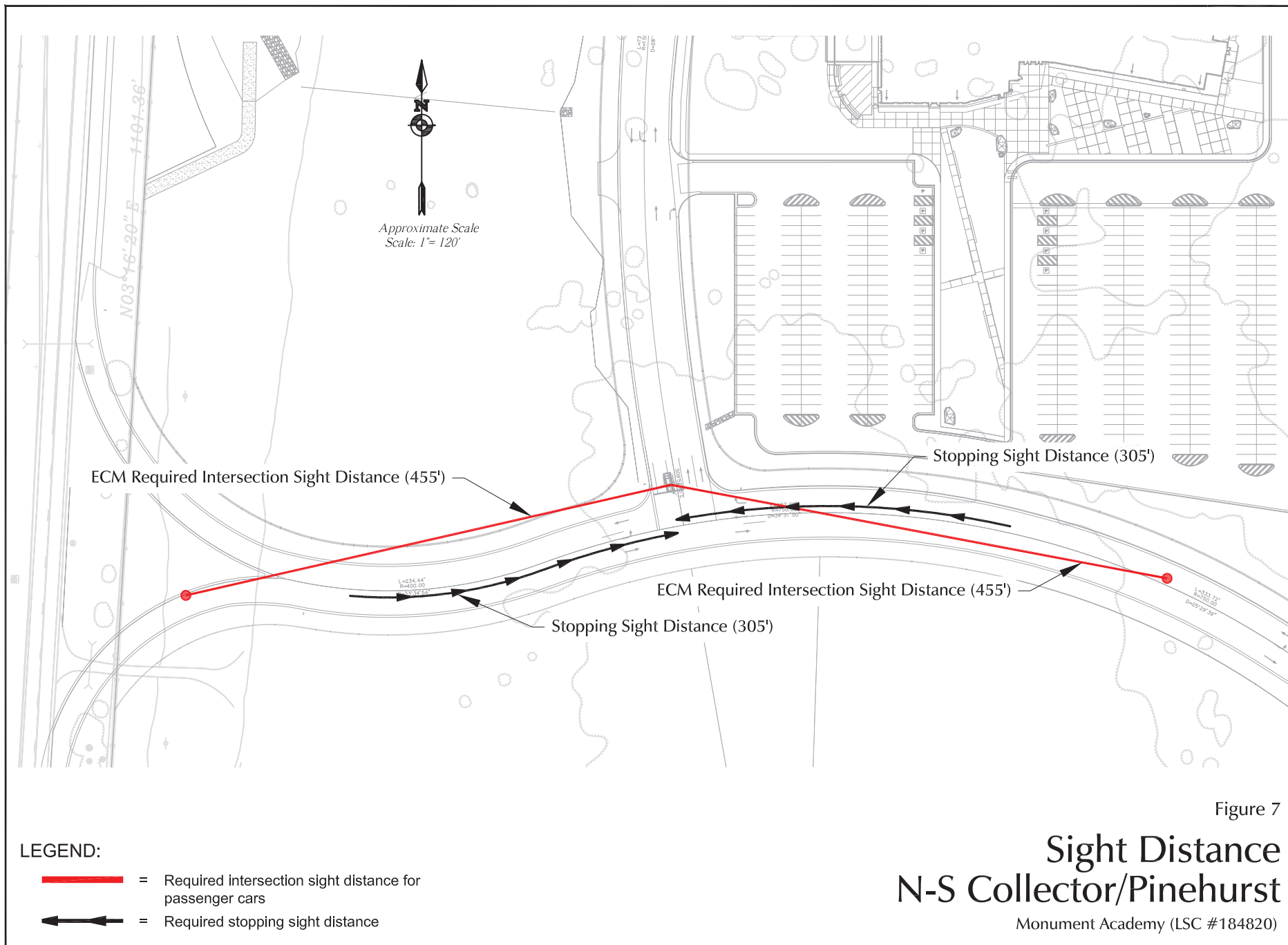
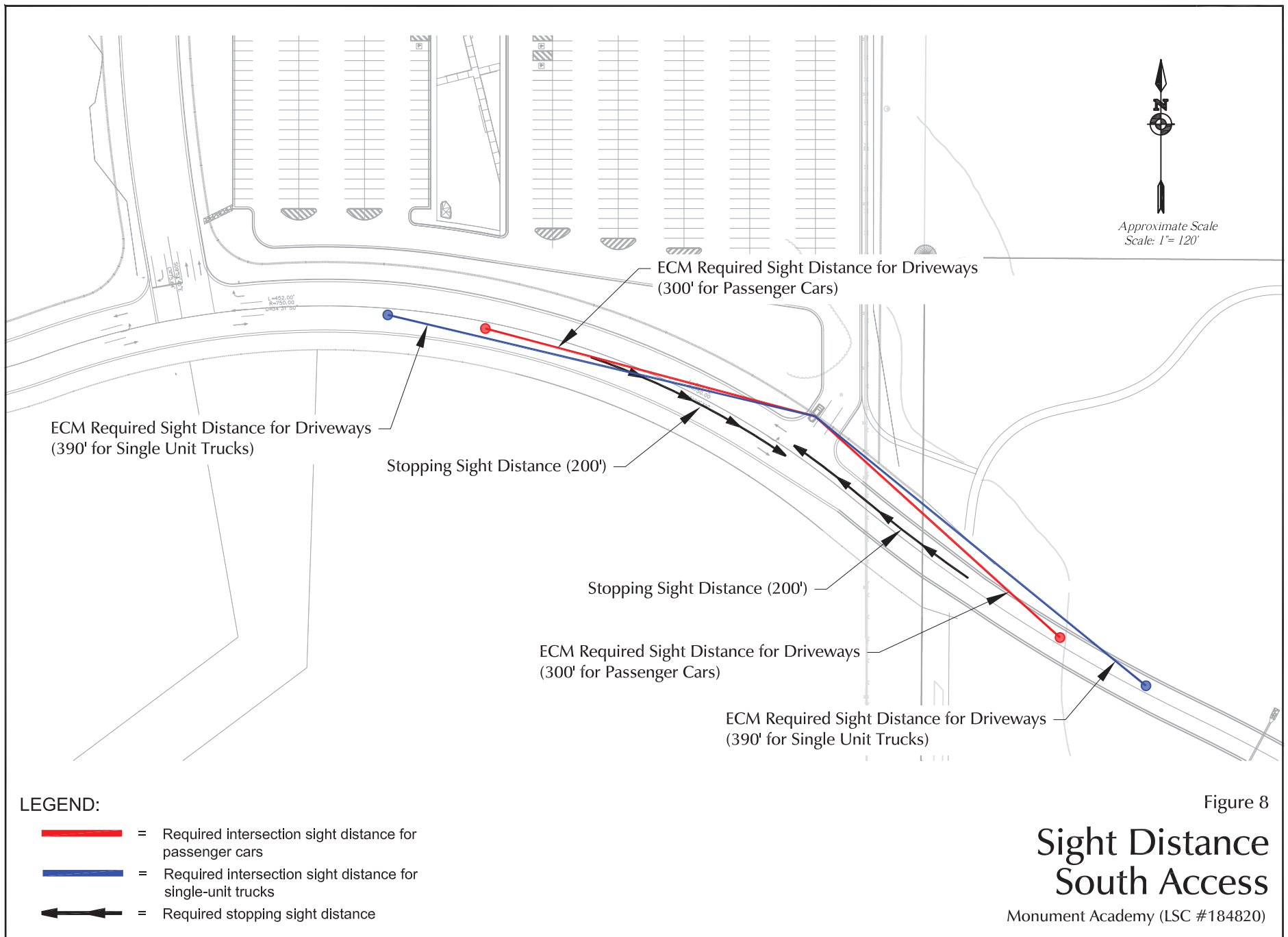


Figure 6

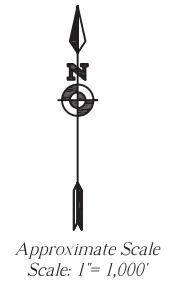
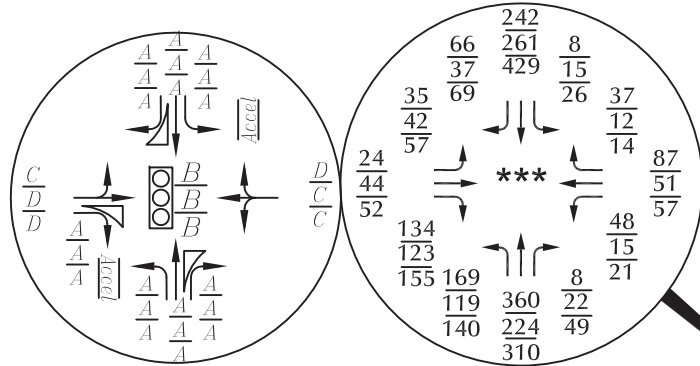
## Sight Distance YMCA Access

Monument Academy (LSC #184820)

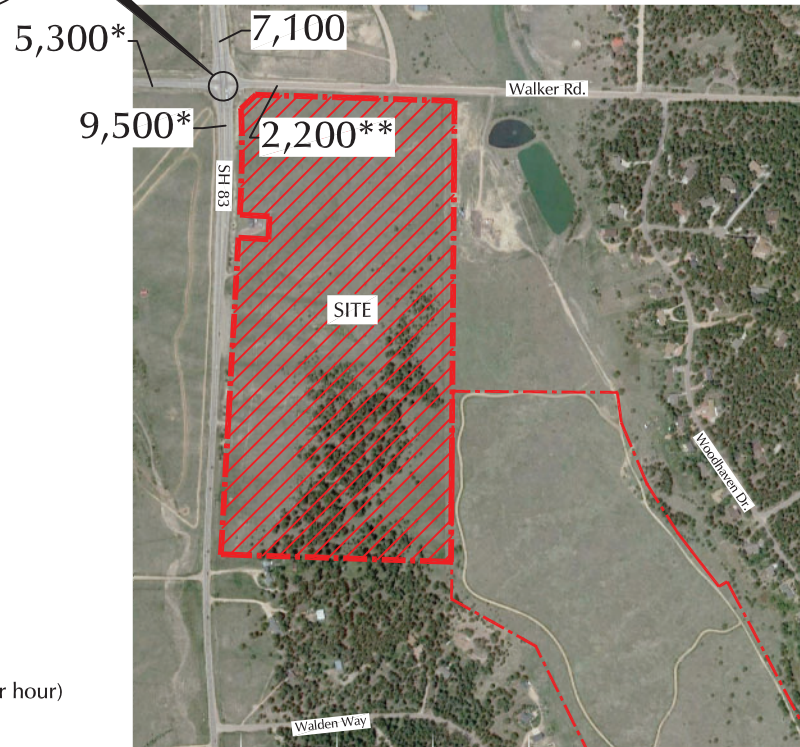








- \* CDOT 2017 AADT
- \*\* Estimates by LSC
- \*\*\* Southbound through volume adjusted based on more recent count at Walden/SH 83



#### LEGEND:



= Traffic Signal

$\frac{XX}{XX}$  = AM Weekday Peak-Hour Traffic (6:45-7:45am)(vehicles per hour)

$\frac{XX}{XX}$  = School Peak-Hour Traffic (2:00-3:00pm)

$\frac{XX}{XX}$  = PM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{A}{B}$  = AM Individual Movement Peak-Hour Level of Service

$\frac{B}{C}$  = School Individual Movement Peak-Hour Level of Service

$\frac{C}{C}$  = PM Individual Movement Peak-Hour Level of Service

$\frac{C}{C}$  = AM Entire Intersection Peak-Hour Level of Service

$\frac{C}{C}$  = School Entire Intersection Peak-Hour Level of Service

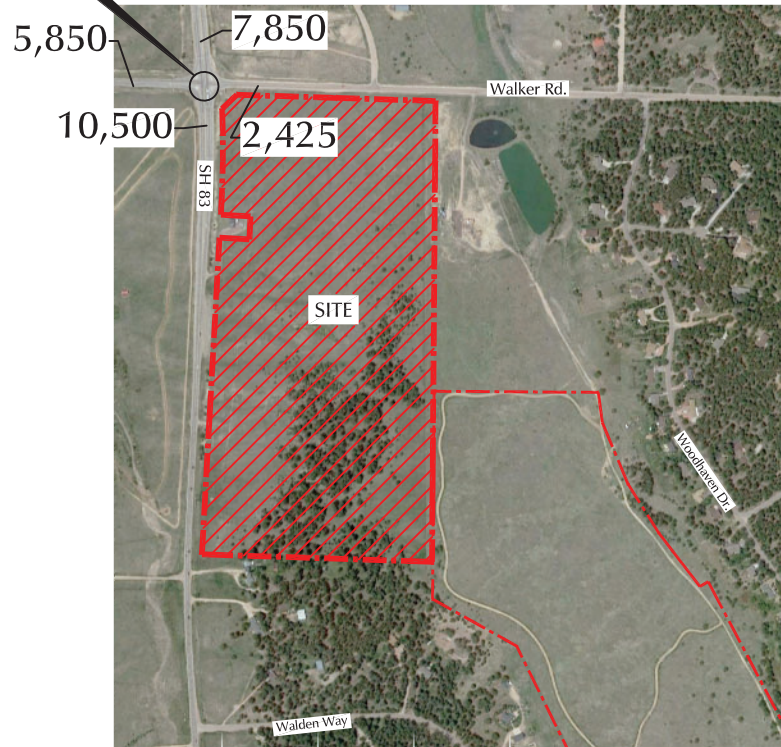
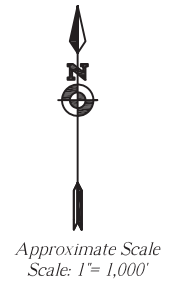
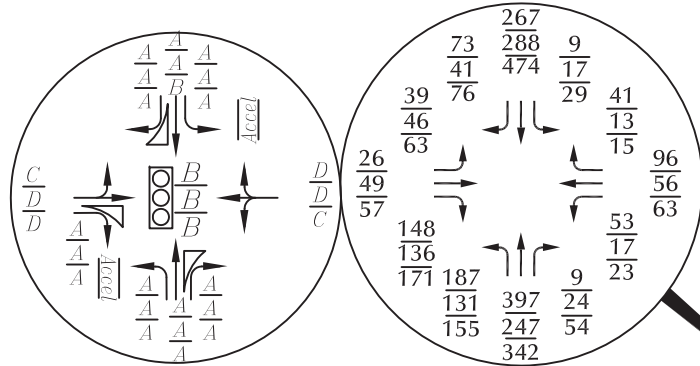
$\frac{C}{C}$  = PM Entire Intersection Peak-Hour Level of Service

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

Figure 9

## Existing Traffic, Lane Geometry, Traffic Control and Level of Service

Monument Academy (LSC #184820)



#### LEGEND:



= Traffic Signal

XX

AM Weekday Peak-Hour Traffic (vehicles per hour)

XX

School Peak-Hour Traffic (2:00-3:00pm)

XX

PM Weekday Peak-Hour Traffic (vehicles per hour)

A

AM Individual Movement Peak-Hour Level of Service

B

School Individual Movement Peak-Hour Level of Service

C

PM Individual Movement Peak-Hour Level of Service

C

AM Entire Intersection Peak-Hour Level of Service

C

School Entire Intersection Peak-Hour Level of Service

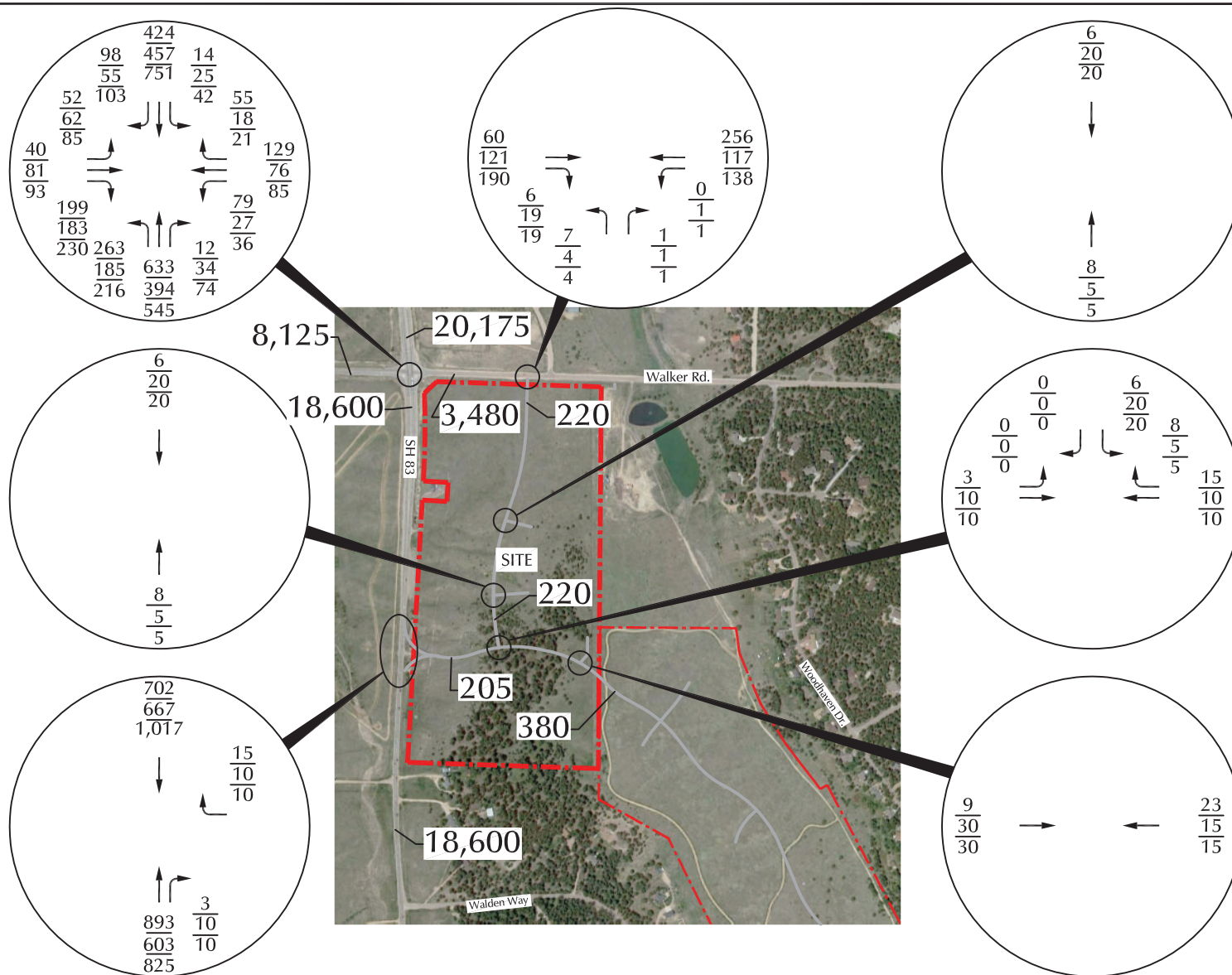
C

PM Entire Intersection Peak-Hour Level of Service

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

Figure 10  
Year 2025 Background Traffic, Lane  
Geometry, Traffic Control and Level of Service

Monument Academy (LSC #184820)



LEGEND:

$\frac{XX}{XX}$  = AM Weekday Peak-Hour Traffic (vehicles per hour)

