Traffic Operations and Safety Assessment

Wekiva Springs Road Traffic Study

Seminole County, Florida

March 2016

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Seminole County, Florida

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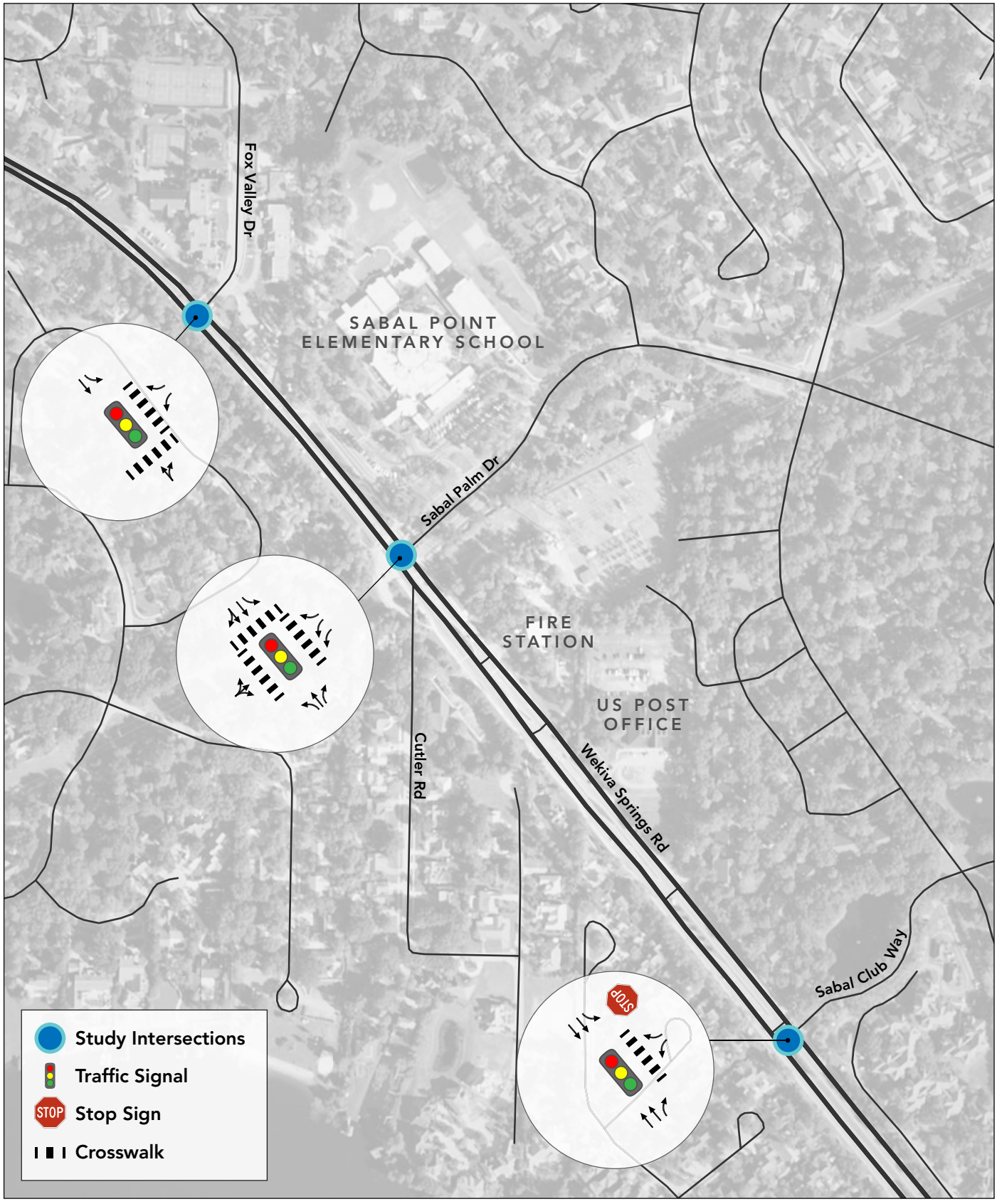
INTRODUCTION

Seminole County requested Kittelson & Associates, Inc. (KAI) to evaluate the crash history and conduct an operations and safety assessment along Wekiva Springs Road from Sabal Club Way to Fox Valley Drive in Seminole County, Florida. This safety assessment originated from concerns noted by the Seminole County Sherriff's Office and local citizens at the signalized intersection of Wekiva Springs Road and Sabal Palm Drive. Wekiva Springs road is a four-lane divided roadway east of Sabal Palm Drive, but the westbound outside lane drops into a right-turn lane at the Sabal Palm Drive intersection. The intersection has a history of crashes associated with vehicles merging from the westbound right-turn lane to the westbound through lane. After reviewing the crash history and conducting travel time studies, Seminole County requested KAI to conduct an operations and safety assessment.

STUDY AREA CHARACTERISTICS

The study area spans approximately 0.5 miles of Wekiva Springs Road and includes the intersections at Sabal Club Way (unsignalized), Sabal Palm Drive (signalized), and Fox Valley Drive (signalized). Wekiva Springs Road is a minor arterial oriented in a northwest/southeast direction, providing connectivity between homes and businesses in the Wekiva Springs area and SR 434. North of the study area, Wekiva Springs Road bends to the west, connecting to Wekiva Springs State Park and further on to Apopka. In the study area's vicinity, Wekiva Spring Road provides access to residential neighborhoods. Fire Station #16, the United States Post Office, and Sabal Point Elementary School are located along the north side as well. **Figure 1** displays the location of the study limits and the lane configurations of the study intersections.

Sabal Club Way, Sabal Palm Drive, and Fox Valley Drive are local streets providing access to the residential subdivisions to the north. Sabal Club Way and Fox Valley Drive form T-intersections with Wekiva Springs Road to provide access to the residential communities to the north. Sabal Palm Drive is a four-legged intersection providing access to residential communities north and south of Wekiva Springs Road, as well as access to Sabal Point Elementary School in the northwest corner of the intersection. Wekiva Springs Road is a four-lane divided road east of Sabal Palm Drive, and a two-lane road west of Fox Valley Drive. Wekiva Springs Road has an unbalanced section between Sabal Palm Drive and Fox Valley Drive, with two eastbound lanes and one westbound lane. The posted speed along Wekiva Springs Road is 35 mph throughout the study limits.



PROJECT LOCATION MAP
SEMINOLE COUNTY, FLORIDA

Figure
1

Section 2
Existing Conditions

EXISTING CONDITIONS

The project team conducted an existing conditions review of the study area, including a historical crash review, field observations, and intersection operations analyses.

HISTORICAL CRASH ANALYSIS

Crash records at the intersection were obtained from Seminole County for a three-year study period (2012-2014) and supplemented with crash data from Florida *Signal Four Analytics*. Over the three-year period, 94 crashes were reported along the study corridor, of which 11 resulted in injury. There were no fatalities. The proportion of severe crashes (12 percent) on this facility is low compared to similar facilities in Florida. Crashes rates ranged between 26 crashes per year in 2012 and 34 crashes per year in 2013 and 2014. The collision types are summarized in **Table 1**.

Table 1 Collision Types

Collision Type	All Crashes		Severe Crashes	
	Frequency	Proportion	Frequency	Proportion
Rear End	62	66%	5	45%
Sideswipe	11	12%	0	-
Left Turn	9	10%	3	27%
Angle	4	4%	1	10%
Bicycle	3	3%	2	18%
Run Off Road	1	1%	0	-
Other	4	4%	0	-
Total	**94**	**100%**	**11**	**100%**

Rear end collisions accounted for two-thirds of the reported crashes and nearly half of the injury crashes. Sideswipe was the second-highest crash type accounting for 12 percent of reported crashes, but no injuries. Other crash types contributing to injuries included left turn, angle, and bicycle crashes.

Of the 73 rear end and sideswipe crashes, 81 percent (59 crashes) occurred along Wekiva Springs Road in the westbound direction. The westbound direction is heaviest during the PM peak, when commuters are returning home from work. Analysis of the crash reports revealed that nearly 90 percent of the crashes occurred during weekdays, and 30 percent of the crashes occurred during the PM peak period (4 to 6 PM). Comparably, less than five percent occurred during the AM peak hour (7 to 9 AM). The crash frequencies by day of week and by hour of day are illustrated in **Figure 2** and **Figure 3**, respectively.

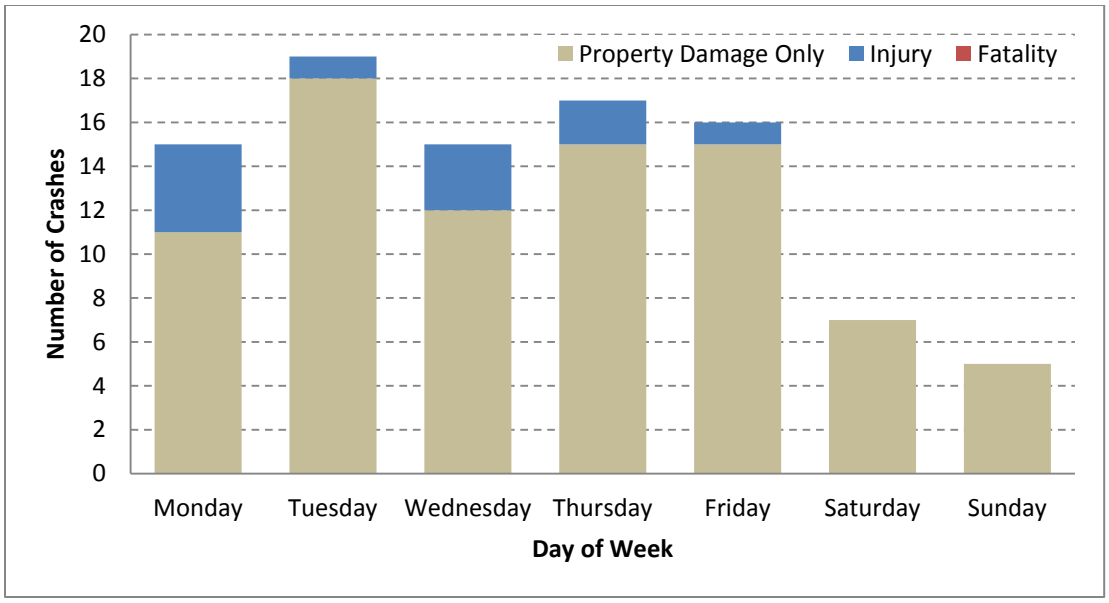


Figure 2 Crash Frequency by Day of Week (2012-2014)

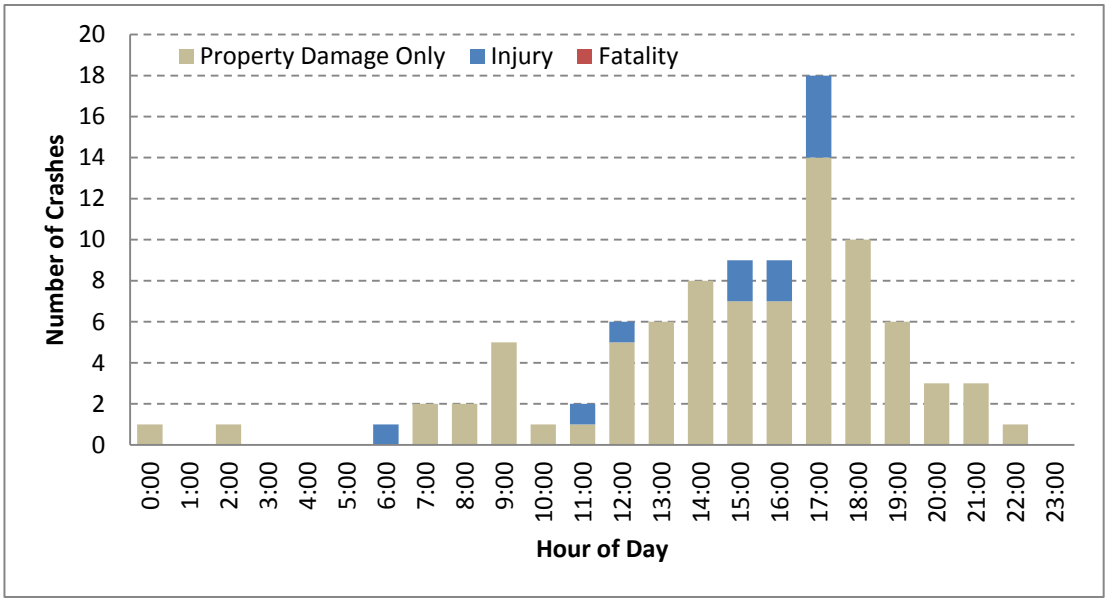
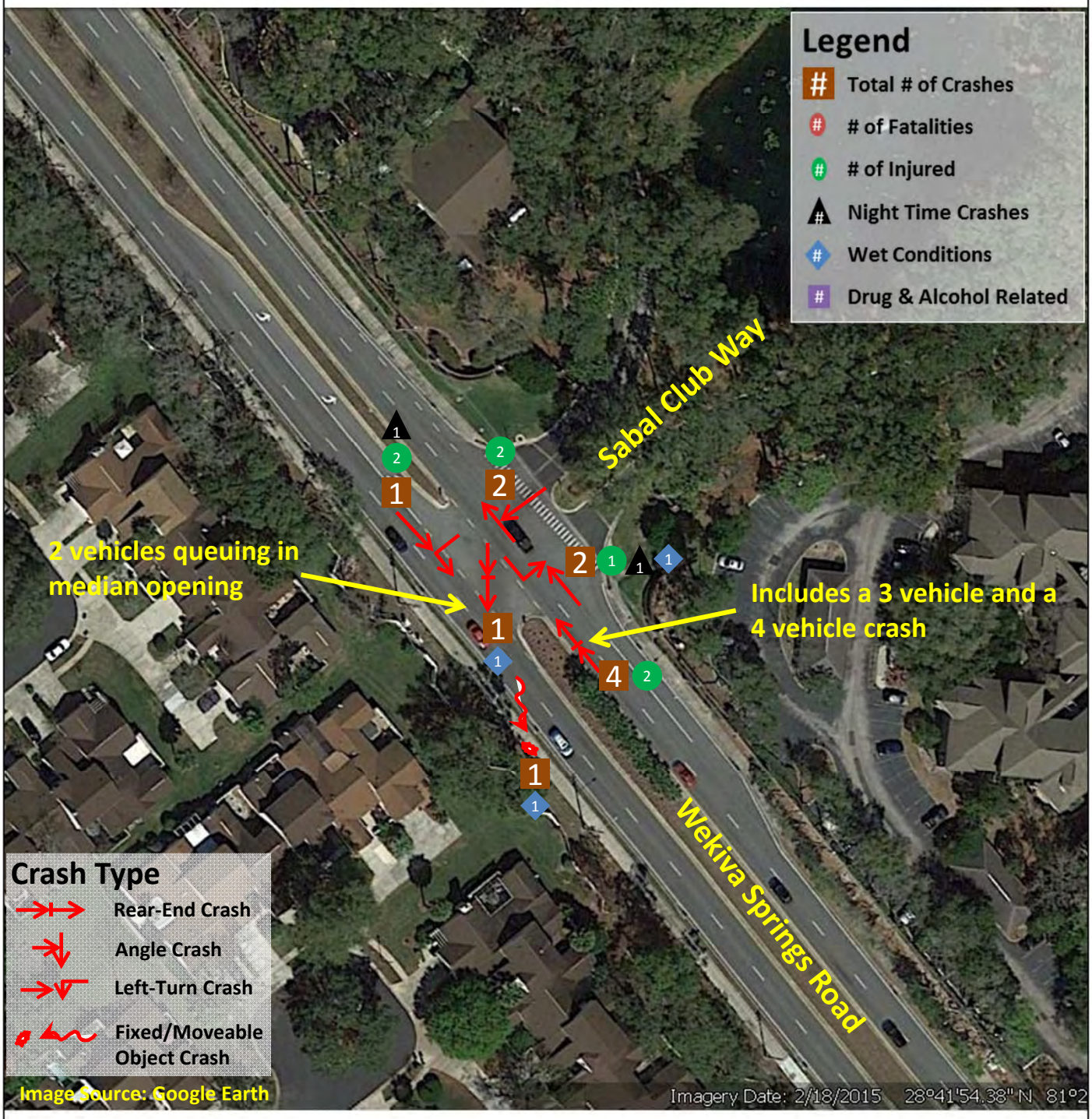


Figure 3 Crash Frequency by Hour of Day (2012-2014)

Each police crash report was reviewed, and a collision diagram illustrating each crash is provided in **Figure 4**. The observed crashes were generally broken down by location as follows:

- Wekiva Springs Road at Sabal Club Way – 11 crashes, including four injury crashes
- Wekiva Springs Road east of Sabal Palm Drive – 13 crashes (no injuries)
- Wekiva Springs Road at Sabal Palm Drive – 56 crashes, including six injury crashes
- Wekiva Springs Road at Fox Valley Drive – 14 crashes, including one injury crash

Most of the crashes (76 percent) occurred in daylight conditions. However, 16 percent occurred on wet road surface conditions. Driver distraction was noted by the reporting officer in 18 percent of the crashes.



Wekiva Springs Road @ Sabal Club Way
Collision Diagram (2012 – 2014)

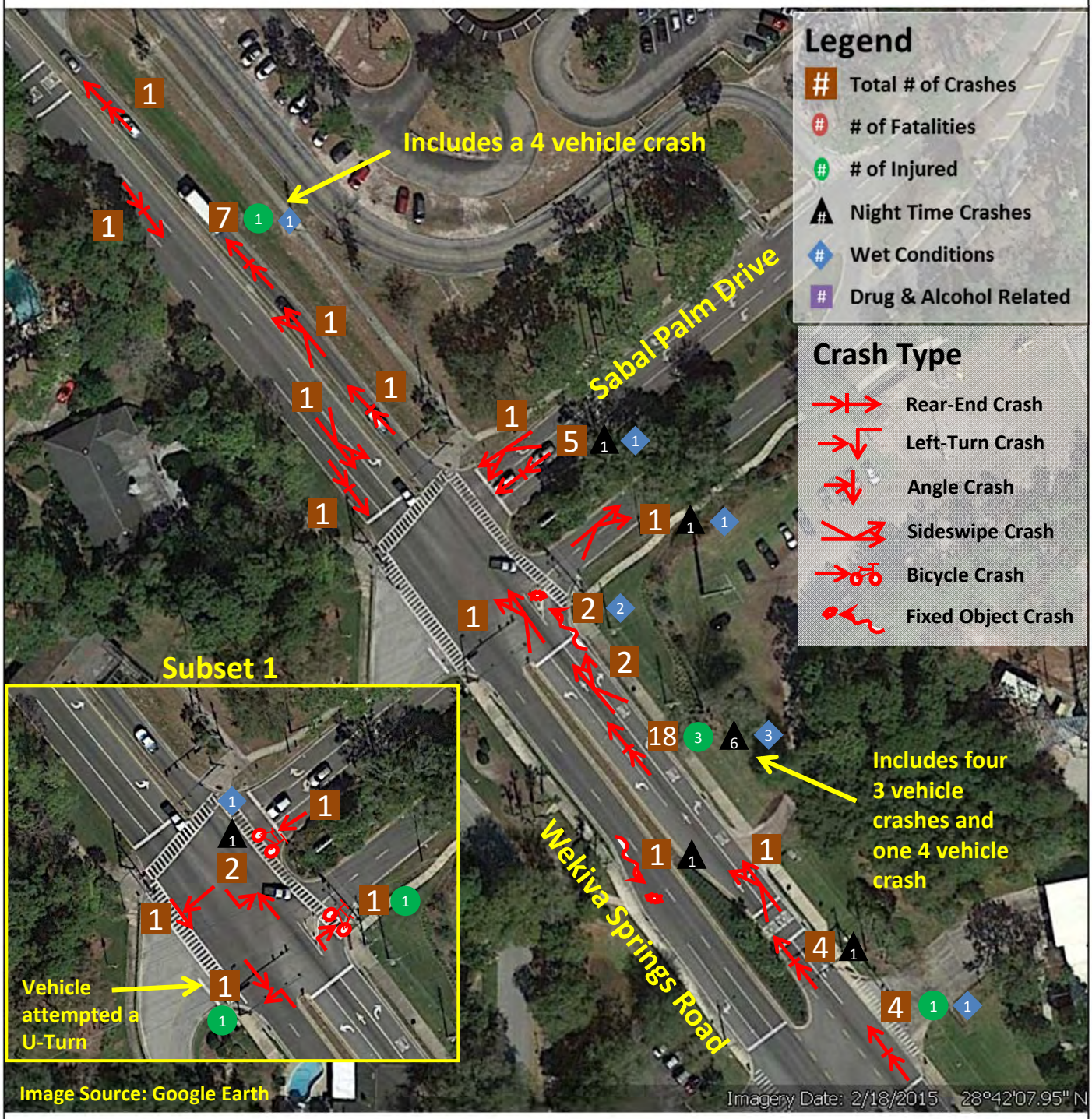
Figure
4a

Wekiva Springs Road North of Sabal Club Way
Collision Diagram (2012 – 2014)

Figure
4b

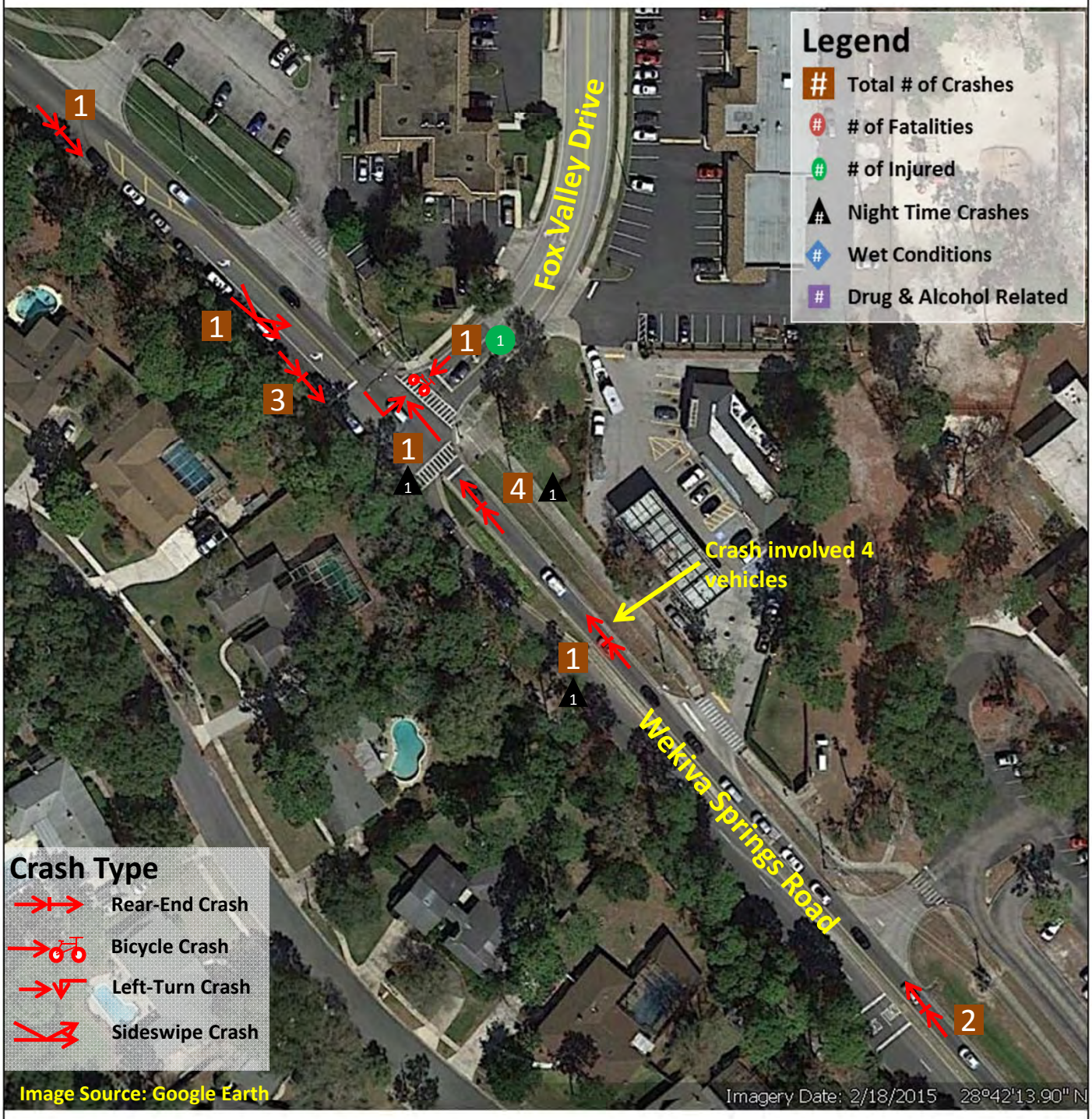
Wekiva Springs Road South of Sabal Palm Drive
Collision Diagram (2012 – 2014)

Figure
4c



Wekiva Springs Road @ Sabal Palm Drive
Collision Diagram (2012 – 2014)

Figure
4d



Wekiva Springs Road @ Fox Valley Drive
Collision Diagram (2012 – 2014)

Figure
4e

FIELD OBSERVATIONS

KAI staff conducted multiple field reviews of the study area to document existing conditions, observe operational and safety issues, and note motorist behaviors. Field reviews were conducted during the weekday AM peak period, mid-afternoon school dismissal period, and the PM peak period. The field reviews were conducted in May 2015 and October 2015 while school was in session. Observations are summarized in the sections below.

