FDOT DISTRICT 5

SILVER STAR FREIGHT SUBAREA STUDY PHASE II

FINAL REPORT

June 2021

EXECUTIVE SUMMARY

The Silver Star Freight Subarea is one of the largest clusters of freight activity in FDOT District Five, with over 14 million square feet of freight-related building floor area with primary access served by key state highways, including Orange Blossom Trail (US 441), John Young Parkway (State Road (SR) 423), and Princeton Street (SR 438), Silver Star Road (SR 416). The subarea also contains a mix of existing and planned residential uses, notably the redevelopment of industrial properties in the Packing District to medium-density residential and mixed-use development. Access to the freight clusters is a key "last-mile" concern for goods movement operations nationwide. The Silver Star Freight Subarea was selected for study based on a quantitative analysis to identify significant freight activity clusters throughout District Five and coordination between FDOT and MetroPlan Orlando.

The first phase of the Silver Star Freight Subarea study identified needs based upon field observations and coordination with area stakeholders:

- The subarea has a wide variety of owners and tenants with uneven investment patterns and ranges of light to heavy industrial uses.
- Industrial uses are often located in relatively close proximity to residential communities that range from long-standing established neighborhoods to recently constructed developments and the emerging Packing District.
- At-grade rail-highway crossings create some delay due to roughness and commercial vehicle operations to stop at crossings.
- The construction of capacity improvements along John Young Parkway will help address the primary operational concerns affecting goods movement operations to and from freight generators, yet field observation suggests some operational concerns, particularly relating to turning radius adequacy and east-west congestion may persist post-construction.
- The multimodal nature of both existing and planned land uses and the mix of land uses, transportation facilities owners/operators across complex jurisdictional boundaries demonstrate the need for continued coordination among state, regional, local, and private entities.

This report describes how the recommendations from the previous phase were advanced, the continued assessments of the transportation system, and recommended actions to facilitate goods movement in the Silver Star Freight Sub Area related to the following elements: safety, signal warrant analysis, at-grade rail-highway crossings, freight signal priority, geometrics, and multimodal infrastructure. The Phase II study recommendations cover a range of near, mid, and long-term recommendations, and are described in more detail throughout the report, including specific locations for future implementation. The following is a high-level summary of the study recommendations:

- Safety Recommendations:
  - Consider providing signal heads with backplates with retroreflective yellow border to reduce the high percentage of rear-end collisions at study intersections.
  - Evaluate and update the signal yellow and red times to accommodate the high percentage of heavy commercial vehicles.
  - Evaluate and enhance intersection lighting to mitigate the high number of crashes occurring in dark conditions.
  - Provide Leading Pedestrian Interval (LPI) signal timing at study intersections to improve crossing safety for pedestrians and bicyclists.

    - Consider prohibiting right turn on red (RTOR) at study intersections or installing yield to pedestrians and bicycles sign at intersection approaches.
- Signal Warrant Recommendations:
    - Incorporate the recommendations from the U.S. 441 access management study and the U.S. 441 and Shader Road intersection ICE analysis being conducted as a separate project by FDOT.
- At-Grade Rail-Highway Crossing Recommendations:
    - Improve drainage conditions at select locations.
    - Update pavement markings.
    - Add pedestrian signal gates at select locations.
    - Add advance warning signs for upcoming rail crossings.
    - Repair sidewalks and add tactile warning strips.
    - Repair asphalt in roadway and pedestrian crossing areas.
    - Modify rail crossing gates and striping at channelized northbound right turn lane at Lee Road / Orange Blossom Trail rail crossing.
- Emerging Technology Recommendations:
    - Implement freight signal priority at key intersections along two corridors to enhance intersection safety.
    - Install rail crossing warnings, queue warnings, and pedestrian detection and warning treatments
- Geometric Recommendations:
    - Perform pavement and geotechnical investigations of pavement issues and develop/implement context-sensitive improvements as appropriate.
    - Modify driveways to meet current standards for width and flares.
    - Adjust left turn lane stop bars to minimize encroachment from adjacent right turn movements.
    - Install “No Parking” signs within the right-of-way at locations specified within the report.
- Multimodal Infrastructure Recommendations:
    - Provide off-street trails or separated bicycle lanes consistent with the Orlando Bicycle Plan.
    - Close existing sidewalk gaps.
    - Address Americans with Disabilities Act (ADA) incompliance and driveway slope issues.
    - Repair sidewalk cracking.
    - Close/narrow driveways at select locations.
    - Coordinate with LYNX to address ADA compliance and access at transit stops.
    - Implement colored and textured crosswalks at intersections and colored bicycle lanes in conflict areas throughout the study area.

It is recommended that the project stakeholders review the detailed study recommendations and work to develop specific strategies for implementation.

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INTRODUCTION AND BACKGROUND

The Silver Star Freight Subarea is a long-standing hub of industrial activity northwest of downtown Orlando, generally located along Orange Blossom Trail (US 441) and John Young Parkway (State Road (SR) 423). This area was converted from predominantly agricultural uses to industrial uses in the 1950s, due in large part to the efforts of Dr. Philip Phillips, who began converting some of his 5,000 acres of agricultural lands to some of the first industrial properties in Central Florida anchored around the Phillips citrus packing plant near the junction of Princeton Street (SR 438) and Orange Blossom Trail. The legacy of Dr. Phillips is continued in the establishment of the Packing District, comprised of land owned by Dr. Phillips Charities, as a new anchor for mixed-use development.

The continued expansion of metropolitan Orlando's economy has created some growth pressures that affect the Silver Star Freight Subarea's economic competitiveness. Notable among these pressures are increased roadway congestion, which affects the cost and reliability of goods movement as well as increased land values that create demand for higher and better uses than low-intensity warehousing and distribution. In addition, operational and safety concerns for truck traffic are evidenced by elements of roadway design, operations, and maintenance throughout the subarea.

Phase I Study

The first phase of the Silver Star Freight Subarea Study was previously completed to assess the existing conditions affecting goods movement in the Silver Star Subarea. **Figure 1** shows the Silver Star Freight Subarea, encompassing an area roughly three miles in length, generally oriented along Orange Blossom Trail and John Young Parkway. The study area width is variable to encompass the major industrial properties generating truck traffic. In the Phase I study, available data from a variety of quantifiable data sources were reviewed, field reviews and stakeholder interviews were conducted, and qualitative assessments of operational problems and recommendations for potential solutions were documented.

Purpose of Phase II Study

The purpose of the Phase II study is to advance the recommendations from Phase I to identify and develop actionable infrastructure improvements in the following areas:

- Safety improvements at key locations identified within the study area
- Signal warrants for the John Young Parkway / Shader Road intersection
- At-grade rail-highway crossings
- Emerging technology, including freight signal priority and connected and automated vehicle technology
- Roadway geometry
- Multimodal infrastructure and accommodations

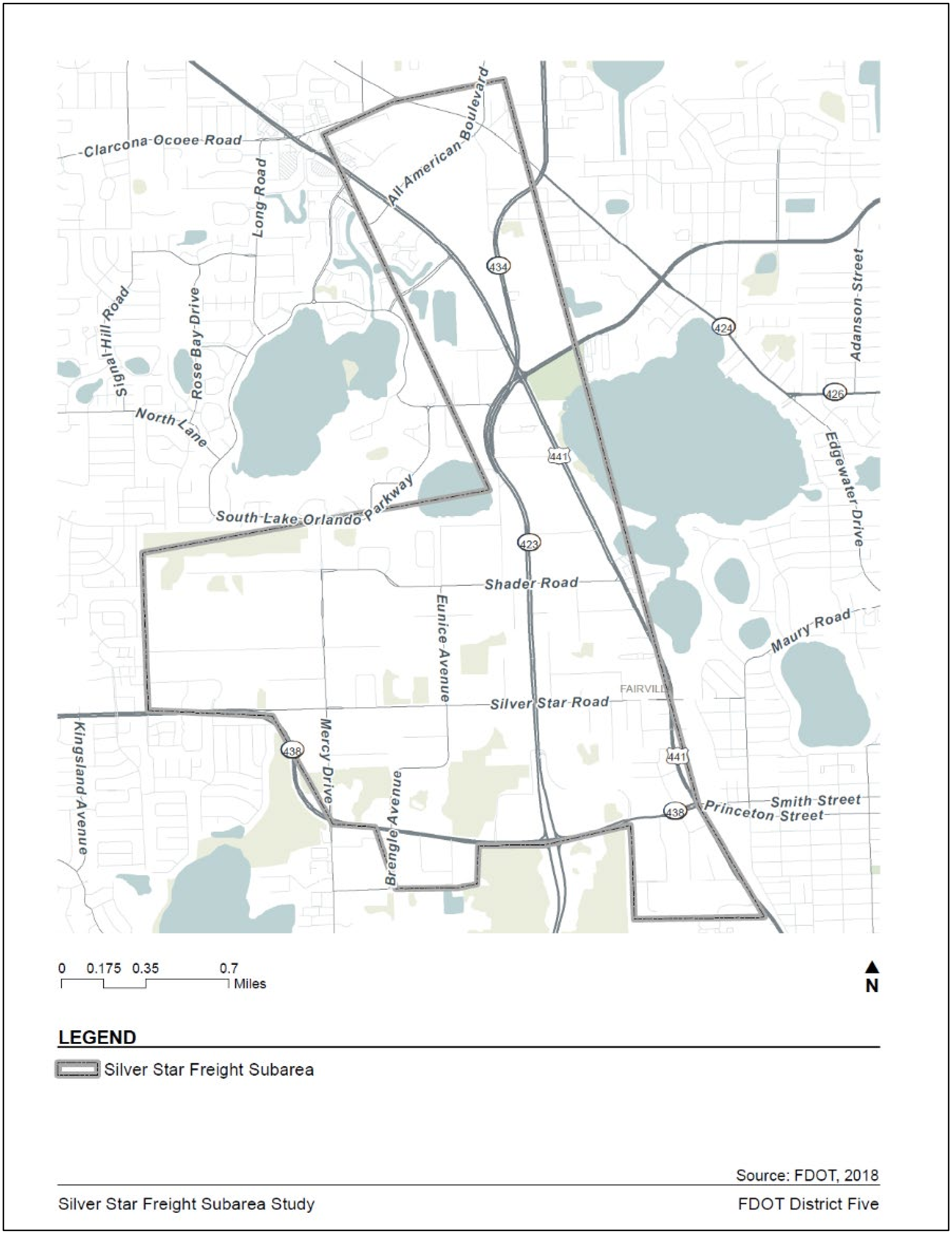


Figure 1. Silver Star Freight Subarea

SAFETY ANALYSIS

Subarea stakeholders identified safety concerns along Pine Hills Road, especially at the Silver Star Road and Colonial Drive (SR 50) intersections. Unlike John Young Parkway with its current construction, these concerns can be more immediately determined and addressed as necessary. Based on the stakeholders' input and Phase I safety analyses, the following signalized intersections were selected for a more detailed crash analysis, and safety evaluation in the Phase II study. The intersection safety analysis includes developing crash diagrams, analyzing causal factors, and identifying countermeasures for the following three signalized intersections:

- Orange Blossom Trail and John Young Parkway
- Pine Hills Road and Silver Star Road
- Pine Hills Road and Colonial Drive

Furthermore, as part of the Phase II safety analysis the commercial vehicular traffic activities throughout the day along John Young Parkway, Orange Blossom Trail, and Silver Star Road were also evaluated to understand the relationship between commercial traffic, congestion, and safety conditions.

Intersection Safety Analysis

Crash analyses were conducted for the three intersections using the most recent five-year crash data obtained from the FDOT Crash Analysis Reporting System (CARS) for the time frame of January 2013 to December 2017. The crash analyses for the individual intersections are documented in the subsequent sections of this report.

Orange Blossom Trail and John Young Parkway Intersection

The Orange Blossom Trail and John Young Parkway intersection vicinity map is shown on **Figure 2**. A summary of existing intersection conditions is provided in **Table 1**. The crashes by severity of incident, by year, are shown in **Table 2**. The pedestrian and bicyclist related crashes by year are indicated in **Table 3**. The vehicular crashes that occurred each year by the manner of collision are summarized in **Table 4**. The commercial vehicle crashes by the manner of collision are presented in **Table 5**. The vehicular crashes by the intersection light conditions are included in **Table 6**. The vehicular crashes by the roadway surface conditions are included in **Table 7**. A Crash Diagram is provided in **Figure 3.** The commercial vehicle crashes are also identified on the crash diagrams to evaluate the commercial vehicle crash patterns, and to identify the appropriate intersection improvements.

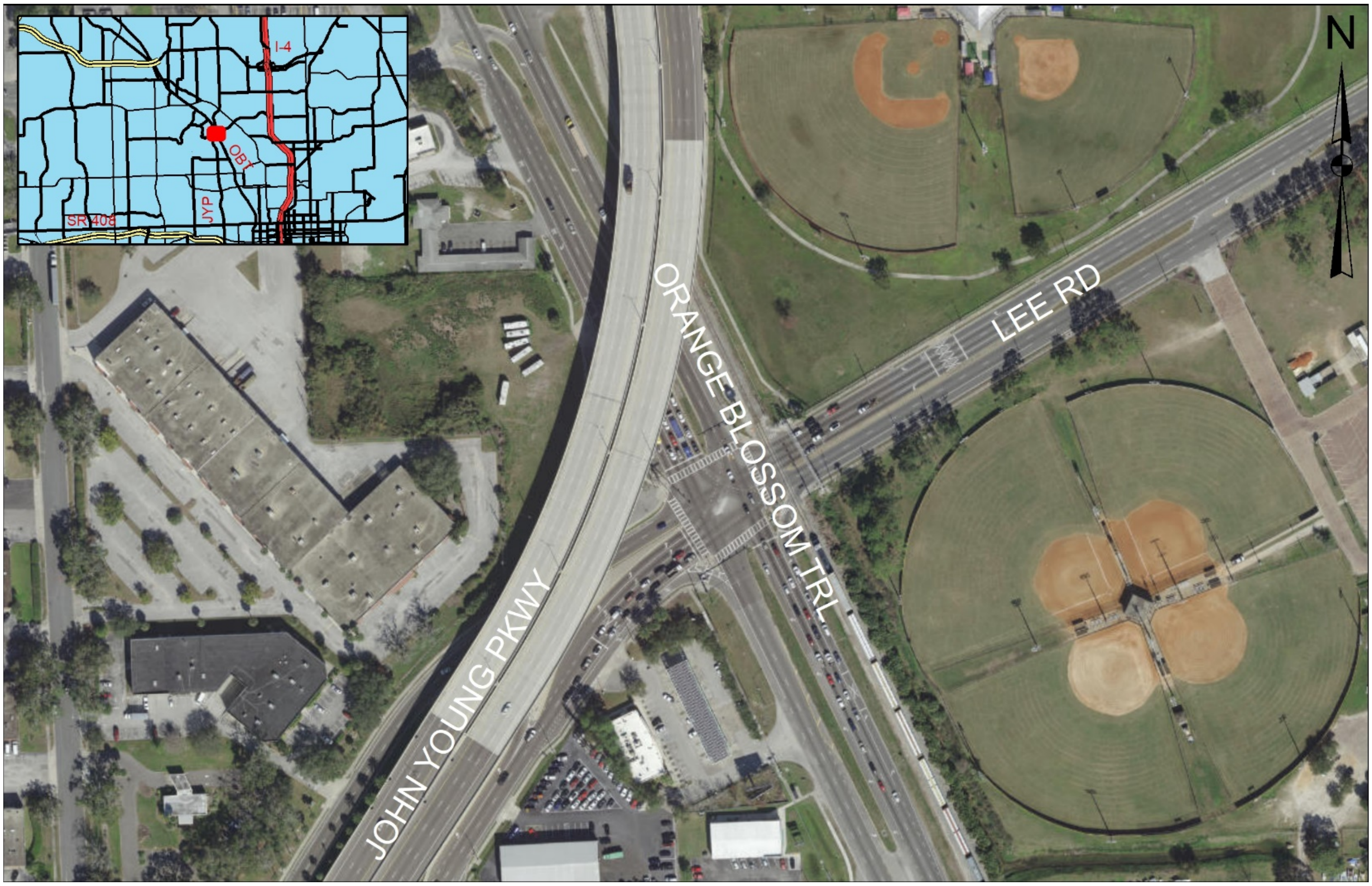


Figure 2. Orange Blossom Trail and John Young Parkway Intersection Map

Table 1. Summary of Existing Orange Blossom Trail and John Young Parkway Intersection Conditions

Feature	Description
Main Street	US 441 (Orange Blossom Trail)
Intersecting Street	John Young Pkwy/Lee Road
Area Location	In Orange County
Surrounding Development	Developed/Urban
Land Uses at Intersection	• North – Trotters Park (Baseball, Soccer) fields • South – Commercial properties including BP gas station/Circle K • East –Lake Fairview Park • West – Commercial properties
Pedestrian Generators	• Parks on the north and east quadrants of the intersection • Commercial properties on the south and west quadrants of the intersection
Traffic Control	The intersection is controlled by traffic signals
Adjacent Signalized Intersections	• To the north, approximately 0.9 mi along Orange Blossom Trail • To the south, approximately 1.5 mi along Orange Blossom Trail • To the east, approximately 0.7 mi along Lee Rd • To the south, approximately 0.9 mi along John Young Pkwy
Orange Blossom Trail	• Functional Classification – Urban Principal Arterial Other • Cross Section – Four-lane divided roadway • Speed Limit – 50 mph • Northbound Approach – Channelized right turn lane, two through lanes and a left turn lane • Southbound Approach – Right turn lane, two through lanes and two left turn lanes • Alignment – Straight and level • Sidewalks – Available along both north and south legs on both sides, except no sidewalk along the south leg on the east side • Utilities – Overhead power lines • Street Lighting – Street Lighting available
John Young Pkwy. / Lee Road	• Functional Classification – Urban Principal Arterial Other • Cross Section – Four-lane divided roadway • Speed Limit – 45 mph • Eastbound Approach – Channelized right turn lane, two through lanes and two left turn lanes • Westbound Approach –Right turn lane, two through lanes and a left turn lane • Alignment – Straight and level • Sidewalks – Available along both east and west legs on both sides • Utilities – Overhead power lines
Other Distinct Features	• Rail tracks run north-south along the east side of the intersection. • At-grade rail crossing on the east leg. • Bike lanes available on both sides of the west leg

Table 2. Orange Blossom Trail and John Young Parkway Intersection Crashes by Year and Severity

Year	Crashes with Fatalities	Crashes with Injuries	Crashes with Property Damage Only	Total
2013	0	13	29	42
2014	0	16	37	53
2015	0	16	21	37
2016	0	7	18	25
2017	0	18	25	43
Total	**0**	**70**	**130**	**200**

Table 3. Orange Blossom Trail and John Young Parkway Intersection Pedestrian and Bicyclist Crashes

Year	Pedestrian Crashes	Bicyclists Crashes	Total Crashes
2013	0	0	0
2014	0	2	2
2015	0	2	2
2016	0	0	0
2017	1	0	1
Total	**1**	**4**	**5**

Table 4. Orange Blossom Trail and John Young Parkway Intersection Vehicle Crashes by Manner of Collision

Year	Rear End Crashes	Head-On Crashes	Angle Crashes	Sideswipe Crashes	Other Crashes	Total Crashes
2013	21 (50%)	3 (7%)	6 (14%)	10 (24%)	2 (5%)	42
2014	28 (53%)	1 (2%)	7 (13%)	13 (25%)	4 (8%)	53
2015	22 (59%)	0 (0%)	7 (19%)	6 (16%)	2 (5%)	37
2016	14 (56%)	0 (0%)	3 (12%)	5 (20%)	3 (12%)	25
2017	21 (49%)	2 (5%)	8 (19%)	7 (16%)	5 (12%)	43
Total	**106 (53%)**	**6 (3%)**	**31 (16%)**	**41 (21%)**	**16 (8%)**	**200**

Table 5. Orange Blossom Trail and John Young Parkway Intersection Commercial Vehicle Crashes by Manner of Collision

Year	Rear End Crashes	Head-On Crashes	Angle Crashes	Sideswipe Crashes	Other Crashes	Total Crashes
2013	1 (17%)	0 (0%)	1 (17%)	4 (67%)	0 (0%)	6
2014	0 (0%)	0 (0%)	1 (17%)	4 (67%)	1 (17%)	6
2015	0 (0%)	0 (0%)	1 (33%)	1 (33%)	1 (33%)	3
2016	4 (50%)	0 (0%)	0 (0%)	3 (38%)	1 (13%)	8
2017	0 (0%)	0 (0%)	4 (57%)	3 (43%)	0 (12%)	7
Total	**5 (17%)**	**0 (0%)**	**7 (23%)**	**15 (50%)**	**3 (10%)**	**30**

Table 6. Orange Blossom Trail and John Young Parkway Intersection Vehicle Crashes by Intersection Light Conditions

Year	Daylight	Dusk	Dawn	Dark	Total Crashes
2013	30 (71%)	2 (5%)	0 (0%)	10 (24%)	42
2014	43 (81%)	3 (6%)	1 (2%)	6 (11%)	53
2015	28 (76%)	1 (3%)	0 (0%)	8 (21%)	37
2016	20 (80%)	1 (4%)	0 (0%)	4 (16%)	25
2017	31 (72%)	1 (2%)	2 (5%)	9 (21%)	43
Total	**152 (76%)**	**8 (4%)**	**3 (2%)**	**37 (18%)**	**200**

Table 7. Orange Blossom Trail and John Young Parkway Intersection Vehicle Crashes by Roadway Surface Conditions

Year	Dry	Wet	Total Crashes
2013	39 (93%)	3 (7%)	42
2014	42 (79%)	11 (21%)	53
2015	30 (81%)	7 (19%)	37
2016	21 (84%)	4 (16%)	25
2017	41 (95%)	2 (5%)	43
Total	**173 (86%)**	**27 (14%)**	**200**

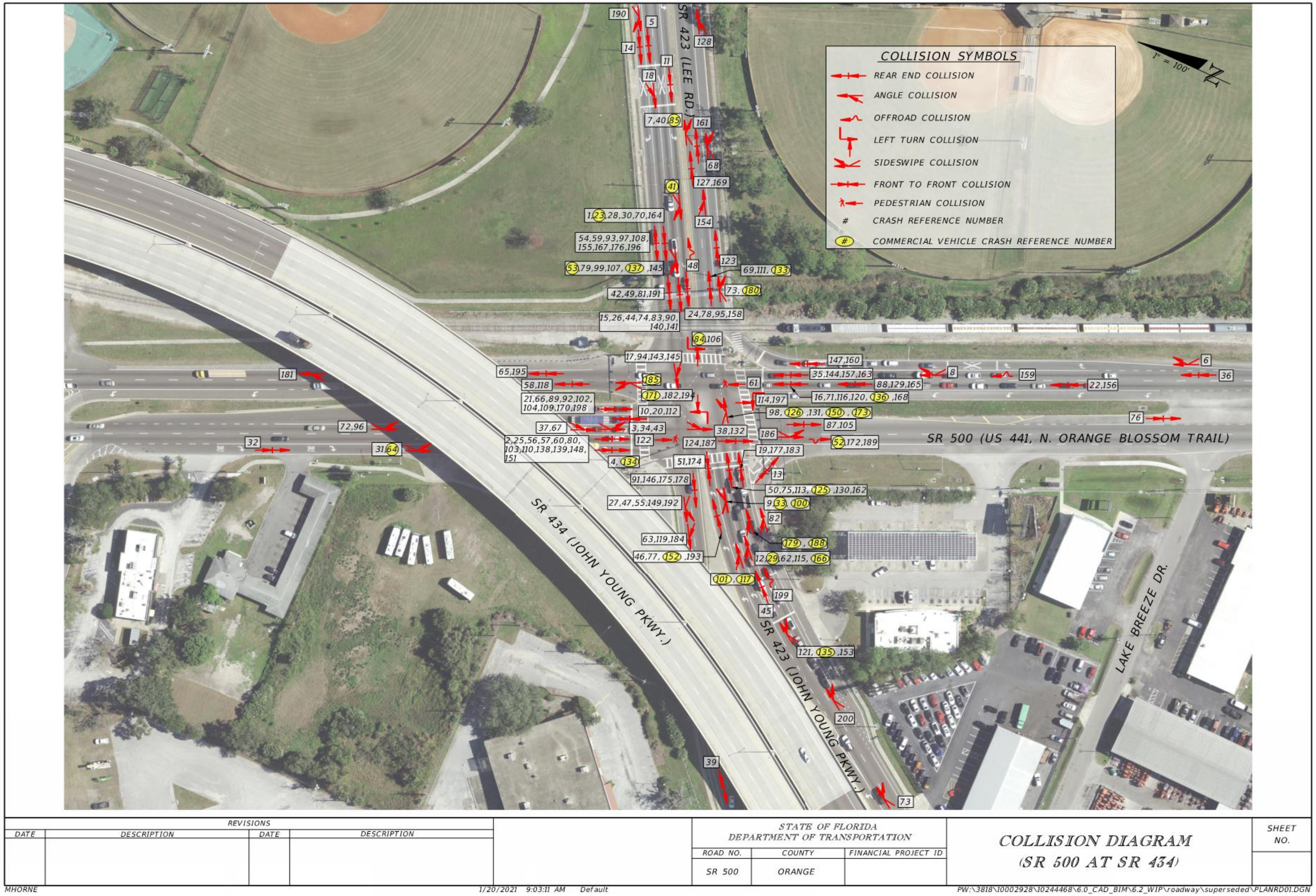


Figure 3. Orange Blossom Trail and John Young Parkway Intersection Crash Diagram

In total, there were 200 crashes reported in the past five years (2013-2017), out of which 30 (15 percent) crashes were commercial vehicle crashes. There have been one pedestrian crash and four bicyclist crashes reported. Most of the intersection crashes 106 (53 percent) were rear end crashes. The angle and sideswipe crashes were reported as 31 (16 percent) and 41 (21 percent), respectively. However, a higher percentage of the commercial vehicle crashes were found as sideswipe crashes (50 percent). The night-time crashes were reported as 18 percent for the five-year period.

The crash rate for the intersection of Orange Blossom Trail and John Young Parkway was estimated and compared to the statewide crash rate for similar facility types. The intersection crash rate is estimated by dividing the number of crashes by millions of entering vehicles. The millions of entering vehicles is the total amount of traffic passing through the intersection: this is calculated by summing the Annual Average Daily Traffic (AADT) volumes of all the roadways at the intersection then multiplying by the number of days in the analysis (365 days per year), then finally dividing by one million. As shown in **Table 8**, the average crash rate for the subject intersection is 1.753, which is significantly higher than the statewide crash rate of 0.587.

Table 8. Orange Blossom Trail and John Young Parkway Intersection Crash Rate

Average Crash Rate per Million Vehicles	
Orange Blossom Trail AADT	32,750
John Young Parkway/Lee Road AADT	29,750
Total Daily Traffic Entering the Intersection	62,500
Number of Years	5
Million Vehicles	114.063
Number of Reported Crashes	200
Intersection Crash Rate	**1.753**
FDOT District Five*	**0.549**
FDOT Statewide*	**0.587**

** Urban 4-5Lane Two-Way Divided Raised*

Based on the intersection crash analysis the following intersection improvements are recommended to mitigate the identified safety issues.

1. Consider providing signal heads with backplates with retroreflective yellow border to reduce the high percentage of rear-end collisions at the intersection.
2. Evaluate and update the signal yellow and red times to accommodate the high percentage of heavy commercial vehicles.
3. Evaluate and enhance the intersection lighting particularly on the approaches and under the John Young Parkway overpass to mitigate the high number of crashes occurring in dark conditions.

Pine Hills Road and Silver Star Road

The Pine Hills Road and Silver Star Road intersection vicinity map is shown on **Figure 4**. A summary of existing intersection conditions is provided in **Table 9**. The crashes by severity of incident, by year, are shown in **Table 10**. The pedestrian and bicyclist related crashes by year are indicated in **Table 11**. The vehicular crashes that occurred each year by the manner of collision are summarized in **Table 12**. The commercial vehicular crashes by the manner of collision are presented in **Table 13**. The vehicular crashes by the intersection light conditions are included in **Table 14**. The vehicular crashes by the roadway surface conditions are included in **Table 15**. A Crash Diagram is provided in **Figure 5**. The commercial vehicle crashes are also identified on the crash diagrams to evaluate the commercial vehicle crash patterns, and to identify the appropriate intersection improvements.

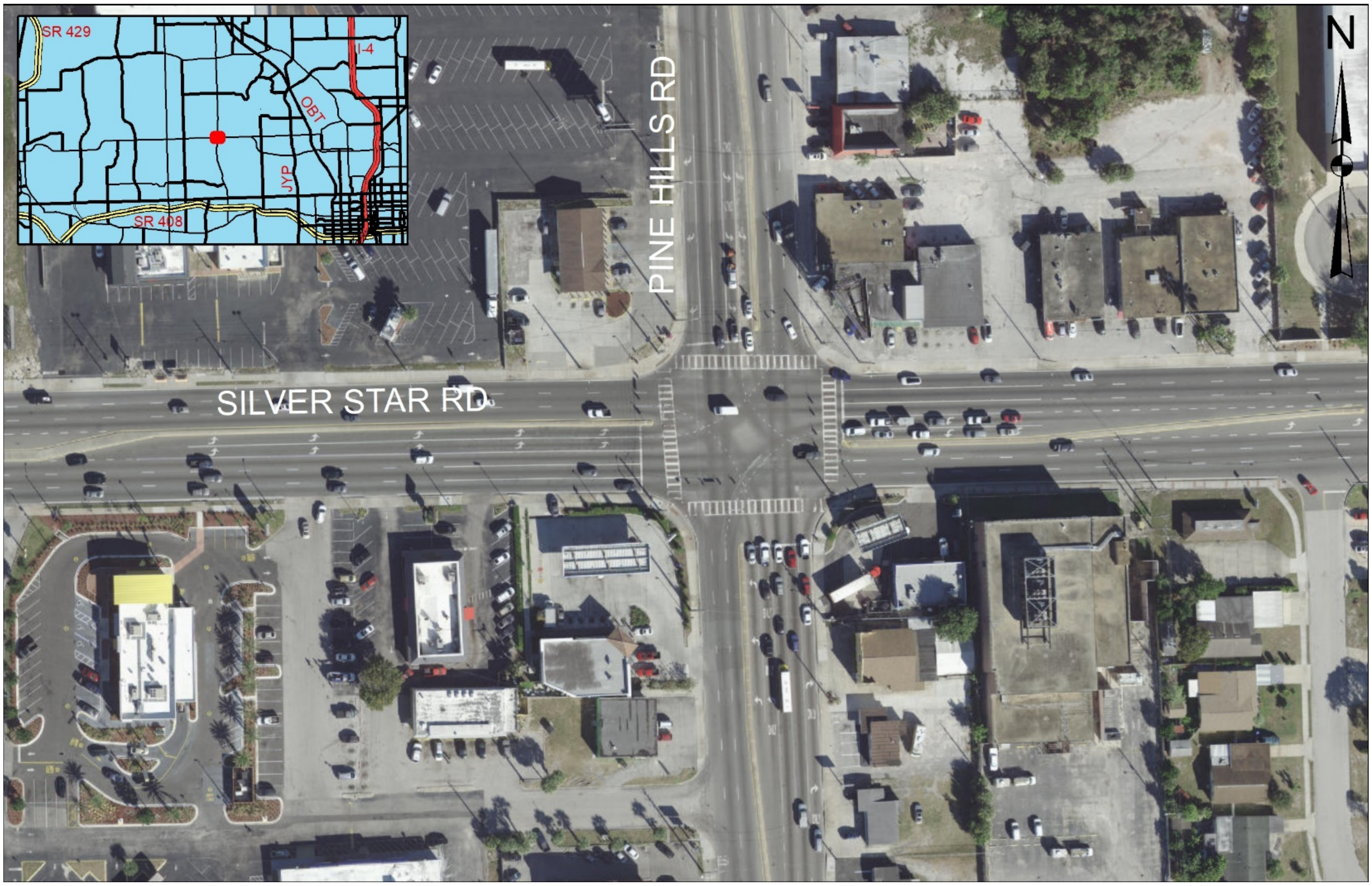


Figure 4. Pine Hills Road and Silver Star Road Intersection Map

Table 9. Summary of Existing Pine Hills Road and Silver Star Road Intersection Conditions

Feature	Description
Main Street	Silver Star Rd
Intersecting Street	Pine Hills Rd
Area Location	In Orange County
Surrounding Development	Developed/Urban
Land Uses at Intersection	• Northeast – Commercial properties including Value Pawn, Clipper City, and The Seafood Station • Northwest – Commercial properties including Andy's Corner convenience store • Southeast –Commercial properties including CITGO • Southwest – Commercial properties including Mobil, and Sobik's Subs
Pedestrian Generators	• Commercial properties on all four quadrants of the intersection, and along roadways; Evans High School is located just east of the intersection; also, the Pine Hills Trail crosses Silver Star Rd about 0.2 miles west of the intersection.
Traffic Control	The intersection is controlled by traffic signals
Adjacent Signalized Intersections	• To the north, approximately 0.2 mi along Pine Hills Road • To the south, approximately 0.4 mi along Pine Hills Road • To the east, approximately 0.2 mi along Silver Star Road • To the west, approximately 0.2 mi along Silver Star Road
Silver Star Road	• Functional Classification – Urban Principal Arterial Other • Cross Section – Six-lane divided roadway • Speed Limit – 40 mph • Eastbound Approach – Shared though-right turn lane, two through lanes and two left turn lanes • Westbound Approach – Shared though-right turn lane, two through lanes and two left turn lanes • Alignment – Straight and level • Sidewalks – Available along both east and west legs on both sides • Utilities – Overhead power lines • Street Lighting – Street Lighting available
Pine Hills Road	• Functional Classification – Minor Urban Arterial • Cross Section – Five-lane undivided roadway • Speed Limit – 40 mph • Northbound Approach –Right turn lane, two through lanes and two left turn lanes • Southbound Approach – Right turn lane, two through lanes and two left turn lanes • Alignment – Straight and level • Sidewalks – Available along both north and south legs on both sides • Utilities – Overhead power lines
Other Distinct Features	• Evans High School is located northeast of the intersection • There is significant pedestrian activity in the area • No on street bike lanes on either Silver Star Rd or Pine Hills Rd • The Pine Hills Trail runs parallel to Pine Hills Rd about 0.2 miles to the west of Silver Star Rd

Table 10. Pine Hills Road and Silver Star Road Intersection Crashes by Year and Severity

Year	Crashes with Fatalities	Crashes with Injuries	Crashes with Property Damage Only	Total
2013	2 (Ped)	19	25	46
2014	0	23	22	45
2015	1 (Ped)	25	22	48
2016	0	25	33	58
2017	0	24	37	61
Total	**3 (Ped)**	**116**	**139**	**258**

Table 11. Pine Hills Road and Silver Star Road Intersection Pedestrian and Bicyclist Crashes

Year	Pedestrian Crashes	Bicyclists Crashes	Total Crashes
2013	5	4	9
2014	3	1	4
2015	5	1	6
2016	4	2	6
2017	1	1	2
Total	**18**	**9**	**27**

Table 12. Pine Hills Road and Silver Star Road Intersection Vehicle Crashes by Manner of Collision

Year	Rear End Crashes	Head-On Crashes	Angle Crashes	Sideswipe Crashes	Other Crashes	Total Crashes
2013	16 (35%)	0 (0%)	11 (24%)	11 (24%)	8 (17%)	46
2014	29 (64%)	0 (0%)	6 (13%)	4 (9%)	6 (13%)	45
2015	21 (44%)	0 (0%)	9 (19%)	8 (17%)	10 (20%)	48
2016	30 (52%)	0 (0%)	13 (22%)	6 (10%)	9 (16%)	58
2017	29 (48%)	1 (2%)	15 (25%)	9 (15%)	7 (11%)	61
Total	**125 (48%)**	**1 (0%)**	**54 (21%)**	**38 (15%)**	**40 (16%)**	**258**

Table 13. Pine Hills Road and Silver Star Road Intersection Commercial Vehicle Crashes by Manner of Collision

Year	Rear End Crashes	Head-On Crashes	Angle Crashes	Sideswipe Crashes	Other Crashes	Total Crashes
2013	3 (43%)	0 (0%)	2 (29%)	2 (29%)	0 (0%)	7
2014	2 (67%)	0 (0%)	0 (0%)	0 (0%)	1 (33%)	3
2015	0 (0%)	0 (0%)	0 (0%)	2 (100%)	0 (0%)	2
2016	1 (17%)	0 (0%)	2 (33%)	1 (17%)	2 (33%)	6
2017	3 (50%)	0 (0%)	1 (17%)	2 (33%)	0 (0%)	6
Total	**9 (38%)**	**0 (0%)**	**5 (21%)**	**7 (29%)**	**3 (12%)**	**24**

Table 14. Pine Hills Road and Silver Star Road Intersection Vehicle Crashes by Intersection Light Conditions

Year	Daylight	Dusk	Dawn	Dark	Total Crashes
2013	35 (76%)	3 (7%)	1 (2%)	7 (15%)	46
2014	27 (60%)	0 (0%)	0 (0%)	18 (40%)	45
2015	32 (67%)	0 (0%)	0 (0%)	16 (33%)	48
2016	42 (72%)	2 (4%)	1 (2%)	13 (22%)	58
2017	48 (79%)	2 (3%)	2 (3%)	9 (15%)	61
Total	**184 (71%)**	**7 (3%)**	**4 (2%)**	**63 (24%)**	**258**

Table 15. Pine Hills Road and Silver Star Road Vehicle Crashes by Roadway Surface Conditions

Year	Dry	Wet	Total Crashes
2013	44 (96%)	2 (4%)	46
2014	42 (93%)	3 (7%)	45
2015	46 (96%)	2 (4%)	48
2016	57 (98%)	1 (2%)	58
2017	54 (89%)	7 (11%)	61
Total	**243 (94%)**	**15 (6%)**	**258**

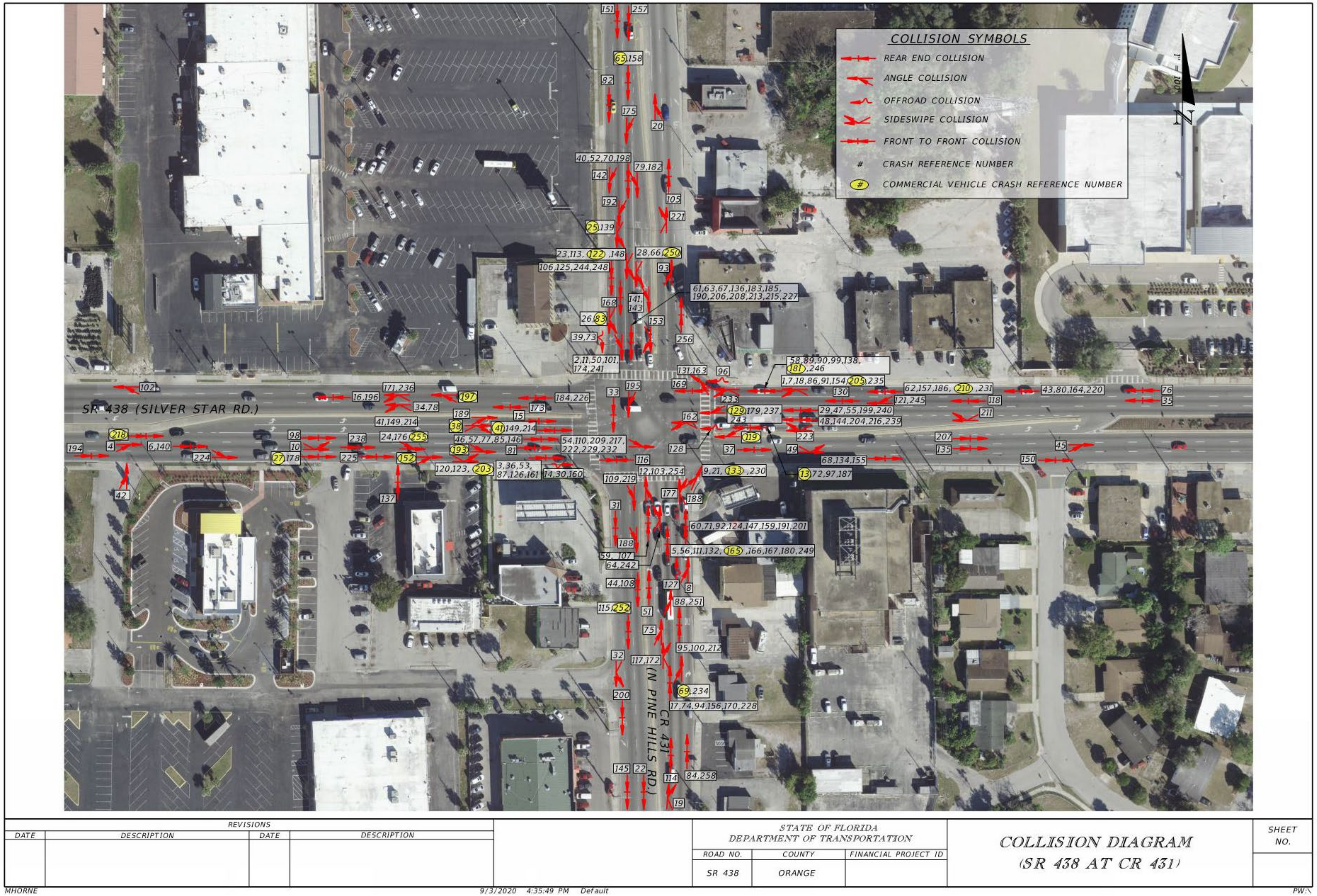


Figure 5. Pine Hills Road and Silver Star Road Intersection Crash Diagram

In total, there were 258 crashes reported in the past five years (2013-2017), out of which 24 (9.3 percent) were commercial vehicle crashes. There have been 18 pedestrian crashes and nine bicyclist crashes reported, and three of the pedestrian crashes resulted in fatalities. Two pedestrian crashes and five bicycle crashes involved right turning vehicles. The highest percentage of intersection crashes 125 (48 percent) were rear end crashes. The angle and sideswipe crashes were reported as 54 (21 percent) and 38 (15 percent), respectively. However, a higher percentage of the commercial vehicle crashes were found as sideswipe crashes (29 percent). The night-time crashes were reported as 24 percent for the five-year period.

The crash rate for the intersection of Pine Hills Road and Silver Star Road was estimated and compared to the statewide crash rate for similar facility types. The intersection crash rate is estimated by dividing the number of crashes by millions of entering vehicles. The millions of entering vehicles is the total amount of traffic passing through the intersection: this is calculated by summing the AADT volumes of all the roadways at the intersection then multiplying by the number of days in the analysis (365 days per year), then finally dividing by one million. As shown in **Table 16**, the average crash rate for the subject intersection is 1.977, which is significantly higher than the statewide crash rate of 0.826.

Table 16. Pine Hills Road and Silver Star Road Intersection Crash Rate

Average Crash Rate per Million Vehicles	
Pine Hills Road AADT	35,500
Silver Star Road AADT	36,000
Total Daily Traffic Entering the Intersection	71,500
Number of Years	5
Million Vehicles	130.488
Number of Reported Crashes	258
Intersection Crash Rate	**1.977**
FDOT District Five*	**0.815**
FDOT Statewide*	**0.826**

** Urban 6+Lane Two-Way Divided Raised*

Orange County conducted the *Pine Hills Road Pedestrian/Bicycle Safety Study,* from Colonial Drive to Bonnie Brae Circle, to develop alternatives and strategies that identify solutions to provide safe walking and cycling mobility needs along the corridor. In the study, the following intersection improvements were identified for the Pine Hills Road and Silver Star Road intersection. The project is currently in design and scheduled for construction in 2022.

1. Reconstructing curb returns.
2. Adding high intensity crosswalks.
3. Providing new mast arms signal.
4. Add a low wall with sign tower and wayfinding signage.

5. Expanding the ped areas on the northeast and southwest corners by removing at least a portion of the acceleration lane.
6. Lighting improvements.

Considering the Orange County study and the intersection crash analysis, the following additional intersection improvements are recommended to mitigate the identified safety issues.

1. Consider providing signal heads with backplates with retroreflective yellow border to reduce the high percentage of rear-end collisions at the intersection.
2. Evaluate and update the signal yellow and red times to accommodate the high percentage of heavy commercial vehicles.
3. Consider extending the westbound left-turn lanes at the intersection, by closing the Evans High School directional median opening located immediately east of the intersection, to potentially reduce the crashes at the westbound approach of the intersection.
4. Provide Leading Pedestrian Interval (LPI) signal timing at all the intersection approaches to improve the pedestrian and bicyclist safety conditions.
5. Consider prohibiting right turn on red (RTOR) at the intersection or installing yield to pedestrians and bicycles signs at intersection approaches.

Pine Hills Road and Colonial Drive Intersection

The Pine Hills Road and Colonial Drive intersection vicinity map is shown on **Figure 6**. A summary of existing intersection conditions is provided in **Table 17.** The crashes by severity of incident, by year, are shown in **Table 18**. The pedestrians and bicyclist related crashes by year are indicated in **Table** 19. The vehicular crashes that occurred each year by the manner of collision are summarized in **Table 20**. The commercial vehicular crashes by the manner of collision are presented in **Table 21**. The vehicular crashes by the intersection light conditions are included in **Table 22**. The vehicular crashes by the roadway surface conditions are included in **Table 23**. A Crash Diagram is provided in **Figure 7.** The commercial vehicle crashes are also identified on the crash diagrams to evaluate the commercial vehicle crash patterns, and to identify the appropriate intersection improvements.

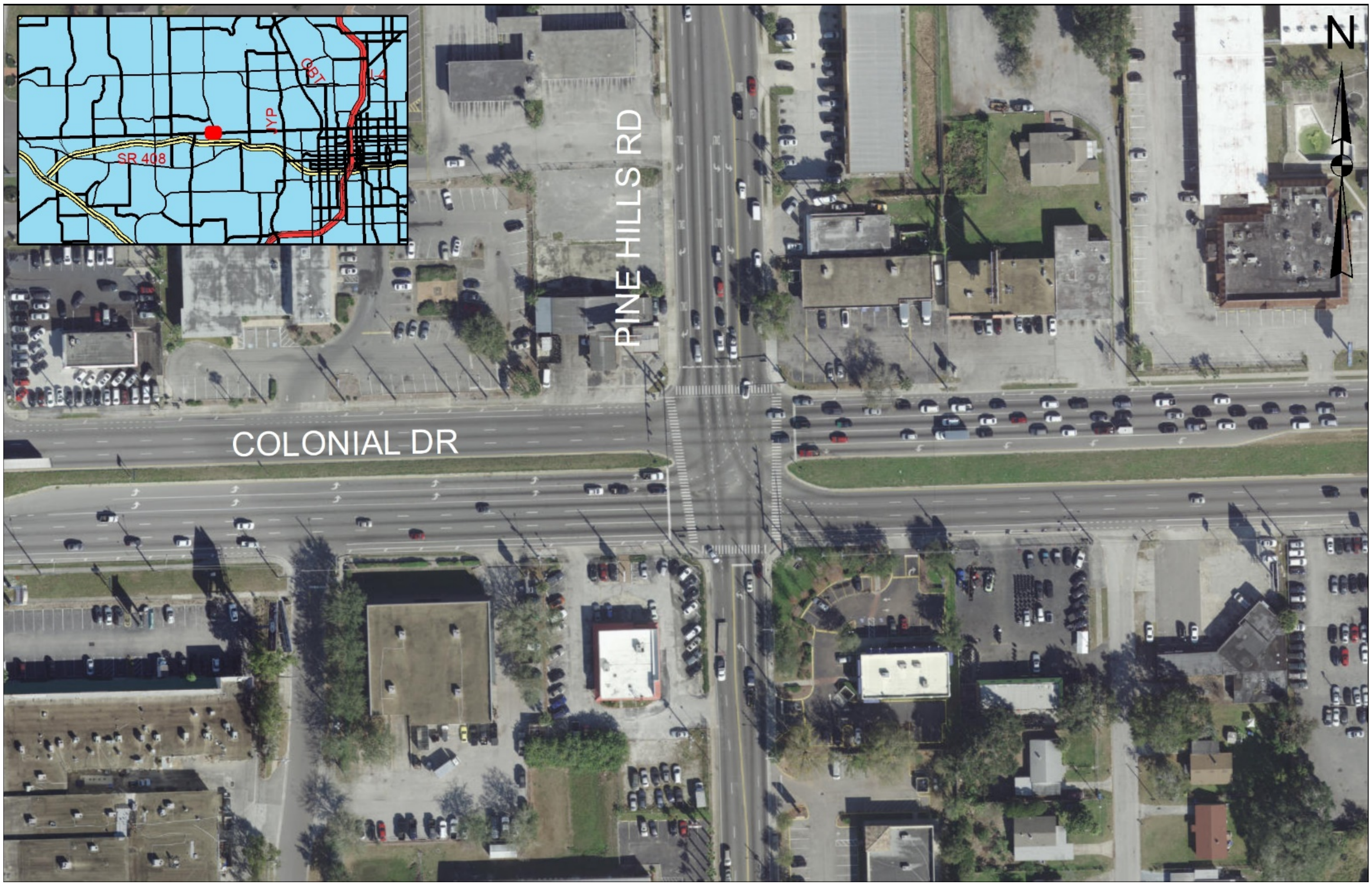


Figure 6. Pine Hills Road and Colonial Drive Intersection Map

Table 17. Summary of Existing Pine Hills Road and Colonial Drive Intersection Conditions

Feature	Description
Main Street	Colonial Dr
Intersecting Street	Pine Hills Rd
Area Location	In Orange County
Surrounding Development	Developed/Urban
Land Uses at Intersection	• Northeast – Commercial properties including Buddy's Home Furnishing, Super Star K, and Marco's Crab Shack • Northwest – Commercial properties including Kings Used & New Tires • Southeast – Commercial properties including Amscot, and Western Union • Southwest – Commercial properties including Tucker Auto Sales
Pedestrian Generators	• Commercial properties on all four quadrants of the intersection, and along roadways intersection • Pine Hills Trail begins approximately 0.5 mile to the northwest of the intersection along Alhambra Dr • Barnett Park is located approximately 0.5 mile to the northeast of the intersection
Traffic Control	The intersection is controlled by traffic signals
Adjacent Signalized Intersections	• To the north, approximately 0.4 mi along Pine Hills Road • To the south, approximately 0.7 mi along Pine Hills Rd • To the east, approximately 0.5 mi along Colonial Dr • To the west, approximately 0.2 mi along Colonial Dr
SR 50 (Colonial Drive)	• Functional Classification – Urban Principal Arterial Other • Cross Section – Six-lane divided roadway • Speed Limit – 45 mph • Eastbound Approach – One shared though-right turn lane, two through lanes and two left turn lanes • Westbound Approach – One shared though-right turn lane, two through lanes and one left turn lane • Alignment – Straight and level • Sidewalks – Available along both east and west legs on both sides • Utilities – Overhead power lines • Street Lighting – Street Lighting available
Pine Hills Road	• Functional Classification – Minor Urban Arterial • Cross Section – Five-lane undivided roadway north of Colonial Drive, four-lane undivided roadway south of Colonial Drive • Speed Limit – 40 mph • Northbound Approach – One shared though-right turn lane, one through lane and one left turn lane • Southbound Approach – One right turn lane, two through lanes and two left turn lanes • Alignment – Straight and level • Sidewalks – Available along both north and south legs on both sides • Utilities – Overhead power lines
Other Distinct Features	• On street bike lanes available along both sides of Colonial Dr/ Colonial Drive

Table 18. Pine Hills Road and Colonial Drive Intersection Crashes by Year and Severity

Year	Crashes with Fatalities	Crashes with Injuries	Crashes with Property Damage Only	Total
2013	0	25	18	43
2014	0	23	30	53
2015	0	21	30	51
2016	0	19	48	67
2017	0	21	35	56
Total	**0**	**109**	**161**	**270**

Table 19. Pine Hills Road and Colonial Drive Intersection Pedestrian and Bicyclist Crashes

Year	Pedestrian Crashes	Bicyclists Crashes	Total Crashes
2013	1	0	1
2014	4	1	5
2015	2	3	5
2016	2	1	3
2017	0	1	1
Total	**9**	**6**	**15**

Table 20. Pine Hills Road and Colonial Drive Intersection Vehicle Crashes by Manner of Collision

Year	Rear End Crashes	Head-On Crashes	Angle Crashes	Sideswipe Crashes	Other Crashes	Total Crashes
2013	21 (49%)	0 (0%)	8 (19%)	7 (16%)	7 (16%)	43
2014	26 (49%)	1 (2%)	10 (19%)	6 (11%)	10 (19%)	53
2015	24 (47%)	0 (0%)	11 (22%)	5 (10%)	11 (21%)	51
2016	28 (42%)	1 (1%)	24 (36%)	6 (9%)	8 (12%)	67
2017	31 (55%)	0 (0%)	15 (27%)	6 (11%)	4 (7%)	56
Total	**130 (48%)**	**2 (1%)**	**68 (25%)**	**30 (11%)**	**40 (15%)**	**270**

Table 21. Pine Hills Road and Colonial Drive Intersection Commercial Vehicle Crashes by Manner of Collision

Year	Rear End Crashes	Head-On Crashes	Angle Crashes	Sideswipe Crashes	Other Crashes	Total Crashes
2013	0 (0%)	0 (0%)	0 (0%)	2 (50%)	2 (50%)	4
2014	4 (67%)	0 (0%)	0 (0%)	2 (33%)	0 (0%)	6
2015	2 (29%)	0 (0%)	3 (43%)	1 (14%)	1 (14%)	7
2016	0 (0%)	0 (0%)	2 (29%)	5 (71%)	0 (0%)	7
2017	2 (67%)	0 (0%)	0 (0%)	1 (33%)	0 (12%)	3
Total	**8 (30%)**	**0 (0%)**	**5 (19%)**	**11 (41%)**	**3 (11%)**	**27**

Table 22. Pine Hills Road and Colonial Drive Intersection Vehicle Crashes by Intersection Light Conditions

Year	Daylight	Dusk	Dawn	Dark	Total Crashes
2013	19 (44%)	2 (5%)	2 (5%)	20 (46%)	43
2014	33 (62%)	1 (2%)	0 (0%)	19 (36%)	53
2015	33 (65%)	1 (2%)	0 (0%)	17 (33%)	51
2016	42 (63%)	2 (3%)	1 (1%)	22 (33%)	67
2017	44 (78%)	2 (4%)	0 (0%)	10 (18%)	56
Total	**171 (63%)**	**8 (3%)**	**3 (1%)**	**88 (33%)**	**270**

Table 23. Pine Hills Road and Colonial Drive Vehicle Crashes by Roadway Surface Conditions

Year	Dry	Wet	Total Crashes
2013	40 (93%)	3 (7%)	43
2014	44 (83%)	9 (21%)	53
2015	46 (90%)	5 (10%)	51
2016	62 (93%)	5 (7%)	67
2017	51 (91%)	5 (9%)	56
Total	**243 (90%)**	**27 (10%)**	**270**

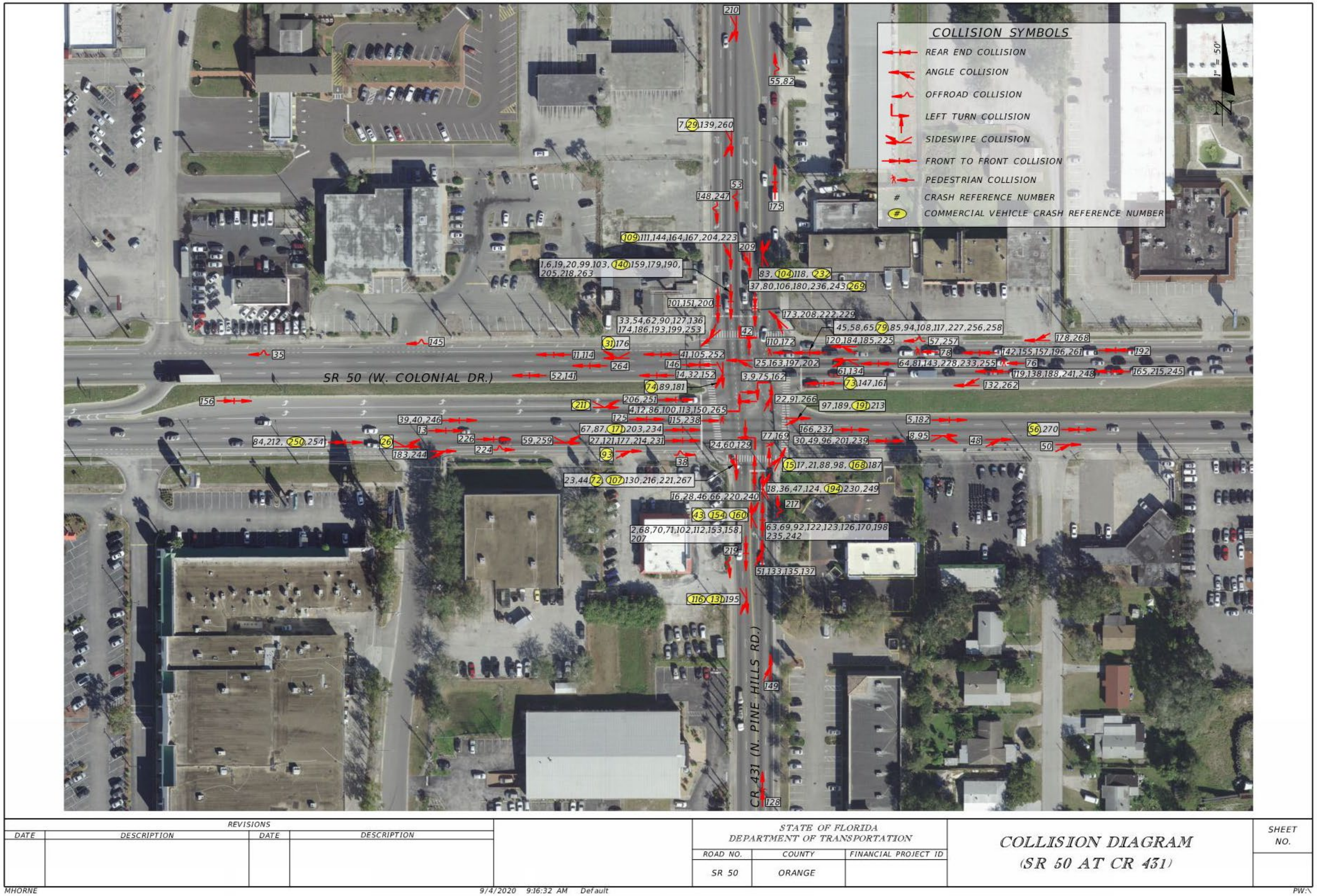


Figure 7. Pine Hills Road and Colonial Drive Intersection Crash Diagram

In total, there were 270 crashes reported in the past five years (2013-2017), out of which 27 (10 percent) were commercial vehicle crashes. There have been nine pedestrian crashes and six bicyclist crashes reported. One pedestrian crash and four bicycle crashes involved right turning vehicles. The highest percentage of intersection crashes 130 (48 percent) were rear end crashes. The angle and sideswipe crashes were reported as 68 (25 percent) and 30 (11 percent), respectively. However, a higher percentage of the commercial vehicle crashes were found as sideswipe crashes (41 percent). The night-time crashes were reported as 33 percent for the five-year period.

The crash rate for the intersection of Pine Hills Road and Colonial Drive was estimated and compared to the statewide crash rate for similar facility types. The intersection crash rate is estimated by dividing the number of crashes by millions of entering vehicles. The millions of entering vehicles is the total amount of traffic passing through the intersection: this is calculated by summing the AADT volumes of all the roadways at the intersection then multiplying by the number of days in the analysis (365 days per year), then finally dividing by one million. As shown in **Table 24**, the average crash rate for the subject intersection is 1.873, which is significantly higher than the statewide crash rate of 0.826.

Table 24. Pine Hills Road and Colonial Drive Intersection Crash Rate

Average Crash Rate per Million Vehicles	
Pine Hills Road AADT	37,000
Colonial Drive AADT	42,000
Total Daily Traffic Entering the Intersection	79,000
Number of Years	5
Million Vehicles	144.175
Number of Reported Crashes	270
Intersection Crash Rate	**1.873**
FDOT District Five*	**0.815**
FDOT Statewide*	**0.826**

** Urban 6+Lane Two-Way Divided Raised*

Based on the intersection crash analysis the following intersection improvements are recommended to mitigate the identified safety issues.

1. Consider providing signal heads with backplates with retroreflective yellow border to reduce the high percentage of rear-end collisions at the intersection.
2. Evaluate and update the signal yellow and red times to accommodate the high percentage of heavy commercial vehicles.
3. Provide LPI signal timing at all the intersection approaches to improve the pedestrian and bicyclist safety conditions.
4. Consider prohibiting RTOR at the intersection or installing yield to pedestrians and bicycles signs at intersection approaches.

5. Evaluate and enhance the intersection lighting to mitigate the high number of crashes occurring in dark conditions.
6. Consider evaluating innovative intersection concepts such as Median U-turn (MUT) or Restricted Crossing U-turn (RCUT) to reduce the vehicular conflicts and the number of crashes.

Roadway Congestion, Commercial Traffic, and Safety Evaluation

The commercial traffic throughout the day as well as congestion along John Young Parkway, Orange Blossom Trail, and Silver Star Road were analyzed to understand the relationship between commercial traffic, congestion, and safety conditions.

Truck Traffic Origin/Destination Trip Patterns

Truck origin and destination data comes from Streetlight. Streetlight data is anonymized data from smart phones and navigation systems that is collected as vehicles using these devices pass near specially equipped streetlights. The points at which trucks destined for locations in the study area enter the study area and the location of those destinations are mapped in **Figure 8** and **Figure 9**. **Figure 8** reflects the data from all trucks and **Figure 9** reflects the data only from the heaviest classes of trucks. Both maps show the highest percentage of trucks entering the study area from the south on John Young Parkway, with the percentage of heavy trucks entering at that point (46.13 percent) more than ten percentage points higher than that of all trucks entering there (34.52 percent). The second most popular gateway is Lee Road (SR 423), a direct connection from I-4. A combination of the percentages of each polygon along Silver Star Road reveals that the highest percentage of both categories of truck traffic is destined for locations along that corridor. The highest percentage, by far, of heavy trucks are bound for locations to the west of John Young Parkway.

Figure 10 shows that overall traffic volume is concurrent with truck traffic volume in that John Young Parkway is the busiest roadway in the subarea, serving a daily volume of more than 50,000 vehicles overall. One interesting inversion between the truck and total AADT data is that, while the volume for overall vehicles is lower on the segment of John Young Parkway between Silver Star Road and Princeton Street than it is elsewhere on John Young Parkway, the volume of trucks is higher on that segment.

Figure 11 shows the average daily truck traffic in the subarea. The pure volume of truck traffic is highest on John Young Parkway. The roadway segment between Princeton Street and Silver Star Road sees an average volume of 6,000 trucks per day, while the segment between Silver Star Road and Orange Blossom Trail sees an average volume of 3,501 to 6,000 trucks per day.

Figure 12 shows truck percentage as a share of total traffic. The corridor for which trucks constitute the highest share of traffic is Mercy Drive, which runs north-south and bisects the east-west industrial cluster. Trucks constitute a total of more than 15 percent of the traffic on this road. This is likely because Mercy Drive ends at the northern boundary of the industrial park, so it makes sense that a large proportion of the traffic on that roadway within the study area would be trucks destined for the industrial facilities along that road. The only other corridor for which trucks constitute a similar share of traffic is John Young Parkway from Silver Star Road to Princeton Street, where trucks are 11-15 percent of traffic. Elsewhere on major roads in the subarea, truck traffic constitutes 2.5-10 percent of overall traffic. This pattern, where volume is highest south of Silver Star Road and thins out just north of it, complements the data showing that the highest percentage (34.52 percent) of commercial traffic entering the subarea enters via the southern gateway on John Young Parkway.