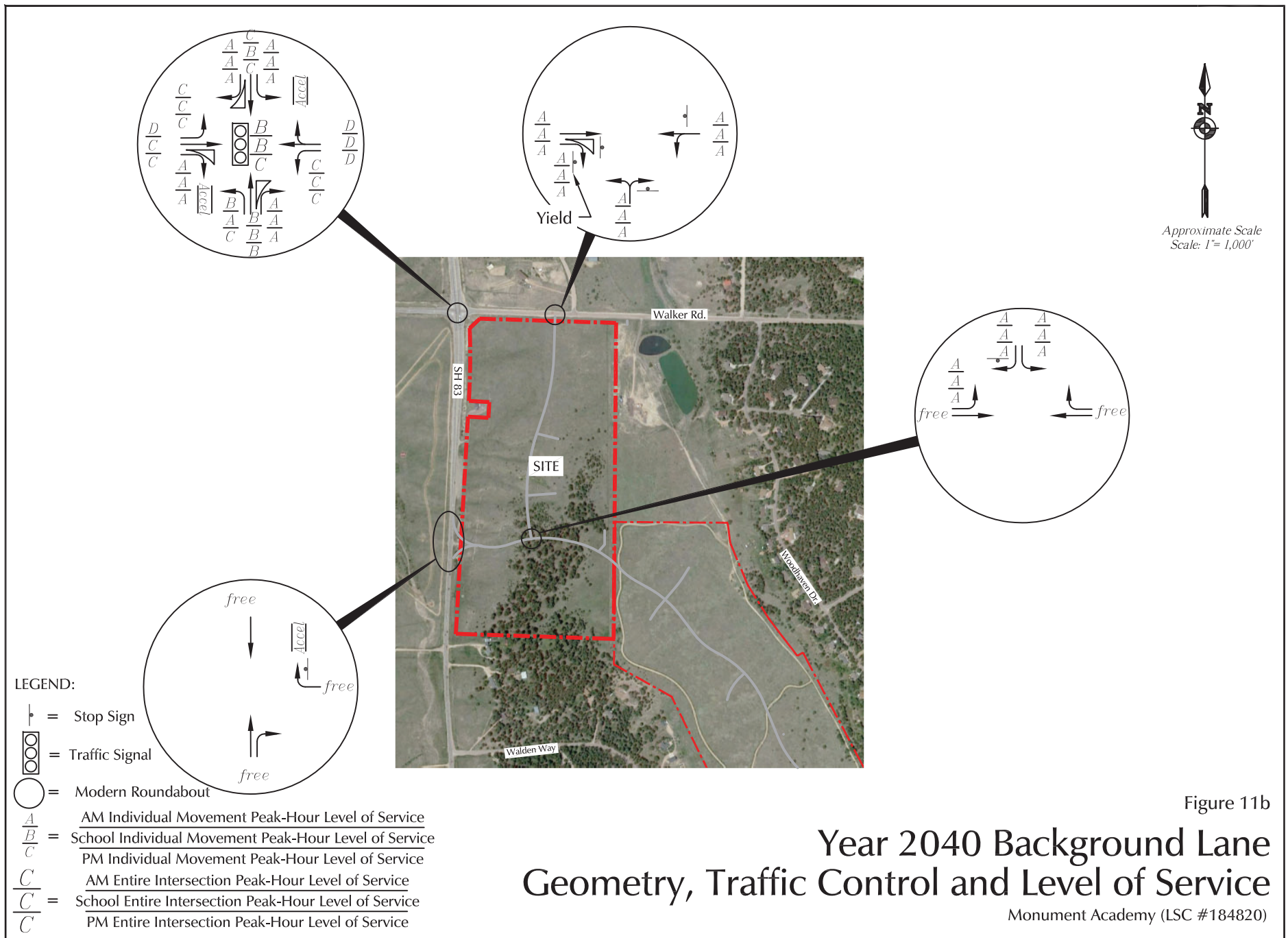
$\frac{XX}{XX}$  = School Peak-Hour Traffic (2:00-3:00pm)

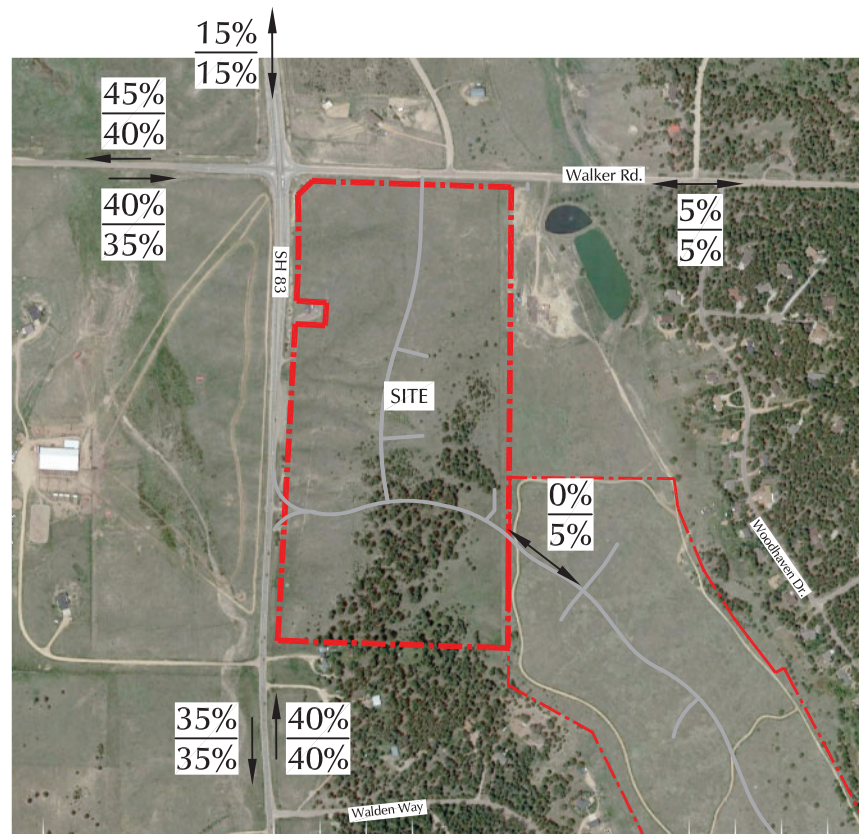
$\frac{XX}{XX}$  = PM Weekday Peak-Hour Traffic (vehicles per hour)

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

Figure 11a  
**Year 2040**  
**Background Traffic**  
Monument Academy (LSC #184820)





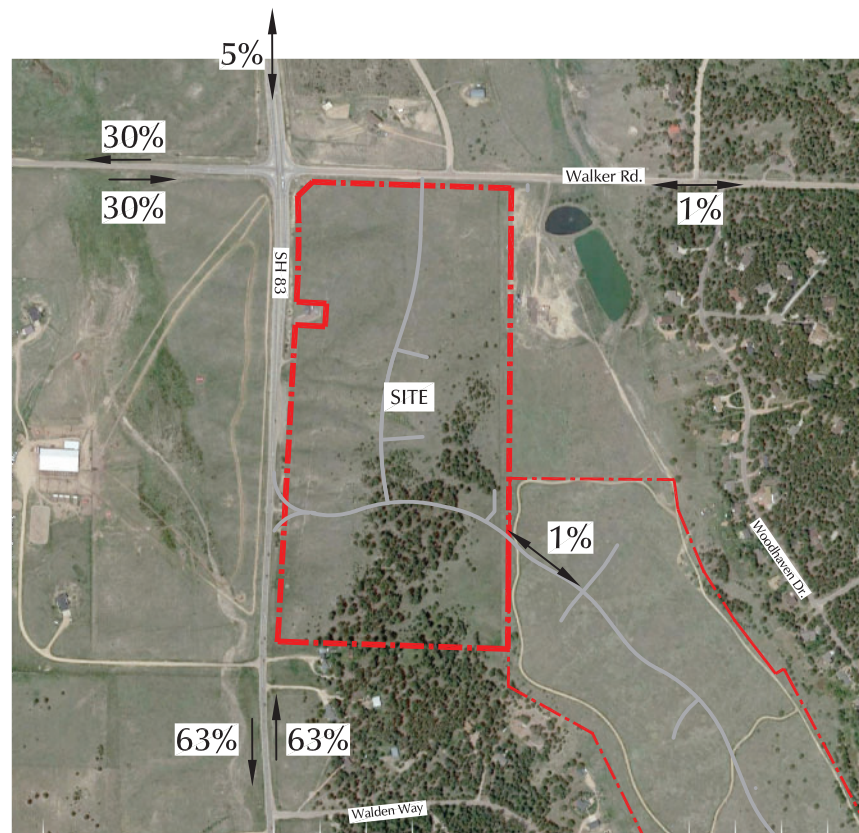


Approximate Scale  
Scale: 1" = 1,000'

Figure 12  
Directional Distribution of  
Phase 1 and 2 Site-Generated Traffic  
Monument Academy (LSC #184820)

LEGEND:

$\frac{XX\%}{XX\%} = \frac{\text{Short-Term Percent Directional Distribution}}{\text{Long-Term Percent Directional Distribution}}$



Approximate Scale  
Scale: 1" = 1,000'

LEGEND:



XX% = Residential Percent Directional Distribution

Figure 13  
Directional Distribution  
of Future Phases Site-Generated Traffic

Monument Academy (LSC #184820)



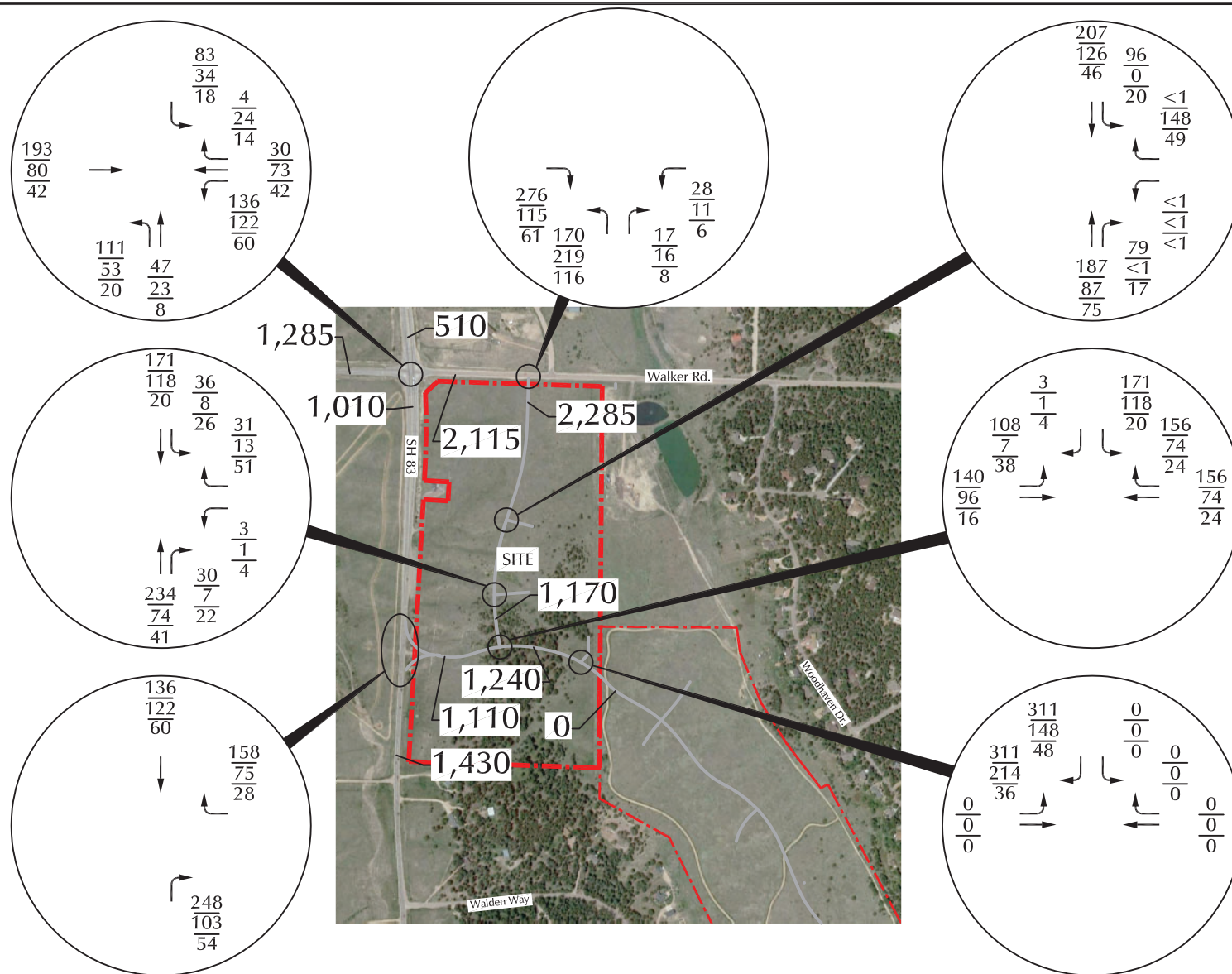


Figure 14

## Short-Term Assignment of Phases 1 and 2 Site-Generated Traffic

Monument Academy (LSC #184820)

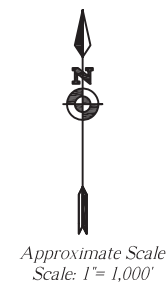
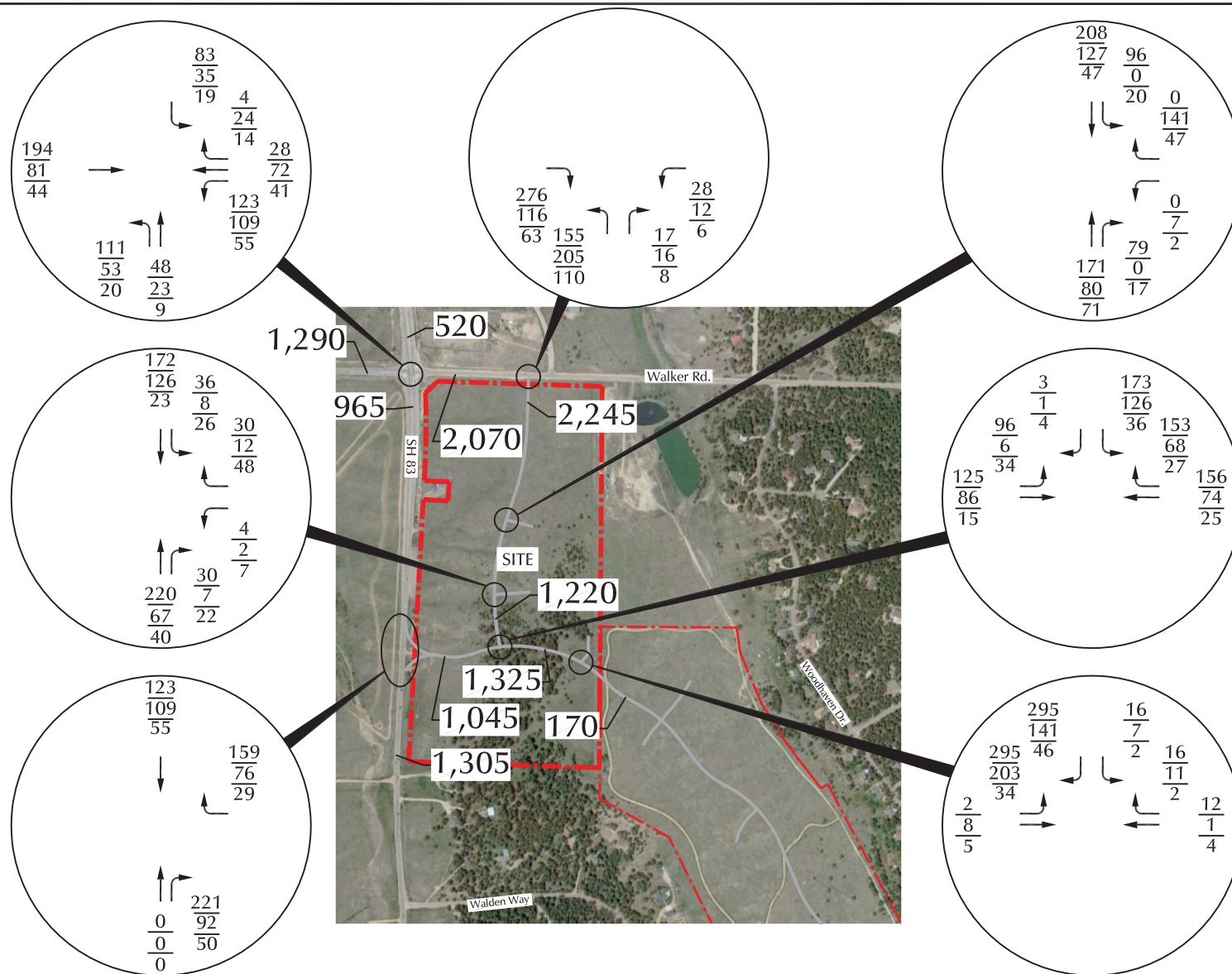
### LEGEND:

$\frac{XX}{XX}$  = AM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{XX}{XX}$  = School Peak-Hour Traffic (2:00-3:00pm)

$\frac{XX}{XX}$  = PM Weekday Peak-Hour Traffic (vehicles per hour)

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



LEGEND:

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

XX = School Peak-Hour Traffic (2:00-3:00pm)

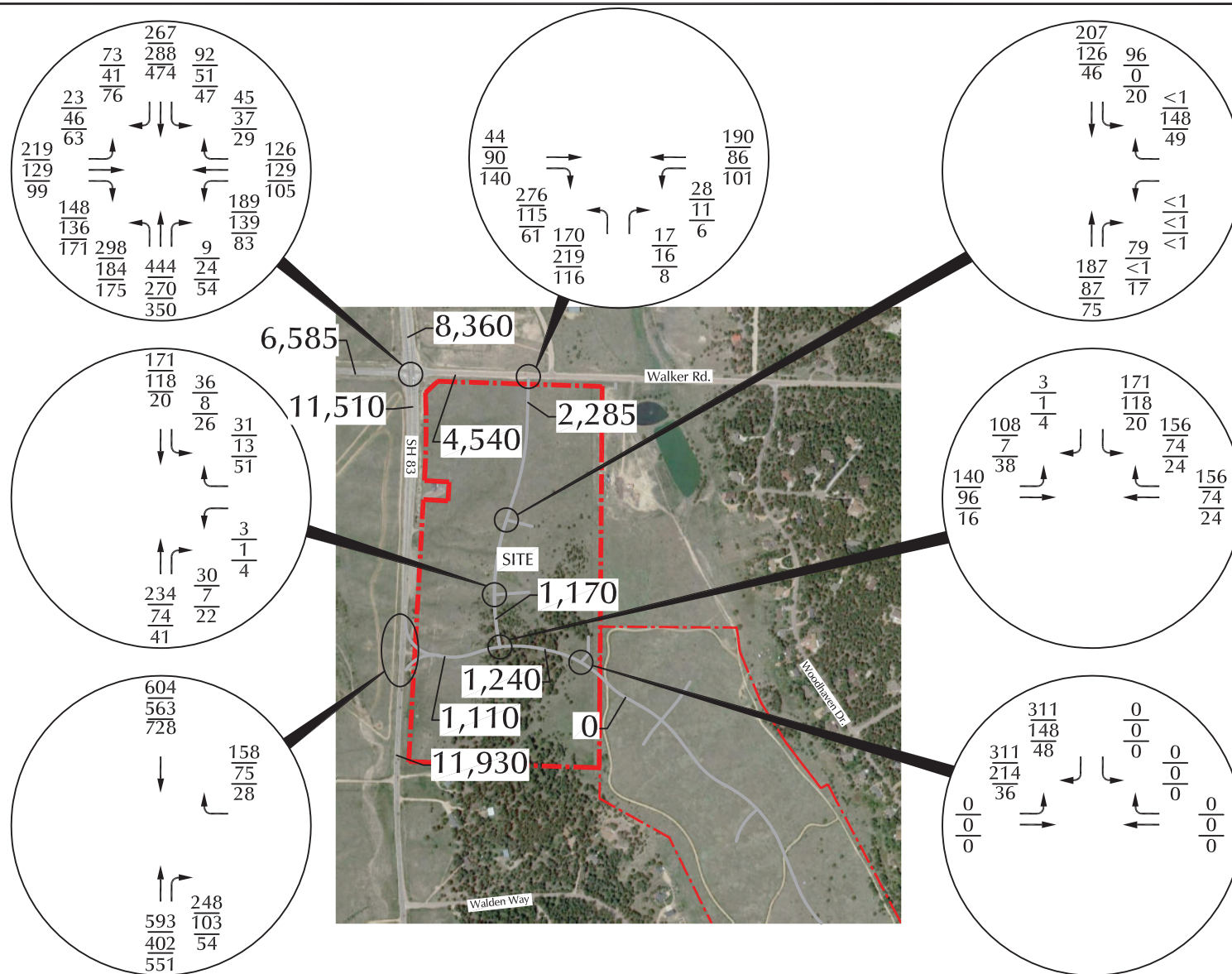
XX = PM Weekday Peak-Hour Traffic (vehicles per hour)

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

Figure 15

## Buildout Assignment of Site-Generated Traffic

Monument Academy (LSC #184820)



LEGEND:

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

XX = School Peak-Hour Traffic (2:00-3:00pm)