General Observations

- In the westbound direction, Wekiva Springs Road transitions from two lanes to one lane with a right-turn lane drop at the Sabal Palm Drive intersection.
    - In advance of the right-turn lane drop, RIGHT TURN LANE ENDS warning signs are present 900 feet and 500 feet upstream on both sides of the road. Additionally, three RIGHT LANE MUST TURN RIGHT regulatory signs are present in 200-foot intervals approaching the Sabal Palm Drive intersection.
    - Solid white lane striping is present between the fire station emergency signal and Sabal Palm Drive (approximately 300 feet).
- In the eastbound direction, Wekiva Springs Road transitions from one lane to two lanes just east of the Fox Valley Drive intersection.
- A condition diagram illustrating the signs and pavement markings is provided in **Appendix A**.

AM Peak Period Operations

- The peak direction traffic was eastbound in the morning, with the majority of commuter traffic leaving the residential areas to the west/north and traveling toward SR 434 and I-4 to the east. Good eastbound signal progression was noted between Fox Valley Drive and Sabal Palm Drive.
- An extensive eastbound queue was present at the Fox Valley Drive signal, which only has one eastbound lane through the intersection (see **Figure 5**).

Figure 5 Eastbound AM Queue

- At the Fox Valley Drive intersection, a school crossing guard assisted students walking to school. The intersection's pedestrian phase limited vehicular capacity at the intersection, contributing to the eastbound queue.
- Westbound traffic demand and westbound queuing associated with the school arrival period was noted, and the westbound queue cleared at approximately 8:40 AM (see **Figure 6**).

Figure 6 Westbound AM Queue

- The minor approaches at the two signalized intersections were adequately served.
- Late merging from the westbound right-turn lane to the westbound through lane at Sabal Palm Drive was noted but was minimal.

Mid-Afternoon Peak Period Operations

- The mid-afternoon peak period was associated with the school dismissal period at Sabal Point Elementary School.
- Heavy queuing developed in the westbound direction along Wekiva Springs Road. At times the queue from Fox Valley Drive extended through the signal at Sabal Palm Drive (see **Figure 7**). The queue at Sabal Palm Drive extended past the fire station (400 feet to the east).

Figure 7 Westbound Mid-Day Queue

- School pedestrian crossings at Fox Valley Drive appeared to extend or interrupt the cycle and break up the coordination between the Fox Valley Drive and Sabal Palm Drive intersections.
- Traffic congestion cleared the intersections by 3:05 PM.
- Late merging from the westbound right-turn lane to the westbound through lane at Sabal Palm Drive was noted, but it was minimal and occurred at low speeds.

PM Peak Period Operations

- The peak direction of traffic was westbound in the evening, with the majority of commuter traffic returning from SR 434 and I-4 to the residential areas in and beyond the study area.
- Westbound signal progression was noted between Sabal Palm Drive and Fox Valley Drive. However, the westbound demand originating from the east (two westbound lanes on Wekiva Springs Road) exceeded the capacity of the westbound movements through the Sabal Palm Drive and Fox Valley Drive intersections (one westbound lane on Wekiva Springs Road).
- Because westbound demand exceeded capacity, a westbound queue developed between Fox Valley Drive and Sabal Palm Drive and extended more than a half-mile east of Sabal Palm Drive. It was noted the queue in the through lane extended beyond the first warning sign notifying motorists of the lane drop – 900 feet upstream of Sabal Palm Drive (see **Figure 8**).

Figure 8 Westbound PM Queue

- The westbound queue remained throughout the entire peak hour.
- Late merging from the westbound right-turn lane to the westbound through lane at Sabal Palm Drive occurred at a higher rate (approximately one to two per cycle) than in the morning and mid-afternoon peak periods (see **Figure 9**).

Figure 9 Late Lane Changing

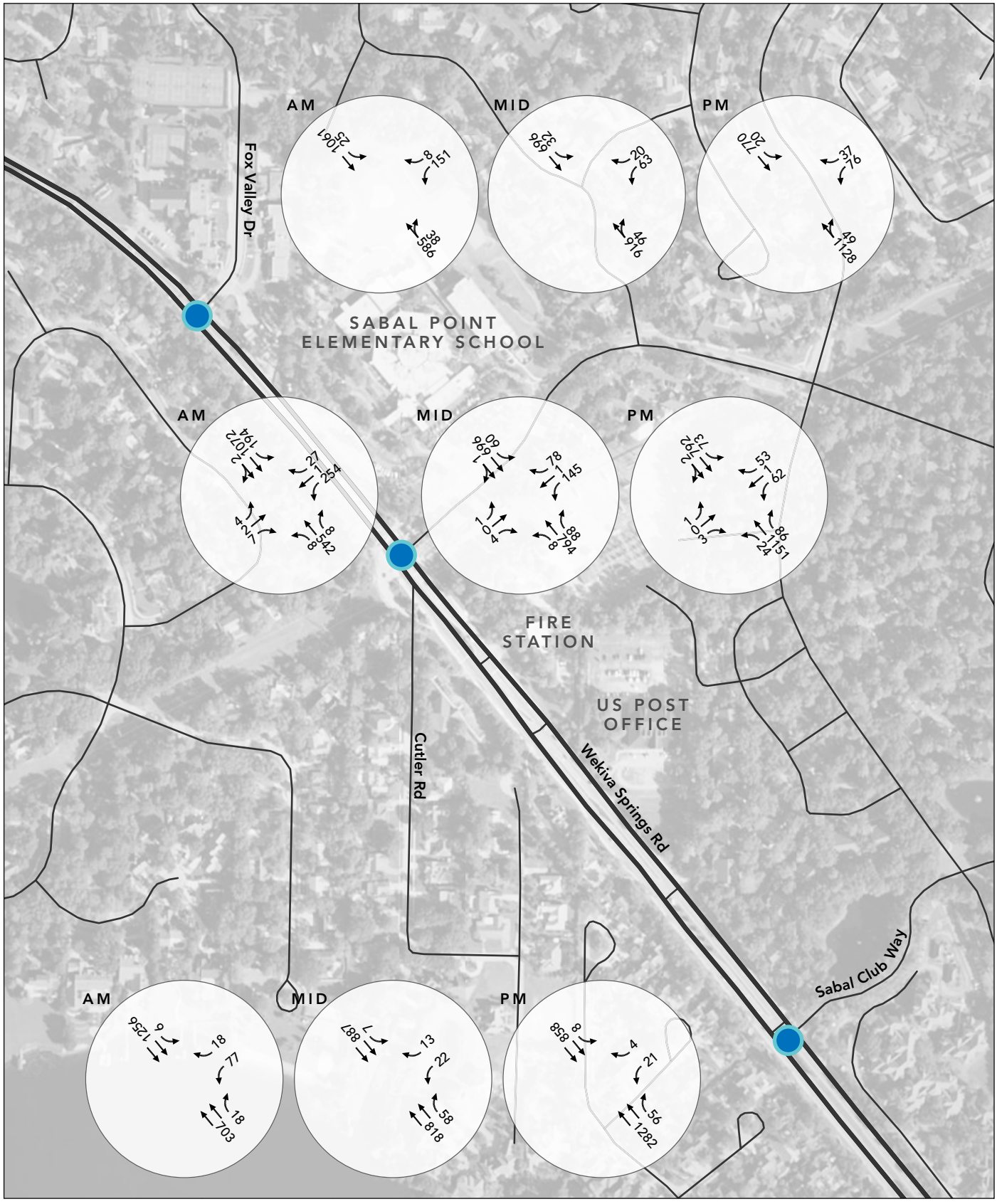
TRAFFIC OPERATIONS

Intersection turning movement volumes were obtained during the AM, mid-afternoon, and PM peak periods on a typical weekday while school was in session. The intersection volumes were adjusted with a 0.98 seasonal factor based upon the 2014 Florida Traffic Information (FTI) seasonal factor for the week of data collection. The raw traffic counts are provided in **Appendix B**, and the seasonally adjusted traffic volumes are illustrated in **Figure 10**.

Intersection Capacity Analysis

The AM, mid-afternoon, and PM peak hour intersection operations were analyzed using Synchro 9 and the Highway Capacity Software (HCS 2010), and the analyses are summarized in **Table 2**, **Table 3**, and **Table 4**, respectively. Intersection capacity analysis output is provided in **Appendix C**.

In the AM peak hour, the eastbound peak direction operates at LOS B at Fox Valley Drive, according to Highway Capacity procedures, and the volume is approaching capacity with a volume-to-capacity (v/c) ratio of 0.88. The eastbound v/c ratio decreases to 0.49 at Sabal Palm Drive due to the addition of the second through lane. The minor approaches operate at LOS E and LOS F due to the long cycle length, and the southbound approaches at Fox Valley Drive and at Sabal Palm Drive are approaching capacity with v/c ratios between 0.85 and 0.90. As noted in the field review observations, extensive eastbound queuing developed at the Fox Valley Drive intersection that is not reflected in the capacity analysis. The corridor is capacity constrained on that approach, so the volume processed (and analyzed) does not fully represent the traffic demand during the peak analysis period.



EXISTING (2015) INTERSECTION VOLUMES
SEMINOLE COUNTY, FLORIDA

Figure **10**

Table 2 Corridor Operations Summary – AM Peak Hour

Intersection Metric	Eastbound	Westbound	Northbound	Southbound	Overall
Wekiva Springs Road at Fox Valley Drive *(signalized)*					
LOS	B	B	-	E	C
Average Delay (sec)	17.9	10.7	-	77.7	20.6
v/c Ratio	0.88	0.57	-	0.89	-
Wekiva Springs Road at Sabal Palm Drive *(signalized)*					
LOS	B	B	F	F	C
Average Delay (sec)	12.2	16.3	105.8	84.6	23.5
v/c Ratio	0.49	0.53	0.54	0.85	-
Wekiva Springs Road at Sabal Club Way *(unsignalized)**					
LOS	B	-	-	F	-
Average Delay (sec)	10.4	-	-	80.2	-
v/c Ratio	0.01	-	-	0.67	-

**Performance measures reported for critical movements at unsignalized intersection approaches*

Table 3 Corridor Operations Summary – Mid-Afternoon Peak Hour

Intersection Metric	Eastbound	Westbound	Northbound	Southbound	Overall
Wekiva Springs Road at Fox Valley Drive *(signalized)*					
LOS	A	B	-	E	B
Average Delay (sec)	4.5	15.1	-	71.6	13.4
v/c Ratio	0.54	0.82	-	0.78	-
Wekiva Springs Road at Sabal Palm Drive *(signalized)*					
LOS	B	C	E	D	C
Average Delay (sec)	11.2	32.0	69.2	47.0	25.5
v/c Ratio	0.39	0.93	0.44	0.74	-
Wekiva Springs Road at Sabal Club Way *(unsignalized)**					
LOS	A	-	-	E	-
Average Delay (sec)	9.6	-	-	35.3	-
v/c Ratio	0.01	-	-	0.17	-

**Performance measures reported for critical movements at unsignalized intersection approaches*

In the mid-afternoon peak hour, the westbound peak direction operates at LOS C and LOS B at Sabal Palm Drive and Fox Valley Drive, respectively, with corresponding v/c ratios of 0.93 and 0.82, respectively. Vehicles leaving Sabal Point Elementary are served by the southbound approach at Sabal Palm Drive operating at LOS D with a v/c ratio of 0.74.

Table 4 Corridor Operations Summary – PM Peak Hour

Intersection Metric	Eastbound	Westbound	Northbound	Southbound	Overall
Wekiva Springs Road at Fox Valley Drive *(signalized)*					
LOS	A	C	-	F	C
Average Delay (sec)	6.6	32.0	-	91.9	25.6
v/c Ratio	0.59	0.96	-	0.81	-
Wekiva Springs Road at Sabal Palm Drive *(signalized)*					
LOS	B	D	F	F	C
Average Delay (sec)	11.7	38.8	121.8	91.2	31.2
v/c Ratio	0.66	0.98	0.46	0.77	-
Wekiva Springs Road at Sabal Club Way *(unsignalized)**					
LOS	B	-	-	F	-
Average Delay (sec)	11.8	-	-	74.9	-
v/c Ratio	0.02	-	-	0.30	-

**Performance measures reported for critical movements at unsignalized intersection approaches*

In the PM peak hour, the westbound peak direction operates at LOS D and LOS C at Sabal Palm Drive and Fox Valley Drive, respectively. The volume is at or near capacity with v/c ratios near 1.0. The minor approaches operate at LOS F due to the long cycle length, but the v/c ratios are less than 0.85. Similar to the AM peak period, the capacity analysis does not fully and accurately represent the field conditions, particularly on the westbound approaches at the Sabal Palm Drive and the Fox Valley Drive intersections. Extensive queueing beyond the peak hour reveals that corridor is capacity constrained on the westbound approaches, so the volume processed (and analyzed) does not fully represent the traffic demand during the peak analysis period.

Corridor Simulation Analysis

In addition to the intersection capacity analyses, corridor analysis was conducted using Synchro's SimTraffic simulation software to more accurately capture the peak hour queue's interaction with other intersections and its impact on the system as a whole. Five simulation runs were conducted for the study in each of the study periods (i.e., AM, mid-afternoon, and PM peak hours), and network statistics were averaged to obtain measures of effectiveness for each period. The average network measures of effectiveness are reported in **Table 5**, and detailed simulation reports are provided in **Appendix D**. Over the three peak hours of a typical weekday, the network experiences a total delay of 400 hours, approximately 9,000 total stops, and 265 gallons of fuel consumption.

Table 5 Network Measures of Effectiveness - Existing

Peak Hour	Total Delay (hours)	Total Stops	Fuel Consumption (gallons)
AM Peak	147.7	2,336	92.3
Mid-Afternoon Peak	140.6	2,986	83.4
PM Peak	112.6	3,645	88.6
Total	**400.9**	**8,967**	**264.3**

**AM and Mid-Afternoon Peak Hours includes school traffic delays on side streets*

In the AM peak hour, the greatest delays are reported on Wekiva Springs Road eastbound at Fox Valley Drive (9.0 hours) and at Sabal Palm Drive (4.1 hours), and southbound on Sabal Palm Drive (5.5 hours). The eastbound queue at Fox Valley Drive exceeds 500 feet, which is consistent with field observations.

In the mid-afternoon peak hour, the greatest delay is reported on Wekiva Springs Road westbound at Sabal Palm Drive (50.5 hours), and the queue exceeds 1,900 feet. Similarly, in the PM peak hour, the greatest delay is reported on Wekiva Springs Road westbound at Sabal Palm Drive (52.0 hours), with an additional 37.3 hours reported upstream of Sabal Club Way. The westbound queue is reported to extend from the Sabal Palm Drive intersection to 1,400 feet beyond the Sabal Club Way intersection, which is consistent with field observations.

Section 3
Potential Safety Improvements

POTENTIAL SAFETY IMPROVEMENTS

After completion of the field reviews and the existing conditions analysis, a project team meeting was held with Seminole County staff and a citizen stakeholder representing the Wekiva Springs Road Safety Task Force. Discussion from the meeting resulted in direction to assess a range of potential improvements to address the corridor's safety issues. The improvements varied from signing and pavement marking improvements to corridor operational improvements.

SIGNING AND PAVEMENT MARKING IMPROVEMENTS

To address the issue of lane change/merging issues within the Wekiva Springs Road/Sabal Palm Drive intersection influence area and provide advanced warning of the westbound queueing at the intersection, three short-term improvements were identified. Two of these improvements relate to lane changes at or near the Sabal Palm Drive intersection, and the other relates to advanced warning regarding the extensive westbound queue in the PM peak period. The following sections describe the potential effectiveness and feasibility of these improvements.

Lane Changes at Intersection

Two options were considered to help mitigate the lane change behavior occurring immediately east of the Sabal Palm Drive intersection:

- Provide more direct guidance to westbound through vehicles to begin merging upstream by adding merge signage/pavement markings between the fire station and the US Postal Service driveway, approximately 400 to 900 feet east of the Sabal Palm Drive intersection; and

- Prohibit and/or physically restrict lane changing from the fire station driveway west to the Sabal Palm Drive intersection (300 feet). Lane changing could be prohibited by painting a double white line between the right-turn lane and the westbound through lane, or the movement could be physically restricted by installing a Qwick Kurb traffic separator.

Lane Change Guidance

In the existing condition, right-turn arrows with the words ONLY are painted from the fire station driveway to the westbound stop bar for an approximate length of 300 feet. In addition to the pavement markings, RIGHT LANE ENDS warning signs are placed approximately 500 feet and 900 feet in advance of the intersection on both sides of the road, and RIGHT LANE MUST TURN RIGHT regulatory signs are posted at 200-foot interval approaching the intersection. There are seven signs notifying approaching motorists of the lane drop beginning 900 feet upstream of the intersection.

Figure 11 Existing Warning and Regulatory Signs

To further emphasize the right-turn lane drop lane at the intersection, the use of additional merge signs and lane-reduction transition markings was evaluated to inform westbound drivers to merge 400 to 900 feet in advance of the intersection. The FHWA *Manual on Uniform Traffic Control Devices for Street and Highways, 2009 Edition* (MUTCD) was consulted for guidance and standards. Section 2C.42 of the MUTCD states:

> "*In dropped lane situations, regulatory signs (see Section 2B.20) shall be used to inform road users that a through lane is becoming a mandatory turn lane. The W4-2* [LANE ENDS]*, W9-1* [RIGHT LANE ENDS]*, and W9-2* [LANE ENDS MERGE LEFT] *signs shall not be used in dropped lane situations.*" (Emphasis added)

Similarly, Section 3B.09 of the MUTCD states:

> "*Lane-reduction transition markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. Lane-reduction transition markings are not used for lane drops.*" (Emphasis added)

For the lane drop situation, Section 3B.04 of the 2009 MUTCD states:

> *"A dotted white line marking shall be used as the lane line to separate a through lane that continues beyond the interchange or intersection from an adjacent lane for…a through lane that becomes a mandatory exit or turn lane."* (Emphasis added)

The MUTCD states that lane ends warning signs and lane-reduction transition markings are not to be used in lane drop situations. Therefore, the option of adding merge signs and lane-reduction transition markings is not feasible at this location. However, modifying the typical broken white line to be a dotted white line between the Post Office driveway (900 feet) and the fire station (400 feet) would further emphasize to the motorist the approaching lane drop into a mandatory right-turn lane. While this improvement will provide benefit to motorists throughout the day, its benefit will diminish somewhat during the PM peak period when the queue westbound extends beyond 900 feet.

It is also recommended the RIGHT LANE ENDS signs be replaced with RIGHT LANE MUST TURN RIGHT signs for consistency with the MUTCD. The plaques below the signs displaying the number of feet (500 feet and 900 feet) to the Sabal Palm Drive intersection should be maintained.

Lane Change Restriction

To provide a more formal separation and prohibit lane change or merging movements between the westbound through and right-turn lanes, painting a double white stripe from the fire station driveway to the westbound stop bar was evaluated. Section 3B.04 of the 2009 MUTCD states:

> *"Where crossing the lane line markings is discouraged, the lane line markings shall consist of a normal or wide solid white line."* (Emphasis added)

This section also provides the following standard:

> *"Where crossing the lane line markings is prohibited, the lane line markings shall consist of a solid double white line (see Figure 3B-12)."* (Emphasis added)

In the existing condition, crossing the lane line markings is discouraged (but not prohibited) by a solid white line. If the County desires to prohibit crossing the lane line markings at this location, it would be feasible to paint a double white line between the westbound through and right-turn lanes. The installation of a double white line should be supplemented with enforcement.

The double white stripes are typically six inches wide (each) with four inches of separation between for a total width of 16 inches. With the existing six-inch stripe, an extra 10 inches would be needed for the double white stripe installation, and five inches could be taken from each of the 11-foot travel lanes. An example application from the MUTCD is shown in **Figure 12**.

Figure 3B-12. Example of Solid Double White Lines Used to Prohibit Lane Changing

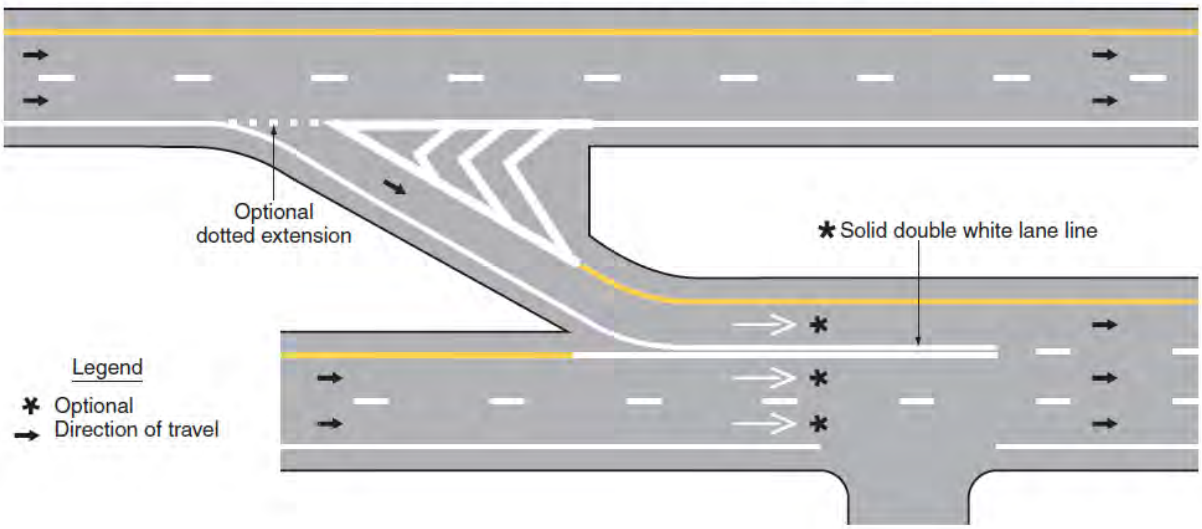


Figure 12 Example Application of Solid Double White Line (MUTCD)

Another option to provide a more formal separation and physically restrict lane change or merging movements between the westbound through and right-turn lanes includes the installation of a Qwick Kurb traffic separator, as illustrated in **Figure 13**.