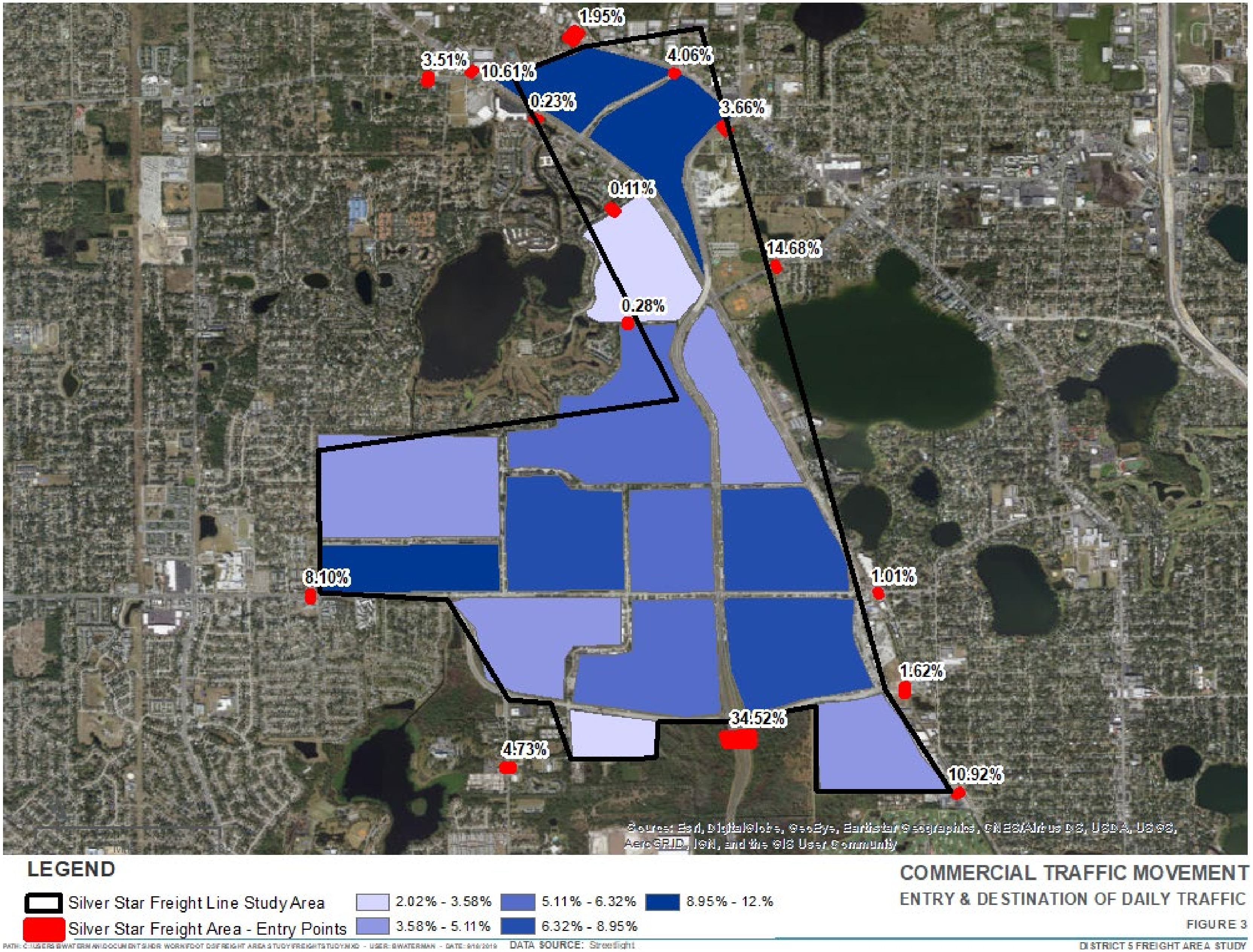


Figure 8. Truck Traffic Distribution Along Major Roadways

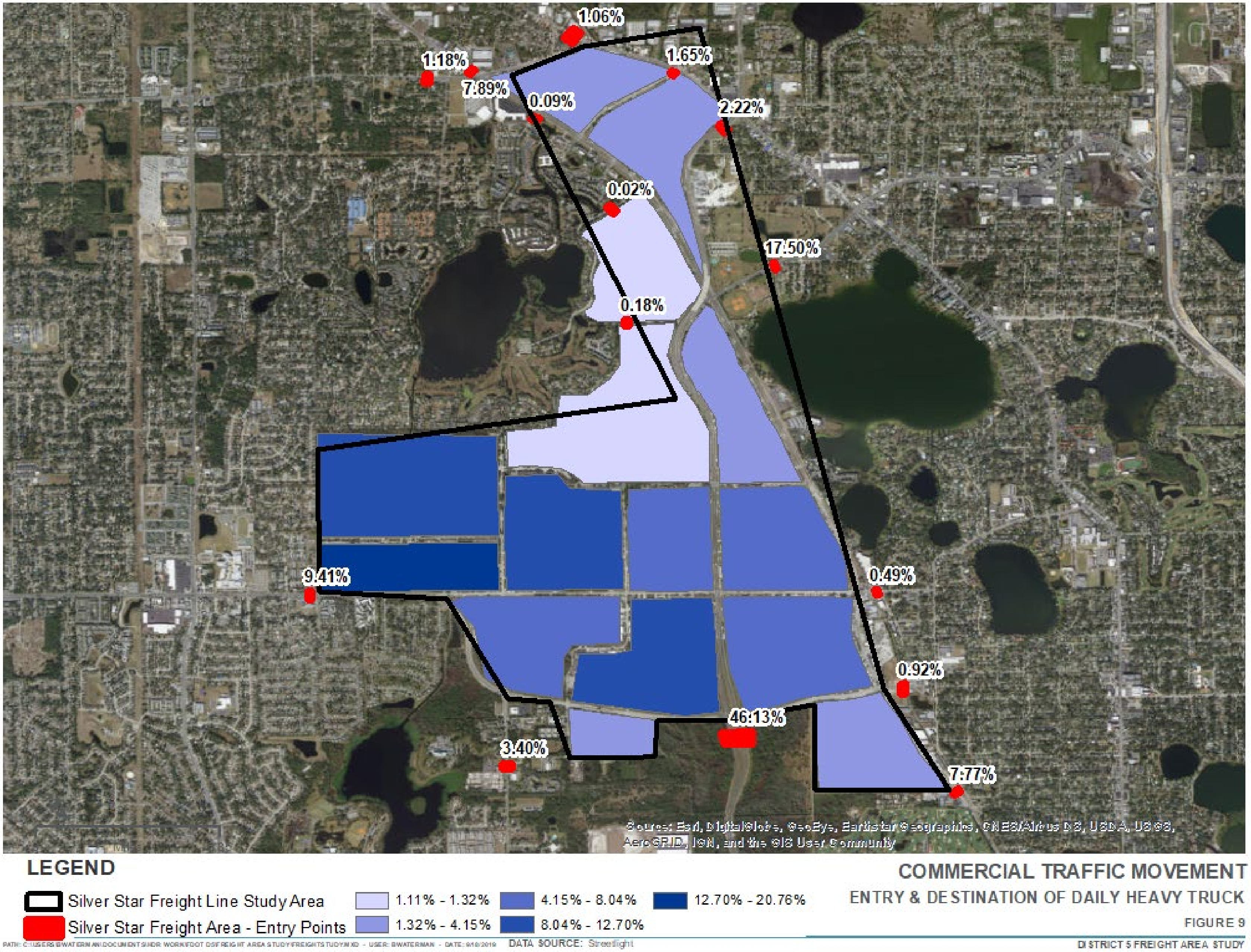


Figure 9. Heavy Truck Traffic Distribution Along Major Roadways

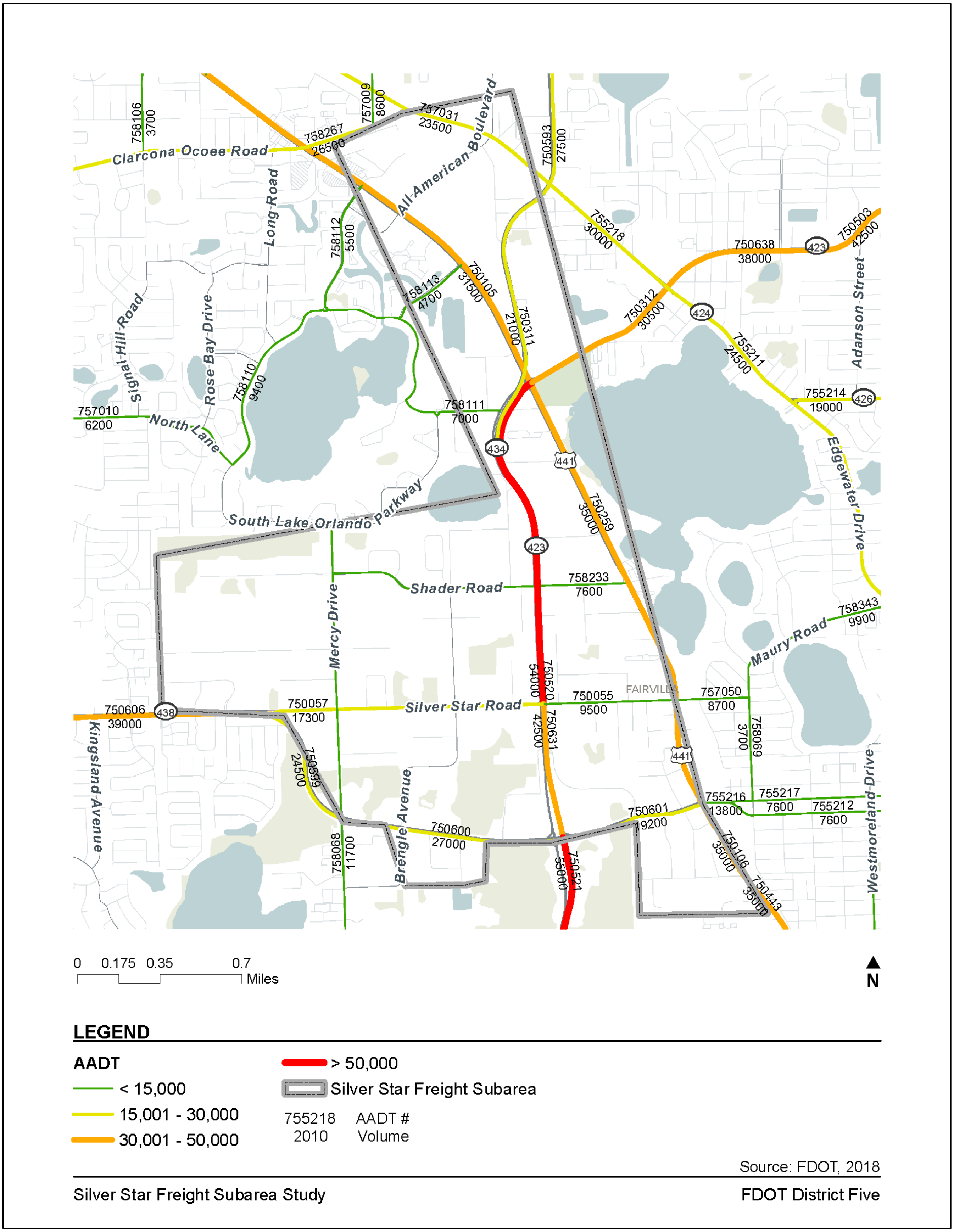


Figure 10. Roadway Annual Average Daily Traffic (AADT) Volumes

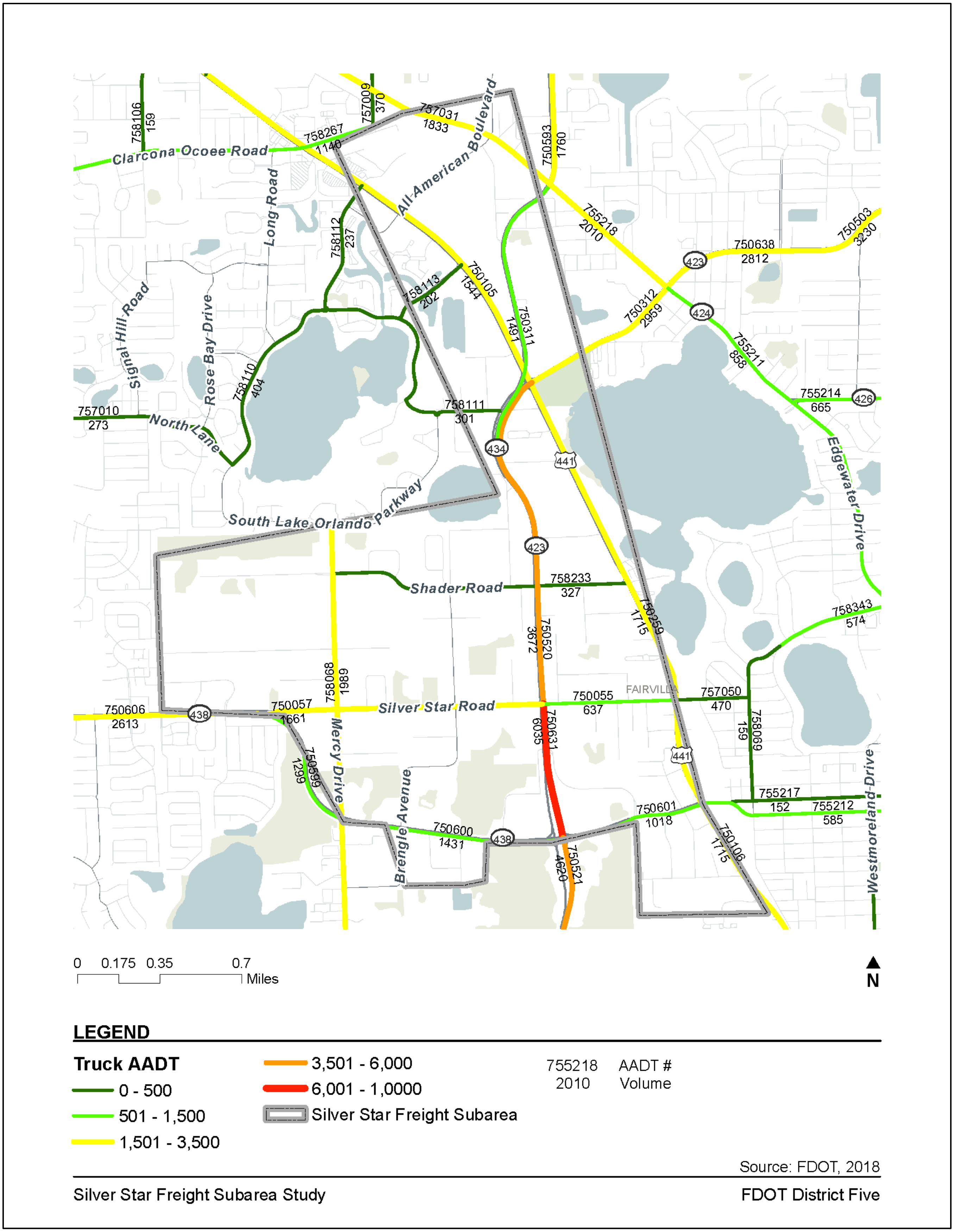


Figure 11. Roadway Daily Truck Traffic Volumes

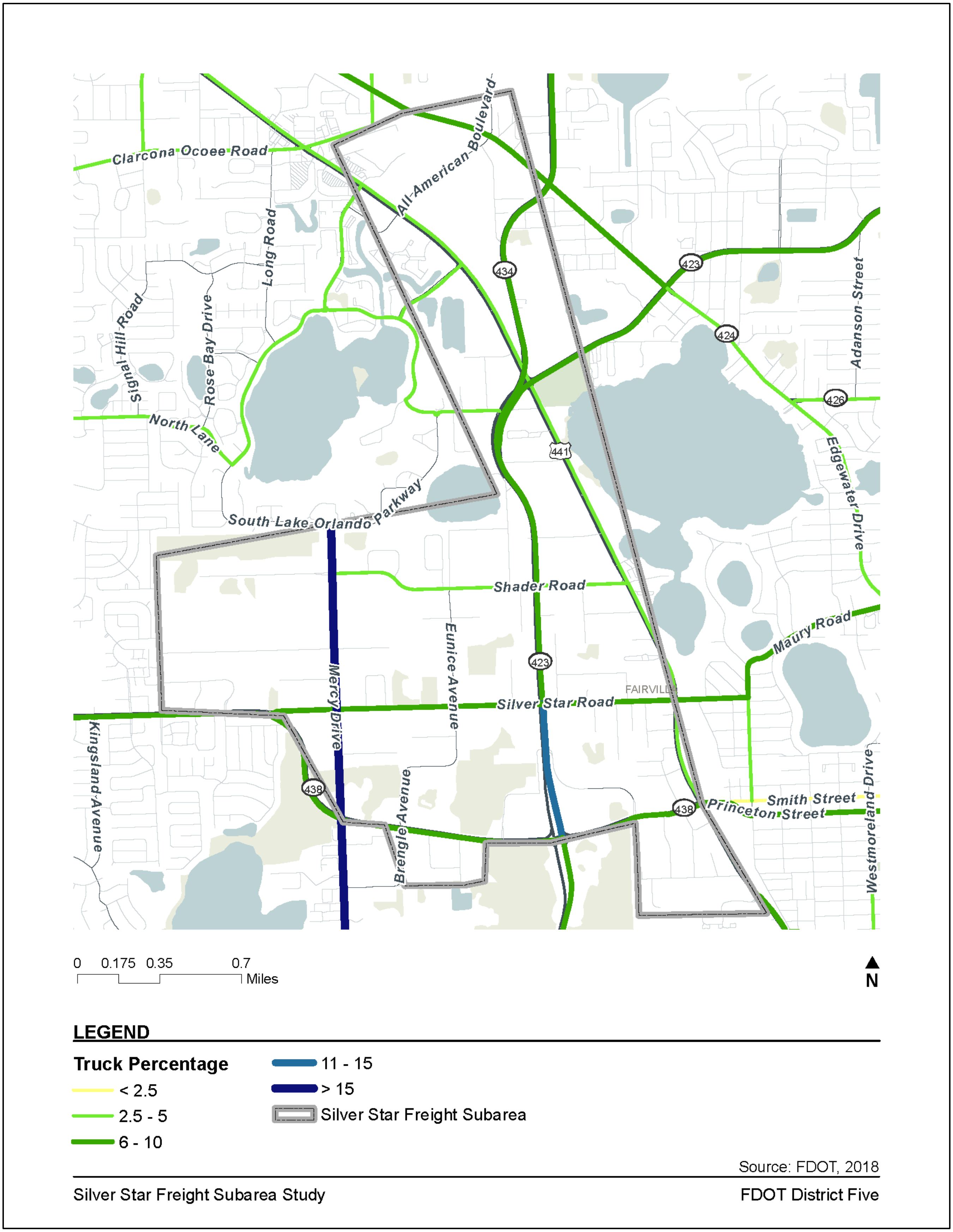


Figure 12. Roadway Daily Truck Traffic Percentages

Roadway Congestion

An analysis of roadway congestion in the subarea is based on two different sources: Streetlight data and the American Transportation Research Institute's (ATRI) database of commercial traffic movement. The ATRI database is comprised of Global Positioning System (GPS) data from trucks. The ATRI data used for this study are from August 2017 to July 2018.

Figure 13, Figure 14, and **Figure 15** are based on Streetlight data and visualize traffic congestion within the subarea as a percentage of the expected travel speed. Green segments represent the least difference between free flow/posted speed and the speed at which vehicles were actually recorded to be moving on these segments; red segments represent the greatest difference between free flow and recorded speed. For instance, consider a segment for which the free flow speed is 40 MPH but on which traffic was recorded as actually moving at 26 MPH. The recorded speed, 26 MPH, is 65 percent of the expected travel speed, 40 MPH, which represents the full 100 percent. The difference between the expected travel speed and the recorded travel speed relative to one another (100-65 percent) would then be 35 percent, so this segment would be represented on the map in red.

Figure 13 shows congested travel conditions throughout the day. The data suggests that the roadways in the industrial cluster north of Silver Star Road as well as Orange Blossom Trail north of the intersection with John Young Parkway and the roadways that branch off from that segment are consistently moderately congested throughout the day. Shader Road between John Young Parkway and Orange Blossom Trail experiences the highest level of daily congestion in the study area. Silver Star Road east of John Young Parkway, Mercy Drive south of Silver Star Road, Lake Breeze Drive west of John Young Parkway, All American Boulevard and Clarcona Ocoee Road also experience moderate congestion throughout the day.

Figure 14 shows congested travel conditions during morning peak travel hours (7 AM to 9 AM) and **Figure 15** shows congested travel conditions for evening peak travel hours (4 PM to 6 PM). The same four roadway segments are 35 percent or more congested during both peak periods:

- Silver Star Road between John Young Parkway and Orange Blossom Trail
- Shader Road between John Young Parkway and Orange Blossom Trail
- Clarcona Ocoee Road from Orange Blossom Trail to Edgewater Drive
- Princeton Street from Orange Blossom Trail to Coolidge Avenue

All segments of Orange Blossom Trail within the study area seem to be more congested during evening peak hours than morning. Shader Road west of John Young Parkway is significantly more congested in the morning.

Figure 16 shows the most congested roadway segments for trucks within the study area. This map shows that the most congested segments are along John Young Parkway, particularly south of Silver Star Road, and on Lynx Lane where it connects to John Young Parkway. This provides a different picture from the Streetlight data in part because the ATRI data used to identify the segments is weighted for truck volume, whereas the amount of delay is the most heavily weighted factor in the Streetlight data. For instance, a longer delay for a side street on which there are fewer trucks will show up as more congested on a Streetlight map, but the ATRI analysis considers that a shorter delay on a busier road affects a larger volume of trucks. Further, this larger volume of trucks has an overall expectation of less delay if they are on a main road as opposed to a side street, so the difference between expected speed and actual speed is greater, as opposed to the expectation of some delay on side streets that are not operationally designed to handle larger flows of traffic.

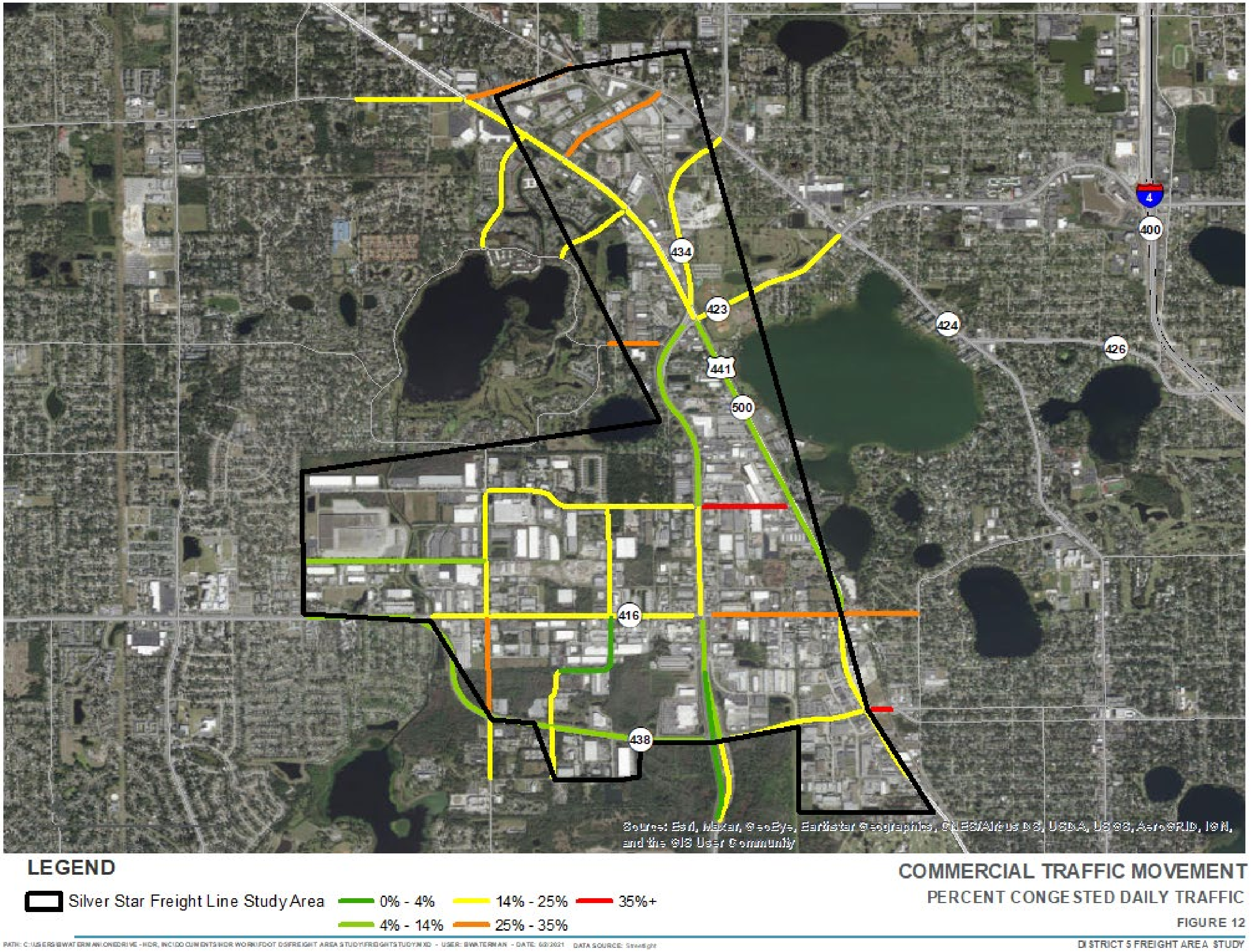


Figure 13. Roadway Daily Percent Congested Travel

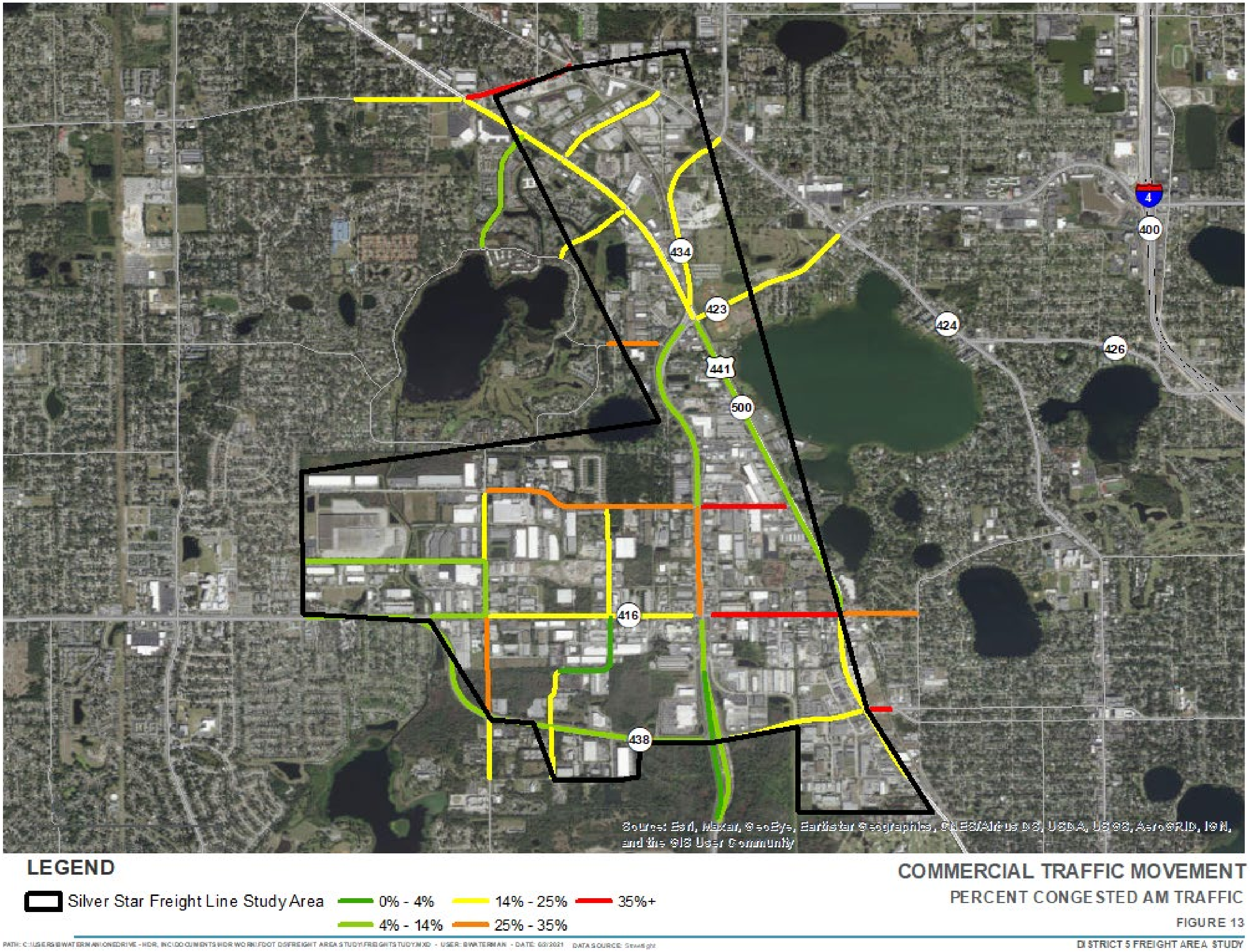


Figure 14. Roadway AM Peak Period (7-9 AM) Percent Congested Travel

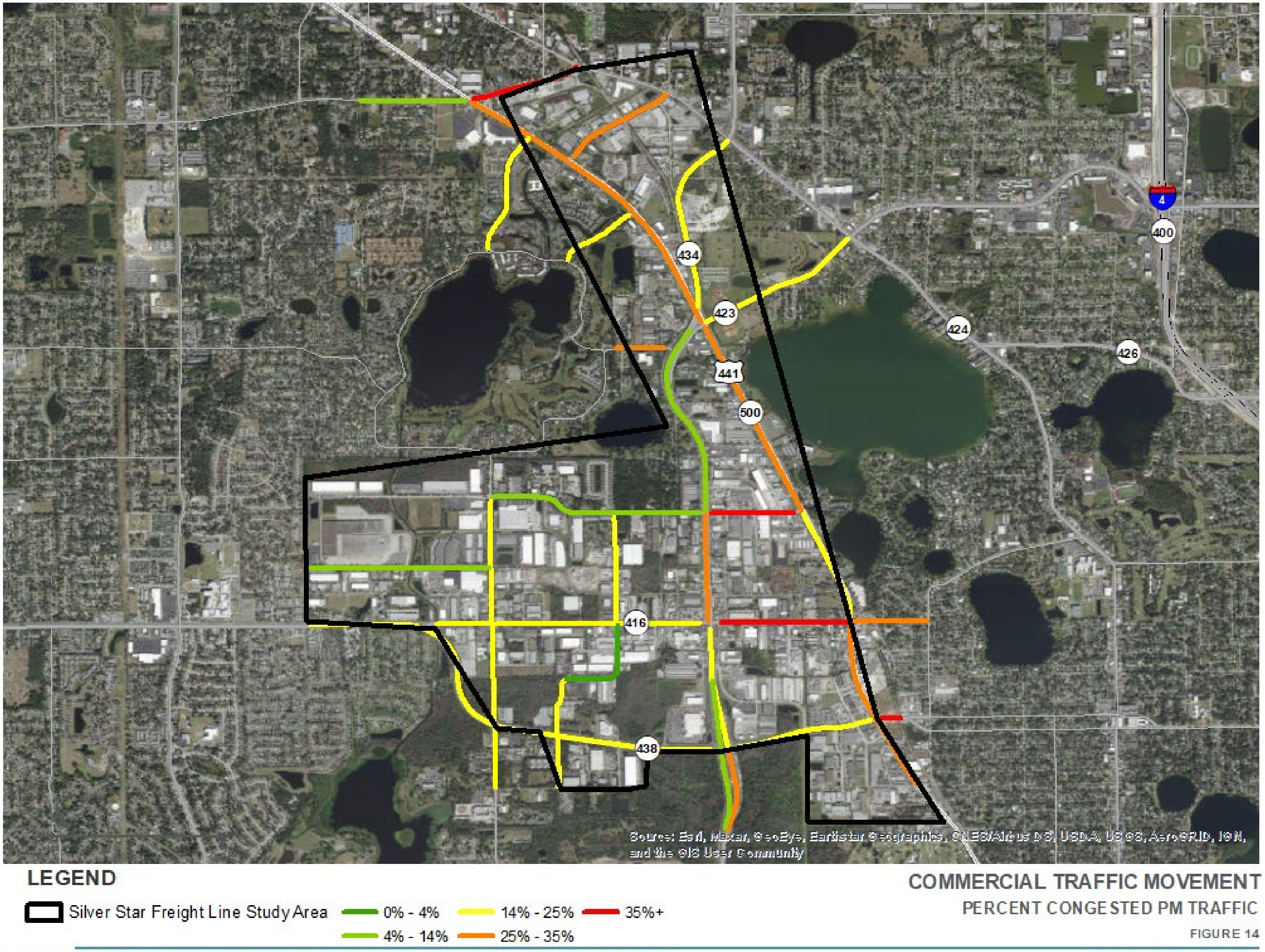


Figure 15. Roadway PM Peak Period (4-6 PM) Percent Congested Travel

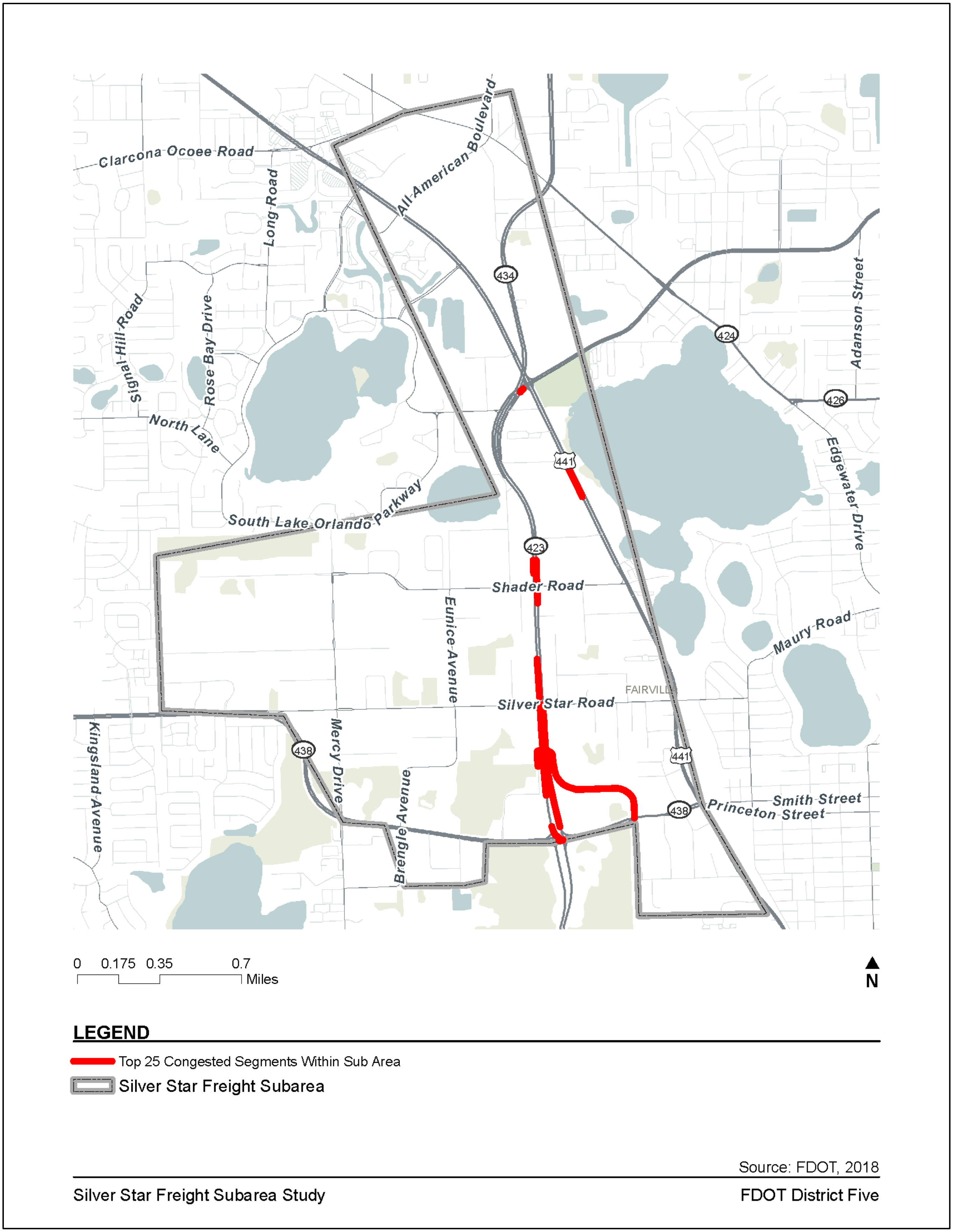


Figure 16. Congested Roadway Segments for Trucks

Roadway Crash Patterns

The crash data used for this study was drawn from FDOT's Crash Analysis Reporting System (CARS). According to this data, John Young Parkway, has three hot spots for crash activity. **Figure 17** shows the vehicle crash frequency within 100 feet of any given spot.

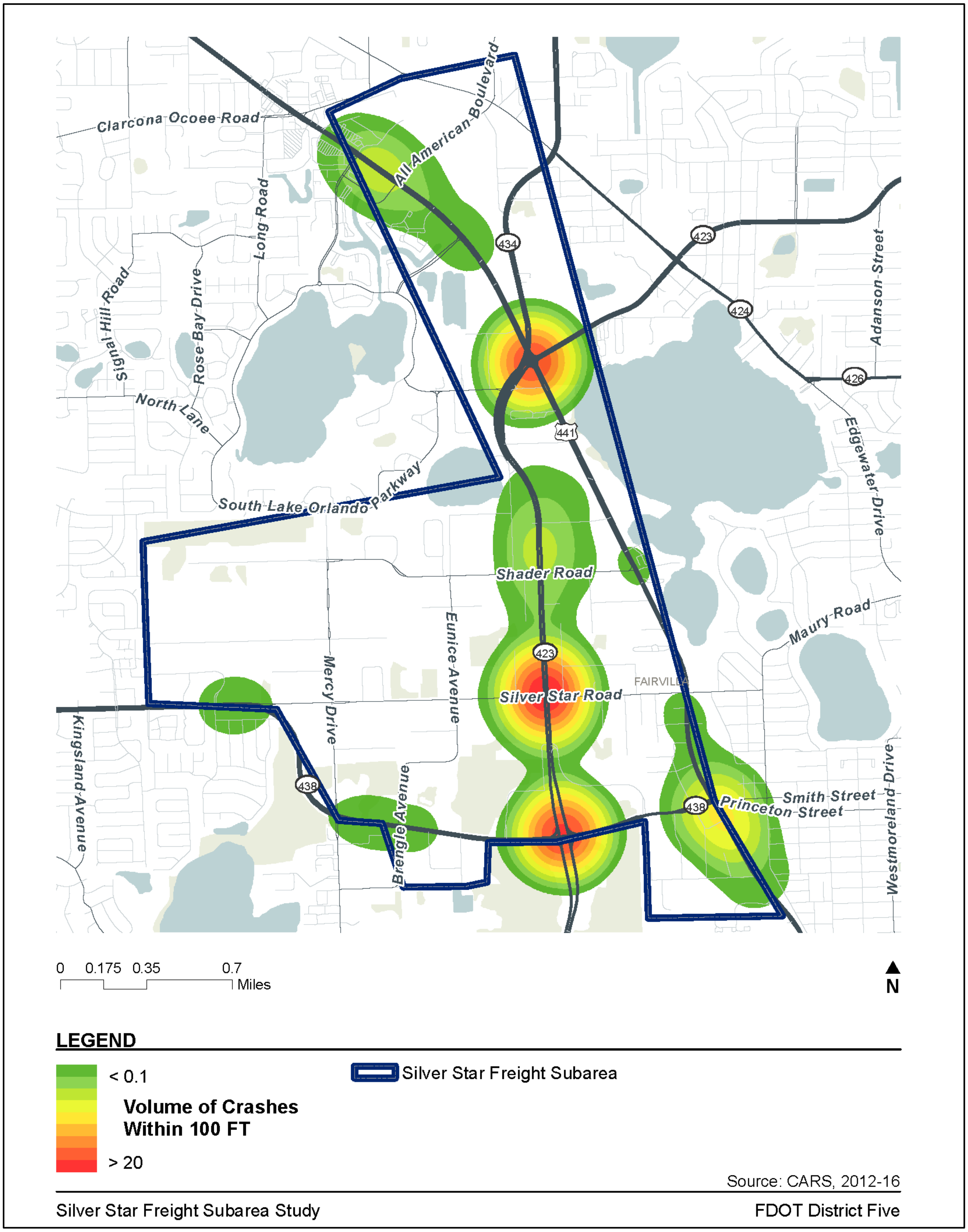


Figure 17. Roadway Vehicle Crash Heat Map

John Young Parkway Hourly Traffic Distribution and Crash Analysis

The truck volume data, the congestion data, and the crash data indicate that John Young Parkway is the most significant roadway for freight mobility in the Silver Star Freight Subarea. John Young Parkway has the highest volume of trucks as well as the most congested truck traffic. A large share of the crashes that occur within the study area occur along this roadway. John Young Parkway will also be crucial for traffic traveling to and from the planned Packing District development at the southeastern bounds of the study area.

John Young Parkway hourly traffic distribution was compared to the time of day crash patterns in this section of the report. Understanding the relationship between traffic congestion, and safety conditions will help to identify appropriate congestion relief measures for vehicular traffic, and to identify roadway improvements to improve safety and travel time reliability along the corridor. The John Young Parkway hourly traffic distribution, and hourly crash patterns are depicted in **Figure 18** and **Figure 19**, for the segments south of Silver Star Road, and north of Silver Star Road, respectively. The hourly crash distribution pattern indicates that commercial vehicle crashes are slightly higher during the mid-day time period, in which the traffic volumes are relatively low. It may be due to the speed differential between the personal vehicles and commercial vehicle during the relatively less congested time periods. However, no significant abnormalities can be identified based on the hourly traffic and crash distribution patterns.

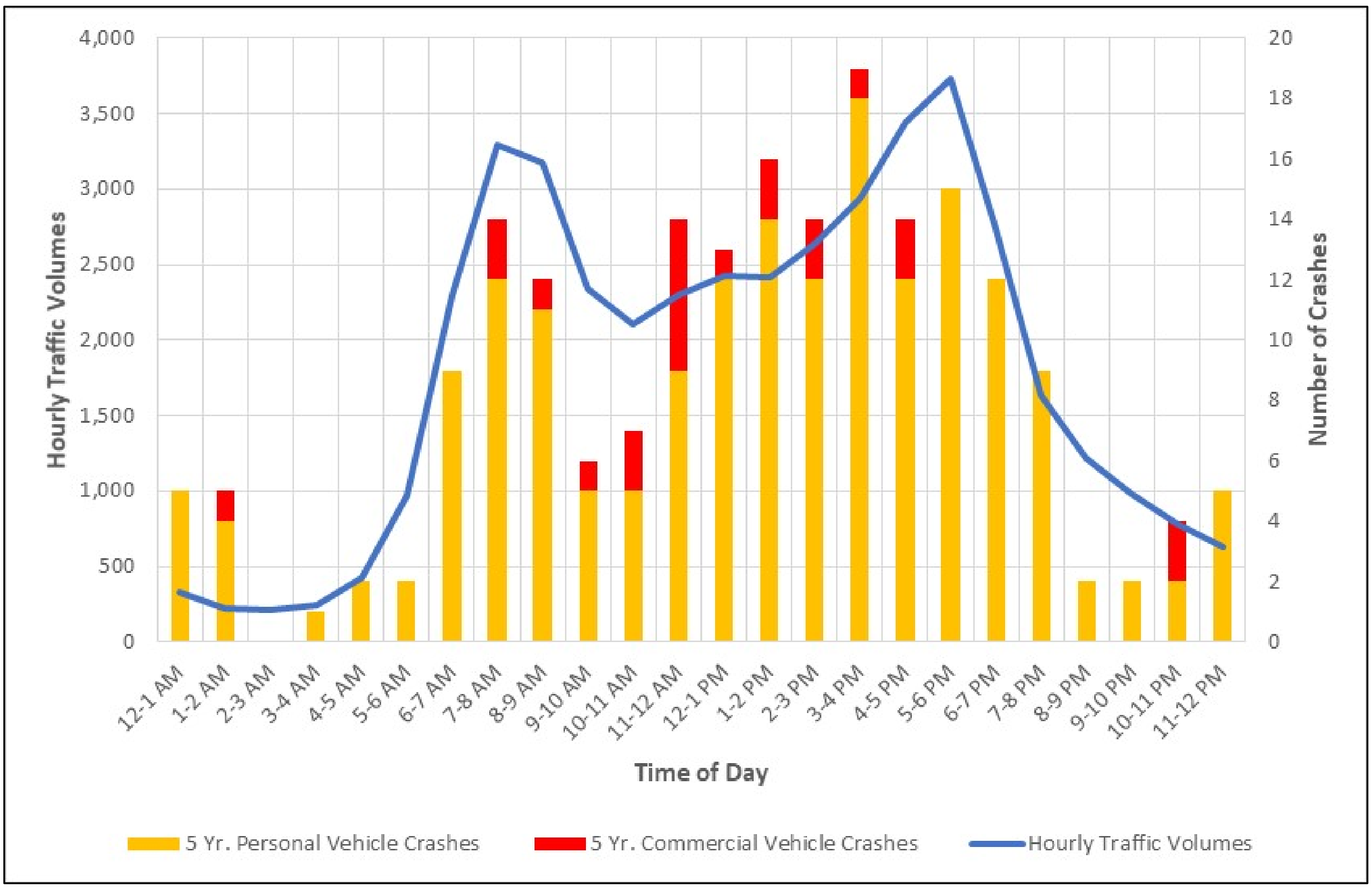


Figure 18. John Young Parkway (Between Princeton Street and Silver Star Road) Hourly Traffic Distribution and Crash Patterns

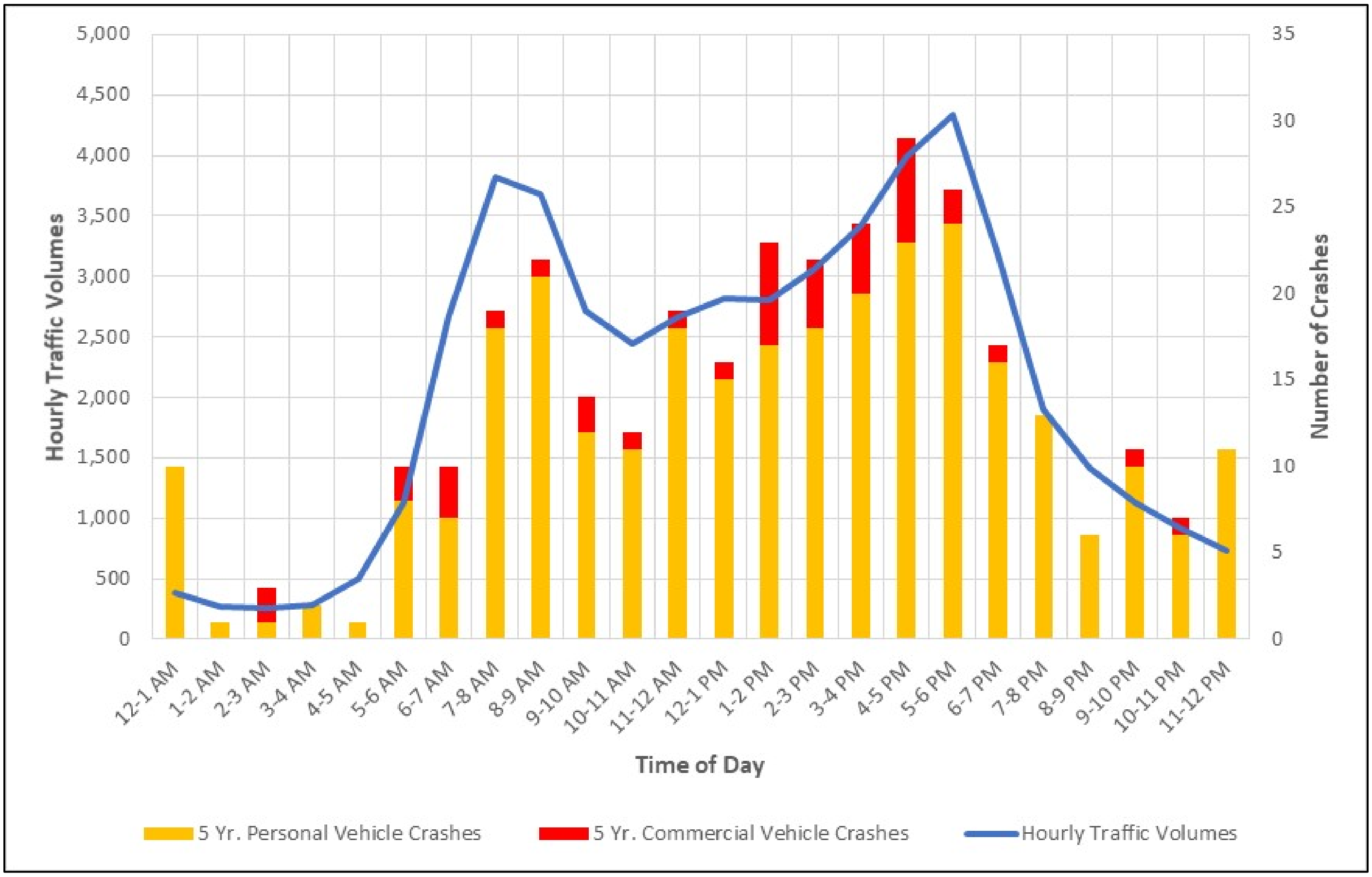


Figure 19. John Young Parkway (Between Silver Star Road and Orange Blossom Trail) Hourly Traffic Distribution and Crash Patterns

Orange Blossom Trail Hourly Traffic Distribution and Crash Analysis

The truck volume data, the congestion data, and the crash data all indicate that Orange Blossom Trail is a significant arterial roadway for freight mobility in the Silver Star Freight Subarea. The planned redevelopment of the Packing District and other planned urban and community activity centers along Orange Blossom Trail will increase the need for Orange Blossom Trail to function as a more multimodal urban street.

Orange Blossom Trail hourly traffic distribution was compared to the time of day crash patterns in this section of the report. Understanding the relationship between traffic congestion, and safety conditions would help to identify appropriate congestion relief measures for vehicular traffic, and to identify roadway improvements to improve safety and travel time reliability along the corridor. The Orange Blossom Trail hourly traffic distribution and hourly crash patterns are depicted in **Figure 20**, for the segment between Silver Star Road and John Young Parkway/Lee Road. The hourly crash distribution pattern indicates that commercial vehicle crashes are slightly higher during the mid-day time period, in which the traffic volumes are relatively low. It may be due to the speed differential between the personal vehicles and commercial vehicle during the relatively less congested time periods. However, no significant abnormalities can be identified based on the hourly traffic and crash distribution patterns.

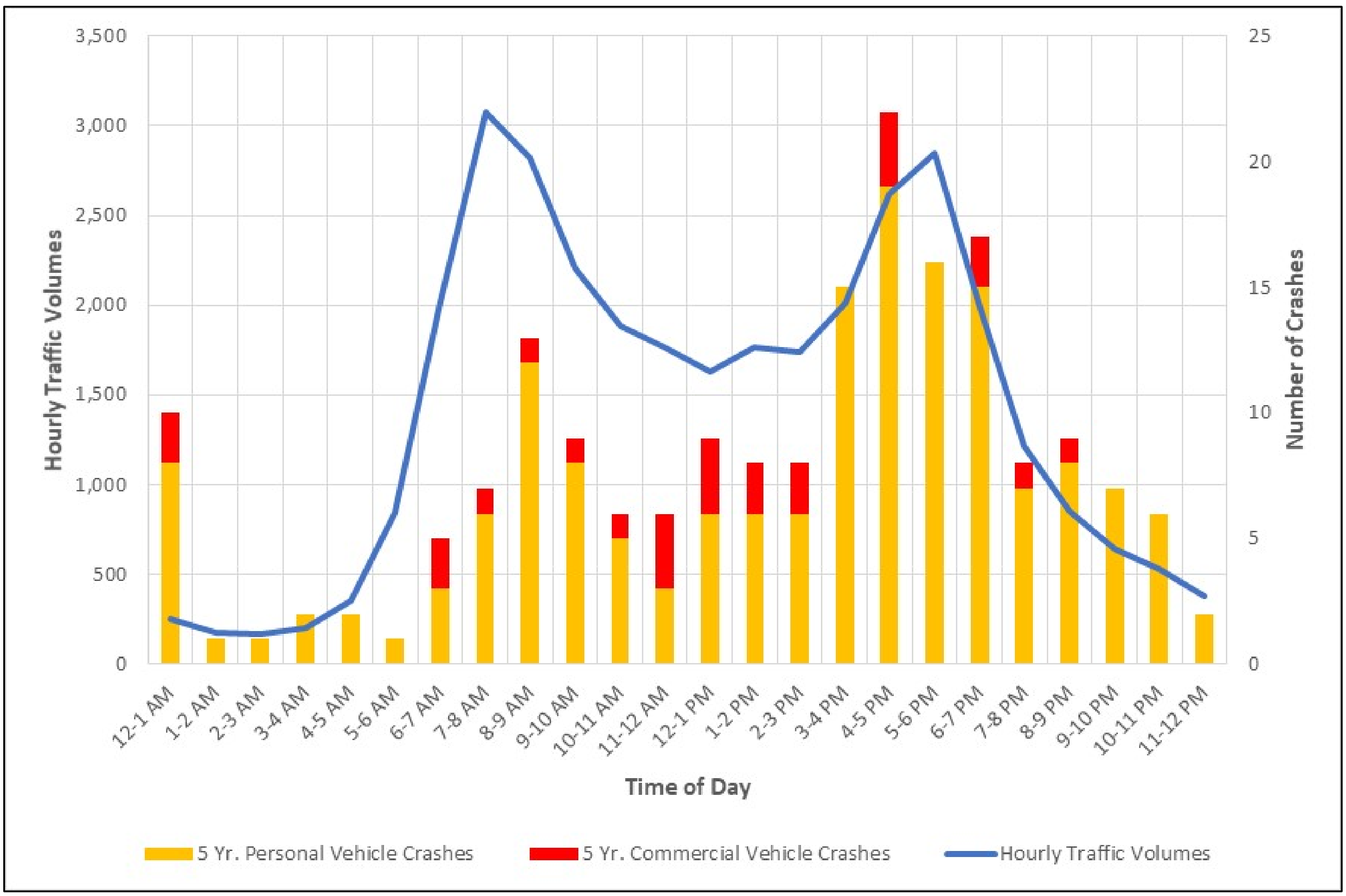


Figure 20. Orange Blossom Trail (Between Silver Star Road and John Young Parkway) Hourly Traffic Distribution and Crash Patterns

Silver Star Road Traffic Hourly Distribution and Crash Analysis

The truck volume data, the congestion data, and the crash data all indicate that Silver Star Road as a critical east-west roadway for freight mobility in the Silver Star Freight Subarea. Silver Star Road functions as a major arterial to carry commercial traffic to and from western areas of the Silver Star Freight Subarea. It also serves as a collector roadway facility distributing commercial vehicle traffic from John Young Parkway and Orange Blossom Trail to the industrial land uses located within the Silver Star Freight Subarea.

Silver Star Road hourly traffic distribution was compared to the time of day crash patterns in this section of the report. Understanding the relationship between traffic congestion and safety conditions would help to identify appropriate congestion relief measures for vehicular traffic and to identify roadway improvements to improve safety and travel time reliability along the corridor. The Silver Star Road hourly traffic distribution and hourly crash patterns are depicted in **Figure 21** and **Figure 22**, for the segments west of John Young Parkway and east of John Young Parkway, respectively. The hourly crash distribution pattern indicates that commercial vehicle crashes are slightly higher during the mid-day time period, in which the traffic volumes were relatively low. It may be due to the speed differential between the personal vehicles and commercial vehicle during the relatively less congested time periods. However, no significant anomalies can be identified based on the hourly traffic and crash distribution patterns.

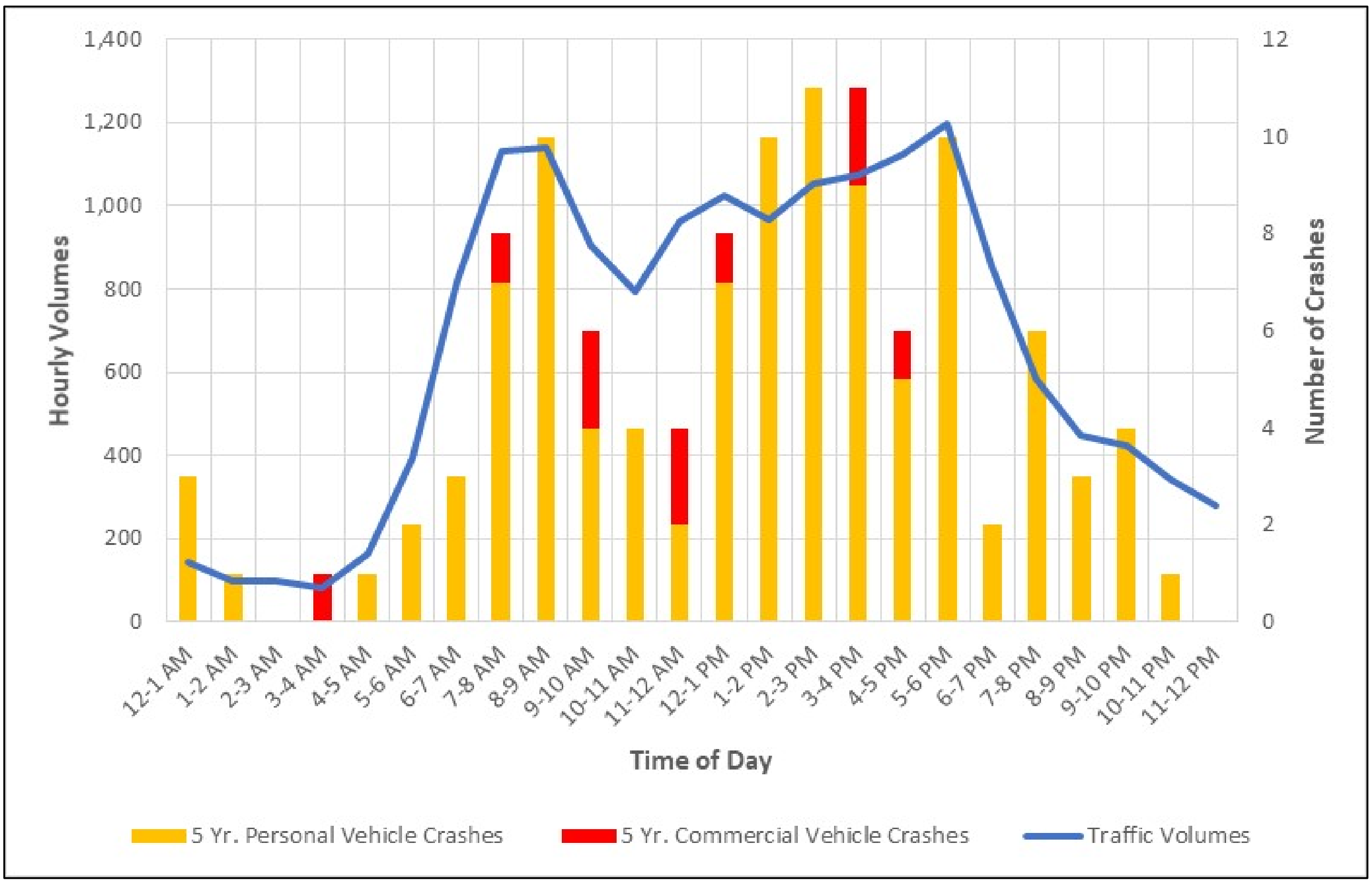


Figure 21. Silver Star Road (Between Princeton Street and John Young Parkway) Hourly Traffic Distribution and Crash Patterns

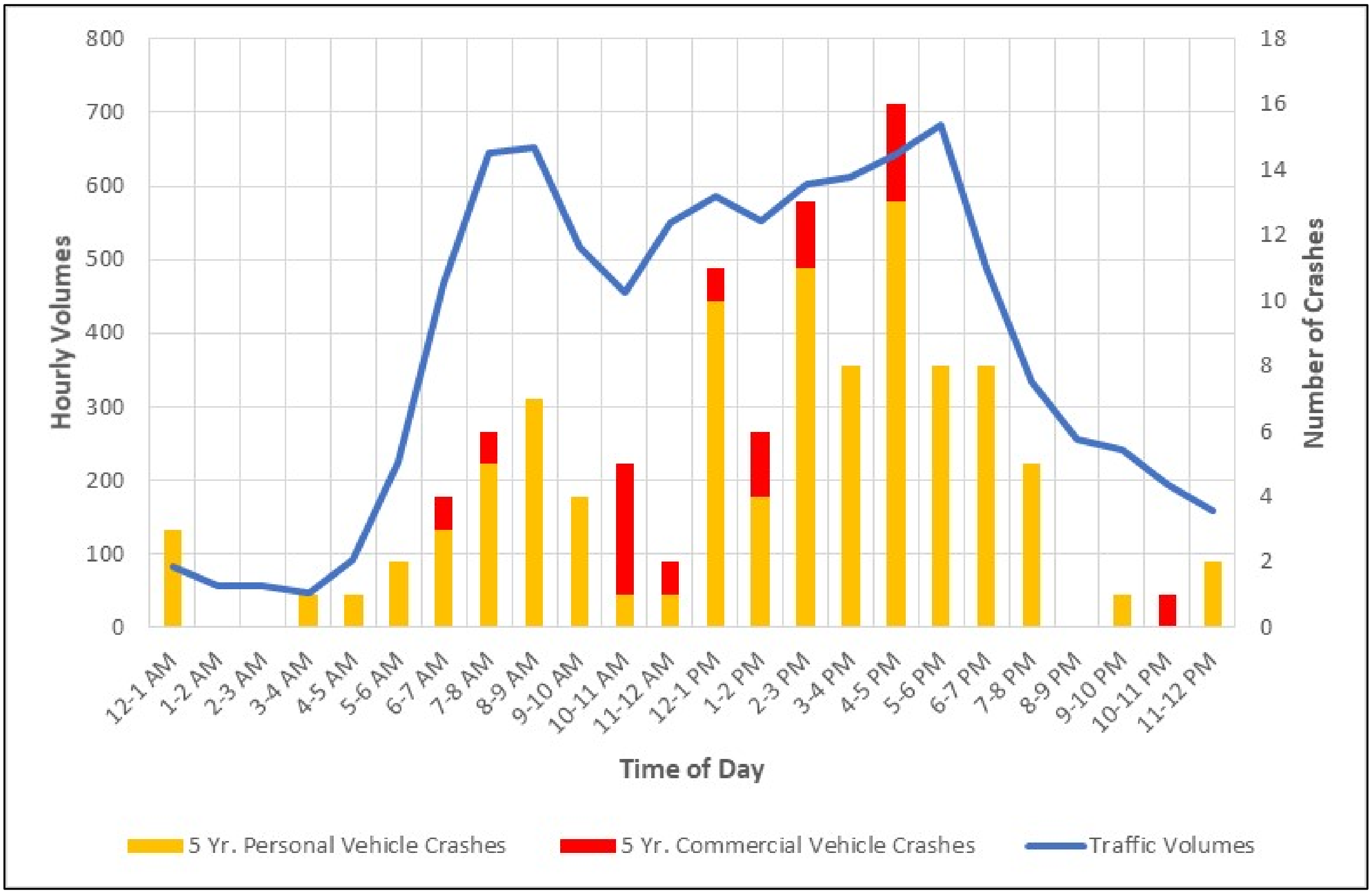


Figure 22. Silver Star Road (Between John Young Parkway and Orange Blossom Trail) Hourly Traffic Distribution and Crash Patterns

Recommendations

Overview

Intersection safety evaluations and crash analyses were conducted for the following signalized intersections.

- Orange Blossom Trail and John Young Parkway
- Pine Hills Road and Silver Star Road
- Pine Hills Road and Colonial Drive

Based on the intersection crash analyses the following improvements are recommended to mitigate the identified safety issues.

Orange Blossom Trail and John Young Parkway Intersection Improvements

1. Consider providing signal heads with backplates with retroreflective yellow border to reduce the high percentage of rear-end collisions at the intersection.

2. Evaluate and update the signal yellow and red times to accommodate the high percentage of heavy commercial vehicles.
3. Evaluate and enhance the intersection lighting particularly on the approaches and under the overpass to mitigate the high number of crashes occurring in dark conditions.

Pine Hills Road and Silver Star Road Intersection Improvements

1. Consider providing signal heads with backplates with retroreflective yellow border to reduce the high percentage of rear-end collisions at the intersection.
2. Evaluate and update the signal yellow and red times to accommodate the high percentage of heavy commercial vehicles.
3. Consider extending the westbound left-turn lanes at the intersection, by closing the Evans High School directional median opening located immediately east of the intersection, to potentially reduce the crashes at the westbound approach of the intersection.
4. Provide LPI signal timing at all the intersection approaches to improve the pedestrian and bicyclist safety conditions.
5. Consider prohibiting RTOR at the intersection or installing yield to pedestrians and bicycles signs at intersection approaches.

Pine Hills Road and Colonial Drive Intersection Improvements

1. Consider providing signal heads with backplates with retroreflective yellow border to reduce the high percentage of rear-end collisions at the intersection.
2. Evaluate and update the signal yellow and red times to accommodate the high percentage of heavy commercial vehicles.
3. Provide LPI signal timing at all the intersection approaches to improve the pedestrian and bicyclist safety conditions.
4. Consider prohibiting RTOR at the intersection or installing yield to pedestrians and bicycles signs at intersection approaches.
5. Evaluate and enhance the intersection lighting to mitigate the high number of crashes occurring in dark conditions.
6. Consider evaluating innovative intersection concepts such as MUT or RCUT to reduce the vehicular conflicts and the number of crashes.

As part of the Phase II safety analysis the commercial vehicular traffic activities throughout the day along John Young Parkway, Orange Blossom Trail, and Silver Star Road were also evaluated to understand the relationship between commercial traffic, congestion, and safety conditions. No specific anomalies were identified based on this analysis that suggest specific improvement recommendations.

SIGNAL WARRANT ANALYSIS

The Orange Blossom Trail and Shader Road intersection is a two-way stop controlled unsignalized intersection within the Silver Star Freight Subarea Study limits. As part of the Silver Star Freight Subarea Study Phase I, it was recommended to perform a signal warrant analysis for this intersection because of the excessive delay observed for the Shader Road eastbound left-turning traffic.

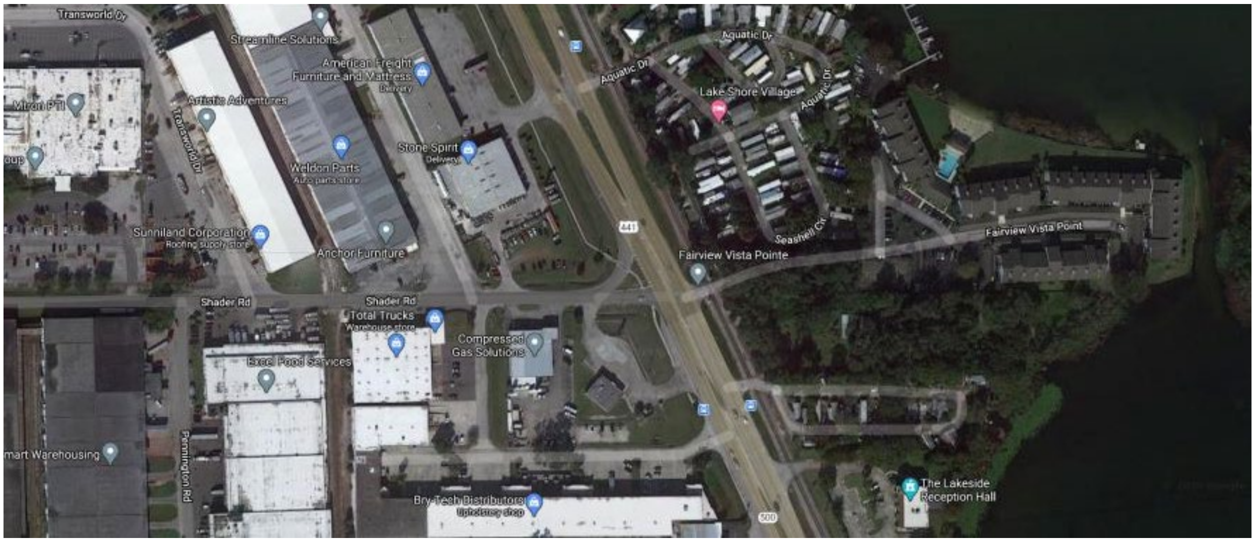


Figure 23. Orange Blossom Trail and Shader Road Intersection

Subsequently, a signal warrant study was conducted by the FDOT District Five to determine if a traffic signal should be installed at the intersection. Based on the signal warrant analysis, the signalization of the intersection is not warranted. The signal warrant study recommended to modify the median opening at the intersection of U.S. 441 and Shader Road/Fairview Vista Point to a directional opening to restrict side street left-turn and through movements, allowing northbound and southbound left-turns onto Shader Road and Fairview Vista Point. Construction of left-turn lanes and directional median openings were proposed approximately 760' to the north and 720' to the south of Shader Road to facilitate U-turns along the corridor.

The signal warrant study recommendations are being considered in the FDOT U.S. 441 access management study between Princeton Street and Lee Road, which is currently underway. In the access management study, an Intersection Control Evaluation (ICE) analysis has been conducted to evaluate other improvement options for the intersection. The ICE stage 1 analysis has been completed, and it is currently moving into stage 2. The stage 1 analysis identified and advanced some potential options for stage 2 including a signal, a RCUT signal (half signal for northbound left turns), and a quadrant roadway configuration. Implementation of the recommendations from the ICE process may be incorporated into a resurfacing project or alternatively a stand-alone safety project, but FDOT Traffic Operations will handle the implementation scheduling. The ICE analysis and the access management study are anticipated to be completed by mid-2021. The U.S. 441 access management study and the U.S. 441 and Shader Road intersection ICE analysis recommendations will be incorporated in the Silver Star Freight Study Phase II recommendations.

AT-GRADE RAIL-HIGHWAY CROSSING EVALUATIONS

This chapter documents the at-grade rail-highway crossing analysis performed and the recommendations for continued enhancements to the subarea.