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

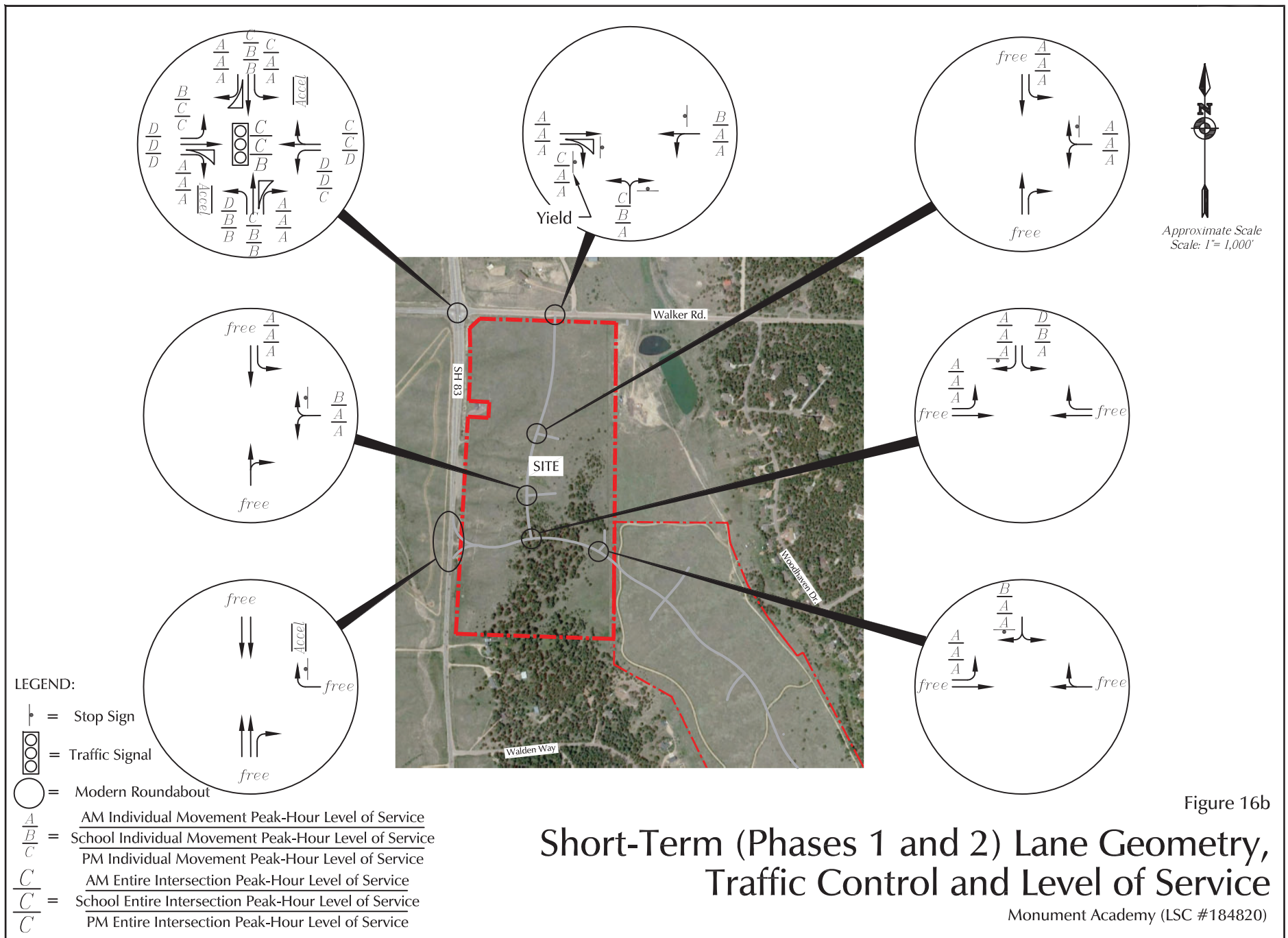
X,XXX= Average Daily Traffic (vehicles per day)

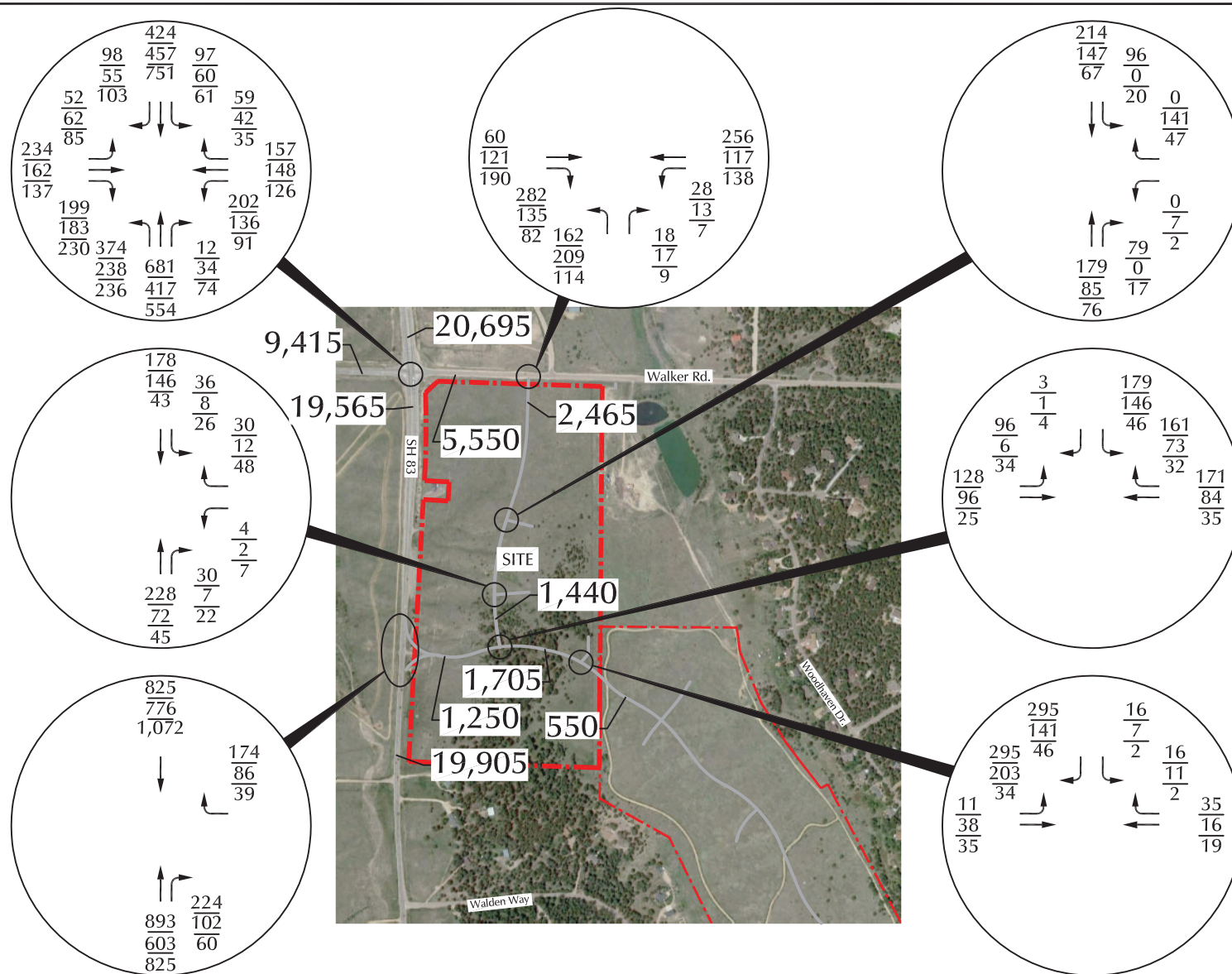
# Short-Term (Phase 1 and 2 Only) Total Traffic

Monument Academy (LSC #184820)

Figure 16a







LEGEND:

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

XX = School Peak-Hour Traffic (2:00-3:00pm)

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

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

Figure 17a

**Year 2040  
Total Traffic**

Monument Academy (LSC #184820)



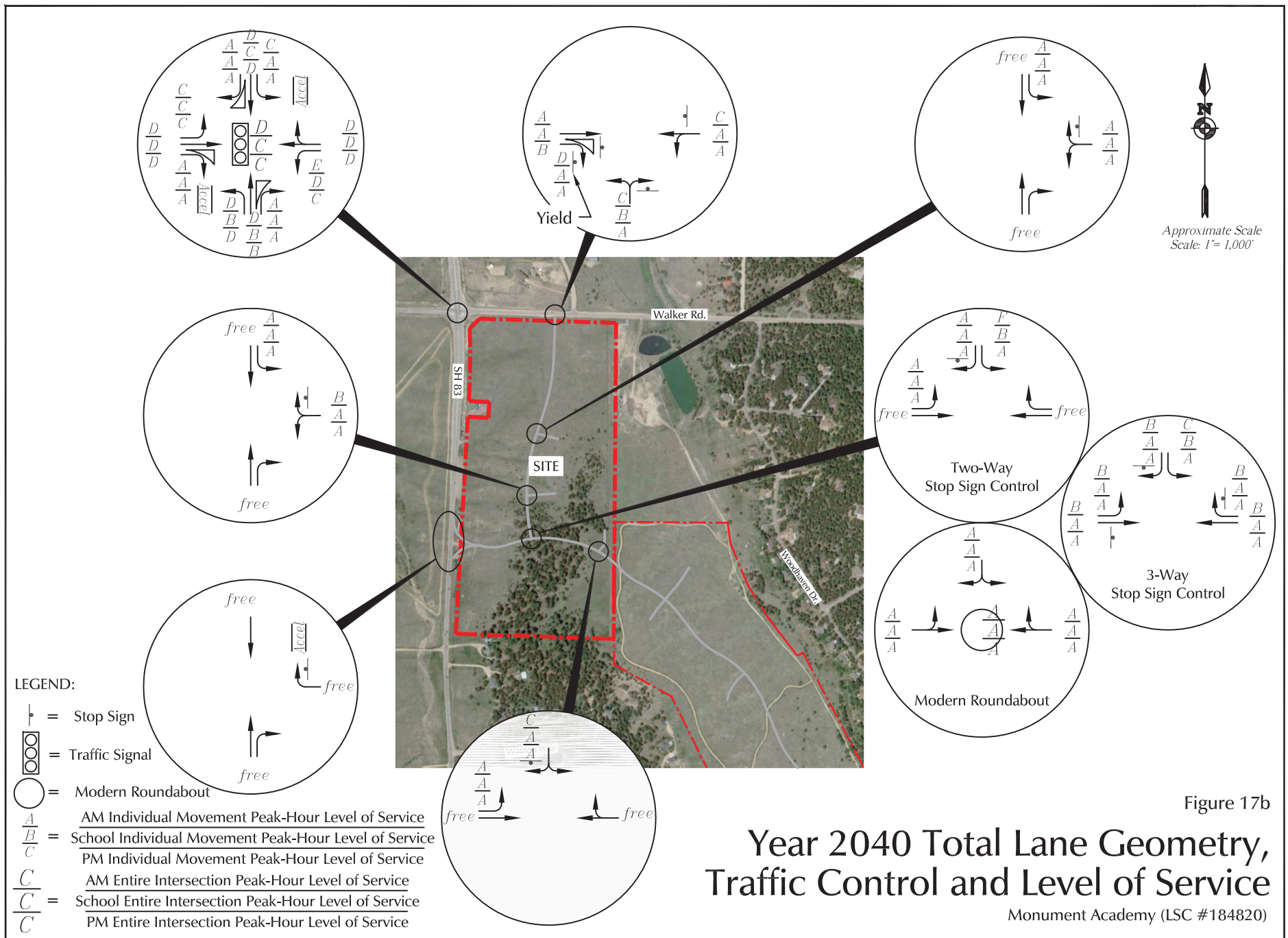
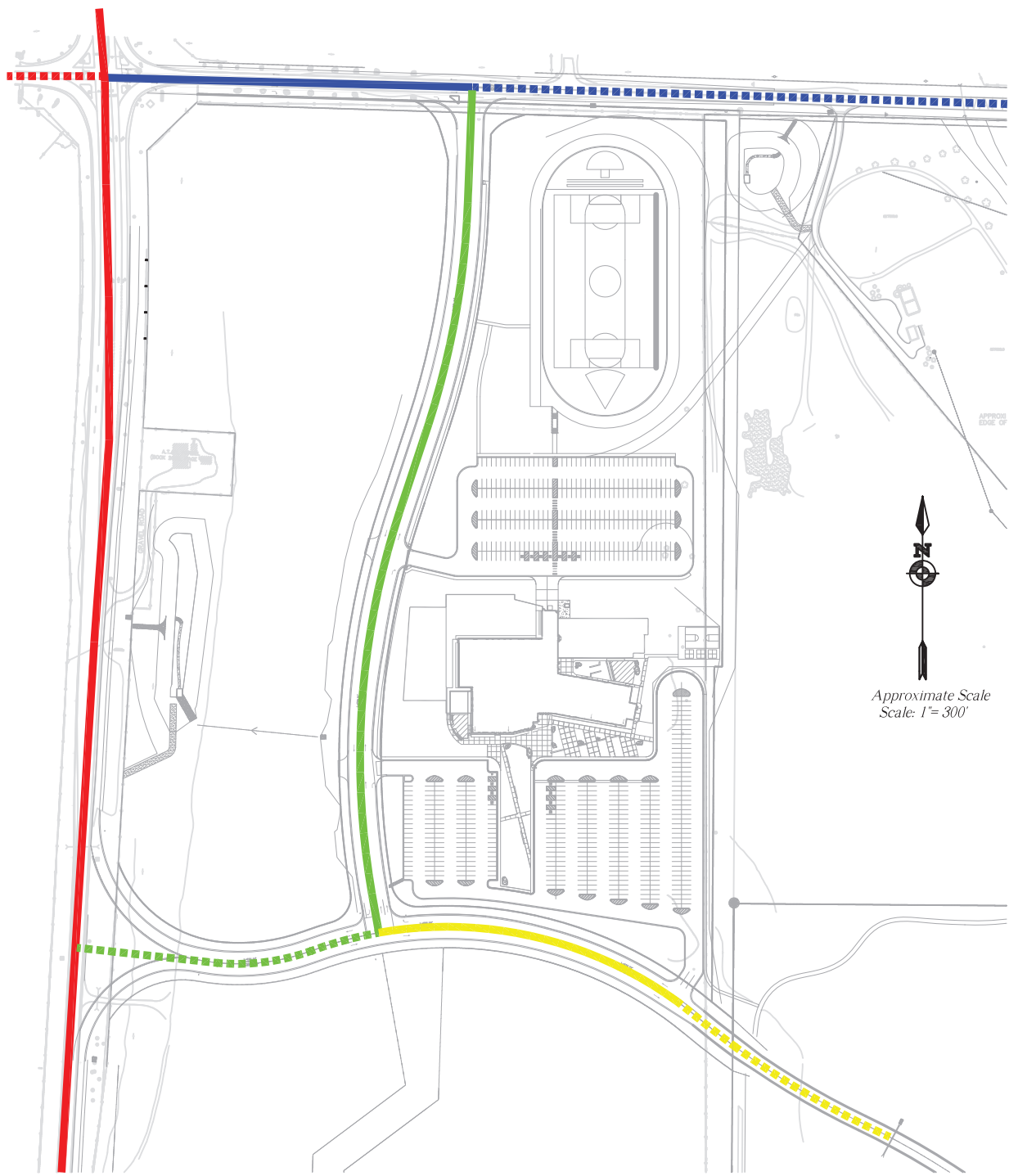


Figure 17b



LEGEND:

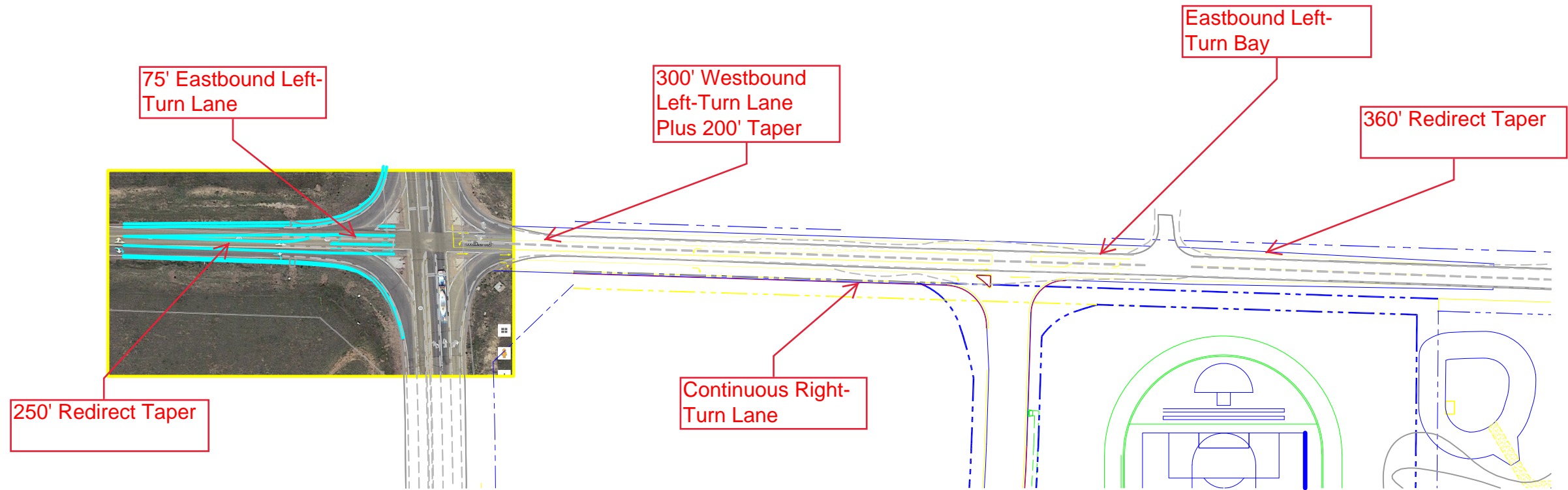
- = Regional Highway (CDOT R-A)
- - - = Three Lane, Rural Principal Arterial
- = Urban Minor Arterial
- - - = Rural Minor Arterial
- = Urban Non-Residential Collector
- - - = Rural Minor Collector
- = Urban Local
- - - = Rural Local

Figure 18

# Roadway Classifications

Monument Academy (LSC #184820)

Exhibit:  
Highway 105/Walker Road Improvements



↑ N  
1"=150'  
(on 11x17)

# LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210

Colorado Springs, CO 80905

719-633-2868

File Name : Hwy 83 - Walden Way AM 11-18

Site Code : 184820

Start Date : 11/29/2018

Page No : 1

## Groups Printed- Unshifted

	Hwy 83 Southbound				Walden Way Westbound				Hwy 83 Northbound				Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30	0	85	0	0	0	0	4	0	0	91	0	0	0	0	0	0	180
06:45	1	92	0	0	1	0	5	0	0	108	0	0	0	0	0	0	207
Total	1	177	0	0	1	0	9	0	0	199	0	0	0	0	0	0	387
07:00	1	94	0	0	1	0	2	0	0	103	1	0	0	0	0	0	202
07:15	1	114	0	0	1	0	4	0	0	108	0	0	0	0	0	0	228
07:30	1	103	0	0	2	0	6	0	0	104	0	0	0	0	0	0	216
07:45	6	117	0	0	1	0	3	0	0	102	0	0	0	0	0	0	229
Total	9	428	0	0	5	0	15	0	0	417	1	0	0	0	0	0	875
08:00	3	83	0	0	0	0	4	0	0	108	1	0	0	0	0	0	199
08:15	0	101	0	0	1	0	1	0	0	121	0	0	0	0	0	0	224
Grand Total	13	789	0	0	7	0	29	0	0	845	2	0	0	0	0	0	1685
Apprch %	1.6	98.4	0	0	19.4	0	80.6	0	0	99.8	0.2	0	0	0	0	0	
Total %	0.8	46.8	0	0	0.4	0	1.7	0	0	50.1	0.1	0	0	0	0	0	

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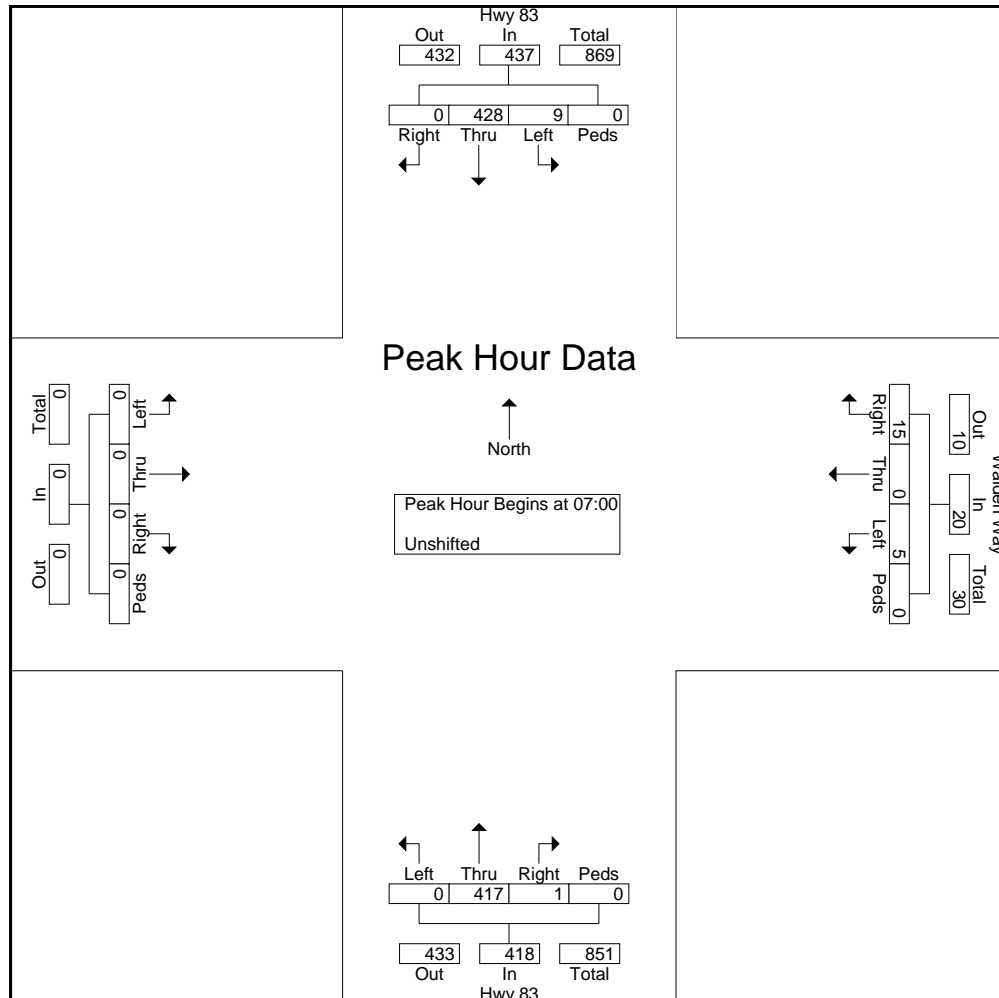
File Name : Hwy 83 - Walden Way AM 11-18