Figure 13 Example Qwick Kurb Applications (www.qwickkurb.com)

While the Qwick Kurb traffic separator would successfully restrict lane change and merging movements near the intersection, the following issues were considered:

- The Qwick Kurb installation requires a minimum width of 11 ¾ inches without any striping. In this case, six-inch white striping separated by a minimum of two inches from the Qwick Kurb would be painted on either side for a total width of 27 ¾ inches (or two feet, four inches). With the existing six-inch stripe, an extra 21 ¾ inches would be needed for the installation, reducing each of the 11-foot travel lanes to approximately 10-foot, one-inch. Narrowing the lane widths to approximately 10 feet may create an issue with fixed object crashes, both with the newly constructed traffic separator and the median curb or outside curb. The narrow lanes can be mitigated by widening the road and relocating the north curb and gutter to the edge of sidewalk, adding two to three feet of pavement width to accommodate the traffic separator.

- The traffic separator may potentially impact emergency vehicle mobility westbound through the intersection, particularly in a situation where the westbound through lane is full and the traffic signal is red. The County should coordinate with emergency service departments prior to implementation of a traffic separator at this location.

Based on the alternatives considered and the issues discussed, lane change and merging near the intersection can be prohibited through the use of a solid double white line at a relatively low cost. A physical traffic separator also appears to be feasible, but at a higher cost. Implementation may require moving the outside curb, and it should also be coordinated with emergency services.

Queue Spillback Warning System

The lane changing improvements presented earlier will address some of the intersection's safety issues in uncongested periods. However, the issues are exacerbated in the PM peak period when the westbound queue extends more than a half-mile in the inside through lane. The following improvement was considered to provide approaching motorists with advance information when the westbound queue is extensive:

- Install a changeable message sign approximately 1,000 feet east of the Lake Brantley Drive/Sabal Palm Drive South signalized intersection that would activate when the queue from the Sabal Palm Drive intersection extends beyond a certain point (e.g., Sabal Club Way).

Section 2L.02 of the 2009 MUTCD states that changeable message signs can be applied in warning situations. The changeable message sign could display the following message (or a similar message) when the queue extends to (or beyond) Sabal Club Way:

The changeable message sign will alert westbound-through drivers to change lanes early when an extensive westbound queue is present. The changeable message sign should be activated by a loop detector that detects the presence of the queue in the westbound inside lane. The changeable message sign should be installed in a location that provides sufficient distance for through-traveling motorists to change lanes in advance of reaching the back of queue. The feasibility of this improvement should be coordinated with the County's Traffic Engineering division.

OPERATIONAL IMPROVEMENTS

The correlation between the corridor's rear end and sideswipe crash issues and the PM peak congestion period was discussed previously in the Historical Crash Analysis section. The extensive westbound queue that develops in the PM peak period is associated with the high numbers of rear end and sideswipe crashes occurring in that direction during the PM peak period. The queue also contributes to improper lane changing activity at the Sabal Palm Drive intersection as the back-of-queue prevents some vehicles from positioning in the correct lane before the outside lane becomes a mandatory right-turn lane. This is supported by field observations.

An operational improvement was considered to increase throughput capacity on Wekiva Springs Road at the Sabal Palm Drive and the Fox Valley Drive intersections. The peak demand at the signalized intersections approaches or exceeds the capacity of a single through lane – eastbound at Fox Valley Drive in the AM peak, and westbound at Sabal Palm Drive and at Fox Valley Drive in the PM peak, resulting in excessive queueing at the signals – eastbound in AM peak and westbound in the PM peak.

Increasing the through capacity at these intersections will reduce the queues (or eliminate them altogether) during the peak periods. The potential improvement includes the following components:

- Extend the outside westbound lane from the Sabal Palm Drive intersection through Fox Valley Drive, merging westbound Wekiva Springs Road from two lanes to one lane approximately 650 feet west/north of Fox Valley Drive. The outside through lanes at Sabal Palm Drive and at Fox Valley Drive will operate as shared through-right lanes.
- Modify the striping on the eastbound approach to Fox Valley Drive and the median on the east side of the intersection to introduce the two-lane eastbound section approximately 225 feet west of Fox Valley Drive. The inside lane at Fox Valley Drive will operate as a shared left-through lane.

A concept diagram for illustrative purposes is included in **Figure 14**.

Operational Benefit

Similar to the existing conditions analysis, corridor analysis was conducted using Synchro's SimTraffic simulation software for the proposed operational improvement to capture interaction between intersections and the system performance as a whole. The average network measures of effectiveness are reported in **Table 6**. Over the three peak hours of a typical weekday, the network experiences an 81 percent reduction in delay, a 49 percent reduction in total stops, and a 23 percent reduction in fuel consumption.

Table 6 Network Measures of Effectiveness – Proposed Improvement Comparison

Peak Hour	Total Delay (hours)	Total Stops	Fuel Consumption (gallons)
AM Peak	147.7 (**31.4**)	2,336 (**1,741**)	92.3 (**69.4**)
Mid-Afternoon Peak	140.6 (**27.8**)	2,986 (**1,937**)	83.4 (**63.3**)
PM Peak	112.6 (**17.8**)	3,645 (**922**)	88.6 (**69.8**)
Total	400.9 (**77.0**)	8,967 (**4,600**)	264.3 (**202.5**)

Performance measures reported for Existing and (Improved**) Scenarios*

In the AM peak hour, the eastbound queue at Fox Valley Drive is reduced to less than 400 feet (exceeded 500 feet in existing condition). In the mid-afternoon peak hour, the westbound queue at Sabal Palm Drive is reduced to less than 200 feet (exceeded 1,900 feet in existing condition). Similarly, in the PM peak hour, the westbound queue at Sabal Palm Drive is reduced to less than 300 feet (approximately 3,000 feet in the existing condition). The proposed improvement would provide significant operational benefit to the Wekiva Springs Road corridor during the peak periods. Detailed reports from the simulation analyses are provided in **Appendix E**.

PROPOSED OPERATIONAL IMPROVEMENT DIAGRAM
WEKIVA SPRINGS, FLORIDA

Figure
14

Impacts to Safety

In addition to the operational benefits discussed above, the proposed operational improvement will positively impact safety as summarized below:

Removal of Lane Drop

By design, the proposed improvement removes the westbound right-turn lane drop at the Sabal Palm Drive intersection and introduces a merge area further downstream, west of Fox Valley Drive. The removal of the right-turn lane drop will eliminate the existing issue of motorists changing lanes at the signalized intersection. At the merge area downstream, two westbound lanes will merge into one on the far side of a signalized intersection (Fox Valley Drive). Similar issues are not expected to surface at this location as the merge area will operate with vehicles in motion, at slow speeds, without the presence of a queue. The SimTraffic simulation did not show any issues at the proposed merge, and the next downstream signal, approximately 0.6 miles downstream at Riverbend Boulevard, is not expected to interact with the proposed merge area.

Queue Reduction

As illustrated in the previous section, the operational improvement is expected to substantially reduce peak direction queues during the peak periods. Reducing the queues (and congestion in general) is expected to reduce crash frequency, as congestion and queueing have been shown to be associated with the rear end and sideswipe crashes on this corridor. As an example, the reduced westbound PM peak period queue, expected as a result of the operational improvement, will no longer interact with traffic operations at the unsignalized Sabal Club Way intersection, reducing conflicts with left-turning vehicles into and out of Sabal Club Way.

Feasibility Considerations

Additional consideration should be given to the cost and feasibility of the proposed operational improvements. A qualitative field review revealed the following construction challenges are present:

- Drainage Impacts – the drainage swale in front of Sabal Point Elementary School will be impacted by the proposed improvement (**Figure 15**). Drainage inlets throughout the curbed section will also need to be relocated when the north side curb is moved.

Figure 15 Drainage Swale

- Property and Driveway Impacts – the change in grade between the road elevation and the 7-11 property east of Fox Valley Drive will need to be mitigated during design (**Figure 16**).

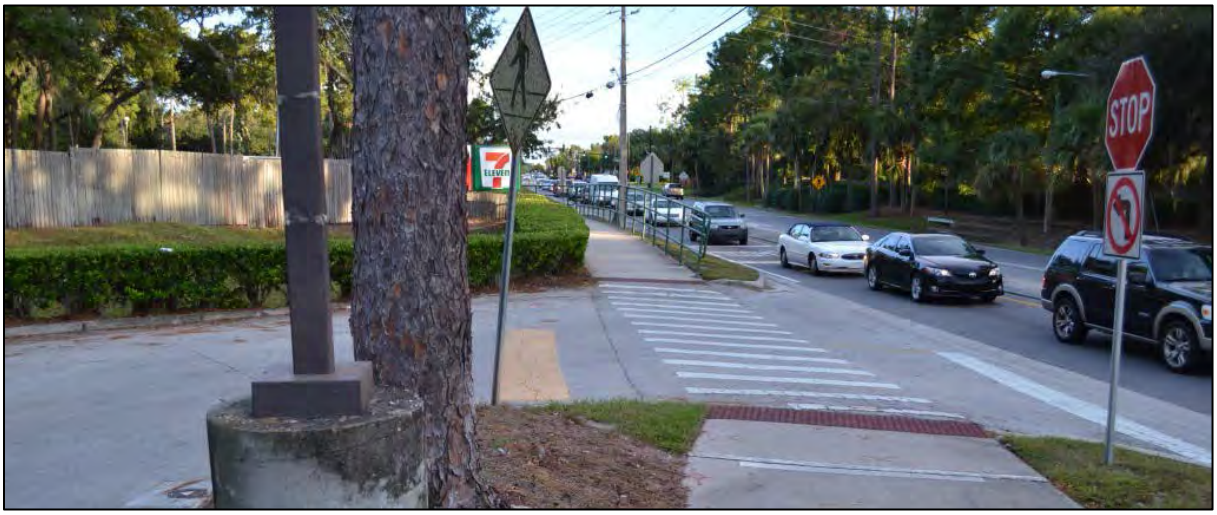


Figure 16 Elevation Change

- Utility Impacts – several concrete utility poles will be impacted by the proposed improvement (**Figure 17**), as well as underground fiber on the north side of the road.

Figure 17 Utility Impacts

- Traffic Signal Impacts – the mast arm traffic signal in the northwest corner at Sabal Palm Drive will likely need to be relocated as a result of the proposed improvement (**Figure 18**). Eastbound signal phasing at the Fox Valley Drive intersection may need to be modified to accommodate the shared thru-left lane.

Figure 18 Mast Arm Impacts

A detailed conceptual design and an engineering cost estimate are recommended to further evaluate the feasibility and the benefit-cost ratio of the proposed operational improvements.

Section 4
Findings and Recommendations

FINDINGS AND RECOMMENDATIONS

Seminole County requested Kittelson & Associates, Inc. (KAI) to evaluate the crash history and conduct an operations and safety assessment along Wekiva Springs Road from Sabal Club Way to Fox Valley Drive in Seminole County, Florida. This safety assessment originated from concerns noted by the Seminole County Sherriff's Office and local citizens at the signalized intersection of Wekiva Springs Road and Sabal Palm Drive. After reviewing the crash history and conducting travel time studies, Seminole County requested KAI to conduct an operations and safety assessment.

FINDINGS

Over the three-year period, 94 crashes were reported along the study corridor, of which 11 resulted in injury. There were no fatalities. The majority of crashes were rear end or sideswipe crashes, with a high percentage occurring in the westbound direction during the PM peak hour.

Field observations revealed that an extensive eastbound queue develops in the AM peak hour at the Fox Valley Drive signal, which only has one eastbound lane through the intersection. Similarly, an extensive westbound queue develops in the PM peak hour at Sabal Palm Drive and at Fox Valley Drive, which only have one westbound lane through the intersections. Intersection capacity analyses revealed that these movements are at or near capacity in their respective peak hours. Corridor analyses revealed that these issues cause more than 400 hours of delay to the traveling public in this area on a typical weekday.

The following safety and operational improvements were considered to reduce crashes associated with the westbound drop lane at Sabal Palm Drive:

Signing and Pavement Markings

- Provide more direct guidance to westbound through vehicles to begin merging upstream with the use of signs and/or pavement markings between the fire station and the US Postal Service driveway, approximately 400 to 900 feet east of the Sabal Palm Drive intersection;

- Prohibit and/or physically restrict lane changing from the fire station driveway west to the Sabal Palm Drive intersection (approximately 300 feet) through the use of double white lines or a traffic separator; and

- Install a changeable message sign to provide approaching motorists with advance information when the westbound queue is extensive.

Operational Improvements

- Extend the outside westbound lane from the Sabal Palm Drive intersection through Fox Valley Drive and merge westbound Wekiva Springs Road from two lanes to one lane west/north of the Fox Valley Drive intersection.

- Modify the striping on the eastbound approach to Fox Valley Drive and the median on the east side of the intersection to introduce the two-lane eastbound section west of the Fox Valley Drive intersection.

RECOMMENDATIONS

As a result of the analysis described herein, the following short-term improvements are recommended:

- Modify the typical broken white line to be a dotted white line between the Post Office driveway and the fire station, approximately 900 and 400 feet east of Sabal Palm Drive, respectively.

- Replace the RIGHT LANE ENDS signs with RIGHT LANE MUST TURN RIGHT signs for consistency with the MUTCD. Maintain the plaques below the signs displaying the number of feet (500 feet and 900 feet) to the Sabal Palm Drive intersection.

- Paint a double white stripe from the fire station driveway to the westbound stop bar at Sabal Palm Drive (approximately 300 feet) to prohibit lane changing at or near the intersection, and supplement the lane change prohibition with enforcement.

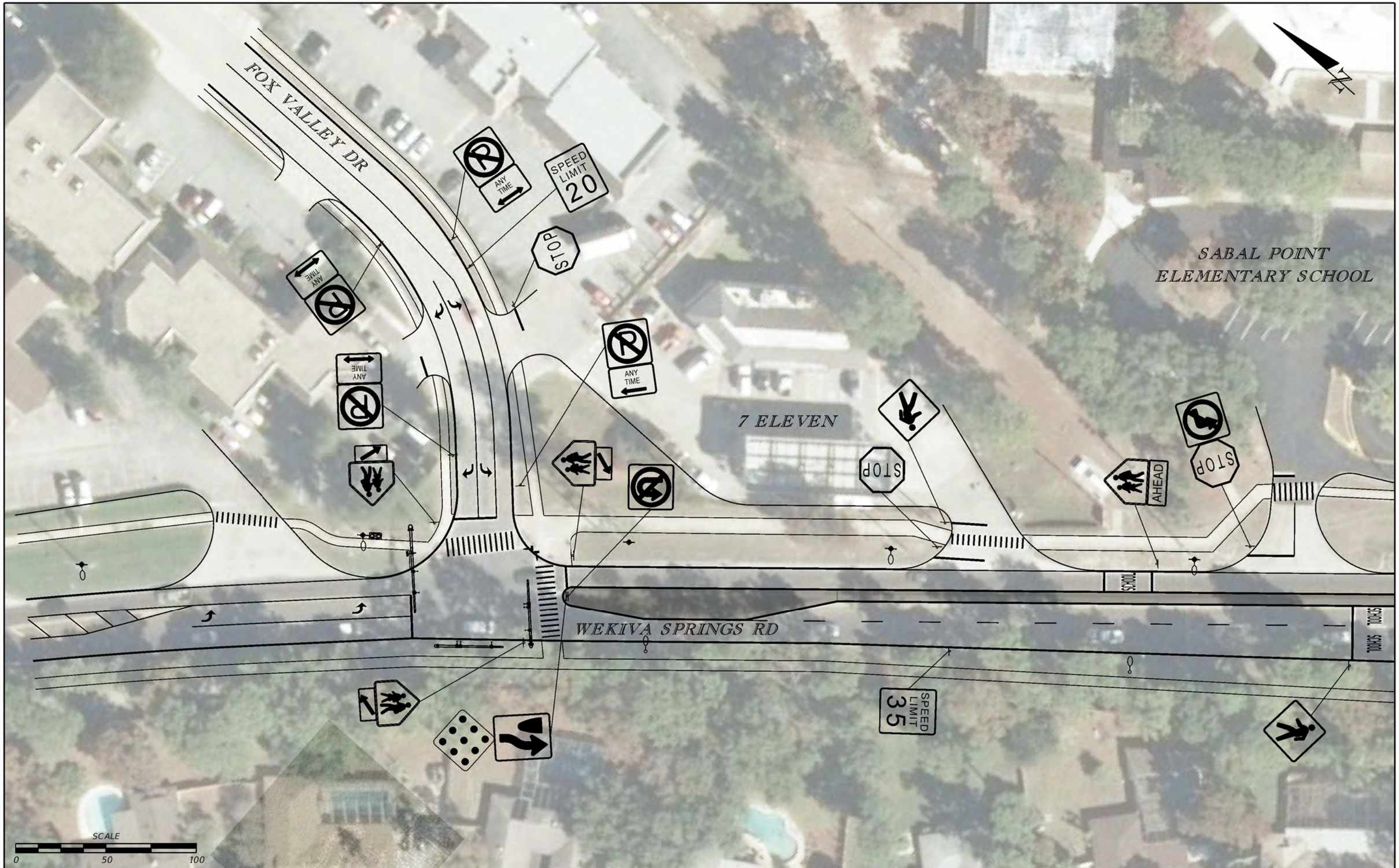
Further coordination with other departments or agencies is required to evaluate the costs and feasibility of the following potential improvements:

- Installation of a traffic separator from the fire station driveway to the westbound stop bar at Sabal Palm Drive (approximately 300 feet) to physically restrict lane changing at or near the intersection (in lieu of the double white stripe recommended above).

- Installation of a changeable message sign and loop detection to provide approaching motorists with advance information when the westbound queue is extensive.

- Roadway improvements from west of Fox Valley Drive to Sabal Palm Drive to provide two through lanes in each direction through the signalized intersections. A conceptual design and engineering cost estimate is recommended to provide additional information related to the feasibility and the benefit-cost ratio of the proposed improvement.

Appendix A
Condition Diagram



SYMBOLS

Traffic Sign | Traffic Controller Cabinet | Utility Pole

Signal Head | Luminaire

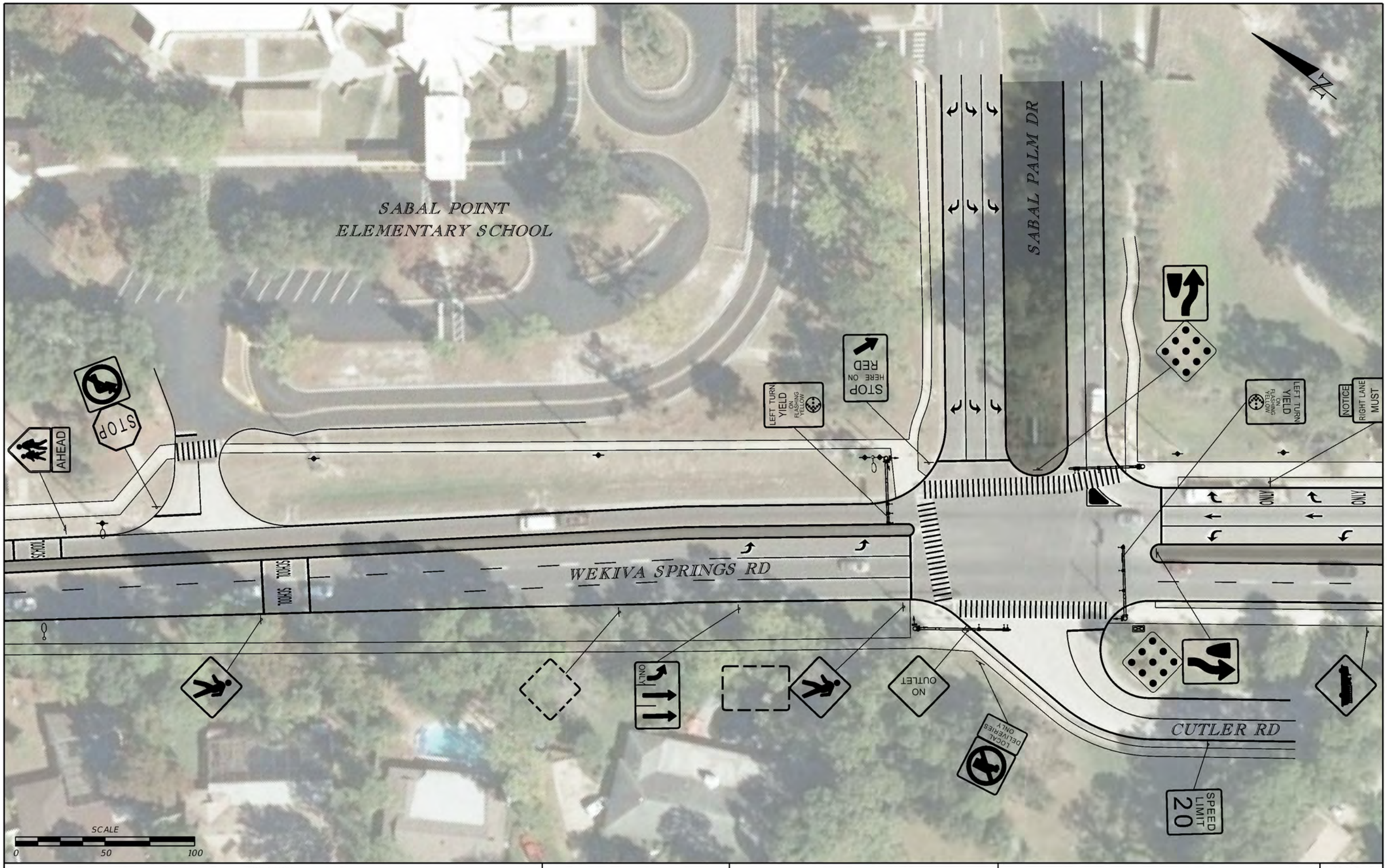
KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
225 E. Robinson St, Suite 450, ORLANDO FL 32801

WEKIVA SPRINGS ROAD

CONDITION DIAGRAM

FIGURE NO.