Existing Conditions

There are seven at-grade rail-highway crossings on state roads in the Silver Star Freight Subarea. The crossings were analyzed through field visits, Federal Railroad Administration (FRA) crossing inventory data, FRA crossing accident reports, CARS accident data, Federal Transit Administration (FTA) state of good repair asset ratings, and compliance with FDOT, FRA, and American Railway Engineering and Maintenance-of-Way Association (AREMA) standards. **Figure 24** describes the FTA Asset Criteria and Scoring System.

FTA-Industry SGR Working Group

ASSET CRITERIA AND SCORING SYSTEM

Asset Rating Score	Asset Age (Percent % of Useful Life Remaining)	Asset Condition (Quality, Level of Required Maintenance)	Asset Performance (Reliability, Ambience, Safety, Meets Industry Standards)	Level of Maintenance (Level of Preventative and Corrective Maintenance)
5	Asset new or nearly new 75% - 100%	Asset new or like new; no visible defects	Asset meets or exceeds all performance and reliability metrics, industry standards	No unfunded or deferred maintenance activities
4	Asset nearing or at its midlife point 50% - 75%	Asset showing minimal signs of wear; some slight defects or deterioration	Asset generally meets performance and reliability metrics, industry standards	Some temporary deferments of PM and CM; but no activities skipped completely
3	Asset has passed its midlife point 25% - 50%	Some moderately defective or deteriorated components; expected maintenance needs	Occassional performance and reliability issues; may be sub-standard in some areas	More frequent and extended deferments of PM and CM; some activities skipped altogether
2	Asset nearing or at end of its useful life 0% - 25%	Increasing number of defects, deteriorating components; growing maintenance needs	Performance and reliability problems becoming more serious; sub-standard elements	PM and CM activities frequently delayed or skipped until major problems surface
1	Asset is past its useful life	Asset in need or replacement or restoration; may have critically damaged components	Frequent performance and reliability problems; does not meet industry standards	Significant backlog of PM and CM work due to history of deferred and skipped activities
0	Asset non-operable	Asset non-operable	Asset non-operable	Asset non-operable

CONDITION RATING

Asset Condition Rating		
Rating Description	Scoring Range	
Excellent	4.4 to 5.0	In SGR ? 2.5
Good	3.4 to 4.3	
Adequate	2.5 to 3.3	
		SGR 2.50
Marginal	1.8 to 2.4	Not SGR <2.5
Poor	1.0 to 1.7	
Non-Operable	0	

Figure 24. FTA Asset Criteria and Scoring System

John Young Parkway (621558V)

Rail siding crossing is for Best Block Building Materials Market. Siding is used sporadically depending on the business needs. The crossing was fully renovated approximately 5-6 years ago with the expansion of John Young Parkway from four lanes to six lanes. This renovation included new signals, crossing surface, pavement markings, and signage. **Figure 25** shows faded pavement markings. **Figure 26** shows wear in the concrete panels. **Figure 27** indicates drainage concerns with soil erosion.

All required advanced warning signs are present. There are zero recorded accidents in the FRA database. The grade crossing is in good condition overall.

Table 25. FTA Asset Condition - John Young Parkway

Asset Age	Asset Condition	Asset Performance	Level of Maintenance	Asset Condition Rating
20%	30%	30%	20%	**Good**
5	4	4	4	**3.8**

Figure 25. John Young Parkway Pavement Markings

Figure 26. John Young Parkway Concrete Panels

Figure 27. John Young Parkway Soil Erosion

Lee Road (622393D)

Lee Road grade crossing was updated approximately four years ago with the Orange Blossom Trail Improvement project. The grade crossing panels and pavement markings are in good condition. **Figure 28** provides a view of the crossing looking east from the southern end. The signal gates on this island have been damaged several times by vehicles. There are no gates protecting pedestrians in the northwest, southeast, or southwest quadrants. There are no tactile warning strips for pedestrians on the sidewalks in the northwest or southeast quadrants. Railroad crossing pavement markings are missing on Orange Blossom Trail southbound (SB) in the left turn lane. Existing railroad pavement markings are in good condition. Advanced warning signs are missing on Orange Blossom Trail northbound (NB) and SB. It was also noted that vehicles making a NB right turn onto Lee Road will stop on the crossing to wait for an appropriate time to merge onto Lee Road. There are zero recorded accidents in the FRA database. The existing grade crossing components are in good condition.

Table 26. FTA Asset Condition – Lee Road

Asset Age	*Asset Condition*	*Asset Performance*	*Level of Maintenance*	*Asset Condition Rating*
20%	*30%*	*30%*	*20%*	***Good***
5	*4*	*2*	*4*	***3.6***

Figure 28. Looking east at southern end of Lee Road crossing

Orange Blossom Trail (622365A)

Orange Blossom Trail was renovated approximately 4-5 years ago with new crossing components. **Figure 29** shows the sidewalk changing to an uneven asphalt surface through the west side of the crossing. **Figure 30** shows the sidewalk ending at the crossing on the east side. There are no tactile warning strips for pedestrians on the sidewalks. There are poor drainage conditions. The railroad crossing pavement markings are faded as noted in **Figure 31.** The required advanced warning signs are present. The latest accident recorded by the FRA was in 1988 for a collision with no injuries. Overall, the grade crossing is in good condition.

Table 27. FTA Asset Condition – Orange Blossom Trail

Asset Age	Asset Condition	Asset Performance	Level of Maintenance	Asset Condition Rating
20%	30%	30%	20%	**Good**
5	4	3	4	**3.9**

Figure 29. Orange Blossom Trail west side looking south

Figure 30. Orange Blossom Trail east side looking north

Figure 31. Orange Blossom Trail pavement markings

N John Young Parkway (622370W)

This crossing is under renovation as part of the John Young Parkway expansion project from four to six lanes. The project is expected to be completed in early 2021. **Figure 32** shows a signal gate for pedestrians and vehicles southbound on N John Young Parkway. There appears to be no pedestrian gate for the northbound direction. Temporary railroad pavement markings are currently being used in **Figure 33.** Crossing to be reviewed for pedestrian gate and permanent pavement markings once construction is completed. The latest accident recorded by the FRA was in 2002 for a collision with no injuries. Overall, the grade crossing components appear to be in excellent condition.

Table 28. FTA Asset Condition – N John Young Parkway

Asset Age	Asset Condition	Asset Performance	Level of Maintenance	Asset Condition Rating
20%	30%	30%	20%	**Excellent**
5	5	4	5	**4.7**

Figure 32. N John Young Parkway Southbound

Figure 33. N John Young Parkway Northbound

Silver Star Road (622371D)

Silver Star Road crossing looking south is shown in **Figure 34**. The concrete crossing panels and adjacent asphalt appear to be deteriorating as shown in **Figure 35 and Figure 36.** Asphalt for the pedestrian crossing on the north end is also deteriorating as shown in **Figure 37.** The sidewalk ends just before the grade crossing on the southern end as indicated in **Figure 38.** The railroad pavement markings are faded as noted in **Figure 39.** All required advanced warning signs are present. The latest accident recorded by the FRA was in 1993 for a collision with no injuries. The crossing overall is in adequate condition.

Table 29. FTA Asset Condition – Silver Star Road

Asset Age	Asset Condition	Asset Performance	Level of Maintenance	Asset Condition Rating
20%	30%	30%	20%	**Adequate**
4	3	3	2	**3.0**

Figure 34. Silver Star Road Looking South

Figure 35. Silver Star Road Looking South Left Side

Figure 36. Silver Star Road Looking South Right Side

Figure 37. Silver Star Road North Pedestrian Crossing

Figure 38. Silver Star Road Looking East

Figure 39. Silver Star Road Pavement Markings

W Princeton Street (622363L)

West Princeton Street crossing components are approximately 12 years old. The crossing consists of concrete panels with rubber rail seals and cantilevers, flashing lights and gates in the southwest and northeast quadrants. **Figure 40** shows a view of the crossing looking east. The crossing is missing tactile warning strips on the sidewalks as shown in **Figure 41 and Figure 42.** The pavement markings are in good condition. All required advanced warning signs are present. There are zero recorded accidents in the FRA database. Overall, the crossing is in good condition.

Table 30. FTA Asset Condition – W Princeton St

Asset Age	Asset Condition	Asset Performance	Level of Maintenance	Asset Condition Rating
20%	30%	30%	20%	**Good**
3	4	5	5	**4.3**

Figure 40. W Princeton St Looking East

Figure 41. W Princeton St North End of Crossing Looking East

Figure 42. W Princeton St South End of Crossing Looking East

N Orange Blossom Trail (622359W)

N Orange Blossom Trail looking north is shown in **Figure 43.** There is sidewalk through the west side of the crossing. On the east side of the crossing, the sidewalk directs pedestrians to the shoulder of the road through the grade crossing as noted in **Figure 44.** Pedestrian gates are missing in each quadrant. FDOT noted pedestrian gates were scheduled to be installed at this location but were not completed due to limited real estate. Tactile warning strips are missing on the sidewalks. Railroad pavement markings are faded, as shown in **Figure 45**.

Table 31. FTA Asset Condition – N Orange Blossom Trail

Asset Age	Asset Condition	Asset Performance	Level of Maintenance	Asset Condition Rating
20%	30%	30%	20%	**Good**
3	4	3	4	**3.5**

Figure 43. N Orange Blossom Trail Looking North

Figure 44. N Orange Blossom Trail East Side

Figure 45. N Orange Blossom Trail Pavement Markings

Recommendations

Grade crossing evaluations were conducted for the following locations:

- MP 809.3 John Young Parkway, 621558V
- MP 809.89 Lee Road, 622393D
- MP 811.4 Orange Blossom Trail, 622365A
- MP 811.4 North John Young Parkway, 622370W
- MP 811.4 Silver Star Road, 622371D
- MP 811.85 West Princeton Street, 622363L
- MP 812.3 North Orange Blossom Trail, 622359W

Based on the analysis, the following improvements are recommended for consideration. Dynamic envelope pavement markings are scheduled for installation by March 2022 as part of a separate FDOT project and are therefore excluded from these recommendations.

John Young Parkway (621558V)

1. Update pavement markings.
2. Improve site drainage conditions.

Lee Road (622393D)

1. Add pedestrian signal gates in northwest, southeast, and southwest quadrants.
2. Add tactile warning panels on sidewalks in southeast and northwest quadrants.
3. Add railroad pavement markings on Orange Blossom Trail SB in left turn lane.
4. Add W10-2 advance warning signs on Orange Blossom Trail NB and SB.
5. Make adjustments to channelized NB right turn lane for striping, delineators, and rail crossing gates (see proposed concept in **Figure 46**). The existing railroad signal arm for the NB right turn lane is relocated to the east side of the crossing, closer to the railroad tracks, to help protect the signal gate infrastructure from being struck. The concept also shows the pedestrian gate added to the existing railroad signal arm for the remaining traffic heading east on Lee Road. Other pedestrian gates are added at the northwest and southeast quadrants of the grade crossing. There is currently no protection for pedestrians at these locations.

Orange Blossom Trail (622365A)

1. Repair sidewalk and add tactile warning strips.
2. Update railroad and stop bar pavement markings.

N John Young Parkway (622370W)

1. Confirm pedestrian gate is installed and railroad pavement markings meet FDOT standards once construction is completed.

Silver Star Road (622371D)

1. Repair asphalt in roadway and pedestrian crossing.
2. Update railroad and stop bar pavement markings.
3. Consider extending sidewalk through grade crossing and adding pedestrian signal gates.

W Princeton Street (622363L)

1. Add tactile warning strips to sidewalks.

N Orange Blossom Trail (622359W)

1. Add tactile warning strips to sidewalks.
2. Add pedestrian gates on southwest and northeast quadrants. It is noted that there is insufficient space behind the back of sidewalk to install a pedestrian gate in the southwest quadrant. However, the typical section on Orange Blossom Trail is being modified as part of the Packing District improvements (as discussed in the Planned and Programmed Improvements / Proposed Developments section of the Multimodal Infrastructure Evaluations chapter of this report). While the proposed Packing District improvements end just north of this crossing, it is recommended to consider extending them to the south beyond the rail crossing, changing the configuration on the west side to allow enough space to a install pedestrian gate behind the back of sidewalk.

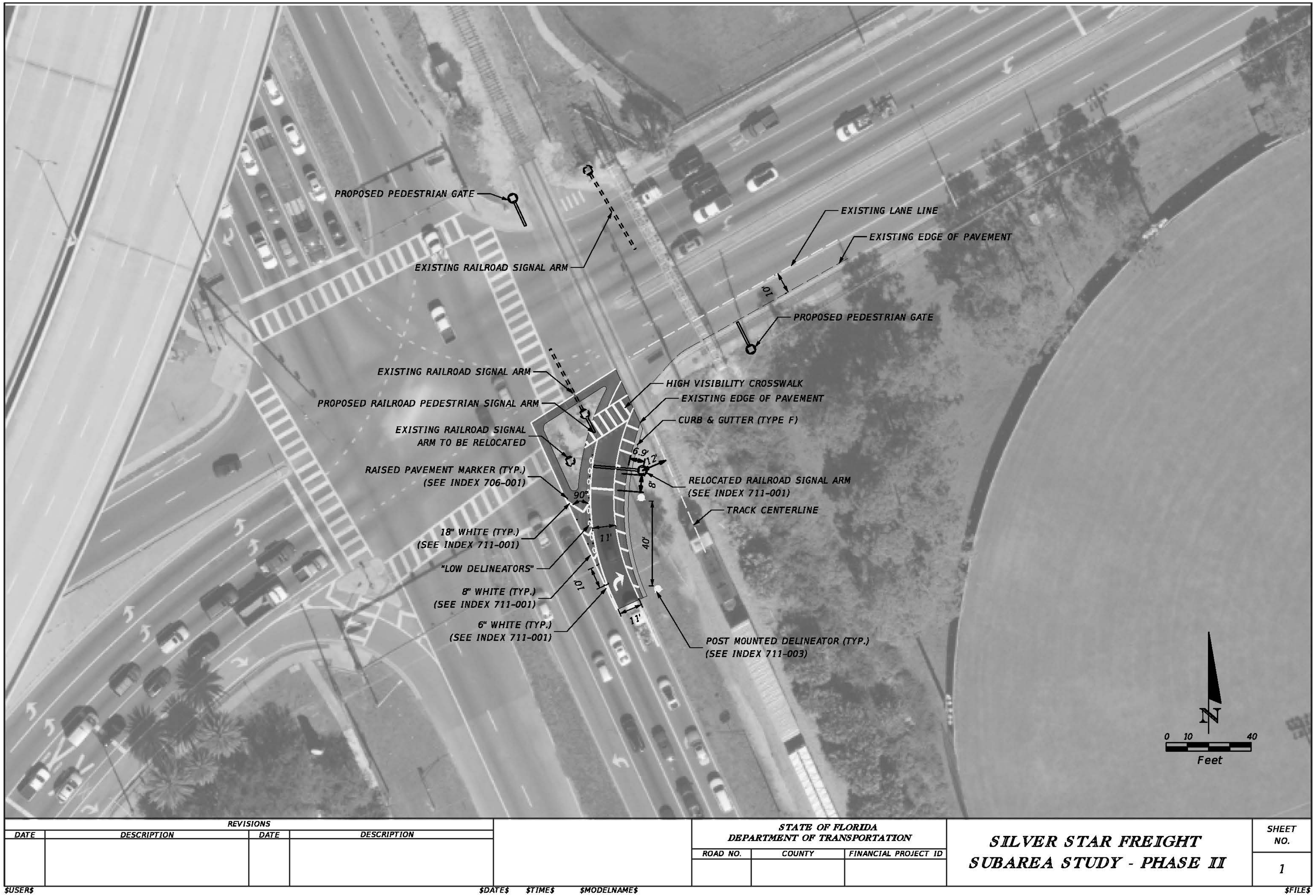


Figure 46. John Young Parkway / Lee Road at Orange Blossom Trail At-Grade Rail Crossing Concept

EMERGING TECHNOLOGIES

The Phase I Study for the Silver Star Freight Subarea identified the need to evaluate the potential applications of emerging technologies to enhance safety and mobility with the subarea. This section will evaluate the existing and planned technologies within the subarea, and then evaluate the potential effectiveness of additional technological applications.

Existing and Planned Intelligent Transportation System (ITS) Assets

MetroPlan Orlando ITS Master Plan

The 2017 MetroPlan Orlando ITS Master Plan includes an inventory of existing ITS infrastructure, ITS needs, and planned investments in the coming years. Existing assets in the study area include:

- Fiber optic communications owned by both Orange County (**Figure 47**) and the City of Orlando (**Figure 48**).
- A traffic signal network owned by both Orange County (**Figure 49**) and the City of Orlando (**Figure 50**).
- Dynamic message signage (DMS) and closed-circuit television (CCTV) cameras owned by both Orange County (**Figure 51**) and the City of Orlando (**Figure 52**).

Insights based on these assets include:

- Fiber exists on John Young Parkway, Orange Blossom Trail, and a portion of Silver Star Road, though it is owned by a combination of Orange County and the City of Orlando.
- The signal network includes numerous corridors with interspersed ownership between Orange County and the City of Orlando. Both agencies have the majority of their signal systems interconnected to their Traffic Management Center (TMC). Traffic signals in Orange County are capable of accommodating transit signal priority (TSP). TSP generally functions the same way as freight signal priority (FSP), which is a key recommended consideration for Phase II of this study.
- CCTV monitoring is relatively sparse within the study area, only present at the intersection of Princeton Street and Orange Blossom Trail.

The ITS Master Plan also highlights several future projects and needs of interest:

- The City of Orlando plans to upgrade its Active Traffic Management System (ATMS).
- The City of Orlando plans to upgrade signals to include TSP capabilities over multiple phases, while LYNX is deploying automated vehicle location (AVL) on buses.
- The City of Orlando has communication with 85 percent of signals, with a need to provide coverage for remaining signals.
- Currently, only FDOT can view the data feeds of other agencies. There is a need to expand data sharing to allow multiple agencies to view regional real-time conditions, such as CCTV video sharing.

Finally, the ITS Master Plan includes discussion of ITS infrastructure to support emerging technologies:

- The potential for corridors to serve as a test bed for intelligent traffic signal systems, including FSP.
- Intelligent pedestrian and cyclist detection at traffic signals.

- The utilization of vehicle-to-infrastructure data as an input to advanced traveler information systems.
- Providing signal phase and timing to vehicles using connected vehicle equipment.
- A range of other potential connected vehicle applications, including curve speed warning, pedestrian in signalized crosswalk warning, red light violation warning, intersection movement assist, vehicle turning right in front of transit vehicle warning, mobile accessible pedestrian signal systems, and TSP.

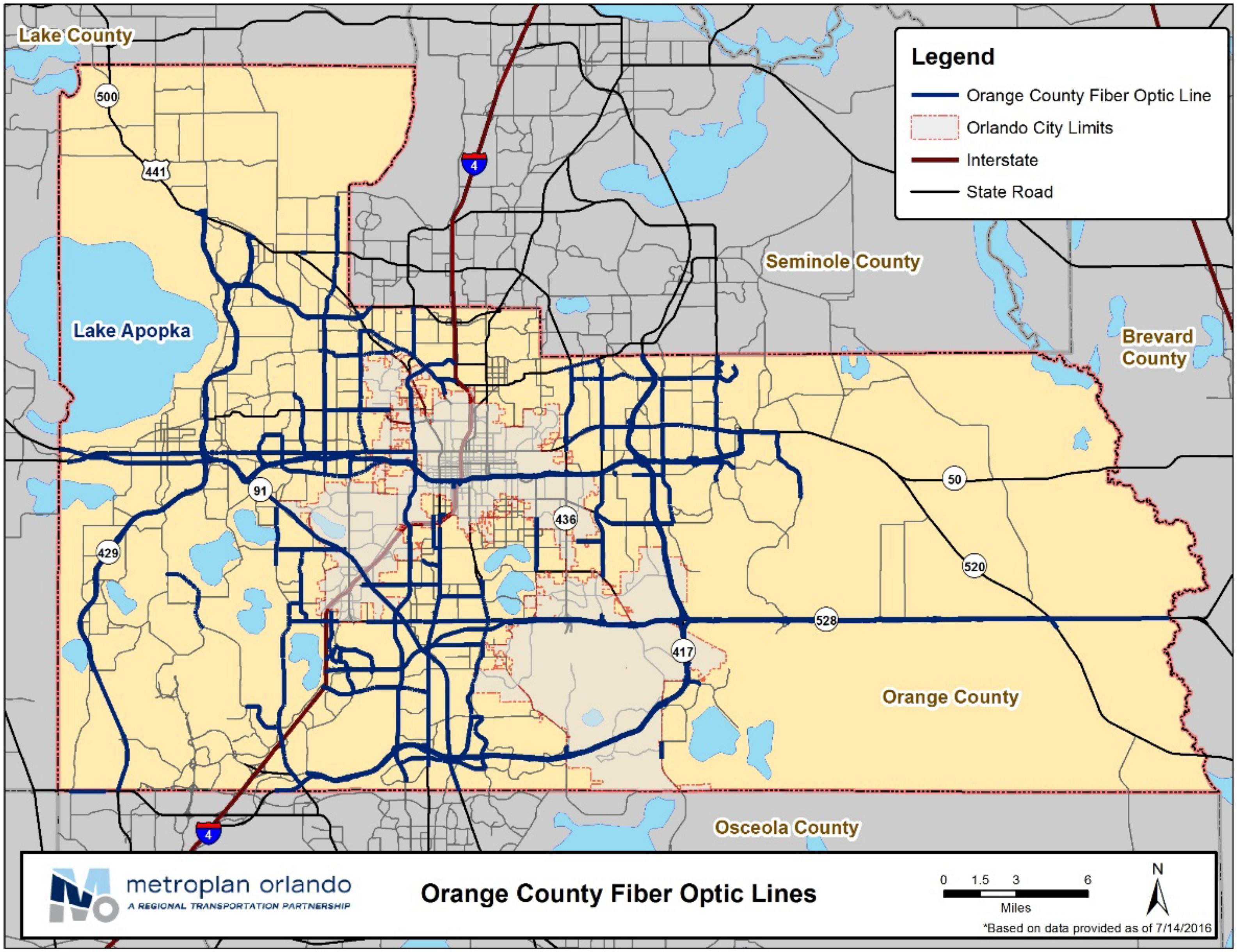


Figure 47. Orange County Fiber Optic Lines

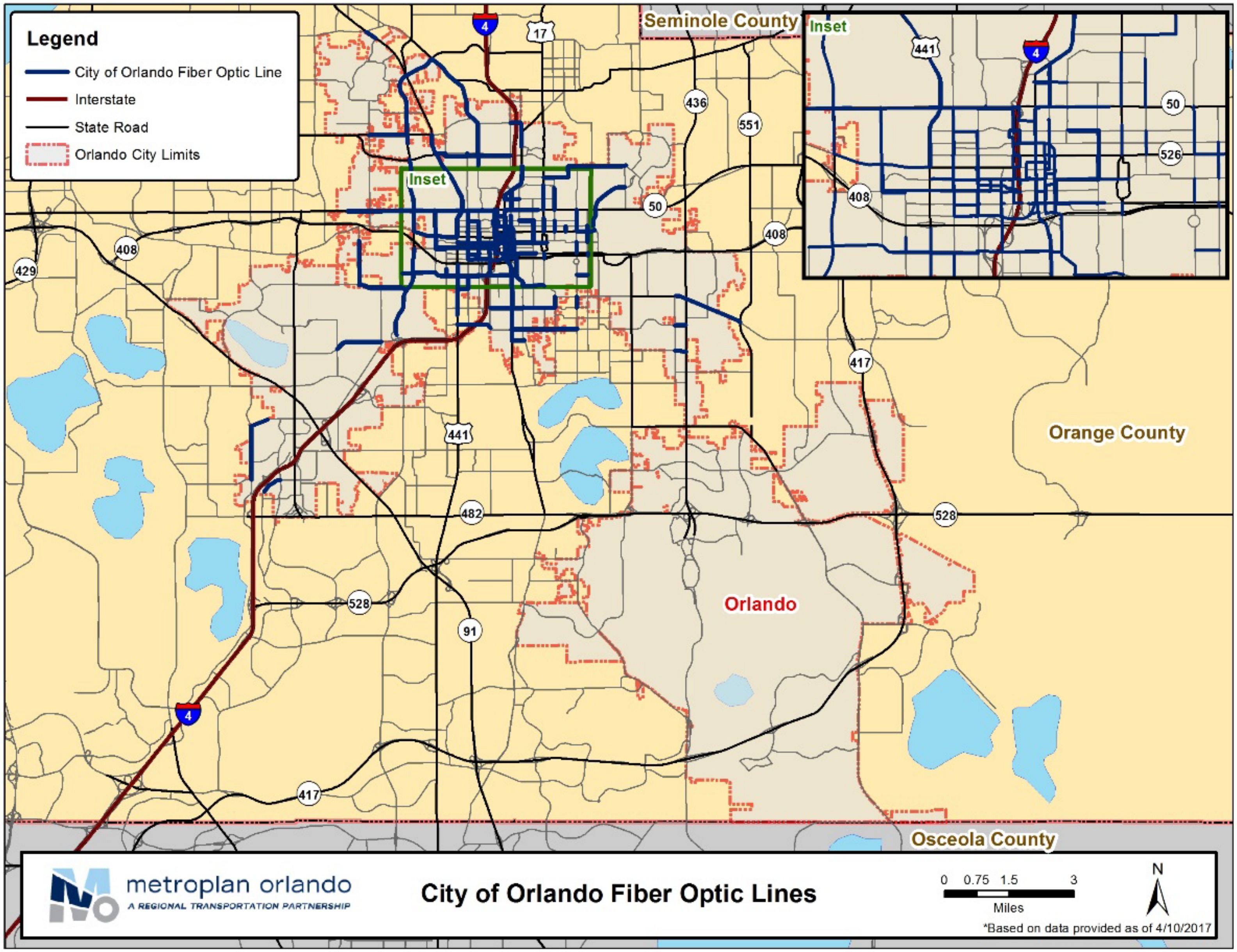


Figure 48. City of Orlando Fiber Optic Lines

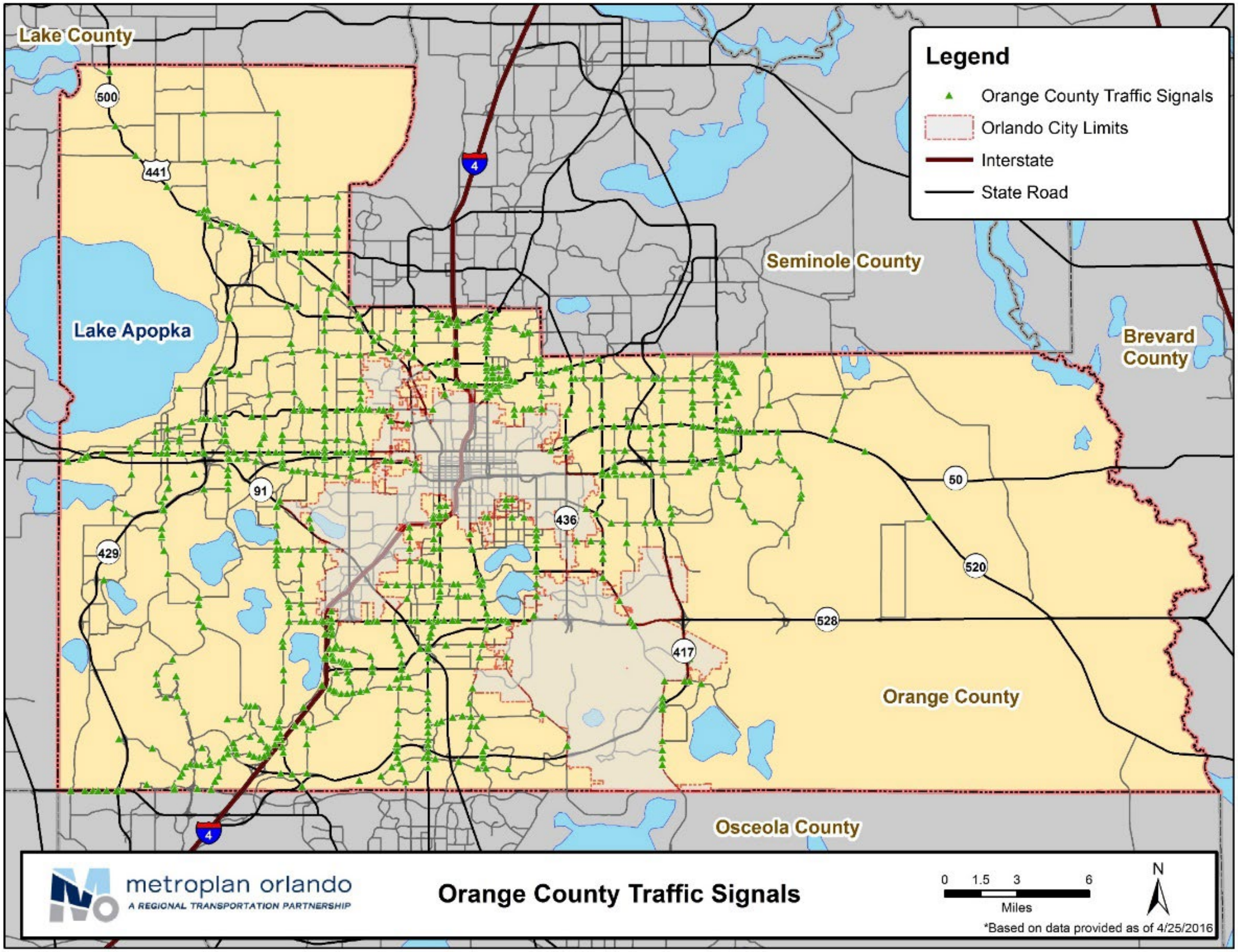


Figure 49. Orange County Traffic Signals

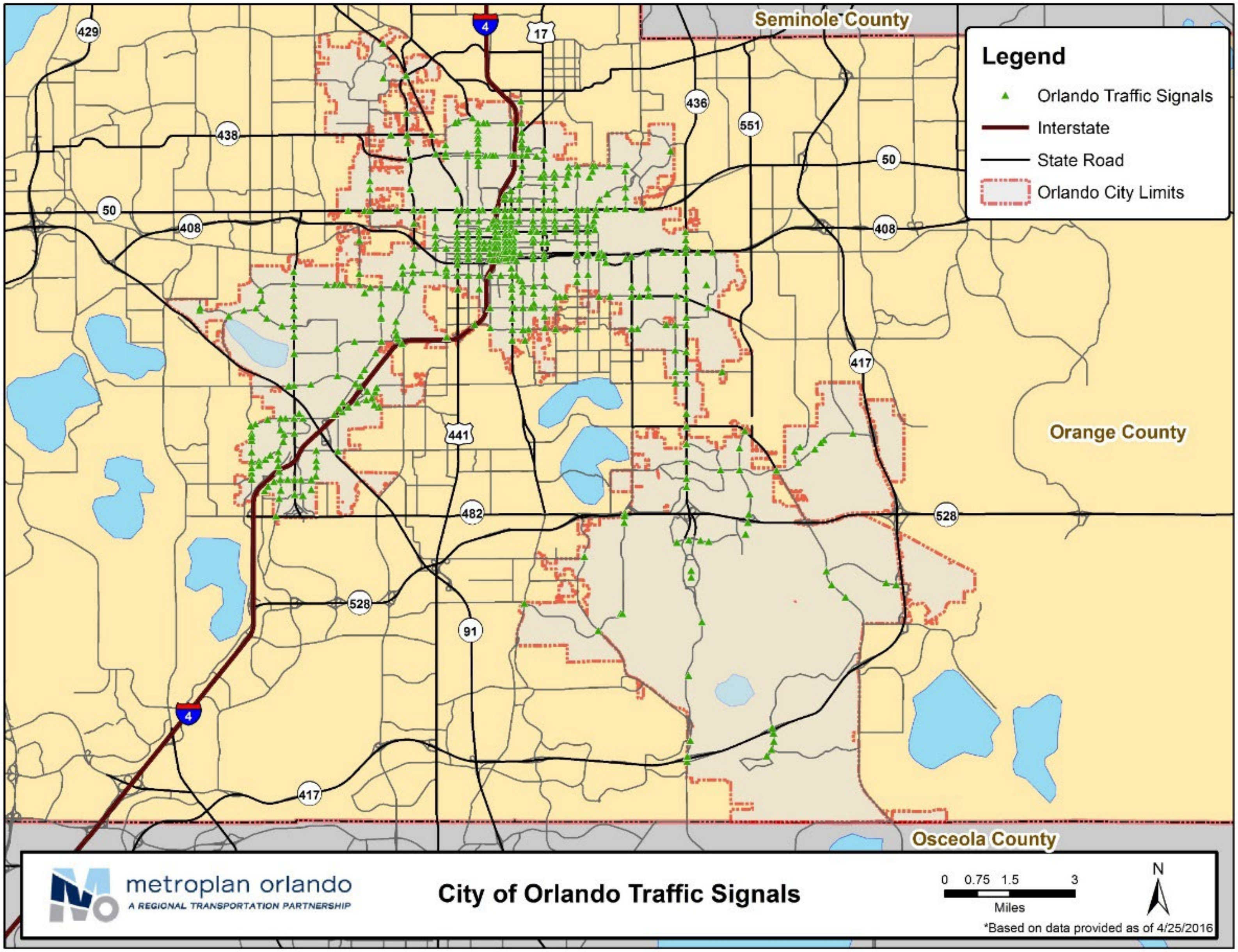


Figure 50. City of Orlando Traffic Signals

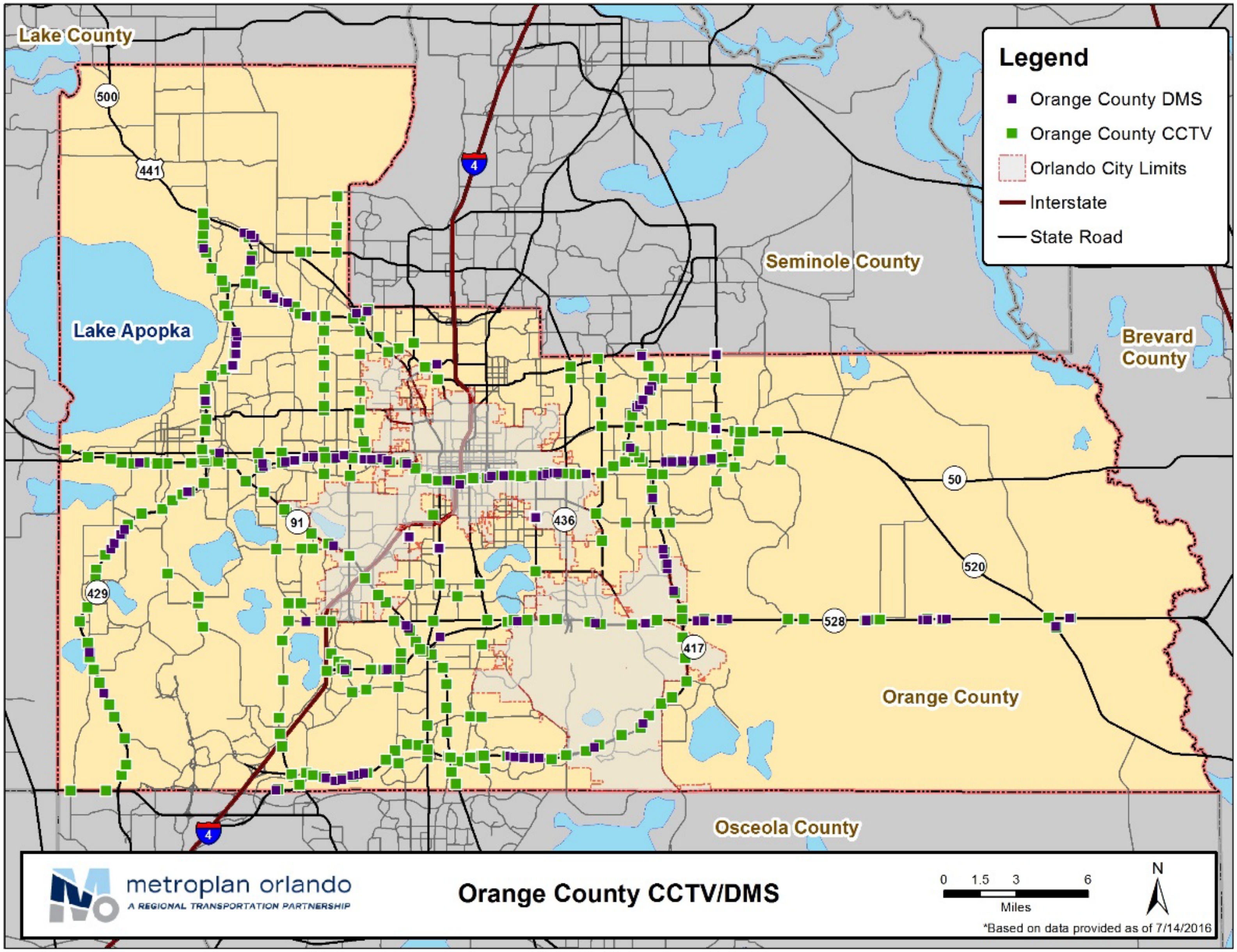


Figure 51. Orange County CCTV and DMS

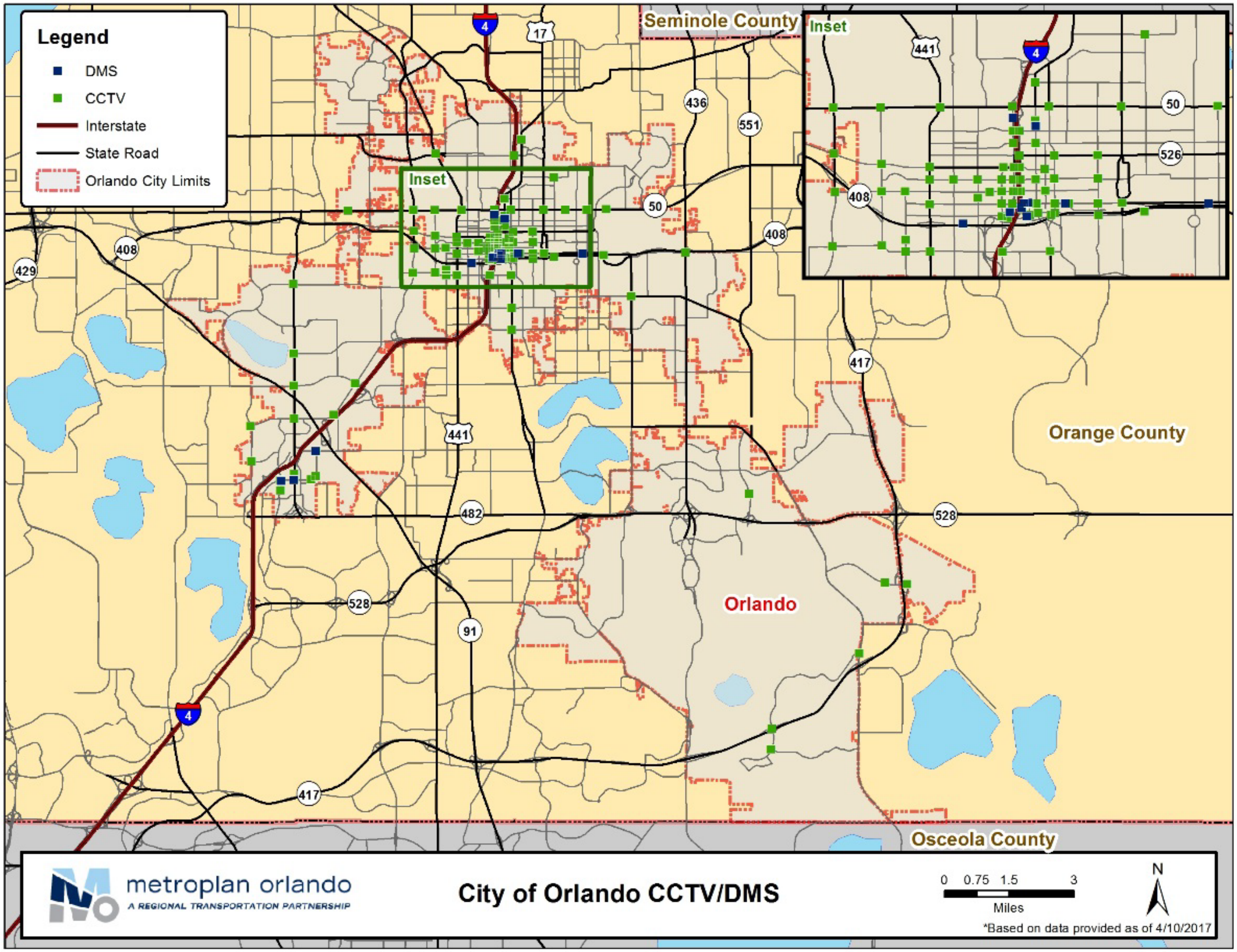


Figure 52. City of Orlando CCTV and DMS

FDOT District Five Central Florida ITS Projects

The most recent FDOT District Five ITS project list includes a number of projects relevant to the study area (many of which are described in the MetroPlan Orlando ITS Master Plan), as shown in **Table 32**.

Table 32. FDOT District Five ITS Projects

Project Name	Status	Timeframe	Description
City of Orlando CCTV Expansion	Planned	Short	This project would add additional devices to expand the City of Orlando CCTV capability.
City of Orlando Travel Time System	Planned	Short	This project would establish a travel time system in the City of Orlando. The project will integrate this into the regional travel time system
City of Orlando ATMS Upgrade	Planned	Medium	This project would connect the City of Orlando to the FDOT SunGuide system. This would allow Orlando to share video with FDOT.
City of Orlando TSP Expansion	Planned	Short	This project would expand TSP capability in the City of Orlando
Orange County Adaptive Signal System	Planned	Short	Upgrading existing signal detection, communication, and hardware system. Installing Bluetooth readers.
Orange County ATMS Phases 3 and 4	Planned	Short	Upgrading existing signal detection, communication and hardware system. Upgrading existing TMC video display system. Installing Bluetooth readers.
Greater Orlando TSP Phases 1, 2, and 3	Planned	Short	Installing TSP equipment on 608 intersections throughout Orange and Seminole Counties.

Relevant Emerging Technology Projects

FDOT District Five and MetroPlan Orlando have championed two recent emerging technology deployment efforts that may include concepts relevant to this study area. In 2017 District Five secured federal funding for the Connecting East Orlando Communities project. This project will include three primary deployments:

- GreenWay real-time decision support and management of over 1,000 traffic signals, including the following applications:
    - TSP.
    - Adaptive traffic signal interface with SunRail's positive train control system.
    - Expansion of integrated corridor management capabilities.
    - Various performance measurement and data visualization capabilities.
- PedSafe pedestrian and cyclist crash avoidance technologies, including connected bus and fleet vehicles, emulated on-board units (via personal mobile devices) for pedestrians, and roadside units to facilitate communication among these devices.
- SmartCommunity mobility on demand services.

Within the study area, the John Young Parkway and Orange Blossom Trail have been identified for GreenWay deployment. PedSafe installations have been identified to the southwest of the study area on Colonial Drive, while SmartCommunity deployments will occur to the east of the study area in downtown Orlando. **Figure 53** includes a map of these deployments.

MetroPlan Orlando recently submitted an emerging technology grant application for the AIM2GO concept, aimed at facilitating complete trips for underserved populations in the Orlando area. Key components of this effort include a central payment system, a multilingual trip planner tool, transit kiosks, and enhanced data collection. While funding decisions have not been made, these potential deployments are presented for context as it relates to potential transit service improvements within the study area.

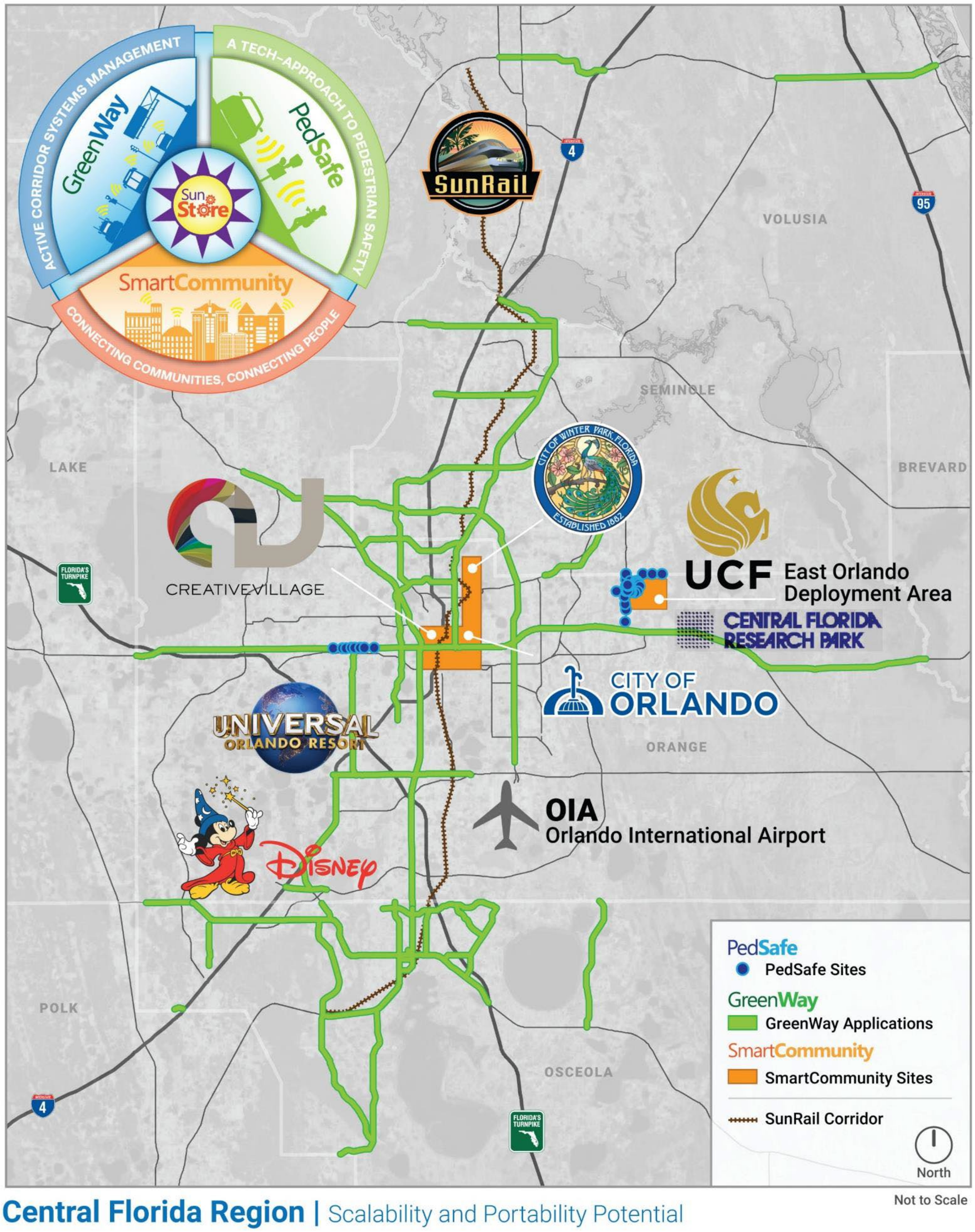


Figure 53. SmartCommunity Deployments in the Central Florida Region

Statewide Freight Signal Priority Efforts

The FDOT Central Office Connected and Automated Vehicle (CAV) program is currently in the process of assessing the potential to deploy FSP using a range of technologies (discussed further in the Potential Solutions section below). As part of this effort, the top 10 most congested arterial corridors were identified for each district. The study area was identified as a freight cluster, with one of the top 10 freight bottlenecks occurring just south of the study area on John Young Parkway. **Figure 54** identifies top regional bottlenecks for District 5.

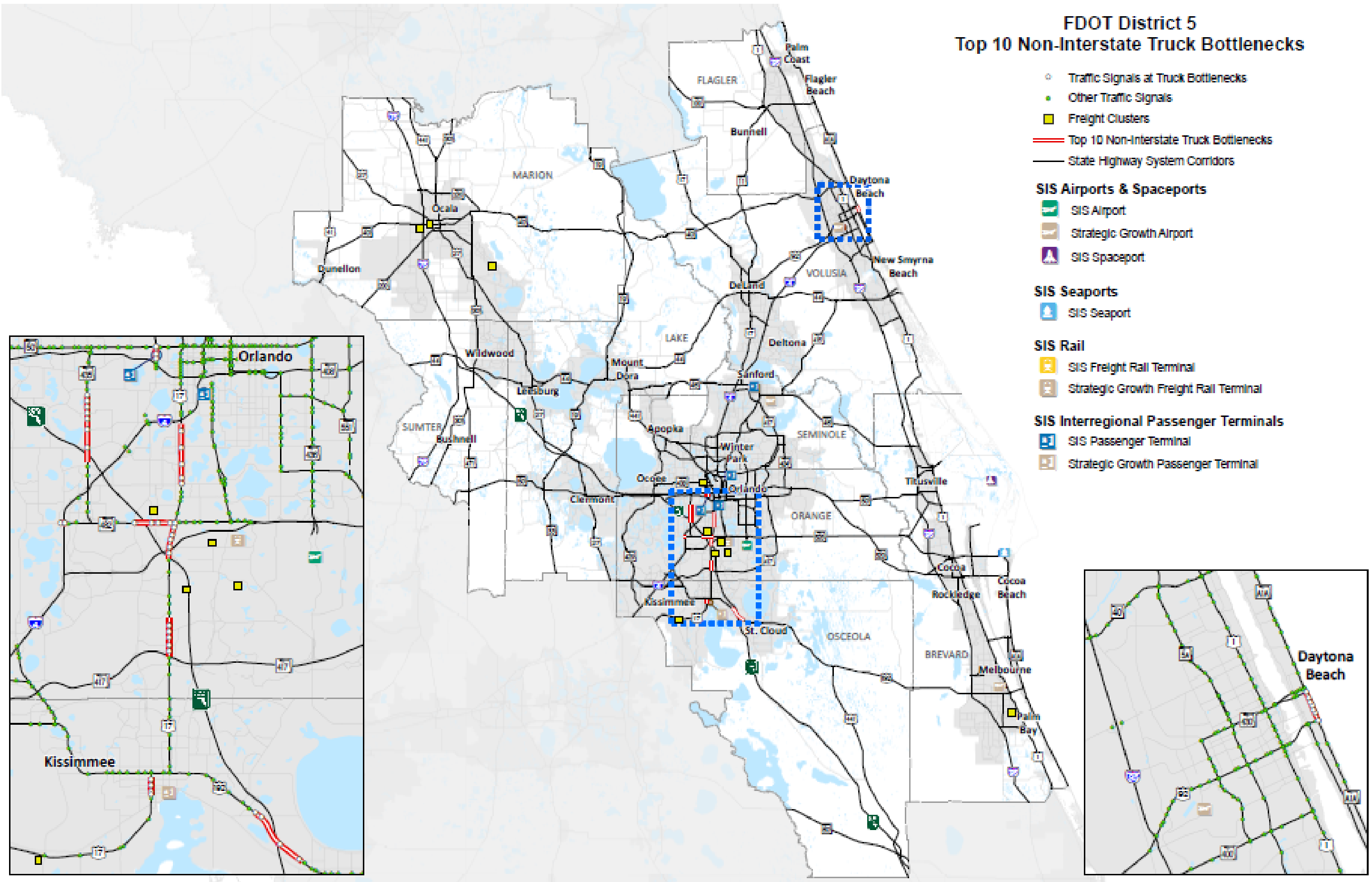


Figure 54. FDOT District Five Top 10 Non-Interstate Truck Bottlenecks

Summary of Existing and Planned Emerging Technology Investments

- There is widespread fiber throughout the project area, though it is owned by multiple agencies.
- The traffic signal network is generally interconnected and monitored at agency's individual TMCs, with some data pushed to FDOT.
- Orange County and the City of Orlando both plan a range of signal investments including expanding TMC connectivity, ATMS upgrades, TSP, and advanced traveler information.
- Emerging technologies such as CAVs and signal priority are considered in the MetroPlan Orlando ITS Master Plan.
- The region has demonstrated a commitment to investing in emerging technology, as evidenced by the Connecting East Orlando Communities and AIM2GO projects.

Potential Technology Solutions

Based on the existing conditions, existing and planned ITS assets, and related emerging technology efforts at the statewide and regional level, the following deployments within the study area are have been assessed:

- FSP utilizing traditional communications technologies and existing ATMS capabilities.
- FSP utilizing connected vehicle technology.
- Additional safety applications enabled by connected vehicle technology within the study area:
  - Red light violation warning
  - Intersection movement assist, and left turn assist.
  - Railroad crossing violation warning.
  - Pedestrian detection and warning.
  - Queue warning.

Each of these concepts are described below, including discussion of potential barriers to implementation.

Freight Signal Priority

FSP involves advanced detection or communication from vehicle-based equipment to alert traffic signal controllers that a freight vehicle is approaching an intersection. This level of awareness can, when conditions are warranted, be used to grant signal priority to one or more oncoming freight vehicles. There are three primary variables that drive FSP applications:

- Detection method (optical emitters, localized radio units, GPS, or connected vehicle technology).
- Method by which priority is granted (distributed priority decisions made by an individual signal controller vs. centralized priority decision made by a TMC).
- Impact on signal phasing (extension of green phase vs. early termination of red phase).

Detection Method

Communication Mechanism	Advantages	Disadvantages
Optical Emitters: Vehicle based-emitter sends infrared or strobe light signal to receiver mounted above signal	• Commonly used and relatively inexpensive technology • Ability to set multiple tiers of priority • Communication with TMC not required to grant priority	• Provides limited information about vehicle • Prone to false positives during adverse weather conditions • Prone to false negatives if line of sight is blocked
Localized Radio Unit: Vehicle-based radio unit sends signal to receiver associated with the signal	• Adjustable range from intersection based on the radio frequency • Cannot be blocked by visual obstructions or adverse weather conditions	• Susceptible to signal interference in dense urban environments
GPS: Vehicle-based GPS communicates vehicle location directly to a traffic management center	• Can offer better information about vehicle trajectory • Does not require the installation of detection equipment at intersections	• Requires that signals are connected to TMC to function • Presents potential privacy concerns to operators of privately-owned vehicles

Communication Mechanism	Advantages	Disadvantages
Connected Vehicle (CV) Technology: on-board unit communicates directly with roadside equipment to facilitate priority request	• Detailed information about the vehicle can be provided • The request is sent directly to the signal cabinet controller • Communication with TMC not required to grant priority	• In-vehicle CV technology is required • Cost of integration into existing signal system can be high

Priority Method

Method	Advantages	Disadvantages
Distributed Priority: Decision-making is made at the intersection level by the traffic signal controller	• The controller cabinet is able to make a quick decision whether or not to provide freight vehicle with priority • Does not cause an interruption to network coordination • Does not require extra clearance intervals	• Due to the limited information provided about vehicle, it is impossible to classify the priority • Does not allow for communication between the freight vehicle operator and system administrators • Cannot simultaneously facilitate multiple requests • Priority may be granted whether the priority is needed or not (i.e., when the freight vehicle is empty)
Centralized Priority: Decision-making is made at the TMC and communicated to the traffic signal controller	• Can simultaneously facilitate multiple requests • Capable of ranking importance of priority requests • Can be programmed to focus on different performance outcomes (e.g., less traffic delay, lower emissions) • Considers real-time traffic conditions	• Real-time communication between multiple parties is necessary • More costly to implement than distributed priority • Priority classification decisions must be made or a hierarchy must be established

Priority Method Impacts

Impact on Phasing	Advantages	Disadvantages
Green Extension: The green phase is extended to allow detected freight vehicle to pass through intersection	• Reduces delay in the direction in which the freight vehicle is traveling • Easy to implement • Little disruption to traffic • Effective with even small volumes of freight vehicles	• Can be disruptive during peak traffic periods • Depends on reliability of detection method
Early Green/Red Truncation: The red signal phase is ended and the green phase is provided earlier than otherwise programmed, clearing the intersection for an approaching freight vehicle	• Reduces delays of freight vehicles at red traffic lights, especially those with long cycles • More effective for higher volume of freight vehicles	• Requires early detection of the freight vehicle so that there is time to safely adjust the signal phase • Can be disruptive to the overall traffic network • Depends on reliability of detection method

Candidate Locations for Freight Signal Priority

Figure 55 shows the truck percentage on the study subarea roadway network, indicating a high percentage of truck traffic on north-south routes including John Young Parkway and Mercy Drive, as well as on east-west routes including Silver Star Road and Princeton Street. **Figure 56**, showing the most congested segments on the corridor according to ATRI, indicates that commercial traffic experiences the most congestion on north-south corridors of John Young Parkway and Orange Blossom Trail. Conversely, **Figure 57** shows overall daily congestion for all traffic, indicating congestion is more pronounced on east-west corridors. One key constraint is that operational improvements to John Young Parkway and Mercy Drive may impact east-west traffic flows, which are already suffering from high levels of congestion, especially during AM and PM peak hours.

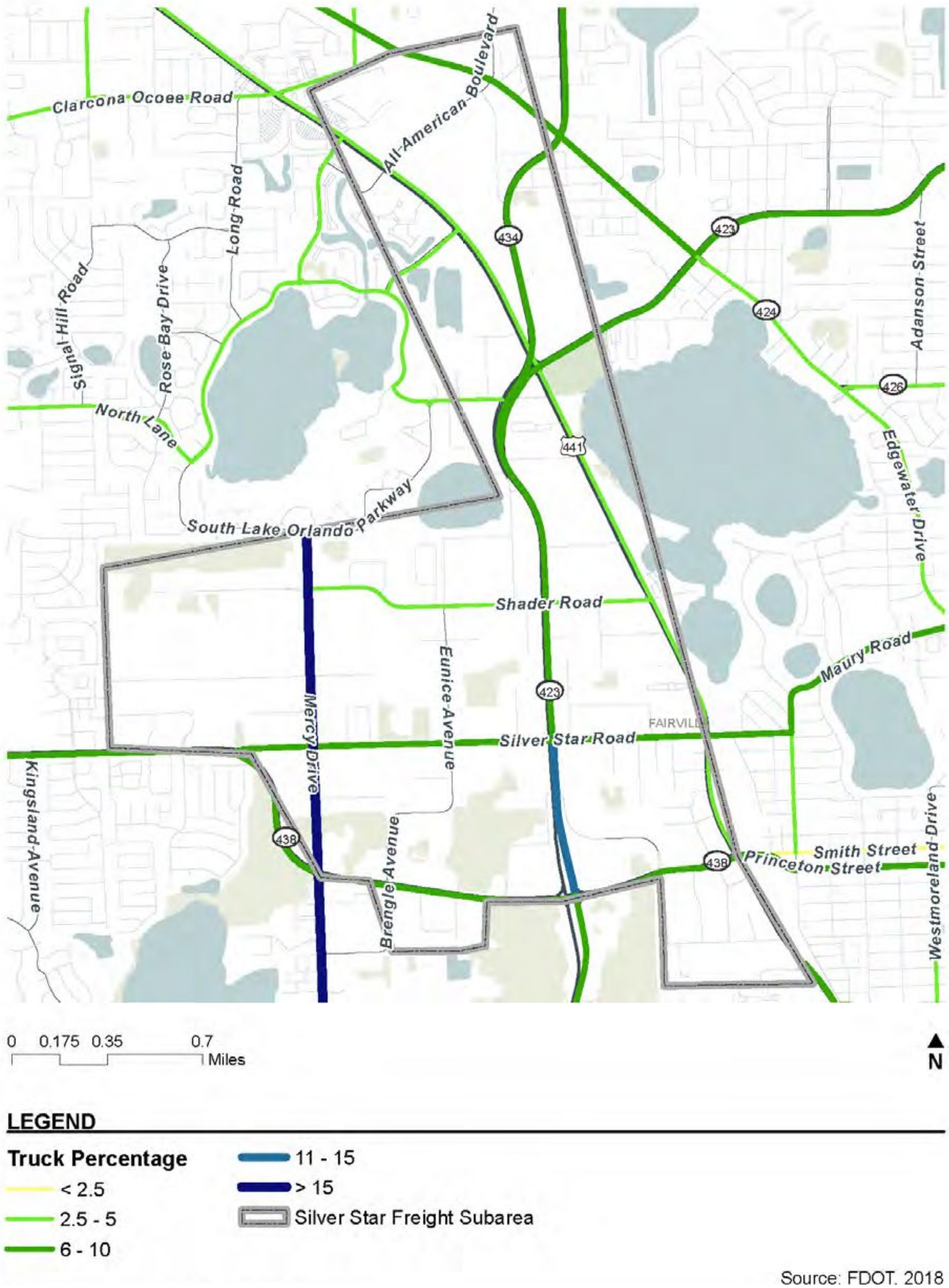


Figure 55. Corridor Truck Percentages

Figure 56. Top 25 Congested Segments Within Subarea

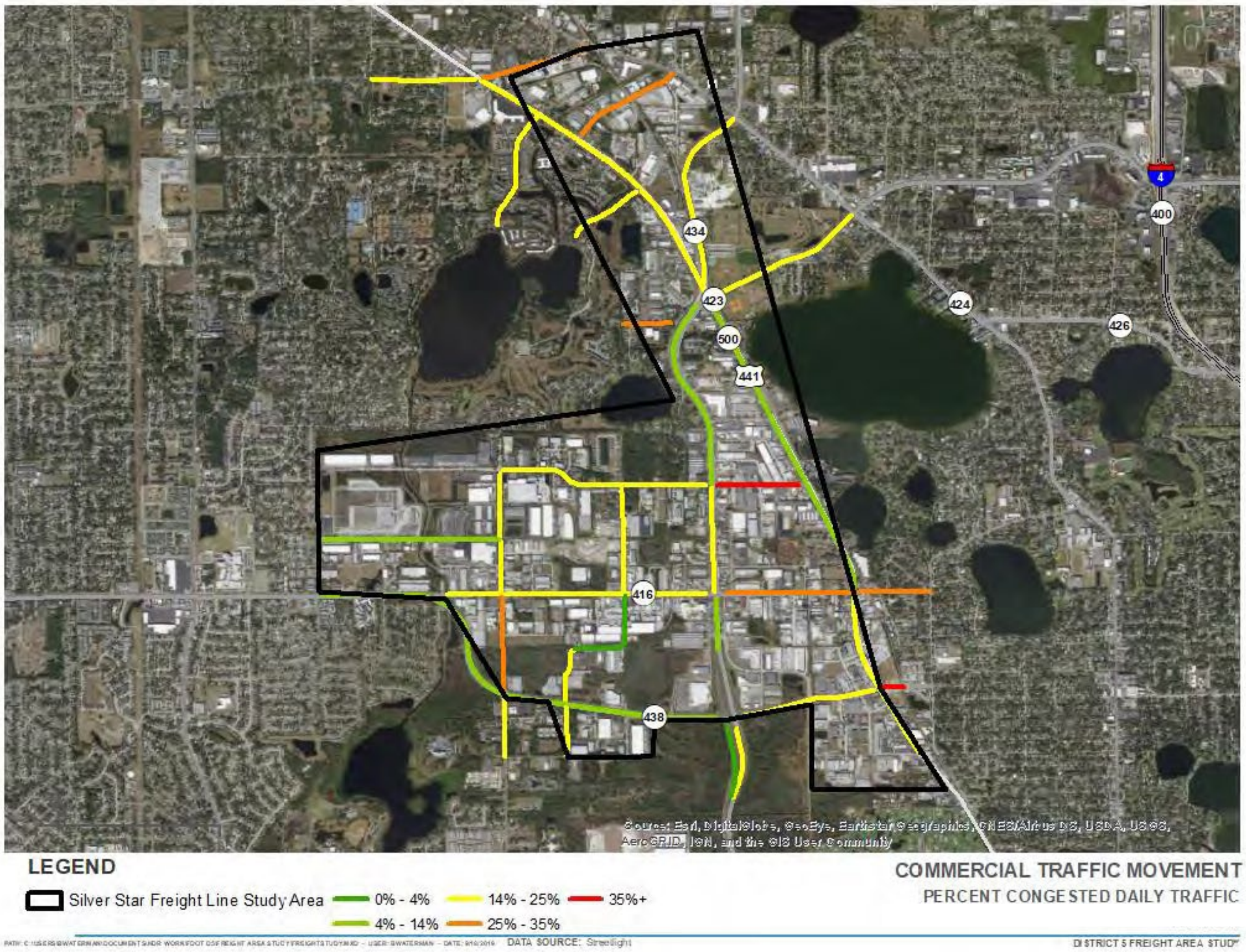


Figure 57. Commercial Traffic Movement Congestion

Of the corridors in the study area, John Young Parkway and Lynx Lane are best suited for FSP. These corridors are prone to freight delay according to ATRI data and exhibit high truck volumes compared to the rest of the study area. However, it is important to note that of the top 1,000 freight bottlenecks identified within the state, only one occurred within the study area (Lee Road at the intersection of Orange Blossom Trail). Orange Blossom Trail also includes one segment with a high degree of freight delay, however it is not associated with a signalized intersection.

One key consideration in implementing FSP on John Young Parkway is the high amount of east-west congestion on traversing corridors. Implementation of any freight priority strategy would require traffic modeling to determine the overall impacts to the roadway network.

Alternatives for Deploying Fright Signal Priority

Alternative 1: Utilize Traditional Detection Methods

Most signals in Orange County and the City of Orlando are already connected to their respective TMCs. Given the recent and planned investments in ATMS upgrades, the study area may be well suited for centralized priority. Given the existing and planned investments in TSP throughout the region, there is already precedent for making priority decisions at the TMC. As ATMS upgrades are scoped, their ability to support signal priority should be considered.

Alternative 2: Utilize Connected Vehicle Technology
Based on the availability of fiber within the project area, some of the enabling infrastructure for connected a vehicle-based system is already in place. Such a system could serve as the basis for other safety applications, including the ones described below, offering an additional incentive to freight operators to consider the technology. One key consideration for any connected vehicle deployment will be the recent decision by the Federal Communications Commission (FCC) regarding the dedicated short-range communications (DSRC) spectrum. On November 18, 2020 the FCC voted to release the spectrum reserved for transportation back to industry for other uses. Any new deployment should consider instead utilizing the emerging cellular vehicle-to-everything (C-V2X) standard.

FSP is heavily dependent upon stakeholder buy-in from the freight community, as most strategies require the installation of specialized equipment on commercial vehicles. Optical emitters and local radio units offer a relatively low cost and optimal privacy. Alternatively, GPS or connected vehicle-based systems offer better knowledge of routing intent, which would offer more functionality to a centralized priority system.

Safety Applications Enabled by a Connected Vehicle Based System

Red Light Violation Warning

Red light violation warning is a vehicle-to-infrastructure (V2I) application that utilizes connected vehicle technology to determine when a vehicle may run a red light and provide an in-vehicle alert to drivers. A roadside unit is connected to the signal cabinet to provide signal phase and timing to oncoming vehicles. When an on-board unit determines that based on current conditions a red light violation is possible, a warning is presented to the driver. **Figure 58** below illustrates the general mechanics of a red light violation warning application, developed by U.S. DOT.