Site Code : 184820

Start Date : 11/29/2018

Page No : 2

	Hwy 83 Southbound					Walden Way Westbound					Hwy 83 Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 to 08:15 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00																					
07:00	1	94	0	0	95	1	0	2	0	3	0	103	1	0	104	0	0	0	0	0	202
07:15	1	114	0	0	115	1	0	4	0	5	0	<b>108</b>	0	0	<b>108</b>	0	0	0	0	0	228
07:30	1	103	0	0	104	<b>2</b>	0	<b>6</b>	0	<b>8</b>	0	104	0	0	104	0	0	0	0	0	216
07:45	<b>6</b>	<b>117</b>	0	0	<b>123</b>	1	0	3	0	4	0	102	0	0	102	0	0	0	0	0	<b>229</b>
Total Volume	9	428	0	0	437	5	0	15	0	20	0	417	1	0	418	0	0	0	0	0	875
% App. Total	2.1	97.9	0	0		25	0	75	0		0	99.8	0.2	0		0	0	0	0		
PHF	.375	.915	.000	.000	.888	.625	.000	.625	.000	.625	.000	.965	.250	.000	.968	.000	.000	.000	.000	.000	.955



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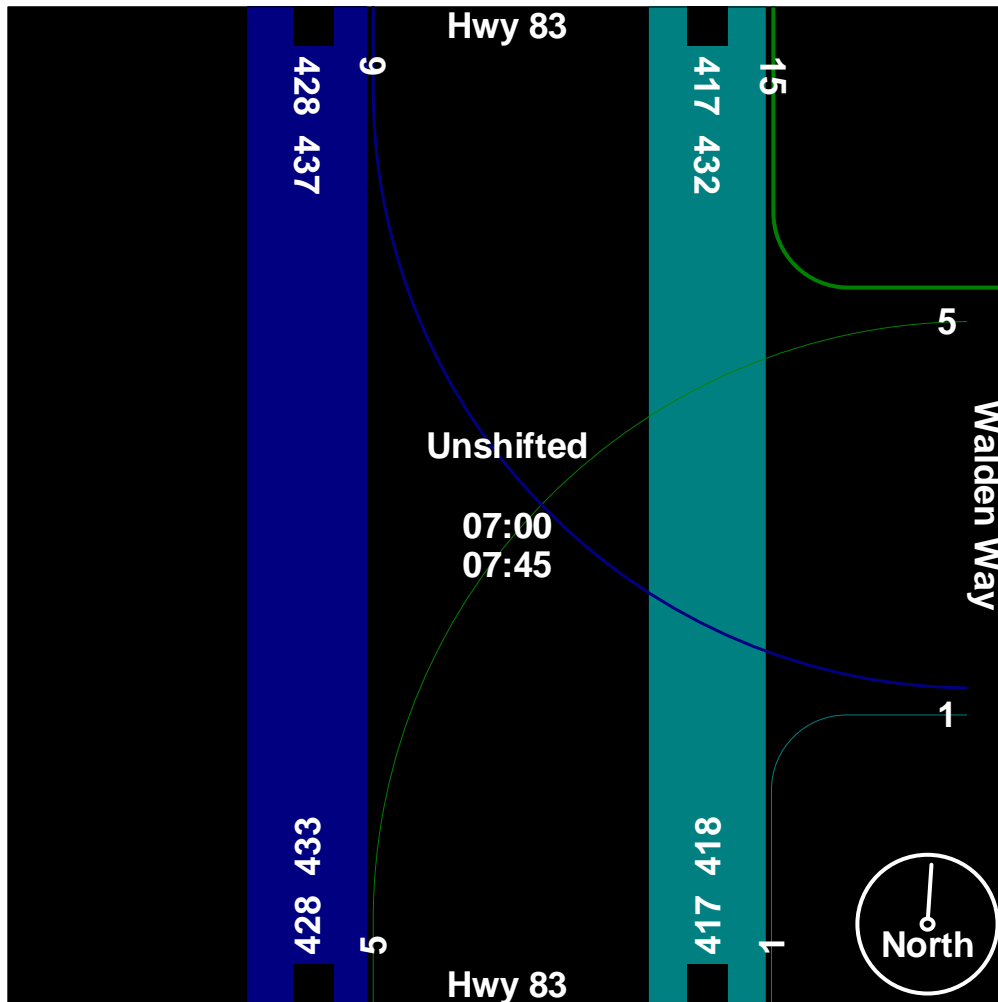
719-633-2868

File Name : Hwy 83 - Walden Way AM 11-18

Site Code : 184820

Start Date : 11/29/2018

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File Name : Hwy 83 - Walden Way PM 11-18

Site Code : 184820

Start Date : 11/29/2018

Page No : 1

## Groups Printed- Unshifted

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Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
16:00	3	157	0	0	3	0	2	0	0	109	0	0	0	0	0	0	274
16:15	0	149	0	0	1	0	2	0	0	96	2	0	0	0	0	0	250
16:30	1	149	0	0	0	0	5	0	0	126	1	0	0	0	0	0	282
16:45	2	129	0	0	1	0	4	0	0	108	1	0	0	0	0	0	245
Total	6	584	0	0	5	0	13	0	0	439	4	0	0	0	0	0	1051
17:00	8	169	0	0	0	0	2	0	0	126	0	0	0	0	0	0	305
17:15	0	147	0	0	0	0	0	0	0	117	2	0	0	0	0	0	266
17:30	1	146	0	0	0	0	5	0	0	105	0	0	0	0	0	0	257
17:45	2	134	0	0	0	0	1	0	0	89	0	0	0	0	0	0	226
Total	11	596	0	0	0	0	8	0	0	437	2	0	0	0	0	0	1054
Grand Total	17	1180	0	0	5	0	21	0	0	876	6	0	0	0	0	0	2105
Apprch %	1.4	98.6	0	0	19.2	0	80.8	0	0	99.3	0.7	0	0	0	0	0	
Total %	0.8	56.1	0	0	0.2	0	1	0	0	41.6	0.3	0	0	0	0	0	

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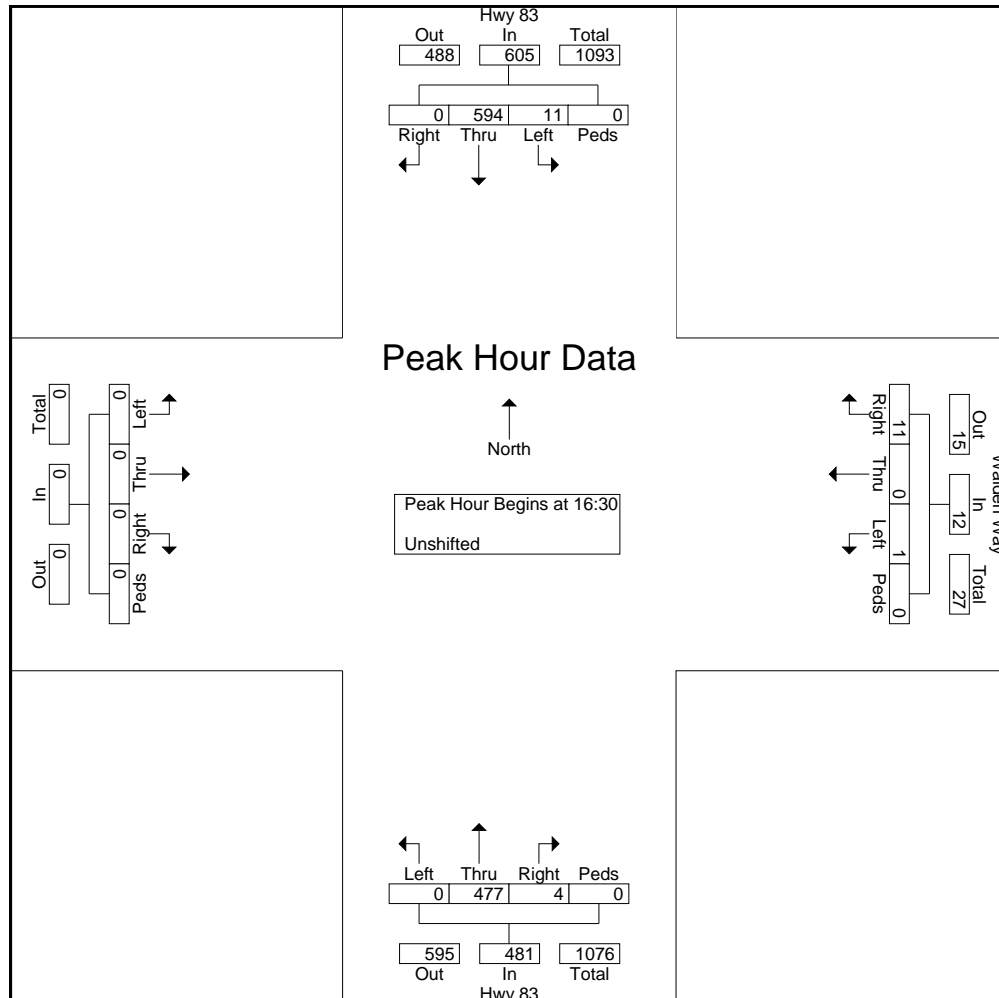
File Name : Hwy 83 - Walden Way PM 11-18

Site Code : 184820

Start Date : 11/29/2018

Page No : 2

	Hwy 83 Southbound					Walden Way Westbound					Hwy 83 Northbound					Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:30																					
16:30	1	149	0	0	150	0	0	5	0	5	0	126	1	0	127	0	0	0	0	0	282
16:45	2	129	0	0	131	1	0	4	0	5	0	108	1	0	109	0	0	0	0	0	245
17:00	8	169	0	0	177	0	0	2	0	2	0	126	0	0	126	0	0	0	0	0	305
17:15	0	147	0	0	147	0	0	0	0	0	0	117	2	0	119	0	0	0	0	0	266
Total Volume	11	594	0	0	605	1	0	11	0	12	0	477	4	0	481	0	0	0	0	0	1098
% App. Total	1.8	98.2	0	0		8.3	0	91.7	0		0	99.2	0.8	0		0	0	0	0		
PHF	.344	.879	.000	.000	.855	.250	.000	.550	.000	.600	.000	.946	.500	.000	.947	.000	.000	.000	.000	.000	.900





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Colorado Springs, CO 80905

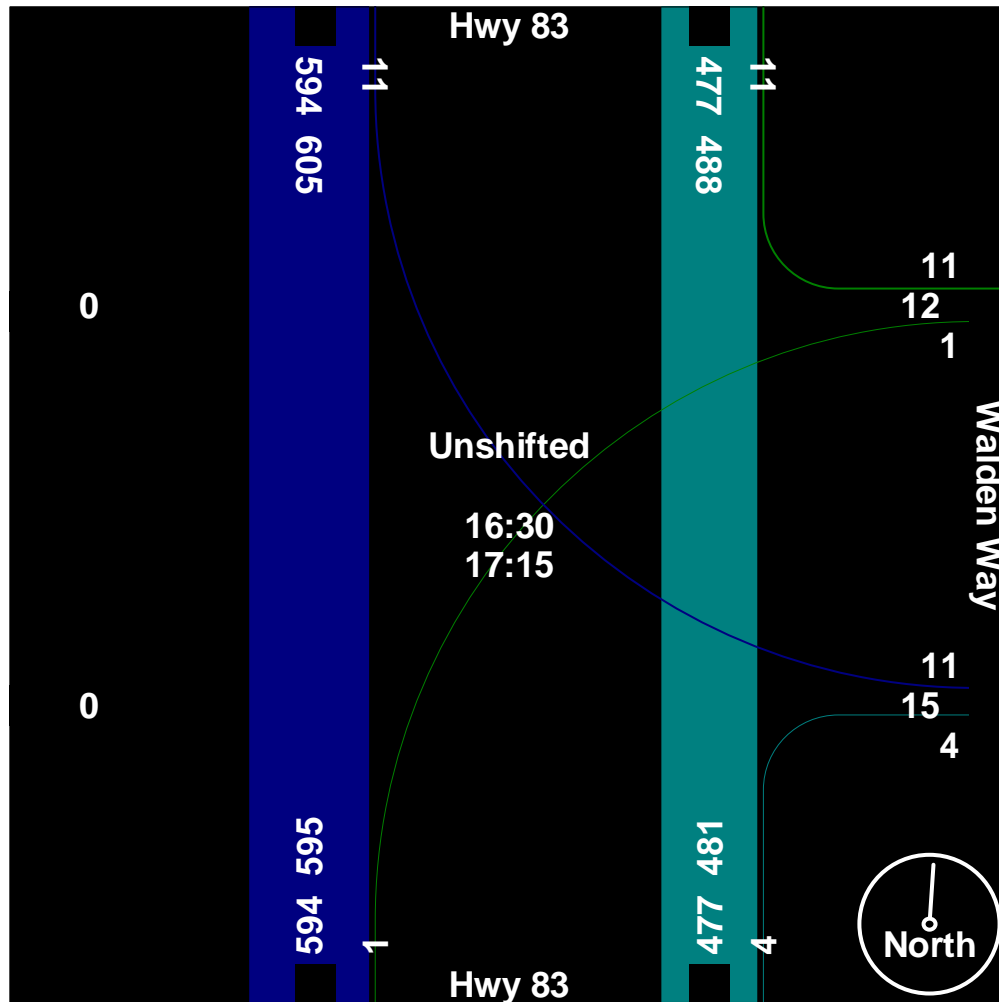
719-633-2868

File Name : Hwy 83 - Walden Way PM 11-18

Site Code : 184820

Start Date : 11/29/2018

Page No : 3



# LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210

Colorado Springs, CO 80905

719-633-2868

File Name : Hwy 83 - Walker Rd AM

Site Code : 184820

Start Date : 8/29/2018

Page No : 1

## Groups Printed- Unshifted

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Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30	2	46	5	0	9	9	2	0	17	72	1	0	3	1	19	0	186
06:45	0	52	11	0	10	21	8	0	34	97	1	0	4	0	23	0	261
Total	2	98	16	0	19	30	10	0	51	169	2	0	7	1	42	0	447
07:00	3	60	20	0	8	30	13	0	39	95	2	0	7	3	37	0	317
07:15	4	63	26	0	17	18	10	0	45	107	0	0	8	5	32	0	335
07:30	1	67	9	0	13	18	6	0	51	61	5	0	16	16	42	0	305
07:45	3	54	9	0	8	9	6	0	32	76	7	0	2	10	40	0	256
Total	11	244	64	0	46	75	35	0	167	339	14	0	33	34	151	0	1213
08:00	2	50	9	0	8	5	3	0	28	74	5	0	8	7	14	0	213
08:15	3	50	8	0	2	11	1	0	38	75	9	0	5	7	10	0	219
Grand Total	18	442	97	0	75	121	49	0	284	657	30	0	53	49	217	0	2092
Apprch %	3.2	79.4	17.4	0	30.6	49.4	20	0	29.2	67.7	3.1	0	16.6	15.4	68	0	
Total %	0.9	21.1	4.6	0	3.6	5.8	2.3	0	13.6	31.4	1.4	0	2.5	2.3	10.4	0	

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719-633-2868

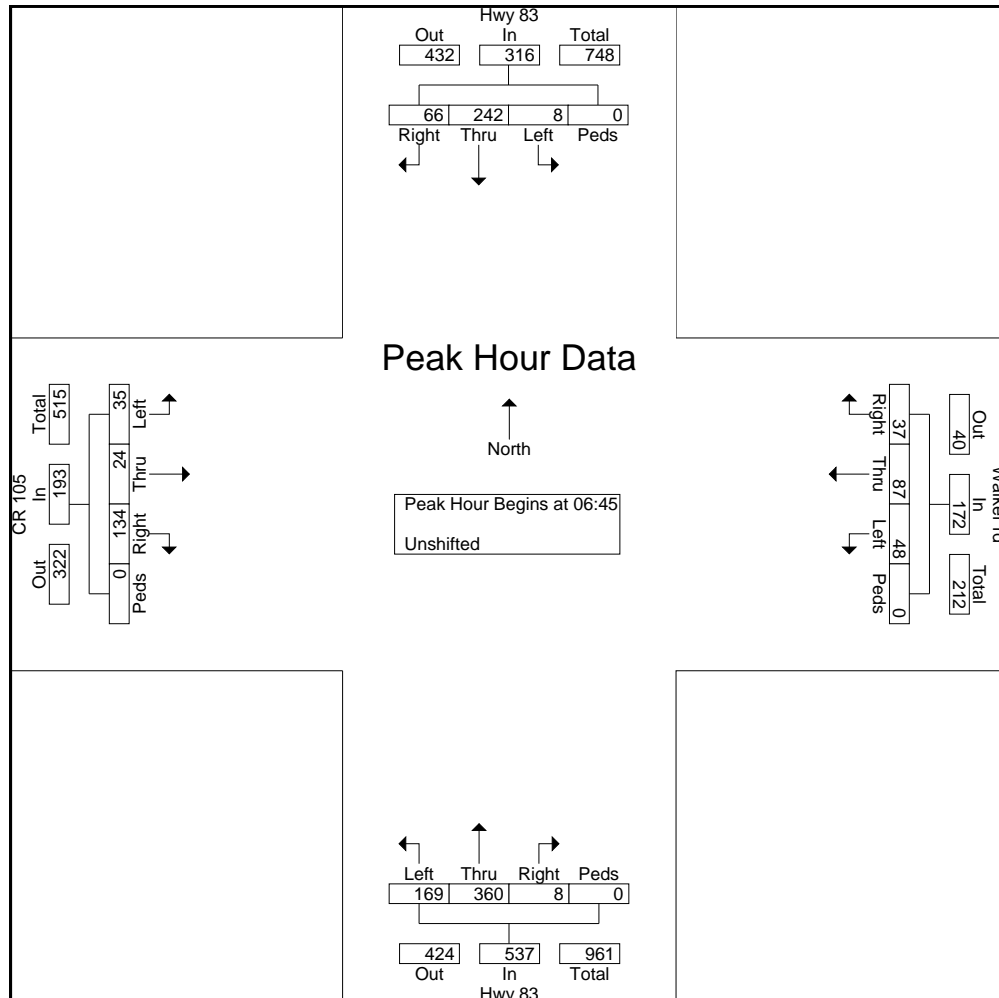
File Name : Hwy 83 - Walker Rd AM

Site Code : 184820

Start Date : 8/29/2018

Page No : 2

	Hwy 83 Southbound					Walker rd Westbound					Hwy 83 Northbound					CR 105 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:30 to 08:15 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:45																					
06:45	0	52	11	0	63	10	21	8	0	39	34	97	1	0	132	4	0	23	0	27	261
07:00	3	60	20	0	83	8	30	13	0	51	39	95	2	0	136	7	3	37	0	47	317
07:15	4	63	26	0	93	17	18	10	0	45	45	107	0	0	152	8	5	32	0	45	335
07:30	1	67	9	0	77	13	18	6	0	37	51	61	5	0	117	16	16	42	0	74	305
Total Volume	8	242	66	0	316	48	87	37	0	172	169	360	8	0	537	35	24	134	0	193	1218
% App. Total	2.5	76.6	20.9	0		27.9	50.6	21.5	0		31.5	67	1.5	0		18.1	12.4	69.4	0		
PHF	.500	.903	.635	.000	.849	.706	.725	.712	.000	.843	.828	.841	.400	.000	.883	.547	.375	.798	.000	.652	.909