1



SYMBOLS

Traffic Sign | Traffic Controller Cabinet | Utility Pole

Signal Head | Luminaire

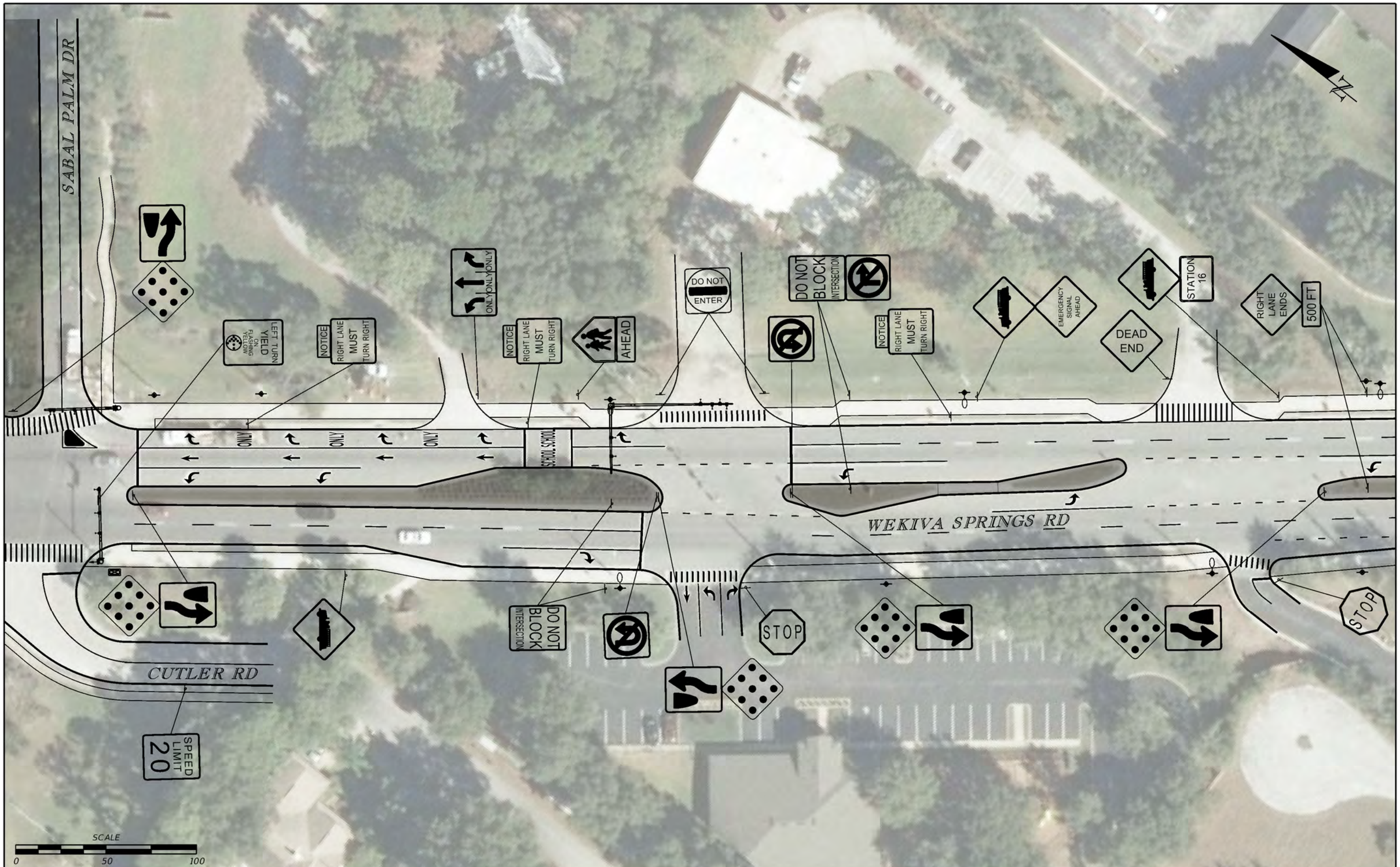
KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
225 E. Robinson St, Suite 450, ORLANDO FL 32801

WEKIVA SPRINGS ROAD

CONDITION DIAGRAM

FIGURE NO.

2



SYMBOLS

Traffic Sign | Traffic Controller Cabinet | Utility Pole

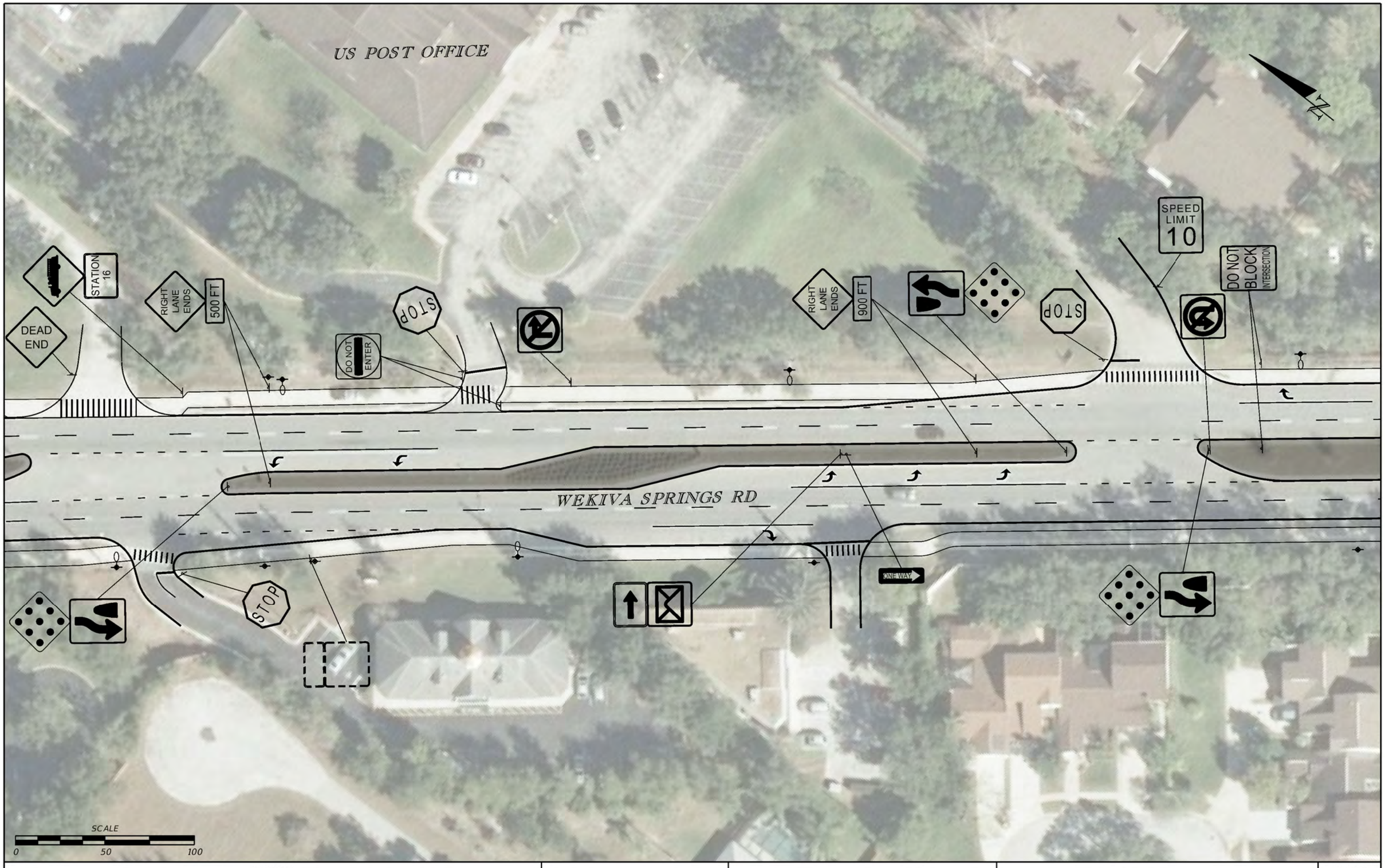
Signal Head | Luminaire

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
226 E. Robinson St, Suite 450, ORLANDO FL 32801

WEKIVA SPRINGS ROAD

CONDITION DIAGRAM

FIGURE NO. 3



SYMBOLS

Traffic Sign | Traffic Controller Cabinet | Utility Pole

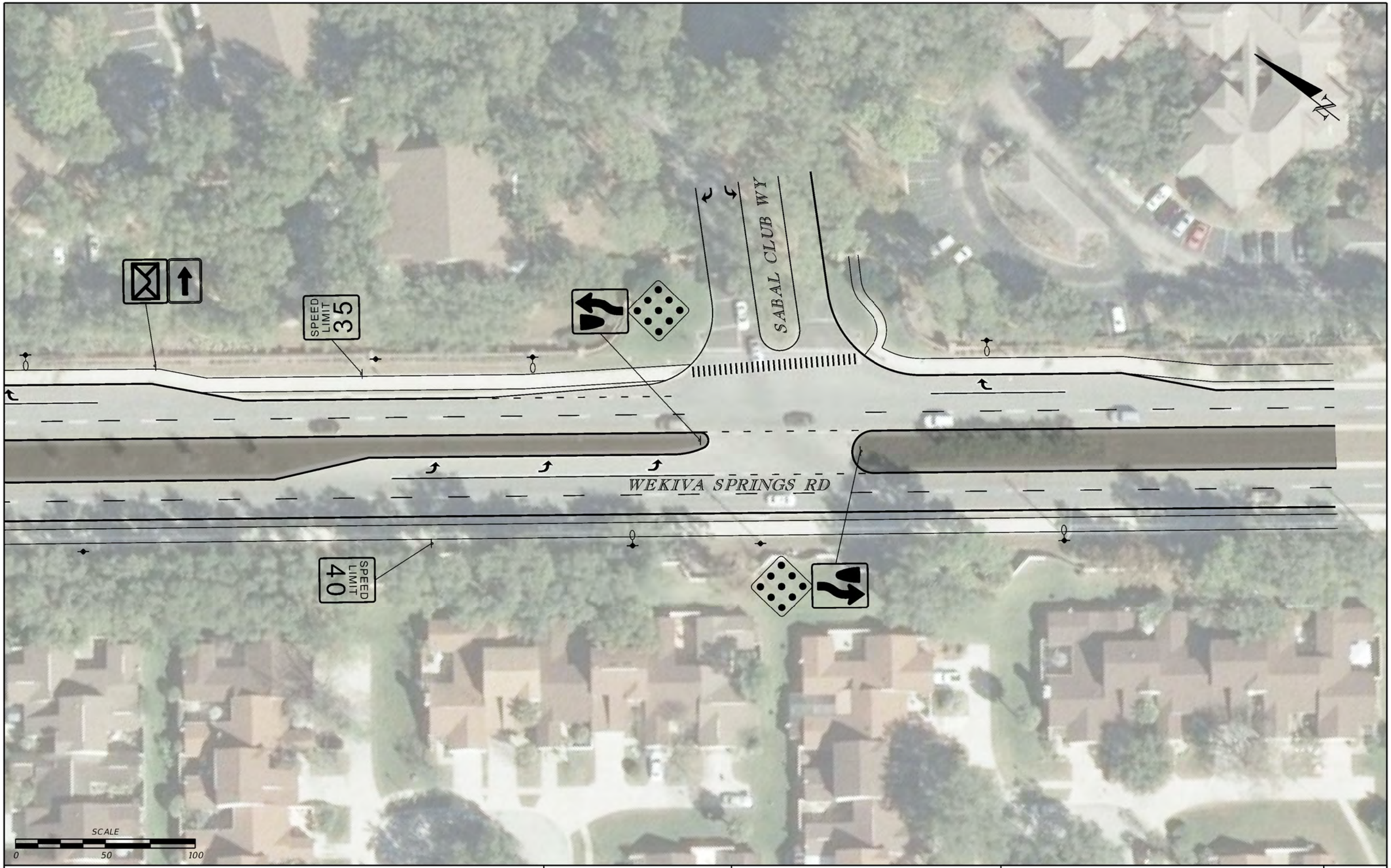
Signal Head | Luminaire

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
226 E. Robinson St, Suite 450, ORLANDO FL 32801

WEKIVA SPRINGS ROAD

CONDITION DIAGRAM

FIGURE NO. 4



SYMBOLS

Traffic Sign | Traffic Controller Cabinet | Utility Pole

Signal Head | Luminaire

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
226 E. Robinson St, Suite 460, ORLANDO FL 32801

WEKIVA SPRINGS ROAD

CONDITION DIAGRAM

FIGURE NO. 5

Appendix B
Intersection Traffic Volumes

VEHICLE TURNING MOVEMENT COUNT

SECTION:		**CITY:**	Altamonte Springs	**COUNTY:**	Seminole
STATE ROUTE:	Wekiva Springs Rd	**INTERSECTING ROUTE:**	Sabal Palm Dr	**MILEPOST:**	
OBSERVER:	VHB, Inc	**DATE OF COUNT:**	5/19/2015 Tuesday		
WEATHER:	CLEAR	**ROAD CONDITION:**	Clear		
NORTH APPROACH:	Sabal Palm Dr	**EAST APPROACH:**	Wekiva Springs Rd		
SOUTH APPROACH:	Sabal Palm Dr	**WEST APPROACH:**	Wekiva Springs Rd		
		COUNT PERIODS:	7:00 AM - 07:00 PM		

ALL VEHICLES / ALL MOVEMENTS

START	EASTBOUND						WESTBOUND							SOUTHBOUND						NORTHBOUND							GRAND
TIME	U-TURN	LEFT	THRU INSIDE	THRU OUTSIDE	RTOR	TOTAL	U-TURN	LEFT	THRU	RIGHT	RTOR	TOTAL	NS TOTAL	U-TURN	LEFT	THRU	RIGHT	RTOR	TOTAL	U-TURN	LEFT	THRU	RIGHT	RTOR	TOTAL	EW TOTAL	TOTAL
7:00	0	0	0	5	0	5	0	7	0	4	0	11	16	0	5	321	0	0	326	0	1	101	7	0	109	435	451
7:15	0	0	0	4	0	4	0	13	0	2	0	15	19	0	8	369	0	0	377	0	0	119	17	0	136	513	532
7:30	0	0	0	2	0	2	0	12	0	3	0	15	17	0	11	333	0	0	344	0	0	139	14	0	153	497	514
7:45	0	2	0	1	0	3	0	18	0	2	0	20	23	0	21	354	0	0	375	0	1	133	29	0	163	538	561
Total	**0**	**2**	**0**	**12**	**0**	**14**	**0**	**50**	**0**	**11**	**0**	**61**	**75**	**0**	**45**	**1,377**	**0**	**0**	**1,422**	**0**	**2**	**492**	**67**	**0**	**561**	**1,983**	**2,058**
8:00	0	0	2	2	0	4	0	53	0	8	0	61	65	0	47	286	1	0	334	0	3	146	33	0	182	516	581
8:15	0	2	0	2	0	4	0	95	1	6	0	102	106	1	74	206	1	0	282	1	1	143	31	0	176	458	564
8:30	0	0	0	2	0	2	1	92	0	12	0	105	107	0	55	248	0	0	303	0	2	131	22	0	155	458	565
8:45	0	0	0	2	0	2	0	27	0	3	0	30	32	0	18	308	1	0	327	0	0	118	12	0	130	457	489
Total	**0**	**2**	**2**	**8**	**0**	**12**	**1**	**267**	**1**	**29**	**0**	**298**	**310**	**1**	**194**	**1,048**	**3**	**0**	**1,246**	**1**	**6**	**538**	**98**	**0**	**643**	**1,889**	**2,199**
9:00	0	2	0	0	0	2	0	19	0	1	0	20	22	0	13	221	1	0	235	0	1	158	17	0	176	411	433
9:15	0	0	0	0	0	0	0	7	0	4	0	11	11	0	9	206	0	0	215	0	0	133	11	0	144	359	370
9:30	0	1	0	0	0	1	0	10	0	0	0	10	11	0	8	220	0	0	228	0	0	147	15	0	162	390	401
9:45	0	1	0	3	0	4	0	9	0	1	0	10	14	0	10	179	0	0	189	0	1	154	7	0	162	351	365
Total	**0**	**4**	**0**	**3**	**0**	**7**	**0**	**45**	**0**	**6**	**0**	**51**	**58**	**0**	**40**	**826**	**1**	**0**	**867**	**0**	**2**	**592**	**50**	**0**	**644**	**1,511**	**1,569**
10:00	0	0	0	0	0	0	0	11	0	5	0	16	16	0	4	172	1	0	177	0	0	112	5	0	117	294	310
10:15	0	1	0	0	0	1	0	4	0	2	0	6	7	1	9	171	1	0	182	0	1	133	10	0	144	326	333
10:30	0	1	0	0	0	1	0	12	0	3	0	15	16	0	8	194	0	0	202	0	0	125	6	0	131	333	349
10:45	0	0	0	1	0	1	0	14	0	2	0	16	17	0	7	169	0	0	176	0	2	111	7	0	120	296	313
Total	**0**	**2**	**0**	**1**	**0**	**3**	**0**	**41**	**0**	**12**	**0**	**53**	**56**	**1**	**28**	**706**	**2**	**0**	**737**	**0**	**3**	**481**	**28**	**0**	**512**	**1,249**	**1,305**
11:00	0	0	0	1	0	1	0	9	0	1	0	10	11	0	11	171	2	0	184	0	1	139	9	0	149	333	344
11:15	0	2	0	1	0	3	0	8	0	4	0	12	15	0	6	162	1	0	169	0	1	161	8	0	170	339	354
11:30	0	1	0	0	0	1	0	8	0	4	0	12	13	0	12	171	0	0	183	0	1	144	11	0	156	339	352
11:45	0	0	0	4	0	4	0	14	0	2	0	16	20	0	11	187	0	0	198	0	4	160	15	0	179	377	397
Total	**0**	**3**	**0**	**6**	**0**	**9**	**0**	**39**	**0**	**11**	**0**	**50**	**59**	**0**	**40**	**691**	**3**	**0**	**734**	**0**	**7**	**604**	**43**	**0**	**654**	**1,388**	**1,447**
12:00	0	0	0	1	0	1	0	11	0	12	0	23	24	0	8	179	0	0	187	0	0	147	19	0	166	353	377
12:15	0	1	0	2	0	3	0	8	0	2	0	10	13	0	18	167	1	0	186	1	1	202	14	0	218	404	417
12:30	0	0	0	0	0	0	0	7	0	3	0	10	10	0	10	203	0	0	213	0	3	183	10	0	196	409	419
12:45	0	0	0	2	0	2	0	9	0	1	0	10	12	0	15	182	0	0	197	0	0	200	9	0	209	406	418
Total	**0**	**1**	**0**	**5**	**0**	**6**	**0**	**35**	**0**	**18**	**0**	**53**	**59**	**0**	**51**	**731**	**1**	**0**	**783**	**1**	**4**	**732**	**52**	**0**	**789**	**1,572**	**1,631**
13:00	0	0	0	0	0	0	0	8	0	4	0	12	12	0	5	176	0	0	181	0	2	171	11	0	184	365	377
13:15	0	1	0	0	0	1	0	8	0	1	0	9	10	0	9	175	1	0	185	0	1	156	10	0	167	352	362
13:30	0	0	0	0	0	0	0	5	0	2	0	7	7	0	11	178	1	0	190	1	2	204	15	0	222	412	419
13:45	0	1	0	1	0	2	0	11	0	3	0	14	16	0	16	173	0	0	189	0	0	164	11	0	175	364	380
Total	**0**	**2**	**0**	**1**	**0**	**3**	**0**	**32**	**0**	**10**	**0**	**42**	**45**	**0**	**41**	**702**	**2**	**0**	**745**	**1**	**5**	**695**	**47**	**0**	**748**	**1,493**	**1,538**
14:00	0	0	0	0	0	0	0	14	0	5	0	19	19	0	10	136	1	0	147	1	1	176	12	0	190	337	356
14:15	0	0	0	0	0	0	0	7	0	2	0	9	9	0	15	191	0	0	206	0	4	172	20	0	196	402	411
14:30	0	3	0	2	0	5	0	5	0	7	0	12	17	0	32	175	2	0	209	0	3	192	30	0	225	434	451
14:45	0	2	0	1	0	3	0	47	2	9	0	58	61	0	27	134	1	0	162	0	2	177	25	0	204	366	427
Total	**0**	**5**	**0**	**3**	**0**	**8**	**0**	**73**	**2**	**23**	**0**	**98**	**106**	**0**	**84**	**636**	**4**	**0**	**724**	**1**	**10**	**717**	**87**	**0**	**815**	**1,539**	**1,645**
15:00	0	1	0	2	0	3	3	61	1	32	0	97	100	0	32	190	0	0	222	0	1	121	28	0	150	372	472
15:15	0	0	0	2	0	2	0	48	0	39	0	87	89	0	9	167	0	0	176	0	2	206	25	0	233	409	498
15:30	0	0	0	0	0	0	2	17	0	9	0	28	28	0	7	184	0	0	191	0	3	242	21	0	266	457	485
15:45	0	0	0	0	0	0	0	17	0	0	0	17	17	0	13	169	1	0	183	0	2	241	16	0	259	442	459
Total	**0**	**1**	**0**	**4**	**0**	**5**	**5**	**143**	**1**	**80**	**0**	**229**	**234**	**0**	**61**	**710**	**1**	**0**	**772**	**0**	**8**	**810**	**90**	**0**	**908**	**1,680**	**1,914**
16:00	0	0	0	2	0	2	0	13	1	4	0	18	20	0	19	169	0	0	188	0	2	240	22	0	264	452	472
16:15	0	0	0	1	0	1	0	11	0	10	0	21	22	0	14	211	1	0	226	0	5	240	16	0	261	487	509
16:30	0	1	0	3	0	4	0	6	0	14	0	20	24	0	17	193	1	0	211	1	3	271	25	0	300	511	535
16:45	0	0	0	3	0	3	0	9	0	10	0	19	22	0	9	209	2	0	220	0	5	256	20	0	281	501	523
Total	**0**	**1**	**0**	**9**	**0**	**10**	**0**	**39**	**1**	**38**	**0**	**78**	**88**	**0**	**59**	**782**	**4**	**0**	**845**	**1**	**15**	**1,007**	**83**	**0**	**1,106**	**1,951**	**2,039**
17:00	0	0	0	1	0	1	0	18	0	11	0	29	30	0	13	195	0	0	208	0	4	284	18	0	306	514	544
17:15	0	0	0	1	0	1	0	14	1	17	0	32	33	0	20	204	0	0	224	4	7	305	19	0	335	559	592
17:30	0	1	0	1	0	2	0	12	0	11	0	23	25	0	20	220	1	0	241	3	1	281	24	0	309	550	575
17:45	0	0	0	0	0	0	0	19	0	15	0	34	34	0	21	189	1	0	211	0	5	304	27	0	336	547	581
Total	**0**	**1**	**0**	**3**	**0**	**4**	**0**	**63**	**1**	**54**	**0**	**118**	**122**	**0**	**74**	**808**	**2**	**0**	**884**	**7**	**17**	**1,174**	**88**	**0**	**1,286**	**2,170**	**2,292**
18:00	0	0	0	0	0	0	0	10	2	1	9	22	22	0	18	196	0	0	214	1	2	271	25	0	299	513	535
18:15	0	1	0	1	0	2	0	4	0	3	11	18	20	0	20	201	2	0	223	0	2	269	19	0	290	513	533
18:30	0	0	0	2	0	2	0	21	0	11	7	39	41	0	14	179	2	0	195	0	2	247	19	0	268	463	504
18:45	0	0	0	1	0	1	0	10	0	7	6	23	24	0	13	154	1	0	168	0	2	204	18	0	224	392	416
Total	**0**	**1**	**0**	**4**	**0**	**5**	**0**	**45**	**2**	**22**	**33**	**102**	**107**	**0**	**65**	**730**	**5**	**0**	**800**	**1**	**8**	**991**	**81**	**0**	**1,081**	**1,881**	**1,988**

VEHICLE TURNING MOVEMENT COUNT - 15 MIN SUMMARY

SECTION:		**CITY:**	Altamonte Springs	**COUNTY:**	Seminole
STATE ROUTE:	Wekiva Springs Rd	**INTERSECTING ROUTE:**	Sabal Club Way	**MILEPOST:**	
OBSERVER:	VHB, Inc	**DATE OF COUNT:**	5/19/2015 Tuesday		
WEATHER:	CLEAR	**ROAD CONDITION:**	Clear		
NORTH APPROACH:	Sabal Club Way	**EAST APPROACH:**	Wekiva Springs Rd		
SOUTH APPROACH:	Sabal Club Way	**WEST APPROACH:**	Wekiva Springs Rd		
		COUNT PERIODS:	7:00 AM - 07:00 PM		