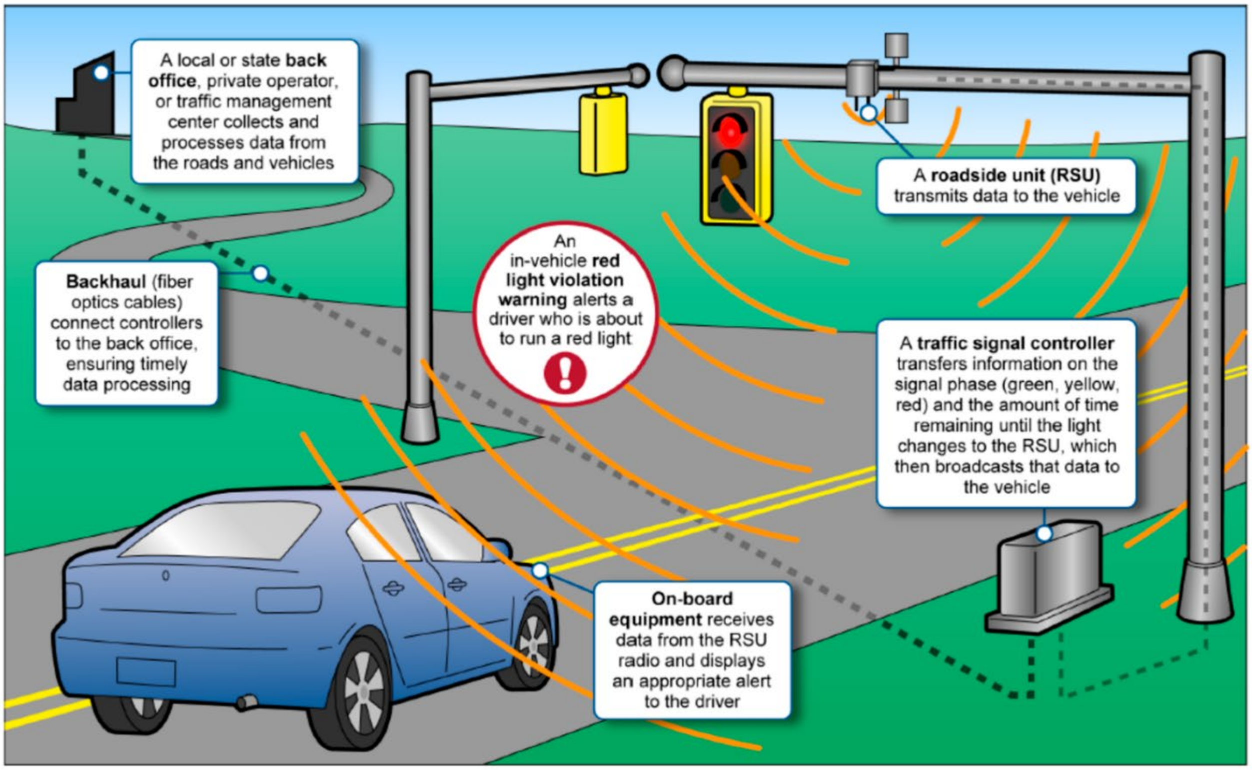


Figure 58. Red Light Violation Warning System

Some automakers have also utilized signal data from TMCs to provide alerts to vehicles of the "countdown to green." Over time, this technology could evolve to include the functionality of red light violation warnings without the need for infrastructure investment at the intersection level.

Intersection Movement Assist/Left Turn Assist

Intersection movement assist and left turn assist are vehicle-to-vehicle (V2V) applications that warn drivers when it is not safe to enter an intersection or make a turning movement. Unlike the red light violation warning application, both are dependent upon a certain level of connected vehicle saturation on the corridor. If a package of connected vehicle applications were offered to freight users of the corridor, this could be one way to increase penetration and provide a meaningful number of users for V2V safety applications.

Figure 59 shows a crash heat map of the study area. Crashes are highest at three intersections along John Young Parkway: Sliver Star Road, Princeton Street, and Orange Blossom Trail. Given the high volume of intersection crashes, particularly on John Young Parkway at the intersections of Silver Star Road and Princeton Street, intersection collision avoidance applications such as red light violation warning, intersection movement assist, and left turn assist could provide value to both the freight community and the general public.

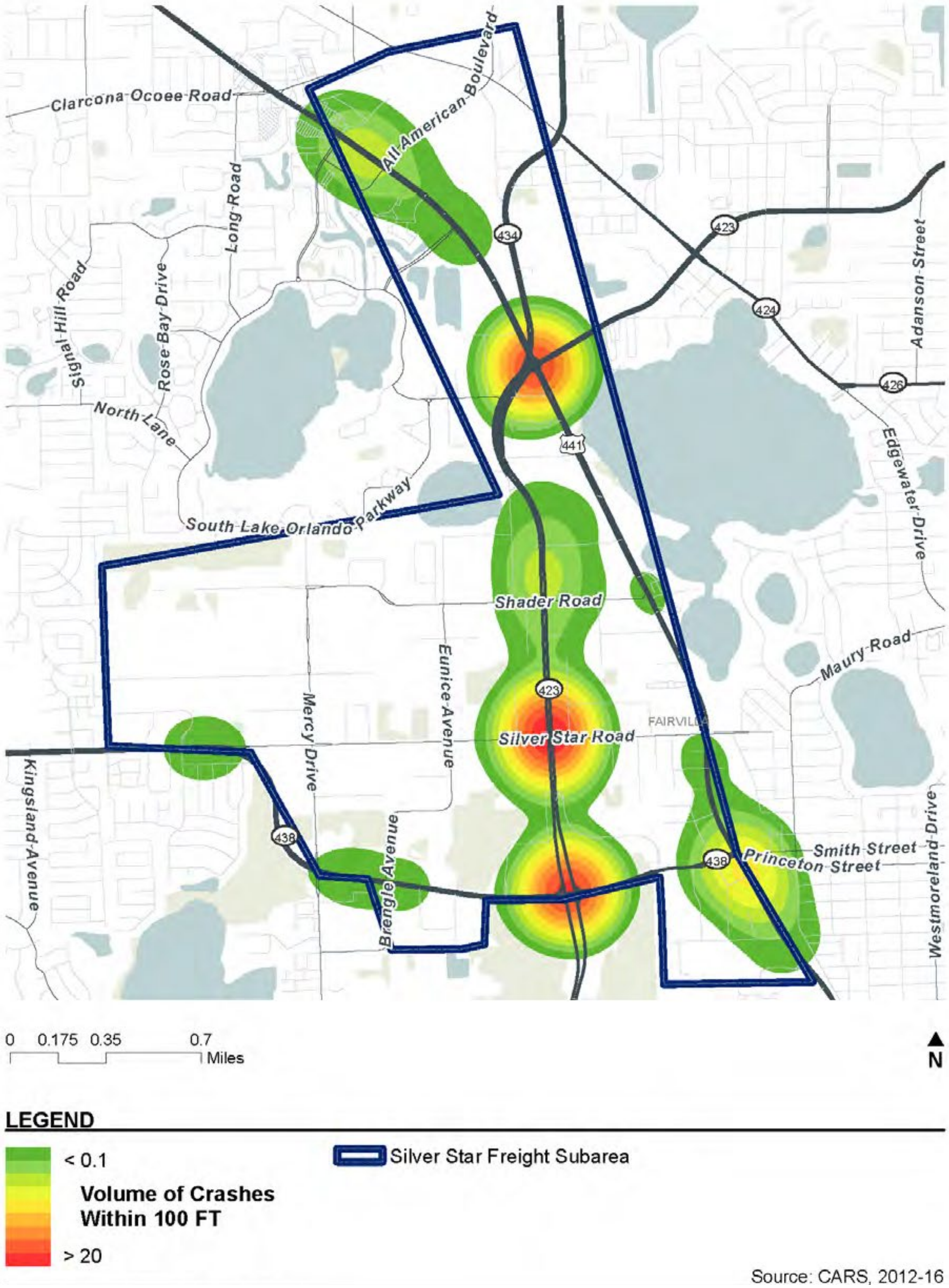


Figure 59. Heat Map of Crashes within Subarea

Queue Warning

Queue warning utilizes communications to enable vehicles to detect queueing and broadcast alerts to infrastructure and nearby vehicles. This can complement infrastructure-based queue detection and warning systems by providing data in real-time and serving as a mechanism for in-vehicle alerts. These applications could be especially beneficial to commercial vehicles in the study area, which have longer stopping distances when queues arise. Queue warning would also enable speed harmonization, which ingests similar data from vehicles to make speed recommendations to drivers to reduce speed variability. Not only does this reduce the likelihood of end of queue crashes, but it can be used to prevent flow breakdowns and maximize roadway capacity.

Of the crashes involving trucks in the study area, 70 percent were not at intersections and 34 percent were front to rear, potentially indicating crashes due to queueing. **Figure 60** shows a crash heat map for front-rear collisions that occurred outside of intersections, which may be used as an indicator for the locations of end of queue crashes. The intersections of John Young Parkway and Princeton Street, Silver Star Road, and Orange Blossom Trail; as well as Orange Blossom Trail and Clarcona Ocoee Road all register a high number of potential end of queue crashes.

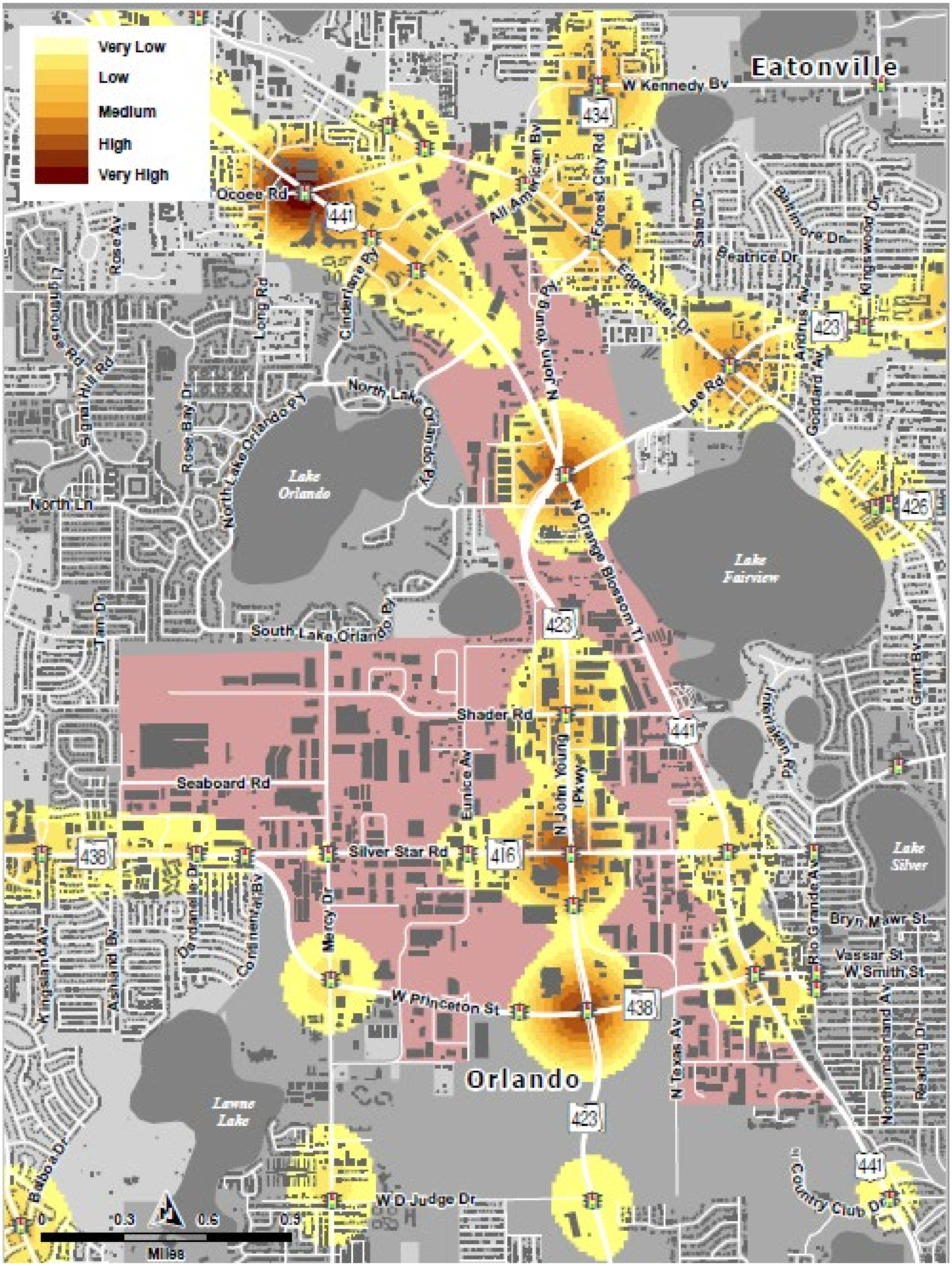


Figure 60. Crash Heat Map of Front-Rear Crash Types

Rail Crossing Violation Warning

Similar to the red light violation warning, this application provides a means for vehicles approaching a rail crossing to be warned of an imminent violation of an active warning/protective system (i.e., flashing lights, gates, or both). The potential also exists for mobility-related improvements based on accurate train arrival and the train's anticipated occupancy duration of the rail crossing. By integrating connected vehicle roadside units into the track signaling system, this application could also be used to suggest alternate routing.

Of the railroad crossings assessed in the study area, the crossing on Lee Road, as shown in **Figure 61**, could be a candidate for rail crossing violation warning. Gates on the right turn lane from northbound Orange Blossom Trail to eastbound Lee Road have been damaged numerous times by vehicles. One proposed solution is the installation of advanced warning signs on northbound and southbound Orange Blossom Trail. Advanced warning signage could be supplemented by in-vehicle warnings for connected vehicles.

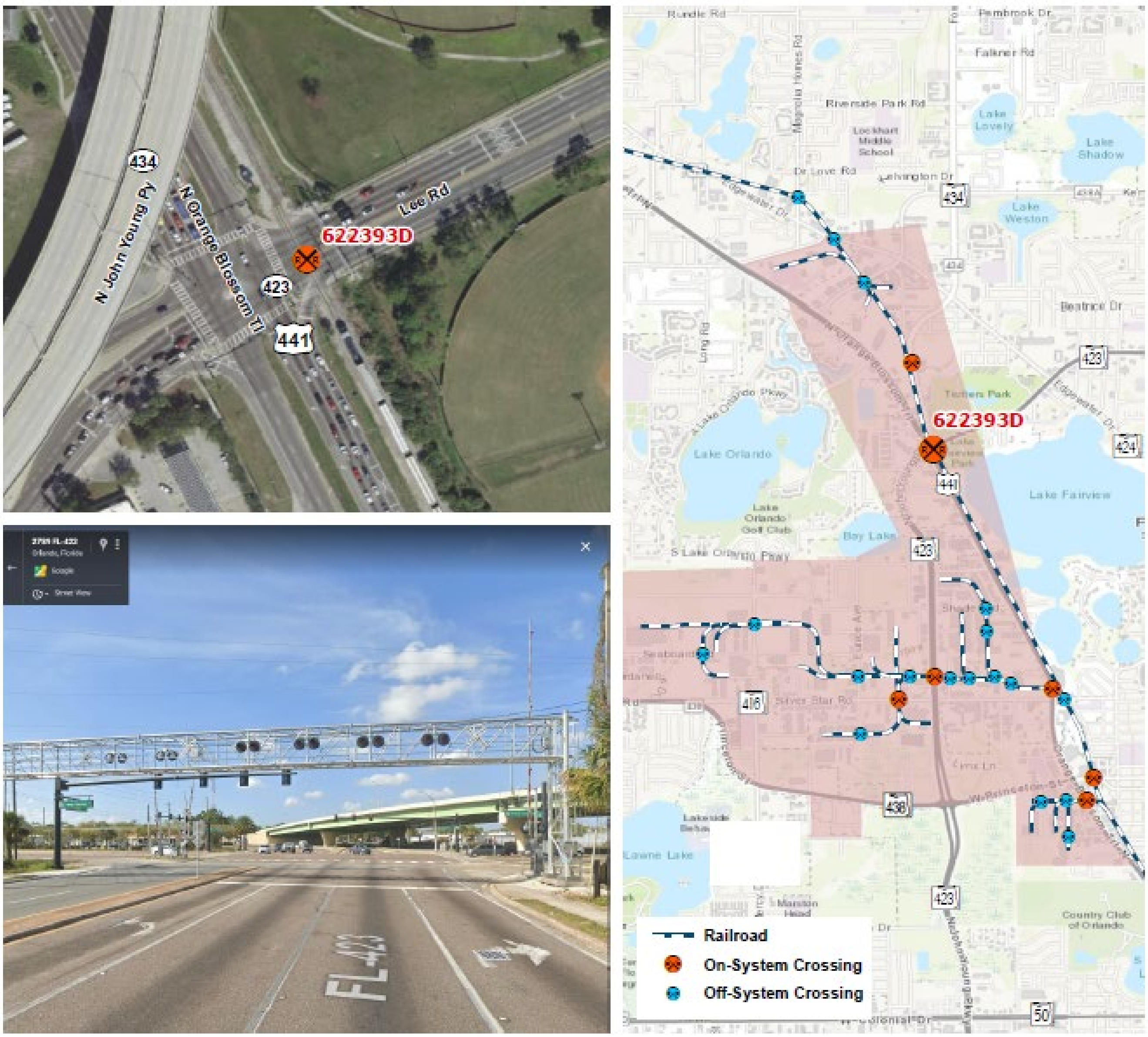


Figure 61. Lee Road Rail Crossing (622393D)

Pedestrian Detection and Warning Treatments

In addition to the intersection safety improvements suggested in the Safety Analysis, there are various emerging technologies that can be used to enhance pedestrian safety:

- Pedestrian detection in crosswalks (such as video or radar-based systems) can be used to identify when a pedestrian is present, and provide more time for crossing if needed.
- Pedestrians can be incorporated into the connected vehicle environment by using mobile devices as a surrogate on-board unit (as is planned in the East Orlando Connected Communities Deployment).
- In-vehicle connected vehicle devices can be used to warn drivers of a pedestrian in a crosswalk before the vehicle makes a turning movement.
- Infrastructure-based lighting can be used to draw attention to crosswalks or provide alerts to drivers when a pedestrian has entered the roadway.

Figure 62 shows bicycle and pedestrian crashes in the project area from 2014-2019, with 44 percent occurring at intersections. The most prominent concentrations of bicycle and pedestrian crashes occurred at the intersections of Silver Star Road and Orlando West Drive (21 crashes); John Young Parkway/Forest City Road and Edgewater Drive (12 crashes); and Orange Blossom Trail and Clarcona Ocoee Road (11 crashes).

Additional safety analysis conducted in the study area as part of Phase II indicates pedestrian and bicycle crashes are relatively frequent at the following intersections: Pine Hills Road and Silver Star Road (27 from 2013-2017); Pine Hills Road and Colonial Drive (15 from 2013-2017); and Orange Blossom Trail and John Young Parkway (five from 2013-2017).

Pedestrian detection and warning treatments should be considered at one or more of the above intersections, with in-vehicle warnings made possible as a component of a larger suite of connected vehicle applications.

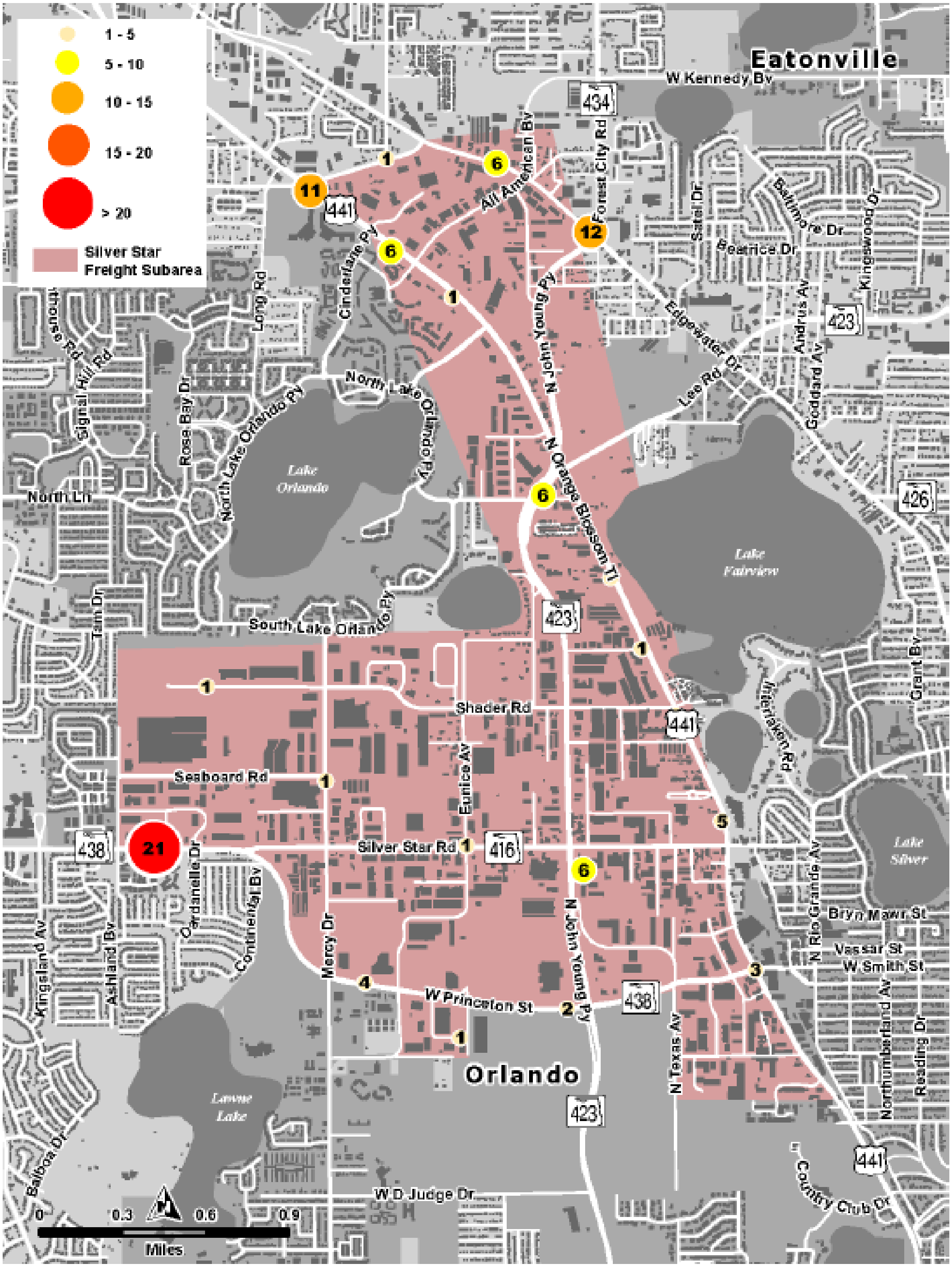


Figure 62. Numbers of Bicycle and Pedestrian Crashes by General Location (2014-2019)

Summary of Recommended Projects

FSP could be implemented using either traditional detection techniques or connected vehicle technology. The chief benefit of opting for connected vehicle technology would be the ability to offer other secondary safety applications. The following corridors are most suitable for FSP based on freight delay within the study area:

- John Young Parkway, including the extension to Lee Road.
- Lynx Lane.

The following connected vehicle safety applications could be offered if a connected vehicle solution is utilized:

- **Red light violation and intersection movement assist** on John Young Parkway at the intersections of Sliver Star Road, Princeton Street, and Orange Blossom Trail.
- **Queue warning** on John Young Parkway at the intersections of Princeton Street, Silver Star Road, and Orange Blossom Trail; as well as Orange Blossom Trail and Clarcona Ocoee Road.
- **Rail crossing violation warning** at the crossing on Lee Road for vehicles turning from northbound and southbound Orange Blossom Trail.
- **Pedestrian detection and warning** at the following intersections Silver Star Road and Orlando West Drive; John Young Parkway/Forest City Road and Edgewater Drive; Orange Blossom Trail and Clarcona Ocoee Road; Pine Hills Road and Silver Star Road; Pine Hills Road and Colonial Drive; and Orange Blossom Trail and John Young Parkway.

GEOMETRIC EVALUATIONS

This section describes the assessment of the existing conditions of each of the state road corridors within the study area.

1. Silver Star Road
2. John Young Parkway / Lee Road (SR 423)
3. John Young Parkway (SR 434)
4. Princeton Street
5. Orange Blossom Trail

The project team visited the project study area on multiple occasions to observe existing geometric and operational conditions. Truck parking activities, particularly along roadway travel lanes, curbs, and shoulders (which may create operational challenges) were also noted during the field review.

Silver Star Road

Limits: Coast Line Drive to Taft Avenue

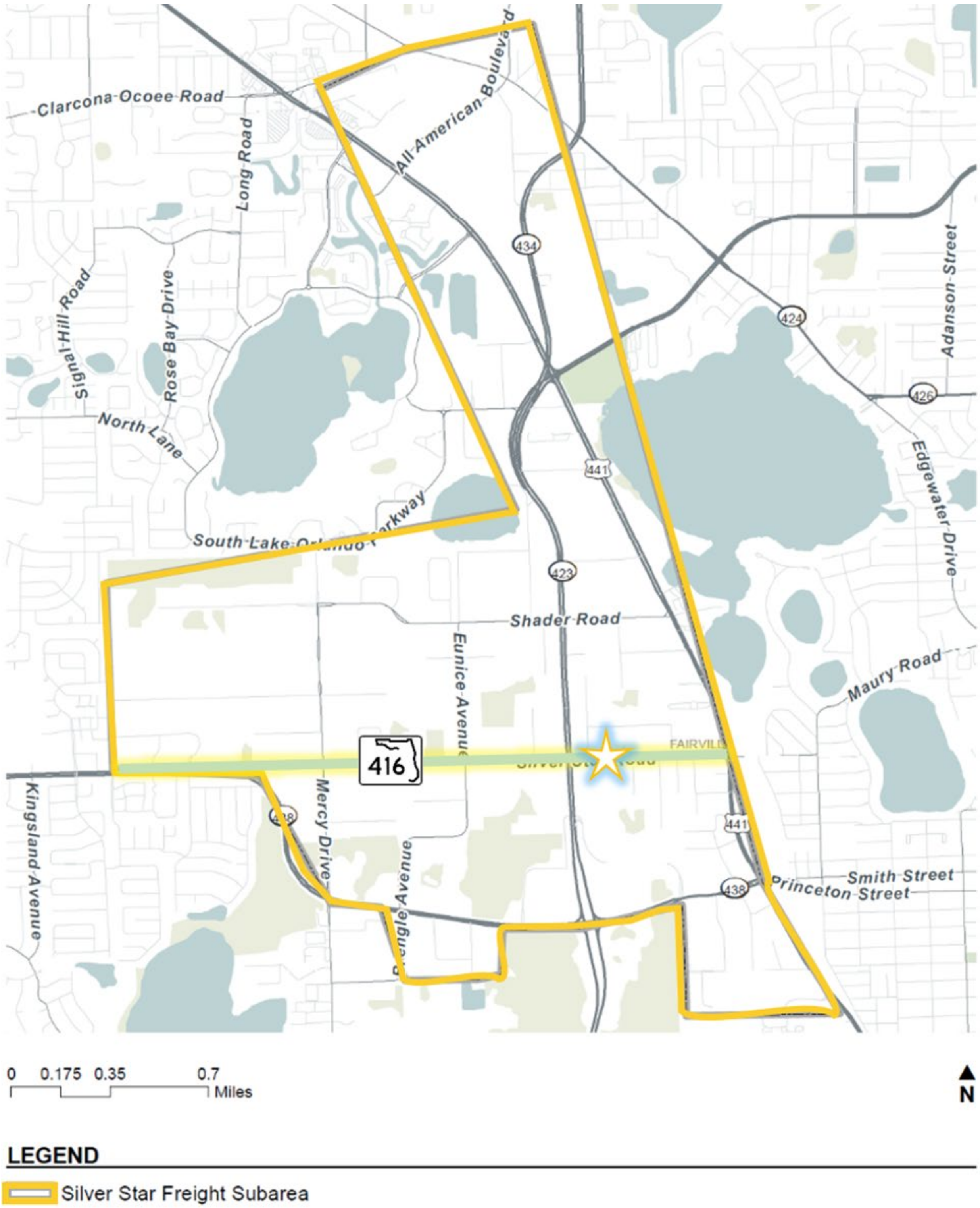


Figure 63. Silver Star Road Study Area Limits

Overview

The Silver Star Road corridor within the project limits is a 2.30-mile-long minor arterial with primarily industrial land use and some commercial land use as well. There are two railroad crossings along Silver Star Road, the first being approximately 900 feet west of John Young Parkway and the second being 250 feet east of Orange Blossom Trail. There are six signalized intersections within the study corridor. Generally, within the study corridor Silver Star Road is an undivided two-lane road with a two-way left-turn lane. East of Orange Blossom Trail, Silver Star Road is a four-lane undivided road, but transitions into two lanes approximately 700 feet west of Orange Blossom Trail. From Coast Line Drive to Dardenelle Drive, Silver Star Road is a six-lane road with three lanes in each direction separated by a raised median approaching Continental Boulevard. East of Continental Boulevard, Silver Star Road is a four-lane undivided road until approximately 300 feet east of Mercy Drive where it transitions into a two-lane undivided roadway.

Source: HDR

Figure 64. Silver Star Road Looking West

Pavement Conditions

Pavement markings along the corridor were generally faded. Pavement cracking was identified at numerous cross streets and driveways along Silver Star Road such as the Wendy's driveway at Hansrob Road, and across from the CITGO gas station leading into Custom Freight Carriers (**Figure 66**). Cracking was also observed along the shoulders of the corridor in various areas.

Operational Conditions

Field observations during the morning found some queuing occurred at the signalized intersections at John Young Parkway and Orange Blossom Trail. Additionally, queuing also occurred along the corridor in instances where trucks tried to maneuver into and out of driveways particularly at businesses where truck activity was apparent. It was also observed in the field that large trucks were parked in travel lanes creating hazardous conditions for passenger cars. A truck was observed parked in the auxiliary lane in front of the CITGO gas station as shown in **Figure 66** and photos 15 and 16.

Geometric Conditions

Off-tracking was observed at numerous driveways along the corridor as identified in the Silver Star Road Field Review Location Map and Photos (**Figure 65** and **Figure 66**). Minimal to no off-tracking was observed at signalized intersections. Occasional lane encroachment was identified across the corridor and signalized intersections by turning trucks. In some locations, such as the intersection of Silver Star Road and Orange Blossom Trail it appeared that trucks had to mount curb in order to complete their maneuver based on the curb conditions observed in the field (see photo 18).

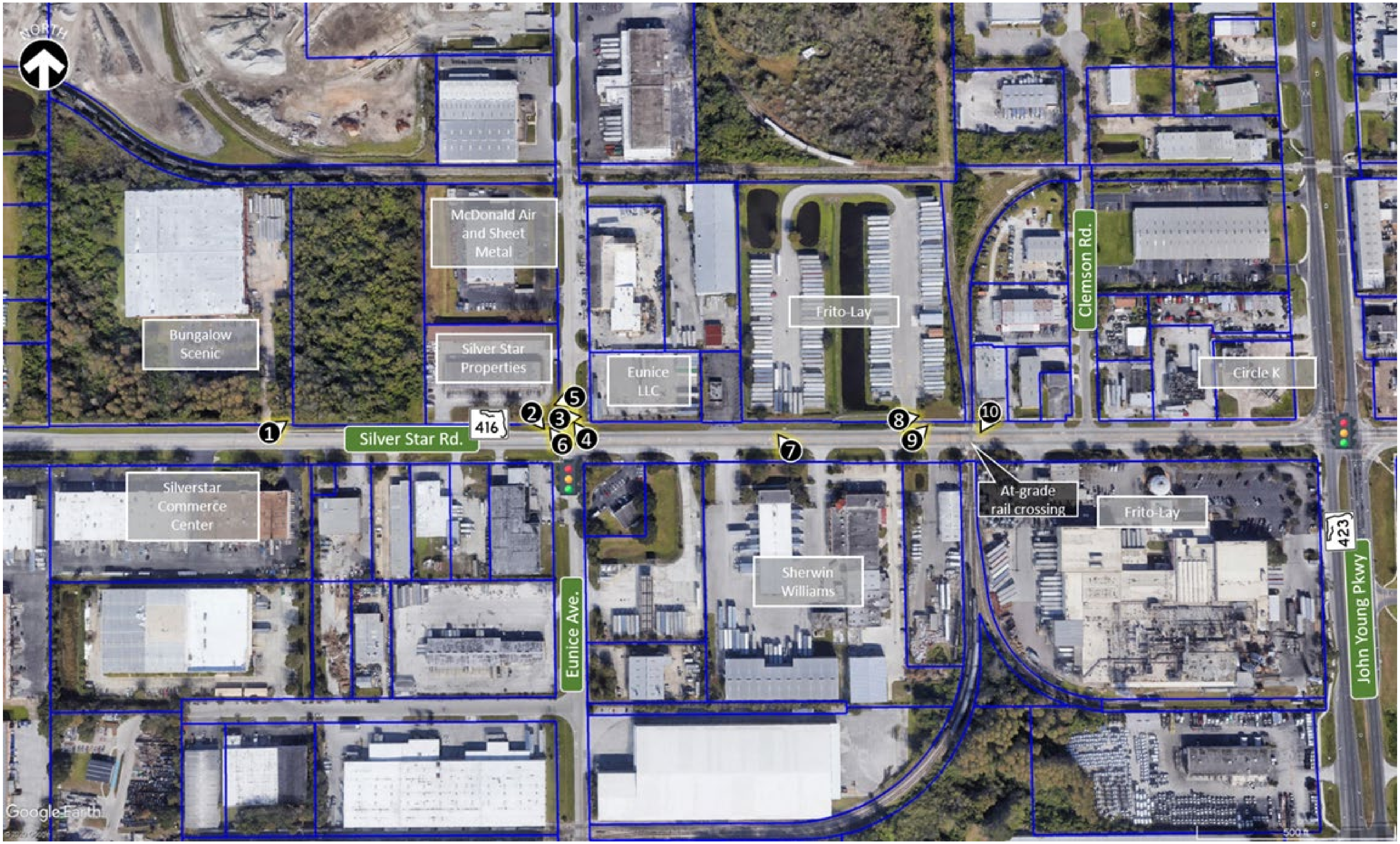


Figure 65. Silver Star Road Field Review Location Map (Part 1)

Figure 66. Silver Star Road Field Review Location Map (Part 2)

Off-tracking 700 feet west of Eunice Ave (Source: HDR)

Off-tracking on northwest corner of Eunice Ave intersection (Source: HDR)

Off-tracking on the northwest corner of Eunice Ave intersection looking east (Source: HDR)

Poor pavement marking conditions at the Eunice Ave intersection (Source: HDR)

Off-tracking on the northwest corner of Eunice Ave intersection looking southwest (Source: HDR)

Off-tracking on northwest corner of Eunice Ave intersection (Source: HDR)

Rail crossing pavement markings slightly faded (Source: HDR)

Off-tracking on the northern side of street in front of Frito-Lay (Source: HDR)

Off-tracking 400 feet west of Clemson Road looking northeast (Source: HDR)

Cracked pavement right in front of rail crossing (Source: HDR)

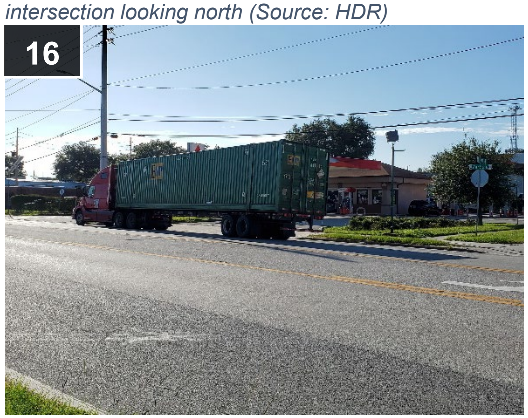
Off-tracking at Hansrob Road intersection looking west (Source: HDR)

Off-tracking at Regent Ave intersection looking east (Source: HDR)

Off-tracking on the northwest corner of Regent Ave intersection looking north (Source: HDR)

Off-tracking on the northwest corner of Regent Ave intersection looking south (Source: HDR)

Truck parking in travel lane in front of CITGO gas station with off-tracking in the foreground (Source: HDR)



Truck parking in travel lane in front of CITGO gas station (Source: HDR)

Apparent concrete spill at the southwest corner of Orange Blossom Trail (Source: HDR)

Cracked pavement and curb at the southwest corner of Orange Blossom Trail (Source: HDR)

AutoTURN Analysis

An AutoTURN analysis was conducted) to evaluate potential operational challenges that may occur at the intersection of Silver Star Road and Orange Blossom Trail. The results of the analysis are shown below. As shown, WB-62FL vehicles making right turns at this intersection must swing wide and encroach into the perpendicular street's left turn lane in order to make the turn without mounting the curb/sidewalk on the corner. A potential improvement to help allow this maneuver to happen without conflicting with the perpendicular street left turns would be to shift the stop bar back for all left turn lanes to a point beyond where truck encroachment would occur.

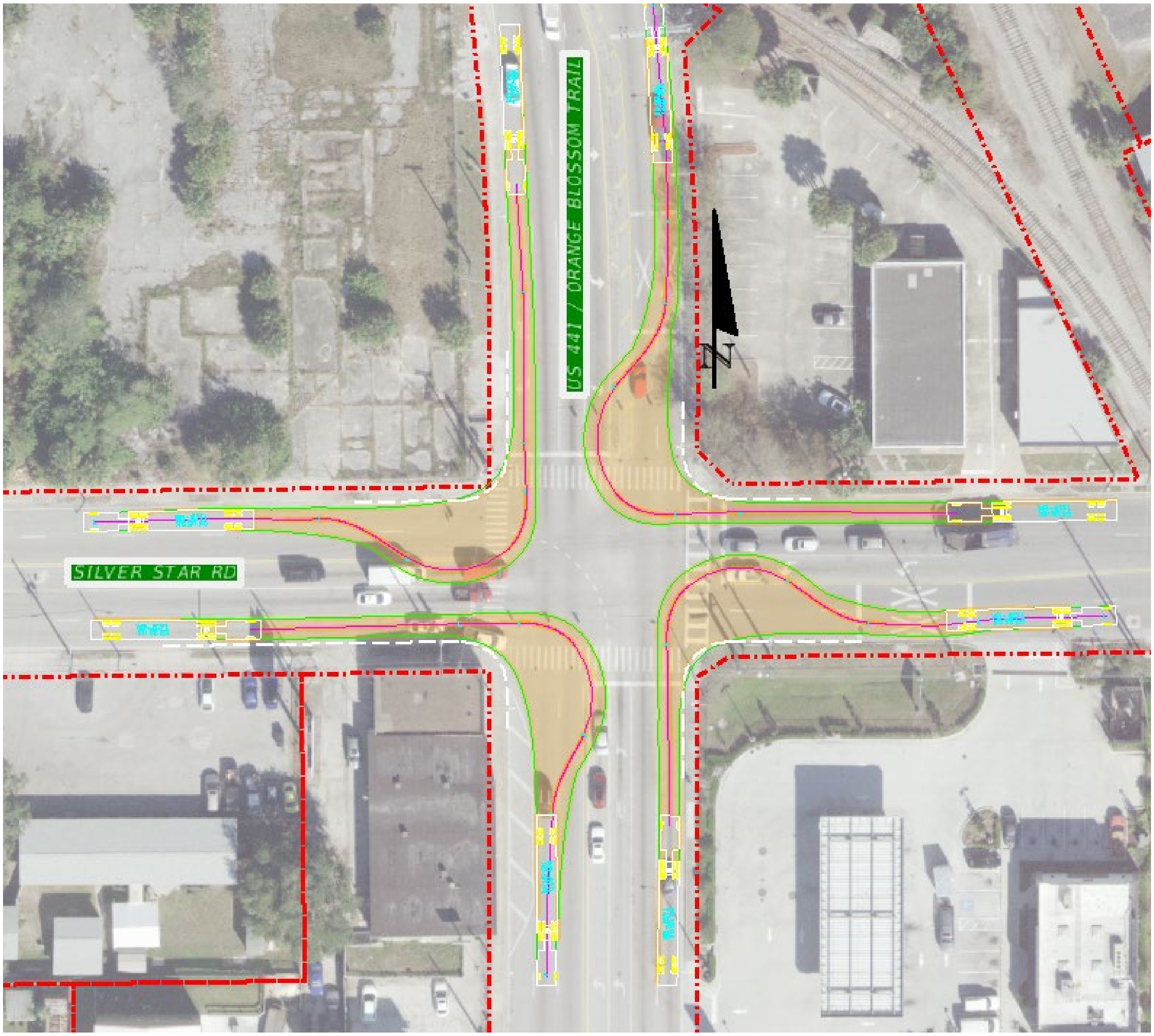


Figure 67. Silver Star Road at Orange Blossom Trail AutoTURN Check

Observations & Recommendations

Observation	Recommendation
Off-tracking at driveways; Evidence suggests off-tracking along Silver Star Road is due to driveway configurations not accommodating large truck turning movements	Modify driveways to ensure driveways meet current standards for width and flares. Reconstruct driveways as needed to meet current standards.
Poor Pavement Conditions	Perform pavement evaluation / geotechnical investigation of pavement issues
Short-term idling / parking on shoulders and travel lanes	Install No Parking signs within the right-of-way. Local agencies should approach business owners to identify a solution. In addition, local agencies should coordinate with local law enforcement to enforce the no parking restrictions.
AutoTURN run for a WB-62FL shows all right turn movements are possible with minor lane encroachment	Consider relocating stop bar for left turn lanes to minimize WB-62FL encroachment

John Young Parkway / Lee Road (SR 423)

Limits: Princeton Street to Lake Fairview Park / Arawak Lane

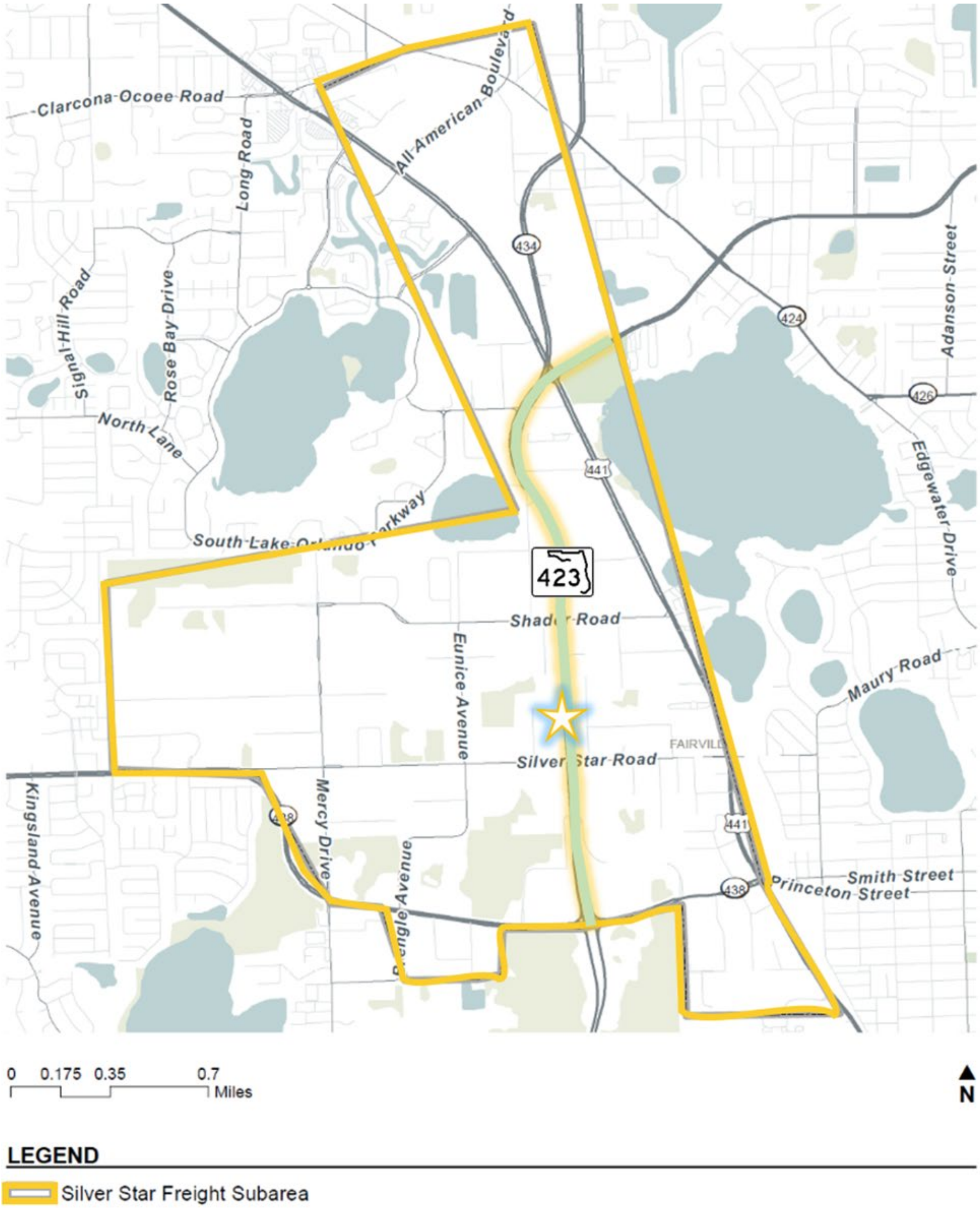


Figure 68. John Young Parkway / Lee Road Study Area Limits

Overview

The John Young Parkway / Lee Road corridor within the project limits is a 2.26-mile-long principal arterial with primarily industrial and commercial land use. There are two railroad crossings along this corridor, the first being approximately 670 feet north of Silver Star Road and the second being just east of the Orange Blossom Trail intersection. There are five signalized intersections withing the study corridor. Construction to widen John Young Parkway to six lanes from West Colonial Drive to Shader Road is currently on-going. The construction plans were obtained and used to confirm wheel paths of WB-62FL (**Figure 71**). Generally, within the study corridor John Young Parkway is a four-lane divided roadway with two lanes in each direction. North of Ace Road and approaching Forest City Road, John Young Parkway transitions into a six-lane divided roadway separated by a raised median. John Young Parkway is currently being widened and upon completion it will be a six-lane divided roadway with three lanes in each direction.

Source: HDR

Figure 69. John Young Parkway Looking South

Pavement Conditions

The current limits of the current construction on John Young Parkway made it difficult to determine existing pavement conditions. FDOT is widening the road from four lanes to six lanes beginning at West Colonial Drive and ending at Shader Road. In addition to widening, other improvements include curb and gutter, drainage, sidewalks, signals, signing and pavement markings, ITS, and two new drainage ponds. The limits of the improvement fall within the study area from Princeton Street to Shader Road. Generally, the pavement conditions north of Shader Road and just east of Orange Blossom Trail were in fair condition. It should be noted that current pavement markings are likely to be temporary or old due to ongoing construction. Final pavement markings are yet to be installed.

Operational Conditions

Field observations during the morning did not find evidence of operational challenges. Due to ongoing construction it was not determined if truck operational challenges (if any) were evident.

Geometric Conditions

Off-tracking was not observed during the field review.

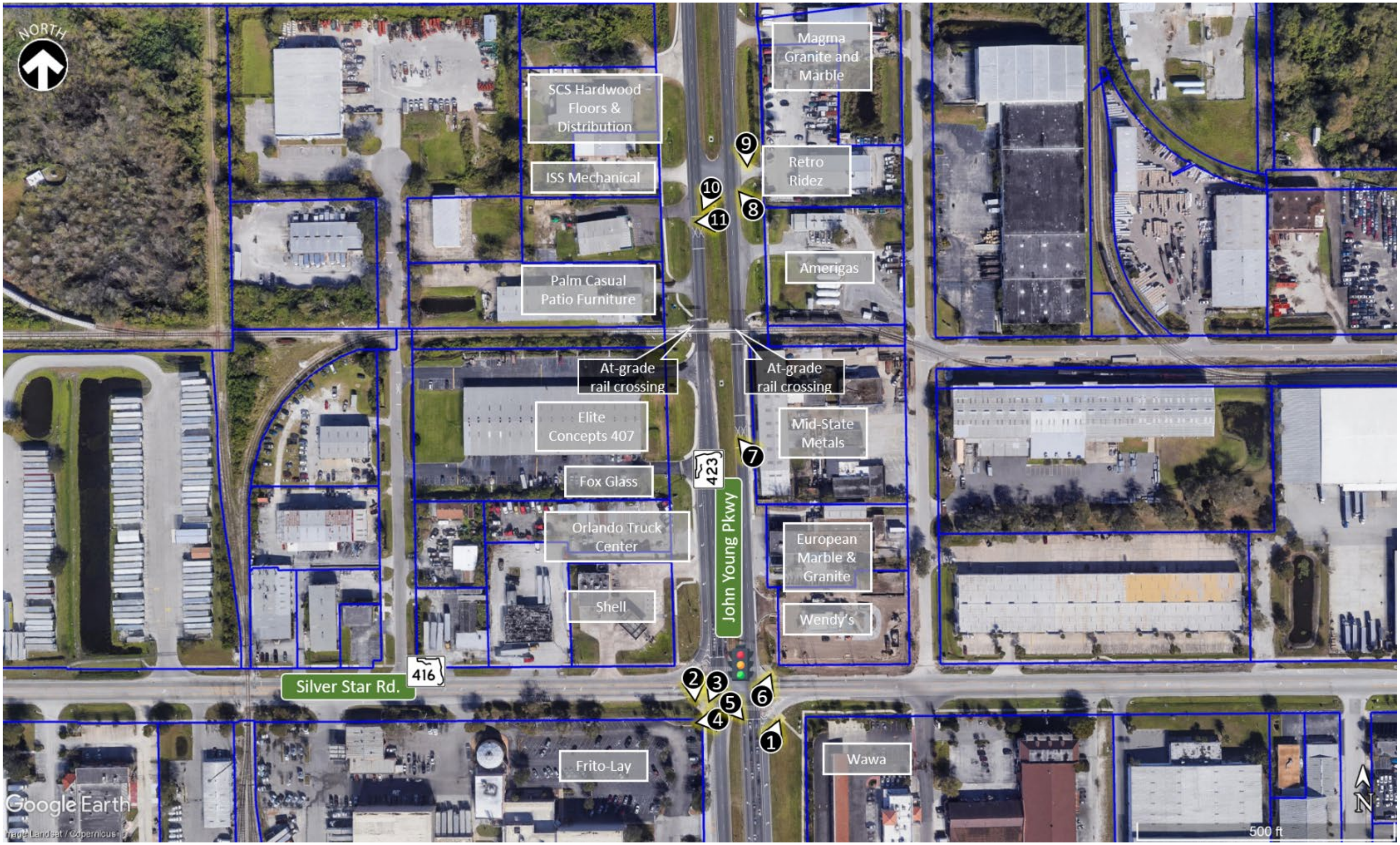


Figure 70. John Young Parkway (SR 423) Field Review Location Map

Southeast corner of John Young Parkway at Silver Star Road (Source: HDR)

Reconstructed curb at southwest corner of John Young Parkway at Silver Star Road (Source: HDR)

Reconstructed curb at southwest corner of John Young Parkway at Silver Star Road (Source: HDR)

Reconstructed curb at southwest corner of John Young Parkway at Silver Star Road (Source: HDR)

Ongoing construction on John Young Parkway (Source: HDR)

Newly constructed curb at northwest corner of John Young Parkway at Silver Star Road (Source: HDR)

7

Pavement markings along John Young Parkway generally in fair condition with ongoing construction although slightly faded (Source: HDR)

8

Pavement markings along John Young Parkway generally in fair condition with ongoing construction (Source: HDR)

9

Reconstructed curb on John Young Parkway in front of driveway leading to Amerigas (Source: HDR)

10

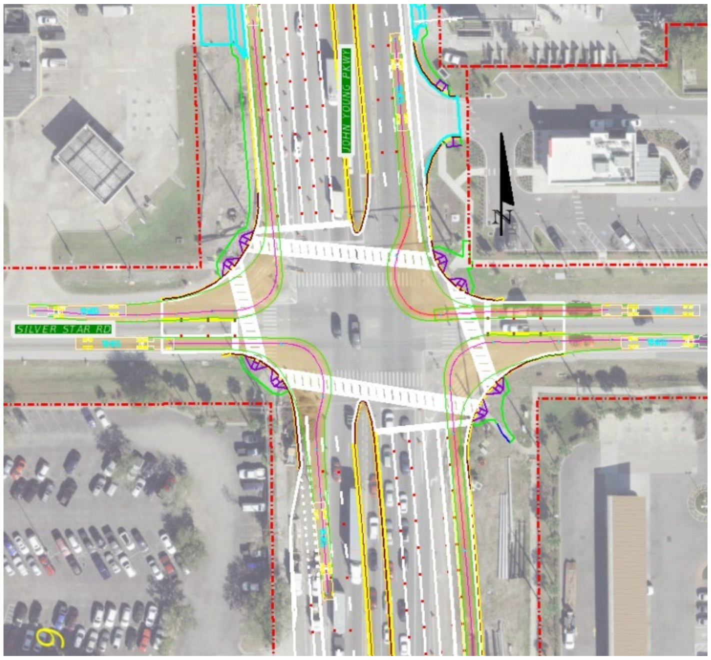
John Young Parkway looking south; pavement markings generally in fair condition with ongoing construction but slightly faded (Source: HDR)

11

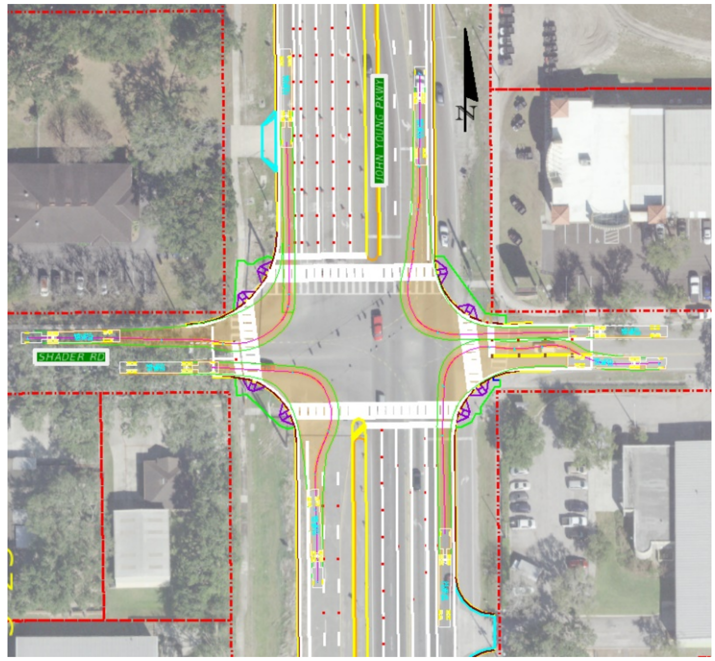
Pavement markings along John Young Parkway generally in fair condition with ongoing construction although slightly faded (Source: HDR)

AutoTURN Analysis

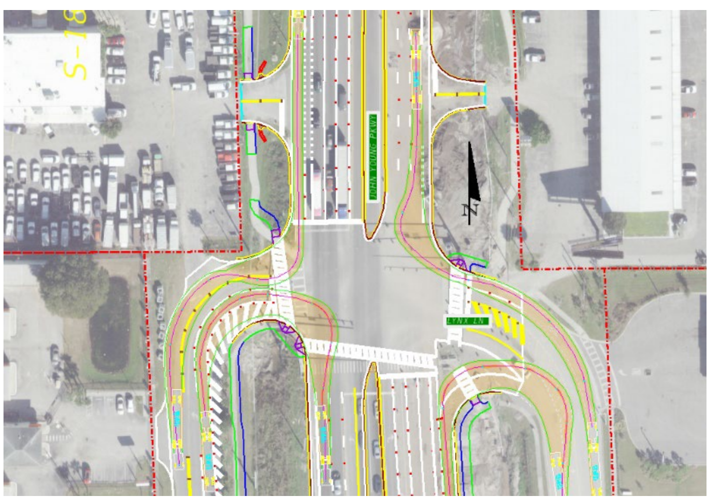
An AutoTURN analysis was conducted using provided construction documents for the John Young Parkway widening project to evaluate potential operational challenges that may occur at signalized intersections. The results of the analysis are shown in **Figure 71**. As shown in **Figure 71**, there are no encroachment issues for WB62-FL vehicles making right turns, with the exception of encroachment into the eastbound and westbound left turn lanes at Shader Road and the eastbound left turn lane at Lynx Lane. A potential improvement to mitigate the encroachment would be to shift the stop line back for these specific left turn lanes to a point beyond where truck encroachment would occur.



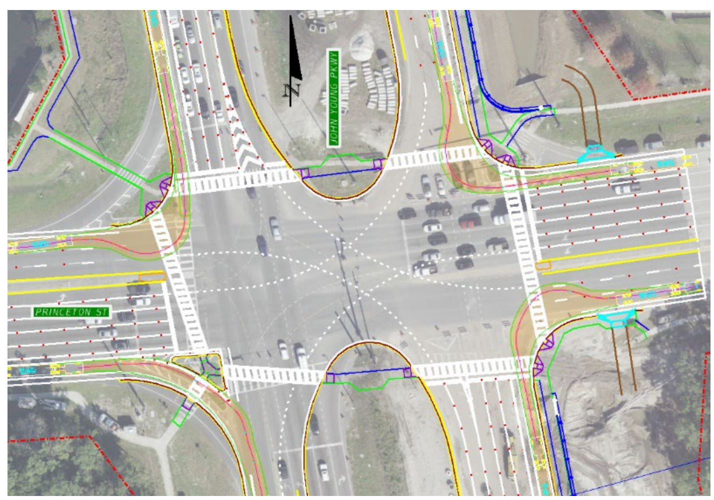
John Young Parkway and Silver Star Road



John Young Parkway and Shader Road (opposing lane encroachment on east leg)



John Young Parkway and Lynx Lane



John Young Parkway and Princeton Street

Figure 71. AutoTURN Analysis at Intersections of John Young Parkway and Signalized Cross Streets

Observations & Recommendations

Observation	Recommendation
Construction underway	Consider revisiting once construction is complete.
AutoTURN run for a WB-62FL show all right turn movements are possible with minor lane encroachment only into eastbound and westbound left turn lanes at Shader Road intersection	Consider relocating stop bar for left turn lanes to minimize WB-62FL encroachment

John Young Parkway (SR 434)

Limits: Orange Blossom Trail to 0.1 miles south of Edgewater Drive

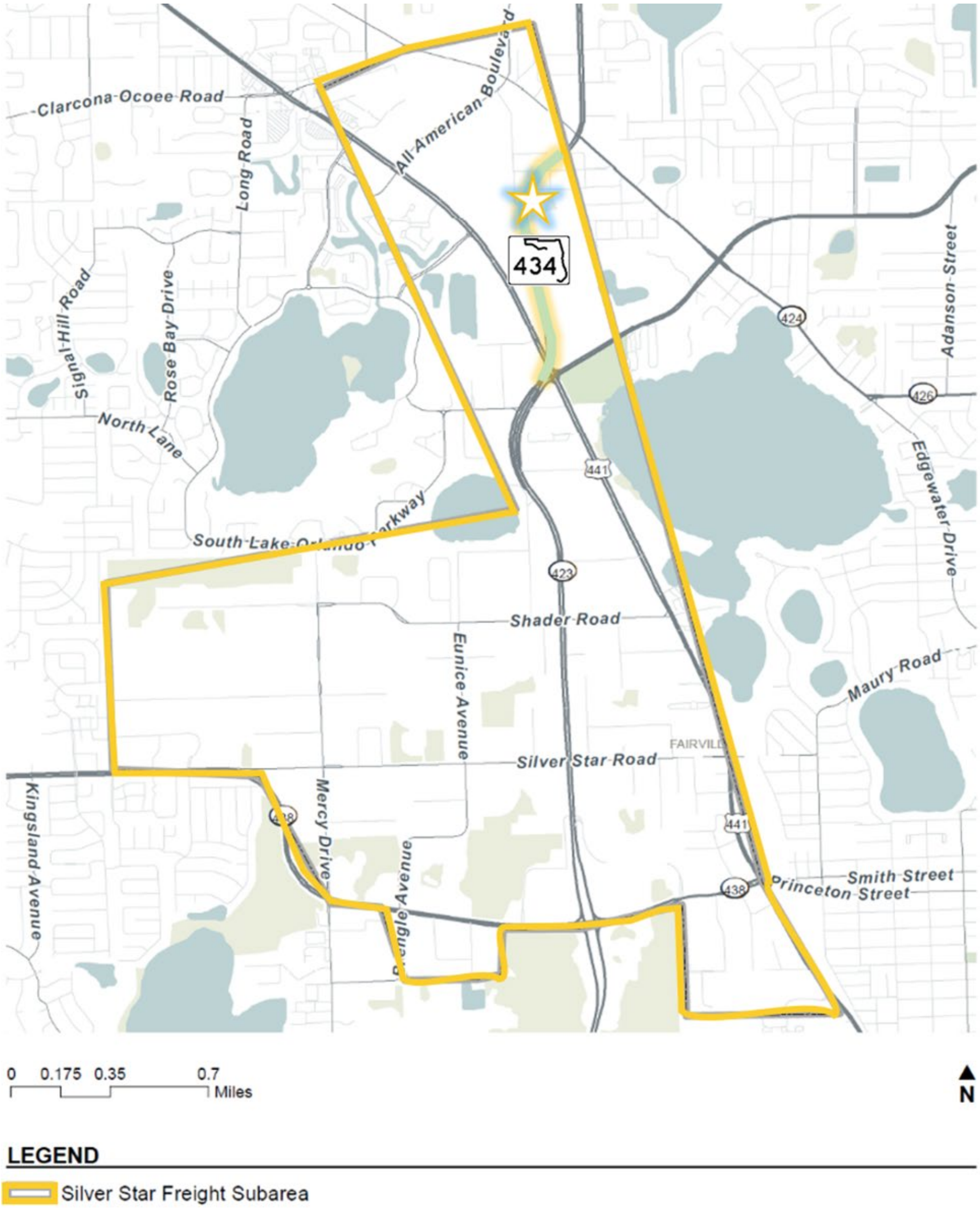


Figure 72. John Young Parkway (SR 434) Study Area Limits

Overview

The John Young Parkway (SR 434) corridor within the project limits is a 1.2-mile-long principal arterial with primarily industrial land use and some commercial land use as well. There is one railroad crossing approximately 0.5 miles south of the John Young Parkway and Edgewater Drive intersection. There is only one signalized intersection along the corridor. Within the study corridor John Young Parkway is a six-lane divided roadway with three lanes in each direction.

Source: HDR

Figure 73. John Young Parkway (SR 434) Looking North

Pavement Conditions
Pavement markings along the corridor were visible and no pavement cracking was observed. Generally, the pavement was in fair condition.

Operational Conditions
Field observations during the morning did not find evidence of operational challenges.

Geometric Conditions
Off-tracking was not observed along the corridor.

Figure 74. John Young Parkway (SR 434) Field Review Location Map

Pavement markings in fair condition on John Young Parkway (SR 434) (Source: HDR)

John Young Parkway (SR 434)looking south (Source: HDR)

Sand on John Young Parkway (SR 434), however pavement markings remain in fair condition (Source: HDR)

Observations & Recommendations

Observation	Recommendation
Segment of John Young Parkway (SR 434) in study area has fair pavement conditions. Minimal to no off-tracking was observed in the field.	N/A

Princeton Street

Limits: Silver Star Road to Coolidge Avenue

Figure 75. Princeton Street Study Area Limits

Overview

The Princeton Street corridor within the project limits is a 2.30-mile-long minor arterial with primarily industrial and commercial land use and some residential and governmental land use as well. There is one railroad crossing approximately 490 feet east of Orange Blossom Trail. There are four signalized intersections across the corridor. Generally, within the study corridor Princeton Street is a four-lane divided roadway with two lanes in each direction separated by a raised median. East of Walmart Plaza Princeton Street is a six-lane divided roadway with three lanes in each direction to Orange Blossom Trail. East of Orange Blossom Trail, Princeton Street is a four-lane undivided roadway where it transitions into two one-way two-lane roads east of the at-grade rail crossing that continue outside the study corridor limits. The Princeton Street corridor falls within the Packing District Project, and within this study corridor is a proposed lane elimination / repurposing project between Orange Blossom Trail and John Young Parkway as well as a proposed roundabout at Texas Avenue.

Source: HDR

Figure 76. Princeton Street Looking East

Pavement Conditions

Pavement marking and conditions along the corridor were in fair condition. No cracking or damaged pavement was observed.

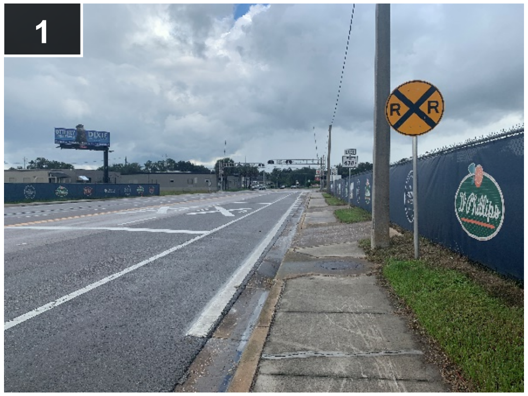
Operational Conditions

Field observations during the morning did not identify queueing.

Geometric Conditions

Only minimal amounts of off-tracking was observed along the corridor at signalized intersections and driveways based on the current curb conditions.