# LSC Transportation Consultants, Inc.

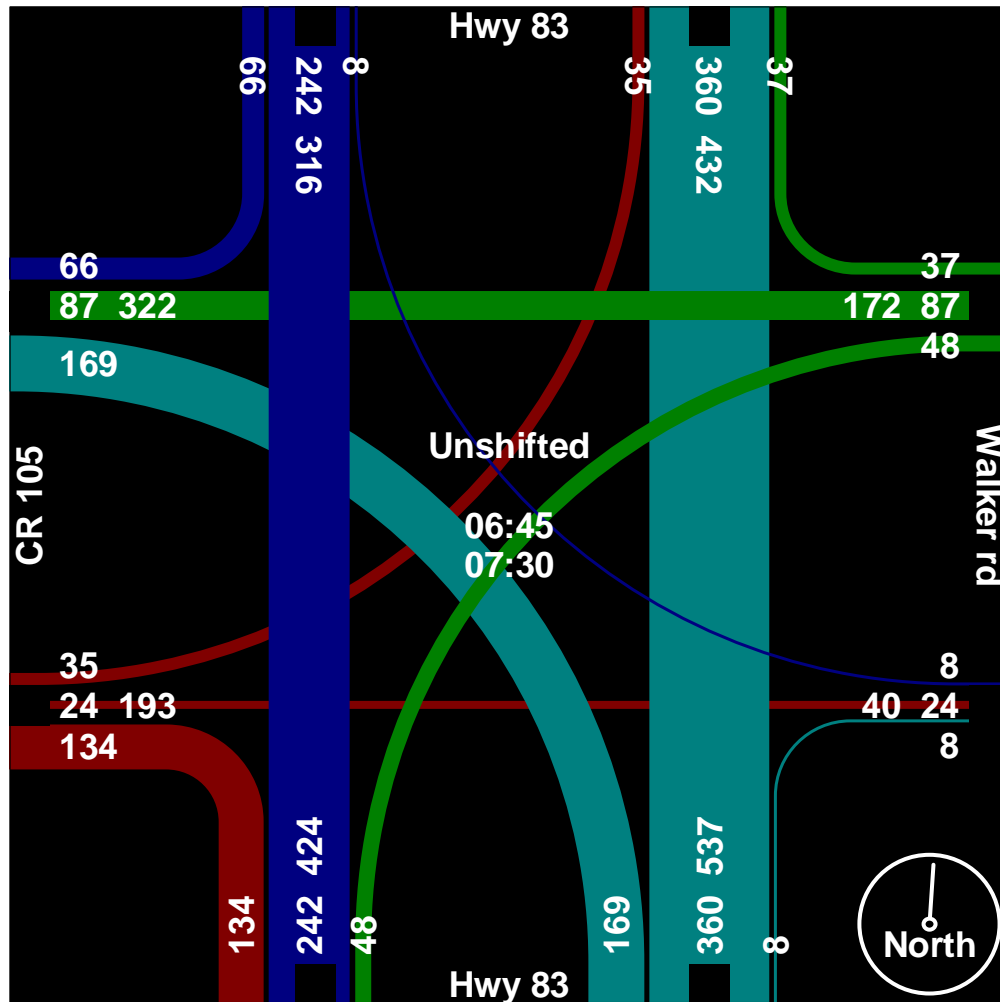
545 E Pikes Peak Ave, Suite 210  
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719-633-2868

File Name : Hwy 83 - Walker Rd AM

Site Code : 184820

Start Date : 8/29/2018

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# LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210

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719-633-2868

File Name : Hwy 83 - Walker Rd Mid

Site Code : 00184820

Start Date : 9/5/2018

Page No : 1

## Groups Printed- Unshifted

	Hwy 83 Southbound				Walker Rd Westbound				Hwy 83 Northbound				CR 105 Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
13:45	0	65	9	0	2	4	0	0	15	48	2	0	4	8	24	0	181
Total	0	65	9	0	2	4	0	0	15	48	2	0	4	8	24	0	181
14:00	4	75	11	0	3	16	2	0	22	62	6	0	9	10	29	0	249
14:15	3	69	13	0	5	15	5	0	33	44	6	0	9	4	32	0	238
14:30	3	56	3	0	3	9	3	0	33	57	4	0	8	16	33	0	228
14:45	5	61	10	0	4	11	2	0	31	61	6	0	16	14	29	0	250
Total	15	261	37	0	15	51	12	0	119	224	22	0	42	44	123	0	965
Grand Total	15	326	46	0	17	55	12	0	134	272	24	0	46	52	147	0	1146
Apprch %	3.9	84.2	11.9	0	20.2	65.5	14.3	0	31.2	63.3	5.6	0	18.8	21.2	60	0	
Total %	1.3	28.4	4	0	1.5	4.8	1	0	11.7	23.7	2.1	0	4	4.5	12.8	0	



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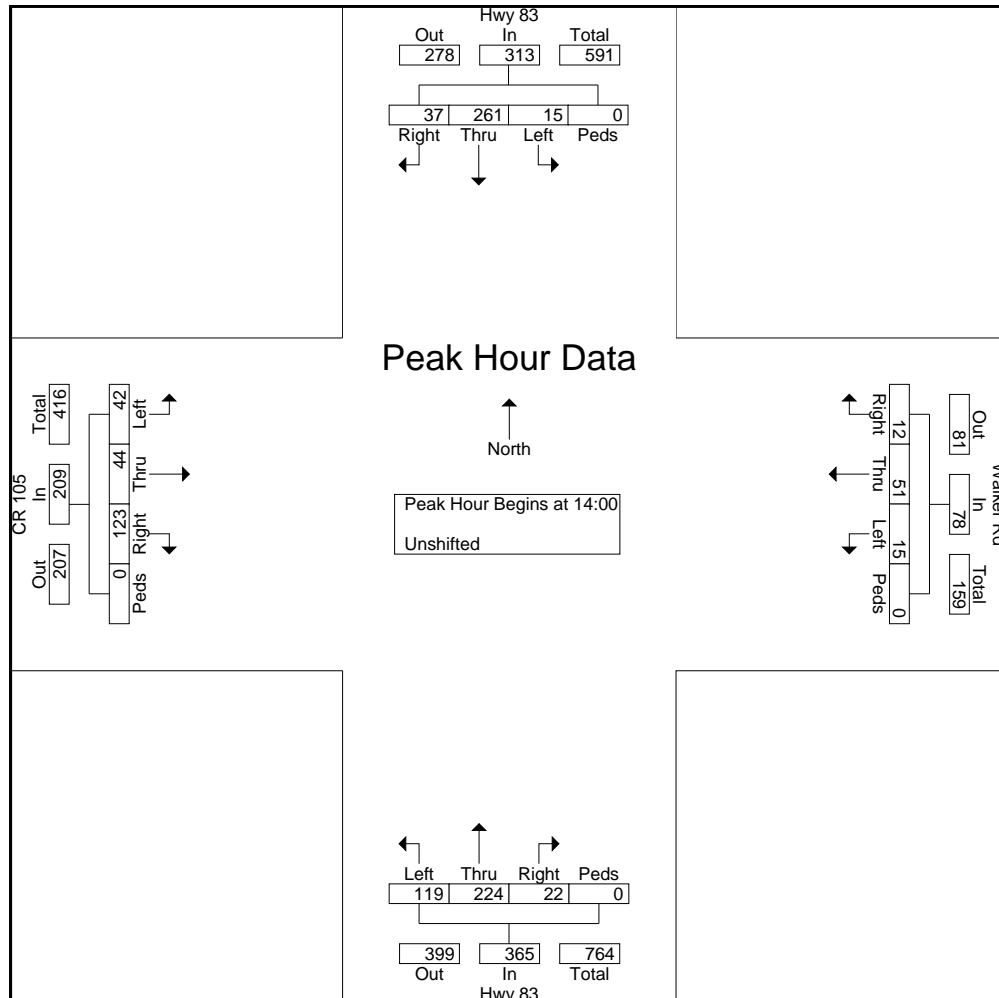
File Name : Hwy 83 - Walker Rd Mid

Site Code : 00184820

Start Date : 9/5/2018

Page No : 2

	Hwy 83 Southbound					Walker Rd Westbound					Hwy 83 Northbound					CR 105 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 13:45 to 14:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 14:00																					
14:00	4	75	11	0	90	3	16	2	0	21	22	62	6	0	90	9	10	29	0	48	249
14:15	3	69	13	0	85	5	15	5	0	25	33	44	6	0	83	9	4	32	0	45	238
14:30	3	56	3	0	62	3	9	3	0	15	33	57	4	0	94	8	16	33	0	57	228
14:45	5	61	10	0	76	4	11	2	0	17	31	61	6	0	98	16	14	29	0	59	250
Total Volume	15	261	37	0	313	15	51	12	0	78	119	224	22	0	365	42	44	123	0	209	965
% App. Total	4.8	83.4	11.8	0		19.2	65.4	15.4	0		32.6	61.4	6	0		20.1	21.1	58.9	0		
PHF	.750	.870	.712	.000	.869	.750	.797	.600	.000	.780	.902	.903	.917	.000	.931	.656	.688	.932	.000	.886	.965



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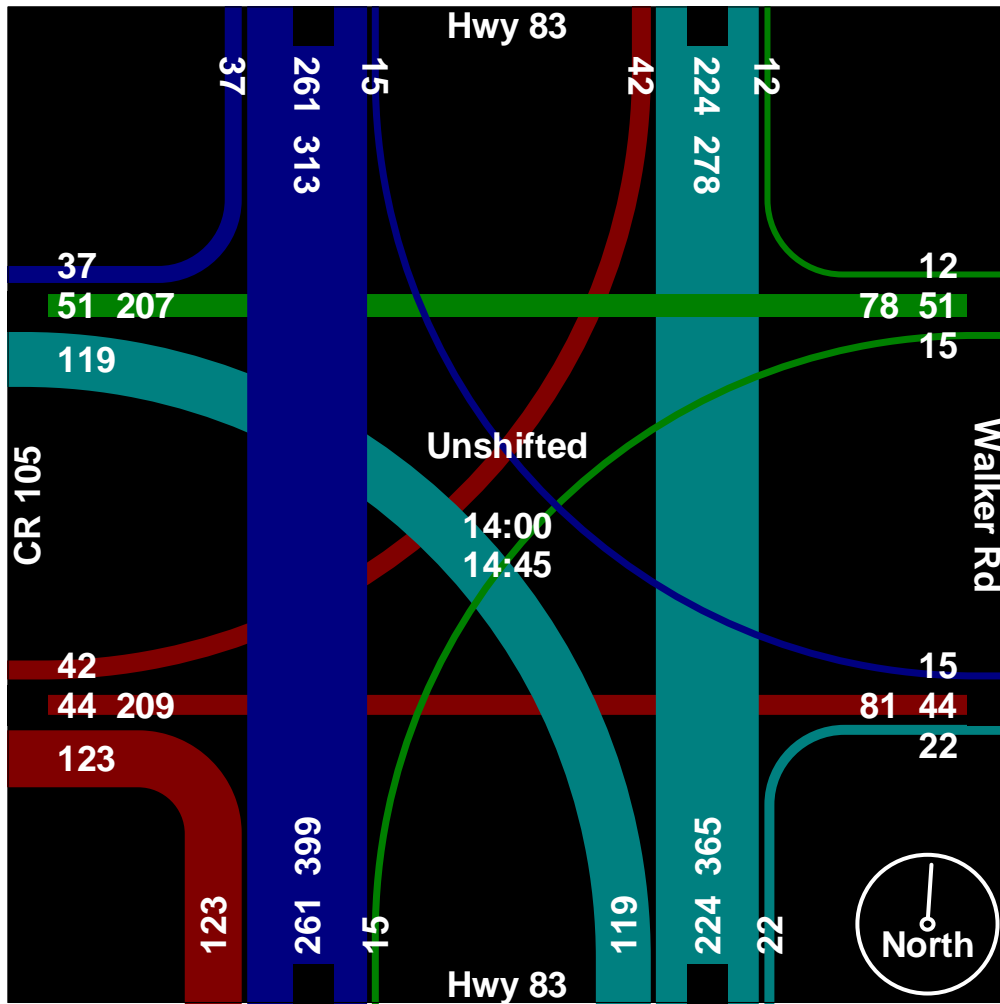
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719-633-2868

File Name : Hwy 83 - Walker Rd Mid

Site Code : 00184820

Start Date : 9/5/2018

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545 E Pikes Peak Ave, Suite 210

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719-633-2868

File Name : Hwy 83 - Walker Rd PM

Site Code : 184820

Start Date : 8/29/2018

Page No : 1

## Groups Printed- Unshifted

	Hwy 83 Southbound				Walker Rd Westbound				Hwy 83 Northbound				CR 195 Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
16:15	3	89	15	0	8	12	1	0	31	98	5	0	11	21	49	0	343
16:30	5	96	16	0	12	14	1	0	30	106	6	0	12	22	54	0	374
16:45	4	101	18	0	6	11	1	0	36	80	7	0	18	17	34	0	333
Total	12	286	49	0	26	37	3	0	97	284	18	0	41	60	137	0	1050
17:00	8	156	19	0	3	11	5	0	40	94	11	0	9	16	45	0	417
17:15	6	147	13	0	5	19	4	0	35	60	14	0	19	11	44	0	377
17:30	4	162	22	0	11	15	4	0	38	89	15	0	11	13	30	0	414
17:45	8	170	15	0	2	12	1	0	27	67	9	0	18	12	36	0	377
Total	26	635	69	0	21	57	14	0	140	310	49	0	57	52	155	0	1585
18:00	0	168	16	0	3	11	1	0	26	69	8	0	17	11	32	0	362
Grand Total	38	1089	134	0	50	105	18	0	263	663	75	0	115	123	324	0	2997
Apprch %	3	86.4	10.6	0	28.9	60.7	10.4	0	26.3	66.2	7.5	0	20.5	21.9	57.7	0	
Total %	1.3	36.3	4.5	0	1.7	3.5	0.6	0	8.8	22.1	2.5	0	3.8	4.1	10.8	0	

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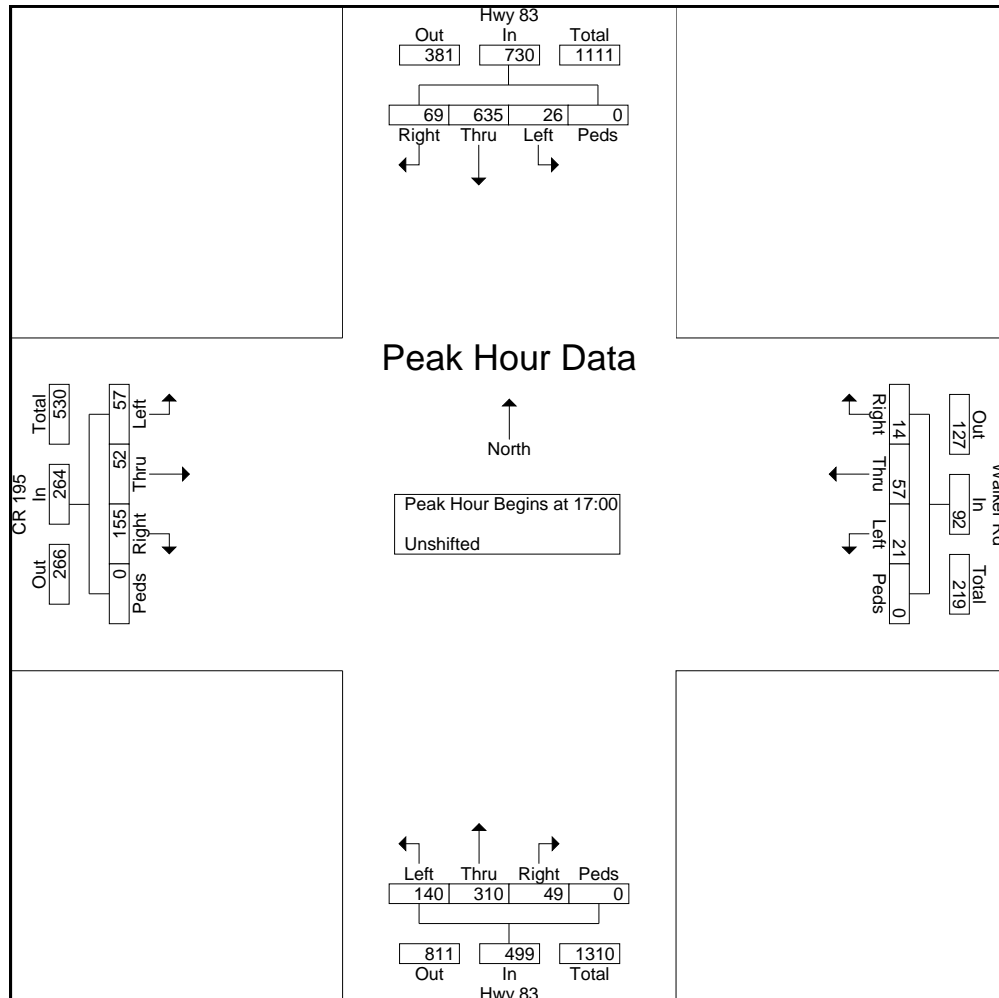
File Name : Hwy 83 - Walker Rd PM

Site Code : 184820

Start Date : 8/29/2018

Page No : 2

	Hwy 83 Southbound					Walker Rd Westbound					Hwy 83 Northbound					CR 195 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 17:00																					
17:00	8	156	19	0	183	3	11	5	0	19	40	94	11	0	145	9	16	45	0	70	417
17:15	6	147	13	0	166	5	19	4	0	28	35	60	14	0	109	19	11	44	0	74	377
17:30	4	162	22	0	188	11	15	4	0	30	38	89	15	0	142	11	13	30	0	54	414
17:45	8	170	15	0	193	2	12	1	0	15	27	67	9	0	103	18	12	36	0	66	377
Total Volume	26	635	69	0	730	21	57	14	0	92	140	310	49	0	499	57	52	155	0	264	1585
% App. Total	3.6	87	9.5	0		22.8	62	15.2	0		28.1	62.1	9.8	0		21.6	19.7	58.7	0		
PHF	.813	.934	.784	.000	.946	.477	.750	.700	.000	.767	.875	.824	.817	.000	.860	.750	.813	.861	.000	.892	.950



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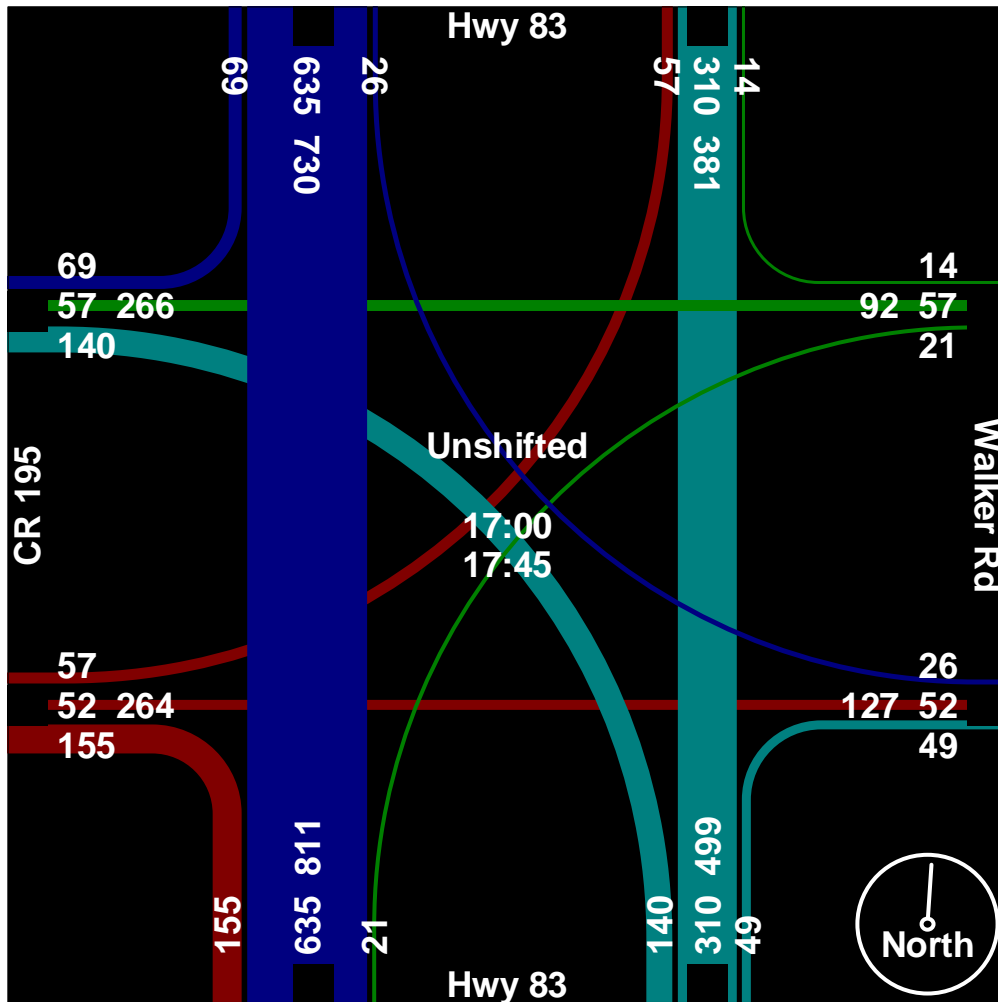
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719-633-2868

File Name : Hwy 83 - Walker Rd PM

Site Code : 184820

Start Date : 8/29/2018

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# Timings

1: SH 83 & SH 105/Walker Rd

Existing Traffic

AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↔	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	35	24	134	48	87	169	360	8	8	242	66
Future Volume (vph)	35	24	134	48	87	169	360	8	8	242	66
Turn Type	Perm	NA	Free	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	4	4		8	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	25.0	25.0		25.0	25.0	10.0	55.0	55.0	10.0	55.0	55.0
Total Split (%)	27.8%	27.8%		27.8%	27.8%	11.1%	61.1%	61.1%	11.1%	61.1%	61.1%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		13.7	83.9		13.7	59.2	58.3	58.3	55.1	50.1	50.1
Actuated g/C Ratio		0.16	1.00		0.16	0.71	0.69	0.69	0.66	0.60	0.60
v/c Ratio		0.29	0.08		0.66	0.26	0.32	0.01	0.01	0.26	0.08
Control Delay		34.0	0.1		41.9	5.6	7.2	0.0	4.8	9.5	2.2
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		34.0	0.1		41.9	5.6	7.2	0.0	4.8	9.5	2.2
LOS		C	A		D	A	A	A	A	A	A
Approach Delay		10.5			41.9		6.6			7.9	
Approach LOS		B			D		A			A	