ALL VEHICLES / ALL MOVEMENTS

START	EASTBOUND						WESTBOUND							SOUTHBOUND						NORTHBOUND							GRAND
TIME	U-TURN	LEFT	THRU INSIDE	THRU OUTSIDE	RTOR	TOTAL	U-TURN	LEFT	THRU	RIGHT	RTOR	TOTAL	NS TOTAL	U-TURN	LEFT	THRU	RIGHT	RTOR	TOTAL	U-TURN	LEFT	THRU	RIGHT	RTOR	TOTAL	EW TOTAL	TOTAL
7:00	0	0	0	0	0	0	0	21	0	6	0	27	27	0	0	294	0	0	294	0	0	107	0	0	107	401	428
7:15	0	0	0	0	0	0	0	20	0	6	0	26	26	0	2	313	0	0	315	0	0	135	2	0	137	452	478
7:30	0	0	0	0	0	0	0	26	0	6	0	32	32	0	0	310	0	0	310	0	0	159	2	0	161	471	503
7:45	0	0	0	0	0	0	0	16	0	3	0	19	19	0	0	317	0	0	317	0	0	167	6	0	173	490	509
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**83**	**0**	**21**	**0**	**104**	**104**	**0**	**2**	**1,234**	**0**	**0**	**1,236**	**0**	**0**	**568**	**10**	**0**	**578**	**1,814**	**1,918**
8:00	0	0	0	0	0	0	0	24	0	5	0	29	29	0	1	351	0	0	352	0	0	187	4	0	191	543	572
8:15	0	0	0	0	0	0	0	13	1	4	0	18	18	0	5	304	0	0	309	0	0	204	6	0	210	519	537
8:30	0	0	0	0	0	0	0	20	0	6	0	26	26	1	5	319	0	0	325	0	0	141	5	0	146	471	497
8:45	0	0	0	0	0	0	0	13	0	7	0	20	20	0	1	304	0	0	305	0	0	122	4	0	126	431	451
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**70**	**1**	**22**	**0**	**93**	**93**	**1**	**12**	**1,278**	**0**	**0**	**1,291**	**0**	**0**	**654**	**19**	**0**	**673**	**1,964**	**2,057**
9:00	0	0	0	0	0	0	0	8	0	4	0	12	12	0	3	247	0	0	250	0	0	162	4	0	166	416	428
9:15	0	0	0	0	0	0	0	8	0	4	0	12	12	0	1	225	0	0	226	0	0	134	4	0	138	364	376
9:30	0	0	0	0	0	0	0	17	0	2	0	19	19	0	0	241	0	0	241	0	0	169	5	0	174	415	434
9:45	0	0	0	0	0	0	0	9	0	7	0	16	16	0	0	207	0	0	207	0	0	136	5	0	141	348	364
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**42**	**0**	**17**	**0**	**59**	**59**	**0**	**4**	**920**	**0**	**0**	**924**	**0**	**0**	**601**	**18**	**0**	**619**	**1,543**	**1,602**
10:00	0	0	0	0	0	0	0	3	0	1	0	4	4	0	0	186	0	0	186	0	0	129	1	0	130	316	320
10:15	0	0	0	0	0	0	0	5	0	3	0	8	8	0	0	182	0	0	182	0	0	142	4	0	146	328	336
10:30	0	0	0	0	0	0	0	5	0	1	0	6	6	0	1	209	0	0	210	0	0	123	6	0	129	339	345
10:45	0	0	0	0	0	0	0	8	0	6	0	14	14	0	1	201	0	0	202	0	0	123	9	0	132	334	348
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**21**	**0**	**11**	**0**	**32**	**32**	**0**	**2**	**778**	**0**	**0**	**780**	**0**	**0**	**517**	**20**	**0**	**537**	**1,317**	**1,349**
11:00	0	0	0	0	0	0	0	7	0	5	0	12	12	0	3	170	0	0	173	0	0	154	6	0	160	333	345
11:15	0	0	0	0	0	0	0	6	0	4	0	10	10	0	1	181	0	0	182	0	0	177	4	0	181	363	373
11:30	0	0	0	0	0	0	0	5	0	0	0	5	5	0	2	188	0	0	190	0	0	157	7	0	164	354	359
11:45	0	0	0	0	0	0	0	12	0	0	0	12	12	1	2	202	0	0	205	0	0	180	6	0	186	391	403
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**30**	**0**	**9**	**0**	**39**	**39**	**1**	**8**	**741**	**0**	**0**	**750**	**0**	**0**	**668**	**23**	**0**	**691**	**1,441**	**1,480**
12:00	0	0	0	0	0	0	0	4	0	3	0	7	7	0	0	192	0	0	192	0	0	175	8	0	183	375	382
12:15	0	0	0	0	0	0	0	7	0	3	0	10	10	0	2	188	0	0	190	0	0	219	2	0	221	411	421
12:30	0	0	0	0	0	0	0	4	0	5	0	9	9	0	4	208	0	0	212	0	0	193	5	0	198	410	419
12:45	0	0	0	0	0	0	0	6	0	1	0	7	7	0	3	187	0	0	190	0	0	217	7	0	224	414	421
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**21**	**0**	**12**	**0**	**33**	**33**	**0**	**9**	**775**	**0**	**0**	**784**	**0**	**0**	**804**	**22**	**0**	**826**	**1,610**	**1,643**
13:00	0	0	0	0	0	0	0	5	0	3	0	8	8	0	1	189	0	0	190	0	0	190	8	0	198	388	396
13:15	0	0	0	0	0	0	0	8	0	4	0	12	12	0	1	185	0	0	186	0	0	175	4	0	179	365	377
13:30	0	0	0	0	0	0	1	6	0	2	0	9	9	0	1	185	0	0	186	0	0	220	6	0	226	412	421
13:45	0	0	0	0	0	0	0	9	0	2	0	11	11	0	0	192	0	0	192	0	0	174	5	0	179	371	382
Total	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**28**	**0**	**11**	**0**	**40**	**40**	**0**	**3**	**751**	**0**	**0**	**754**	**0**	**0**	**759**	**23**	**0**	**782**	**1,536**	**1,576**
14:00	0	0	0	0	0	0	0	2	0	1	0	3	3	0	0	153	0	0	153	0	0	188	6	0	194	347	350
14:15	0	0	0	0	0	0	0	7	0	2	0	9	9	0	0	185	0	0	185	0	0	202	7	0	209	394	403
14:30	0	0	0	0	0	0	0	5	0	0	0	5	5	0	3	181	0	0	184	0	0	245	5	0	250	434	439
14:45	0	0	0	0	0	0	0	6	0	4	0	10	10	0	4	175	0	0	179	0	0	253	4	0	257	436	446
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**0**	**7**	**0**	**27**	**27**	**0**	**7**	**694**	**0**	**0**	**701**	**0**	**0**	**888**	**22**	**0**	**910**	**1,611**	**1,638**
15:00	0	0	0	0	0	0	1	7	0	5	0	13	13	0	2	270	0	0	272	2	0	181	22	0	205	477	490
15:15	0	0	0	0	0	0	0	8	0	2	0	10	10	0	0	232	0	0	232	3	0	191	24	0	218	450	460
15:30	0	0	0	0	0	0	0	4	0	3	0	7	7	0	3	206	0	0	209	0	0	209	8	0	217	426	433
15:45	0	0	0	0	0	0	0	2	0	3	0	5	5	0	2	197	0	0	199	0	0	254	5	0	259	458	463
Total	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**21**	**0**	**13**	**0**	**35**	**35**	**0**	**7**	**905**	**0**	**0**	**912**	**5**	**0**	**835**	**59**	**0**	**899**	**1,811**	**1,846**
16:00	0	0	0	0	0	0	0	2	0	5	0	7	7	1	3	178	0	0	182	0	0	268	10	0	278	460	467
16:15	0	0	0	0	0	0	0	7	0	3	0	10	10	0	5	211	0	0	216	0	0	242	6	0	248	464	474
16:30	0	0	0	0	0	0	0	8	0	2	0	10	10	0	4	203	0	0	207	0	0	312	9	0	321	528	538
16:45	0	0	0	0	0	0	0	6	0	5	0	11	11	1	2	220	0	0	223	0	0	288	12	0	300	523	534
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**23**	**0**	**15**	**0**	**38**	**38**	**2**	**14**	**812**	**0**	**0**	**828**	**0**	**0**	**1,110**	**37**	**0**	**1,147**	**1,975**	**2,013**
17:00	0	0	0	0	0	0	0	5	0	1	0	6	6	0	2	224	0	0	226	0	0	337	10	0	347	573	579
17:15	0	0	0	0	0	0	0	8	0	0	0	8	8	0	5	221	0	0	226	0	0	330	16	0	346	572	580
17:30	0	0	0	0	0	0	0	5	0	2	0	7	7	0	1	236	0	0	237	0	0	307	14	0	321	558	565
17:45	0	0	0	0	0	0	0	3	0	1	0	4	4	0	0	194	0	0	194	0	0	334	17	0	351	545	549
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**21**	**0**	**4**	**0**	**25**	**25**	**0**	**8**	**875**	**0**	**0**	**883**	**0**	**0**	**1,308**	**57**	**0**	**1,365**	**2,248**	**2,273**
18:00	0	0	0	0	0	0	0	7	0	2	0	9	9	1	5	213	0	0	219	0	0	288	16	0	304	523	532
18:15	0	0	0	0	0	0	1	2	0	1	0	4	4	1	4	198	0	0	203	0	0	297	12	0	309	512	516
18:30	0	0	0	0	0	0	0	4	0	1	0	5	5	0	3	214	0	0	217	0	0	251	11	0	262	479	484
18:45	0	0	0	0	0	0	0	5	0	1	0	6	6	0	1	165	0	0	166	0	0	212	18	0	230	396	402
Total	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**18**	**0**	**5**	**0**	**24**	**24**	**2**	**13**	**790**	**0**	**0**	**805**	**0**	**0**	**1,048**	**57**	**0**	**1,105**	**1,910**	**1,934**

Roadway Count Summary

Vanasse Hangen Brustlin, Inc.

County	Seminole	**City**	Altamonte Springs
Intersection	Fox Valley Dr	&	Wekiva Springs Rd
Date	May 19, 2015		**All Vehicles**
Time Period	7:00 to 9:00		

VHB Project #: 62552.14

Time Period	Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	0	0	0	22	0	10
7:15 - 7:30	0	0	0	25	0	9
7:30 - 7:45	0	0	0	31	0	11
7:45 - 8:00	0	0	0	28	0	7
8:00 - 8:15	0	0	0	43	0	8
8:15 - 8:30	0	0	0	44	0	10
8:30 - 8:45	0	0	0	40	0	9
8:45 - 9:00	0	0	0	38	0	12
	0	0	0	271	0	76

Time Period	Southbound			Northbound		
	Left	Through	Right	Left	Through	Right
7:00 - 7:15	10	309	0	0	94	3
7:15 - 7:30	9	313	0	0	116	8
7:30 - 7:45	15	281	0	0	144	8
7:45 - 8:00	6	311	0	0	135	2
8:00 - 8:15	7	280	0	0	146	7
8:15 - 8:30	3	232	0	0	165	14
8:30 - 8:45	10	277	0	0	166	16
8:45 - 9:00	10	285	0	0	119	7
	70	2,288	0	0	1,085	65

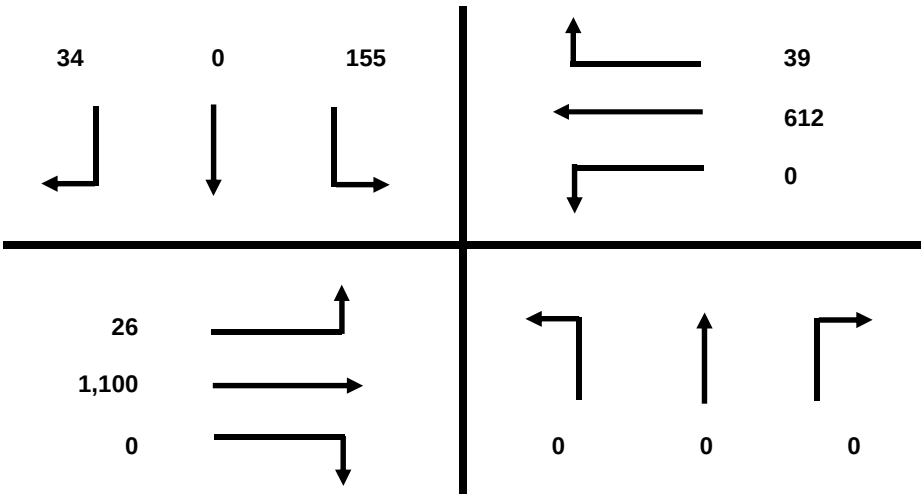
North / South
Wekiva Springs Rd

East / West
Fox Valley Dr

Peak Hour
7:45 - 8:45

Peak Hour Factor
0.95

Total Pk Hr Voume
1,966



Roadway Count Summary

Vanasse Hangen Brustlin, Inc (VHB)

County	Seminole	**City**	Altamonte Springs
Intersection	Fox Valley Dr	&	Wekiva Springs Rd
Date	May 19, 2015		
Time Period	2:00 PM to 6:00 PM		**All Vehicles**

VHB Project #: 62552.14

Time Period	Eastbound				Westbound			
	Left	Through	Right	Total	Left	Through	Right	Total
14:00 - 14:15	0	0	0	0	14	0	11	25
14:15 - 14:30	0	0	0	0	20	0	5	25
14:30 - 14:45	0	0	0	0	26	0	10	36
14:45 - 15:00	0	0	0	0	18	0	11	29
15:00 - 15:15	0	0	0	0	22	0	15	37
15:15 - 15:30	0	0	0	0	10	0	10	20
15:30 - 15:45	0	0	0	0	15	0	11	26
15:45 - 16:00	0	0	0	0	19	0	17	36
16:00 - 16:15	0	0	0	0	11	0	13	24
16:15 - 16:30	0	0	0	0	18	0	7	25
16:30 - 16:45	0	0	0	0	35	0	8	43
16:45 - 17:00	0	0	0	0	12	0	15	27
17:00 - 17:15	0	0	0	0	25	0	18	43
17:15 - 17:30	0	0	0	0	19	0	15	34
17:30 - 17:45	0	0	0	0	19	0	14	33
17:45 - 18:00	0	0	0	0	16	0	19	35
TOTAL	**0**	**0**	**0**	**0**	**299**	**0**	**199**	**498**

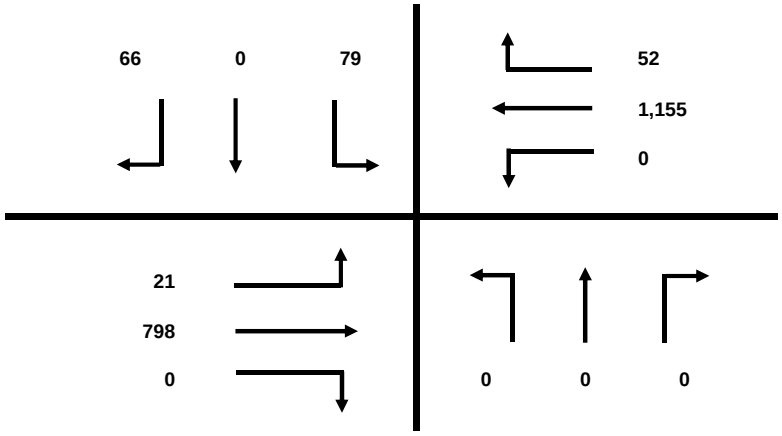
Time Period	Southbound				Northbound			
	Left	Through	Right	Total	Left	Through	Right	Total
14:00 - 14:15	10	156	0	166	0	159	9	168
14:15 - 14:30	10	202	0	212	0	182	8	190
14:30 - 14:45	9	176	0	185	0	177	14	191
14:45 - 15:00	14	170	0	184	0	167	10	177
15:00 - 15:15	7	203	0	210	0	194	16	210
15:15 - 15:30	10	181	0	191	0	268	12	280
15:30 - 15:45	10	167	0	177	0	255	11	266
15:45 - 16:00	6	171	0	177	0	237	8	245
16:00 - 16:15	4	189	0	193	0	238	7	245
16:15 - 16:30	7	206	0	213	0	232	18	250
16:30 - 16:45	9	186	0	195	0	267	18	285
16:45 - 17:00	7	209	0	216	0	264	16	280
17:00 - 17:15	7	188	0	195	0	285	13	298
17:15 - 17:30	5	210	0	215	0	300	16	316
17:30 - 17:45	5	209	0	214	0	277	13	290
17:45 - 18:00	4	191	0	195	0	293	10	303
TOTAL	**124**	**3,014**	**0**	**3,138**	**0**	**3,795**	**199**	**3,994**

North / South
Wekiva Springs Rd

East / West
Fox Valley Dr

Peak Hour
17:00 - 18:00

Peak Hour Factor
0.96



2014 Peak Season Factor Category Report - Report Type: ALL

Category: 7700 SEMINOLE COUNTYWIDE

MOCF: 0.97

Week	Dates	SF	PSCF
1	01/01/2014 - 01/04/2014	1.02	1.05
2	01/05/2014 - 01/11/2014	1.04	1.07
3	01/12/2014 - 01/18/2014	1.05	1.08
4	01/19/2014 - 01/25/2014	1.03	1.06
5	01/26/2014 - 02/01/2014	1.02	1.05
6	02/02/2014 - 02/08/2014	1.00	1.03
7	02/09/2014 - 02/15/2014	0.99	1.02
* 8	02/16/2014 - 02/22/2014	0.97	1.00
* 9	02/23/2014 - 03/01/2014	0.97	1.00
*10	03/02/2014 - 03/08/2014	0.96	0.99
*11	03/09/2014 - 03/15/2014	0.96	0.99
*12	03/16/2014 - 03/22/2014	0.96	0.99
*13	03/23/2014 - 03/29/2014	0.96	0.99
*14	03/30/2014 - 04/05/2014	0.96	0.99
*15	04/06/2014 - 04/12/2014	0.96	0.99
*16	04/13/2014 - 04/19/2014	0.97	1.00
*17	04/20/2014 - 04/26/2014	0.97	1.00
*18	04/27/2014 - 05/03/2014	0.97	1.00
*19	05/04/2014 - 05/10/2014	0.97	1.00
*20	05/11/2014 - 05/17/2014	0.98	1.01
21	05/18/2014 - 05/24/2014	0.98	1.01
22	05/25/2014 - 05/31/2014	0.99	1.02
23	06/01/2014 - 06/07/2014	1.00	1.03
24	06/08/2014 - 06/14/2014	1.00	1.03
25	06/15/2014 - 06/21/2014	1.01	1.04
26	06/22/2014 - 06/28/2014	1.02	1.05
27	06/29/2014 - 07/05/2014	1.02	1.05
28	07/06/2014 - 07/12/2014	1.03	1.06
29	07/13/2014 - 07/19/2014	1.03	1.06
30	07/20/2014 - 07/26/2014	1.02	1.05
31	07/27/2014 - 08/02/2014	1.02	1.05
32	08/03/2014 - 08/09/2014	1.01	1.04
33	08/10/2014 - 08/16/2014	1.01	1.04
34	08/17/2014 - 08/23/2014	1.00	1.03
35	08/24/2014 - 08/30/2014	1.01	1.04
36	08/31/2014 - 09/06/2014	1.02	1.05
37	09/07/2014 - 09/13/2014	1.03	1.06
38	09/14/2014 - 09/20/2014	1.04	1.07
39	09/21/2014 - 09/27/2014	1.02	1.05
40	09/28/2014 - 10/04/2014	1.01	1.04
41	10/05/2014 - 10/11/2014	1.00	1.03
42	10/12/2014 - 10/18/2014	0.99	1.02
43	10/19/2014 - 10/25/2014	1.00	1.03
44	10/26/2014 - 11/01/2014	1.01	1.04
45	11/02/2014 - 11/08/2014	1.02	1.05
46	11/09/2014 - 11/15/2014	1.03	1.06
47	11/16/2014 - 11/22/2014	1.04	1.07
48	11/23/2014 - 11/29/2014	1.03	1.06
49	11/30/2014 - 12/06/2014	1.03	1.06
50	12/07/2014 - 12/13/2014	1.02	1.05
51	12/14/2014 - 12/20/2014	1.02	1.05
52	12/21/2014 - 12/27/2014	1.04	1.07
53	12/28/2014 - 12/31/2014	1.05	1.08

* Peak Season

2014 Peak Season Factor Category Report - Report Type: ALL
Category: 7744 SEMINOLE I4 URBAN

MOCF: 0.97

Week	Dates	SF	PSCF
1	01/01/2014 - 01/04/2014	0.97	1.00
2	01/05/2014 - 01/11/2014	1.01	1.04
3	01/12/2014 - 01/18/2014	1.06	1.09
4	01/19/2014 - 01/25/2014	1.05	1.08
5	01/26/2014 - 02/01/2014	1.04	1.07
6	02/02/2014 - 02/08/2014	1.03	1.06
7	02/09/2014 - 02/15/2014	1.02	1.05
8	02/16/2014 - 02/22/2014	1.01	1.04
9	02/23/2014 - 03/01/2014	0.99	1.02
*10	03/02/2014 - 03/08/2014	0.98	1.01
*11	03/09/2014 - 03/15/2014	0.97	1.00
*12	03/16/2014 - 03/22/2014	0.95	0.98
*13	03/23/2014 - 03/29/2014	0.96	0.99
*14	03/30/2014 - 04/05/2014	0.96	0.99
*15	04/06/2014 - 04/12/2014	0.96	0.99
*16	04/13/2014 - 04/19/2014	0.96	0.99
*17	04/20/2014 - 04/26/2014	0.97	1.00
*18	04/27/2014 - 05/03/2014	0.98	1.01
*19	05/04/2014 - 05/10/2014	0.98	1.01
*20	05/11/2014 - 05/17/2014	0.99	1.02
*21	05/18/2014 - 05/24/2014	0.99	1.02
*22	05/25/2014 - 05/31/2014	0.99	1.02
23	06/01/2014 - 06/07/2014	0.99	1.02
24	06/08/2014 - 06/14/2014	0.98	1.01
25	06/15/2014 - 06/21/2014	0.98	1.01
26	06/22/2014 - 06/28/2014	0.98	1.01
27	06/29/2014 - 07/05/2014	0.99	1.02
28	07/06/2014 - 07/12/2014	0.99	1.02
29	07/13/2014 - 07/19/2014	0.99	1.02
30	07/20/2014 - 07/26/2014	0.99	1.02
31	07/27/2014 - 08/02/2014	1.00	1.03
32	08/03/2014 - 08/09/2014	1.00	1.03
33	08/10/2014 - 08/16/2014	1.00	1.03
34	08/17/2014 - 08/23/2014	1.00	1.03
35	08/24/2014 - 08/30/2014	1.01	1.04
36	08/31/2014 - 09/06/2014	1.02	1.05
37	09/07/2014 - 09/13/2014	1.03	1.06
38	09/14/2014 - 09/20/2014	1.04	1.07
39	09/21/2014 - 09/27/2014	1.11	1.14
40	09/28/2014 - 10/04/2014	1.17	1.21
41	10/05/2014 - 10/11/2014	1.23	1.27
42	10/12/2014 - 10/18/2014	1.29	1.33
43	10/19/2014 - 10/25/2014	1.23	1.27
44	10/26/2014 - 11/01/2014	1.18	1.22
45	11/02/2014 - 11/08/2014	1.12	1.15
46	11/09/2014 - 11/15/2014	1.06	1.09
47	11/16/2014 - 11/22/2014	1.00	1.03
48	11/23/2014 - 11/29/2014	0.99	1.02
49	11/30/2014 - 12/06/2014	0.98	1.01
50	12/07/2014 - 12/13/2014	0.98	1.01
51	12/14/2014 - 12/20/2014	0.97	1.00
52	12/21/2014 - 12/27/2014	1.01	1.04
53	12/28/2014 - 12/31/2014	1.06	1.09

* Peak Season

Appendix C
Intersection Capacity Analysis (Existing)

Timings

1: Wekiva Springs Rd. & Fox Valley Dr.