Figure 77. Princeton Street Field Review Location Map



Princeton Street approximately 160 feet east of Orange Blossom Trail looking east (Source: HDR)

Pavement markings along Princeton Street are in good condition (Source: HDR)

Pavement markings along Princeton Street are in good condition (Source: HDR)

Existing curb radii on Princeton Street approximately 160 feet west of the at grade rail crossing (Source: HDR)

Existing curb radii on Princeton Street approximately 190 feet west of the at grade rail crossing (Source: HDR)

Existing asphalt sidewalk connection to the concrete sidewalks on Princeton Street near Packing District construction site (Source: HDR)

Princeton Street looking west; pavement markings in good condition (Source: HDR)

Observations & Recommendations

Observation	Recommendation
Segment of Princeton Street in study area has good pavement conditions. Limited to no off-tracking was observed in the field.	N/A

Orange Blossom Trail

Limits: Golfview Street to Cinderlane Parkway

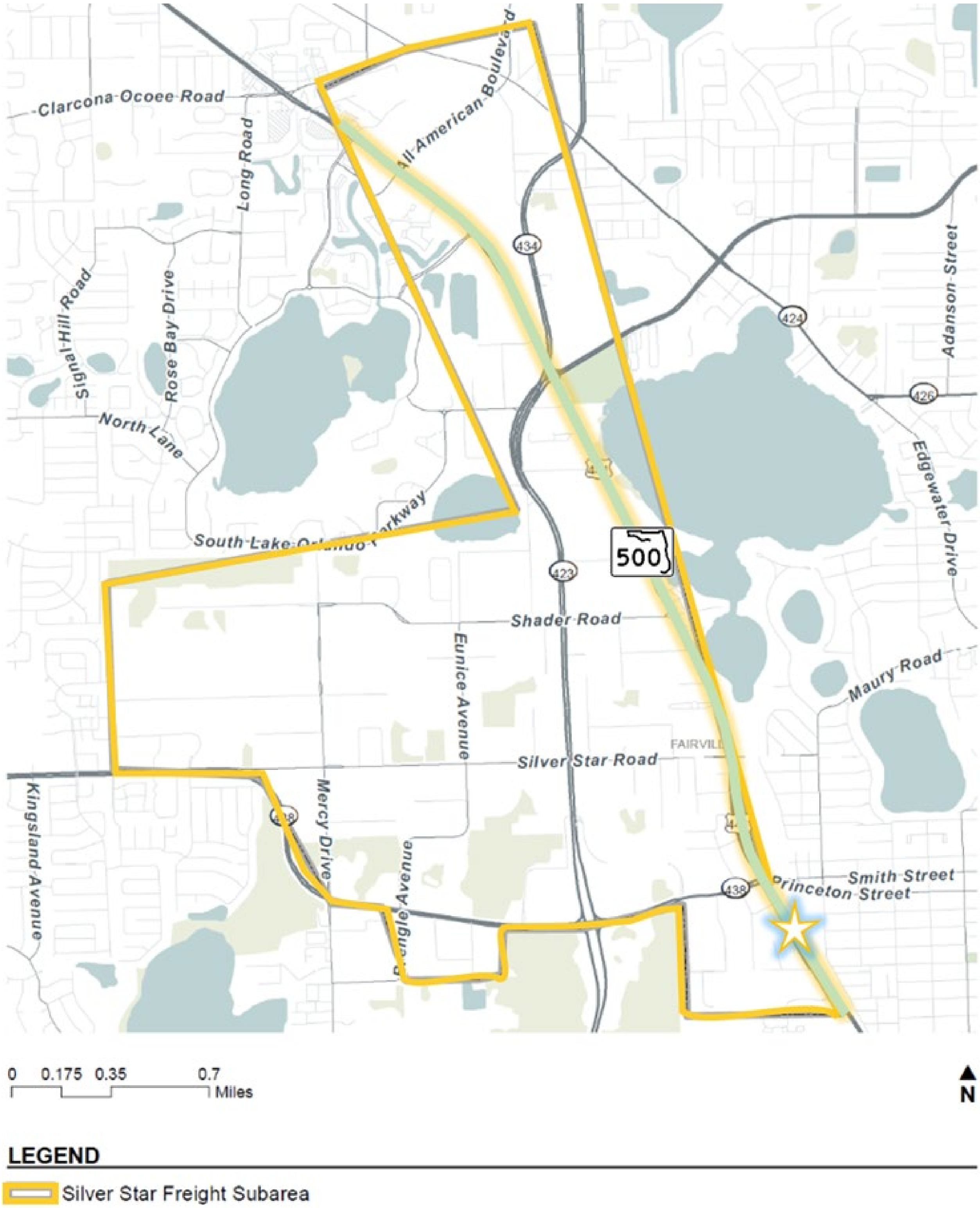


Figure 78. Orange Blossom Trail Study Area Limits

Overview

The Orange Blossom Trail corridor within the project limits is a 3.60-mile-long principal arterial with primarily industrial and commercial land use and some governmental land use as well. There are two railroad crossings, the first being approximately 680 feet south of Princeton Street and the second being 280 feet north of Silver Star Road. There are six signalized intersections within the study corridor. Generally, within the study corridor Orange Blossom Trail is a four-lane divided roadway with two lanes in each direction.

Source: HDR

Figure 79. Orange Blossom Trail Looking South

Pavement Conditions

Pavement markings along the corridor were generally in fair condition, however south of the John Young Parkway overpass and north of Silver Star Road the pavement markings appeared faded. Cracking was observed along the shoulders of the corridor between those two state roads. Loose gravel was also observed at numerous driveways south of Silver Star Road on the west side of Orange Blossom Trail. The loose gravel and poor pavement conditions in this section of the study area could be due to large and heavy freight movement to industrial / commercial businesses in this area as identified in **Figure 80** and **Figure 81**.

Operational Conditions

Field observations during the morning found some queuing occurred at signalized intersections, particularly at the intersection of Orange Blossom Trail and Silver Star Road. A truck parked in a southbound right turn lane north of the John Young Parkway overpass was also observed in the field which could create hazardous conditions for passenger cars as shown in photo 14.

Geometric Conditions

Although a large presence of heavy truck traffic was observed during the field review, minimal to no off-tracking was not observed at driveways, signalized intersections, and along the corridor. The only evidence of off-tracking observed in the field occurred at the intersection of Orange Blossom Trail at Silver Star Road as shown in **Figure 81**. However, some tire tracks noticed at the intersection of Orange Blossom Trail and John Young Parkway / Lee Road suggested some off-tracking occurred (**Figure 82**). There was no evidence that existing roadway geometric configurations contributed to off-tracking in any other locations.

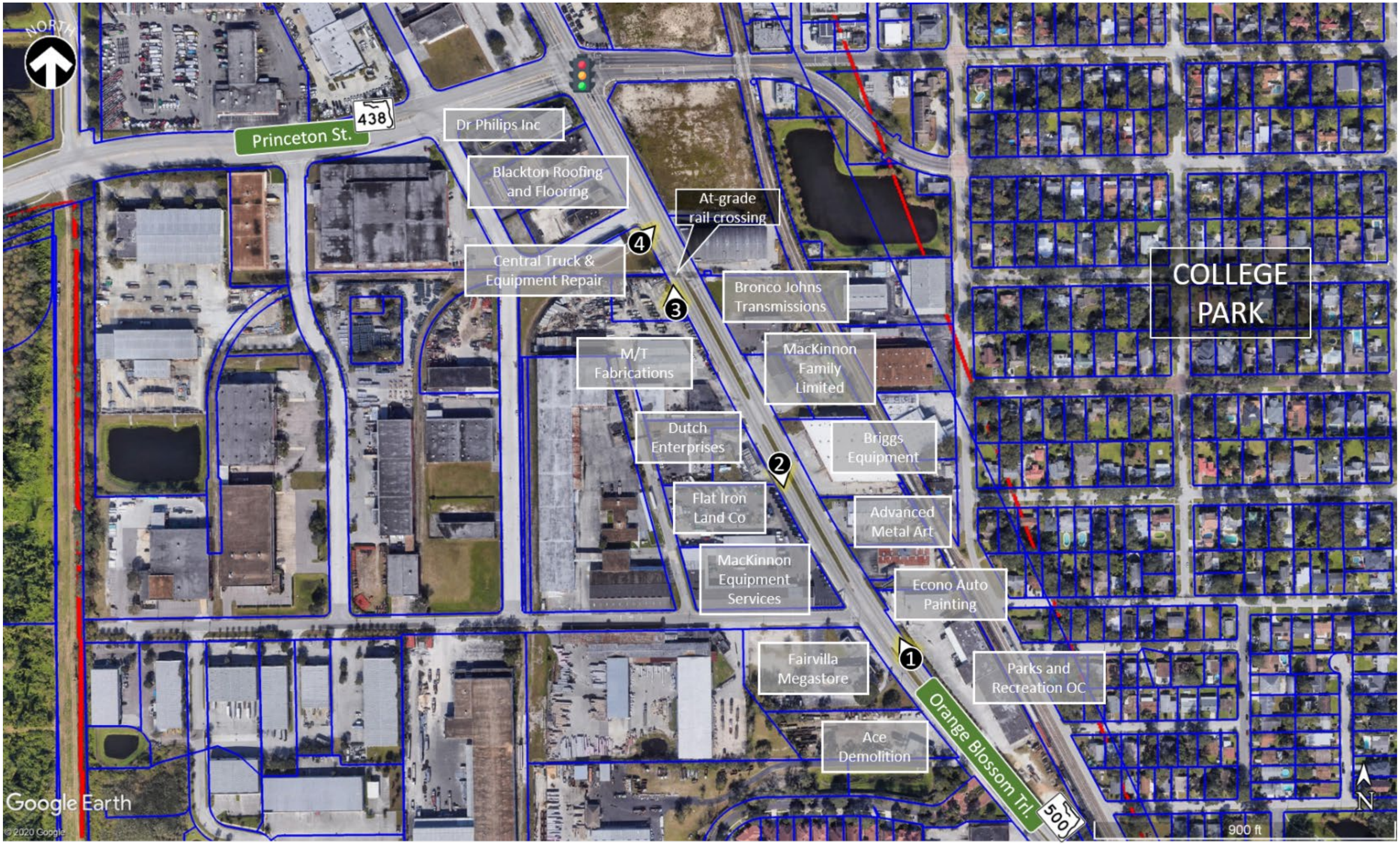


Figure 80. Orange Blossom Trail Field Review Location Map (Part 1)

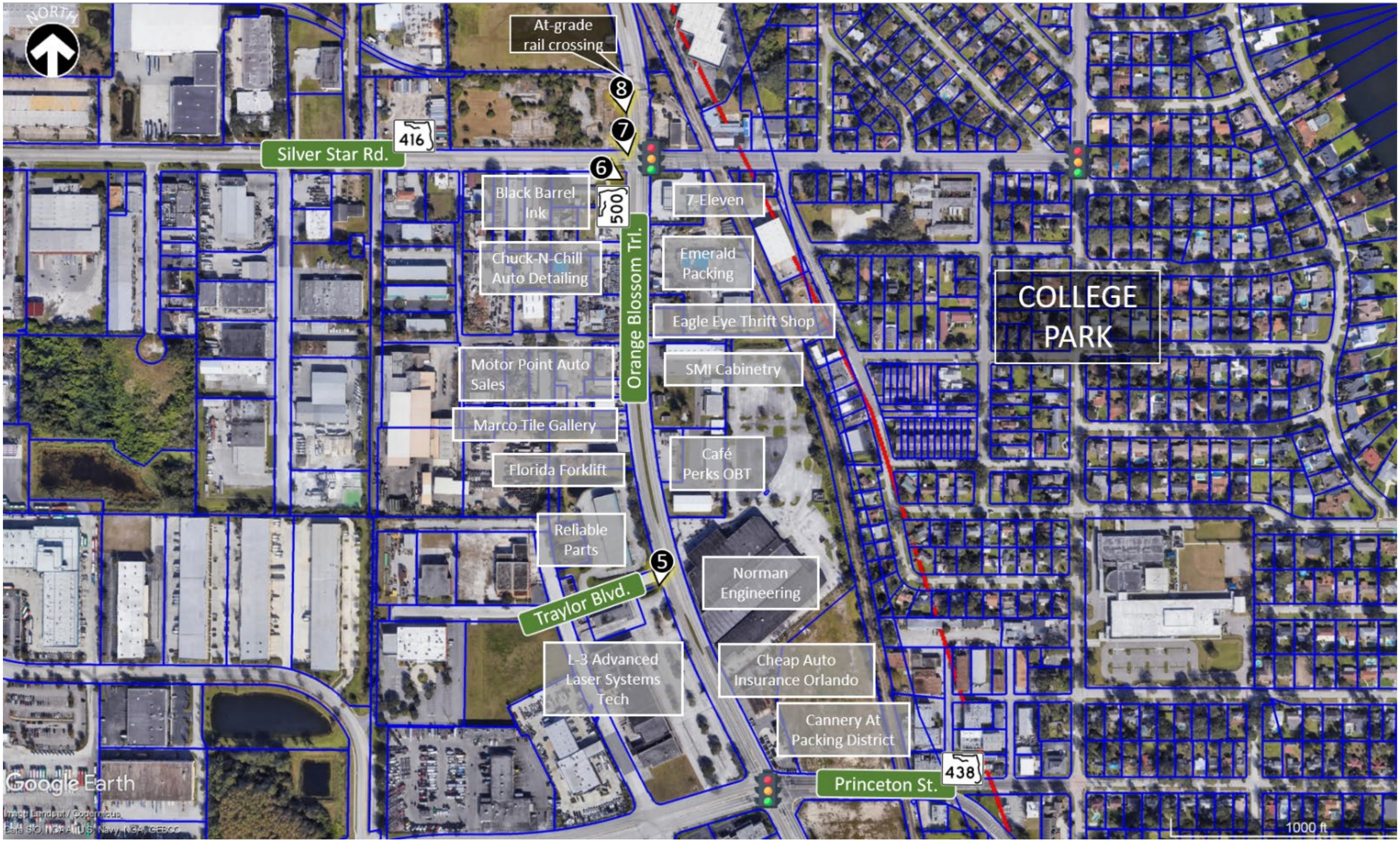


Figure 81. Orange Blossom Trail Field Review Location Map (Part 2)

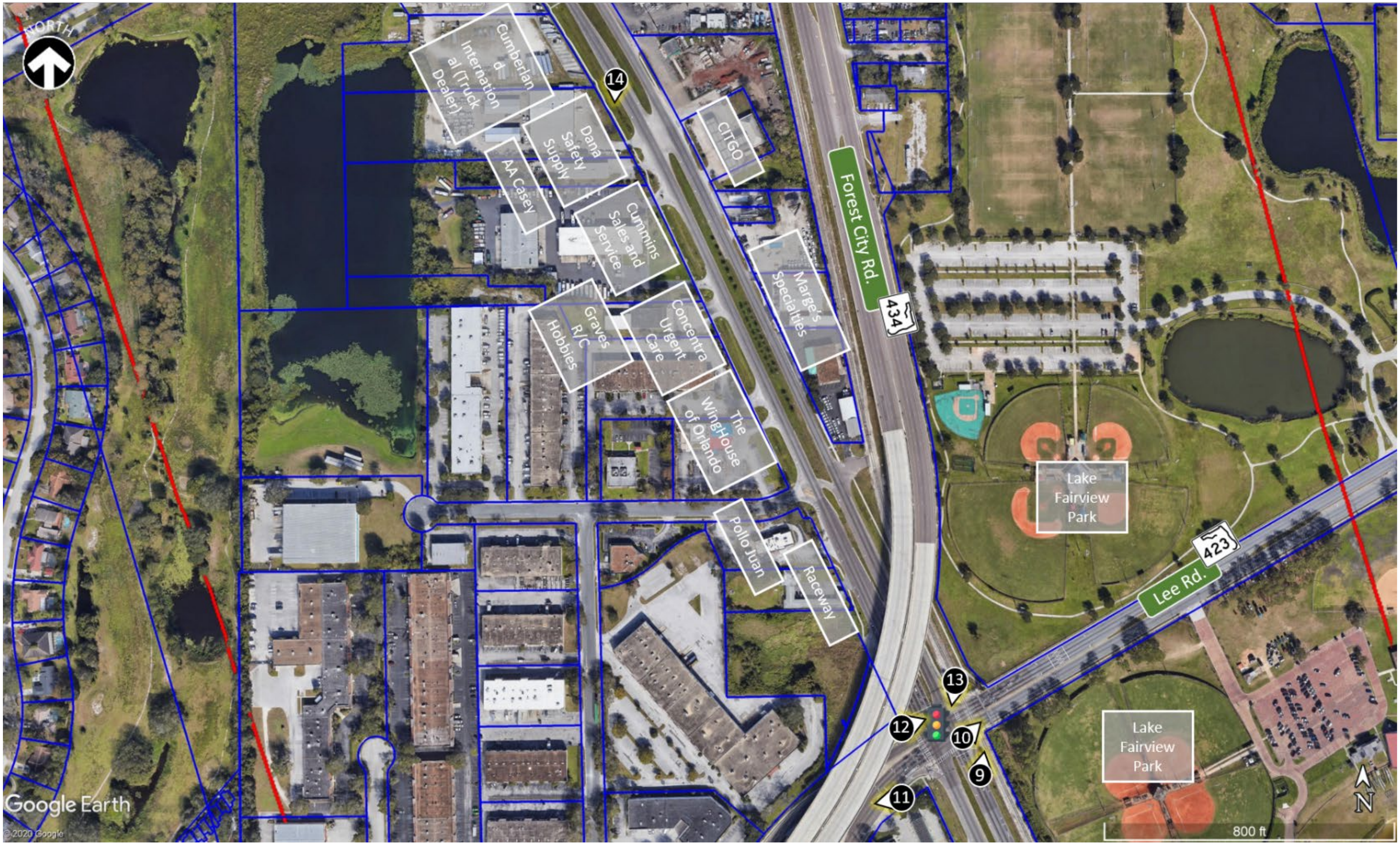


Figure 82. Orange Blossom Trail Field Review Location Map (Part 3)

Parked truck over top of curb on Orange Blossom Trail near Econo Auto Painting (Source: HDR)

Curb Mounting on Orange Blossom Trail in front of Flat Iron Land Co. (Source: HDR)

Orange Blossom Trail looking north at rail crossing south of Princeton Street; evidence of cracked pavement (Source: HDR)

Existing pavement markings on Orange Blossom Trail in front of Central Truck & Equipment Repair (Source: HDR)

Off-tracking observed at corner of Orange Blossom Trail and Traylor Blvd (Source: HDR)

Sidewalk Cracking on Orange Blossom Trail at Silver Star Road (Source: HDR)

Existing northwest corner curb radii on Orange Blossom Trail at Silver Star Road (Source: HDR)

Tire markings outside the travel lane on Orange Blossom Trail approaching Silver Star Road southbound (Source: HDR)

Slight off-tracking observed on Orange Blossom Trail at Lee Road near railroad crossing (Source: HDR)

Tire markings outside the travel lane on Orange Blossom Trail approaching Silver Star Road southbound (Source: HDR)

Existing pavement markings on Orange Blossom Trail approaching the at grade rail crossing on Lee Road appear in fair condition but slightly faded (Source: HDR)

Truck maneuvering the northwest corner Orange Blossom Trail at John Young Parkway / Lee Road without running over the curb; no evidence of off-tracking (Source: HDR)

Southwest corner of Orange Blossom Trail at John Young Parkway / Lee Road shows evidence of slight off-tracking (Source: HDR)

Travel Lane Parking in Opposite Direction of Flow near Cumberland International (Truck Dealer on Orange Blossom Trail) (Source: HDR)

Observations & Recommendations

Observation	Recommendation
Truck Parking on Shoulders and in Turn Lanes	Install no parking signs within the right-of-way. Local agencies should approach business owners to identify a solution. In addition, local agencies should coordinate with local law enforcement to enforce the no parking restrictions.

MULTIMODAL INFRASTRUCTURE EVALUATIONS

This section describes the multimodal infrastructure needs in the study area. Consideration of existing and future land use, activity patterns, proposed developments, and planned and programmed improvements in the Silver Star Freight Subarea helped in the assessment of bicycle, pedestrian, and transit infrastructure needs.

Existing Conditions

Land Use

The Silver Star Freight Subarea can be categorized into two main land use types of industrial and commercial. This is reflected by the large presence of the purple and red color identified as industrial and commercial uses, respectively, in **Figure 83**. There is also evidence of some vacant land use. Outside of the subarea the overall character of land use is primarily residential.

Context Classification

The most prominent context classification of all state roads within the Silver Star Freight Subarea is C3C – Suburban Commercial. North of the intersection of Orange Blossom Trail and John Young Parkway / Lee Road the context classification changes from C3C – Suburban Commercial to C4 – Urban General, as shown in **Figure 84**.

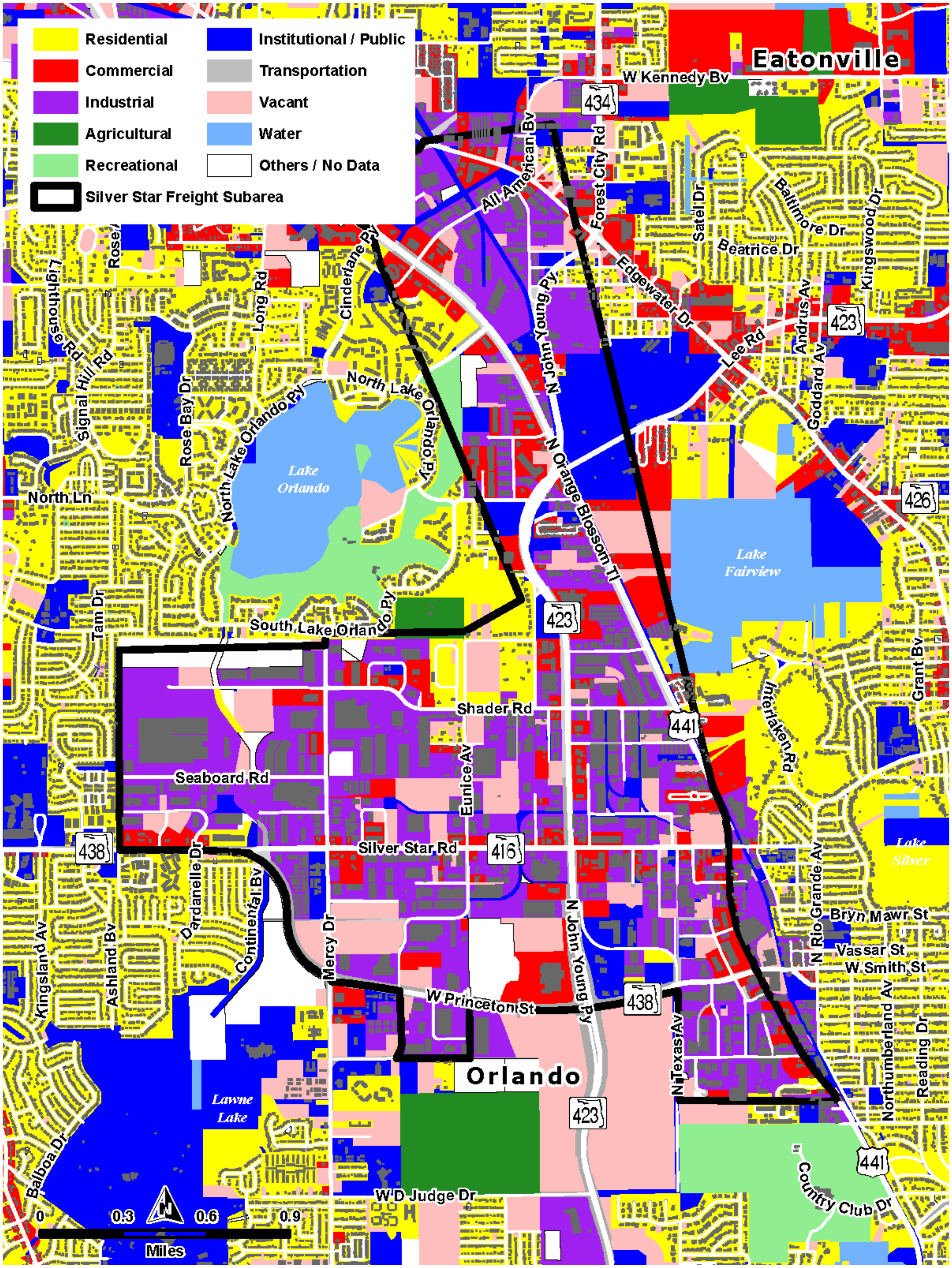


Figure 83. Existing Land Use

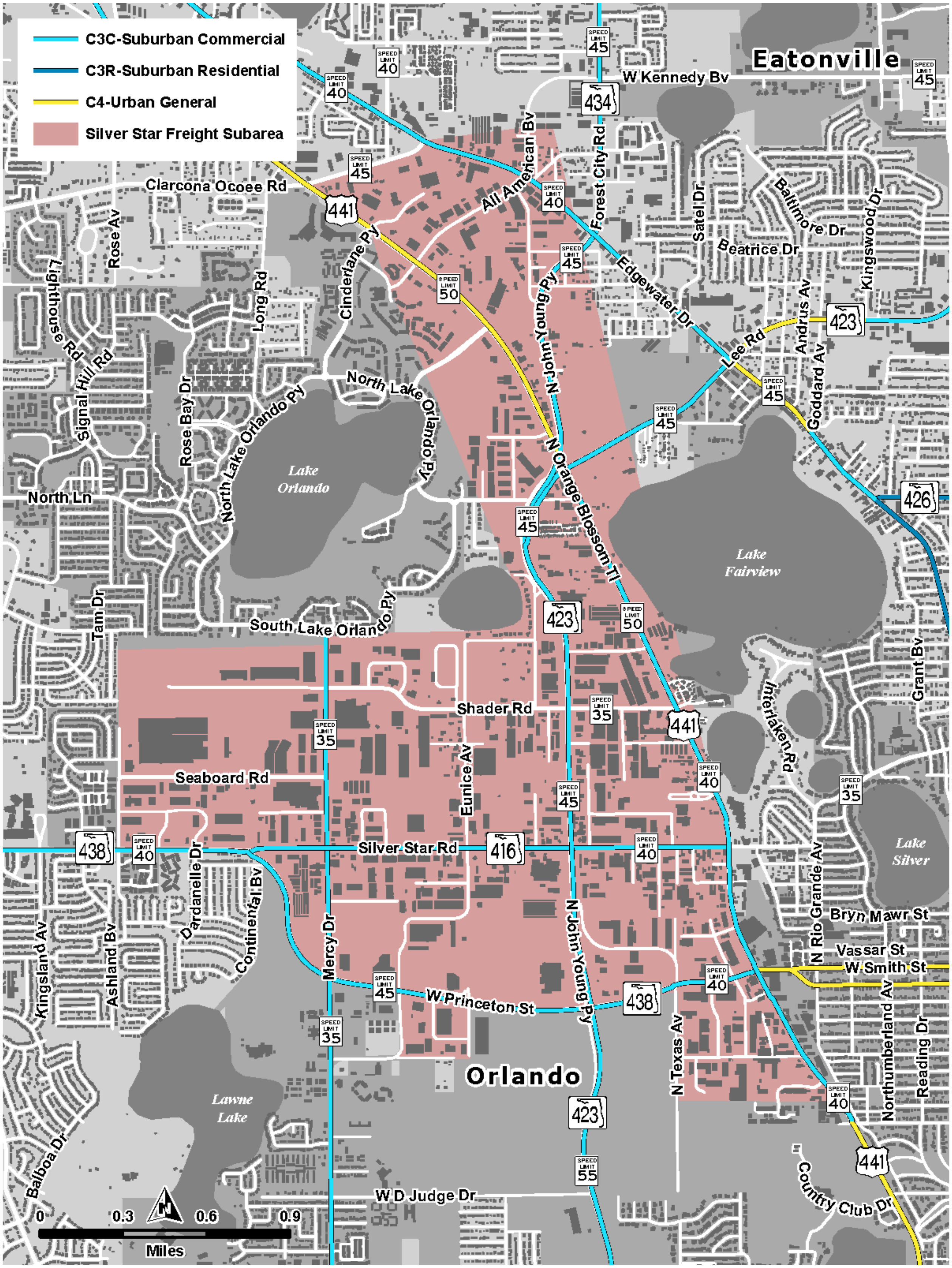


Figure 84. Context Classification and Posted Speed

Multimodal Infrastructure Features

A field review was conducted on October 9, 2020 to observe existing bicycle, pedestrian, and transit infrastructure. For detailed observations, including sidewalk gaps and multimodal infrastructure conditions, refer to the *Field Review Observations* section.

Sidewalk Gaps

Figure 85 shows where sidewalk gaps exist within the subarea. **Table 33** identifies the limits of the existing sidewalk gaps on all state roads within the study area.

Table 33. State Roads with Existing Sidewalk Gaps

Corridor	From	To	Location	Approximate Length
Silver Star Road	Existing concrete sidewalk in front of *Life-Storage Orlando*	Existing concrete sidewalk in front of *Life Line of Christ*	South side	755 feet (0.14 miles)
	Northwest crosswalk at Mercy Drive	50 feet east of Mercy Drive	North side	50 feet
	Existing concrete sidewalk in front of *Life Line of Christ*	Existing concrete sidewalk in front of *Luke's Landscaping Inc.*	South side	1,814 feet (0.34 miles)
	At-grade rail crossing in front of *AmeriGas Propane*	John Young Parkway	South side	871 feet (0.17 miles)
	Existing concrete sidewalk in front of *Re Michel Company*	Existing concrete sidewalk in front of *Groundwater Protection*	South side	612 feet (0.12 miles)
	Dinneen Avenue	Regent Avenue	South side	306 feet (0.1 miles)
	Orange Blossom Trail	Taft Avenue	South side	486 feet (0.10 miles)
John Young Parkway (SR 434)	John Young Parkway Overpass at Orange Blossom Trail	*Wawa* gas station driveway	West side	4,208 feet (0.80 miles)
Orange Blossom	Woodruff Avenue	At-grade rail crossing in front of *Habitat for Humanity ReStore*	East side	2,500 feet (0.47 miles)
	At-grade rail crossing approximately 300 feet north of Silver Star Road	John Young Parkway / Lee Road	East side	7,548 feet (1.43 miles)

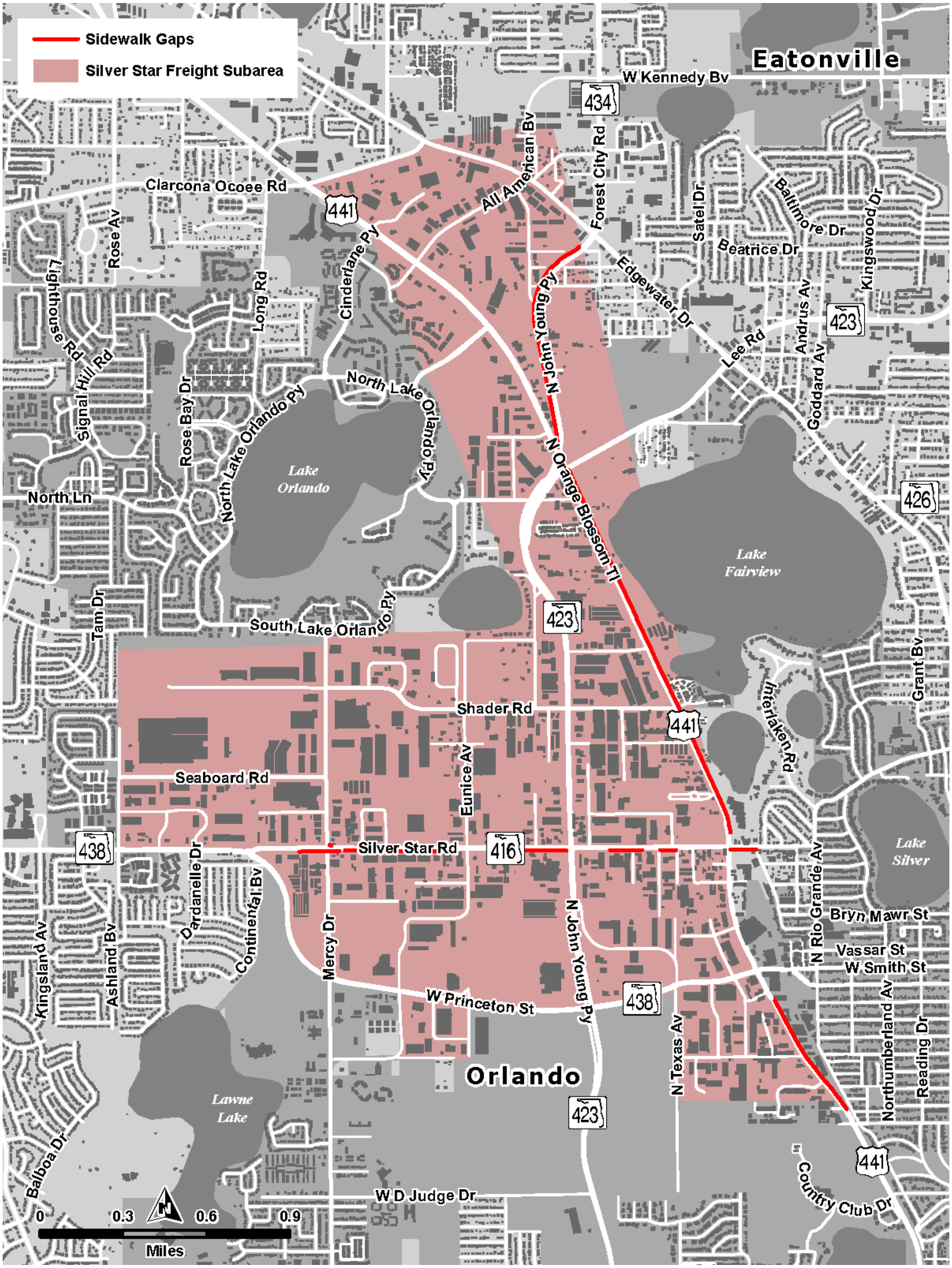


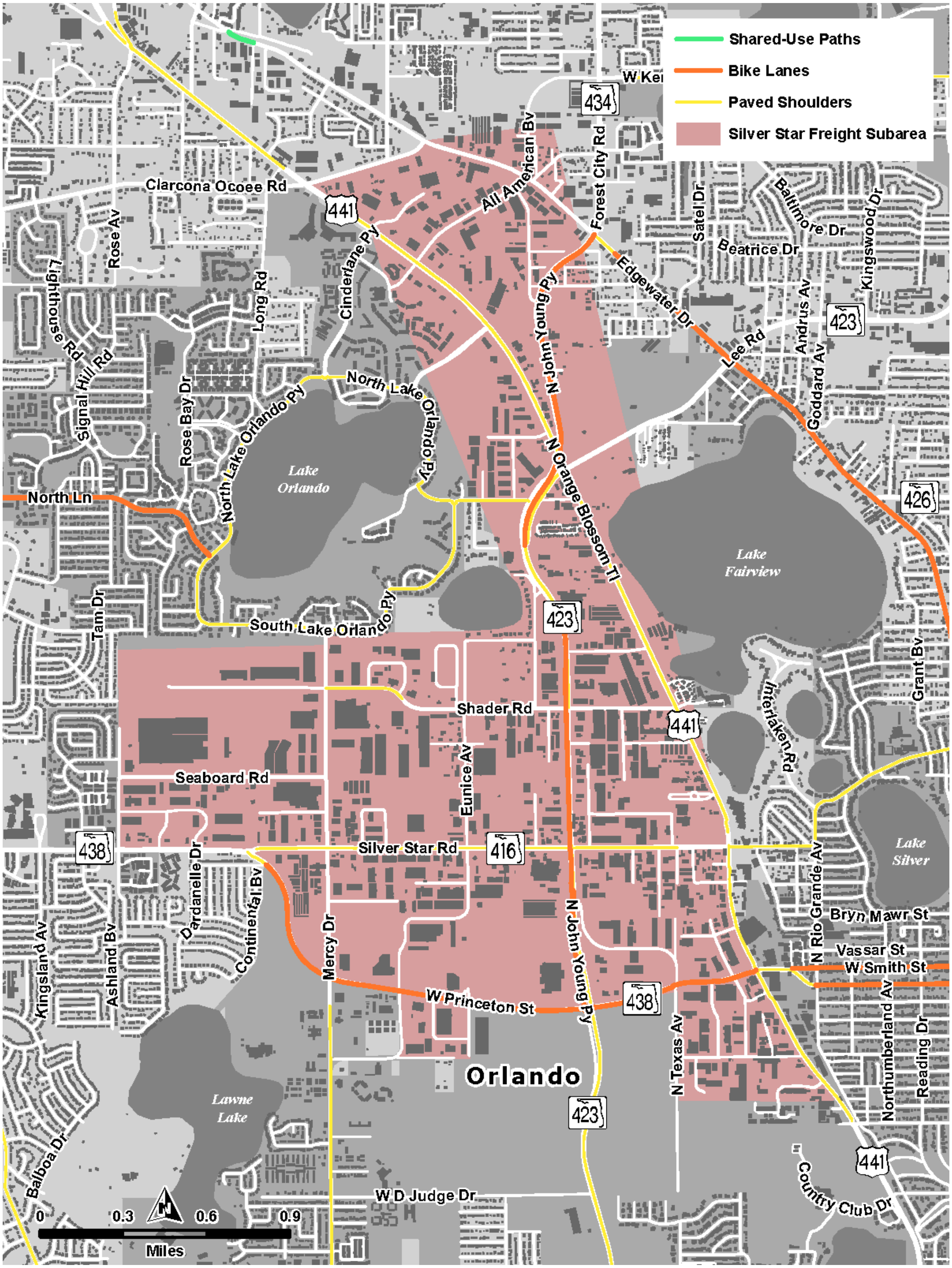
Figure 85. Existing Sidewalk Gaps

Bike Facilities

The most prominent bike facility present in the Silver Star Freight Subarea are paved shoulders as shown in **Figure 86**. The only state roads with bike lanes are Princeton Street and John Young Parkway (SR 434). There are no existing shared use paths in the study area. **Table 34** identifies locations where there are no existing bike facilities on the state roads within the study corridor.

Table 34. State Roads with No Bike Facilities

Corridor	From	To	Location	Approximate Length
Silver Star Road	Le Havre Boulevard	Continental Boulevard	Both sides	2,500 feet (0.47 miles)
	Regent Avenue	Orange Blossom Trail	Both sides	1,043 feet (0.20 miles)
Orange Blossom Trail	Silver Star Road	At-grade rail crossing approximately 300 feet north of Silver Star Road	Both sides	300 feet (0.06 miles)
	Cinderlane Parkway	Clarcona Ocoee Road	Both sides	1,480 feet (0.28 miles)



Note: This bike lane facility on John Young Parkway from Princeton Street to Shader Lane is shown as existing to reflect the design plans

Figure 86. Existing Bike Facilities

Activity Patterns

Transit Network / Ridership

Figure 87 shows the existing LYNX bus routes, stops, and service frequencies. Transit service is provided on most of the collector and arterial roadways within the study area, with most service at 60 minute or less frequent headways. However, higher frequency service at 30 minutes or better is provided through the center of the study area on portions of John Young Parkway, Princeton Street, Shader Road, and Mercy Drive. Although there are many bus stops along Orange Blossom Trail, transit ridership is overall very low, as shown in **Figure 88**. Transit ridership is the highest in the study area on Orange Blossom Trail at Silver Star Road and on Princeton Street at Mercy Drive.

Bicycle and Pedestrian Crashes

Crash records were acquired using the FDOT Signal Four Analytics database for the Silver Star Freight Subarea. Five years of crash records were compiled from January 1, 2014 through December 31, 2019. The crash records represent a combined set of bicycle and pedestrian crashes.

It can be observed that more crashes occurred at intersections, as shown in **Figure 89**. A total of 88 crashes occurred within the study area during the 5-year period, and 44 out of the 88 (50 percent) occurred at an intersection. The most prominent concentration of bicycle and pedestrian crashes occurred on Silver Star Road at Orlando West Drive with 21 crashes, on John Young Parkway (SR 434) at Edgewater Drive with 12 crashes, and on Orange Blossom Trail at Clarcona Ocoee Road with 11 crashes, as shown in **Figure 90**.

It should be noted that the highest bus ridership locations within the study area, as shown in **Figure 88**, does not overlap with the highest bicycle and pedestrian crash clusters. Often, the highest bicycle and pedestrian crash areas are heavily correlated with transit activity.

Population and Employment Density

Consistent with the existing land use map shown in **Figure 83**, the population density within the study area is much lower than the surrounding area, however the employment density is much higher within the study area than the areas immediately outside the study area, as shown in **Figure 91** and **Figure 92.**

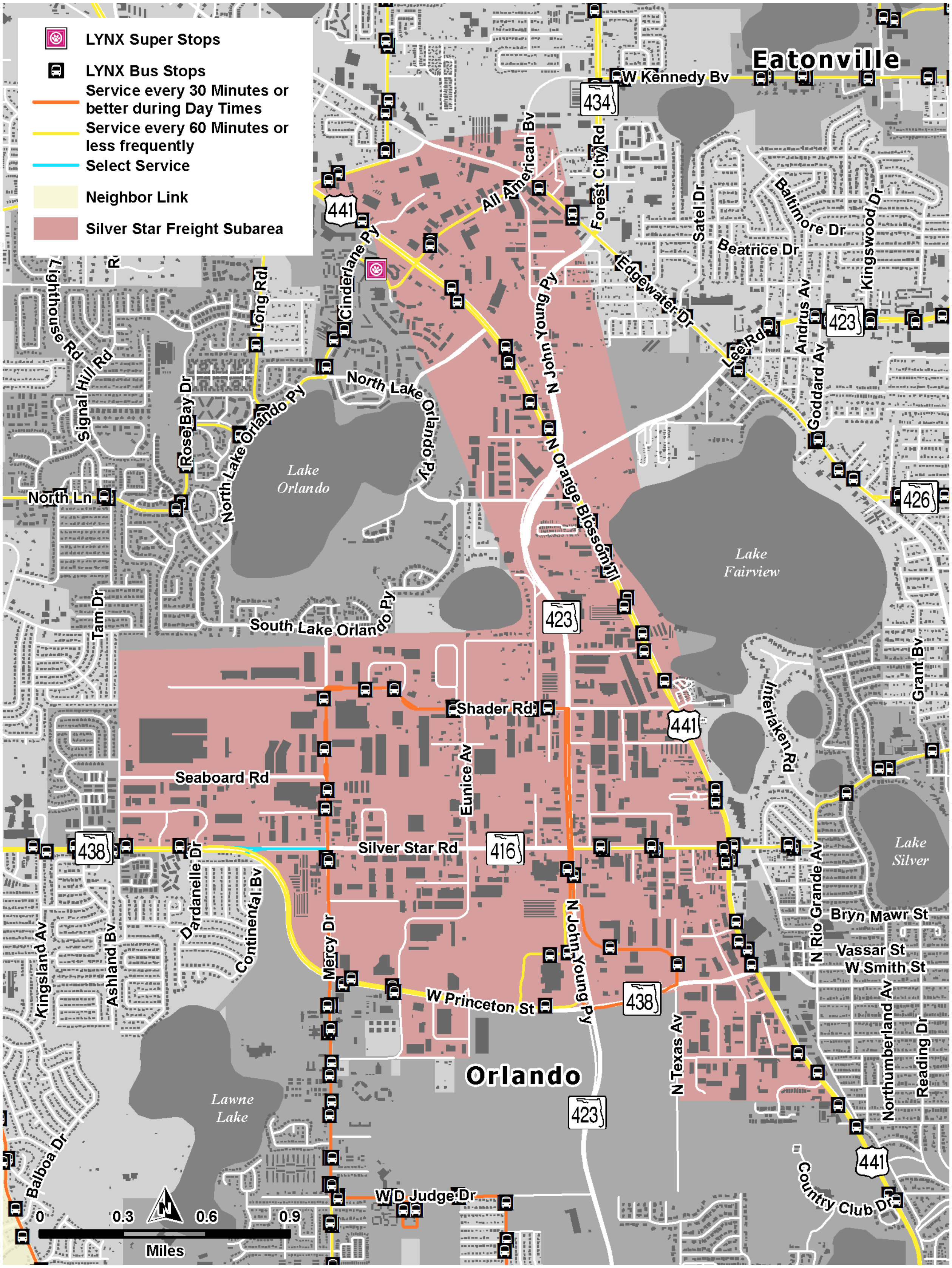


Figure 87. Transit Network and Service Frequency

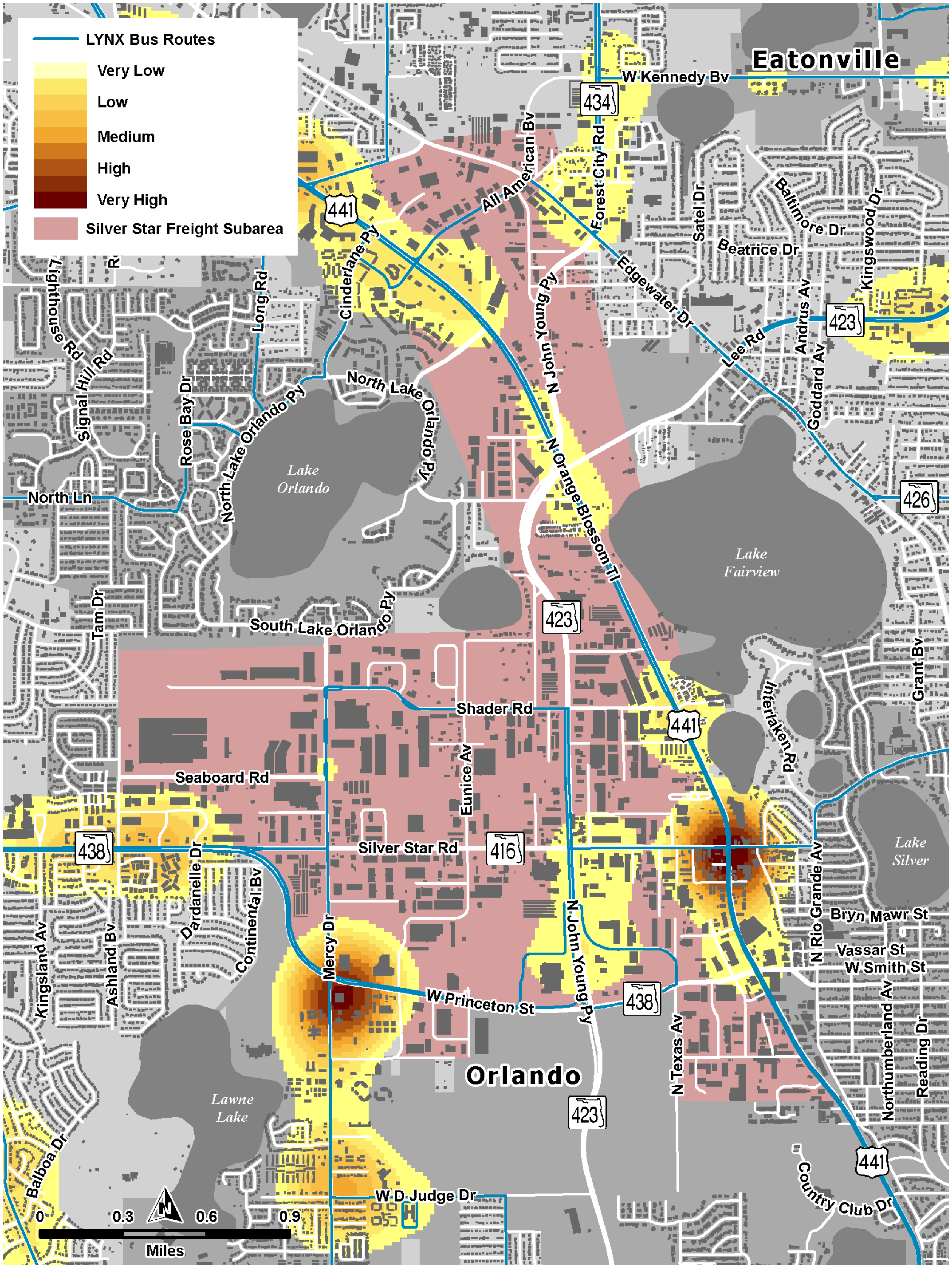


Figure 88. Transit Ridership

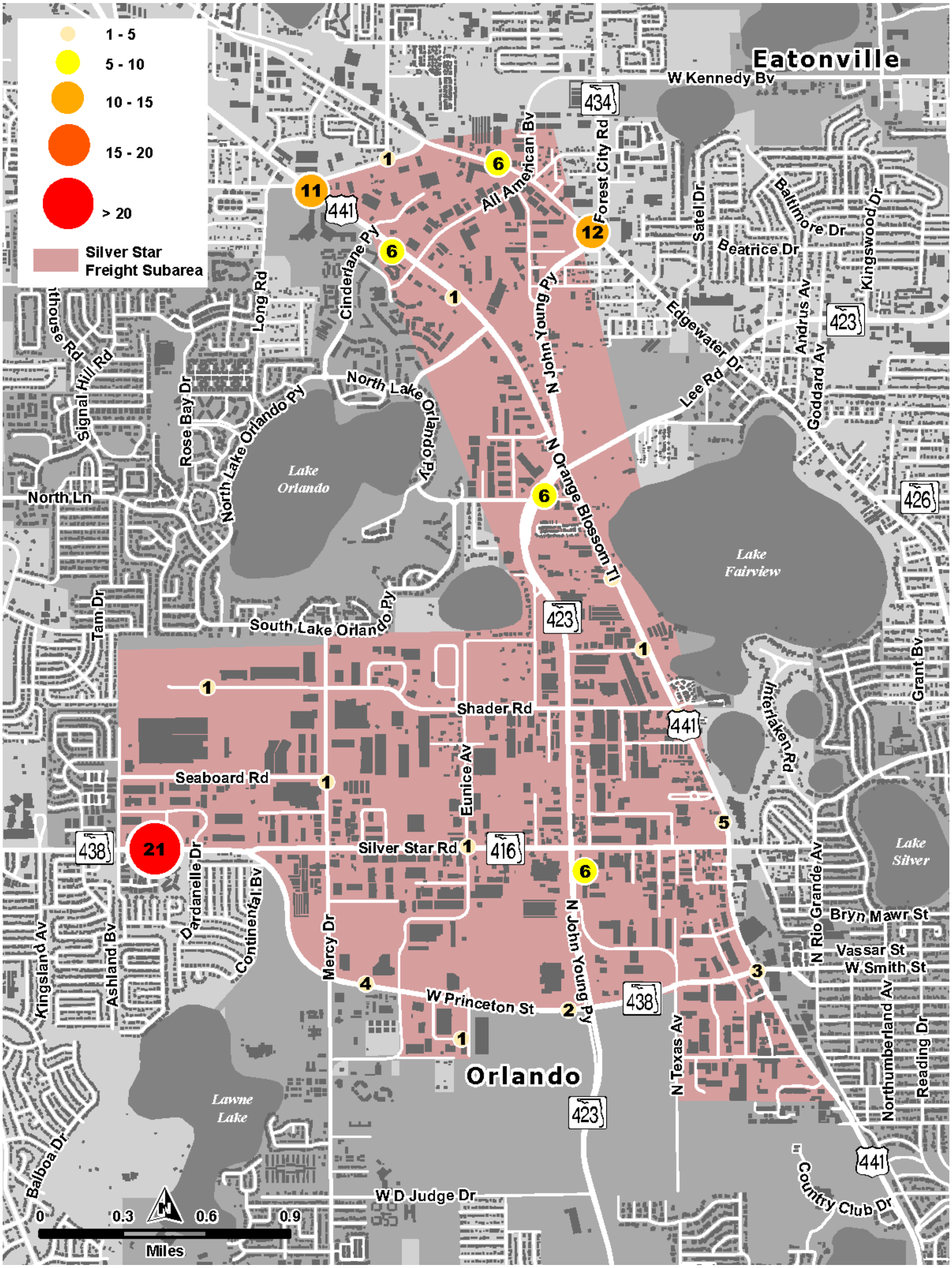


Figure 89. Numbers of Bicycle and Pedestrian Crashes by General Location (2014—2019)

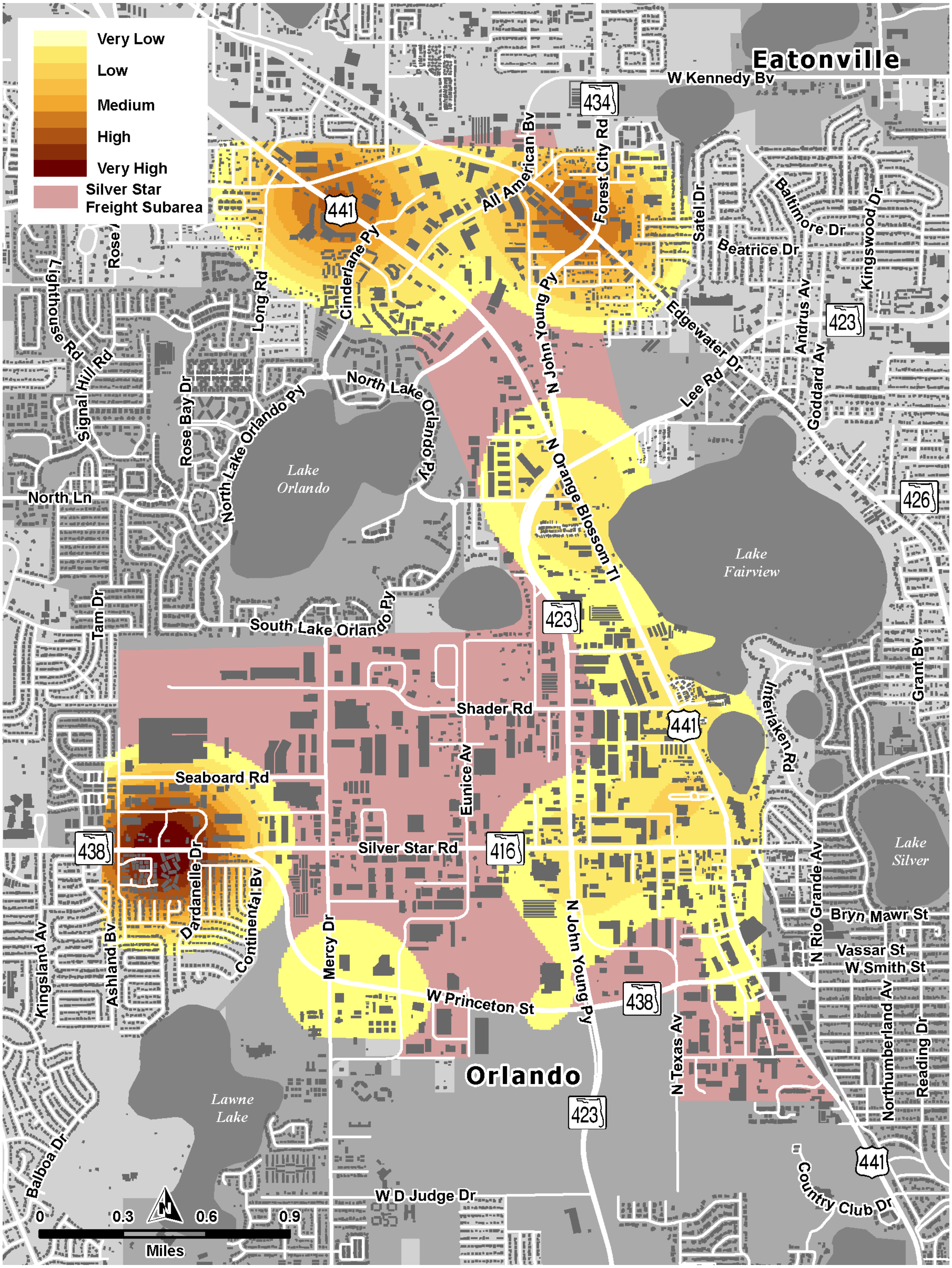


Figure 90. Bicycle and Pedestrian Crash Hotspots

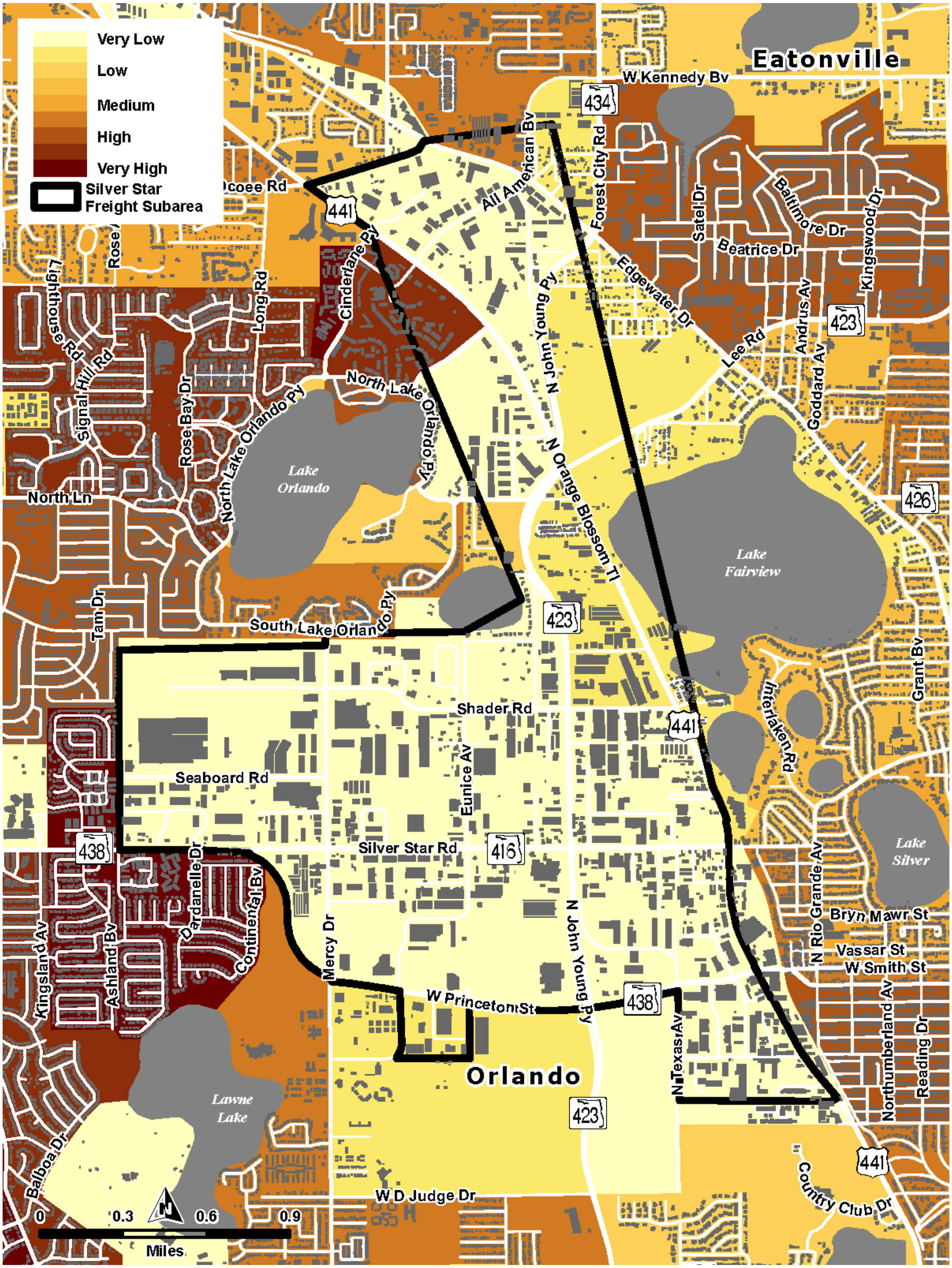


Figure 91. Population Density

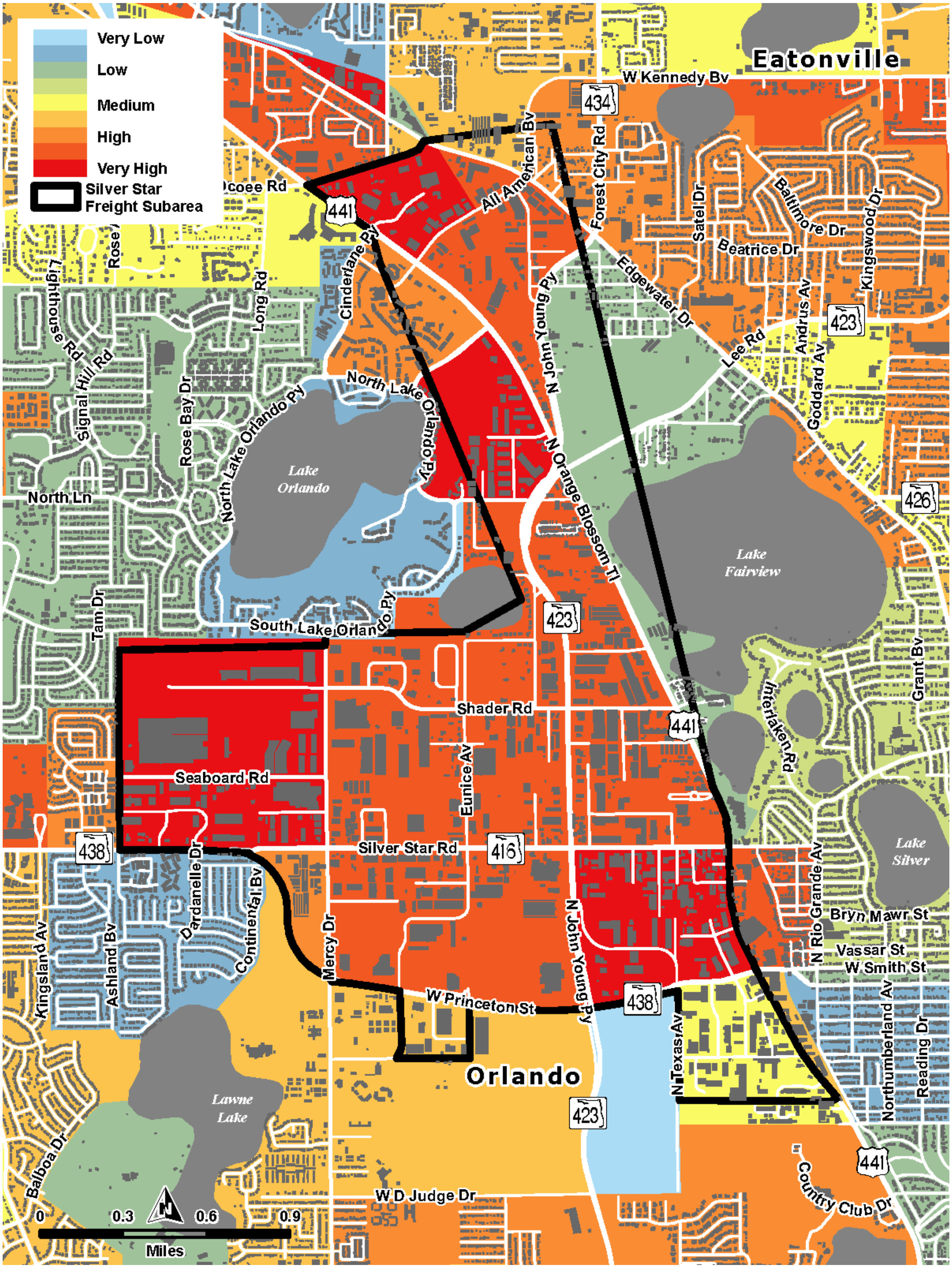


Figure 92. Employment Density

Planned and Programmed Improvements / Proposed Developments

The freight transportation network within the subarea has various projects as noted in the Phase I Final Report. The following planned improvements include roadway and capacity improvement projects, premium transit projects, and roadway operational improvement and safety projects.

- Planned Roadway and Capacity Improvement Projects
  a. SR 434/Forest City Road from SR 424/Edgewater Drive to Orange/Seminole County Line [Widen to 6 Lanes – Construction fiscal year (FY) 2022]
  b. SR 423/John Young Parkway from Colonial Drive to Shader Road [Add Lanes and Reconstruct – Construction FY 2020]
  c. All American Boulevard from Edgewater Drive to SR 434/Forest City Road [Widen to four Lanes and New four-Lane Road – Construction FY 2021]
  d. Bridge Repair / Rehabilitation Project – Orange Blossom Trail northbound and southbound over Railroad Bridge #750002 and #750167 [Construction FY 2020]
- Planned Premium Transit Project
  a. The Orange Blossom Trail high capacity transit services to link downtown Orlando to Apopka and Eustis, which is envisioned as an express bus service connecting existing and planned activity centers
- Planned Roadway Operational Improvement Projects
  a. Edgewater Drive from Lakeview Street to Par Street [Urban Corridor Improvements – Complete Street – Preliminary Engineering FY 2022, Construction FY 2024]
  b. Orange Blossom Trail at Rosamund Drive [Intersection Improvement – Construction FY 2023]
- Other Planned Improvements
  a. Orange County Pedestrian Lighting Projects (Bundles B, D, and G) [CST FY 2019]

Other planned improvement projects and proposed developments that will impact the bicycle, pedestrian, and transit modes are associated with The Packing District, the Orlando Bike Plan, and the City of Orlando's Vision Zero Action Plan.

Future Land Use

The future land use of the Silver Star Freight Subarea is primarily industrial and mixed use as shown in **Figure 93**. This future land use information comes from East Central Florida Regional Planning Council (ECFRPC).

The future land use information shown in **Figure 94** comes from the City of Orlando's statutorily required comprehensive plan, which also shows land use that is primarily industrial.