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 83.9

Natural Cycle: 45

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 12.2

Intersection LOS: B

Intersection Capacity Utilization 51.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd

10 s	55 s	25 s
10 s	55 s	25 s























# Timings

1: SH 83 & SH 105/Walker Rd

Existing + Site-Generated Traffic

Midday (2-3 PM)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	42	44	123	15	51	119	224	22	15	261	37
Future Volume (vph)	42	44	123	15	51	119	224	22	15	261	37
Turn Type	Perm	NA	Free	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	4	4		8	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	25.0	25.0		25.0	25.0	10.0	55.0	55.0	10.0	55.0	55.0
Total Split (%)	27.8%	27.8%		27.8%	27.8%	11.1%	61.1%	61.1%	11.1%	61.1%	61.1%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		10.2	76.1		10.0	57.8	58.3	58.3	55.0	52.6	52.6
Actuated g/C Ratio		0.13	1.00		0.13	0.76	0.77	0.77	0.72	0.69	0.69
v/c Ratio		0.47	0.09		0.41	0.15	0.17	0.02	0.02	0.20	0.03
Control Delay		40.2	0.1		34.8	3.7	4.9	0.0	3.5	7.4	0.2
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		40.2	0.1		34.8	3.7	4.9	0.0	3.5	7.4	0.2
LOS		D	A		C	A	A	A	A	A	A
Approach Delay		16.5			34.8		4.2			6.3	
Approach LOS		B			C		A			A	

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 76.1

Natural Cycle: 40

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 10.4




Intersection LOS: B

Intersection Capacity Utilization 43.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd





















		
Ø1	Ø2	Ø4
10 s	55 s	25 s
		
Ø5	Ø6	Ø8
10 s	55 s	25 s

# Timings

1: SH 83 & SH 105/Walker Rd

Existing Traffic

PM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	57	52	155	21	57	140	310	49	26	429	69
Future Volume (vph)	57	52	155	21	57	140	310	49	26	429	69
Turn Type	Perm	NA	Free	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	4	4		8	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	25.0	25.0		25.0	25.0	10.0	55.0	55.0	10.0	55.0	55.0
Total Split (%)	27.8%	27.8%		27.8%	27.8%	11.1%	61.1%	61.1%	11.1%	61.1%	61.1%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		11.3	79.1		11.0	58.7	58.1	58.1	55.5	50.5	50.5
Actuated g/C Ratio		0.14	1.00		0.14	0.74	0.73	0.73	0.70	0.64	0.64
v/c Ratio		0.54	0.10		0.39	0.24	0.26	0.05	0.03	0.36	0.07
Control Delay		42.1	0.1		33.9	4.6	6.8	1.0	3.8	9.2	1.6
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		42.1	0.1		33.9	4.6	6.8	1.0	3.8	9.2	1.6
LOS		D	A		C	A	A	A	A	A	A
Approach Delay		17.5			33.9		5.6			7.9	
Approach LOS		B			C		A			A	

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 79.1

Natural Cycle: 40

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 10.4

Intersection LOS: B

Intersection Capacity Utilization 54.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd























# Timings

1: SH 83 & SH 105/Walker Rd

# Short-Term Background Traffic

AM School Peak Hour (7:45-8:45 AM)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	39	26	148	53	96	187	397	9	9	267	73
Future Volume (vph)	39	26	148	53	96	187	397	9	9	267	73
Turn Type	Perm	NA	Free	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	4	4		8	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	25.0	25.0		25.0	25.0	10.0	55.0	55.0	10.0	55.0	55.0
Total Split (%)	27.8%	27.8%		27.8%	27.8%	11.1%	61.1%	61.1%	11.1%	61.1%	61.1%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		14.5	84.7		14.5	59.2	58.3	58.3	55.1	50.1	50.1
Actuated g/C Ratio		0.17	1.00		0.17	0.70	0.69	0.69	0.65	0.59	0.59
v/c Ratio		0.32	0.09		0.69	0.30	0.35	0.01	0.02	0.28	0.09
Control Delay		34.6	0.1		43.6	6.1	7.8	0.0	4.9	10.0	2.4
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		34.6	0.1		43.6	6.1	7.8	0.0	4.9	10.0	2.4
LOS		C	A		D	A	A	A	A	B	A
Approach Delay		10.6			43.6		7.1			8.3	
Approach LOS		B			D		A			A	

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 84.7

Natural Cycle: 50

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 12.8

Intersection LOS: B

Intersection Capacity Utilization 54.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd























# Timings

1: SH 83 & SH 105/Walker Rd

## Short-Term Background Traffic

Midday (2-3 PM)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	46	49	136	17	56	131	247	24	17	288	41
Future Volume (vph)	46	49	136	17	56	131	247	24	17	288	41
Turn Type	Perm	NA	Free	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	4	4		8	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	25.0	25.0		25.0	25.0	10.0	55.0	55.0	10.0	55.0	55.0
Total Split (%)	27.8%	27.8%		27.8%	27.8%	11.1%	61.1%	61.1%	11.1%	61.1%	61.1%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		10.8	78.7		10.7	59.6	59.9	59.9	55.5	50.5	50.5
Actuated g/C Ratio		0.14	1.00		0.14	0.76	0.76	0.76	0.71	0.64	0.64
v/c Ratio		0.53	0.10		0.44	0.17	0.19	0.02	0.02	0.24	0.04
Control Delay		42.3	0.1		35.2	4.0	5.2	0.0	3.7	7.9	0.4
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		42.3	0.1		35.2	4.0	5.2	0.0	3.7	7.9	0.4
LOS		D	A		D	A	A	A	A	A	A
Approach Delay		17.5			35.2		4.5			6.8	
Approach LOS		B			D		A			A	

### Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 78.7

Natural Cycle: 40

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 10.9

Intersection LOS: B

Intersection Capacity Utilization 46.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd





















		
Ø1	Ø2	Ø4
10 s	55 s	25 s
		
Ø5	Ø6	Ø8
10 s	55 s	25 s

# Timings

1: SH 83 & SH 105/Walker Rd

# Short-Term Background Traffic

PM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	63	57	171	23	63	155	342	54	29	474	76
Future Volume (vph)	63	57	171	23	63	155	342	54	29	474	76
Turn Type	Perm	NA	Free	Perm	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	4	4		8	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	25.0	25.0		25.0	25.0	10.0	55.0	55.0	10.0	55.0	55.0
Total Split (%)	27.8%	27.8%		27.8%	27.8%	11.1%	61.1%	61.1%	11.1%	61.1%	61.1%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag						Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		12.1	82.3		12.1	58.2	56.3	56.3	55.1	50.1	50.1
Actuated g/C Ratio		0.15	1.00		0.15	0.71	0.68	0.68	0.67	0.61	0.61
v/c Ratio		0.59	0.11		0.40	0.30	0.31	0.06	0.04	0.42	0.08
Control Delay		44.2	0.1		33.4	5.4	7.6	1.4	4.1	10.5	2.0
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		44.2	0.1		33.4	5.4	7.6	1.4	4.1	10.5	2.0
LOS		D	A		C	A	A	A	A	B	A
Approach Delay		18.3			33.4		6.4			9.0	
Approach LOS		B			C		A			A	

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 82.3

Natural Cycle: 45

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 11.3

Intersection LOS: B

Intersection Capacity Utilization 59.2%

ICU Level of Service B























Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd



Timings  
1: SH 83 & SH 105/Walker Rd

Short-Term Total Traffic  
AM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	39	219	148	189	126	298	444	9	92	267	73
Future Volume (vph)	39	219	148	189	126	298	444	9	92	267	73
Turn Type	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	7	4		3	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	14.0	27.0		17.0	30.0	10.0	36.0	36.0	10.0	36.0	36.0
Total Split (%)	15.6%	30.0%		18.9%	33.3%	11.1%	40.0%	40.0%	11.1%	40.0%	40.0%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	26.1	19.4	87.3	36.0	29.0	36.1	31.0	31.0	36.1	31.0	31.0
Actuated g/C Ratio	0.30	0.22	1.00	0.41	0.33	0.41	0.36	0.36	0.41	0.36	0.36
v/c Ratio	0.10	0.82	0.09	0.81	0.43	0.87	0.76	0.02	0.60	0.47	0.13
Control Delay	16.2	49.1	0.1	38.1	25.1	45.7	34.7	0.1	27.4	25.4	1.2
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	16.2	49.1	0.1	38.1	25.1	45.7	34.7	0.1	27.4	25.4	1.2
LOS	B	D	A	D	C	D	C	A	C	C	A
Approach Delay		32.8			31.9		38.5			22.1	
Approach LOS		C			C		D			C	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 87.3

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 32.2

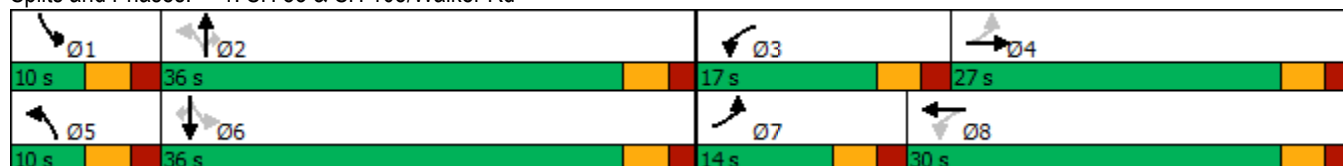
Intersection LOS: C

Intersection Capacity Utilization 69.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd





Intersection

Intersection Delay, s/veh 19.4

Intersection LOS C






Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	
Traffic Vol, veh/h	44	276	28	190	170	17
Future Vol, veh/h	44	276	28	190	170	17
Peak Hour Factor	0.84	0.53	0.53	1.00	0.53	0.53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	521	53	190	321	32
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	22.8	13.3	18
HCM LOS	C	B	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	91%	0%	0%	13%
Vol Thru, %	0%	100%	0%	87%
Vol Right, %	9%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	187	44	276	218
LT Vol	170	0	0	28
Through Vol	0	44	0	190
RT Vol	17	0	276	0
Lane Flow Rate	353	52	521	243
Geometry Grp	2	7	7	5
Degree of Util (X)	0.6	0.088	0.774	0.408
Departure Headway (Hd)	6.119	6.064	5.352	6.047
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	589	589	672	593
Service Time	4.177	3.823	3.111	4.118
HCM Lane V/C Ratio	0.599	0.088	0.775	0.41
HCM Control Delay	18	9.4	24.1	13.3
HCM Lane LOS	C	A	C	B
HCM 95th-tile Q	4	0.3	7.4	2





HCM 6th TWSC  
3: N-S Collector St & North School Access







Short-Term Total Traffic  
AM Peak Hour

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	187	79	96	207
Future Vol, veh/h	0	0	187	79	96	207
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	-	-	155	255	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	53	53	53	53	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	353	149	181	391
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1106	353	0	0	502	0
Stage 1	353	-	-	-	-	-
Stage 2	753	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	233	691	-	-	1062	-
Stage 1	711	-	-	-	-	-
Stage 2	465	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	193	691	-	-	1062	-
Mov Cap-2 Maneuver	244	-	-	-	-	-
Stage 1	590	-	-	-	-	-
Stage 2	465	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	0	0	2.9			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	-	1062	-	
HCM Lane V/C Ratio	-	-	-	0.171	-	
HCM Control Delay (s)	-	-	0	9.1	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	-	0.6	-	

HCM 6th TWSC  
4: N-S Collector St & YMCA Access

Short-Term Total Traffic  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	31	234	30	36	171
Future Vol, veh/h	3	31	234	30	36	171
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	-	-	-	205	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	53	92	92	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	34	442	33	39	323
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	860	459	0	0	475	0
Stage 1	459	-	-	-	-	-
Stage 2	401	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	326	602	-	-	1087	-
Stage 1	636	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	314	602	-	-	1087	-
Mov Cap-2 Maneuver	428	-	-	-	-	-
Stage 1	613	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	11.6	0	0.9			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	581	1087	-	
HCM Lane V/C Ratio	-	-	0.064	0.036	-	
HCM Control Delay (s)	-	-	11.6	8.4	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-	

Intersection						
Int Delay, s/veh	8.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	108	140	156	156	171	3
Future Vol, veh/h	108	140	156	156	171	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	255	-	-	205	205	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	53	53	53	53	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	108	140	294	294	323	6





Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	588	0	0 650 294
Stage 1	-	-	- - 294 -
Stage 2	-	-	- - 356 -
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	987	-	- - 434 745
Stage 1	-	-	- - 756 -
Stage 2	-	-	- - 709 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	987	-	- - 387 745
Mov Cap-2 Maneuver	-	-	- - 465 -
Stage 1	-	-	- - 674 -
Stage 2	-	-	- - 709 -

Approach	EB	WB	SB
HCM Control Delay, s	4	0	28.2
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	987	-	-	-	465	745
HCM Lane V/C Ratio	0.109	-	-	-	0.694	0.008
HCM Control Delay (s)	9.1	-	-	-	28.5	9.9
HCM Lane LOS	A	-	-	-	D	A
HCM 95th %tile Q(veh)	0.4	-	-	-	5.2	0























HCM 6th TWSC  
6: Pinehurst Cir & South School Access

Short-Term Total Traffic  
AM Peak Hour

Intersection						
Int Delay, s/veh	10.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	311	0	0	0	0	311
Future Vol, veh/h	311	0	0	0	0	311
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	255	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	53	92	92	75	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	587	0	0	0	0	587
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1	0	-	0	1175	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	1174	-
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	1622	-	-	-	212	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	294	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	135	1084
Mov Cap-2 Maneuver	-	-	-	-	135	-
Stage 1	-	-	-	-	652	-
Stage 2	-	-	-	-	294	-
Approach	EB	WB		SB		
HCM Control Delay, s	8.5	0		12.2		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1622	-	-	-	1084	
HCM Lane V/C Ratio	0.362	-	-	-	0.541	
HCM Control Delay (s)	8.5	-	-	-	12.2	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	1.7	-	-	-	3.4	

Timings  
1: SH 83 & SH 105/Walker Rd

Short-Term Total Traffic  
Midday (2-3 PM)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	46	129	136	139	129	184	270	24	51	288	41
Future Volume (vph)	46	129	136	139	129	184	270	24	51	288	41
Turn Type	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	7	4		3	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	25.0		10.0	25.0	10.0	45.0	45.0	10.0	45.0	45.0
Total Split (%)	11.1%	27.8%		11.1%	27.8%	11.1%	50.0%	50.0%	11.1%	50.0%	50.0%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	19.1	14.1	84.3	21.2	18.3	46.2	42.3	42.3	45.1	40.1	40.1
Actuated g/C Ratio	0.23	0.17	1.00	0.25	0.22	0.55	0.50	0.50	0.53	0.48	0.48
v/c Ratio	0.19	0.55	0.10	0.67	0.55	0.34	0.31	0.04	0.12	0.33	0.05
Control Delay	23.4	38.9	0.1	38.5	34.1	11.3	15.3	0.1	9.0	15.9	0.1
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	23.4	38.9	0.1	38.5	34.1	11.3	15.3	0.1	9.0	15.9	0.1
LOS	C	D	A	D	C	B	B	A	A	B	A
Approach Delay		21.0			36.1		12.8			13.1	
Approach LOS		C			D		B			B	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 84.3

Natural Cycle: 55

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 20.3

Intersection LOS: C

Intersection Capacity Utilization 56.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd





			
10 s	45 s	10 s	25 s
			
10 s	45 s	10 s	25 s



Intersection

Intersection Delay, s/veh 10.3

Intersection LOS B






Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	90	115	11	86	219	16
Future Vol, veh/h	90	115	11	86	219	16
Peak Hour Factor	0.92	0.75	0.75	0.81	0.75	0.75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	153	15	106	292	21
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9	9.3	11.7
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	93%	0%	0%	11%
Vol Thru, %	0%	100%	0%	89%
Vol Right, %	7%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	235	90	115	97
LT Vol	219	0	0	11
Through Vol	0	90	0	86
RT Vol	16	0	115	0
Lane Flow Rate	313	98	153	121
Geometry Grp	2	7	7	5
Degree of Util (X)	0.43	0.149	0.203	0.174
Departure Headway (Hd)	4.945	5.476	4.769	5.171
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	724	652	748	689
Service Time	3.001	3.235	2.528	3.238
HCM Lane V/C Ratio	0.432	0.15	0.205	0.176
HCM Control Delay	11.7	9.2	8.8	9.3
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2.2	0.5	0.8	0.6

HCM 6th TWSC  
3: N-S Collector St & North School Access

Short-Term Total Traffic  
Midday (2-3 PM)





Intersection						
Int Delay, s/veh	4.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	148	87	0	0	126
Future Vol, veh/h	0	148	87	0	0	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	-	-	155	255	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	197	116	0	0	168
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	284	116	0	0	116	0
Stage 1	116	-	-	-	-	-
Stage 2	168	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	706	936	-	-	1473	-
Stage 1	909	-	-	-	-	-
Stage 2	862	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	706	936	-	-	1473	-
Mov Cap-2 Maneuver	725	-	-	-	-	-
Stage 1	909	-	-	-	-	-
Stage 2	862	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.9	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	936	1473	-	
HCM Lane V/C Ratio	-	-	0.211	-	-	
HCM Control Delay (s)	-	-	9.9	0	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	0.8	0	-	

HCM 6th TWSC  
4: N-S Collector St & YMCA Access

Short-Term Total Traffic  
Midday (2-3 PM)

Intersection

Int Delay, s/veh 0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	13	74	7	8	118
Future Vol, veh/h	1	13	74	7	8	118
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	-	-	-	205	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	75	92	92	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	14	99	8	9	157







Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	278	103	0
Stage 1	103	-	-
Stage 2	175	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	712	952	-
Stage 1	921	-	-
Stage 2	855	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	708	952	-
Mov Cap-2 Maneuver	722	-	-
Stage 1	915	-	-
Stage 2	855	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	931	1484
HCM Lane V/C Ratio	-	-	0.016	0.006
HCM Control Delay (s)	-	-	8.9	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	96	74	74	118	1
Future Vol, veh/h	7	96	74	74	118	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	255	-	-	205	205	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	128	99	99	157	1





Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	198	0	0 245 99
Stage 1	-	-	- 99 -
Stage 2	-	-	- 146 -
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	1375	-	- 743 957
Stage 1	-	-	- 925 -
Stage 2	-	-	- 881 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1375	-	- 738 957
Mov Cap-2 Maneuver	-	-	- 744 -
Stage 1	-	-	- 919 -
Stage 2	-	-	- 881 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1375	-	-	-	744	957
HCM Lane V/C Ratio	0.007	-	-	-	0.211	0.001
HCM Control Delay (s)	7.6	-	-	-	11.1	8.8
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	0.8	0

HCM 6th TWSC  
6: Pinehurst Cir & South School Access

Short-Term Total Traffic  
Midday (2-3 PM)























Intersection						
Int Delay, s/veh	8.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	214	0	0	0	0	148
Future Vol, veh/h	214	0	0	0	0	148
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	255	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	92	92	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	285	0	0	0	0	197
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1	0	-	0	571	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	570	-
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	1622	-	-	-	482	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	566	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	397	1084
Mov Cap-2 Maneuver	-	-	-	-	397	-
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	566	-
Approach	EB	WB		SB		
HCM Control Delay, s	7.7	0		9.1		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1622	-	-	-	-	1084
HCM Lane V/C Ratio	0.176	-	-	-	-	0.182
HCM Control Delay (s)	7.7	-	-	-	-	9.1
HCM Lane LOS	A	-	-	-	-	A
HCM 95th %tile Q(veh)	0.6	-	-	-	-	0.7

# Timings

1: SH 83 & SH 105/Walker Rd

Short-Term Total Traffic

PM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	63	99	171	83	105	175	350	54	47	474	76
Future Volume (vph)	63	99	171	83	105	175	350	54	47	474	76
Turn Type	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	7	4		3	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	25.0		10.0	25.0	10.0	45.0	45.0	10.0	45.0	45.0
Total Split (%)	11.1%	27.8%		11.1%	27.8%	11.1%	50.0%	50.0%	11.1%	50.0%	50.0%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	13.9	10.5	76.5	13.9	10.6	48.6	47.2	47.2	46.2	41.1	41.1
Actuated g/C Ratio	0.18	0.14	1.00	0.18	0.14	0.64	0.62	0.62	0.60	0.54	0.54
v/c Ratio	0.27	0.41	0.11	0.31	0.51	0.39	0.35	0.06	0.08	0.47	0.08
Control Delay	25.8	36.8	0.1	26.8	36.1	10.3	13.2	0.1	7.3	15.6	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
Total Delay	25.8	36.8	0.1	26.8	36.1	10.3	13.2	0.1	7.3	15.6	0.3
LOS	C	D	A	C	D	B	B	A	A	B	A
Approach Delay		15.9			32.5		11.1			13.0	
Approach LOS		B			C		B			B	