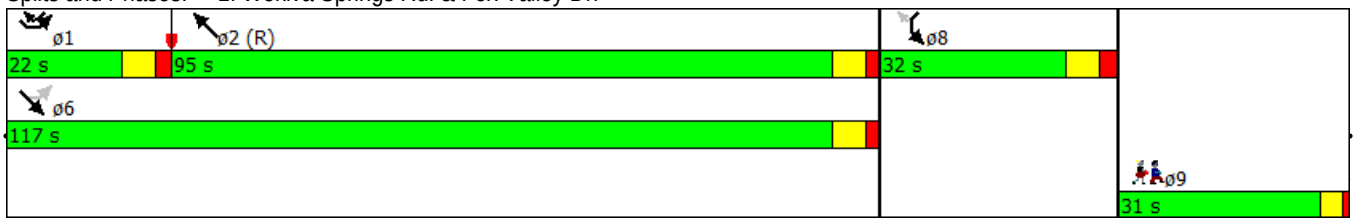
2/24/2016

Lane Group	SEL	SET	NWT	SWL	SWR	ø9
Lane Configurations						
Traffic Volume (vph)	25	1061	586	151	8	
Future Volume (vph)	25	1061	586	151	8	
Lane Group Flow (vph)	26	1105	650	157	8	
Turn Type	pm+pt	NA	NA	Prot	pm+ov	
Protected Phases	1	6	2	8	1	9
Permitted Phases	6				8	
Detector Phase	1	6	2	8	1	
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	5.0	5.0	5.0
Minimum Split (s)	11.5	21.5	27.5	12.2	11.5	26.0
Total Split (s)	22.0	117.0	95.0	32.0	22.0	31.0
Total Split (%)	12.2%	65.0%	52.8%	17.8%	12.2%	17%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	3.0
All-Red Time (s)	2.0	2.0	2.0	2.7	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	7.2	6.5	
Lead/Lag	Lead		Lag		Lead	
Lead-Lag Optimize?	Yes		Yes		Yes	
Recall Mode	None	Max	C-Max	None	None	Max
v/c Ratio	0.10	1.19	0.78	0.86	0.04	
Control Delay	14.5	128.0	27.4	114.2	38.0	
Queue Delay	0.0	0.0	3.0	0.0	0.0	
Total Delay	14.5	128.0	30.4	114.2	38.0	
Queue Length 50th (ft)	12	~1564	668	182	6	
Queue Length 95th (ft)	27	#1833	890	#303	19	
Internal Link Dist (ft)		289	108	223		
Turn Bay Length (ft)	140					
Base Capacity (vph)	317	930	833	200	283	
Starvation Cap Reductn	0	0	100	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.08	1.19	0.89	0.79	0.03	

Intersection Summary

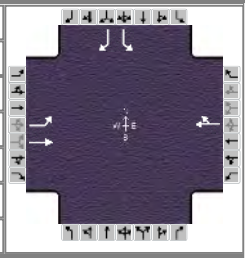
Cycle Length: 180
Actuated Cycle Length: 180
Offset: 70 (39%), Referenced to phase 2:NWT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Wekiva Springs Rd. & Fox Valley Dr.



HCS 2010 Signalized Intersection Results Summary

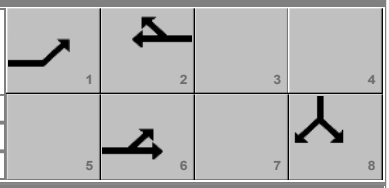
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	11/3/2015	Area Type	Other
Jurisdiction		Time Period		PHF	0.96
Intersection	Fox Valley Drive	Analysis Year	2015	Analysis Period	1> 7:00
File Name	AM Existing.xus				
Project Description	AM Peak Hour				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	25	1061			586	38				151		8

Signal Information			
Cycle, s	149.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	3.3	110.2	17.5	0.0	0.0	0.0
Yellow	4.5	4.5	4.0	0.0	0.0	0.0
Red	2.0	2.0	1.0	0.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6		2				8
Case Number	1.0	4.0		8.3				9.0
Phase Duration, s	9.8	126.5		116.7				22.5
Change Period, (Y+R_c), s	6.5	6.5		6.5				5.0
Max Allow Headway (*MAH*), s	3.1	0.0		0.0				3.2
Queue Clearance Time (g_s), s	2.6							17.3
Green Extension Time (g_e), s	0.0	0.0		0.0				0.2
Phase Call Probability	0.66							1.00
Max Out Probability	0.00							0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6			2	12				3		18
Adjusted Flow Rate (*v*), veh/h	26	1105			650					157		8
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1524	1569			1552					1509		1356
Queue Service Time (g_s), s	0.6	69.1			28.0					15.3		0.8
Cycle Queue Clearance Time (g_c), s	0.6	69.1			28.0					15.3		0.8
Green Ratio (*g*/*C*)	0.64	0.67			0.61					0.10		0.10
Capacity (*c*), veh/h	520	1264			1148					177		159
Volume-to-Capacity Ratio (*X*)	0.050	0.875			0.566					0.889		0.052
Available Capacity (c_a), veh/h	742	1264			1148					273		246
Back of Queue (*Q*), veh/ln (50th percentile)	0.2	21.5			9.2					6.6		0.3
Queue Storage Ratio (*RQ*) (50th percentile)	0.03	0.00			0.00					0.00		0.00
Uniform Delay (d_1), s/veh	6.9	9.5			8.7					64.8		58.4
Incremental Delay (d_2), s/veh	0.0	8.6			2.0					13.9		0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0					0.0		0.0
Control Delay (*d*), s/veh	7.0	18.2			10.7					78.7		58.5
Level of Service (LOS)	A	B			B					E		E
Approach Delay, s/veh / LOS	17.9	B		10.7	B		0.0			77.7	E	
Intersection Delay, s/veh / LOS	20.6						C					

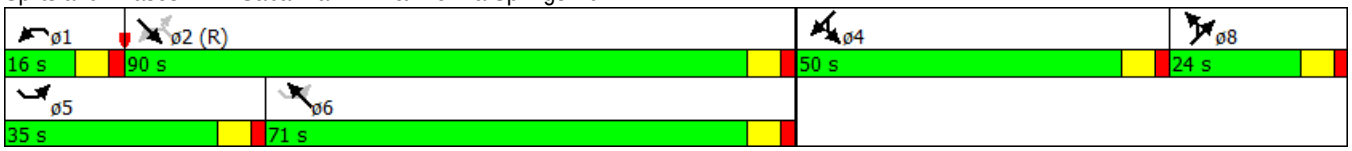
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.6	A	2.2	B	2.2	B	2.3	B
Bicycle LOS Score / LOS	2.4	B	1.6	A				F

Lane Group	SEL	SET	NWL	NWT	NWR	NET	SWL	SWT
Lane Configurations								
Traffic Volume (vph)	194	1072	8	542	8	2	254	1
Future Volume (vph)	194	1072	8	542	8	2	254	1
Lane Group Flow (vph)	198	1096	8	553	8	13	259	29
Turn Type	D.P+P	NA	D.P+P	NA	custom	NA	Split	NA
Protected Phases	5	2	1	6		8	4	4
Permitted Phases	6		2		2			
Detector Phase	5	2	1	6	2	8	4	4
Switch Phase								
Minimum Initial (s)	6.0	15.0	6.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	12.5	43.5	12.5	49.5	43.5	12.5	34.5	34.5
Total Split (s)	35.0	90.0	16.0	71.0	90.0	24.0	50.0	50.0
Total Split (%)	19.4%	50.0%	8.9%	39.4%	50.0%	13.3%	27.8%	27.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	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)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			
Recall Mode	None	C-Max	None	Max	C-Max	None	None	None
v/c Ratio	0.40	0.51	0.03	0.60	0.01	0.20	0.76	0.18
Control Delay	10.4	16.7	7.9	28.3	11.2	90.1	90.4	71.1
Queue Delay	0.0	0.3	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	10.4	17.1	7.9	28.4	11.2	90.1	90.4	71.1
Queue Length 50th (ft)	71	290	2	345	2	15	155	31
Queue Length 95th (ft)	m94	m336	9	709	12	42	201	66
Internal Link Dist (ft)		434		1665		232		357
Turn Bay Length (ft)	140		150					
Base Capacity (vph)	548	2159	320	923	938	161	662	319
Starvation Cap Reductn	0	474	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	34	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.65	0.03	0.62	0.01	0.08	0.39	0.09

Intersection Summary

Cycle Length: 180
Actuated Cycle Length: 180
Offset: 42 (23%), Referenced to phase 2:NWSE, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Sabal Palm Dr. & Wekiva Springs Rd.



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	194	1072	2	8	542	8	4	2	7	254	1	27
Future Volume (veh/h)	194	1072	2	8	542	8	4	2	7	254	1	27
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1584	1600	1600	1538	1538	1600	1664	1600	1538	1600	1600
Adj Flow Rate, veh/h	198	1094	2	8	553	8	4	2	7	259	1	28
Adj No. of Lanes	1	2	0	1	1	1	0	1	0	2	1	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	1	1	0	4	4	0	0	0	4	0	0
Cap, veh/h	542	2225	4	354	1043	887	7	4	13	304	5	141
Arrive On Green	0.05	0.72	0.72	0.01	0.68	0.68	0.02	0.02	0.02	0.11	0.11	0.11
Sat Flow, veh/h	1494	3083	6	1524	1538	1308	461	231	807	2842	47	1320
Grp Volume(v), veh/h	198	534	562	8	553	8	13	0	0	259	0	29
Grp Sat Flow(s),veh/h/ln	1494	1505	1583	1524	1538	1308	1499	0	0	1421	0	1367
Q Serve(g_s), s	7.3	27.5	27.5	0.3	32.5	0.4	1.6	0.0	0.0	16.1	0.0	3.5
Cycle Q Clear(g_c), s	7.3	27.5	27.5	0.3	32.5	0.4	1.6	0.0	0.0	16.1	0.0	3.5
Prop In Lane	1.00		0.00	1.00		1.00	0.31		0.54	1.00		0.97
Lane Grp Cap(c), veh/h	542	1086	1143	354	1043	887	24	0	0	304	0	146
V/C Ratio(X)	0.37	0.49	0.49	0.02	0.53	0.01	0.54	0.00	0.00	0.85	0.00	0.20
Avail Cap(c_a), veh/h	697	1086	1143	418	1043	887	146	0	0	687	0	330
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.2	10.8	10.8	8.6	14.6	9.4	87.9	0.0	0.0	79.0	0.0	73.4
Incr Delay (d2), s/veh	0.4	1.6	1.5	0.0	1.9	0.0	17.9	0.0	0.0	6.7	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	11.9	12.5	0.1	14.2	0.1	0.8	0.0	0.0	6.6	0.0	1.3
LnGrp Delay(d),s/veh	11.7	12.4	12.3	8.6	16.5	9.4	105.8	0.0	0.0	85.7	0.0	74.0
LnGrp LOS	B	B	B	A	B	A	F			F		E
Approach Vol, veh/h		1294			569			13			288	
Approach Delay, s/veh		12.2			16.3			105.8			84.6	
Approach LOS		B			B			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	136.4		25.7	16.3	128.6		9.4
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5
Max Green Setting (Gmax), s	9.5	83.5		43.5	28.5	64.5		17.5
Max Q Clear Time (g_c+I1), s	2.3	29.5		18.1	9.3	34.5		3.6
Green Ext Time (p_c), s	0.0	16.1		1.1	0.5	13.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	23.5
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	3.1

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	6	1256	703	18	77	18
Future Vol, veh/h	6	1256	703	18	77	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	175	-	-	140	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	33	2	3	0	1	6
Mvmt Flow	6	1351	756	19	83	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	756	0	-	0	1444	378
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	688	-
Critical Hdwy	4.76	-	-	-	6.82	7.02
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	2.53	-	-	-	3.51	3.36
Pot Cap-1 Maneuver	675	-	-	-	124	608
Stage 1	-	-	-	-	427	-
Stage 2	-	-	-	-	463	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	675	-	-	-	123	608
Mov Cap-2 Maneuver	-	-	-	-	123	-
Stage 1	-	-	-	-	427	-
Stage 2	-	-	-	-	459	-

Approach	SE	NW	SW
HCM Control Delay, s	0	0	67.1
HCM LOS			F

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	675	-	123	608
HCM Lane V/C Ratio	-	-	0.01	-	0.673	0.032
HCM Control Delay (s)	-	-	10.4	-	80.2	11.1
HCM Lane LOS	-	-	B	-	F	B
HCM 95th %tile Q(veh)	-	-	0	-	3.6	0.1

Timings

1: Wekiva Springs Rd. & Fox Valley Dr.

2/24/2016

Lane Group	SEL	SET	NWT	SWL	SWR	ø9
Lane Configurations						
Traffic Volume (vph)	32	696	916	63	20	
Future Volume (vph)	32	696	916	63	20	
Lane Group Flow (vph)	34	733	1012	66	21	
Turn Type	pm+pt	NA	NA	Prot	pm+ov	
Protected Phases	1	6	2	8	1	9
Permitted Phases	6				8	
Detector Phase	1	6	2	8	1	
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	5.0	5.0	5.0
Minimum Split (s)	11.5	21.5	27.5	12.2	11.5	9.5
Total Split (s)	26.0	109.0	83.0	36.0	26.0	35.0
Total Split (%)	14.4%	60.6%	46.1%	20.0%	14.4%	19%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	3.5
All-Red Time (s)	2.0	2.0	2.0	2.7	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	7.2	6.5	
Lead/Lag	Lead		Lag		Lead	
Lead-Lag Optimize?	Yes		Yes		Yes	
Recall Mode	None	Max	C-Max	None	None	Max
v/c Ratio	0.37	0.85	1.33	0.61	0.13	
Control Delay	28.7	43.6	186.5	103.0	38.9	
Queue Delay	0.0	0.0	0.4	0.0	0.0	
Total Delay	28.7	43.6	186.9	103.0	38.9	
Queue Length 50th (ft)	17	705	~1602	77	14	
Queue Length 95th (ft)	39	933	#1891	132	34	
Internal Link Dist (ft)		289	108	223		
Turn Bay Length (ft)	140					
Base Capacity (vph)	189	863	763	228	247	
Starvation Cap Reductn	0	0	45	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.18	0.85	1.41	0.29	0.09	

Intersection Summary

Cycle Length: 180

Actuated Cycle Length: 180

Offset: 52 (29%), Referenced to phase 2:NWT, Start of Green

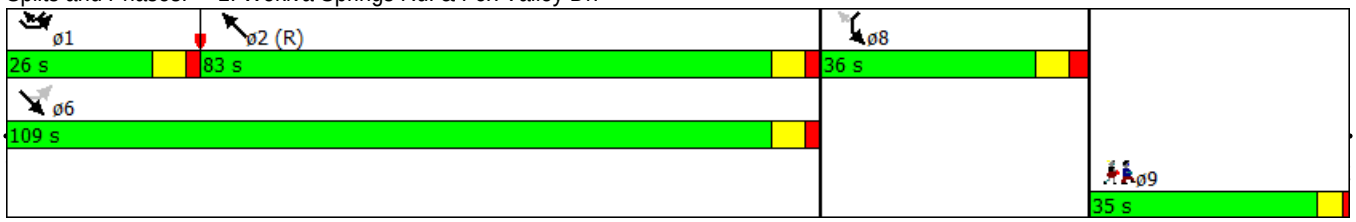
Natural Cycle: 120

Control Type: Actuated-Coordinated

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

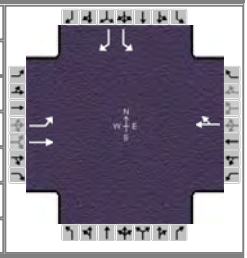
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Wekiva Springs Rd. & Fox Valley Dr.



HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst		Analysis Date	11/3/2015	Area Type	Other
Jurisdiction		Time Period		PHF	0.95
Intersection	Fox Valley Drive	Analysis Year	2015	Analysis Period	1> 7:00
File Name	Mid-Day Existing.xus				
Project Description	Mid-Day				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	32	696			916	46				63		20

Signal Information			
Cycle, s	145.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

							1	2	3	4
Green	3.7	115.0	8.3	0.0	0.0	0.0	5	6	7	8
Yellow	4.5	4.5	4.0	0.0	0.0	0.0				
Red	2.0	2.0	1.0	0.0	0.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	1	6		2				8
Case Number	1.0	4.0		8.3				9.0
Phase Duration, s	10.2	131.7		121.5				13.3
Change Period, ($Y+R_c$), s	6.5	6.5		6.5				5.0
Max Allow Headway (*MAH*), s	3.1	0.0		0.0				3.2
Queue Clearance Time (g_s), s	2.5							8.4
Green Extension Time (g_e), s	0.0	0.0		0.0				0.1
Phase Call Probability	0.74							0.97
Max Out Probability	0.00							0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	1	6			2	12				3		18
Adjusted Flow Rate (*v*), veh/h	34	733			1013					66		21
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1524	1569			1555					1479		1356
Queue Service Time (g_s), s	0.5	17.3			56.0					6.4		2.2
Cycle Queue Clearance Time (g_c), s	0.5	17.3			56.0					6.4		2.2
Green Ratio (*g/C*)	0.67	0.70			0.64					0.05		0.05
Capacity (*c*), veh/h	319	1354			1233					85		78
Volume-to-Capacity Ratio (*X*)	0.106	0.541			0.821					0.784		0.271
Available Capacity (c_a), veh/h	723	1354			1233					316		290
Back of Queue (*Q*), veh/ln (50th percentile)	0.5	3.9			17.3					2.6		0.8
Queue Storage Ratio (*RQ*) (50th percentile)	0.08	0.00			0.00					0.00		0.00
Uniform Delay (d_1), s/veh	14.4	2.5			8.9					67.5		65.5
Incremental Delay (d_2), s/veh	0.1	1.6			6.2					5.8		0.7
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0					0.0		0.0
Control Delay (*d*), s/veh	14.5	4.1			15.1					73.3		66.2
Level of Service (LOS)	B	A			B					E		E
Approach Delay, s/veh / LOS	4.5	A		15.1	B		0.0			71.6	E	
Intersection Delay, s/veh / LOS	13.4						B					

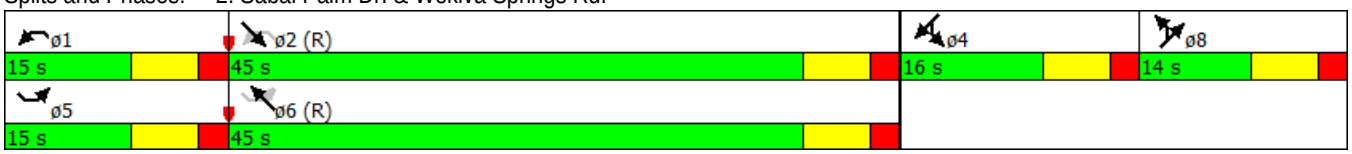
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.6	A	2.2	B	2.2	B	2.3	B
Bicycle LOS Score / LOS	1.8	A	2.2	B				F

Lane Group	SEL	SET	NWL	NWT	NWR	NET	SWL	SWT
Lane Configurations								
Traffic Volume (vph)	60	696	8	794	88	0	145	1
Future Volume (vph)	60	696	8	794	88	0	145	1
Lane Group Flow (vph)	63	726	8	827	92	5	151	82
Turn Type	D.P+P	NA	D.P+P	NA	Perm	NA	Split	NA
Protected Phases	5	2	1	6		8	4	4
Permitted Phases	6		2		6			
Detector Phase	5	2	1	6	6	8	4	4
Switch Phase								
Minimum Initial (s)	6.0	15.0	6.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	12.5	43.5	12.5	21.5	21.5	12.5	12.5	12.5
Total Split (s)	15.0	45.0	15.0	45.0	45.0	14.0	16.0	16.0
Total Split (%)	16.7%	50.0%	16.7%	50.0%	50.0%	15.6%	17.8%	17.8%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	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)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			
Recall Mode	None	C-Max	None	C-Max	C-Max	None	None	None
v/c Ratio	0.27	0.36	0.02	0.89	0.12	0.05	0.55	0.67
Control Delay	6.2	6.9	5.5	32.6	11.2	40.0	46.2	66.7
Queue Delay	0.0	0.0	0.0	48.9	0.0	0.0	0.0	0.0
Total Delay	6.2	6.9	5.5	81.5	11.2	40.0	46.2	66.7
Queue Length 50th (ft)	12	93	1	369	20	3	42	45
Queue Length 95th (ft)	m28	251	7	#816	63	14	73	#112
Internal Link Dist (ft)		434		1665		232		357
Turn Bay Length (ft)	140		150					
Base Capacity (vph)	258	2010	475	926	772	133	292	128
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	329	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.36	0.02	1.39	0.12	0.04	0.52	0.64

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 66 (73%), Referenced to phase 2:NWSE and 6:NWSE, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Sabal Palm Dr. & Wekiva Springs Rd.



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	60	696	1	8	794	88	1	0	4	145	1	78
Future Volume (veh/h)	60	696	1	8	794	88	1	0	4	145	1	78
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1553	1569	1600	1600	1584	1553	1600	1664	1600	1553	1483	1600
Adj Flow Rate, veh/h	62	725	1	8	827	92	1	0	4	151	1	81
Adj No. of Lanes	1	2	0	1	1	1	0	1	0	2	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	2	2	0	1	3	0	0	0	3	0	0
Cap, veh/h	210	1844	3	454	893	744	2	0	9	251	1	109
Arrive On Green	0.05	0.60	0.60	0.01	0.56	0.56	0.01	0.00	0.01	0.09	0.09	0.09
Sat Flow, veh/h	1479	3054	4	1524	1584	1320	289	0	1156	2870	15	1247
Grp Volume(v), veh/h	62	354	372	8	827	92	5	0	0	151	0	82
Grp Sat Flow(s),veh/h/ln	1479	1490	1568	1524	1584	1320	1445	0	0	1435	0	1263
Q Serve(g_s), s	1.5	11.1	11.1	0.2	42.9	2.9	0.3	0.0	0.0	4.6	0.0	5.7
Cycle Q Clear(g_c), s	1.5	11.1	11.1	0.2	42.9	2.9	0.3	0.0	0.0	4.6	0.0	5.7
Prop In Lane	1.00		0.00	1.00		1.00	0.20		0.80	1.00		0.99
Lane Grp Cap(c), veh/h	210	900	947	454	893	744	11	0	0	251	0	110
V/C Ratio(X)	0.30	0.39	0.39	0.02	0.93	0.12	0.44	0.00	0.00	0.60	0.00	0.74
Avail Cap(c_a), veh/h	272	900	947	579	893	744	120	0	0	303	0	133
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.3	9.3	9.3	7.4	17.9	9.2	44.5	0.0	0.0	39.6	0.0	40.1
Incr Delay (d2), s/veh	0.8	1.3	1.2	0.0	16.8	0.3	24.7	0.0	0.0	2.3	0.0	16.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	4.8	5.1	0.1	22.8	1.1	0.2	0.0	0.0	1.9	0.0	2.5
LnGrp Delay(d),s/veh	19.1	10.5	10.5	7.4	34.8	9.6	69.2	0.0	0.0	41.9	0.0	56.5
LnGrp LOS	B	B	B	A	C	A	E			D		E
Approach Vol, veh/h		788			927			5			233	
Approach Delay, s/veh		11.2			32.0			69.2			47.0	
Approach LOS		B			C			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.6	60.8		14.4	11.2	57.2		7.2
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5
Max Green Setting (Gmax), s	8.5	38.5		9.5	8.5	38.5		7.5
Max Q Clear Time (g_c+I1), s	2.2	13.1		7.7	3.5	44.9		2.3
Green Ext Time (p_c), s	0.0	12.4		0.2	0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	25.5
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.6

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	7	887	818	58	22	13
Future Vol, veh/h	7	887	818	58	22	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	175	-	-	140	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	3	1	2	0	0
Mvmt Flow	7	944	870	62	23	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	870	0	-	0	1357	435
Stage 1	-	-	-	-	870	-
Stage 2	-	-	-	-	487	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	783	-	-	-	143	575
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	589	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	783	-	-	-	142	575
Mov Cap-2 Maneuver	-	-	-	-	142	-
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	584	-

Approach	SE	NW	SW
HCM Control Delay, s	0.1	0	26.4
HCM LOS			D

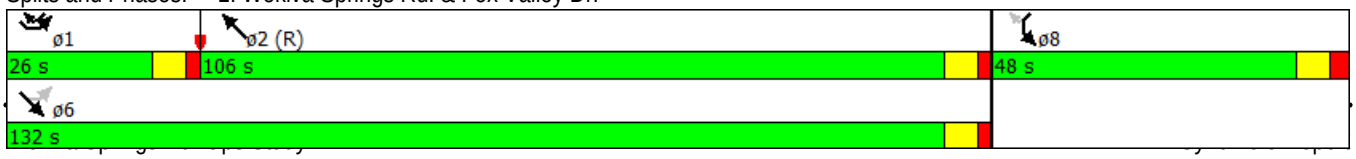
Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	783	-	142	575
HCM Lane V/C Ratio	-	-	0.01	-	0.165	0.024
HCM Control Delay (s)	-	-	9.6	-	35.3	11.4
HCM Lane LOS	-	-	A	-	E	B
HCM 95th %tile Q(veh)	-	-	0	-	0.6	0.1

Lane Group	SEL	SET	NWT	SWL	SWR
Lane Configurations					
Traffic Volume (vph)	20	770	1128	76	37
Future Volume (vph)	20	770	1128	76	37
Lane Group Flow (vph)	21	802	1226	79	39
Turn Type	pm+pt	NA	NA	Prot	pm+ov
Protected Phases	1	6	2	8	1
Permitted Phases	6				8
Detector Phase	1	6	2	8	1
Switch Phase					
Minimum Initial (s)	5.0	15.0	15.0	5.0	5.0
Minimum Split (s)	11.5	21.5	27.5	12.2	11.5
Total Split (s)	26.0	132.0	106.0	48.0	26.0
Total Split (%)	14.4%	73.3%	58.9%	26.7%	14.4%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.7	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	7.2	6.5
Lead/Lag	Lead		Lag		Lead
Lead-Lag Optimize?	Yes		Yes		Yes
Recall Mode	None	Max	C-Max	None	None
v/c Ratio	0.13	0.63	1.02	0.65	0.19
Control Delay	4.5	8.1	23.9	102.4	66.1
Queue Delay	0.0	0.0	2.4	0.0	0.0
Total Delay	4.5	8.1	26.3	102.4	66.1
Queue Length 50th (ft)	3	270	~1547	92	41
Queue Length 95th (ft)	11	461	m#436	151	79
Internal Link Dist (ft)		289	108	223	
Turn Bay Length (ft)	140				
Base Capacity (vph)	259	1272	1204	329	306
Starvation Cap Reductn	0	0	9	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.08	0.63	1.03	0.24	0.13

Intersection Summary

Cycle Length: 180
Actuated Cycle Length: 180
Offset: 0 (0%), Referenced to phase 2:NWT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Wekiva Springs Rd. & Fox Valley Dr.



Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	20	770	1128	49	76	37
Future Volume (veh/h)	20	770	1128	49	76	37
Number	1	6	2	12	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1524	1569	1600	1600	1584	1600
Adj Flow Rate, veh/h	21	802	1175	51	79	39
Adj No. of Lanes	1	1	1	0	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	2	0	0	1	0
Cap, veh/h	131	1348	1226	53	97	112
Arrive On Green	0.02	0.86	0.81	0.81	0.06	0.06
Sat Flow, veh/h	1451	1569	1522	66	1509	1360
Grp Volume(v), veh/h	21	802	0	1226	79	39
Grp Sat Flow(s),veh/h/ln	1451	1569	0	1588	1509	1360
Q Serve(g_s), s	0.4	26.5	0.0	118.6	9.3	4.9
Cycle Q Clear(g_c), s	0.4	26.5	0.0	118.6	9.3	4.9
Prop In Lane	1.00			0.04	1.00	1.00
Lane Grp Cap(c), veh/h	131	1348	0	1279	97	112
V/C Ratio(X)	0.16	0.59	0.00	0.96	0.81	0.35
Avail Cap(c_a), veh/h	262	1348	0	1279	342	333
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	3.6	0.0	15.0	83.1	78.0
Incr Delay (d2), s/veh	0.6	1.9	0.0	17.0	14.7	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	11.9	0.0	57.1	4.3	1.9
LnGrp Delay(d),s/veh	45.5	5.6	0.0	32.0	97.8	79.8
LnGrp LOS	D	A		C	F	E
Approach Vol, veh/h		823	1226		118	
Approach Delay, s/veh		6.6	32.0		91.9	
Approach LOS		A	C		F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	9.8	151.4				161.2		18.8
Change Period (Y+Rc), s	6.5	6.5				6.5		7.2
Max Green Setting (Gmax), s	19.5	99.5				125.5		40.8
Max Q Clear Time (g_c+I1), s	2.4	120.6				28.5		11.3
Green Ext Time (p_c), s	0.0	0.0				79.2		0.3

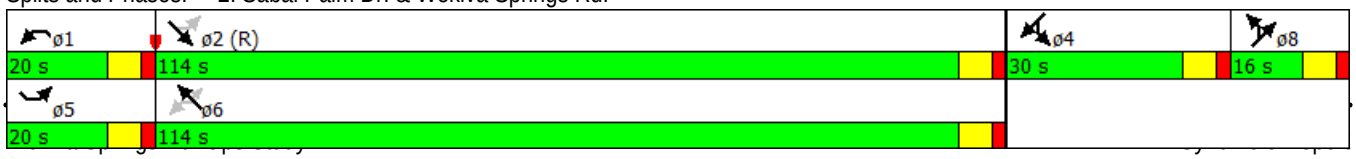
Intersection Summary	
HCM 2010 Ctrl Delay	25.6
HCM 2010 LOS	C

Lane Group	SEL	SET	NWL	NWT	NWR	NET	SWL	SWT
Lane Configurations								
Traffic Volume (vph)	73	792	24	1151	86	0	62	1
Future Volume (vph)	73	792	24	1151	86	0	62	1
Lane Group Flow (vph)	75	818	25	1187	89	4	64	56
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Split	NA
Protected Phases	5	2	1	6		8	4	4
Permitted Phases	2		6		6			
Detector Phase	5	2	1	6	6	8	4	4
Switch Phase								
Minimum Initial (s)	6.0	15.0	6.0	15.0	15.0	6.0	6.0	6.0
Minimum Split (s)	12.5	43.5	12.5	21.5	21.5	12.5	12.5	12.5
Total Split (s)	20.0	114.0	20.0	114.0	114.0	16.0	30.0	30.0
Total Split (%)	11.1%	63.3%	11.1%	63.3%	63.3%	8.9%	16.7%	16.7%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	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)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			
Recall Mode	None	C-Max	None	Max	Max	None	None	None
v/c Ratio	0.45	0.35	0.06	1.03	0.09	0.07	0.32	0.59
Control Delay	19.4	5.5	4.4	58.5	8.2	86.5	82.0	104.2
Queue Delay	0.0	0.0	0.0	10.5	0.0	0.0	0.0	0.0
Total Delay	19.4	5.5	4.4	69.0	8.2	86.5	82.0	104.2
Queue Length 50th (ft)	10	112	4	~1341	24	5	37	65
Queue Length 95th (ft)	m54	161	16	#2001	68	20	64	117
Internal Link Dist (ft)		434		1665		232		357
Turn Bay Length (ft)	140		150					
Base Capacity (vph)	200	2319	502	1148	986	85	364	172
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	31	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.35	0.05	1.06	0.09	0.05	0.18	0.33

Intersection Summary

Cycle Length: 180
Actuated Cycle Length: 180
Offset: 159 (88%), Referenced to phase 2:SETL, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Sabal Palm Dr. & Wekiva Springs Rd.



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	73	792	2	24	1151	86	1	0	3	62	1	53
Future Volume (veh/h)	73	792	2	24	1151	86	1	0	3	62	1	53
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1584	1600	1600	1584	1600	1600	1664	1600	1569	1600	1600
Adj Flow Rate, veh/h	75	816	2	25	1187	89	1	0	3	64	1	55
Adj No. of Lanes	1	2	0	1	1	1	0	1	0	2	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	1	1	0	1	0	0	0	0	2	0	0
Cap, veh/h	114	2378	6	545	1209	1038	2	0	7	156	1	72
Arrive On Green	0.03	0.77	0.77	0.02	0.76	0.76	0.01	0.00	0.01	0.05	0.05	0.05
Sat Flow, veh/h	1524	3080	8	1524	1584	1360	363	0	1090	2898	24	1339
Grp Volume(v), veh/h	75	399	419	25	1187	89	4	0	0	64	0	56
Grp Sat Flow(s),veh/h/ln	1524	1505	1583	1524	1584	1360	1453	0	0	1449	0	1364
Q Serve(g_s), s	1.9	14.8	14.8	0.6	127.3	3.0	0.5	0.0	0.0	3.8	0.0	7.3
Cycle Q Clear(g_c), s	1.9	14.8	14.8	0.6	127.3	3.0	0.5	0.0	0.0	3.8	0.0	7.3
Prop In Lane	1.00		0.00	1.00		1.00	0.25		0.75	1.00		0.98
Lane Grp Cap(c), veh/h	114	1162	1222	545	1209	1038	9	0	0	156	0	73
V/C Ratio(X)	0.66	0.34	0.34	0.05	0.98	0.09	0.46	0.00	0.00	0.41	0.00	0.77
Avail Cap(c_a), veh/h	179	1162	1222	623	1209	1038	77	0	0	378	0	178
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	54.7	6.4	6.4	4.7	20.1	5.4	89.2	0.0	0.0	82.4	0.0	84.1
Incr Delay (d2), s/veh	6.3	0.8	0.8	0.0	21.8	0.2	32.7	0.0	0.0	1.7	0.0	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	6.4	6.7	0.3	62.4	1.2	0.3	0.0	0.0	1.6	0.0	3.1
LnGrp Delay(d),s/veh	61.0	7.2	7.1	4.7	42.0	5.6	121.8	0.0	0.0	84.2	0.0	99.2
LnGrp LOS	E	A	A	A	D	A	F			F		F
Approach Vol, veh/h		893			1301			4			120	
Approach Delay, s/veh		11.7			38.8			121.8			91.2	
Approach LOS		B			D			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.8	145.5		16.2	12.4	143.9		7.6
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5
Max Green Setting (Gmax), s	13.5	107.5		23.5	13.5	107.5		9.5
Max Q Clear Time (g_c+I1), s	2.6	16.8		9.3	3.9	129.3		2.5
Green Ext Time (p_c), s	0.0	35.4		0.4	0.1	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.2
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.8

Movement	SEL	SET	NWT	NWR	SWL	SWR
Traffic Vol, veh/h	8	858	1282	56	21	4
Future Vol, veh/h	8	858	1282	56	21	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	175	-	-	140	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	0	2	1	0	5	0
Mvmt Flow	8	876	1308	57	21	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1308	0	-	0	1762	654
Stage 1	-	-	-	-	1308	-
Stage 2	-	-	-	-	454	-
Critical Hdwy	4.1	-	-	-	6.9	6.9
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	2.2	-	-	-	3.55	3.3
Pot Cap-1 Maneuver	536	-	-	-	73	414
Stage 1	-	-	-	-	212	-
Stage 2	-	-	-	-	598	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	536	-	-	-	72	414
Mov Cap-2 Maneuver	-	-	-	-	72	-
Stage 1	-	-	-	-	212	-
Stage 2	-	-	-	-	589	-

Approach	SE	NW	SW
HCM Control Delay, s	0.1	0	65.1
HCM LOS			F

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1	SWLn2
Capacity (veh/h)	-	-	536	-	72	414
HCM Lane V/C Ratio	-	-	0.015	-	0.298	0.01
HCM Control Delay (s)	-	-	11.8	-	74.9	13.8
HCM Lane LOS	-	-	B	-	F	B
HCM 95th %tile Q(veh)	-	-	0	-	1.1	0

Appendix D
Corridor Analysis (Existing)

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:30	7:30	7:30	7:30	7:30	7:30
End Time	8:45	8:45	8:45	8:45	8:45	8:45
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2313	2355	2317	2391	2243	2324
Vehs Exited	2305	2354	2306	2388	2241	2318
Starting Vehs	112	110	113	115	117	112
Ending Vehs	120	111	124	118	119	117
Travel Distance (mi)	1806	1863	1805	1890	1784	1830
Travel Time (hr)	187.1	227.1	193.7	224.8	183.7	203.3
Total Delay (hr)	132.0	170.7	138.8	167.4	129.5	147.7
Total Stops	2267	2401	2353	2468	2192	2336
Fuel Used (gal)	88.1	98.7	89.8	98.8	86.3	92.3

Interval #0 Information Seeding

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:45
End Time	8:45
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2313	2355	2317	2391	2243	2324
Vehs Exited	2305	2354	2306	2388	2241	2318
Starting Vehs	112	110	113	115	117	112
Ending Vehs	120	111	124	118	119	117
Travel Distance (mi)	1806	1863	1805	1890	1784	1830
Travel Time (hr)	187.1	227.1	193.7	224.8	183.7	203.3
Total Delay (hr)	132.0	170.7	138.8	167.4	129.5	147.7
Total Stops	2267	2401	2353	2468	2192	2336
Fuel Used (gal)	88.1	98.7	89.8	98.8	86.3	92.3

1: Wekiva Springs Rd. & Fox Valley Dr. Performance by approach

Approach	SE	NW	SW	All
Denied Delay (hr)	0.0	0.3	0.0	0.3
Total Delay (hr)	9.0	2.0	3.3	14.3
Total Stops	242	148	135	525
Travel Time (hr)	10.9	2.9	3.6	17.5
Avg Speed (mph)	6	8	2	5
Fuel Used (gal)	4.8	1.3	1.1	7.2
Fuel Eff. (mpg)	13.4	16.1	6.9	12.9

2: Sabal Palm Dr. & Wekiva Springs Rd. Performance by approach

Approach	SE	NW	NE	SW	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	4.1	3.2	0.4	5.5	13.3
Total Stops	456	232	12	271	971
Travel Time (hr)	7.2	9.4	0.4	6.5	23.4
Avg Speed (mph)	14	23	2	3	14
Fuel Used (gal)	3.5	6.3	0.1	2.1	12.0
Fuel Eff. (mpg)	28.4	33.6	6.3	10.0	27.8

3: Wekiva Springs Rd. & Sabal Club Way Performance by approach

Approach	SE	NW	SW	All
Denied Delay (hr)	0.0	0.0	0.0	0.0
Total Delay (hr)	1.5	0.2	1.3	2.9
Total Stops	2	0	97	99
Travel Time (hr)	11.6	5.0	1.7	18.2
Avg Speed (mph)	33	38	5	32
Fuel Used (gal)	13.2	5.0	0.6	18.8
Fuel Eff. (mpg)	29.1	37.8	14.7	31.0

Total Network Performance

Denied Delay (hr)	88.6
Total Delay (hr)	59.1
Total Stops	2336
Travel Time (hr)	203.3
Avg Speed (mph)	16
Fuel Used (gal)	92.3
Fuel Eff. (mpg)	19.8

Arterial Level of Service: NW Wekiva Springs Rd.

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Sabal Club Way	3	0.8	24.8	0.3	40
Sabal Palm Dr.	2	15.8	45.5	0.3	26
	6	3.3	14.0	0.1	25
	13	6.5	10.9	0.0	14
Fox Valley Dr.	1	11.1	16.1	0.0	9
	9	1.3	9.9	0.1	26
Total		38.8	121.2	0.8	26

Arterial Level of Service: SE Wekiva Springs Rd.

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Fox Valley Dr.	1	33.5	40.7	0.1	6
	13	1.3	5.1	0.0	25
	6	0.3	4.7	0.0	32
Sabal Palm Dr.	2	11.3	20.6	0.1	17
Sabal Club Way	3	4.4	33.4	0.3	36
Total		50.9	104.5	0.6	20

Intersection: 1: Wekiva Springs Rd. & Fox Valley Dr.

Movement	SE	SE	B9	B11	NW	B13	B6	SW	SW
Directions Served	L	T	T	T	TR	T	T	L	R
Maximum Queue (ft)	163	418	376	566	227	239	65	260	52
Average Queue (ft)	21	377	342	534	168	85	5	134	8
95th Queue (ft)	80	394	358	553	272	215	39	229	34
Link Distance (ft)		305	271	513	130	168	430	266	266
Upstream Blk Time (%)		40	48	56	12	3		1	
Queuing Penalty (veh)		0	0	0	68	17		0	
Storage Bay Dist (ft)	140								
Storage Blk Time (%)		38							
Queuing Penalty (veh)		9							

Intersection: 2: Sabal Palm Dr. & Wekiva Springs Rd.

Movement	SE	SE	SE	NW	NW	NW	NE	SW	SW	SW
Directions Served	L	T	TR	L	T	R	LTR	L	L	TR
Maximum Queue (ft)	190	274	277	91	457	24	60	268	222	101
Average Queue (ft)	83	129	161	9	211	4	17	174	125	30
95th Queue (ft)	164	259	288	62	407	17	48	247	221	77
Link Distance (ft)		430	430		1632	1632	262	391	391	391
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	140			150						
Storage Blk Time (%)	2	6			16					
Queuing Penalty (veh)	11	13			1					

Intersection: 3: Wekiva Springs Rd. & Sabal Club Way

Movement	SE	NW	SW	SW
Directions Served	L	T	L	R
Maximum Queue (ft)	46	4	190	39
Average Queue (ft)	3	0	60	13
95th Queue (ft)	23	3	134	38
Link Distance (ft)		1391	441	441
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	175			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 119

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	2:45	2:45	2:45	2:45	2:45	2:45
End Time	4:00	4:00	4:00	4:00	4:00	4:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1986	2040	2057	2109	2046	2046
Vehs Exited	1923	1938	1996	2011	1892	1952
Starting Vehs	98	76	111	62	74	83
Ending Vehs	161	178	172	160	228	180
Travel Distance (mi)	1670	1690	1715	1756	1660	1698
Travel Time (hr)	187.8	193.1	182.7	164.2	230.7	191.7
Total Delay (hr)	137.5	142.4	130.9	111.4	180.6	140.6
Total Stops	3057	2849	2940	2778	3312	2986
Fuel Used (gal)	82.1	83.7	81.7	78.3	90.9	83.4

Interval #0 Information Seeding

Start Time	2:45
End Time	3:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:00
End Time	4:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1986	2040	2057	2109	2046	2046
Vehs Exited	1923	1938	1996	2011	1892	1952
Starting Vehs	98	76	111	62	74	83
Ending Vehs	161	178	172	160	228	180
Travel Distance (mi)	1670	1690	1715	1756	1660	1698
Travel Time (hr)	187.8	193.1	182.7	164.2	230.7	191.7
Total Delay (hr)	137.5	142.4	130.9	111.4	180.6	140.6
Total Stops	3057	2849	2940	2778	3312	2986
Fuel Used (gal)	82.1	83.7	81.7	78.3	90.9	83.4

1: Wekiva Springs Rd. & Fox Valley Dr. Performance by approach

Approach	SE	NW	SW	All
Denied Delay (hr)	0.0	45.5	0.0	45.5
Total Delay (hr)	5.9	5.5	1.7	13.1
Total Stops	334	157	77	568
Travel Time (hr)	7.4	51.9	1.9	61.1
Avg Speed (mph)	7	4	2	5
Fuel Used (gal)	3.1	12.8	0.5	16.4
Fuel Eff. (mpg)	15.8	2.2	7.9	4.9

2: Sabal Palm Dr. & Wekiva Springs Rd. Performance by approach

Approach	SE	NW	NE	SW	All
Denied Delay (hr)	0.0	1.3	0.0	0.0	1.3
Total Delay (hr)	0.9	50.5	0.1	4.9	56.4
Total Stops	143	1148	3	214	1508
Travel Time (hr)	3.0	59.5	0.1	5.6	68.2
Avg Speed (mph)	24	5	3	3	5
Fuel Used (gal)	2.0	18.3	0.0	1.7	22.1
Fuel Eff. (mpg)	34.6	14.5	11.2	9.6	15.9

3: Wekiva Springs Rd. & Sabal Club Way Performance by approach

Approach	SE	NW	SW	All
Denied Delay (hr)	0.0	0.1	0.0	0.1
Total Delay (hr)	0.6	2.1	0.3	3.0
Total Stops	5	106	39	150
Travel Time (hr)	8.0	8.0	0.4	16.4
Avg Speed (mph)	35	29	8	31
Fuel Used (gal)	8.9	6.3	0.1	15.3
Fuel Eff. (mpg)	31.7	36.4	23.9	33.5

Total Network Performance

Denied Delay (hr)	47.0
Total Delay (hr)	93.6
Total Stops	2986
Travel Time (hr)	191.7
Avg Speed (mph)	12
Fuel Used (gal)	83.4
Fuel Eff. (mpg)	20.4

Arterial Level of Service: NW Wekiva Springs Rd.

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Sabal Club Way	3	9.1	33.0	0.3	30
Sabal Palm Dr.	2	217.9	254.0	0.3	5
	6	53.3	63.7	0.1	6
	13	33.2	37.6	0.0	4
Fox Valley Dr.	1	24.9	228.3	0.0	5
	9	1.5	10.0	0.1	25
Total		339.9	626.6	0.8	7

Arterial Level of Service: SE Wekiva Springs Rd.

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Fox Valley Dr.	1	27.4	34.6	0.1	7
	13	1.2	5.0	0.0	26
	6	0.2	4.6	0.0	33
Sabal Palm Dr.	2	3.0	12.6	0.1	28
Sabal Club Way	3	2.7	31.9	0.3	37
Total		34.5	88.7	0.6	23

Intersection: 1: Wekiva Springs Rd. & Fox Valley Dr.

Movement	SE	SE	B9	B11	NW	B13	B6	SW	SW
Directions Served	L	T	T	T	TR	T	T	L	R
Maximum Queue (ft)	190	383	322	41	222	274	446	148	65
Average Queue (ft)	42	313	62	3	202	242	423	68	21
95th Queue (ft)	128	440	223	38	211	264	500	129	52
Link Distance (ft)		305	271	513	130	168	430	266	266
Upstream Blk Time (%)		17	2		48	53	19		
Queuing Penalty (veh)		0	0		421	462	167		
Storage Bay Dist (ft)	140								
Storage Blk Time (%)		31							
Queuing Penalty (veh)		10							

Intersection: 2: Sabal Palm Dr. & Wekiva Springs Rd.