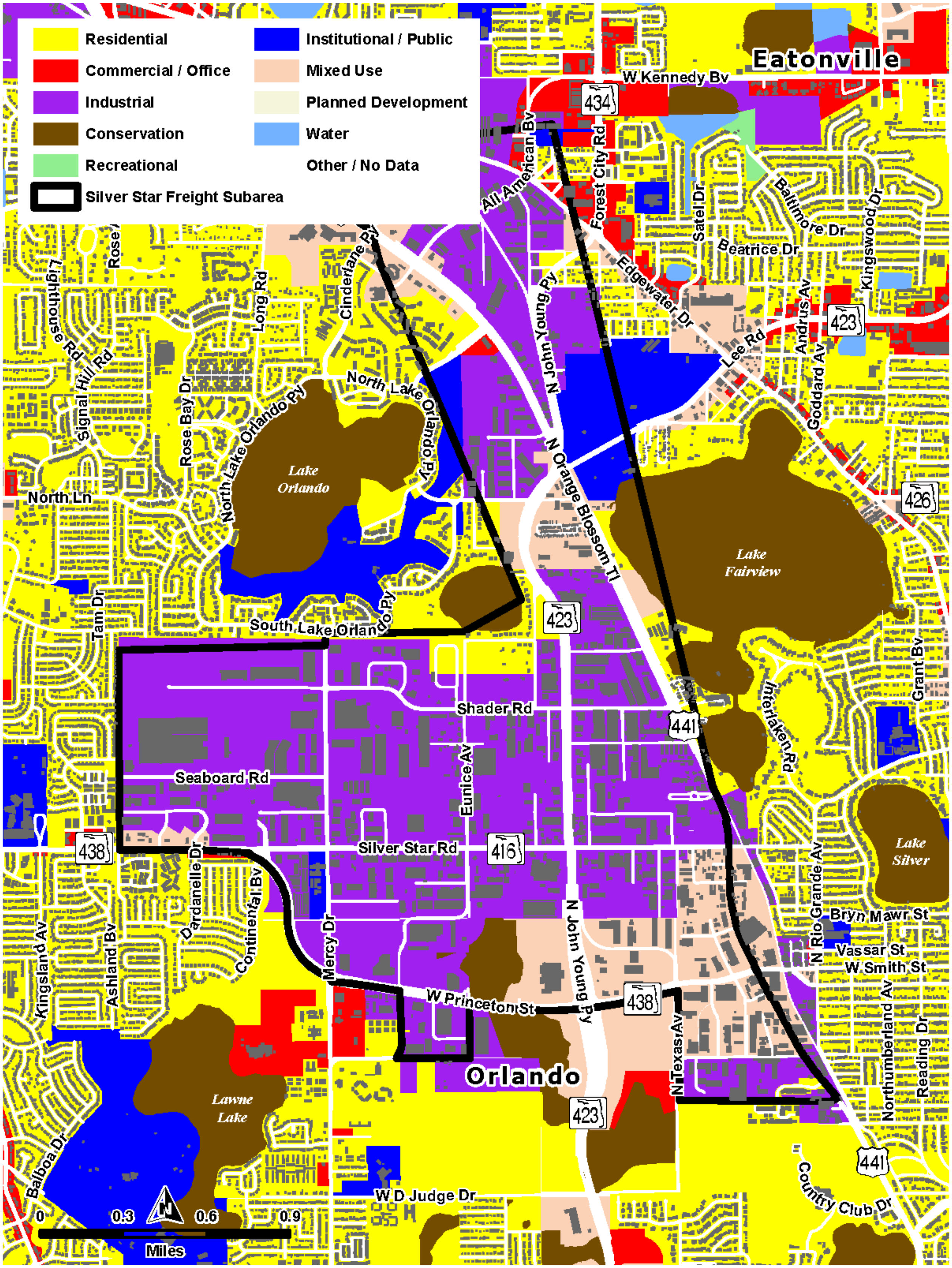


Figure 93. Future Land Use

Source: East Central Florida Regional Planning Council

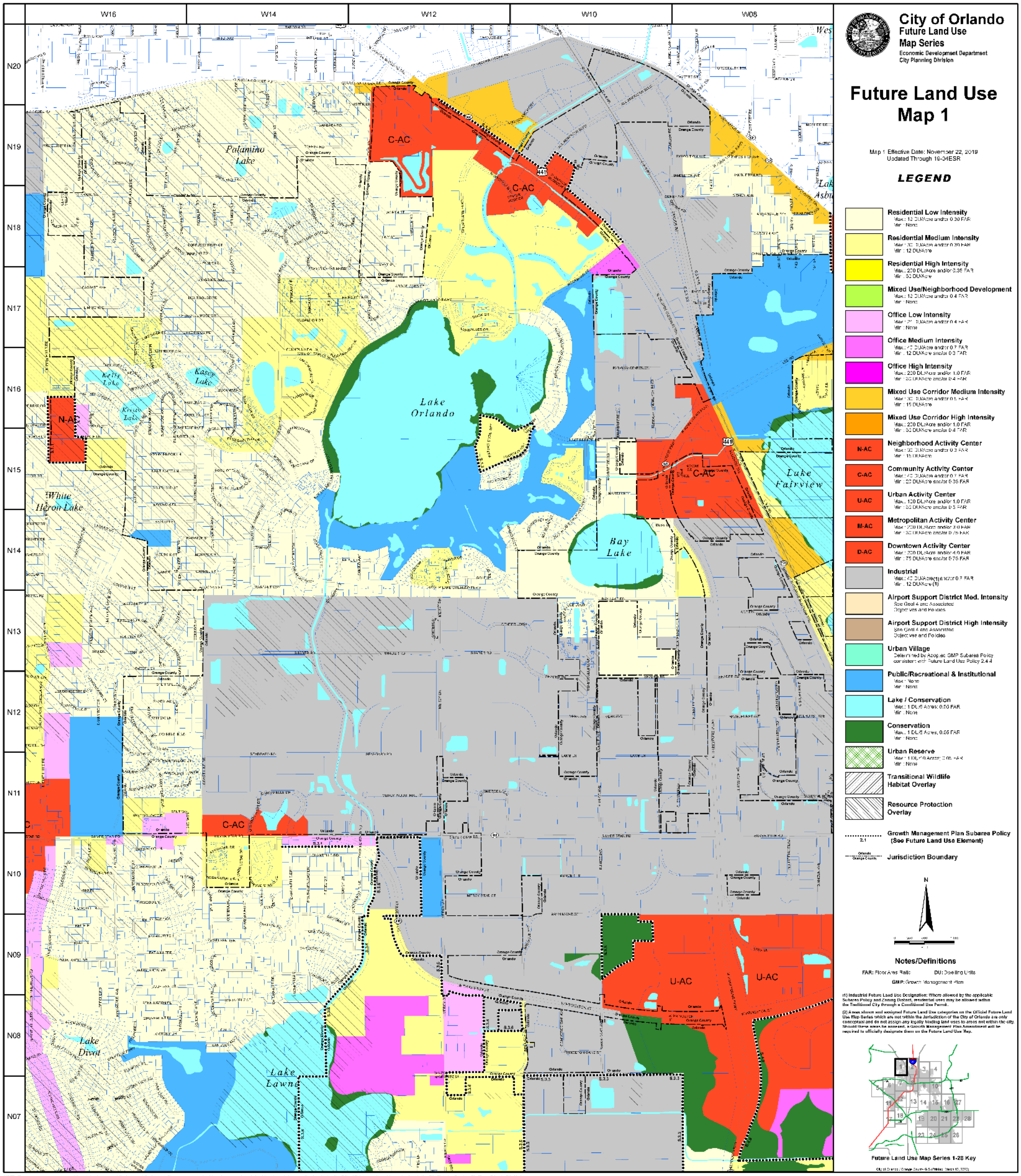


Figure 94. City of Orlando Future Land Use

Source: City of Orlando

The Packing District

The Packing District is a 202-acre planned private development in the vicinity of Orange Blossom Trail and Princeton Street, which is being led by Dr. Phillips Charities and is expected to take a couple decades to complete. The Packing District development intersects with the southern boundaries of the study area, as noted in the Phase I Final Report. The development includes a 105-acre regional park south of Princeton Street between John Young Parkway and Texas Avenue and 97 acres of mixed-use/residential space that straddles Princeton Street between Texas Avenue and Orange Blossom Trail, which is currently made up of commercial and industrial use. The mixed-use spaces are envisioned as a network of plazas that will be connected by pedestrian and bike trails. The development of The Packing District Master Plan as stated on *The Packing District Orlando website* and shown in **Figure 95**, is designed to "encourage community wellness from the development of a new regional park to the network of plazas – each connected by pedestrian and bike trails that stitch everything together." Roadway improvements on the state highway system include a lane repurposing project on Princeton Street from Orange Blossom Trail to east of John Young Parkway which will reduce the cross section from 6 lanes divided to 4 lanes divided, and add a multilane roundabout at Texas Avenue and two-way separated bike lanes, as well as reconstruction of a small section of Orange Blossom Trail.

Figure 96 shows the proposed mobility plan for The Packing District, which includes a new regional trail and proposed elevated pedestrian crossing over Orange Blossom Trail south of Princeton Street.

Orlando Bicycle Plan

The City of Orlando completed a comprehensive, citywide update to their Bicycle Plan in 2020 that established a visionary bicycle network comprised of highly connected, convenient, low-stress facilities and improvements. **Figure 97** shows proposed bike lanes, off street trails or separated bike lanes, and bicycle boulevards (signed and marked bike routes on low speed, low volume streets, with additional traffic calming features) from the Orlando Bicycle Plan.

As shown in **Figure 97**, all the state roads within the Silver Star Freight Subarea are proposed to have off street trails or separated bike lanes. One exception is the segment of Silver Star Road from Princeton Street to Regent Avenue, which does not show proposed improvements, but has existing paved shoulders.

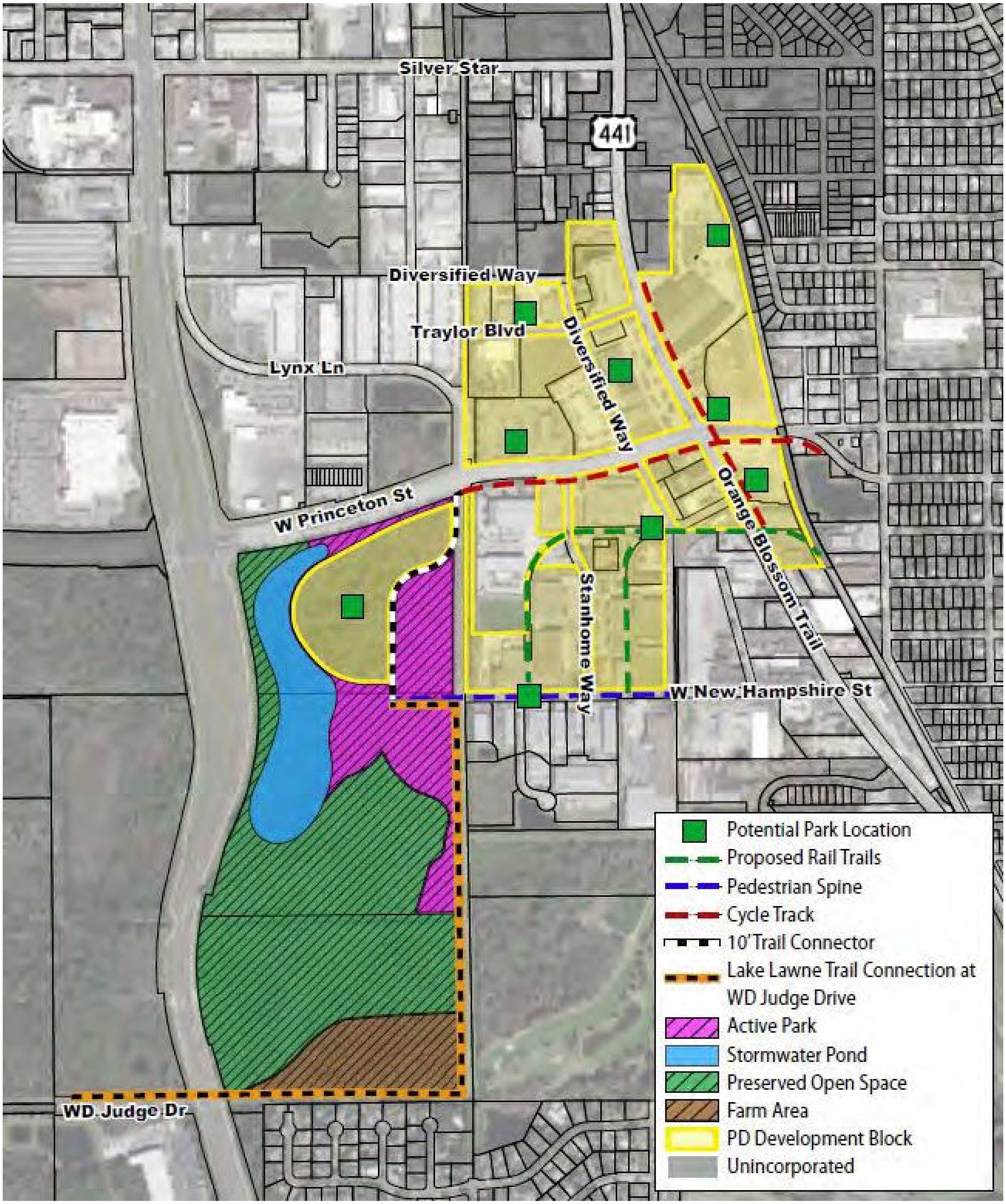


Figure 95. Packing District Master Plan

Source: City of Orlando

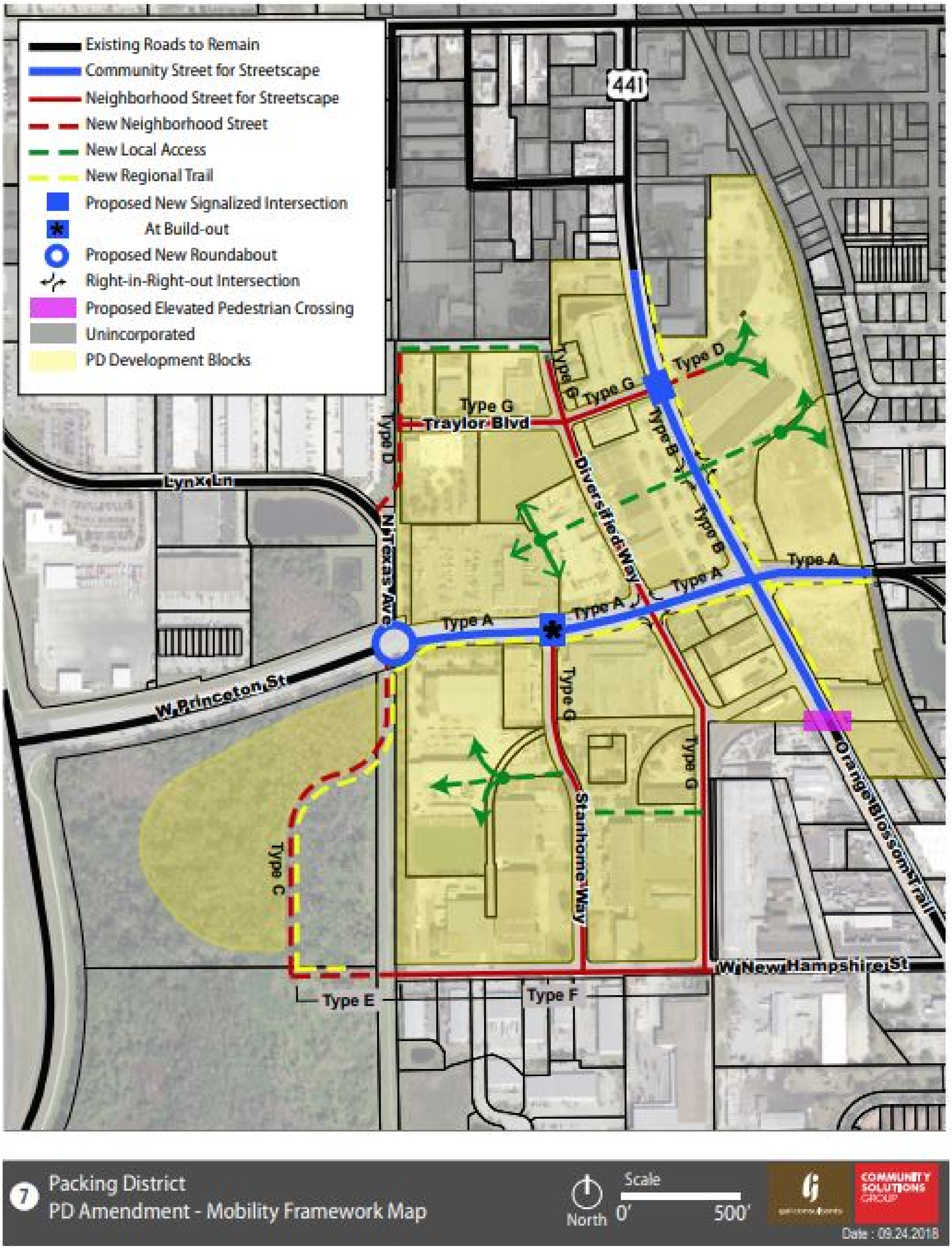


Figure 96. Packing District Proposed Mobility Framework Map

Source: 2018 Rezoning Application

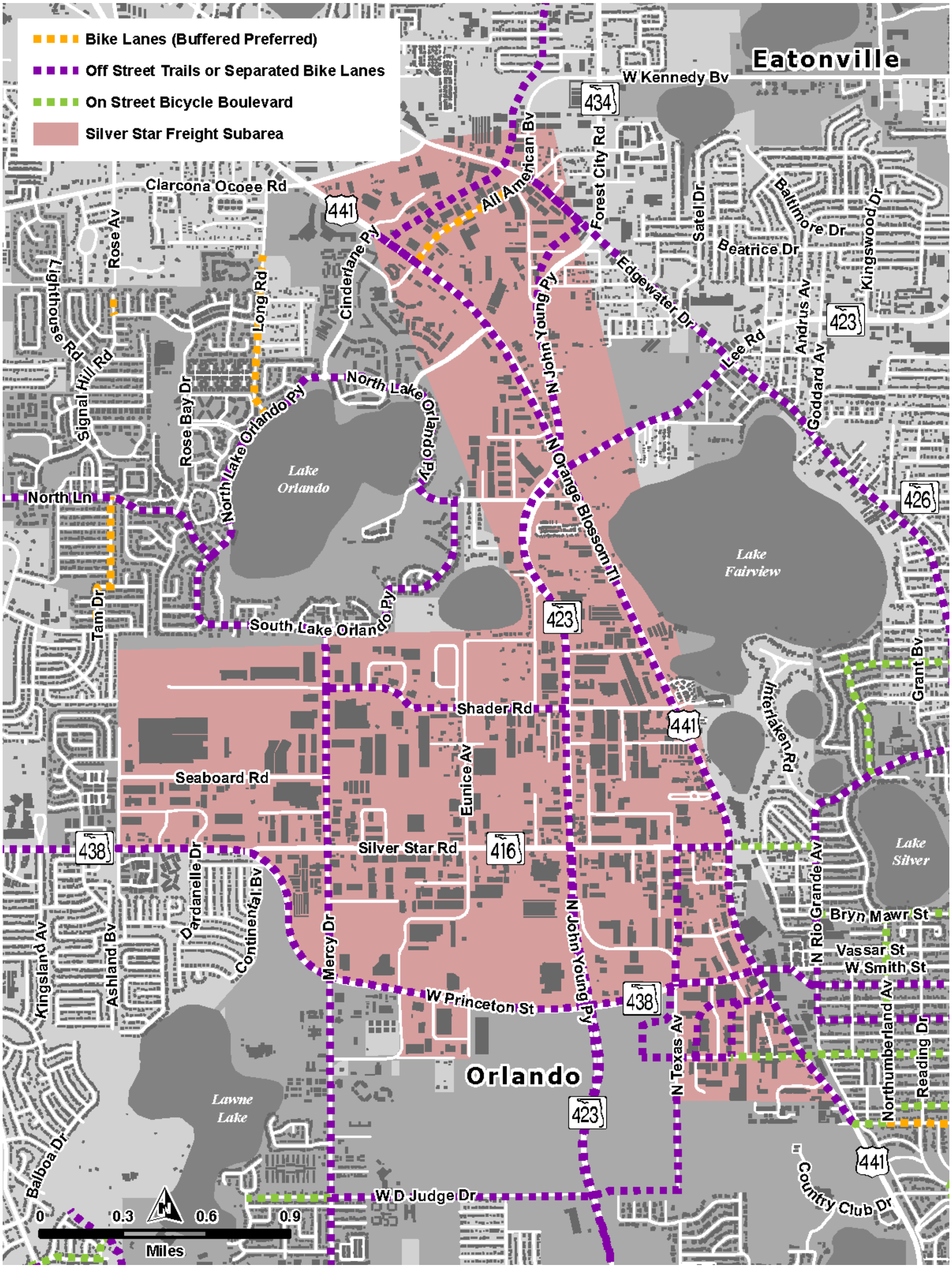


Figure 97. Proposed Bike Facilities

Source: City of Orlando Bicycle Plan

Vision Zero Action Plan

The City of Orlando adopted the Vision Zero Action Plan to eliminate dangerous roadway behavior and all fatal and serious injury crashes within the city by 2040. The Action Plan has six main goals:

1. Adopt a safe systems approach in roadway design, operation and maintenance,
2. Increase everyone's understanding of the leading causes of crashes resulting in serious injuries,
3. Support law enforcement efforts to eliminate behaviors leading to fatal or serious injury crashes,
4. Demonstrate continuous progress toward Vision Zero,
5. Improve access and travel time to Level 1 Trauma Center and other hospitals, and
6. Prioritize investments and programs in communities of concern.

The goals were established by the City of Orlando to provide equitable safety transportation solutions. The solutions were identified through safety projects and program components for Vision Zero which include: Public Comment, the High-Injury Network (HIN) and the Risk-Based Analysis (RBA). With the provided components, crash data was supplemented to identify focus corridors or intersections to seek improvement on.

Figure 98 shows the map of the HIN with emphasis of areas of bicycle and pedestrian focus.

The Top 18 severe crash corridors and intersections (focus corridors) are identified in **Figure 99**. The focus corridors or intersections that fall within the Silver Star Freight Subarea are:

1. Orange Blossom Trail from Clarcona Ocoee Road to All American Boulevard – District 3 (#7)
2. Lee Road from Edgewater Drive to Orange Blossom Trail – District 3 (#8)
3. Silver Star Road from Pine Hills Road to Princeton Street – District 5 (#13)

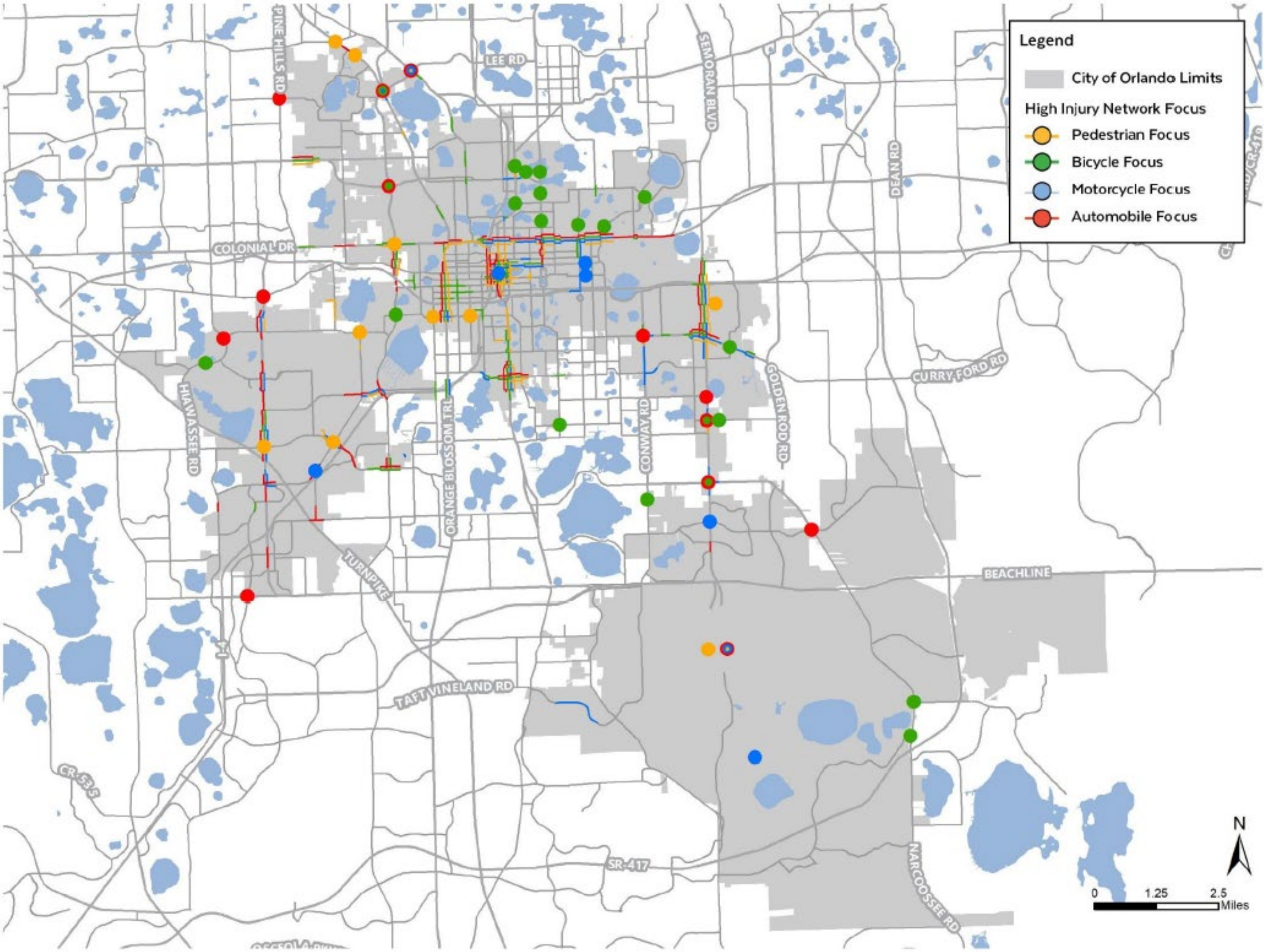


Figure 98. High Injury Network – Focus Corridors and Intersections by Mode

Source: City of Orlando Vision Zero Action Plan

Focus Corridor or Intersection		From	To	Mode of Transportation				Community of Concern	
				Pedestrian	Bicycle	Motorcycle	Automobile	Equity	School
District 2									
4	Semoran Blvd	Lake Underhill Rd	Curry Ford Rd	✓	✓	✓	✓	✓	✓
5	Curry Ford Rd	Don San George Ct	Colton Dr	✓	✓	✓	✓	✓	✓
6	Intersection of Semoran Blvd and Hoffner Ave				✓	✓	✓	✓	✓
District 3									
7	Orange Blossom Tr	Clarcona Ocoee Rd	All American Blvd	✓			✓	✓	✓
8	Lee Rd	Edgewater Dr	OBT	✓	✓	✓	✓		
9	Audubon Park/Colonialtown North Bike Network (with D4)				✓				✓
District 4									
10	Colonial Dr	Maguire Blvd	Mills Ave	✓	✓	✓	✓	✓	✓
11	Intersection of Curry Ford Rd and Conway Rd			✓	✓	✓	✓	✓	✓
12	Intersection of Orange Ave and Michigan Ave			✓	✓	✓	✓		✓
District 5									
13	Silver Star Rd	Pine Hills Rd	Princeton St	✓	✓		✓	✓	
14	Orange Blossom Tr	Gore St	Robinson St	✓	✓	✓	✓	✓	✓
15	Intersection of Orange Ave and Washington St			✓	✓	✓	✓	✓	✓
District 6									
16	Intersection of Conroy Rd and Kirkman Rd			✓	✓	✓	✓	✓	
17	Intersection of Conroy Rd and Vineland Rd			✓		✓	✓	✓	
18	LB McLeod Rd	John Young Pkwy	Bartlett Rd	✓		✓	✓	✓	✓

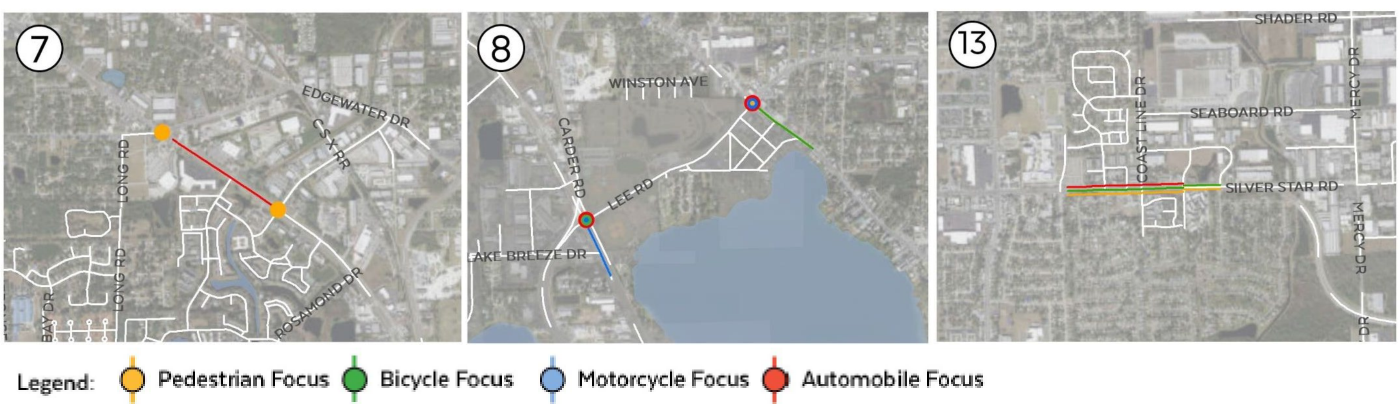


Figure 99. Top 18 Severe Crash Corridors and Intersections – Focus Corridors

Source: City of Orlando Vision Zero Action Plan

Field Review Observations

A field review conducted on October 9, 2020 helped to assess existing bicycle, pedestrian, and transit infrastructure in the Silver Star Freight Subarea. The photos and notes from the field review are included in a Field Observations Inventory (Appendix A).

The bicycle, pedestrian, and transit infrastructure needs focused on the following state roads within the subarea as shown in **Figure 100**:

1. Silver Star Road
2. John Young Parkway / Lee Road
3. John Young Parkway (SR 434)
4. Princeton Street
5. Orange Blossom Trail

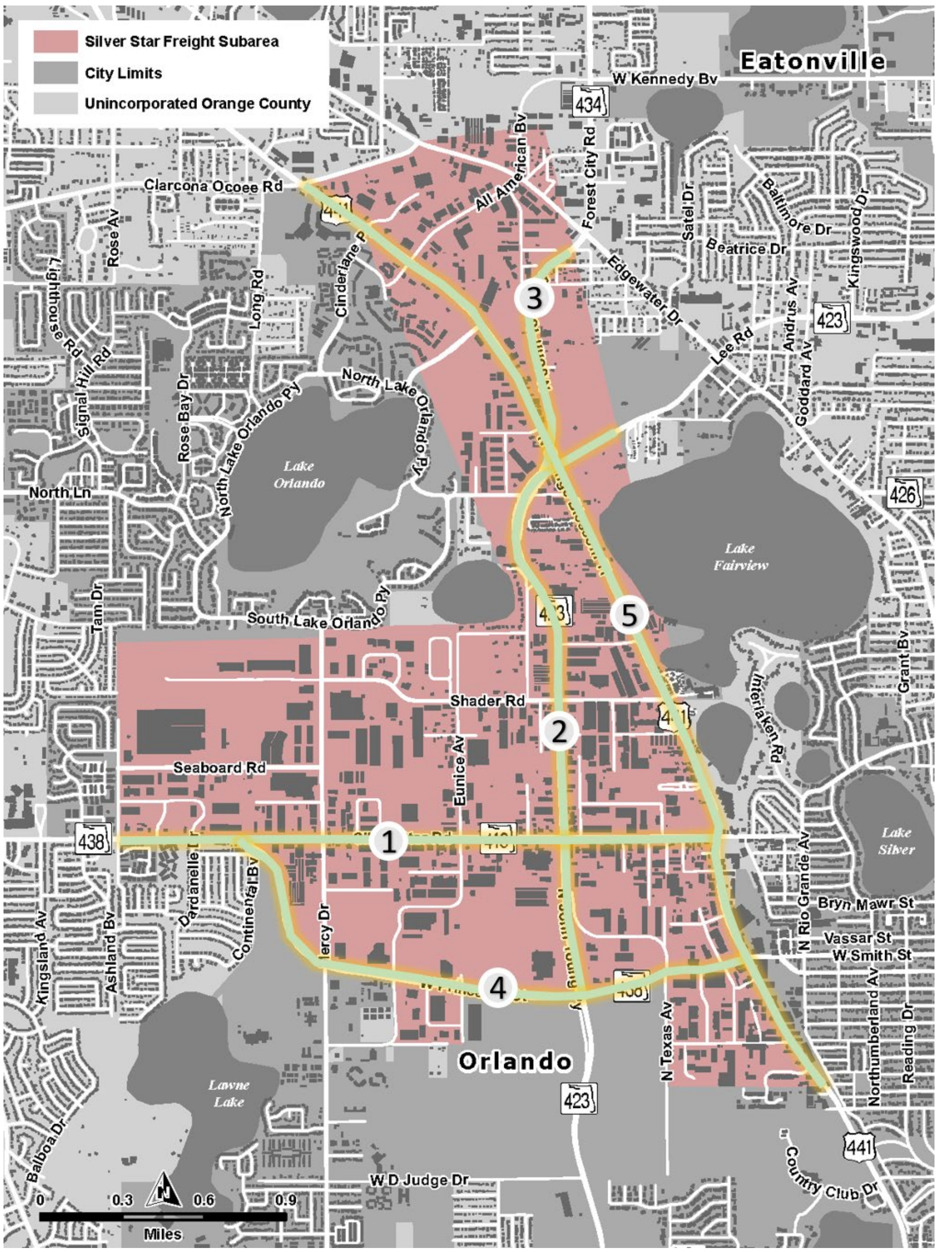


Figure 100. Field Review State Roads

Silver Star Road

(Limits: Coast Line Drive to Taft Avenue)

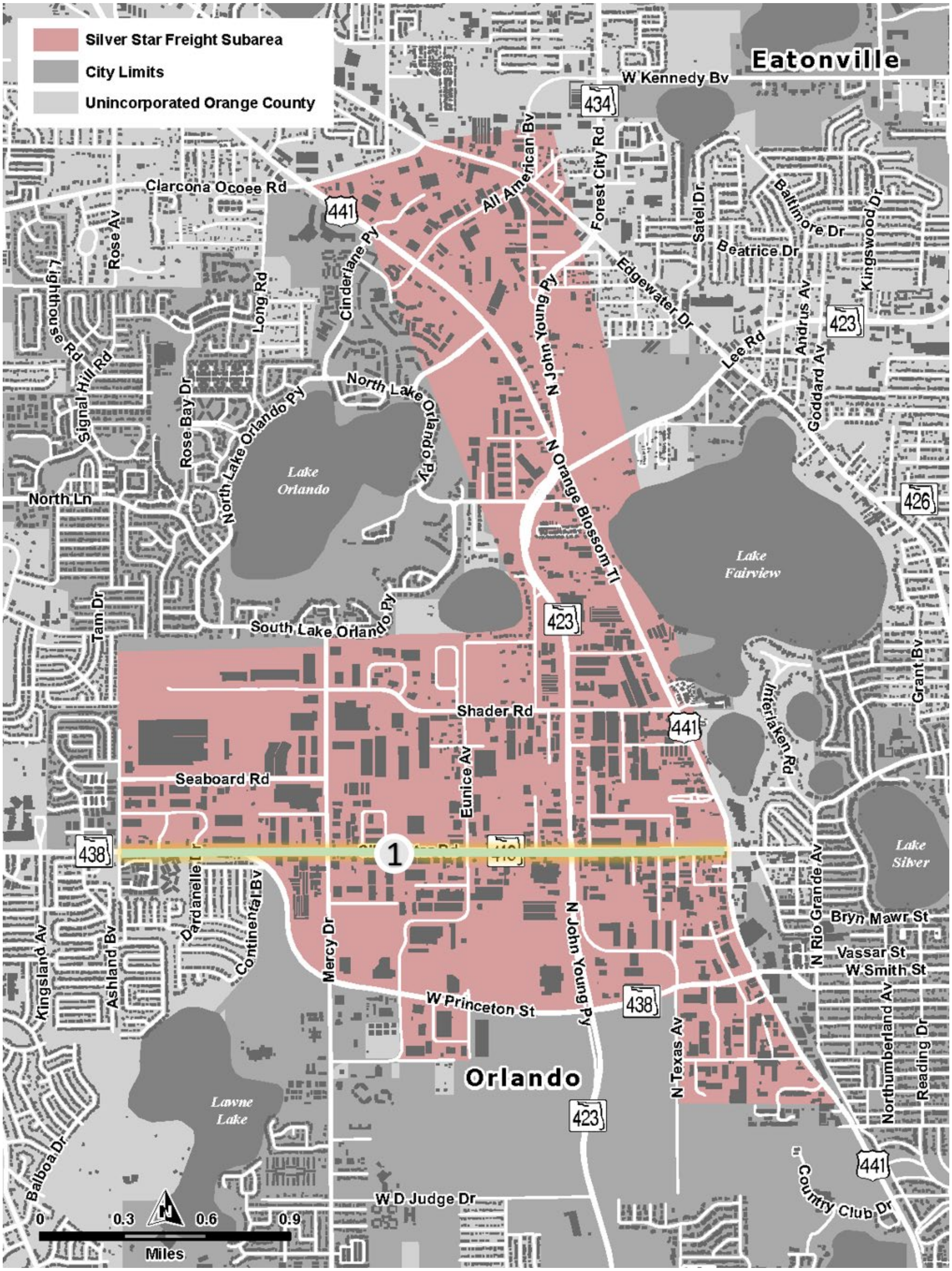


Figure 101. Silver Star Road Limits

Bicycle and Pedestrian Infrastructure Observations

Existing sidewalk gaps on Silver Star Road were previously shown in **Table 33**. Sidewalk conditions along Silver Star Road were generally in fair condition, but there were locations where cracking was observed, and ADA compliancy was not met. **Figure 102** provides some of the photos from the field review. Refer to the Field Observations Inventory in Appendix A for the complete set of field review photos and notes.

Sidewalk cracking at Regent Ave. Not ADA compliant. (Source: HDR)

Sidewalk at southwest crosswalk at Mercy Drive intersection. Overgrown grass is on the concrete. (Source: HDR)

Sidewalk at the Citgo gas station driveway. The slope of the driveway doesn't appear to be ADA compliant. A sidewalk gap can be observed beyond the driveway. (Source: HDR)

Sidewalk gap just west of the Wells Fargo. (Source: HDR)

Sidewalk gap in front of Luke's Landscaping Inc. (Source: HDR)

Sidewalk gap on the south side at Mercy Drive, looking west. (Source: HDR)

Figure 102. Silver Star Road Bicycle and Pedestrian Infrastructure Observations

Transit Observations

Based on the transit network shown in **Figure 87**, transit service is only provided on Silver Star Road within the study area between John Young Parkway and Orange Blossom Trail. The overall transit infrastructure on Silver Star Road was in fair condition. The only notable observation was the lack of platforms at bus stops. Additionally, many of the stops were in the grass or at an inconvenient distance from the roadway. **Figure 103** provides two photos from the field review that show this observation. Refer to the Field Observations Inventory in Appendix A for the complete set of field review photos and notes.

Bus stop on Silver Star Road in front of PNC Bank. The stop is in the grass and there is no platform. (Source: HDR)

LYNX bus stop Silver Star Road near Dinneen Avenue in front of Groundwater Protection. Stop in the grass at some distance from the roadway. (Source: HDR)

Figure 103. Silver Star Road Transit Observations

Observations and Recommendations

Observations	Recommendations
Existing bike facilities inconsistent with Orlando Bicycle Plan	Provide proposed off-street trails or separated bike lanes consistent with the Orlando Bicycle Plan
Sidewalk gaps	Close the following sidewalk gaps: 1. South side from the existing sidewalk at Life-Storage Orlando to Luke's Landscaping Inc. (0.5 mile) 2. North side from Mercy Drive to 50 feet east of Mercy Drive 3. South side from existing sidewalk at Life Line of Christ to existing sidewalk at Luke's Landscaping Inc. (0.34 miles) 4. South side from the at-grade rail crossing to John Young Parkway (0.17 miles) 5. South side from the Re Michel Company to the existing sidewalk at Groundwater Protection (0.12 miles) 6. South side from Dinneen Avenue to Regent Avenue (0.1 miles) 7. South side from Orange Blossom Trail to Taft Avenue for (0.10 miles)
ADA compliance	Address ADA and driveway slope issues in front of the CITGO gas station
Sidewalk cracking	Address sidewalk cracking issues at Regent Avenue and Mercy Drive
Overgrown grass and weeds on sidewalk	Maintenance coordination at Mercy Drive
ADA compliance at stops	Coordinate with LYNX and address ADA issues at the stops in front of PNC Bank and Groundwater Protection

John Young Parkway / Lee Road

(Limits: Princeton Street to Lake Fairview Park / Arawak Lane)

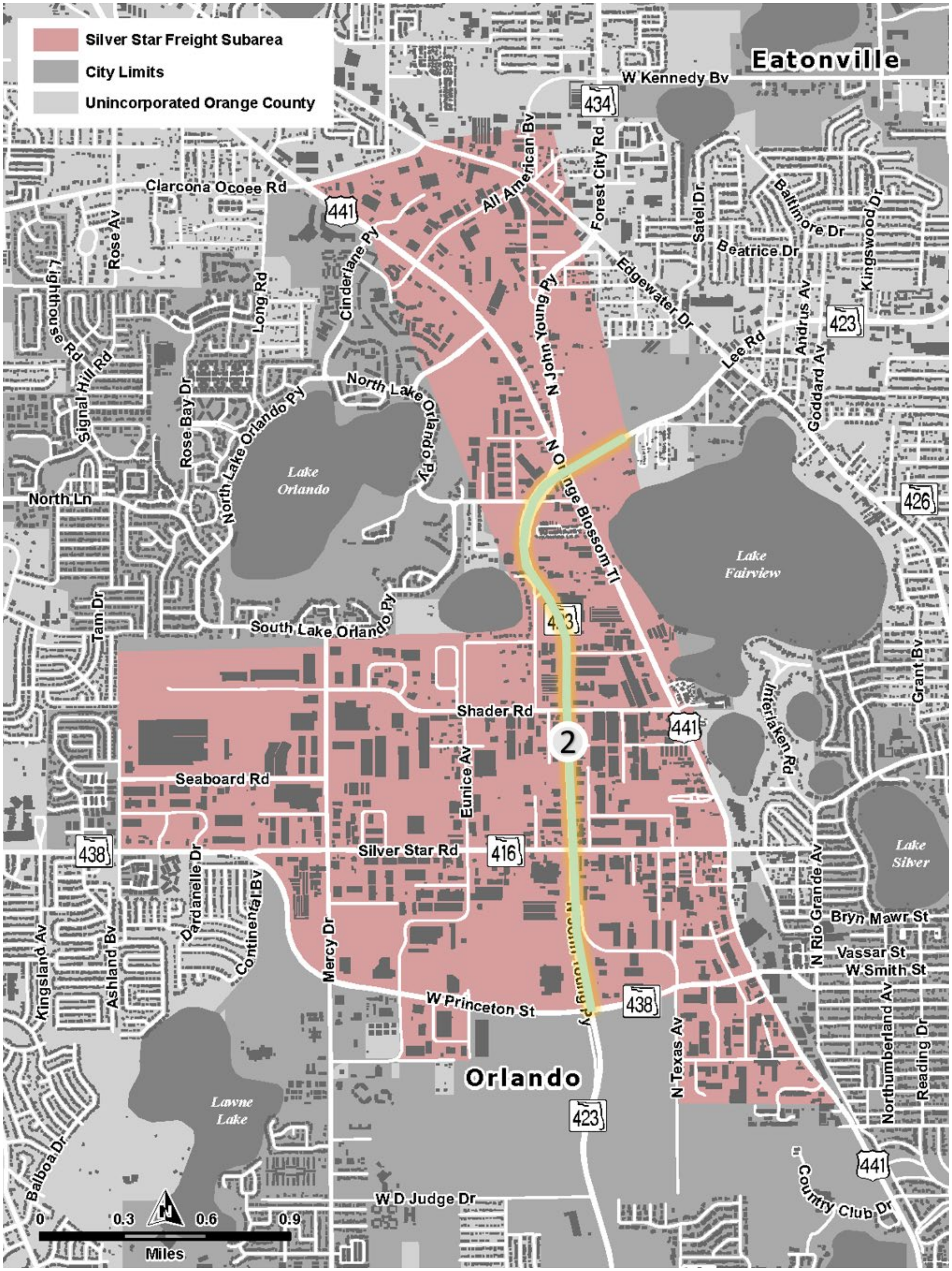


Figure 104. John Young Parkway / Lee Road Limits

Bicycle and Pedestrian Infrastructure Observations

Due to ongoing construction, the focus of the existing bicycle and pedestrian infrastructure conditions along John Young Parkway were primarily in areas outside of the ongoing construction project from Shader Road to Fairview Park / Arawak Lane. Generally, the sidewalk was in good condition and there was only evidence of overgrown grass and weeds on the sidewalk. **Figure 105** below provides some of the photos from the field review. Refer to the Field Observations Inventory in Appendix A for the complete set of field review photos and notes.

Existing sidewalk on the east side of John Young Parkway in front of AmeriGas. Some grass observed over the concrete. (Source: HDR)

Existing sidewalk on the east side of John Young Parkway in front of Retro Ridez LLC. Some overgrown grass observed on the sidewalk. (Source: HDR)

Ongoing construction on John Young Parkway at Silver Star Road. (Source: HDR)

Figure 105. John Young Parkway Bicycle and Pedestrian Infrastructure Observations

Transit Observations

Based on the transit network shown in **Figure 87**, transit service is only provided on John Young Parkway within the study area between Shader Road and LYNX Lane. Ongoing construction on John Young Parkway made it difficult to determine the existing state of transit infrastructure. It is recommended to perform another observational analysis once construction is a complete.

Observations and Recommendations

Observations	Recommendations
Construction underway	Consider revisiting once construction is complete

John Young Parkway (SR 434)

(Limits: Orange Blossom Trail to 0.1 miles south of Edgewater Drive)

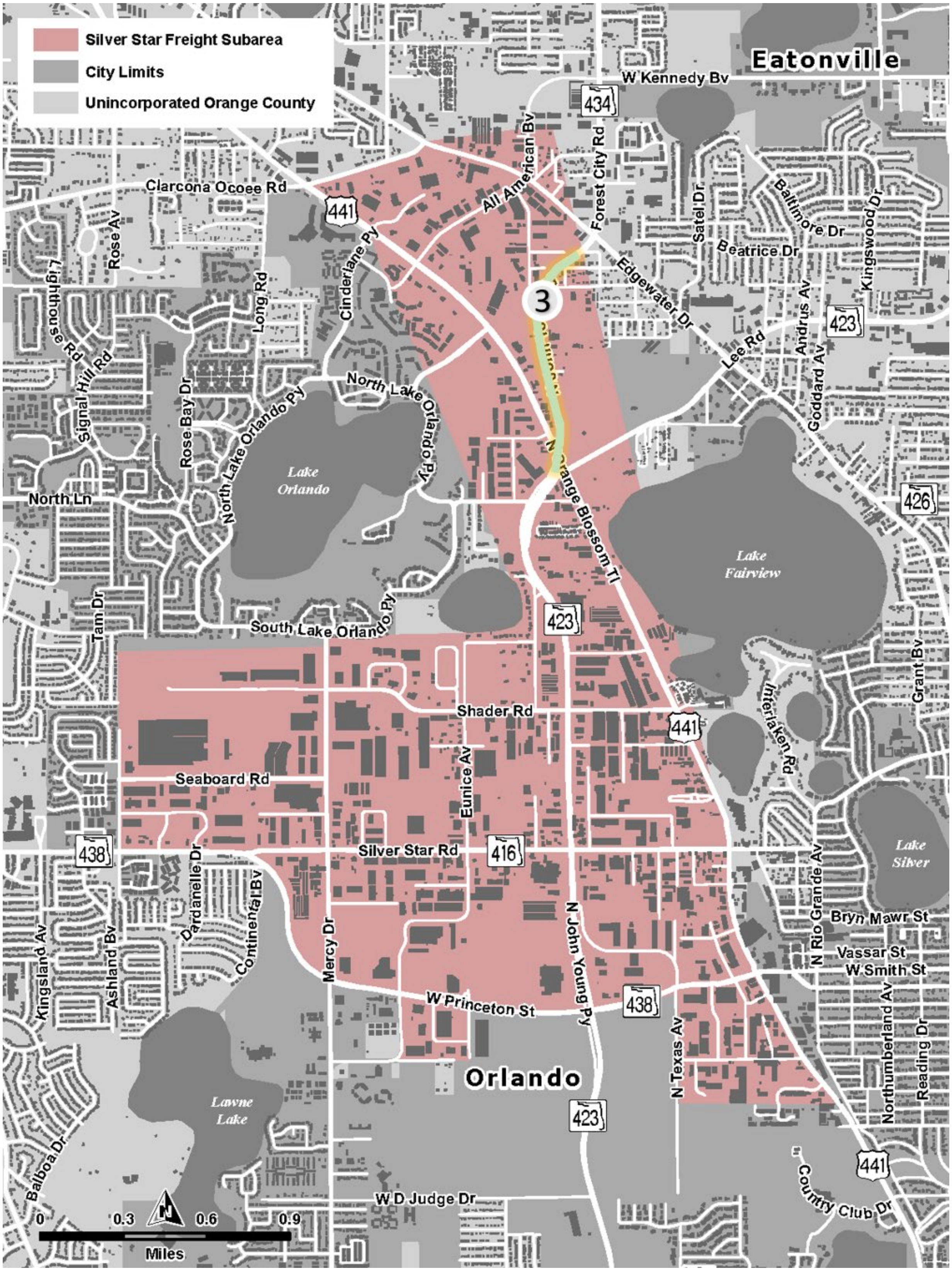


Figure 106. John Young Parkway (SR 434) Limits

Bicycle and Pedestrian Infrastructure Observations

Sidewalk exists on the east side of John Young Parkway (SR 434). There is an existing sidewalk on the west side south of Edgewater Drive but it ends in the area just south of the Wawa gas station adjacent to the railroad tracks. As shown previously in **Table 33**, the west side sidewalk gap exists from the Orange Blossom Trail overpass to the Wawa gas station driveway for approximately 4,208 feet (0.80 miles). It is unlikely that a sidewalk would be allowed in that area adjacent to the railroad tracks because of insufficient offset space from the tracks. It is common for rail companies to require a 25-foot separation from the center of the nearest track to the edge of sidewalk or trail, and in this area, that minimum spacing would not be met. The condition of the existing sidewalk along the east side of John Young Parkway is generally in fair condition.

Bike lanes were observed during the field review. The bike lane pavement markings were also noted to be in fair condition. Two important bicycle infrastructure issues were identified:

1. The existing tracks at the at-grade rail crossing approximately 0.4 miles north of the Orange Blossom Trail overpass cross the road and bike lanes at a skewed angle. Tracks that cross a road at less than 45 degrees can divert a bicyclist's front wheel and cause a crash. The existing angle of the tracks is very shallow particularly in the southbound direction, making travel in the existing bike lane more hazardous.

2. The overpass at Orange Blossom Trail has an unfriendly design for all cyclists, with exception to the most highly confident cyclists. Northbound bicyclists coming from John Young Parkway and continuing north on the overpass are required to weave across two lanes of high speed traffic (with a posted speed of 45 MPH) exiting via the off-ramp to either Orange Blossom Trail or Lee Road, which includes one lane that is a shared through / right turn lane. Although conditions are better for southbound cyclists across the overpass, bicyclists still must weave across one lane of high-speed traffic entering John Young Parkway at the south end of the overpass.

Figure 107 below provides some of the photos from the field review. Refer to the Field Observations Inventory in Appendix A for the complete set of field review photos and notes.

Existing at-grade rail crossing on John Young Parkway. The skewed angled track on the road / bike lane create unsafe conditions for cyclists. (Source: HDR)

Existing sidewalk and bike lane on the east side of John Young Parkway just south of the at-grade rail crossing. Pavement markings appear to be in fair condition. (Source: HDR)

Existing bike lane on the west side of John Young Parkway looking south. Pavement markings for the bike lane appear to be in fair condition. (Source: HDR)

Existing bike lane on the west side of John Young Parkway looking south near Wawa where sidewalk ends. (Source: HDR)

Figure 107. John Young Parkway (SR 434) Bicycle and Pedestrian Infrastructure Observations

Transit Observations

Based on the transit network shown in **Figure 87**, there is no transit service on John Young Parkway (SR 434) within the study area.

Observations and Recommendations

Observations	Recommendations
Existing bike facilities inconsistent with Orlando Bicycle Plan	Eliminate on-street / unprotected bike lanes and provide shared use paths for the entire John Young Parkway corridor within the study area
Low angle rail crossing of bike lanes and roadway at the at-grade rail crossing	Retrofit crossing area to flare the bike lane approach to the tracks in each direction to allow bikes to cross the tracks at a 90-degree angle
Unfriendly interchange design at John Young Parkway / Lee Road at Orange Blossom Trail requires bicyclists to weave across one or more lanes of high-speed traffic	Redesign interchange at next resurfacing project to add bicycle-friendly accommodations
Sidewalk gap on the west side of John Young Parkway (SR 434) adjacent to the railroad tracks	It is unlikely a sidewalk would be allowed in the area adjacent to the railroad tracks because of insufficient offset space from the tracks - it is common for rail companies to require a 25-foot separation from the center of the nearest track to the edge of sidewalk or trail. In this area, that minimum spacing would not be met. No recommendations at this time to close existing gap.
ADA compliance	Address ADA issues in future design project

Princeton Street

(Limits: Silver Star Road to Coolidge Avenue)

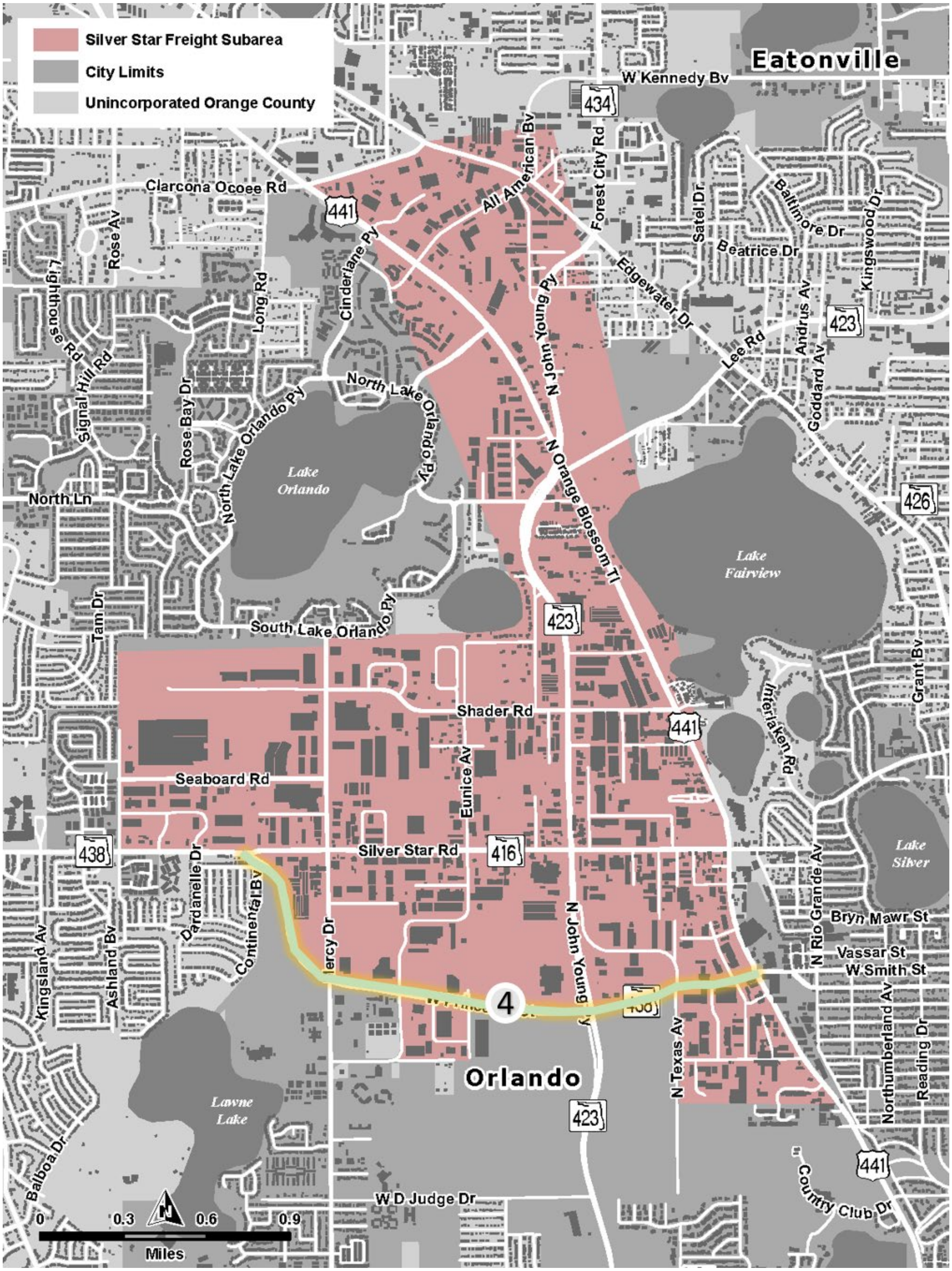


Figure 108. Princeton Street Limits

Bicycle and Pedestrian Infrastructure Observations

Sidewalk exists on Princeton Street on both sides of the road along the corridor within the Silver Star Freight Subarea and no sidewalk gaps were observed. West of Orange Blossom Trail, the sidewalks were generally in fair condition. East of Orange Blossom Trail, the sidewalks still appeared to be in fair condition but certain locations did not appear to be ADA compliant as shown in **Figure 109**. Refer to the Field Observations Inventory in Appendix A for the complete set of field review photos and notes.

Sidewalk at the southeast corner of Orange Blossom Trail intersection. The sidewalk does not appear to be ADA compliant. (Source: HDR)

Sidewalk at Coolidge Avenue. The sidewalk appears in fair condition. (Source: HDR)

Sidewalk on the east side of Princeton Street just south of the at-grade rail crossing at a driveway leading to Packing District. The slope of the driveway doesn't appear to be ADA compliant. (Source: HDR)

Grass over the sidewalk on the north side of Princeton Street just east of the at-grade rail crossing. (Source: HDR)

Truck parked on the sidewalk in front of HeinMiller. The truck is blocking pedestrians from walking on the sidewalk forcing them to walk in the road. (Source: HDR)

Existing asphalt sidewalk connection to the existing concrete sidewalk on the north side of Princeton Street just west of the at-grade rail crossing approaching the Packing District. (Source: HDR)

Figure 109. Princeton Street Bicycle and Pedestrian Infrastructure Observations

Transit Observations

Based on the transit network shown in **Figure 87**, all of Princeton Street within the study area is served by transit, except for the section between Texas Avenue and Orange Blossom Trail. The transit infrastructure observed in the field is in fair to good condition. There were no stops observed in the field that were of concern. **Figure 110** below provides a photo of a bus station observed during the field review. Refer to the Field Observations Inventory in Appendix A for the complete set of field review photos and notes.

Bus stop on the north side of Princeton Street in front of Walmart. The stop has a shaded bench and concrete slab and appears to be in good condition. (Source: HDR)

Figure 110. Princeton Street Transit Observations

Observations and Recommendations

Observations	Recommendations
Existing bike facilities inconsistent with Orlando Bicycle Plan and Packing District Master Plan	Provide off-street trails or separated bike lanes for the entire Princeton Street corridor within the study area
Excessively wide driveways increase pedestrian exposure	Close / narrow driveways on the east side of Orange Blossom Trail
Business parking blocking sidewalks	Coordinate with businesses east of Orange Blossom Trail particularly HeinMiller to prevent parked cars from blocking the sidewalk
Overgrown grass and weeds on the north side of Princeton Street just east of the at-grade rail crossing	Maintenance coordination

Orange Blossom Trail

(Limits: Golfview Street to Cinderlane Parkway)

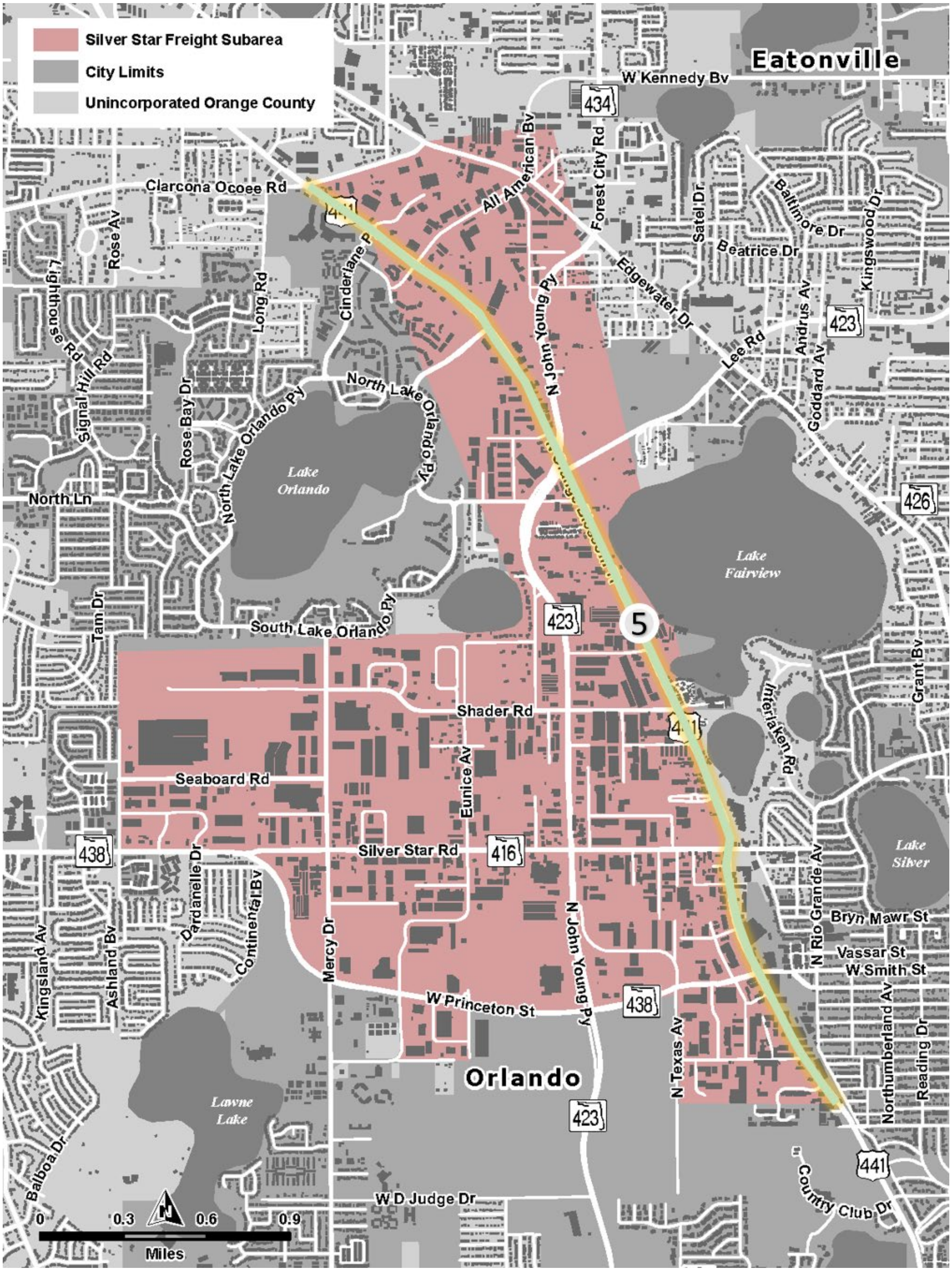


Figure 111. Orange Blossom Trail Limits

Bicycle and Pedestrian Infrastructure Observations

As shown previously in **Table 33**, sidewalk gaps exist along the Orange Blossom Trail corridor in the following locations:

1. East side from Woodruff Avenue to the at-grade rail crossing in front of Habitat for Humanity ReStore (0.47 miles)
2. East side from the at-grade rail crossing approximately 300 feet north of Silver Star Road to Lee Road (1.43 miles)

Sidewalks were generally in fair condition, but there were locations where cracking was observed such as at the southwest corner of the Silver Star Road intersection. The most notable bicycle and pedestrian observations were the lack of sidewalk on the east side of Orange Blossom Trail and driveways and sidewalks that were not ADA compliant. **Figure 112** below provides some of the photos from the field review observations. Refer to the Field Observations Inventory in Appendix A for the complete set of field review photos and notes.

Dirt covering the sidewalk on a driveway at Rubens Street. (Source: HDR)

Sloped sidewalk in front of SK Stones Orlando. Doesn't appear to be ADA compliant. (Source: HDR)

Cracked sidewalk at the southwest corner of the Silver Star Road intersection. Doesn't appear to be ADA compliant. (Source: HDR)

Existing sidewalk approaching the John Young Parkway overpass. Sidewalk in fair condition. (Source: HDR)

No sidewalk present on the east side traveling northbound. (Source: HDR)

Sidewalk gap on the east side in front of Bronco Johns Auto Complete Auto Repair & Transmission. (Source: HDR)

Figure 112. Orange Blossom Trail Bicycle and Pedestrian Infrastructure Observations

Transit Observations

Consistent with the transit network shown in **Figure 87**, transit service is provided along all of the Orange Blossom Trail corridor within the study area. Transit infrastructure conditions along Orange Blossom Trail varied. South of Silver Star Road and north of John Yong Parkway / Lee Road the LYNX transit stops were in fair condition and there were no notable observations. The section south of John Young Parkway and north of Silver Star Road lacked in bus platforms as most stops were in the grass and / or at an inconvenient distance from the roadway. **Figure 113** below provides photos of observations during the field review. Refer to the Field Observations Inventory in Appendix A for the complete set of field review photos and notes.