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 76.5

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 15.2

Intersection LOS: B

Intersection Capacity Utilization 62.8%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd

			
10 s	45 s	10 s	25 s
			
10 s	45 s	10 s	25 s



Intersection

Intersection Delay, s/veh 8.8

Intersection LOS A






Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	
Traffic Vol, veh/h	140	61	6	101	116	8
Future Vol, veh/h	140	61	6	101	116	8
Peak Hour Factor	0.77	0.92	0.92	0.99	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	182	66	7	102	126	9
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.9	8.5	9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	94%	0%	0%	6%
Vol Thru, %	0%	100%	0%	94%
Vol Right, %	6%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	124	140	61	107
LT Vol	116	0	0	6
Through Vol	0	140	0	101
RT Vol	8	0	61	0
Lane Flow Rate	135	182	66	109
Geometry Grp	2	7	7	5
Degree of Util (X)	0.183	0.251	0.079	0.141
Departure Headway (Hd)	4.899	4.971	4.268	4.664
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	733	724	841	770
Service Time	2.926	2.692	1.988	2.689
HCM Lane V/C Ratio	0.184	0.251	0.078	0.142
HCM Control Delay	9	9.4	7.4	8.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.7	1	0.3	0.5





HCM 6th TWSC  
3: N-S Collector St & North School Access

Short-Term Total Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	2.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	49	75	17	20	46
Future Vol, veh/h	0	49	75	17	20	46
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	-	-	155	255	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	53	82	18	22	50
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	176	82	0	0	100	0
Stage 1	82	-	-	-	-	-
Stage 2	94	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	814	978	-	-	1493	-
Stage 1	941	-	-	-	-	-
Stage 2	930	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	802	978	-	-	1493	-
Mov Cap-2 Maneuver	785	-	-	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	930	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	8.9	0	2.3			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	978	1493	-	
HCM Lane V/C Ratio	-	-	0.054	0.015	-	
HCM Control Delay (s)	-	-	8.9	7.4	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	







HCM 6th TWSC  
4: N-S Collector St & YMCA Access

Short-Term Total Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	4.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	51	41	22	26	20
Future Vol, veh/h	4	51	41	22	26	20
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	-	-	-	205	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	55	45	24	28	22
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	135	57	0	0	69	0
Stage 1	57	-	-	-	-	-
Stage 2	78	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	859	1009	-	-	1532	-
Stage 1	966	-	-	-	-	-
Stage 2	945	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	844	1009	-	-	1532	-
Mov Cap-2 Maneuver	810	-	-	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	945	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	8.9	0		4.2		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	991	1532	-	
HCM Lane V/C Ratio	-	-	0.06	0.018	-	
HCM Control Delay (s)	-	-	8.9	7.4	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-	

Intersection

Int Delay, s/veh 4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	38	16	24	24	20	4
Future Vol, veh/h	38	16	24	24	20	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	255	-	-	205	205	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	17	26	26	22	4





Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	52	0	0 125 26
Stage 1	-	-	- 26 -
Stage 2	-	-	- 99 -
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	1554	-	- 870 1050
Stage 1	-	-	- 997 -
Stage 2	-	-	- 925 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1554	-	- 847 1050
Mov Cap-2 Maneuver	-	-	- 799 -
Stage 1	-	-	- 971 -
Stage 2	-	-	- 925 -

Approach	EB	WB	SB
HCM Control Delay, s	5.2	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1554	-	-	-	799	1050
HCM Lane V/C Ratio	0.027	-	-	-	0.027	0.004
HCM Control Delay (s)	7.4	-	-	-	9.6	8.4
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0























HCM 6th TWSC  
6: Pinehurst Cir & South School Access

Short-Term Total Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	7.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	0	0	0	0	48
Future Vol, veh/h	36	0	0	0	0	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	255	-	-	-	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	39	0	0	0	0	52
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1	0	-	0	79	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	78	-
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	1622	-	-	-	924	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	945	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	902	1084
Mov Cap-2 Maneuver	-	-	-	-	902	-
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	945	-
Approach	EB	WB		SB		
HCM Control Delay, s	7.3	0		8.5		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1622	-	-	-	1084	
HCM Lane V/C Ratio	0.024	-	-	-	0.048	
HCM Control Delay (s)	7.3	-	-	-	8.5	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	

Timings  
1: SH 83 & SH 105/Walker Rd

2040 Background Traffic  
AM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	52	40	199	79	129	263	633	12	14	424	98
Future Volume (vph)	52	40	199	79	129	263	633	12	14	424	98
Turn Type	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	7	4		3	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	40.0		16.0	46.0	21.0	50.0	50.0	14.0	43.0	43.0
Total Split (%)	8.3%	33.3%		13.3%	38.3%	17.5%	41.7%	41.7%	11.7%	35.8%	35.8%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	13.0	10.5	89.6	21.9	14.5	57.3	55.3	55.3	44.5	38.6	38.6
Actuated g/C Ratio	0.15	0.12	1.00	0.24	0.16	0.64	0.62	0.62	0.50	0.43	0.43
v/c Ratio	0.27	0.20	0.13	0.26	0.66	0.49	0.58	0.01	0.04	0.56	0.13
Control Delay	31.0	39.9	0.2	28.1	43.2	11.4	15.6	0.0	9.1	24.7	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
Total Delay	31.0	39.9	0.2	28.1	43.2	11.4	15.6	0.0	9.1	24.7	0.3
LOS	C	D	A	C	D	B	B	A	A	C	A
Approach Delay		11.3			38.7		14.1			19.9	
Approach LOS		B			D		B			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 89.6

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 18.6

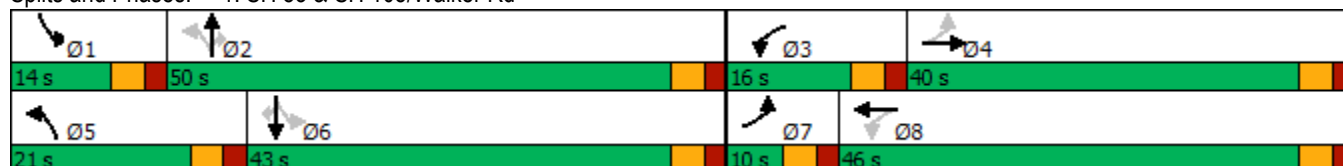
Intersection LOS: B

Intersection Capacity Utilization 68.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd



Intersection

Intersection Delay, s/veh 8.7







Intersection LOS A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	
Traffic Vol, veh/h	60	6	0	256	7	1
Future Vol, veh/h	60	6	0	256	7	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	7	0	278	8	1
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	9	7.9
HCM LOS	A	A	A























Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	88%	0%	0%	0%
Vol Thru, %	0%	100%	0%	100%
Vol Right, %	12%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	8	60	6	256
LT Vol	7	0	0	0
Through Vol	0	60	0	256
RT Vol	1	0	6	0
Lane Flow Rate	9	65	7	278
Geometry Grp	2	7	7	5
Degree of Util (X)	0.012	0.085	0.007	0.317
Departure Headway (Hd)	4.804	4.684	3.983	4.102
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	749	762	894	877
Service Time	2.804	2.431	1.729	2.133
HCM Lane V/C Ratio	0.012	0.085	0.008	0.317
HCM Control Delay	7.9	7.9	6.8	9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.3	0	1.4



Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	3	15	8	6	0
Future Vol, veh/h	0	3	15	8	6	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	255	-	-	205	205	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	3	16	9	7	0
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	25	0	-	0	19	16
Stage 1	-	-	-	-	16	-
Stage 2	-	-	-	-	3	-
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	1589	-	-	-	998	1063
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	1020	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1589	-	-	-	998	1063
Mov Cap-2 Maneuver	-	-	-	-	917	-
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	1020	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		9		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1589	-	-	-	917	-
HCM Lane V/C Ratio	-	-	-	-	0.007	-
HCM Control Delay (s)	0	-	-	-	9	0
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0	-

Timings  
1: SH 83 & SH 105/Walker Rd

2040 Background Traffic  
Midday (2-3 PM)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	62	81	183	27	76	185	394	34	25	457	55
Future Volume (vph)	62	81	183	27	76	185	394	34	25	457	55
Turn Type	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	7	4		3	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	25.0		10.0	25.0	10.0	45.0	45.0	10.0	45.0	45.0
Total Split (%)	11.1%	27.8%		11.1%	27.8%	11.1%	50.0%	50.0%	11.1%	50.0%	50.0%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	14.6	12.9	75.1	12.6	9.1	49.4	48.9	48.9	46.1	41.0	41.0
Actuated g/C Ratio	0.19	0.17	1.00	0.17	0.12	0.66	0.65	0.65	0.61	0.55	0.55
v/c Ratio	0.26	0.27	0.12	0.11	0.43	0.38	0.34	0.03	0.04	0.47	0.06
Control Delay	26.1	31.6	0.2	23.9	35.2	9.2	11.2	0.1	6.5	14.8	0.1
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	26.1	31.6	0.2	23.9	35.2	9.2	11.2	0.1	6.5	14.8	0.1
LOS	C	C	A	C	D	A	B	A	A	B	A
Approach Delay		12.9			32.7		9.9			12.9	
Approach LOS		B			C		A			B	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 75.1

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 13.3

Intersection LOS: B

Intersection Capacity Utilization 56.9%

ICU Level of Service B

Analysis Period (min) 15


Splits and Phases: 1: SH 83 & SH 105/Walker Rd

			
Ø1	Ø2	Ø3	Ø4
10 s	45 s	10 s	25 s
			
Ø5	Ø6	Ø7	Ø8
10 s	45 s	10 s	25 s

Intersection

Intersection Delay, s/veh 8  
Intersection LOS A

Movement EBT EBR WBL WBT NBL NBR







Lane Configurations   
Traffic Vol, veh/h 121 19 1 117 4 1  
Future Vol, veh/h 121 19 1 117 4 1  
Peak Hour Factor 0.92 0.92 0.92 0.92 0.92 0.92  
Heavy Vehicles, % 2 2 2 2 2 2  
Mvmt Flow 132 21 1 127 4 1  
Number of Lanes 1 1 0 1 1 0

Approach EB WB NB

Opposing Approach WB EB  
Opposing Lanes 1 2 0  
Conflicting Approach Left NB EB  
Conflicting Lanes Left 0 1 2  
Conflicting Approach Right NB WB  
Conflicting Lanes Right 1 0 1  
HCM Control Delay 8.1 7.9 7.6  
HCM LOS A A A























Lane NBLn1 EBLn1 EBLn2 WBLn1

Vol Left, % 80% 0% 0% 1%  
Vol Thru, % 0% 100% 0% 99%  
Vol Right, % 20% 0% 100% 0%  
Sign Control Stop Stop Stop Stop  
Traffic Vol by Lane 5 121 19 118  
LT Vol 4 0 0 1  
Through Vol 0 121 0 117  
RT Vol 1 0 19 0  
Lane Flow Rate 5 132 21 128  
Geometry Grp 2 7 7 5  
Degree of Util (X) 0.007 0.168 0.022 0.148  
Departure Headway (Hd) 4.602 4.606 3.905 4.155  
Convergence, Y/N Yes Yes Yes Yes  
Cap 782 780 917 858  
Service Time 2.602 2.328 1.627 2.203  
HCM Lane V/C Ratio 0.006 0.169 0.023 0.149  
HCM Control Delay 7.6 8.3 6.7 7.9  
HCM Lane LOS A A A A  
HCM 95th-tile Q 0 0.6 0.1 0.5

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	10	10	5	20	0
Future Vol, veh/h	0	10	10	5	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	255	-	-	205	205	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	75	75	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	12	7	27	0
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	19	0	-	0	24	12
Stage 1	-	-	-	-	12	-
Stage 2	-	-	-	-	12	-
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	1597	-	-	-	992	1069
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	1011	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1597	-	-	-	992	1069
Mov Cap-2 Maneuver	-	-	-	-	914	-
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	1011	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		9.1		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1597	-	-	-	914	-
HCM Lane V/C Ratio	-	-	-	-	0.029	-
HCM Control Delay (s)	0	-	-	-	9.1	0
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1	-

Timings  
1: SH 83 & SH 105/Walker Rd

2040 Background Traffic  
PM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	85	93	230	36	85	216	545	74	42	751	103
Future Volume (vph)	85	93	230	36	85	216	545	74	42	751	103
Turn Type	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	7	4		3	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	25.0		10.0	25.0	15.0	45.0	45.0	10.0	40.0	40.0
Total Split (%)	11.1%	27.8%		11.1%	27.8%	16.7%	50.0%	50.0%	11.1%	44.4%	44.4%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	13.9	11.4	74.9	13.0	9.5	50.8	46.7	46.7	41.3	36.1	36.1
Actuated g/C Ratio	0.19	0.15	1.00	0.17	0.13	0.68	0.62	0.62	0.55	0.48	0.48
v/c Ratio	0.34	0.33	0.15	0.14	0.45	0.66	0.48	0.07	0.09	0.85	0.13
Control Delay	27.8	34.5	0.2	24.2	35.6	23.7	14.4	0.3	7.4	32.6	1.6
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	27.8	34.5	0.2	24.2	35.6	23.7	14.4	0.3	7.4	32.6	1.6
LOS	C	C	A	C	D	C	B	A	A	C	A
Approach Delay		13.8			32.7		15.6			27.8	
Approach LOS		B			C		B			C	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 74.9

Natural Cycle: 65

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 21.1

Intersection LOS: C

Intersection Capacity Utilization 75.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd



Intersection







Intersection Delay, s/veh 8.9

Intersection LOS A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	
Traffic Vol, veh/h	190	19	1	138	4	1
Future Vol, veh/h	190	19	1	138	4	1
Peak Hour Factor	0.77	0.92	0.92	0.99	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	247	21	1	139	4	1
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.3	8.2	7.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	80%	0%	0%	1%
Vol Thru, %	0%	100%	0%	99%
Vol Right, %	20%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	190	19	139
LT Vol	4	0	0	1
Through Vol	0	190	0	138
RT Vol	1	0	19	0
Lane Flow Rate	5	247	21	140
Geometry Grp	2	7	7	5
Degree of Util (X)	0.007	0.316	0.022	0.165
Departure Headway (Hd)	4.896	4.612	3.911	4.237
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	735	780	915	834
Service Time	2.896	2.338	1.636	2.322
HCM Lane V/C Ratio	0.007	0.317	0.023	0.168
HCM Control Delay	7.9	9.5	6.7	8.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	1.4	0.1	0.6























Intersection						
Int Delay, s/veh	4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	10	10	5	20	0
Future Vol, veh/h	0	10	10	5	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	255	-	-	205	205	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	11	5	21	0
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	16	0	-	0	22	11
Stage 1	-	-	-	-	11	-
Stage 2	-	-	-	-	11	-
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	1602	-	-	-	995	1070
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	1012	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1602	-	-	-	995	1070
Mov Cap-2 Maneuver	-	-	-	-	916	-
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	1012	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		9		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1602	-	-	-	916	-
HCM Lane V/C Ratio	-	-	-	-	0.023	-
HCM Control Delay (s)	0	-	-	-	9	0
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1	-

# Timings

1: SH 83 & SH 105/Walker Rd

2040 Total Traffic

AM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	52	234	199	202	157	374	681	12	97	424	98
Future Volume (vph)	52	234	199	202	157	374	681	12	97	424	98
Turn Type	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	7	4		3	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	40.0		16.0	46.0	21.0	50.0	50.0	14.0	43.0	43.0
Total Split (%)	8.3%	33.3%		13.3%	38.3%	17.5%	41.7%	41.7%	11.7%	35.8%	35.8%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	28.2	23.1	108.4	39.2	31.3	59.2	45.7	45.7	46.5	38.1	38.1
Actuated g/C Ratio	0.26	0.21	1.00	0.36	0.29	0.55	0.42	0.42	0.43	0.35	0.35
v/c Ratio	0.19	0.79	0.13	0.94	0.55	0.94	0.91	0.02	0.63	0.68	0.15
Control Delay	24.3	54.5	0.2	68.6	35.3	50.5	48.3	0.1	33.4	37.4	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
Total Delay	24.3	54.5	0.2	68.6	35.3	50.5	48.3	0.1	33.4	37.4	0.5
LOS	C	D	A	E	D	D	D	A	C	D	A
Approach Delay		31.9			51.4		48.4			31.1	
Approach LOS		C			D		D			C	

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 108.4

Natural Cycle: 90

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 41.8

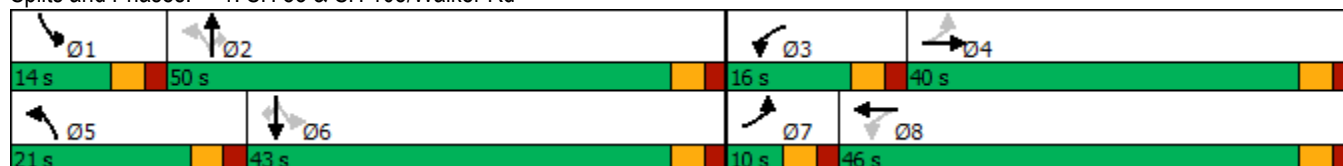
Intersection LOS: D

Intersection Capacity Utilization 83.2%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd





HCM 6th AWSC  
2: N-S Collector St & Walker Rd

2040 Total Traffic  
AM Peak Hour

Intersection

Intersection Delay, s/veh 20.8

Intersection LOS C






Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗		↖	↘	
Traffic Vol, veh/h	60	282	28	256	162	18
Future Vol, veh/h	60	282	28	256	162	18
Peak Hour Factor	0.84	0.53	0.53	1.00	0.53	0.53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	71	532	53	256	306	34
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	24.9	15.6	18.4
HCM LOS	C	C	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	90%	0%	0%	10%
Vol Thru, %	0%	100%	0%	90%
Vol Right, %	10%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	180	60	282	284
LT Vol	162	0	0	28
Through Vol	0	60	0	256
RT Vol	18	0	282	0
Lane Flow Rate	340	71	532	309
Geometry Grp	2	7	7	5
Degree of Util (X)	0.596	0.122	0.804	0.52
Departure Headway (Hd)	6.316	6.155	5.443	6.063
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	571	580	660	590
Service Time	4.384	3.922	3.21	4.14
HCM Lane V/C Ratio	0.595	0.122	0.806	0.524
HCM Control Delay	18.4	9.8	26.9	15.6
HCM Lane LOS	C	A	D	C
HCM 95th-tile Q	3.9	0.4	8.2	3

HCM 6th TWSC  
3: N-S Collector St & North School Access

2040 Total Traffic  
AM Peak Hour





Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	179	79	96	214
Future Vol, veh/h	0	0	179	79	96	214
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	-	-	155	255	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	53	53	53	53	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	338	149	181	404
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1104	338	0	0	487	0
Stage 1	338	-	-	-	-	-
Stage 2	766	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	234	704	-	-	1076	-
Stage 1	722	-	-	-	-	-
Stage 2	459	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	195	704	-	-	1076	-
Mov Cap-2 Maneuver	241	-	-	-	-	-
Stage 1	601	-	-	-	-	-
Stage 2	459	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	0	0	2.8			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	-	1076	-	
HCM Lane V/C Ratio	-	-	-	0.168	-	
HCM Control Delay (s)	-	-	0	9	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	-	0.6	-	

HCM 6th TWSC  
4: N-S Collector St & YMCA Access

2040 Total Traffic  
AM Peak Hour

Intersection

Int Delay, s/veh 0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	30	228	30	36	178
Future Vol, veh/h	4	30	228	30	36	178
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	-	-	-	205	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	53	92	92	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	33	430	33	39	336

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	861	447	0
Stage 1	447	-	-
Stage 2	414	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	326	612	-
Stage 1	644	-	-
Stage 2	667	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	314	612	-
Mov Cap-2 Maneuver	428	-	-
Stage 1	621	-	-
Stage 2	667	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0.9
HCM LOS	B		







Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	583	1098
HCM Lane V/C Ratio	-	-	0.063	0.036
HCM Control Delay (s)	-	-	11.6	8.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

HCM 6th TWSC  
5: Pinehurst Cir & N-S Collector St

2040 Total Traffic  
AM Peak Hour

Intersection

Int Delay, s/veh 21.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	96	128	171	161	179	3
Future Vol, veh/h	96	128	171	161	179	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	255	-	-	205	205	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	53	75	75	53	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	181	171	228	304	338	6

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	532	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	1036	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1036	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	4.7	0	72.2
HCM LOS			F





Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1036	-	-	-	352	811
HCM Lane V/C Ratio	0.175	-	-	-	0.959	0.007
HCM Control Delay (s)	9.2	-	-	-	73.2	9.5
HCM Lane LOS	A	-	-	-	F	A
HCM 95th %tile Q(veh)	0.6	-	-	-	10.4	0