Movement	SE	SE	SE	NW	NW	NW	NE	SW	SW	SW
Directions Served	L	T	TR	L	T	R	LTR	L	L	TR
Maximum Queue (ft)	91	109	130	163	1644	1637	31	166	117	254
Average Queue (ft)	33	34	52	20	1128	775	4	86	14	116
95th Queue (ft)	71	81	108	115	1939	1705	20	139	63	225
Link Distance (ft)		430	430		1632	1632	262	391	391	391
Upstream Blk Time (%)					11	2				
Queuing Penalty (veh)					47	9				
Storage Bay Dist (ft)	140			150						
Storage Blk Time (%)	0	0			63					
Queuing Penalty (veh)	0	0			5					

Intersection: 3: Wekiva Springs Rd. & Sabal Club Way

Movement	SE	NW	NW	NW	SW	SW
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	30	192	143	42	53	31
Average Queue (ft)	4	44	30	7	20	11
95th Queue (ft)	19	190	167	63	47	32
Link Distance (ft)		1391	1391		441	441
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	175			140		
Storage Blk Time (%)			5	0		
Queuing Penalty (veh)			3	0		

Network Summary

Network wide Queuing Penalty: 1124

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2427	2360	2463	2405	2408	2414
Vehs Exited	2330	2243	2359	2290	2273	2299
Starting Vehs	138	128	111	89	118	119
Ending Vehs	235	245	215	204	253	229
Travel Distance (mi)	2095	2014	2104	2063	2068	2069
Travel Time (hr)	205.9	187.3	157.3	151.7	169.2	174.3
Total Delay (hr)	143.5	127.1	94.5	90.2	107.6	112.6
Total Stops	4235	3765	3449	3284	3492	3645
Fuel Used (gal)	96.5	90.3	85.9	83.8	86.7	88.6

Interval #0 Information Seeding

Start Time	4:45
End Time	5:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2427	2360	2463	2405	2408	2414
Vehs Exited	2330	2243	2359	2290	2273	2299
Starting Vehs	138	128	111	89	118	119
Ending Vehs	235	245	215	204	253	229
Travel Distance (mi)	2095	2014	2104	2063	2068	2069
Travel Time (hr)	205.9	187.3	157.3	151.7	169.2	174.3
Total Delay (hr)	143.5	127.1	94.5	90.2	107.6	112.6
Total Stops	4235	3765	3449	3284	3492	3645
Fuel Used (gal)	96.5	90.3	85.9	83.8	86.7	88.6

1: Wekiva Springs Rd. & Fox Valley Dr. Performance by approach

Approach	SE	NW	SW	All
Denied Delay (hr)	0.0	0.0	0.0	0.0
Total Delay (hr)	1.4	2.6	2.5	6.4
Total Stops	127	157	102	386
Travel Time (hr)	2.9	3.7	2.7	9.4
Avg Speed (mph)	18	10	2	10
Fuel Used (gal)	2.1	2.0	0.8	4.8
Fuel Eff. (mpg)	24.3	19.8	7.2	19.8

2: Sabal Palm Dr. & Wekiva Springs Rd. Performance by approach

Approach	SE	NW	NE	SW	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	2.1	52.0	0.1	2.6	56.8
Total Stops	160	1983	3	112	2258
Travel Time (hr)	4.3	63.4	0.1	3.1	70.9
Avg Speed (mph)	18	6	2	3	7
Fuel Used (gal)	2.5	23.5	0.0	0.9	27.0
Fuel Eff. (mpg)	30.5	16.7	7.6	9.7	17.7

3: Wekiva Springs Rd. & Sabal Club Way Performance by approach

Approach	SE	NW	SW	All
Denied Delay (hr)	0.0	1.1	0.0	1.1
Total Delay (hr)	0.8	37.3	4.2	42.3
Total Stops	7	873	24	904
Travel Time (hr)	7.9	47.3	4.3	59.4
Avg Speed (mph)	35	8	0	11
Fuel Used (gal)	8.4	17.9	1.0	27.3
Fuel Eff. (mpg)	32.7	19.6	2.1	23.0

Total Network Performance

Denied Delay (hr)	1.3
Total Delay (hr)	111.3
Total Stops	3645
Travel Time (hr)	174.3
Avg Speed (mph)	12
Fuel Used (gal)	88.6
Fuel Eff. (mpg)	23.3

Arterial Level of Service: NW Wekiva Springs Rd.

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Sabal Club Way	3	99.2	125.0	0.3	8
Sabal Palm Dr.	2	153.3	185.0	0.3	6
	6	6.6	17.2	0.1	20
	13	6.4	10.8	0.0	14
Fox Valley Dr.	1	8.4	12.0	0.0	11
	9	1.4	9.9	0.1	25
Total		275.3	360.0	0.8	9

Arterial Level of Service: SE Wekiva Springs Rd.

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Fox Valley Dr.	1	5.4	12.7	0.1	20
	13	0.8	4.6	0.0	28
	6	0.2	4.6	0.0	33
Sabal Palm Dr.	2	3.4	12.8	0.1	27
Sabal Club Way	3	2.4	32.2	0.3	37
Total		12.2	67.0	0.6	31

Intersection: 1: Wekiva Springs Rd. & Fox Valley Dr.

Movement	SE	SE	NW	B13	B6	SW	SW
Directions Served	L	T	TR	T	T	L	R
Maximum Queue (ft)	107	261	201	226	135	172	109
Average Queue (ft)	20	105	184	61	9	76	37
95th Queue (ft)	66	216	231	185	78	145	87
Link Distance (ft)		305	130	168	430	266	266
Upstream Blk Time (%)		0	15	3			
Queuing Penalty (veh)		0	179	37			
Storage Bay Dist (ft)	140						
Storage Blk Time (%)		3					
Queuing Penalty (veh)		1					

Intersection: 2: Sabal Palm Dr. & Wekiva Springs Rd.

Movement	SE	SE	SE	NW	NW	NW	NE	SW	SW	SW
Directions Served	L	T	TR	L	T	R	LTR	L	L	TR
Maximum Queue (ft)	137	101	131	200	1664	1661	34	141	78	139
Average Queue (ft)	61	41	55	23	1504	1228	3	63	7	56
95th Queue (ft)	116	92	119	103	2091	2250	18	120	45	113
Link Distance (ft)		430	430		1632	1632	262	391	391	391
Upstream Blk Time (%)					27	8				
Queuing Penalty (veh)					174	50				
Storage Bay Dist (ft)	140			150						
Storage Blk Time (%)	1				22					
Queuing Penalty (veh)	4				5					

Intersection: 3: Wekiva Springs Rd. & Sabal Club Way

Movement	SE	NW	NW	NW	SW	SW
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	51	1295	1284	190	214	35
Average Queue (ft)	11	570	547	73	100	7
95th Queue (ft)	40	1414	1385	225	252	27
Link Distance (ft)		1391	1391		441	441
Upstream Blk Time (%)		9	7			
Queuing Penalty (veh)		0	0			
Storage Bay Dist (ft)	175			140		
Storage Blk Time (%)			37			
Queuing Penalty (veh)			20			

Network Summary

Network wide Queuing Penalty: 470

Appendix E
Corridor Analysis (Proposed)

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:45	6:45	6:45	6:45	6:45	6:45
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2492	2586	2513	2447	2523	2512
Vehs Exited	2504	2574	2506	2453	2502	2508
Starting Vehs	101	96	92	97	79	92
Ending Vehs	89	108	99	91	100	99
Travel Distance (mi)	1982	2048	1992	1937	1993	1990
Travel Time (hr)	88.8	99.3	91.3	88.0	91.9	91.9
Total Delay (hr)	28.8	37.1	30.9	29.1	31.2	31.4
Total Stops	1654	1845	1719	1760	1725	1741
Fuel Used (gal)	68.4	72.7	69.6	67.6	68.9	69.4

Interval #0 Information Seeding

Start Time	6:45
End Time	7:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2492	2586	2513	2447	2523	2512
Vehs Exited	2504	2574	2506	2453	2502	2508
Starting Vehs	101	96	92	97	79	92
Ending Vehs	89	108	99	91	100	99
Travel Distance (mi)	1982	2048	1992	1937	1993	1990
Travel Time (hr)	88.8	99.3	91.3	88.0	91.9	91.9
Total Delay (hr)	28.8	37.1	30.9	29.1	31.2	31.4
Total Stops	1654	1845	1719	1760	1725	1741
Fuel Used (gal)	68.4	72.7	69.6	67.6	68.9	69.4

1: Wekiva Springs Rd. & Fox Valley Dr. Performance by approach

Approach	SE	NW	SW	All
Denied Delay (hr)	0.0	0.1	0.0	0.1
Total Delay (hr)	7.0	1.8	3.6	12.5
Total Stops	583	127	145	855
Travel Time (hr)	9.3	2.5	4.0	15.8
Avg Speed (mph)	8	8	2	7
Fuel Used (gal)	4.5	1.1	1.2	6.7
Fuel Eff. (mpg)	17.0	19.5	6.7	15.6

2: Sabal Palm Dr. & Wekiva Springs Rd. Performance by approach

Approach	SE	NW	NE	SW	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	2.6	2.0	0.3	5.8	10.7
Total Stops	271	177	11	277	736
Travel Time (hr)	6.1	8.1	0.3	6.7	21.3
Avg Speed (mph)	19	26	2	3	16
Fuel Used (gal)	4.3	6.0	0.1	2.1	12.5
Fuel Eff. (mpg)	27.1	34.9	6.8	9.7	27.8

3: Wekiva Springs Rd. & Sabal Club Way Performance by approach

Approach	SE	NW	SW	All
Denied Delay (hr)	0.0	0.0	0.0	0.1
Total Delay (hr)	1.3	0.1	2.6	4.0
Total Stops	2	0	101	103
Travel Time (hr)	12.7	5.0	3.0	20.7
Avg Speed (mph)	34	38	3	31
Fuel Used (gal)	14.0	5.0	0.9	19.9
Fuel Eff. (mpg)	31.1	37.8	10.0	31.9

Total Network Performance

Denied Delay (hr)	0.5
Total Delay (hr)	30.9
Total Stops	1741
Travel Time (hr)	91.9
Avg Speed (mph)	22
Fuel Used (gal)	69.4
Fuel Eff. (mpg)	28.7

Arterial Level of Service: NW Wekiva Springs Rd.

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Sabal Club Way	3	0.7	24.8	0.3	40
Sabal Palm Dr.	2	9.8	39.5	0.3	30
	6	2.2	12.8	0.1	27
	13	1.3	5.7	0.0	27
Fox Valley Dr.	1	10.2	14.0	0.0	9
	9	2.3	10.8	0.1	23
Total		26.6	107.6	0.8	28

Arterial Level of Service: SE Wekiva Springs Rd.

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Fox Valley Dr.	1	22.0	29.2	0.1	9
	13	1.3	5.1	0.0	25
	6	0.7	5.1	0.0	30
Sabal Palm Dr.	2	5.3	14.7	0.1	24
Sabal Club Way	3	3.3	32.4	0.3	37
Total		32.7	86.6	0.6	24

Intersection: 1: Wekiva Springs Rd. & Fox Valley Dr.

Movement	SE	SE	B9	B11	NW	NW	B13	SW	SW
Directions Served	LT	T	T	T	T	TR	T	L	R
Maximum Queue (ft)	385	319	229	13	187	164	15	267	48
Average Queue (ft)	294	262	24	0	99	58	0	161	8
95th Queue (ft)	398	345	123	7	172	140	6	253	32
Link Distance (ft)	304	304	271	513	130	130	168	259	259
Upstream Blk Time (%)	5	2	0		5	1		1	
Queuing Penalty (veh)	0	0	0		16	3		0	
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 2: Sabal Palm Dr. & Wekiva Springs Rd.

Movement	SE	SE	SE	NW	NW	NW	NE	SW	SW	SW
Directions Served	L	T	TR	L	T	TR	LTR	L	L	TR
Maximum Queue (ft)	165	150	149	55	211	179	60	253	221	85
Average Queue (ft)	70	53	63	6	90	74	14	169	130	31
95th Queue (ft)	131	122	136	30	189	162	44	230	215	73
Link Distance (ft)		429	429		1632	1632	262	382	382	382
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	140			150						
Storage Blk Time (%)	1	0			3					
Queuing Penalty (veh)	4	0			0					

Intersection: 3: Wekiva Springs Rd. & Sabal Club Way

Movement	SE	SW	SW
Directions Served	L	L	R
Maximum Queue (ft)	34	212	50
Average Queue (ft)	2	88	15
95th Queue (ft)	15	232	42
Link Distance (ft)		441	441
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)	175		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: Bend

Movement	NW	NW
Directions Served	T	T
Maximum Queue (ft)	43	40
Average Queue (ft)	1	1
95th Queue (ft)	30	28
Link Distance (ft)	304	304
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 23

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	2:45	2:45	2:45	2:45	2:45	2:45
End Time	4:00	4:00	4:00	4:00	4:00	4:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2183	2201	2149	2164	2145	2168
Vehs Exited	2199	2190	2161	2144	2145	2168
Starting Vehs	84	71	88	67	77	77
Ending Vehs	68	82	76	87	77	77
Travel Distance (mi)	1816	1832	1793	1792	1792	1805
Travel Time (hr)	84.6	82.4	80.2	81.3	83.3	82.4
Total Delay (hr)	29.8	26.9	26.2	27.2	29.0	27.8
Total Stops	2030	1911	1822	1890	2025	1937
Fuel Used (gal)	63.9	64.0	62.4	63.1	63.2	63.3

Interval #0 Information Seeding

Start Time	2:45
End Time	3:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	3:00
End Time	4:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2183	2201	2149	2164	2145	2168
Vehs Exited	2199	2190	2161	2144	2145	2168
Starting Vehs	84	71	88	67	77	77
Ending Vehs	68	82	76	87	77	77
Travel Distance (mi)	1816	1832	1793	1792	1792	1805
Travel Time (hr)	84.6	82.4	80.2	81.3	83.3	82.4
Total Delay (hr)	29.8	26.9	26.2	27.2	29.0	27.8
Total Stops	2030	1911	1822	1890	2025	1937
Fuel Used (gal)	63.9	64.0	62.4	63.1	63.2	63.3

1: Wekiva Springs Rd. & Fox Valley Dr. Performance by approach

Approach	SE	NW	SW	All
Denied Delay (hr)	0.0	0.3	0.0	0.3
Total Delay (hr)	6.8	5.1	1.8	13.6
Total Stops	499	351	76	926
Travel Time (hr)	8.3	6.4	2.0	16.6
Avg Speed (mph)	6	5	2	5
Fuel Used (gal)	3.3	2.4	0.6	6.2
Fuel Eff. (mpg)	15.2	13.5	7.4	13.9

2: Sabal Palm Dr. & Wekiva Springs Rd. Performance by approach

Approach	SE	NW	NE	SW	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	1.0	2.0	0.1	2.8	5.7
Total Stops	134	239	5	214	592
Travel Time (hr)	3.0	10.3	0.1	3.5	16.9
Avg Speed (mph)	23	28	3	5	22
Fuel Used (gal)	2.2	8.1	0.0	1.2	11.5
Fuel Eff. (mpg)	32.4	35.5	10.6	13.5	32.5

3: Wekiva Springs Rd. & Sabal Club Way Performance by approach

Approach	SE	NW	SW	All
Denied Delay (hr)	0.0	0.1	0.0	0.1
Total Delay (hr)	0.8	0.2	0.2	1.3
Total Stops	4	0	34	38
Travel Time (hr)	8.4	6.3	0.4	15.0
Avg Speed (mph)	35	38	8	35
Fuel Used (gal)	9.3	6.2	0.1	15.6
Fuel Eff. (mpg)	31.4	37.9	22.6	33.9

Total Network Performance

Denied Delay (hr)	0.6
Total Delay (hr)	27.3
Total Stops	1937
Travel Time (hr)	82.4
Avg Speed (mph)	22
Fuel Used (gal)	63.3
Fuel Eff. (mpg)	28.5

Arterial Level of Service: NW Wekiva Springs Rd.

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Sabal Club Way	3	0.9	24.9	0.3	40
Sabal Palm Dr.	2	7.5	39.9	0.3	30
	6	2.8	13.5	0.1	26
	13	6.6	10.9	0.0	14
Fox Valley Dr.	1	18.4	23.0	0.0	6
	9	6.9	15.4	0.1	16
Total		43.1	127.6	0.8	24

Arterial Level of Service: SE Wekiva Springs Rd.

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Fox Valley Dr.	1	30.7	37.8	0.1	7
	13	1.4	5.2	0.0	25
	6	0.4	4.8	0.0	32
Sabal Palm Dr.	2	3.7	13.3	0.1	26
Sabal Club Way	3	3.4	32.7	0.3	36
Total		39.5	93.8	0.6	22

Intersection: 1: Wekiva Springs Rd. & Fox Valley Dr.

Movement	SE	SE	B9	NW	NW	B13	B13	B6	B6	SW	SW
Directions Served	LT	T	T	T	TR	T	T	T	T	L	R
Maximum Queue (ft)	364	327	65	226	215	238	206	59	5	144	86
Average Queue (ft)	231	210	3	202	169	114	70	2	0	59	24
95th Queue (ft)	334	310	31	216	228	210	181	21	3	118	66
Link Distance (ft)	304	304	271	130	130	168	168	429	429	259	259
Upstream Blk Time (%)	2	1		30	16	3	1				
Queuing Penalty (veh)	0	0		132	70	12	4				
Storage Bay Dist (ft)											
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 2: Sabal Palm Dr. & Wekiva Springs Rd.

Movement	SE	SE	SE	NW	NW	NW	NE	SW	SW	SW
Directions Served	L	T	TR	L	T	TR	LTR	L	L	TR
Maximum Queue (ft)	94	128	150	37	192	164	39	148	129	151
Average Queue (ft)	28	26	43	5	86	77	5	84	23	67
95th Queue (ft)	69	84	111	22	157	142	24	134	79	131
Link Distance (ft)		429	429		1632	1632	262	382	382	382
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	140			150						
Storage Blk Time (%)		0			1					
Queuing Penalty (veh)		0			0					

Intersection: 3: Wekiva Springs Rd. & Sabal Club Way

Movement	SE	SW	SW
Directions Served	L	L	R
Maximum Queue (ft)	34	53	27
Average Queue (ft)	4	17	11
95th Queue (ft)	21	46	32
Link Distance (ft)		441	441
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	175		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: Bend

Movement	NW	NW
Directions Served	T	T
Maximum Queue (ft)	316	285
Average Queue (ft)	43	17
95th Queue (ft)	209	126
Link Distance (ft)	304	304
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	1	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: Bend

Movement	NW	B9	B9
Directions Served	T	T	T
Maximum Queue (ft)	268	316	285
Average Queue (ft)	9	43	17
95th Queue (ft)	98	209	126
Link Distance (ft)	271	304	304
Upstream Blk Time (%)	0	0	0
Queuing Penalty (veh)	0	1	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 223

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:45	4:45	4:45	4:45	4:45	4:45
End Time	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2452	2501	2446	2377	2342	2424
Vehs Exited	2453	2475	2441	2371	2337	2416
Starting Vehs	87	83	80	83	95	88
Ending Vehs	86	109	85	89	100	95
Travel Distance (mi)	2187	2242	2177	2124	2090	2164
Travel Time (hr)	82.2	86.4	82.4	81.7	78.8	82.3
Total Delay (hr)	17.1	19.6	17.6	18.3	16.3	17.8
Total Stops	846	1003	939	921	894	922
Fuel Used (gal)	70.2	72.8	70.3	69.1	66.7	69.8

Interval #0 Information Seeding

Start Time	4:45
End Time	5:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2452	2501	2446	2377	2342	2424
Vehs Exited	2453	2475	2441	2371	2337	2416
Starting Vehs	87	83	80	83	95	88
Ending Vehs	86	109	85	89	100	95
Travel Distance (mi)	2187	2242	2177	2124	2090	2164
Travel Time (hr)	82.2	86.4	82.4	81.7	78.8	82.3
Total Delay (hr)	17.1	19.6	17.6	18.3	16.3	17.8
Total Stops	846	1003	939	921	894	922
Fuel Used (gal)	70.2	72.8	70.3	69.1	66.7	69.8

1: Wekiva Springs Rd. & Fox Valley Dr. Performance by movement

Movement	SEL	SET	NWT	NWR	SWL	SWR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.2	1.3	0.8	0.0	1.5	0.7	4.6
Total Stops	21	170	62	2	66	32	353
Travel Time (hr)	0.3	2.9	2.0	0.1	1.7	0.8	7.8
Avg Speed (mph)	5	18	20	16	2	2	13
Fuel Used (gal)	0.1	2.4	1.5	0.0	0.5	0.2	4.7
Fuel Eff. (mpg)	17.6	22.0	27.5	57.2	7.1	7.7	21.6

2: Sabal Palm Dr. & Wekiva Springs Rd. Performance by movement

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NER	SWL	SWT	SWR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (hr)	0.6	0.7	0.0	0.1	2.9	0.2	0.0	0.1	1.5	0.0	1.1	7.3
Total Stops	61	94	0	17	221	18	0	4	65	1	47	528
Travel Time (hr)	0.8	2.8	0.0	0.3	13.9	1.1	0.0	0.1	1.7	0.0	1.2	22.1
Avg Speed (mph)	7	26	26	23	27	26	1	2	3	3	3	23
Fuel Used (gal)	0.3	2.1	0.0	0.2	11.2	0.8	0.0	0.0	0.5	0.0	0.4	15.6
Fuel Eff. (mpg)	21.5	34.0	55.1	35.1	33.7	37.4	4.1	6.1	9.2	9.4	9.8	32.3

3: Wekiva Springs Rd. & Sabal Club Way Performance by movement

Movement	SEL	SET	NWT	NWR	SWL	SWR	All
Denied Delay (hr)	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Total Delay (hr)	0.1	0.6	0.5	0.0	0.7	0.0	2.0
Total Stops	8	0	0	0	20	5	33
Travel Time (hr)	0.1	7.9	9.2	0.4	0.8	0.0	18.6
Avg Speed (mph)	21	36	37	32	2	12	35
Fuel Used (gal)	0.1	8.6	9.1	0.4	0.2	0.0	18.4
Fuel Eff. (mpg)	30.5	33.1	37.3	36.5	7.7	31.2	34.9

Total Network Performance

Denied Delay (hr)	0.3
Total Delay (hr)	17.4
Total Stops	922
Travel Time (hr)	82.3
Avg Speed (mph)	26
Fuel Used (gal)	69.8
Fuel Eff. (mpg)	31.0

Arterial Level of Service: NW Wekiva Springs Rd.

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Sabal Club Way	3	1.5	25.7	0.3	39
Sabal Palm Dr.	2	8.9	42.1	0.3	28
	6	2.7	13.3	0.1	26
	13	1.5	5.9	0.0	26
Fox Valley Dr.	1	2.6	6.2	0.0	21
	9	1.8	10.3	0.1	24
Total		19.0	103.4	0.8	30

Arterial Level of Service: SE Wekiva Springs Rd.

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Fox Valley Dr.	1	6.2	13.5	0.1	19
	13	0.6	4.5	0.0	29
	6	0.2	4.6	0.0	33
Sabal Palm Dr.	2	3.0	12.4	0.1	28
Sabal Club Way	3	2.5	32.2	0.3	37
Total		12.5	67.2	0.6	31

Intersection: 1: Wekiva Springs Rd. & Fox Valley Dr.

Movement	SE	SE	NW	NW	SW	SW
Directions Served	LT	T	T	TR	L	R
Maximum Queue (ft)	200	196	142	91	160	120
Average Queue (ft)	93	68	40	16	74	40
95th Queue (ft)	188	169	114	60	139	96
Link Distance (ft)	304	304	130	130	259	259
Upstream Blk Time (%)			0	0	0	
Queuing Penalty (veh)			2	0	0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Sabal Palm Dr. & Wekiva Springs Rd.

Movement	SE	SE	SE	NW	NW	NW	NE	SW	SW	SW
Directions Served	L	T	TR	L	T	TR	LTR	L	L	TR
Maximum Queue (ft)	120	120	122	63	337	312	39	134	108	136
Average Queue (ft)	43	34	44	11	112	97	7	66	9	56
95th Queue (ft)	88	93	104	50	254	228	27	121	51	110
Link Distance (ft)		429	429		1632	1632	262	382	382	382
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	140			150						
Storage Blk Time (%)	0	0			4					
Queuing Penalty (veh)	2	0			1					

Intersection: 3: Wekiva Springs Rd. & Sabal Club Way

Movement	SE	SW	SW
Directions Served	L	L	R
Maximum Queue (ft)	39	80	30
Average Queue (ft)	7	29	4
95th Queue (ft)	28	74	19
Link Distance (ft)		441	441
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	175		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 9: Bend

Movement	NW
Directions Served	T
Maximum Queue (ft)	10
Average Queue (ft)	0
95th Queue (ft)	7
Link Distance (ft)	304
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 5