Notes

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

HCM 6th TWSC  
6: Pinehurst Cir & South School Access

2040 Total Traffic  
AM Peak Hour







Intersection						
Int Delay, s/veh	15.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	295	11	35	16	16	295
Future Vol, veh/h	295	11	35	16	16	295
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	255	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	53	92	92	75	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	557	12	38	21	30	557
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	59	0	-	0	1175	49
Stage 1	-	-	-	-	49	-
Stage 2	-	-	-	-	1126	-
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	1545	-	-	-	212	1020
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	310	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1545	-	-	-	135	1020
Mov Cap-2 Maneuver	-	-	-	-	135	-
Stage 1	-	-	-	-	622	-
Stage 2	-	-	-	-	310	-
Approach	EB	WB		SB		
HCM Control Delay, s	8.5	0		23.6		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1545	-	-	-	763	
HCM Lane V/C Ratio	0.36	-	-	-	0.769	
HCM Control Delay (s)	8.6	-	-	-	23.6	
HCM Lane LOS	A	-	-	-	C	
HCM 95th %tile Q(veh)	1.7	-	-	-	7.5	

HCM 6th AWSC  
5: Pinehurst Cir & N-S Collector St

2040 Total Traffic  
AM Peak Hour

Intersection

Intersection Delay, s/veh	16.6
Intersection LOS	C

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	96	128	171	161	179	3
Future Vol, veh/h	96	128	171	161	179	3
Peak Hour Factor	0.53	0.75	0.75	0.53	0.53	0.53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	181	171	228	304	338	6
Number of Lanes	1	1	1	1	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	13.3	13.8	24.4
HCM LOS	B	B	C

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	96	128	171	161	179	3
LT Vol	96	0	0	0	179	0
Through Vol	0	128	171	0	0	0
RT Vol	0	0	0	161	0	3
Lane Flow Rate	181	171	228	304	338	6
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.36	0.315	0.41	0.486	0.686	0.01
Departure Headway (Hd)	7.162	6.651	6.47	5.756	7.307	6.089
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	500	538	554	623	493	585
Service Time	4.945	4.434	4.247	3.533	5.072	3.854
HCM Lane V/C Ratio	0.362	0.318	0.412	0.488	0.686	0.01
HCM Control Delay	14	12.5	13.7	13.9	24.7	8.9
HCM Lane LOS	B	B	B	B	C	A
HCM 95th-tile Q	1.6	1.3	2	2.7	5.2	0























HCM 6th Roundabout  
5: Pinehurst Cir & N-S Collector St

2040 Total Traffic  
AM Peak Hour

Intersection			
Intersection Delay, s/veh	7.8		
Intersection LOS	A		
Approach	EB	WB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	352	532	344
Demand Flow Rate, veh/h	359	543	351
Vehicles Circulating, veh/h	345	185	233
Vehicles Exiting, veh/h	239	519	495
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	7.8	8.5	6.6
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	LR
RT Channelized			
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
Entry Flow, veh/h	359	543	351
Cap Entry Lane, veh/h	971	1143	1088
Entry HV Adj Factor	0.979	0.981	0.980
Flow Entry, veh/h	352	532	344
Cap Entry, veh/h	951	1120	1066
V/C Ratio	0.370	0.475	0.323
Control Delay, s/veh	7.8	8.5	6.6
LOS	A	A	A
95th %tile Queue, veh	2	3	1

Timings  
1: SH 83 & SH 105/Walker Rd

2040 Total Traffic  
Midday (2-3 PM)

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	62	162	183	136	148	238	417	34	60	457	55
Future Volume (vph)	62	162	183	136	148	238	417	34	60	457	55
Turn Type	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	7	4		3	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	25.0		10.0	25.0	10.0	45.0	45.0	10.0	45.0	45.0
Total Split (%)	11.1%	27.8%		11.1%	27.8%	11.1%	50.0%	50.0%	11.1%	50.0%	50.0%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	20.7	15.7	85.9	21.8	17.9	46.2	42.3	42.3	45.1	40.1	40.1
Actuated g/C Ratio	0.24	0.18	1.00	0.25	0.21	0.54	0.49	0.49	0.53	0.47	0.47
v/c Ratio	0.27	0.63	0.12	0.71	0.65	0.62	0.48	0.05	0.18	0.55	0.07
Control Delay	24.3	41.1	0.2	41.9	38.8	19.7	18.4	0.1	9.9	20.3	0.2
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	24.3	41.1	0.2	41.9	38.8	19.7	18.4	0.1	9.9	20.3	0.2
LOS	C	D	A	D	D	B	B	A	A	C	A
Approach Delay		22.1			40.1		17.7			17.0	
Approach LOS		C			D		B			B	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 85.9

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 22.7






Intersection LOS: C

Intersection Capacity Utilization 70.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd

			
Ø1	Ø2	Ø3	Ø4
10 s	45 s	10 s	25 s
			
Ø5	Ø6	Ø7	Ø8
10 s	45 s	10 s	25 s



Intersection

Intersection Delay, s/veh 10.6

Intersection LOS B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	
Traffic Vol, veh/h	121	135	13	117	209	17
Future Vol, veh/h	121	135	13	117	209	17
Peak Hour Factor	0.92	0.75	0.75	0.81	0.75	0.75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	132	180	17	144	279	23
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.4	9.9	12.1
HCM LOS	A	A	B






Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	92%	0%	0%	10%
Vol Thru, %	0%	100%	0%	90%
Vol Right, %	8%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	226	121	135	130
LT Vol	209	0	0	13
Through Vol	0	121	0	117
RT Vol	17	0	135	0
Lane Flow Rate	301	132	180	162
Geometry Grp	2	7	7	5
Degree of Util (X)	0.432	0.202	0.24	0.235
Departure Headway (Hd)	5.156	5.516	4.809	5.228
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	693	646	740	679
Service Time	3.229	3.292	2.584	3.312
HCM Lane V/C Ratio	0.434	0.204	0.243	0.239
HCM Control Delay	12.1	9.7	9.1	9.9
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2.2	0.8	0.9	0.9

HCM 6th TWSC  
3: N-S Collector St & North School Access

2040 Total Traffic  
Midday (2-3 PM)

Intersection

Int Delay, s/veh 3.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	141	85	0	0	147
Future Vol, veh/h	7	141	85	0	0	147
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	-	-	155	255	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	188	113	0	0	196

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	309	113	0
Stage 1	113	-	-
Stage 2	196	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	683	940	-
Stage 1	912	-	-
Stage 2	837	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	683	940	-
Mov Cap-2 Maneuver	708	-	-
Stage 1	912	-	-
Stage 2	837	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0
HCM LOS	A		





Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	926	1476
HCM Lane V/C Ratio	-	-	0.213	-
HCM Control Delay (s)	-	-	9.9	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0

HCM 6th TWSC  
4: N-S Collector St & YMCA Access

2040 Total Traffic  
Midday (2-3 PM)

Intersection

Int Delay, s/veh 0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	12	72	7	8	146
Future Vol, veh/h	2	12	72	7	8	146
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	-	-	-	205	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	75	92	92	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	13	96	8	9	195







Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	313	100	0
Stage 1	100	-	-
Stage 2	213	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	680	956	-
Stage 1	924	-	-
Stage 2	823	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	676	956	-
Mov Cap-2 Maneuver	697	-	-
Stage 1	918	-	-
Stage 2	823	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	908	1488
HCM Lane V/C Ratio	-	-	0.017	0.006
HCM Control Delay (s)	-	-	9	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection

Int Delay, s/veh 4.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	96	84	73	146	1
Future Vol, veh/h	6	96	84	73	146	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	255	-	-	205	205	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	128	112	97	195	1

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	209	0	0 256 112
Stage 1	-	-	- 112 -
Stage 2	-	-	- 144 -
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	1362	-	- 733 941
Stage 1	-	-	- 913 -
Stage 2	-	-	- 883 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1362	-	- 729 941
Mov Cap-2 Maneuver	-	-	- 739 -
Stage 1	-	-	- 908 -
Stage 2	-	-	- 883 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1362	-	-	-	739	941
HCM Lane V/C Ratio	0.006	-	-	-	0.263	0.001
HCM Control Delay (s)	7.7	-	-	-	11.6	8.8
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0	-	-	-	1.1	0





HCM 6th TWSC  
6: Pinehurst Cir & South School Access

2040 Total Traffic  
Midday (2-3 PM)

Intersection

Int Delay, s/veh 7.4

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	203	38	16	11	7	141
Future Vol, veh/h	203	38	16	11	7	141
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	255	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	92	92	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	271	41	17	15	9	188

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	32	0	-	0	608	25
Stage 1	-	-	-	-	25	-
Stage 2	-	-	-	-	583	-
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	1580	-	-	-	459	1051
Stage 1	-	-	-	-	998	-
Stage 2	-	-	-	-	558	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1580	-	-	-	380	1051
Mov Cap-2 Maneuver	-	-	-	-	380	-
Stage 1	-	-	-	-	826	-
Stage 2	-	-	-	-	558	-

Approach EB WB SB







HCM Control Delay, s	6.7	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1580	-	-	-	970
HCM Lane V/C Ratio	0.171	-	-	-	0.203
HCM Control Delay (s)	7.7	-	-	-	9.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.6	-	-	-	0.8

Intersection

Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	96	84	73	146	1
Future Vol, veh/h	6	96	84	73	146	1
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	128	112	97	195	1
Number of Lanes	1	1	1	1	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	9.3	8.6	11.3
HCM LOS	A	A	B

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	6	96	84	73	146	1
LT Vol	6	0	0	0	146	0
Through Vol	0	96	84	0	0	0
RT Vol	0	0	0	73	0	1
Lane Flow Rate	8	128	112	97	195	1
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.013	0.19	0.164	0.124	0.317	0.002
Departure Headway (Hd)	5.845	5.341	5.279	4.574	5.859	4.654
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	611	671	679	782	611	765
Service Time	3.59	3.086	3.018	2.313	3.612	2.407
HCM Lane V/C Ratio	0.013	0.191	0.165	0.124	0.319	0.001
HCM Control Delay	8.7	9.3	9.1	8	11.3	7.4
HCM Lane LOS	A	A	A	A	B	A
HCM 95th-tile Q	0	0.7	0.6	0.4	1.4	0

HCM 6th Roundabout  
5: Pinehurst Cir & N-S Collector St

2040 Total Traffic  
Midday (2-3 PM)























Intersection			
Intersection Delay, s/veh	4.2		
Intersection LOS	A		
Approach	EB	WB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	136	209	196
Demand Flow Rate, veh/h	139	213	200
Vehicles Circulating, veh/h	199	8	114
Vehicles Exiting, veh/h	115	330	107
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.3	4.0	4.4
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	LR
RT Channelized			
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
Entry Flow, veh/h	139	213	200
Cap Entry Lane, veh/h	1126	1369	1228
Entry HV Adj Factor	0.982	0.980	0.980
Flow Entry, veh/h	136	209	196
Cap Entry, veh/h	1106	1341	1204
V/C Ratio	0.123	0.156	0.163
Control Delay, s/veh	4.3	4.0	4.4
LOS	A	A	A
95th %tile Queue, veh	0	1	1

# Timings

1: SH 83 & SH 105/Walker Rd

2040 Total Traffic

PM Peak Hour

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	85	137	230	91	126	236	554	74	61	751	103
Future Volume (vph)	85	137	230	91	126	236	554	74	61	751	103
Turn Type	pm+pt	NA	Free	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		Free	8		2		2	6		6
Detector Phase	7	4		3	8	5	2	2	1	6	6
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
Minimum Split (s)	10.0	10.0		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	25.0		10.0	25.0	15.0	45.0	45.0	10.0	40.0	40.0
Total Split (%)	11.1%	27.8%		11.1%	27.8%	16.7%	50.0%	50.0%	11.1%	44.4%	44.4%
Yellow Time (s)	3.0	3.0		3.0	3.0	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	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
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	16.1	12.2	80.4	16.1	12.2	50.4	42.7	42.7	40.3	35.3	35.3
Actuated g/C Ratio	0.20	0.15	1.00	0.20	0.15	0.63	0.53	0.53	0.50	0.44	0.44
v/c Ratio	0.36	0.51	0.15	0.36	0.59	0.80	0.59	0.09	0.16	0.97	0.14
Control Delay	27.5	38.3	0.2	27.3	38.5	38.4	18.8	0.4	9.2	50.2	1.9
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	27.5	38.3	0.2	27.3	38.5	38.4	18.8	0.4	9.2	50.2	1.9
LOS	C	D	A	C	D	D	B	A	A	D	A
Approach Delay		16.9			34.5		22.6			42.1	
Approach LOS		B			C		C			D	

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 80.4

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 29.9

Intersection LOS: C

Intersection Capacity Utilization 82.7%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: SH 83 & SH 105/Walker Rd

			
Ø1	Ø2	Ø3	Ø4
10 s	45 s	10 s	25 s
			
Ø5	Ø6	Ø7	Ø8
15 s	40 s	10 s	25 s



Intersection

Intersection Delay, s/veh 9.5

Intersection LOS A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑		↑	↑	
Traffic Vol, veh/h	190	82	7	138	114	9
Future Vol, veh/h	190	82	7	138	114	9
Peak Hour Factor	0.77	0.92	0.92	0.99	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	247	89	8	139	124	10
Number of Lanes	1	1	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.7	9	9.4
HCM LOS	A	A	A






Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	93%	0%	0%	5%
Vol Thru, %	0%	100%	0%	95%
Vol Right, %	7%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	123	190	82	145
LT Vol	114	0	0	7
Through Vol	0	190	0	138
RT Vol	9	0	82	0
Lane Flow Rate	134	247	89	147
Geometry Grp	2	7	7	5
Degree of Util (X)	0.192	0.344	0.107	0.194
Departure Headway (Hd)	5.161	5.015	4.311	4.763
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	694	718	831	753
Service Time	3.199	2.747	2.043	2.801
HCM Lane V/C Ratio	0.193	0.344	0.107	0.195
HCM Control Delay	9.4	10.4	7.6	9
HCM Lane LOS	A	B	A	A
HCM 95th-tile Q	0.7	1.5	0.4	0.7

HCM 6th TWSC  
3: N-S Collector St & North School Access

2040 Total Traffic  
PM Peak Hour

Intersection

Int Delay, s/veh 2.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	47	76	17	20	67
Future Vol, veh/h	2	47	76	17	20	67
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	-	-	155	255	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	51	83	18	22	73





Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	200	83	0
Stage 1	83	-	-
Stage 2	117	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	789	976	-
Stage 1	940	-	-
Stage 2	908	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	777	976	-
Mov Cap-2 Maneuver	767	-	-
Stage 1	926	-	-
Stage 2	908	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	1.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	965	1491
HCM Lane V/C Ratio	-	-	0.055	0.015
HCM Control Delay (s)	-	-	8.9	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0

HCM 6th TWSC  
4: N-S Collector St & YMCA Access

2040 Total Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	3.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	48	45	22	26	43
Future Vol, veh/h	7	48	45	22	26	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	205	-
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	8	52	49	24	28	47

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	164	61	0	0	73
Stage 1	61	-	-	-	-
Stage 2	103	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	827	1004	-	-	1527
Stage 1	962	-	-	-	-
Stage 2	921	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	812	1004	-	-	1527
Mov Cap-2 Maneuver	787	-	-	-	-
Stage 1	945	-	-	-	-
Stage 2	921	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	2.8
HCM LOS	A		







Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	970	1527
HCM Lane V/C Ratio	-	-	0.062	0.019
HCM Control Delay (s)	-	-	9	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

HCM 6th TWSC  
5: Pinehurst Cir & N-S Collector St

2040 Total Traffic  
PM Peak Hour

Intersection

Int Delay, s/veh 4.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	34	25	35	32	46	4
Future Vol, veh/h	34	25	35	32	46	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	255	-	-	205	205	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	37	27	38	35	50	4

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	73	0	0 139 38
Stage 1	-	-	- 38 -
Stage 2	-	-	- 101 -
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	1527	-	- 854 1034
Stage 1	-	-	- 984 -
Stage 2	-	-	- 923 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1527	-	- 834 1034
Mov Cap-2 Maneuver	-	-	- 795 -
Stage 1	-	-	- 960 -
Stage 2	-	-	- 923 -

Approach	EB	WB	SB
HCM Control Delay, s	4.3	0	9.7
HCM LOS			A





Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1527	-	-	-	795	1034
HCM Lane V/C Ratio	0.024	-	-	-	0.063	0.004
HCM Control Delay (s)	7.4	-	-	-	9.8	8.5
HCM Lane LOS	A	-	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0

HCM 6th TWSC  
6: Pinehurst Cir & South School Access

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	34	35	19	2	2	46
Future Vol, veh/h	34	35	19	2	2	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	255	-	-	-	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	37	38	21	2	2	50

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	23	0	0 134 22
Stage 1	-	-	- 22 -
Stage 2	-	-	- 112 -
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	1592	-	- 860 1055
Stage 1	-	-	- 1001 -
Stage 2	-	-	- 913 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1592	-	- 840 1055
Mov Cap-2 Maneuver	-	-	- 840 -
Stage 1	-	-	- 978 -
Stage 2	-	-	- 913 -

Approach	EB	WB	SB
HCM Control Delay, s	3.6	0	8.6
HCM LOS			A







Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1592	-	-	-	1044
HCM Lane V/C Ratio	0.023	-	-	-	0.05
HCM Control Delay (s)	7.3	-	-	-	8.6
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

HCM 6th AWSC  
5: Pinehurst Cir & N-S Collector St

2040 Total Traffic  
PM Peak Hour

Intersection

Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	34	25	35	32	46	4
Future Vol, veh/h	34	25	35	32	46	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	27	38	35	50	4
Number of Lanes	1	1	1	1	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	2
HCM Control Delay	7.9	7.3	8.4
HCM LOS	A	A	A

Lane	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	34	25	35	32	46	4
LT Vol	34	0	0	0	46	0
Through Vol	0	25	35	0	0	0
RT Vol	0	0	0	32	0	4
Lane Flow Rate	37	27	38	35	50	4
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.053	0.035	0.049	0.038	0.073	0.005
Departure Headway (Hd)	5.166	4.665	4.661	3.96	5.263	4.062
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	688	760	760	892	673	866
Service Time	2.94	2.439	2.44	1.738	3.059	1.858
HCM Lane V/C Ratio	0.054	0.036	0.05	0.039	0.074	0.005
HCM Control Delay	8.2	7.6	7.7	6.9	8.5	6.9
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.2	0.1	0.2	0

HCM 6th Roundabout  
5: Pinehurst Cir & N-S Collector St

2040 Total Traffic  
PM Peak Hour

Intersection			
Intersection Delay, s/veh	3.2		
Intersection LOS	A		
Approach	EB	WB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	64	73	54
Demand Flow Rate, veh/h	66	75	55
Vehicles Circulating, veh/h	51	38	39
Vehicles Exiting, veh/h	43	79	74
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.2	3.2	3.1
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	LT	TR	LR
Assumed Moves	LT	TR	LR
RT Channelized			
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
Entry Flow, veh/h	66	75	55
Cap Entry Lane, veh/h	1310	1327	1326
Entry HV Adj Factor	0.977	0.976	0.982
Flow Entry, veh/h	64	73	54
Cap Entry, veh/h	1279	1296	1302
V/C Ratio	0.050	0.057	0.041
Control Delay, s/veh	3.2	3.2	3.1
LOS	A	A	A
95th %tile Queue, veh	0	0	0

## Queuing and Blocking Report

## Intersection: 1: SH 83 &amp; SH 105/Walker Rd

Movement	EB	EB	WB	WB	NB	NB	NB	B14	B14	SB	SB	SB
Directions Served	L	T	L	TR	L	T	R	T	T	L	T	R
Maximum Queue (ft)	90	298	264	344	476	655	71	358	264	134	401	60
Average Queue (ft)	38	141	127	112	240	332	3	74	31	53	218	7
95th Queue (ft)	76	239	244	241	498	683	52	394	277	105	347	37
Link Distance (ft)		619		612		672	672	886	886		630	
Upstream Blk Time (%)				0		6		0	0			
Queuing Penalty (veh)				0		35		1	1			
Storage Bay Dist (ft)	300		300		500					475		475
Storage Blk Time (%)		0	2	0	3	6					0	
Queuing Penalty (veh)		1	5	0	17	22					0	



# Queuing and Blocking Report

## Intersection: 1: SH 83 & SH 105/Walker Rd

Movement	EB	EB	WB	WB	NB	NB	B14	SB	SB	SB
Directions Served	L	T	L	TR	L	T	T	L	T	R
Maximum Queue (ft)	95	198	182	210	196	224	157	77	284	33
Average Queue (ft)	41	89	79	100	94	100	6	28	142	2
95th Queue (ft)	84	157	152	177	176	181	115	63	245	17
Link Distance (ft)		619		612		672	886		630	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300		300		500			475		475
Storage Blk Time (%)										
Queuing Penalty (veh)										

# Queuing and Blocking Report

2040 Total Traffic

2040 Total Traffic

## Intersection: 1: SH 83 & SH 105/Walker Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	B10
Directions Served	L	T	L	TR	L	T	R	L	T	R	T
Maximum Queue (ft)	122	172	114	190	217	258	33	500	728	500	461
Average Queue (ft)	56	83	54	84	101	125	1	170	551	239	183
95th Queue (ft)	104	141	100	149	166	218	14	526	874	645	522
Link Distance (ft)		619		612		672	672		630		431
Upstream Blk Time (%)									31		20
Queuing Penalty (veh)									0		0
Storage Bay Dist (ft)	300		300		500			475		475	
Storage Blk Time (%)								0	35	0	
Queuing Penalty (veh)								0	56	1	