Bus stop just north of Princeton Street. (Source: HDR)

Bus Stop right in front of Marge's Specialties looking north. In good condition. (Source: HDR)

LYNX bus stop in grass on east side near Cozy Cove Circle. (Source: HDR)

Transit users sitting on bench in the grass in front of Town & Country Manufactured Home Community. (Source: HDR)

Figure 113. Orange Blossom Trail Transit Observations

Observations and Recommendations

Observations	Recommendations
Existing bike facilities inconsistent with Orlando Bicycle Plan and Packing District Master Plan	Provide proposed off-street trails or separated bike lanes consistent with the Orlando Bicycle Plan and Packing District Master Plan.
Sidewalk gaps	Close sidewalk gaps on Orange Blossom Trail at the following locations: 1. East side from Woodruff Avenue to the at-grade rail crossing in front of Habitat for Humanity ReStore (0.47 miles) 2. East side from the at-grade rail crossing approximately 300 feet north of Silver Star Road to Lee Road (1.43 miles)
ADA compliance	Address ADA issues at the southwest corner of Silver Star Road intersection and along driveways on the west side of Orange Blossom Trail from Golfview Street to Shader Road
Abandoned and excessively wide driveways increase pedestrian exposure	Close / narrow driveways on the west side of Orange Blossom Trail from Golfview Street to Shader Road
ADA compliance at stops / stops in the grass	Coordinate with LYNX and address ADA issues from Silver Star Road to the John Young Parkway overpass

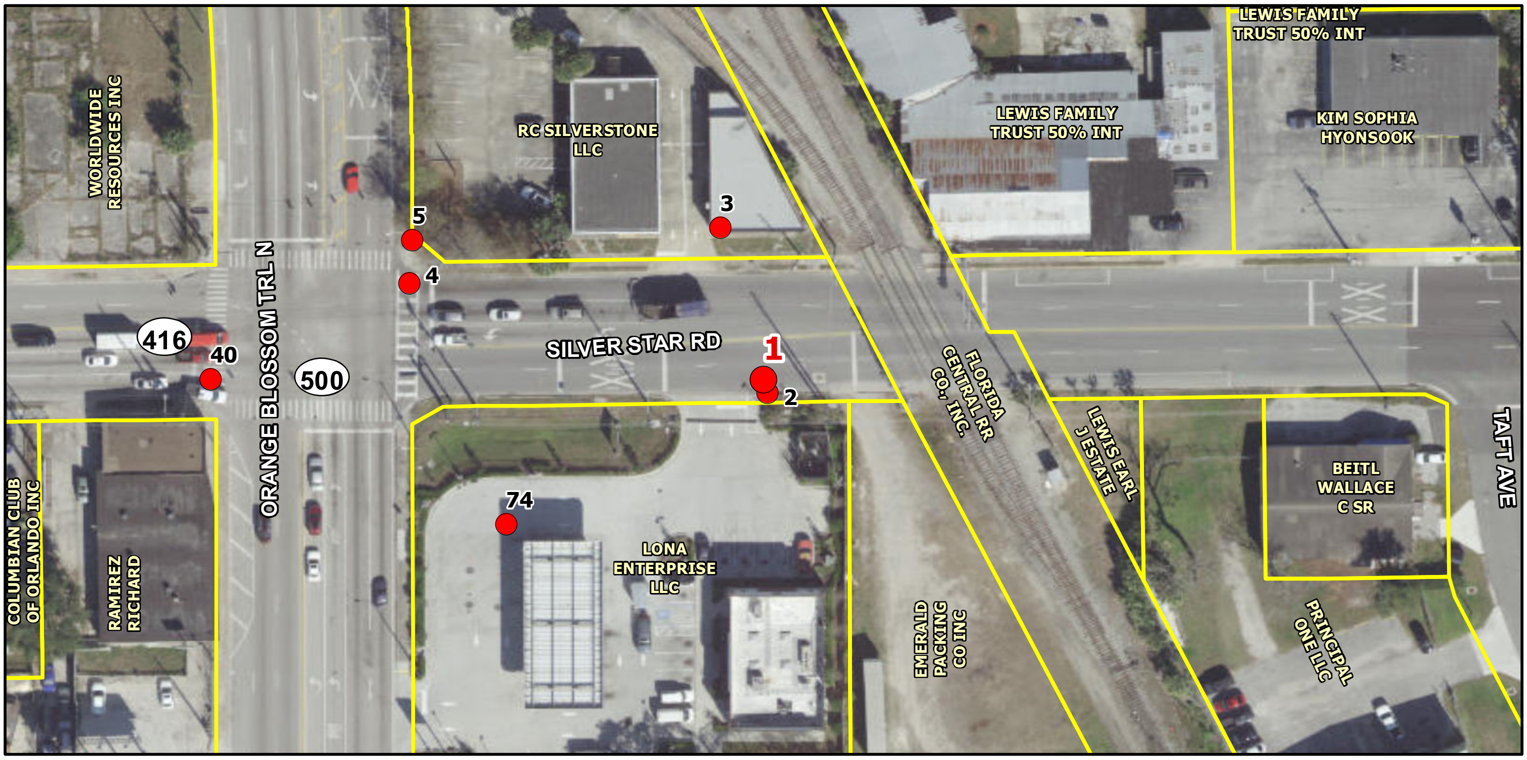
Area-Wide Improvements

Observations and Recommendations

Observations	Recommendations
Some existing crosswalk markings across the study area are faded, and others (even if newer) don't stand out and emphasize these locations as pedestrian crossing locations as much as they could	Provide colored and textured crosswalk markings (e.g., red colored and stamped asphalt with white ladder markings overlaid) at intersections across the study area as opportunities arise to provide additional emphasis of these crossing locations
Existing bicycle facilities are limited, but where present do not include the use of any green color in conflict areas	Add green colored bike lane markings to provide additional emphasis in conflict areas across the study area as opportunities arise, consistent with FDOT design standards

APPENDIX

Appendix A: Field Observations Inventory



Feature ID: 1

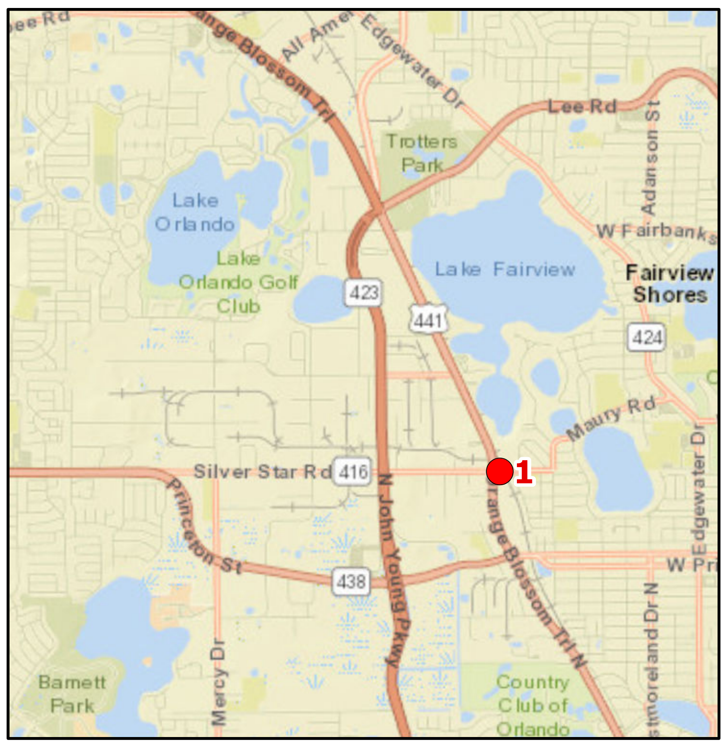
Feature Type: ADA - Safety

Comment: no sidewalk

Lat: 28.57815 **Long:** -81.4064

http://maps.google.com/maps?q=28.57815,-81.4064

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

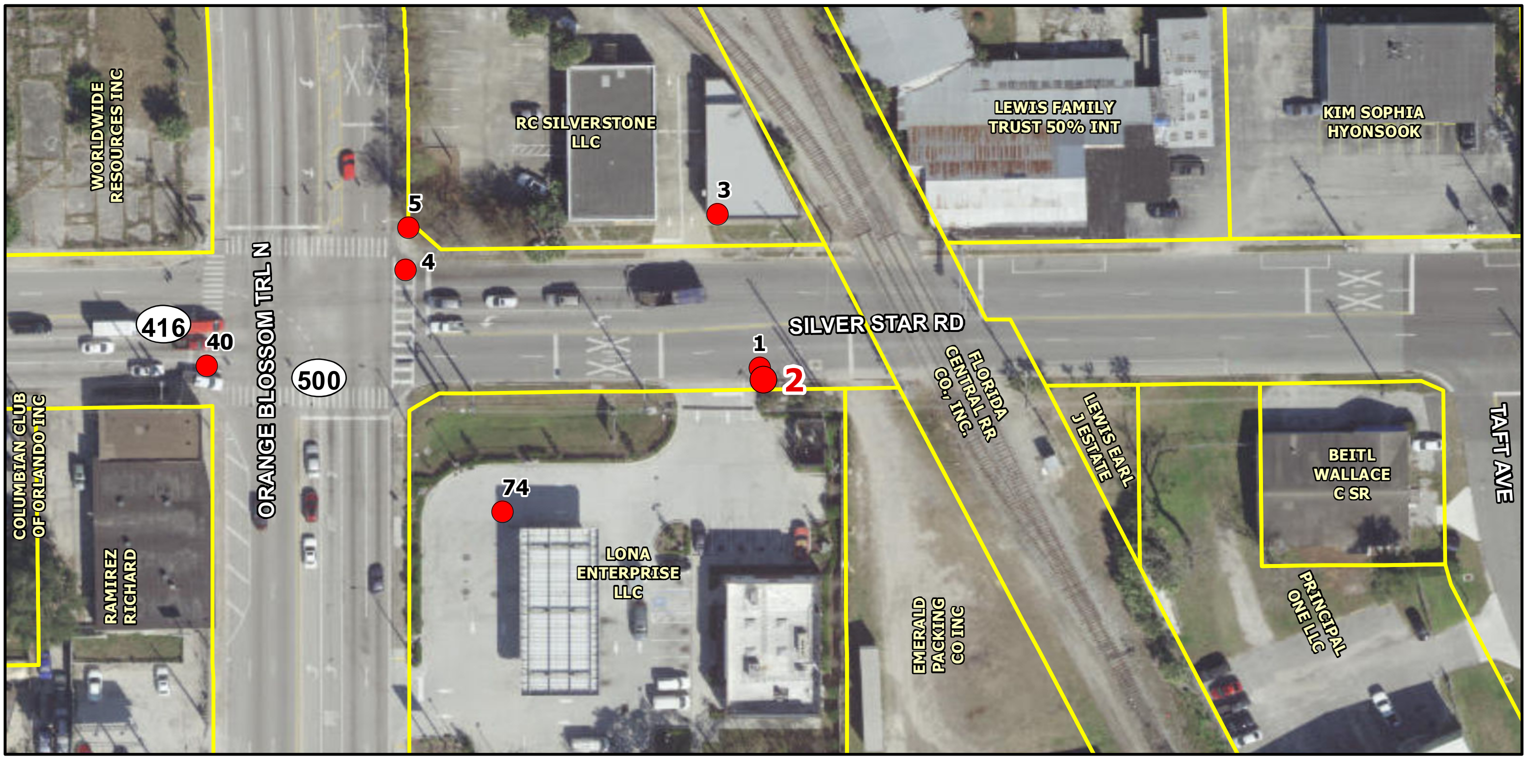
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 2

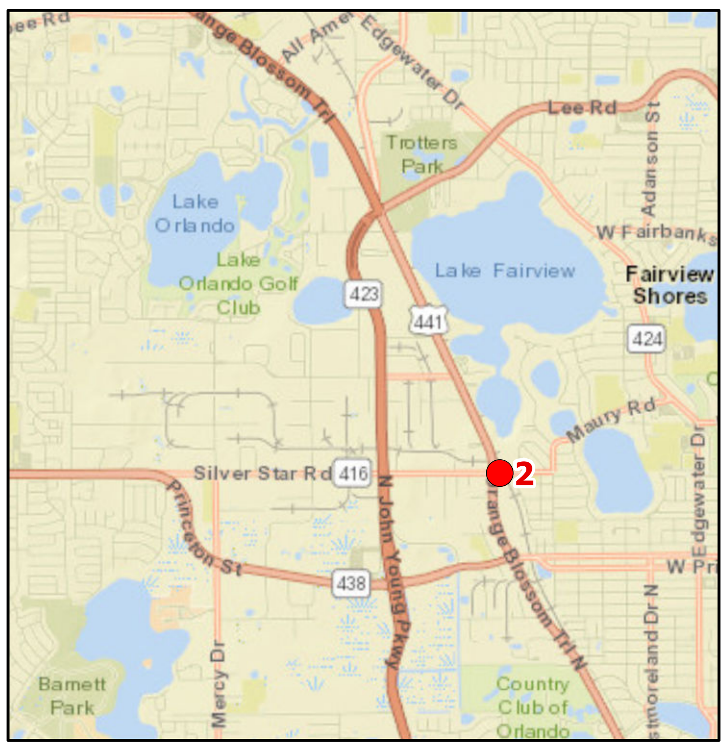
Feature Type: ADA - Safety

Comment:

Lat: 28.57813 **Long:** -81.40639

http://maps.google.com/maps?q=28.57813,-81.40639

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150
Feet

FDOT

Field Observations
Silver Star Freight
Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021

Feature ID: 3

Feature Type: ADA - Safety

Comment: Driveway slope not compliant

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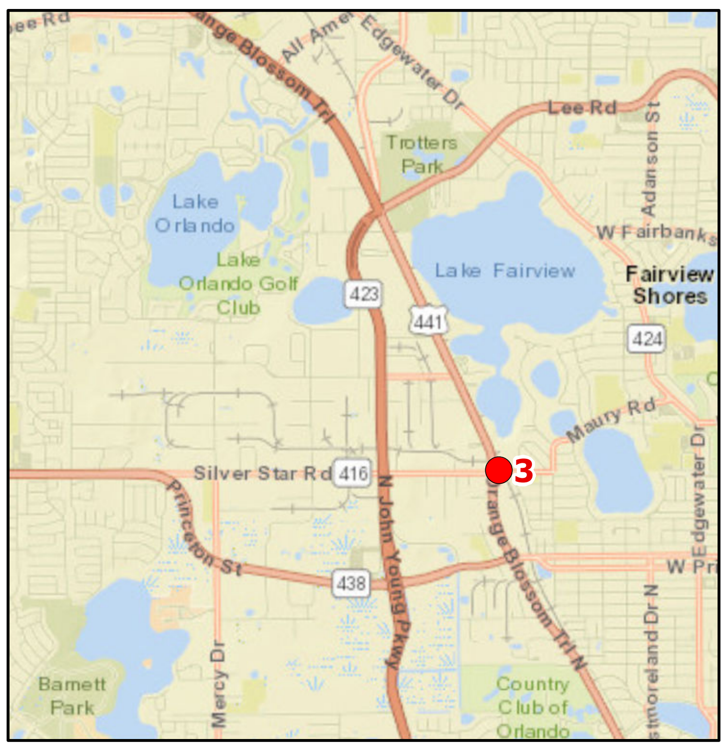
http://maps.google.com/maps?q=28.57837,-81.40646

ADA - Safety | Transit
Damaged Infrastructure | User



FDOT

Map Scale: 1 Inch = 100 Feet

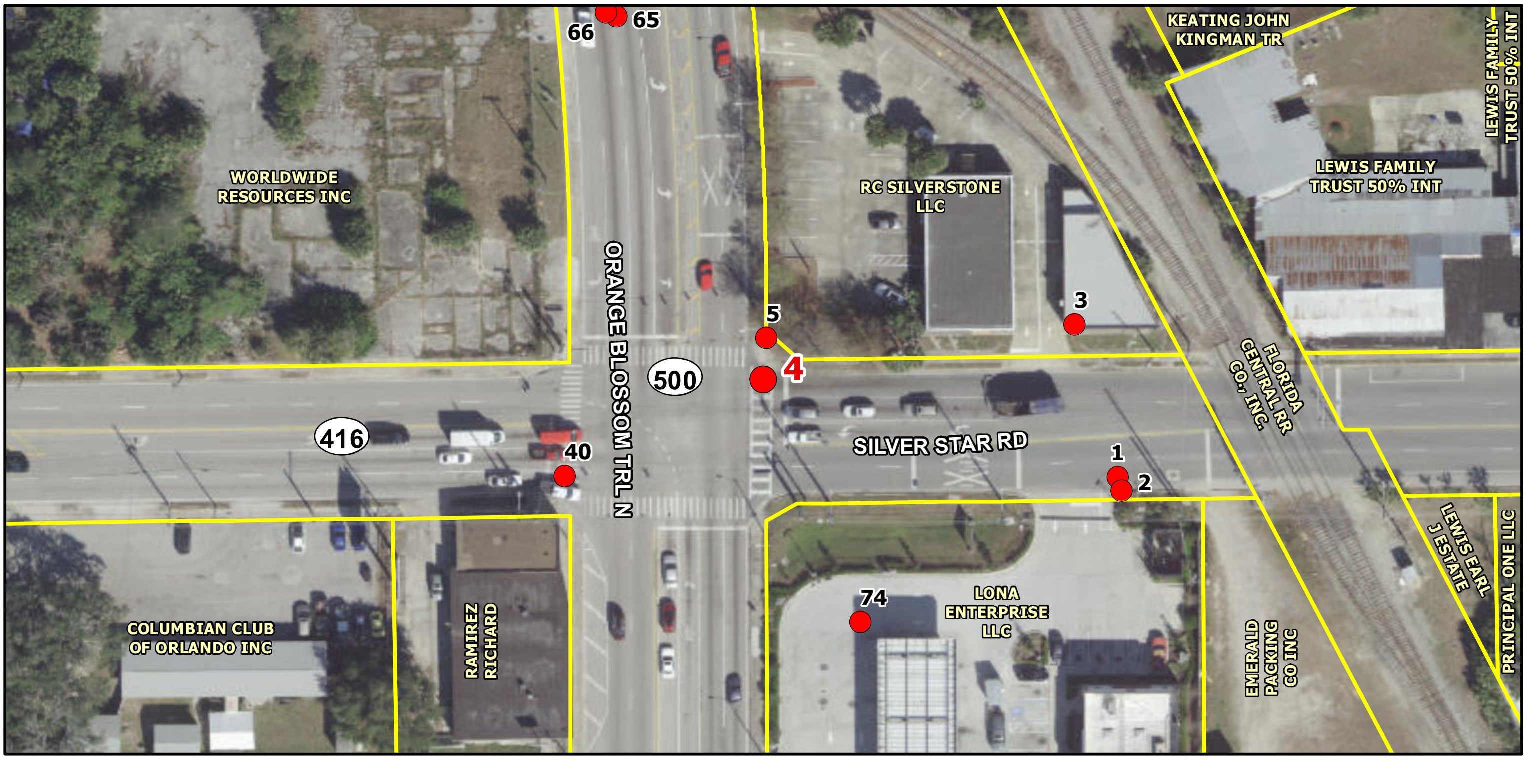
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 4

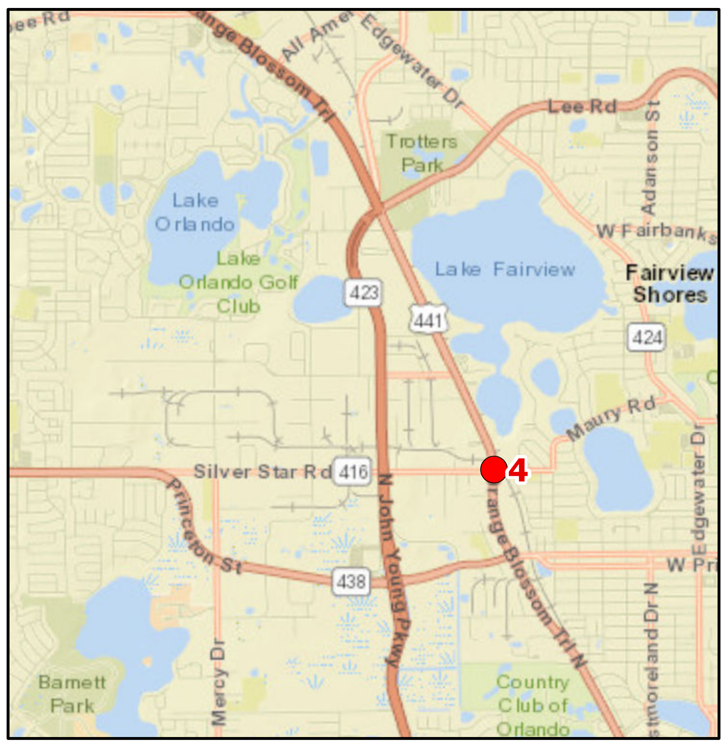
Feature Type: ADA - Safety

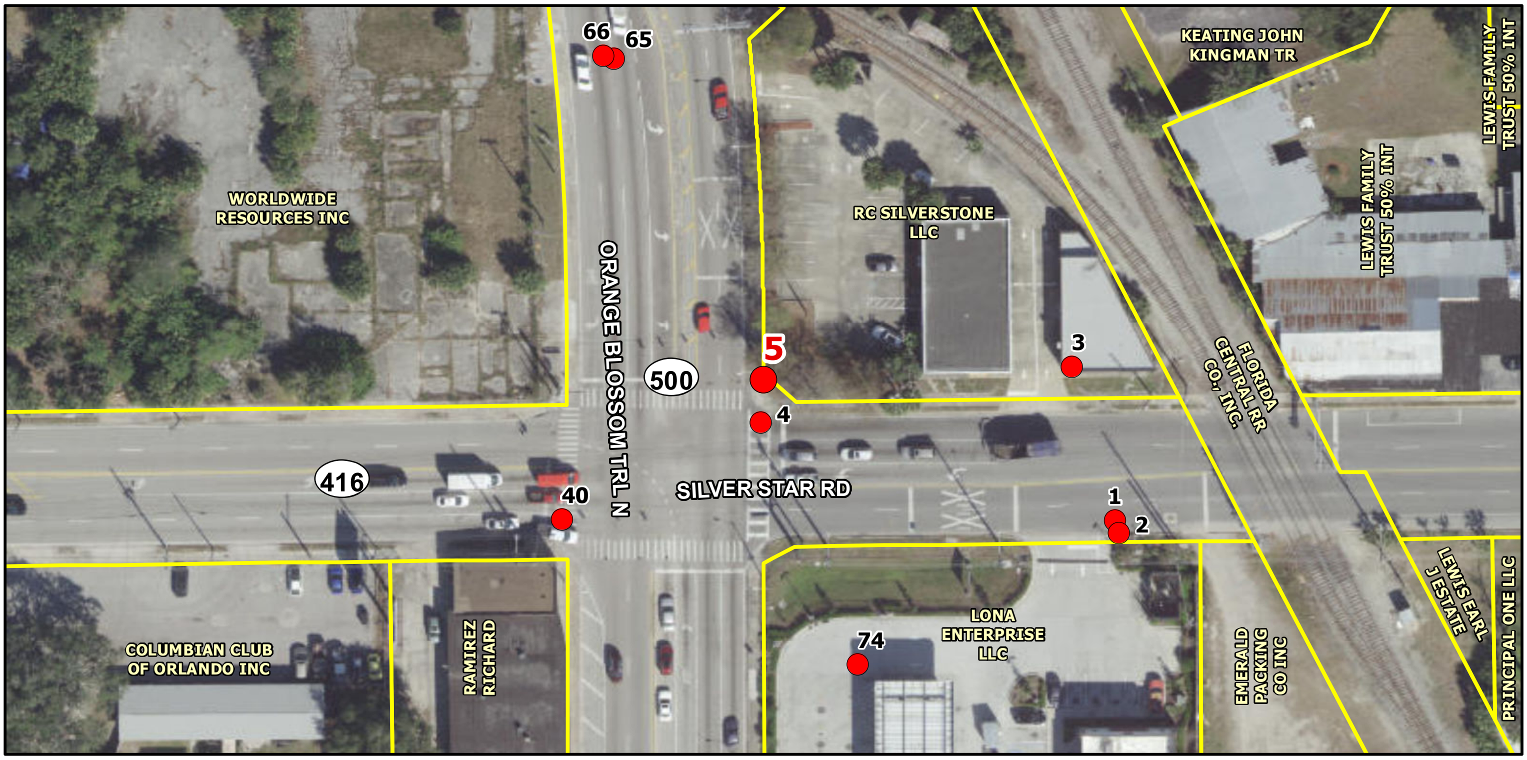
Comment:

Lat: 28.57829 **Long:** -81.40691

http://maps.google.com/maps?q=28.57829,-81.40691

ADA - Safety	Transit
Damaged Infrastructure	User





Feature ID: 5

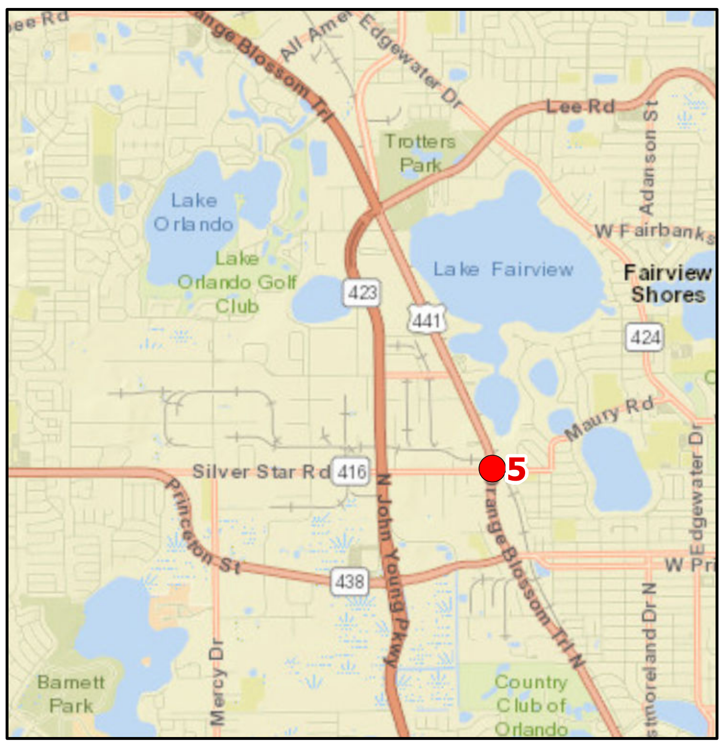
Feature Type: ADA - Safety

Comment:

Lat: 28.57835 **Long:** -81.40691

http://maps.google.com/maps?q=28.57835,-81.40691

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021

Feature ID: 6

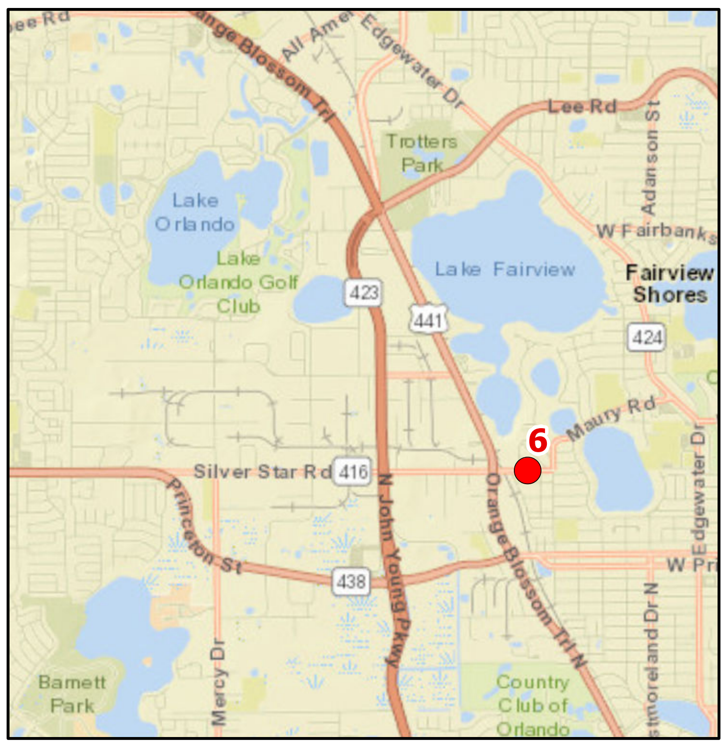
Feature Type: ADA - Safety

Comment:

Lat: 28.5782 **Long:** -81.40405

http://maps.google.com/maps?q=28.5782,-81.40405

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

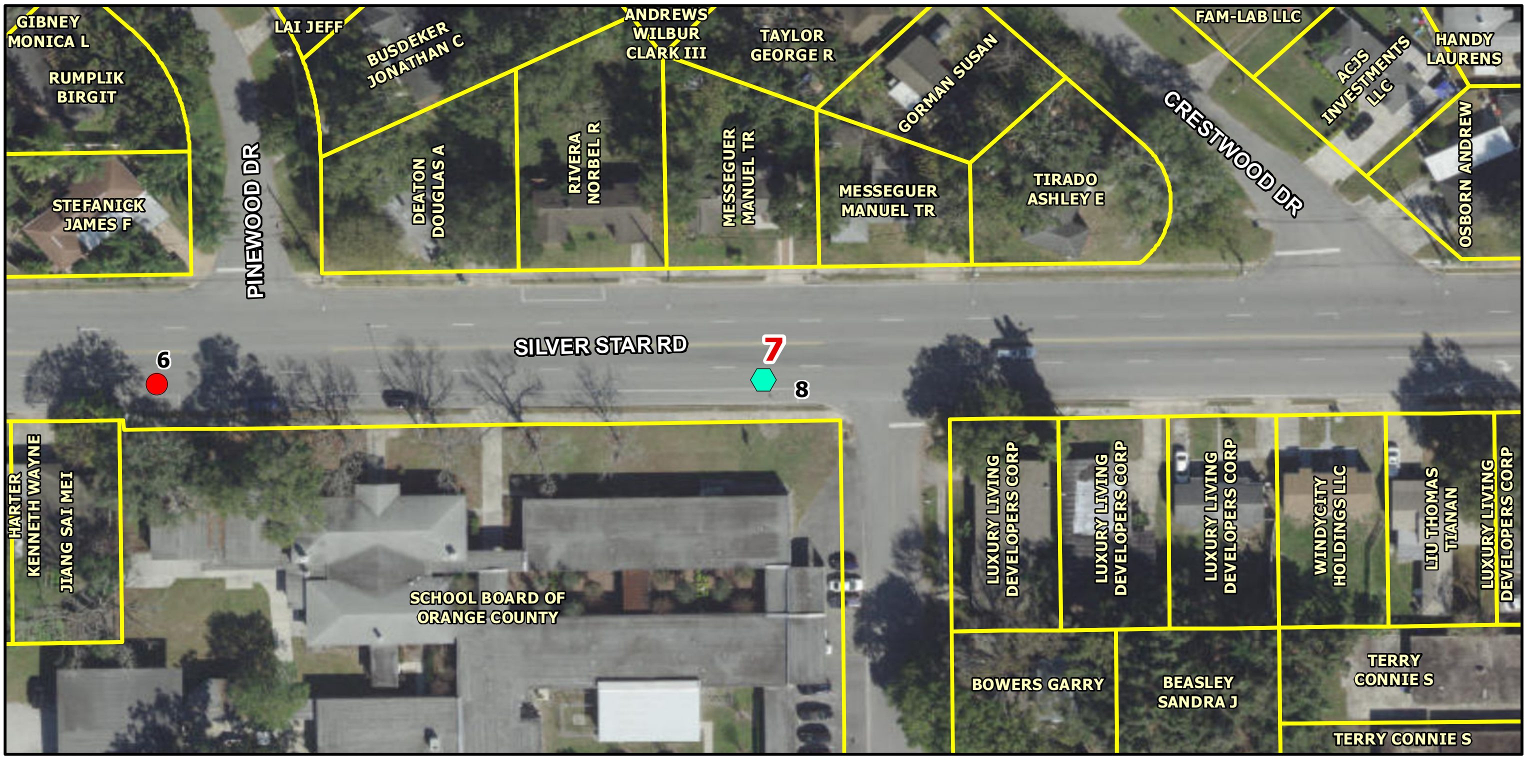
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 7

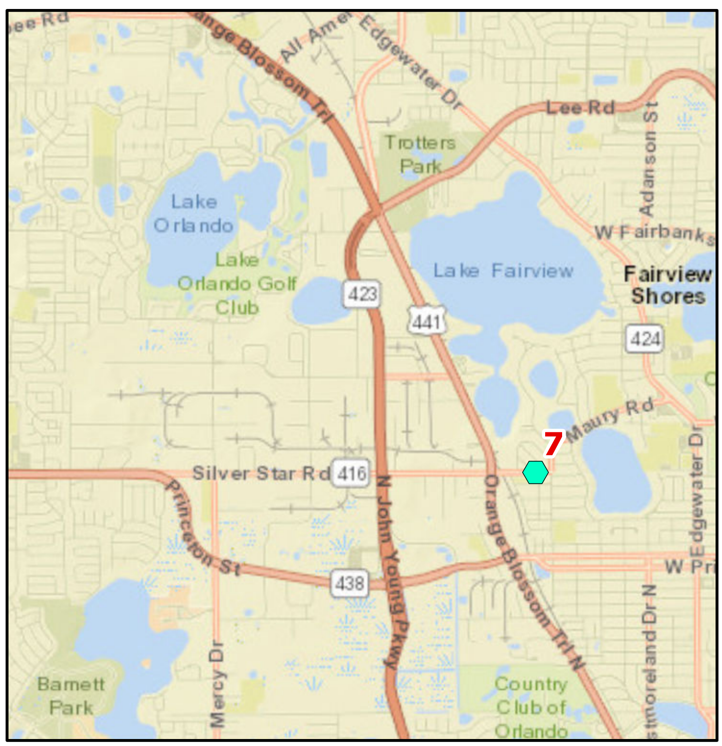
Feature Type: Transit

Comment:

Lat: 28.57821 **Long:** -81.40318

http://maps.google.com/maps?q=28.57821,-81.40318

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

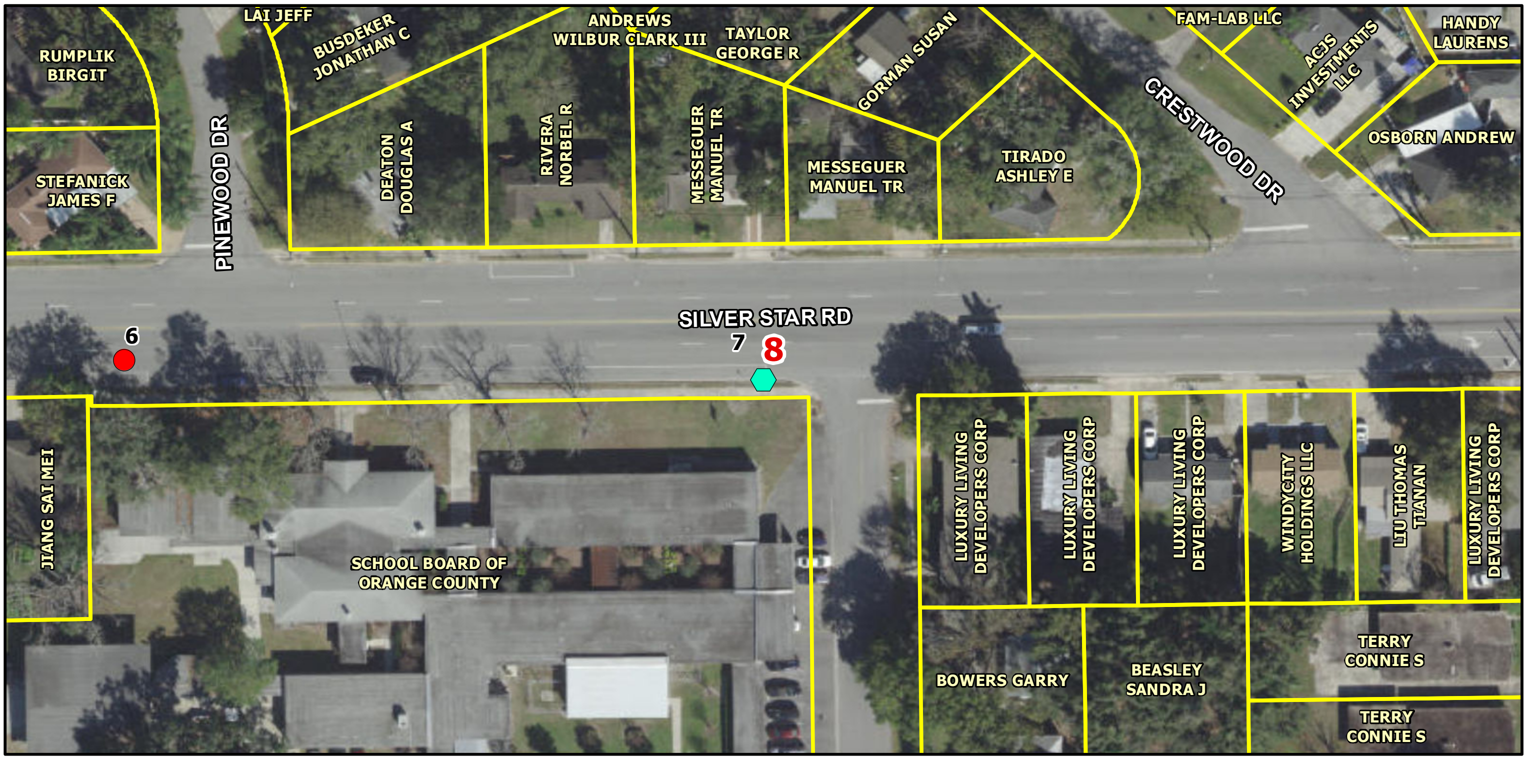
Feet

FDOT

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 8

Feature Type: Transit

Comment:

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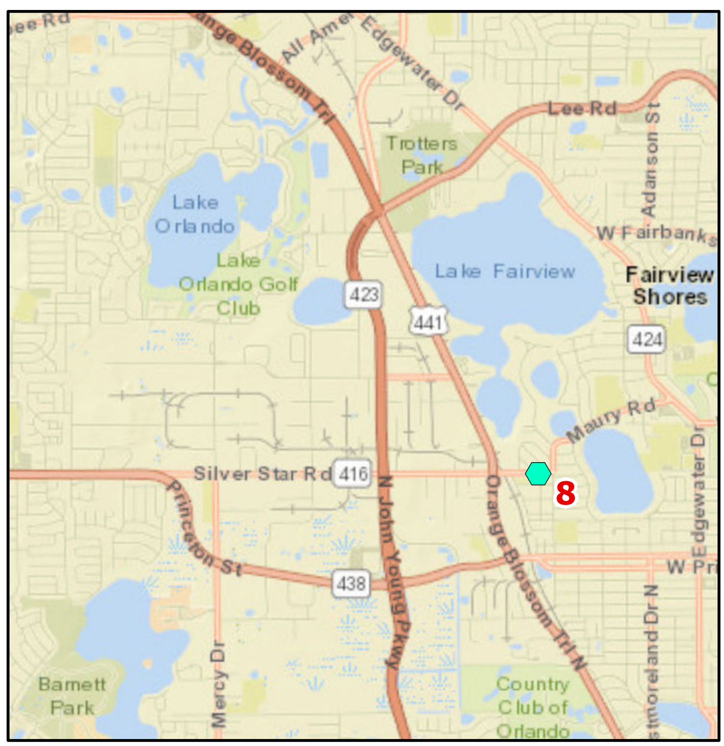
http://maps.google.com/maps?q=28.57817,-81.40314

ADA - Safety
Transit
Damaged Infrastructure
User



Map Scale: 1 Inch = 100 Feet

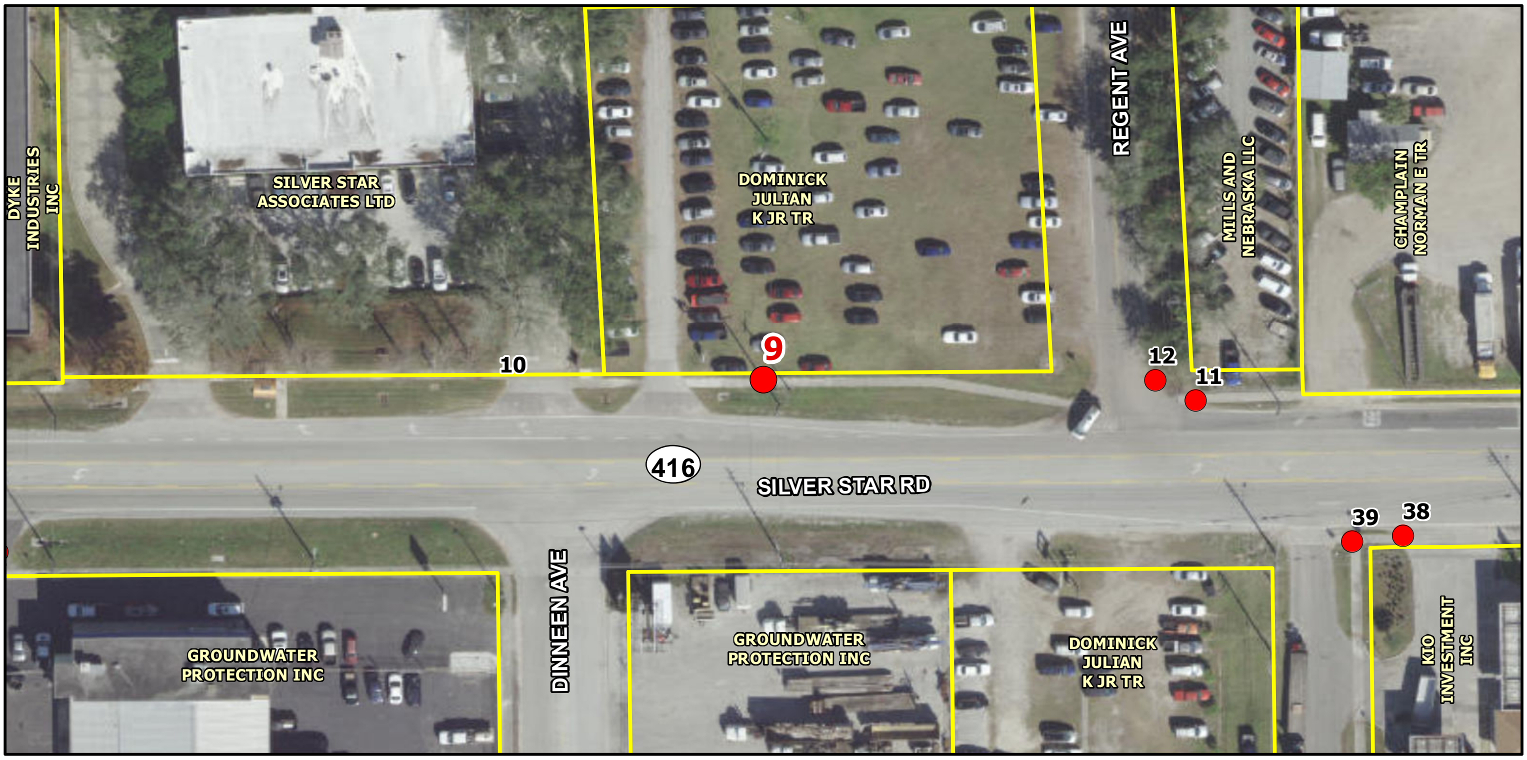
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 9

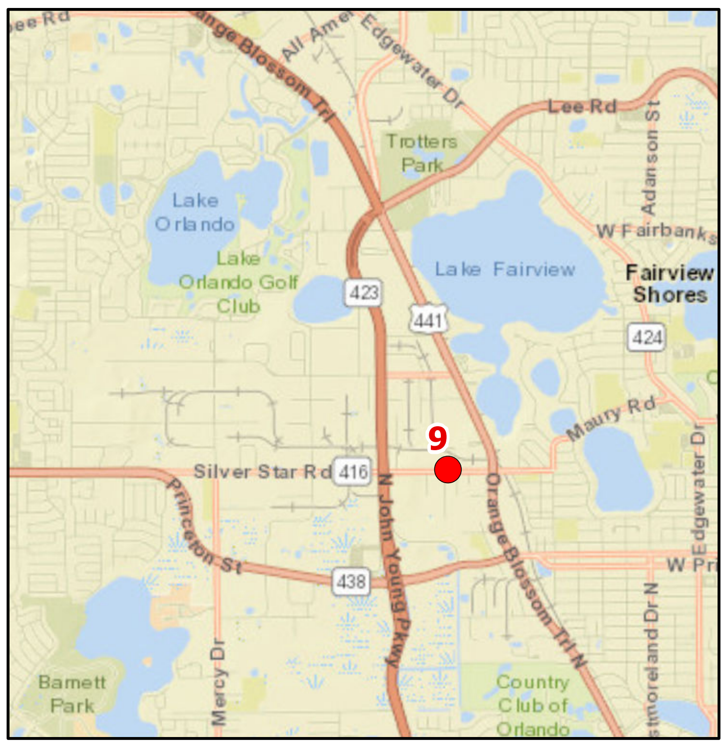
Feature Type: ADA - Safety

Comment:

Lat: 28.5783 **Long:** -81.41088

http://maps.google.com/maps?q=28.5783,-81.41088

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

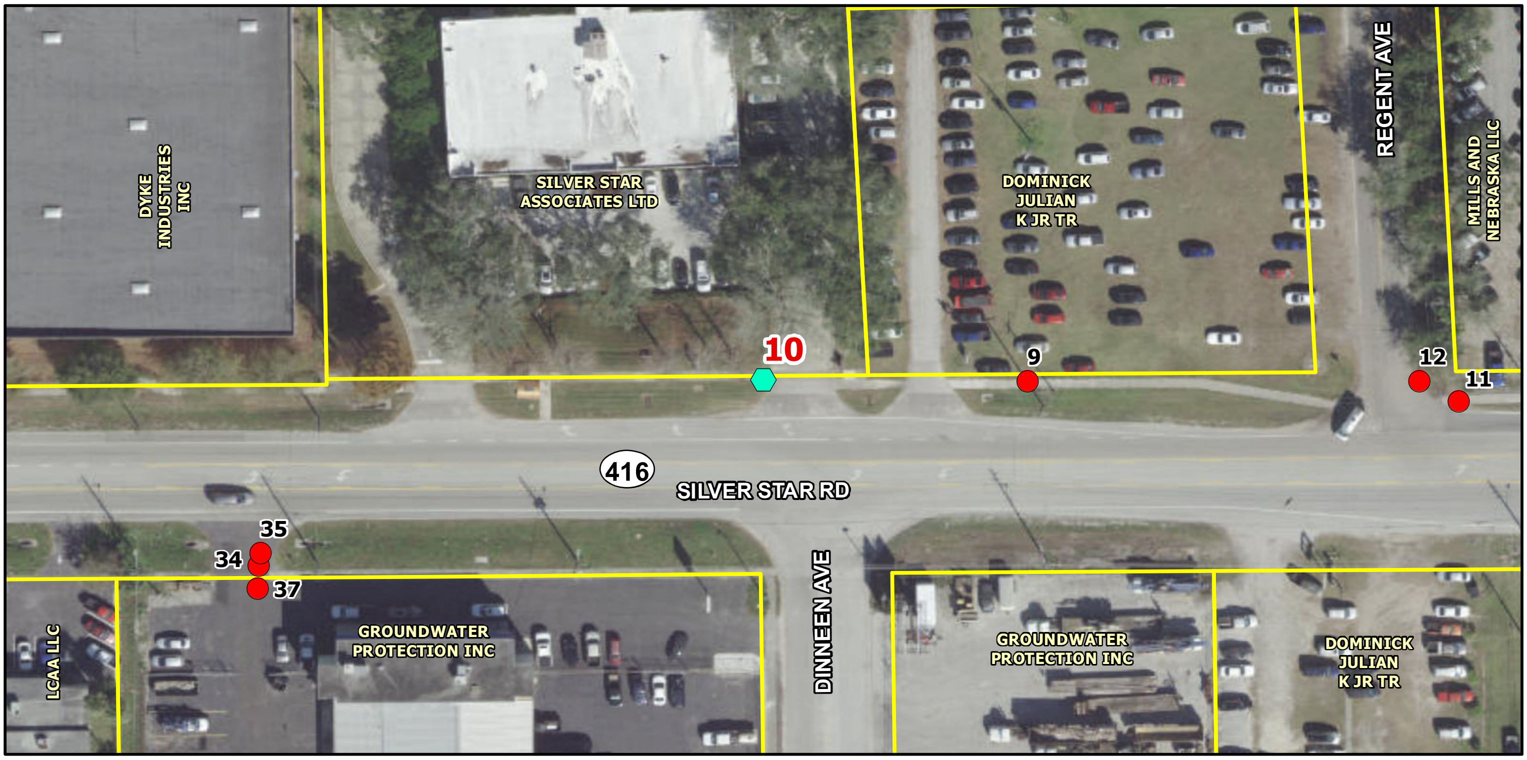
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 10

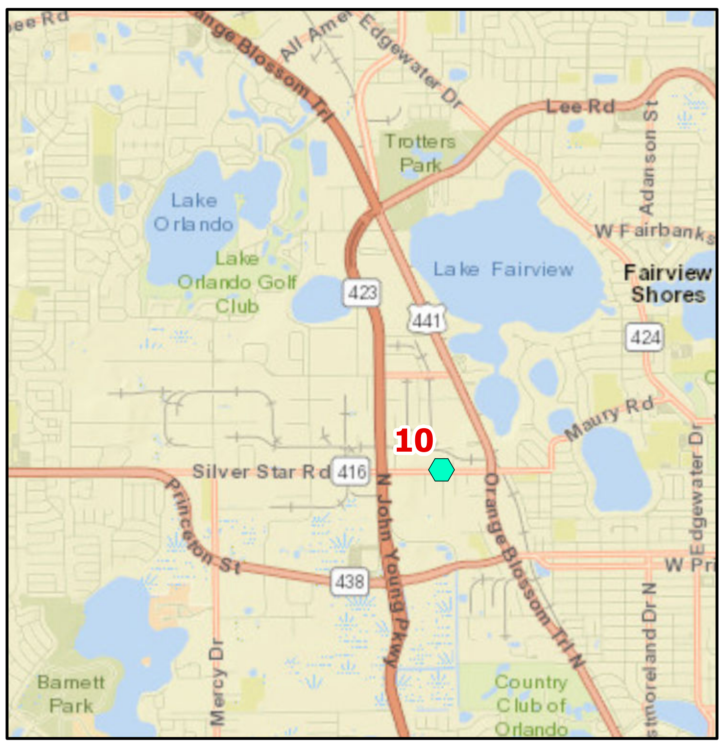
Feature Type: Transit

Comment: Bus Stop with Shelter

Lat: 28.5783 **Long:** -81.41125

http://maps.google.com/maps?q=28.5783,-81.41125

ADA - Safety | Transit | Damaged Infrastructure | User



Map Scale: 1 Inch = 100 Feet

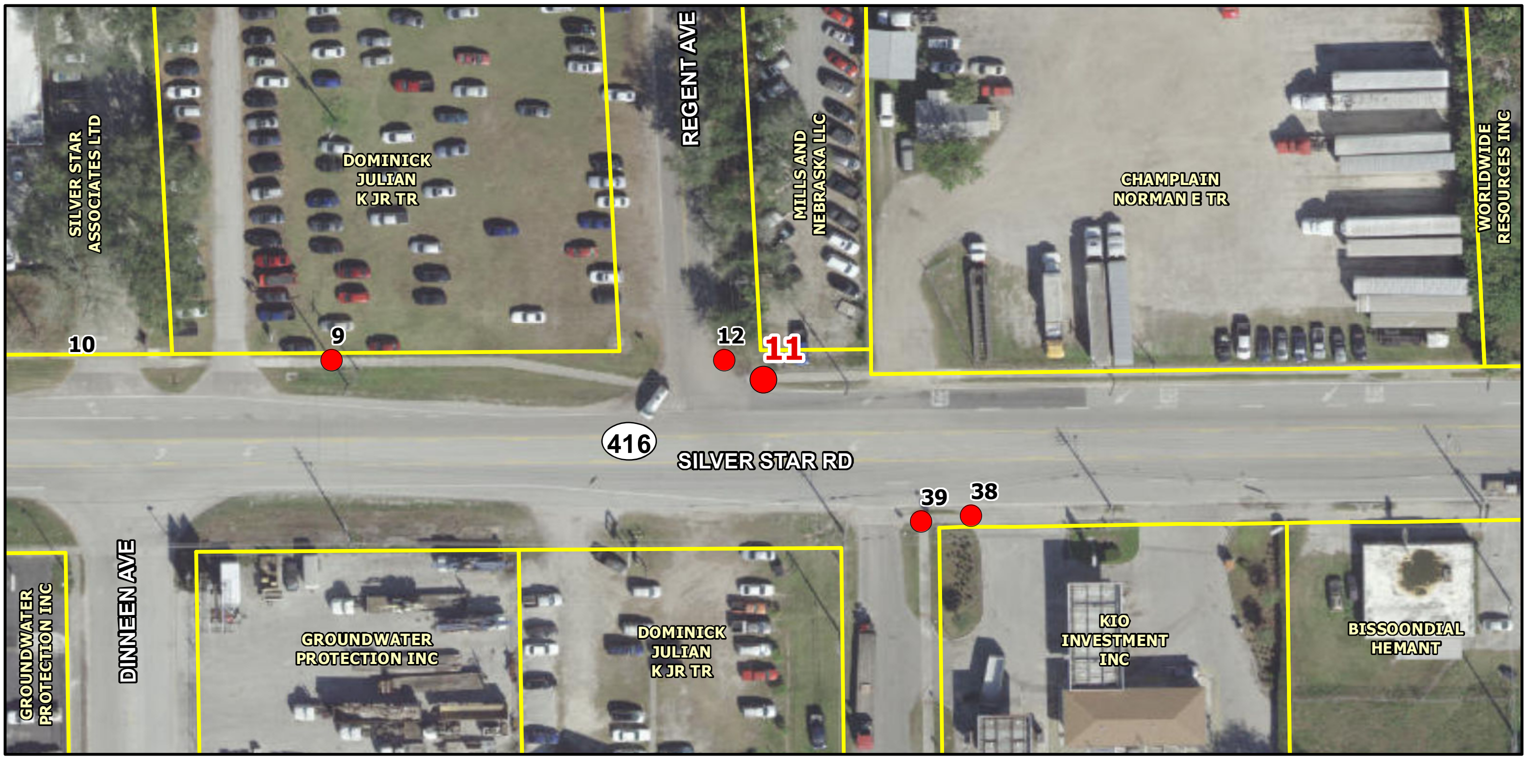
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 11

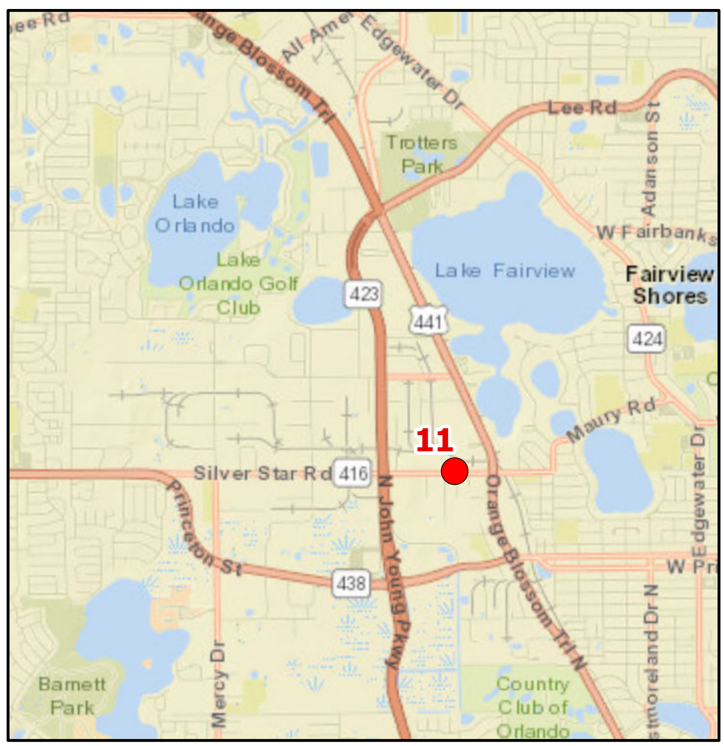
Feature Type: ADA - Safety

Comment:

Lat: 28.57827 **Long:** -81.41026

http://maps.google.com/maps?q=28.57827,-81.41026

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

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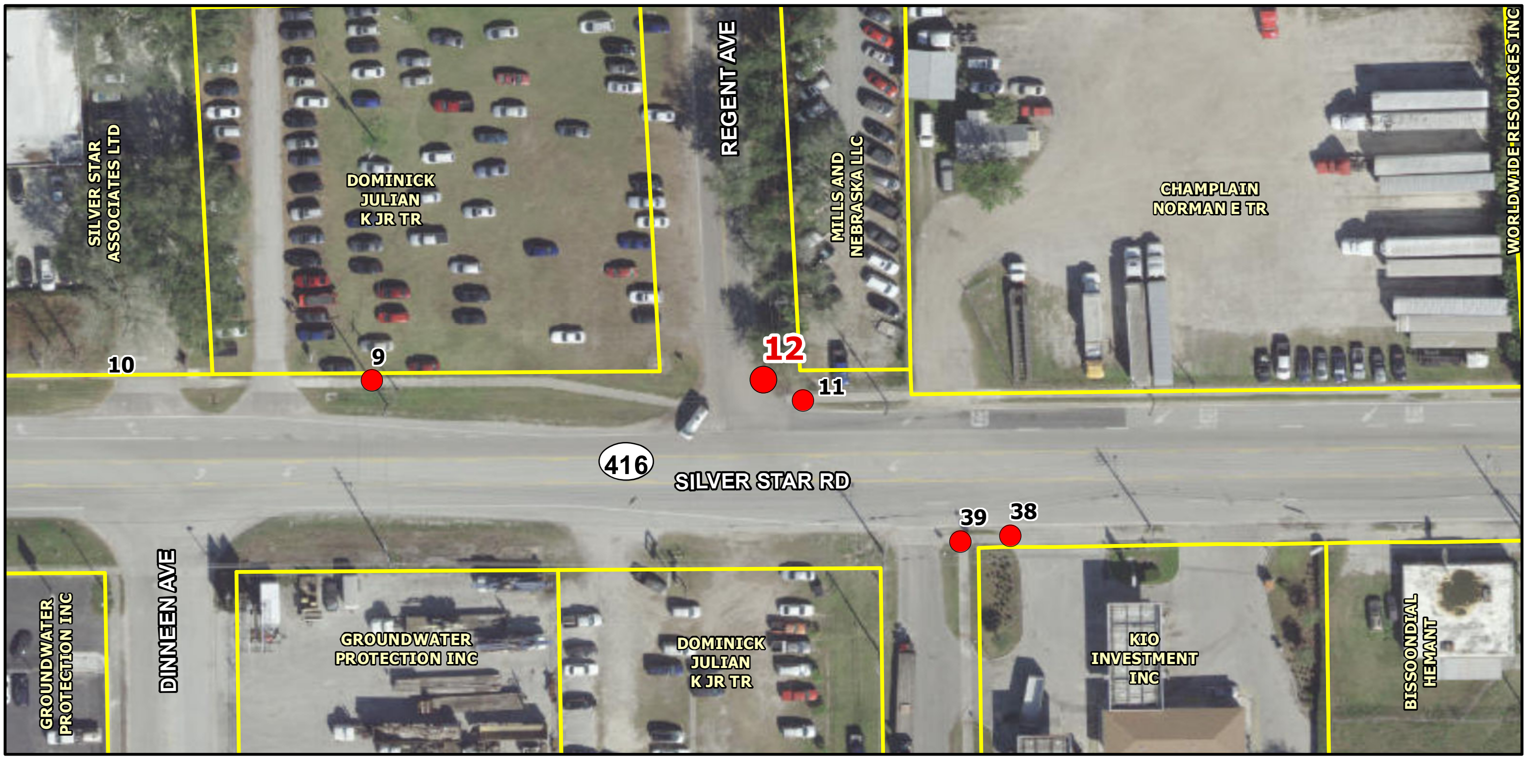

Feature ID: 12

Feature Type: ADA - Safety

Comment:

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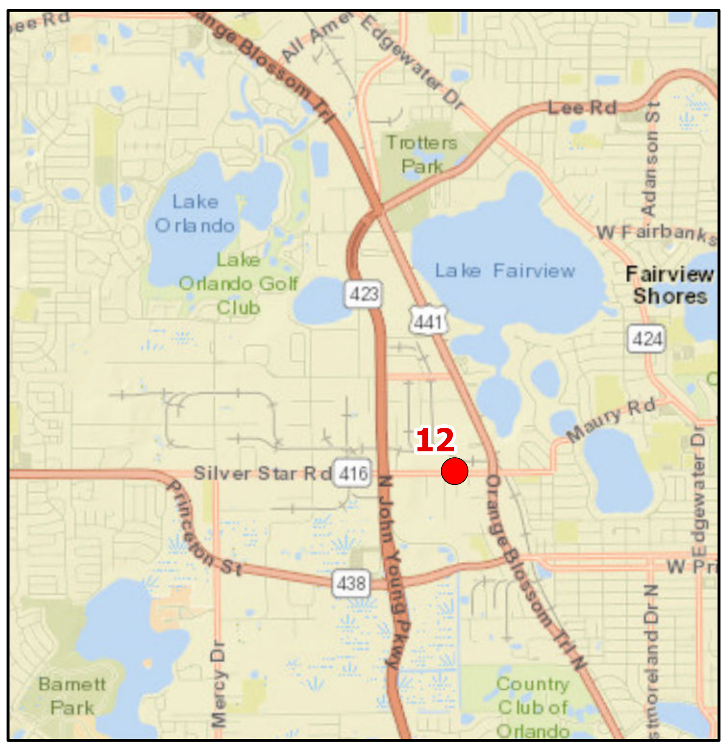
http://maps.google.com/maps?q=28.5783,-81.41032

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

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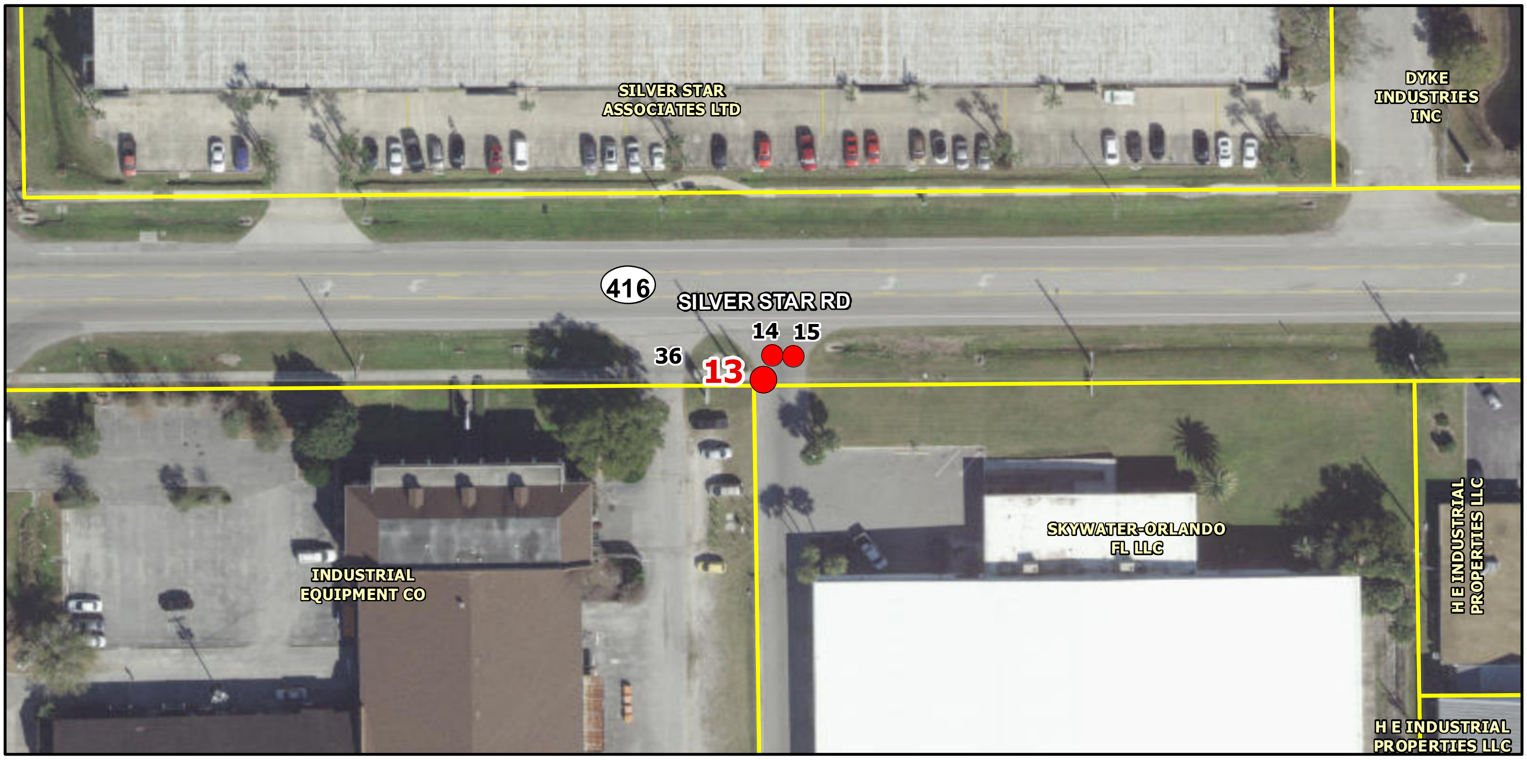

Feature ID: 13

Feature Type: ADA - Safety

Comment:

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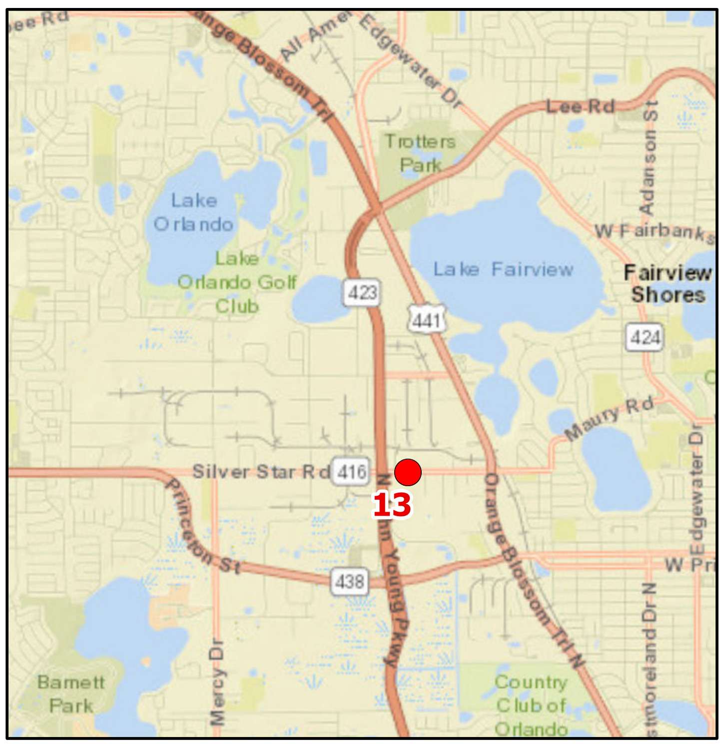
http://maps.google.com/maps?q=28.57801,-81.41415

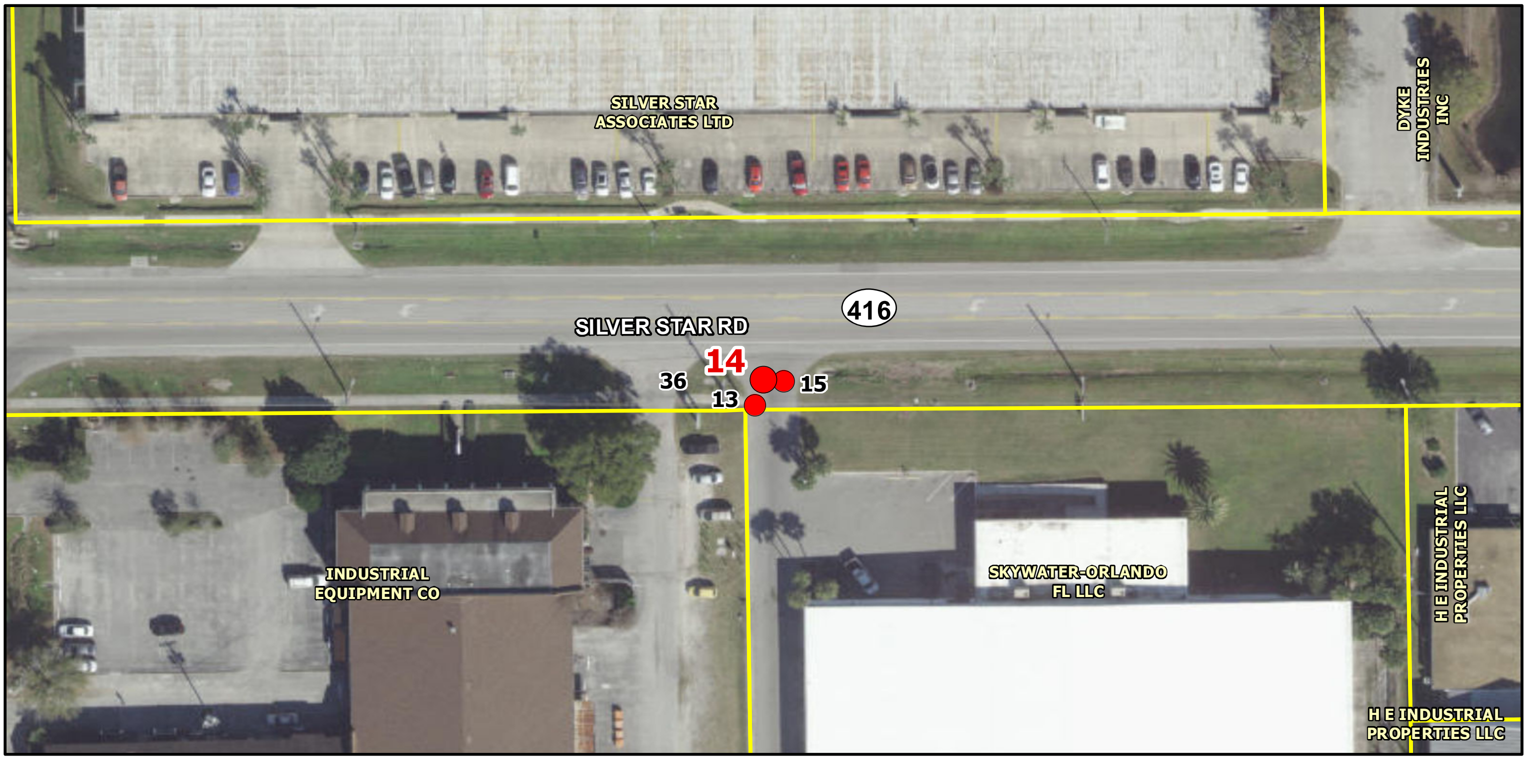
ADA - Safety
Transit
Damaged Infrastructure
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150
Feet

Field Observations
Silver Star Freight
Existing Bike and Ped Transit Infrastructure



Feature ID: 14

Feature Type: ADA - Safety

Comment:

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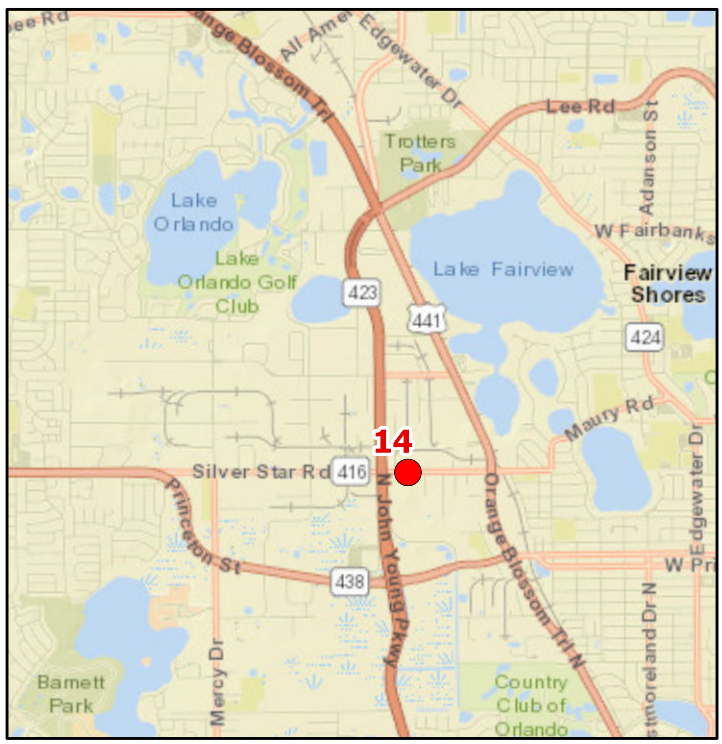
http://maps.google.com/maps?q=28.57805,-81.41414

ADA - Safety
Transit
Damaged Infrastructure
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

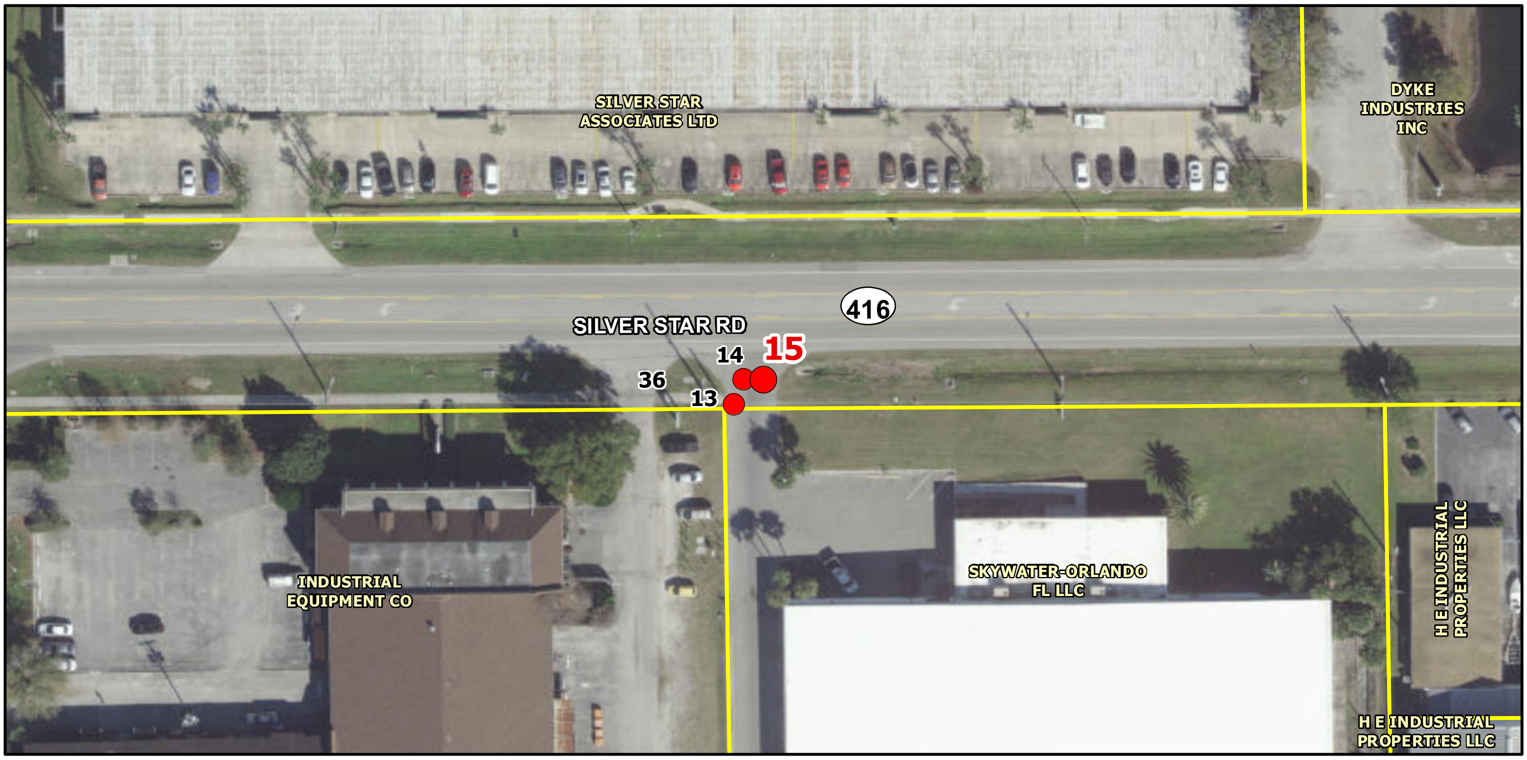
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021



Feature ID: 15

Feature Type: ADA - Safety

Comment:

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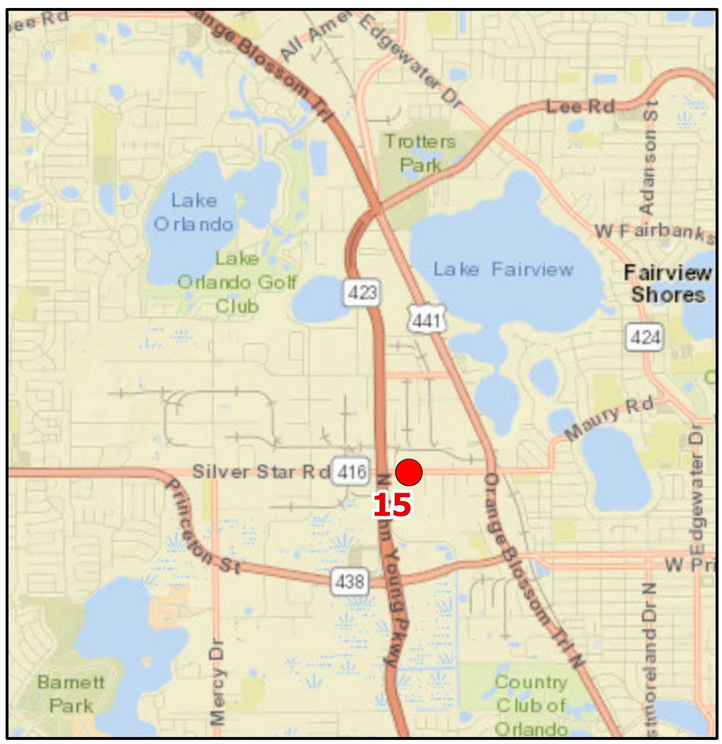
http://maps.google.com/maps?q=28.57804,-81.41411

ADA - Safety | Transit
Damaged Infrastructure | User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

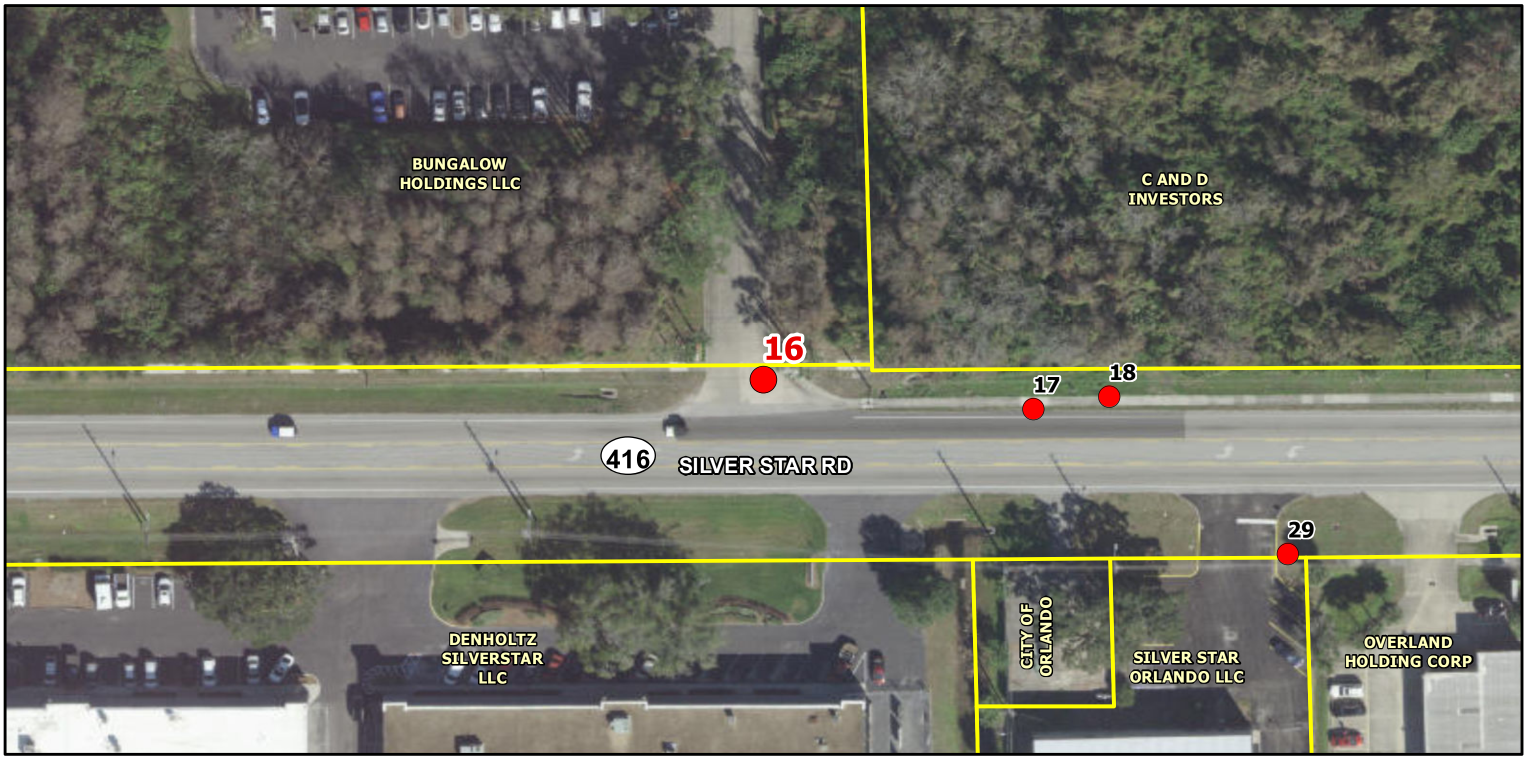
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021



Feature ID: 16

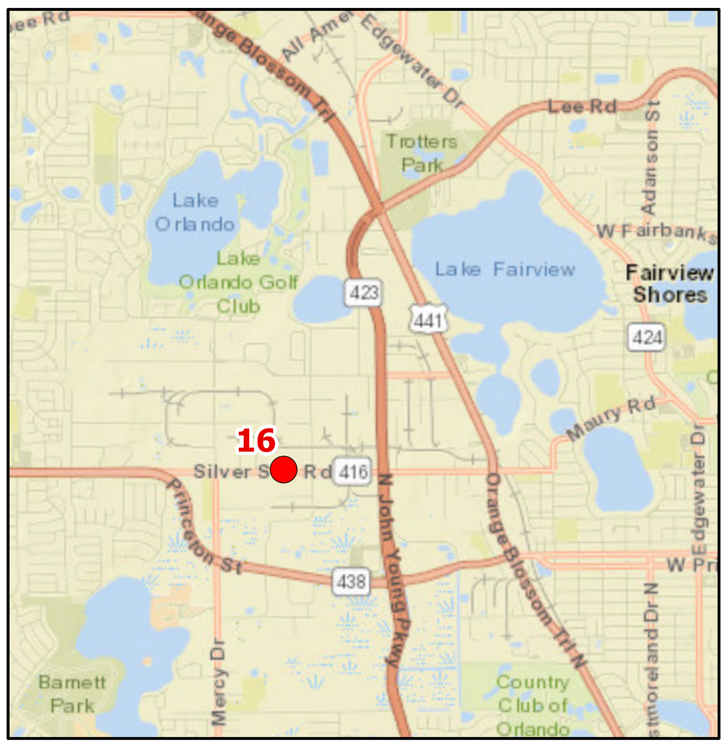
Feature Type: ADA - Safety

Comment:

Lat: 28.5782 **Long:** -81.4249

http://maps.google.com/maps?q=28.5782,-81.4249

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

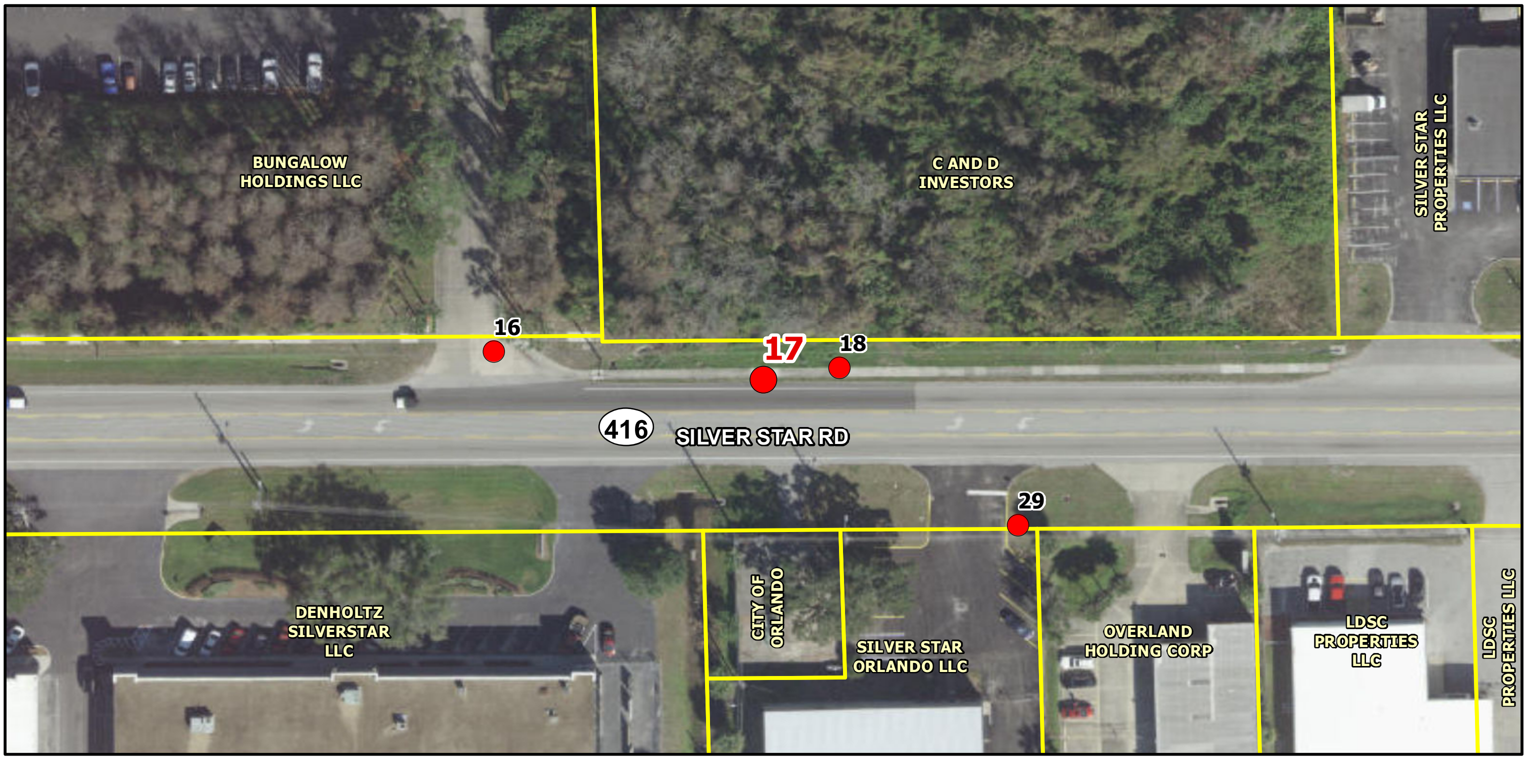
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 17

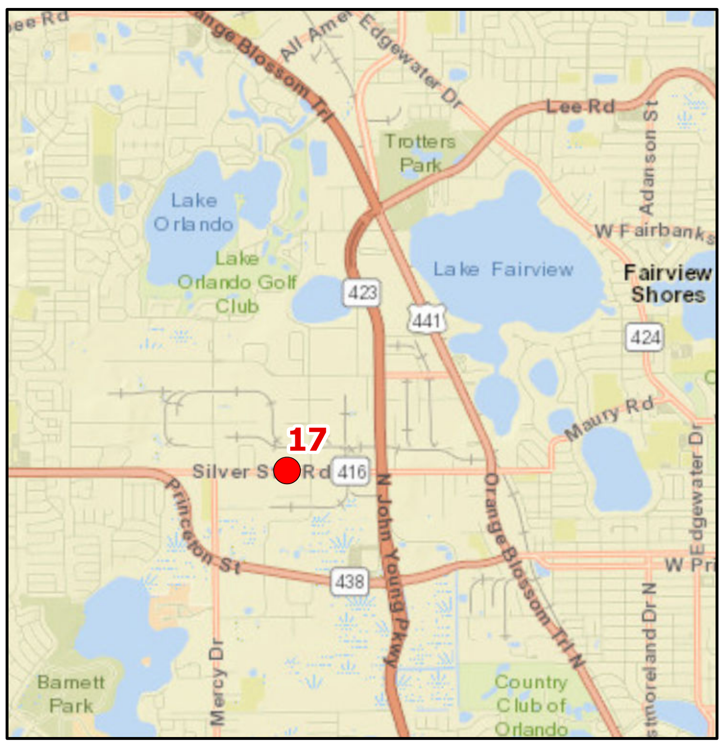
Feature Type: ADA - Safety

Comment:

Lat: 28.57816 **Long:** -81.42451

http://maps.google.com/maps?q=28.57816,-81.42451

- ADA - Safety
- Damaged Infrastructure
- Transit
- User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

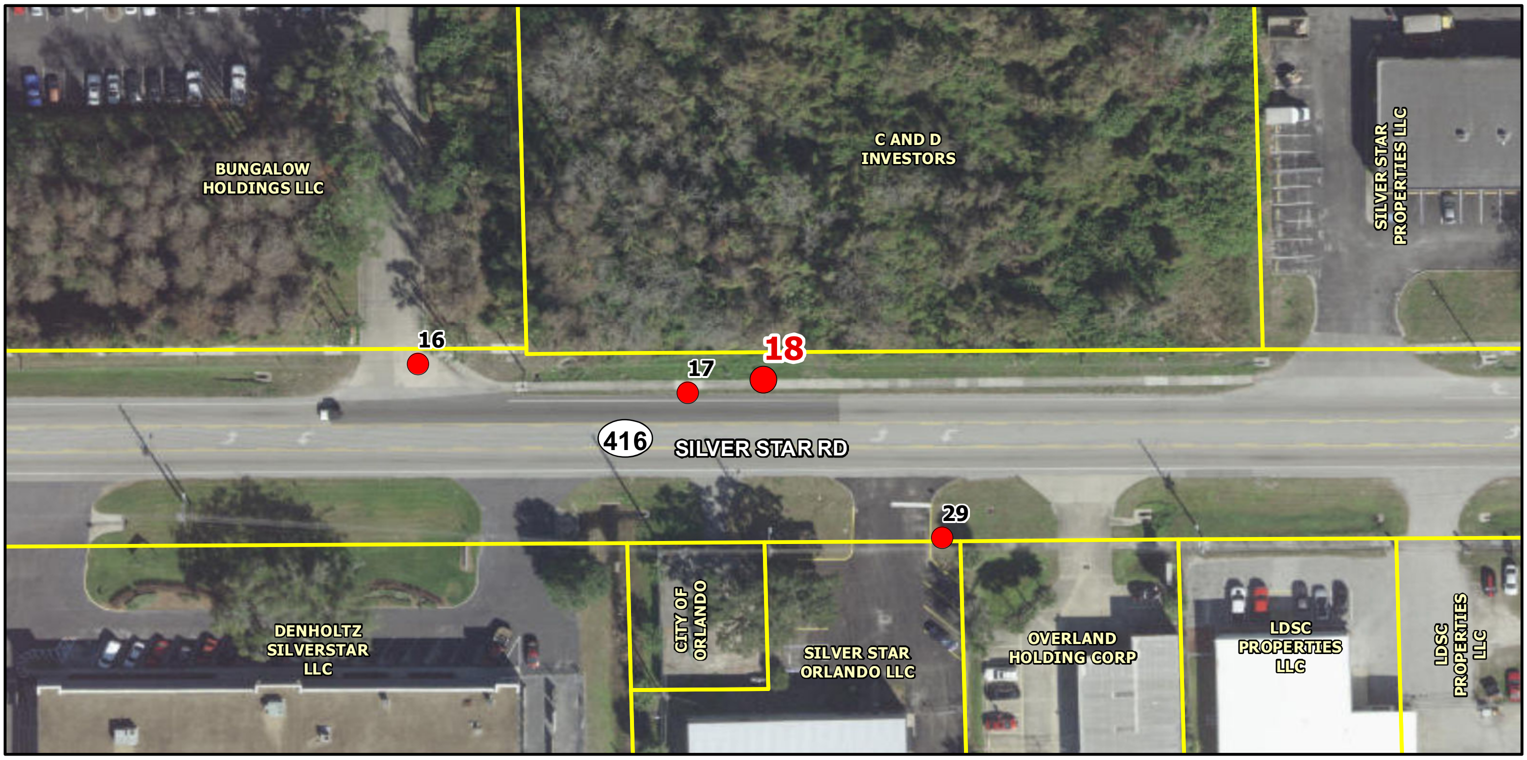
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021



Feature ID: 18

Feature Type: ADA - Safety

Comment:

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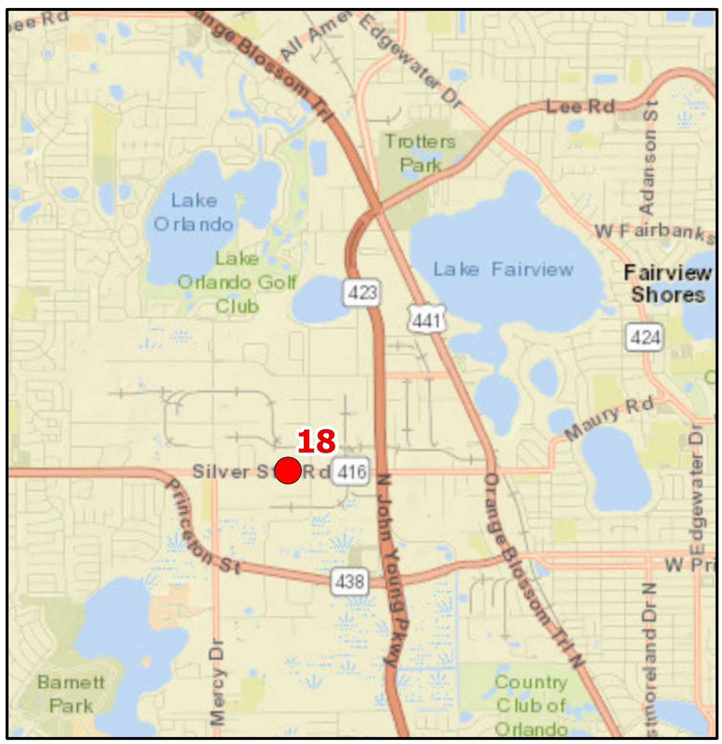
http://maps.google.com/maps?q=28.57818,-81.42441

ADA - Safety
Transit
Damaged Infrastructure
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

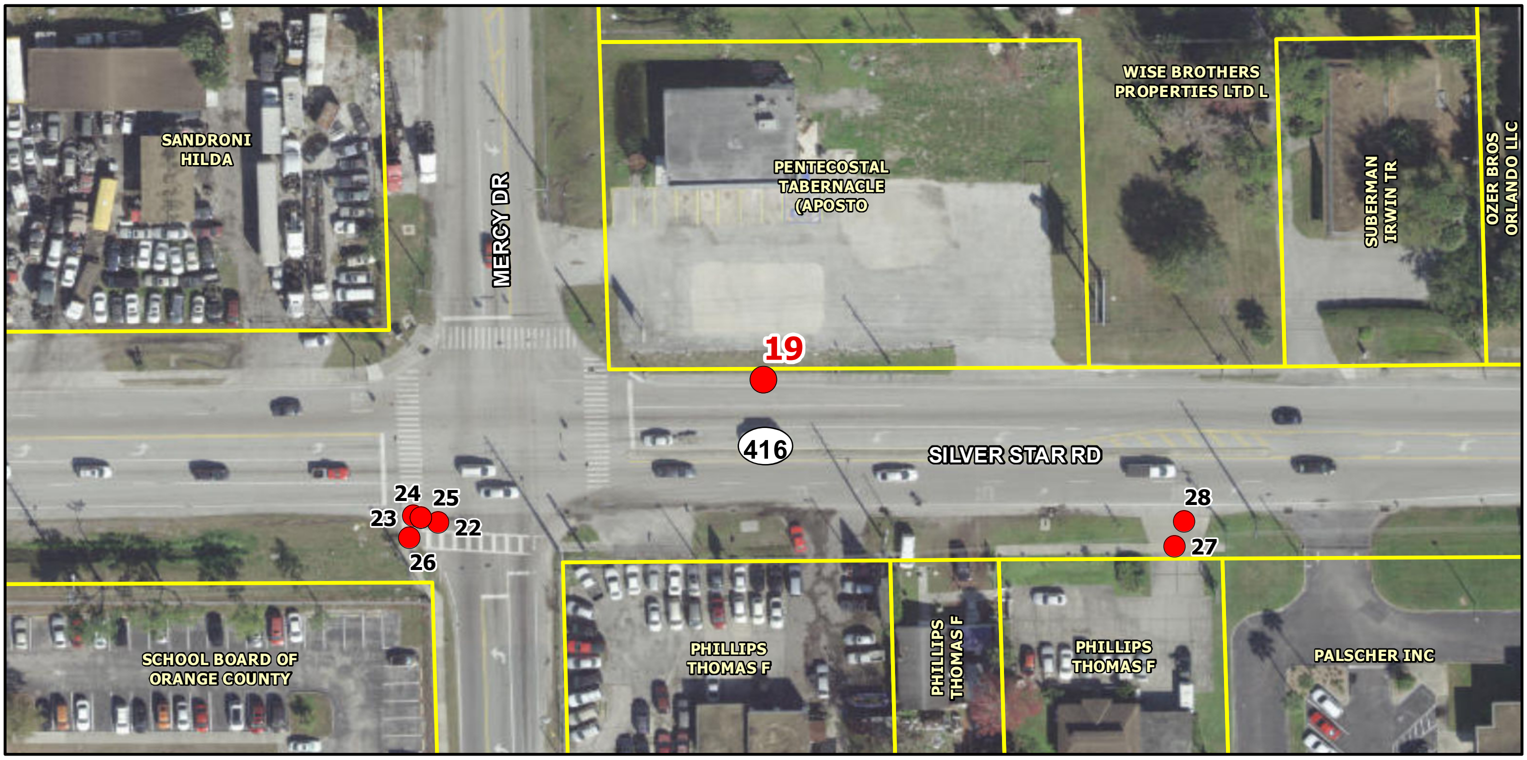
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021



Feature ID: 19

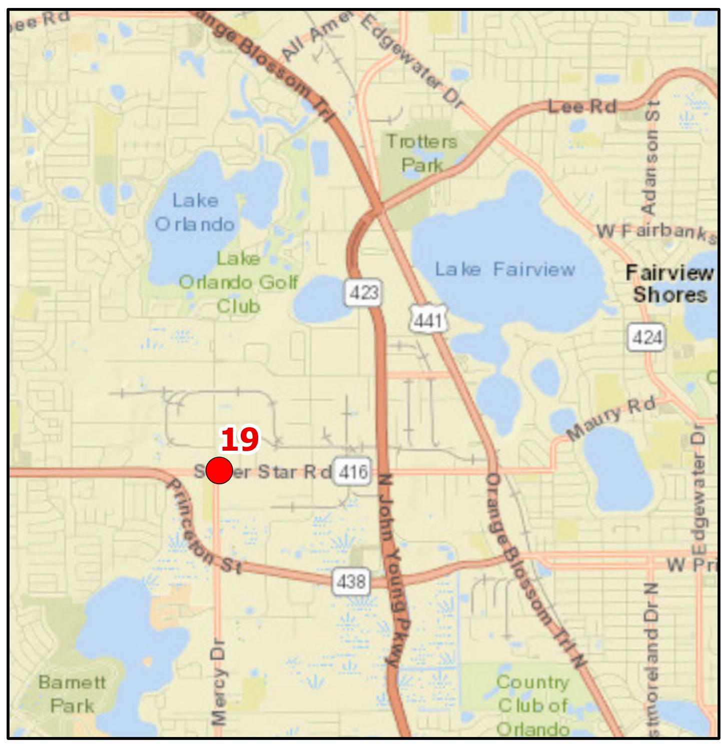
Feature Type: ADA - Safety

Comment:

Lat: 28.57817 **Long:** -81.43043

http://maps.google.com/maps?q=28.57817,-81.43043

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

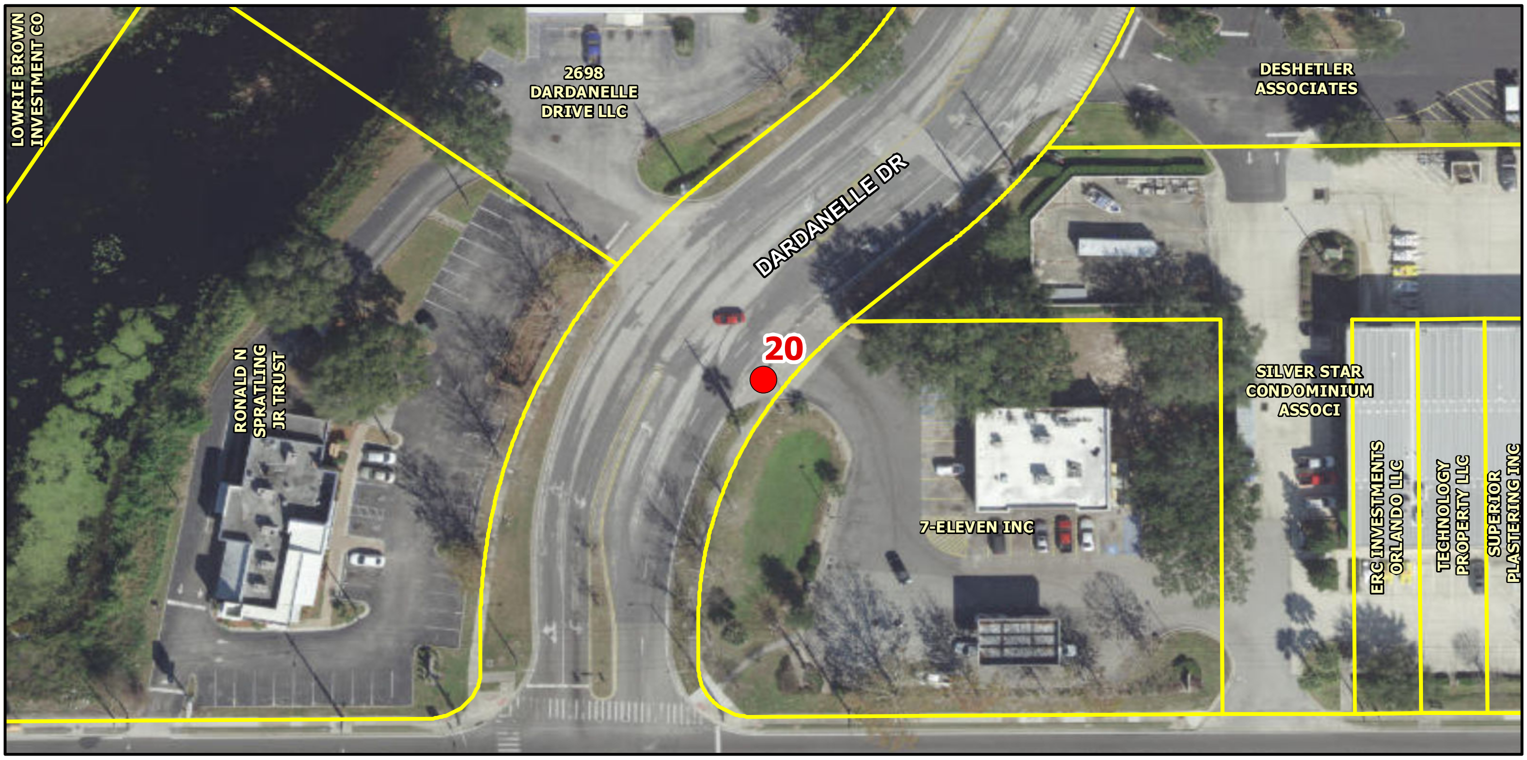
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 20

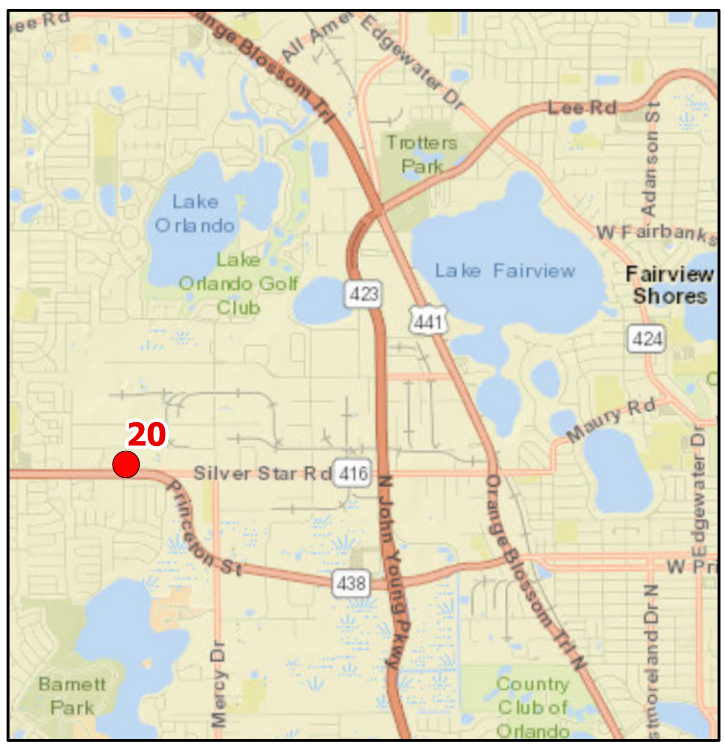
Feature Type: ADA - Safety

Comment: Bike Lane and new sidewalk

Lat: 28.57866 **Long:** -81.43842

http://maps.google.com/maps?q=28.57866,-81.43842

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

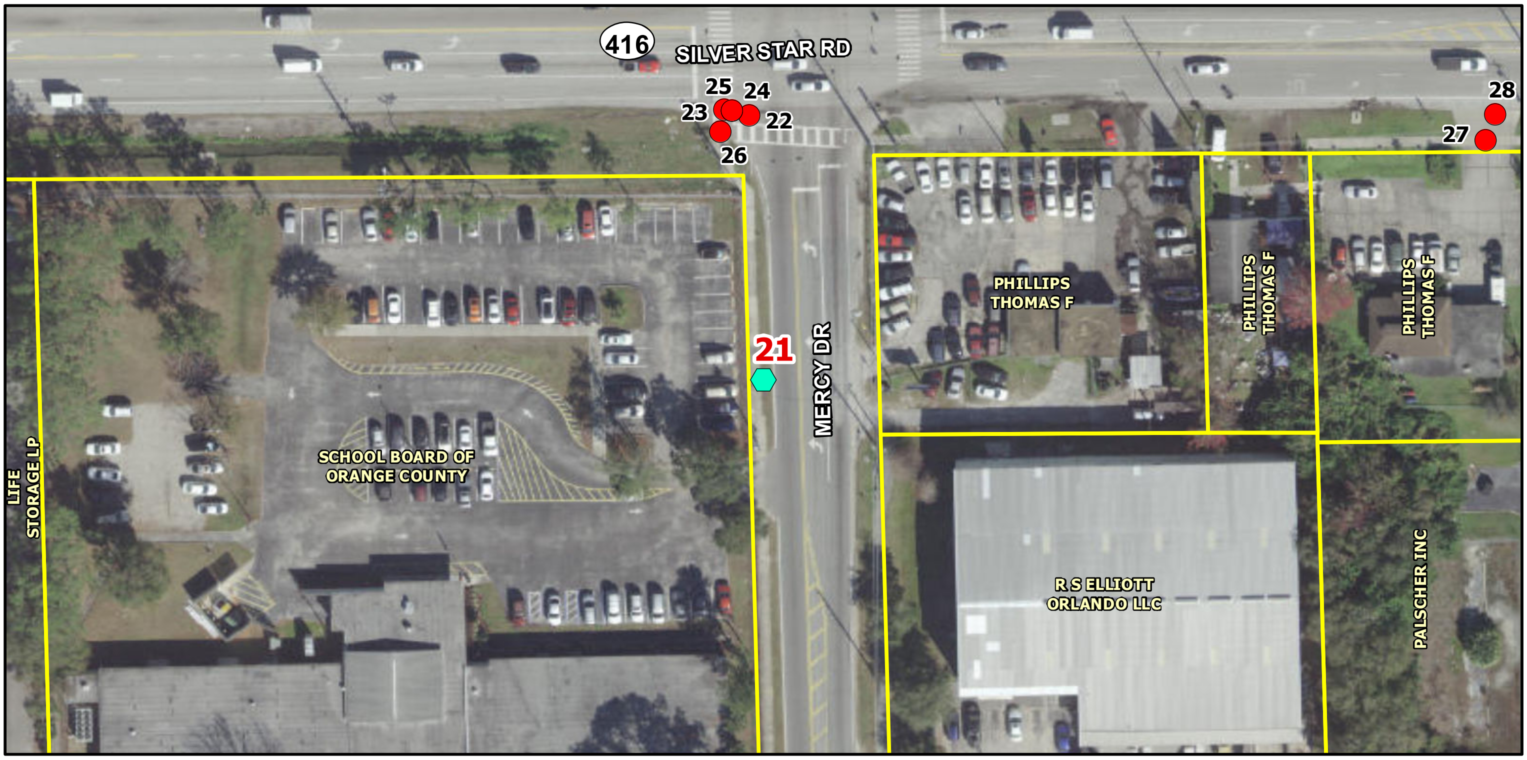
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 21

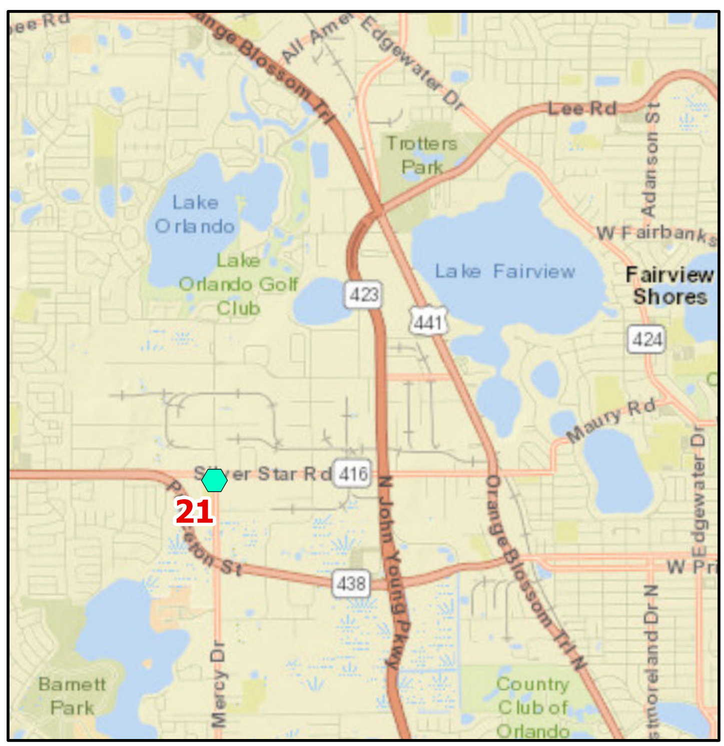
Feature Type: Transit

Comment: Bus Stop

Lat: 28.57759 **Long:** -81.43087

http://maps.google.com/maps?q=28.57759,-81.43087

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

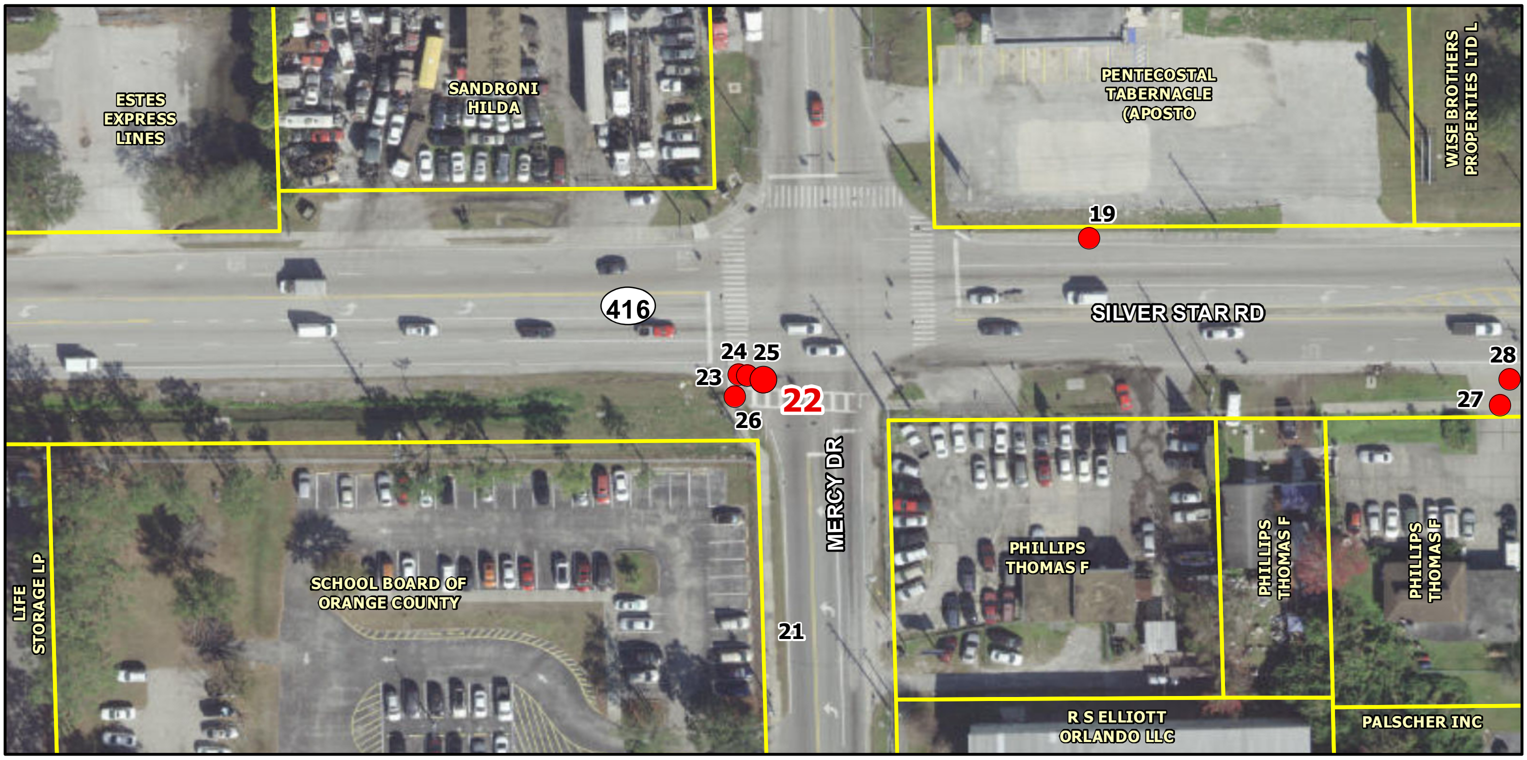
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 22

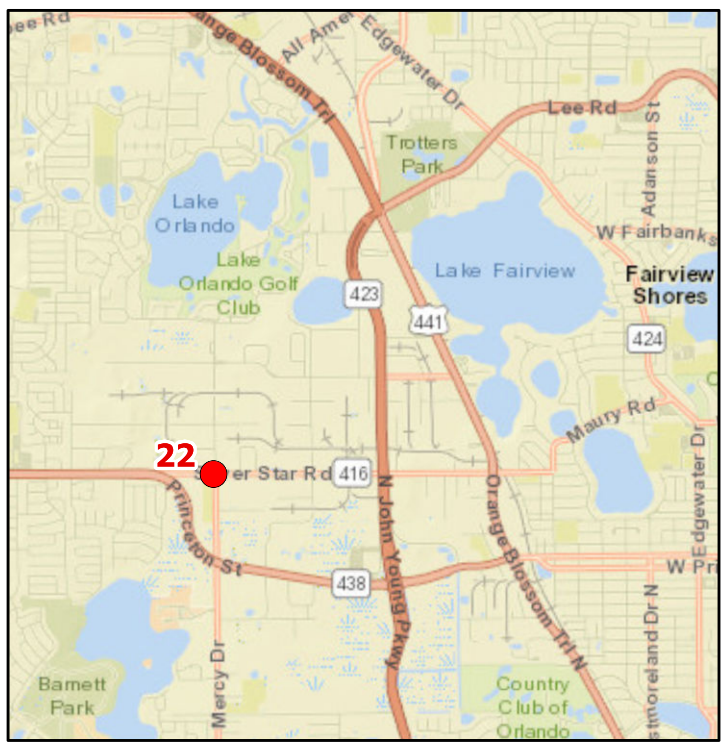
Feature Type: ADA - Safety

Comment:

Lat: 28.57797 **Long:** -81.43089

http://maps.google.com/maps?q=28.57797,-81.43089

ADA - Safety
Damaged Infrastructure
Transit
User



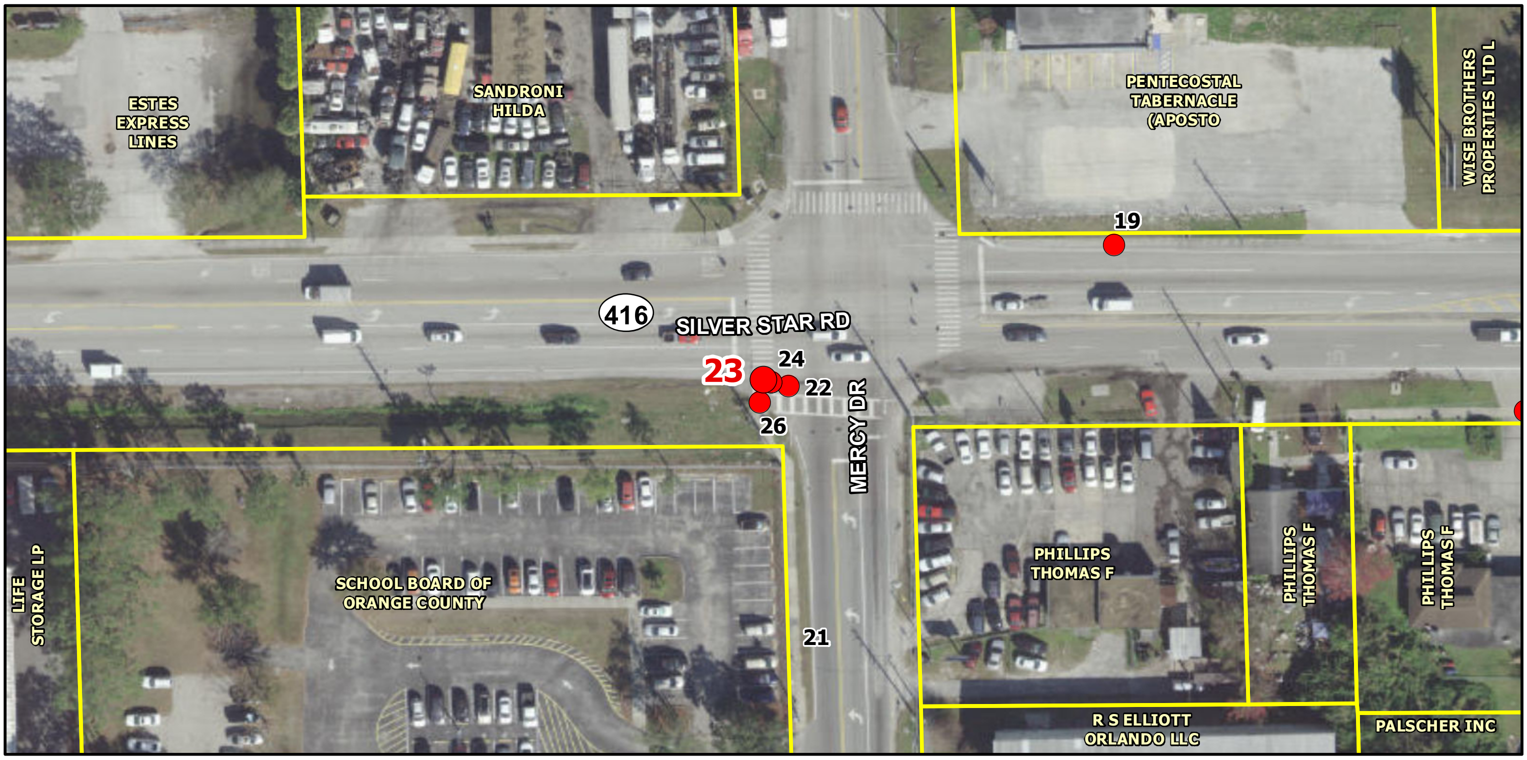
Map Scale: 1 Inch = 100 Feet

0 50 100 150
Feet

Field Observations

Silver Star Freight
Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021



Feature ID: 23

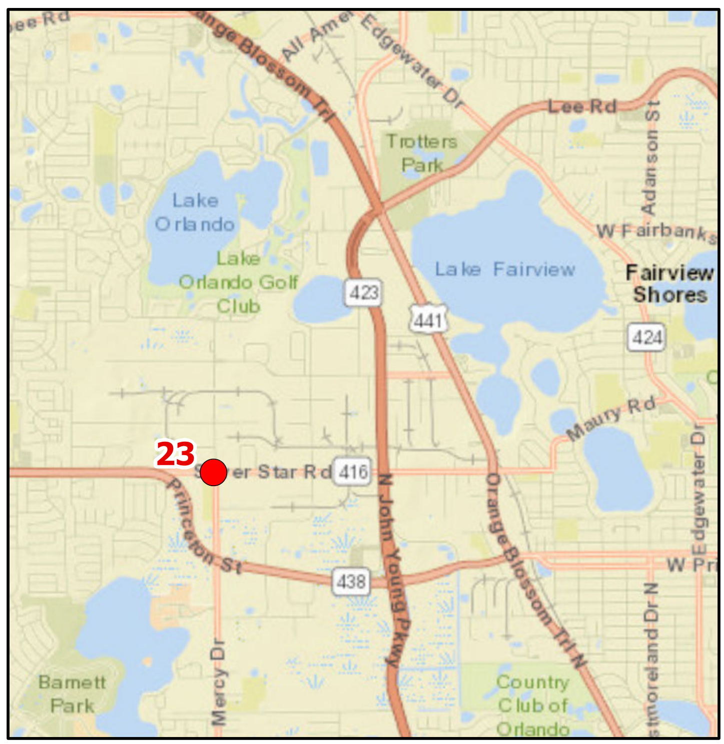
Feature Type: ADA - Safety

Comment:

Lat: 28.57798 **Long:** -81.43093

http://maps.google.com/maps?q=28.57798,-81.43093

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

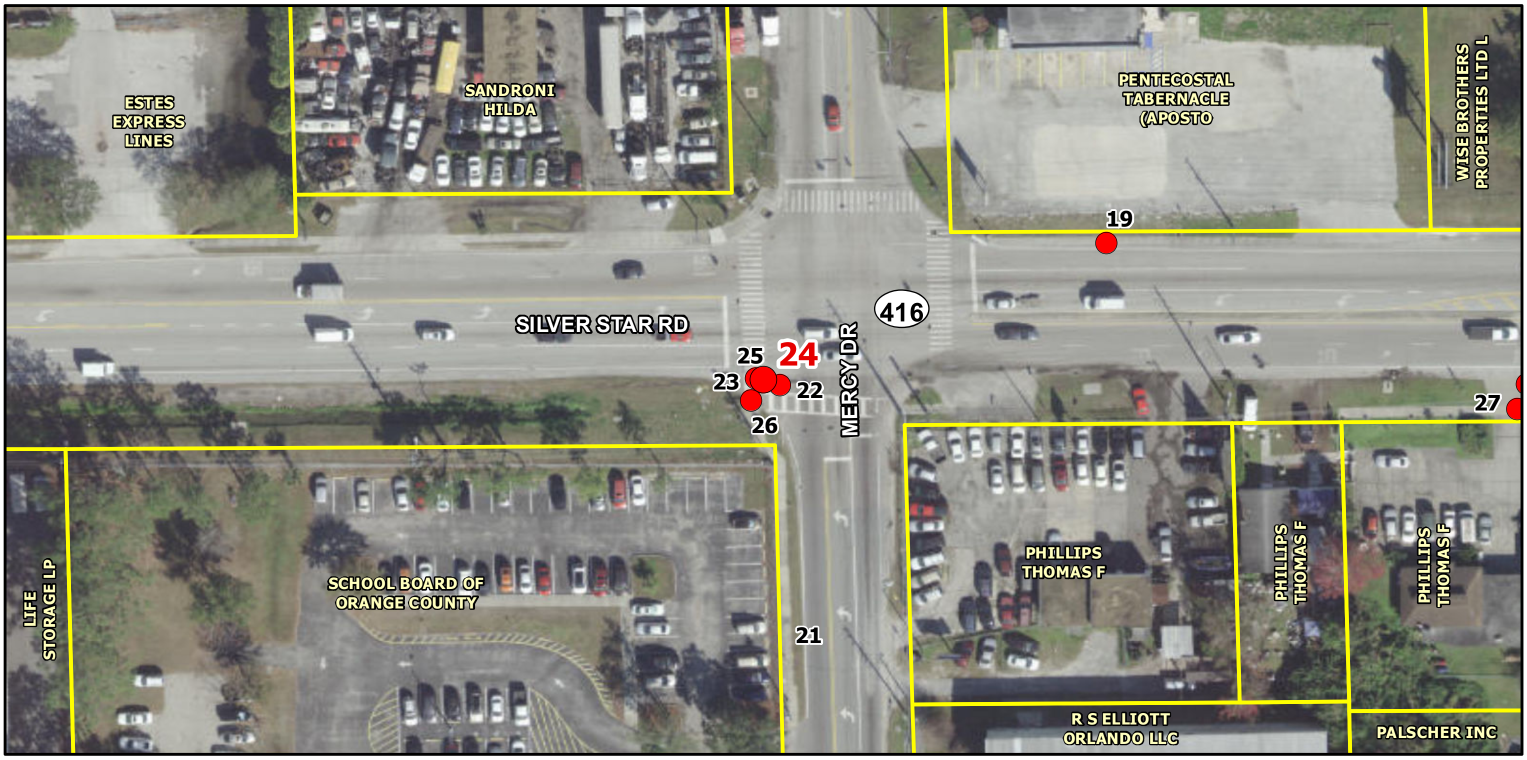
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021



Feature ID: 24

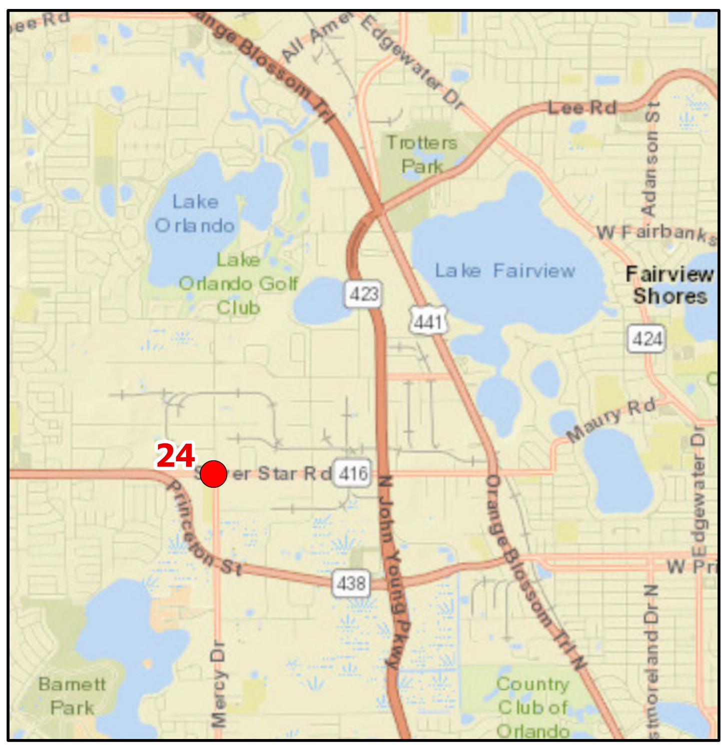
Feature Type: ADA - Safety

Comment: sidewalk ends

Lat: 28.57798 **Long:** -81.43092

http://maps.google.com/maps?q=28.57798,-81.43092

ADA - Safety
Damaged Infrastructure
Transit
User



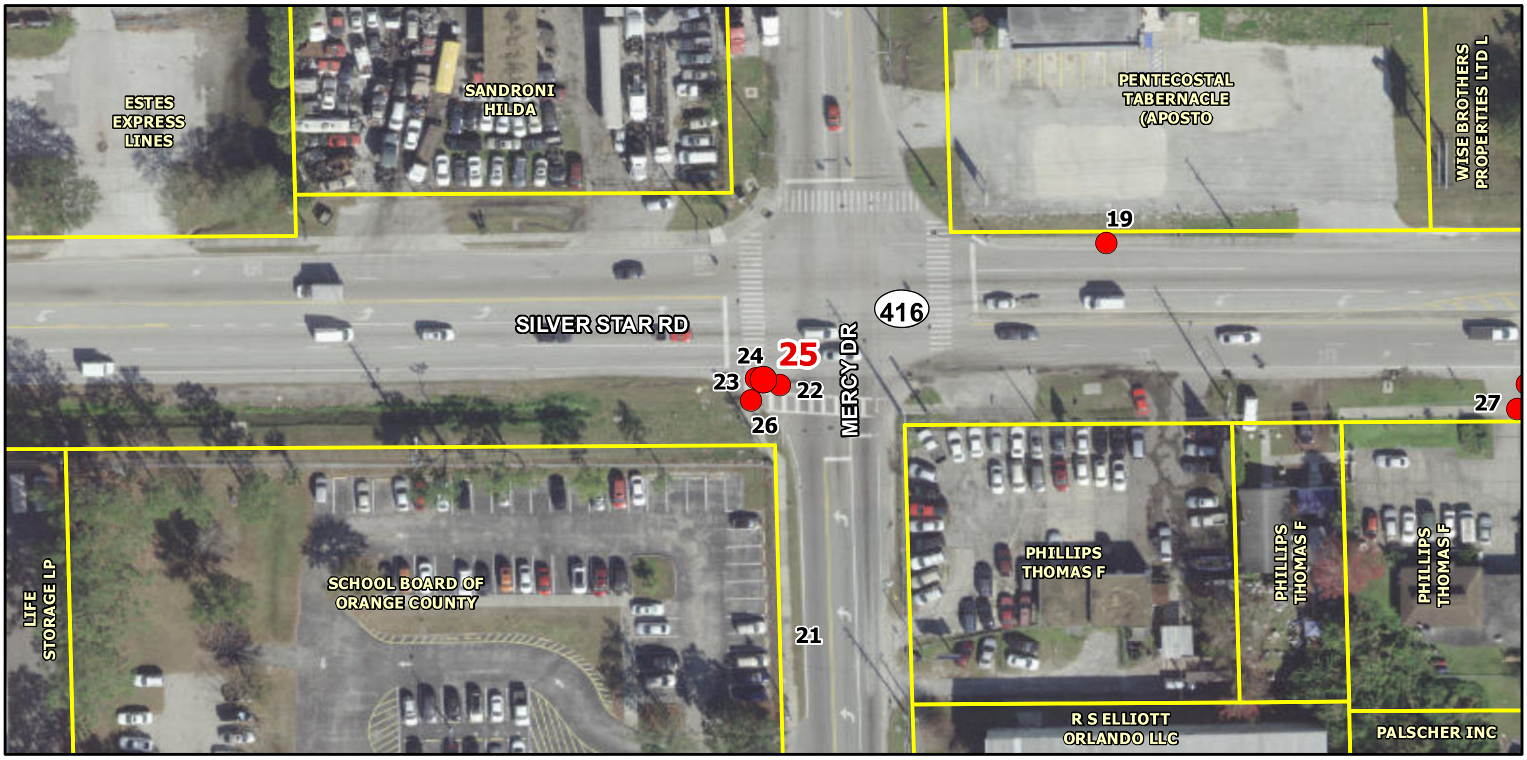
Map Scale: 1 Inch = 100 Feet

0 50 100 150
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 25

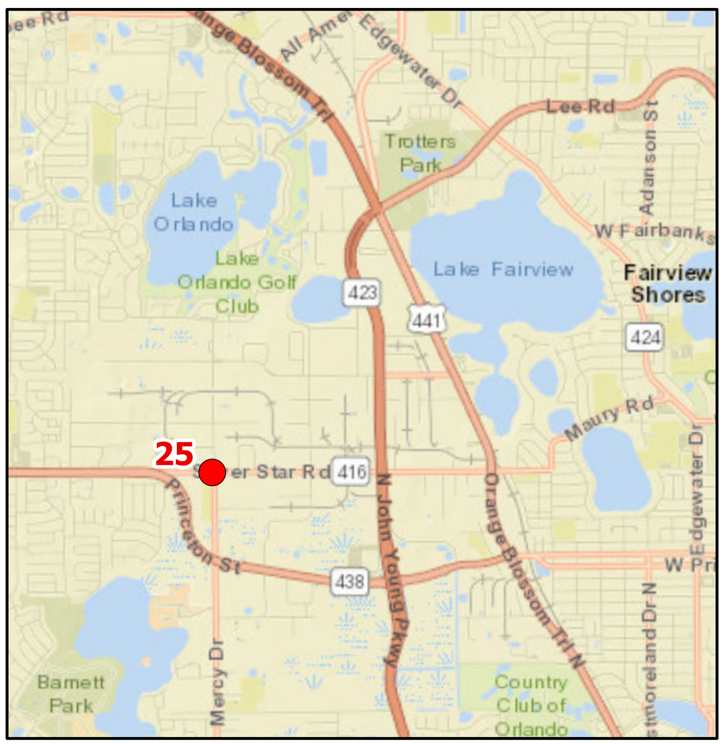
Feature Type: ADA - Safety

Comment:

Lat: 28.57798 **Long:** -81.43092

http://maps.google.com/maps?q=28.57798,-81.43092

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

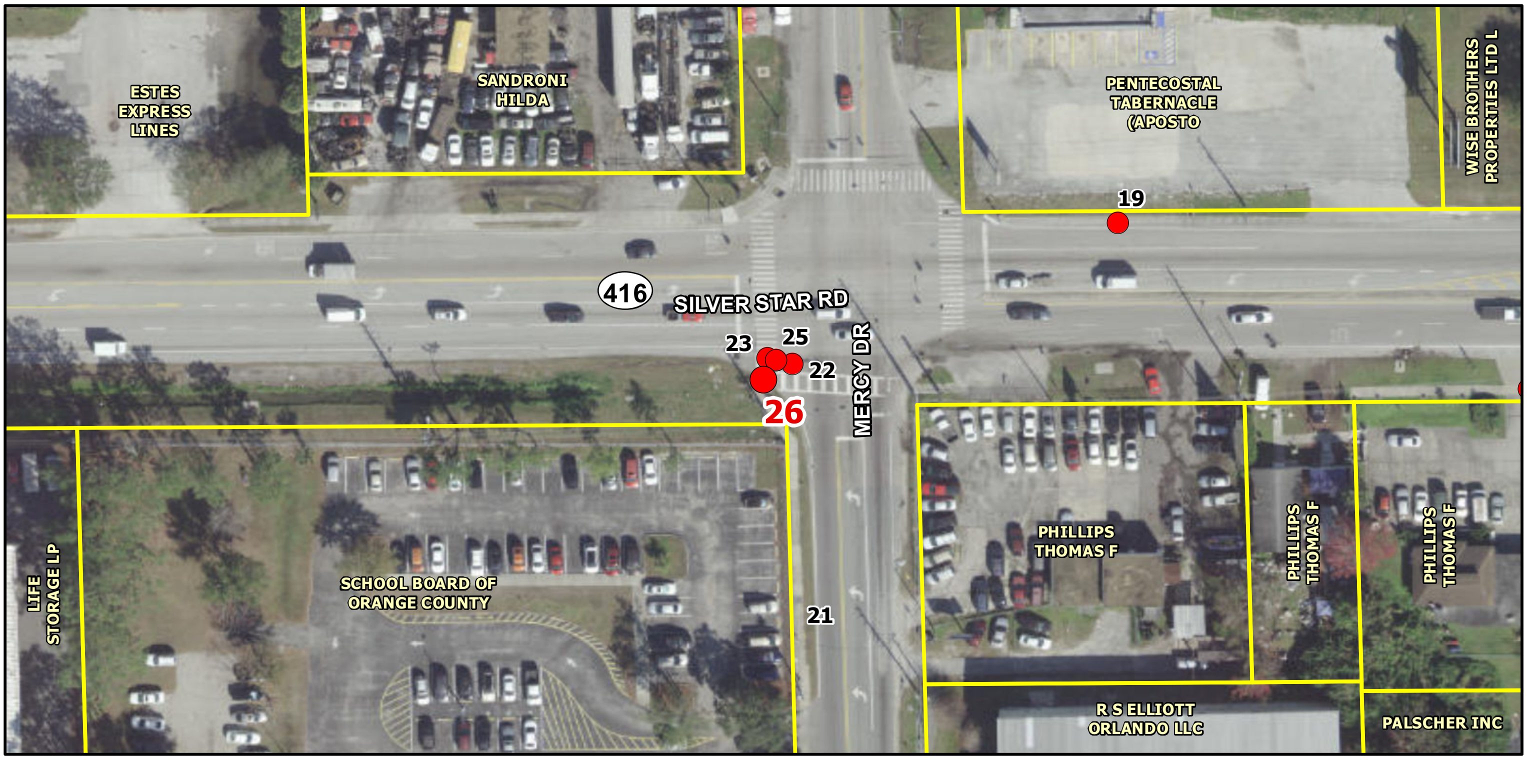
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 26

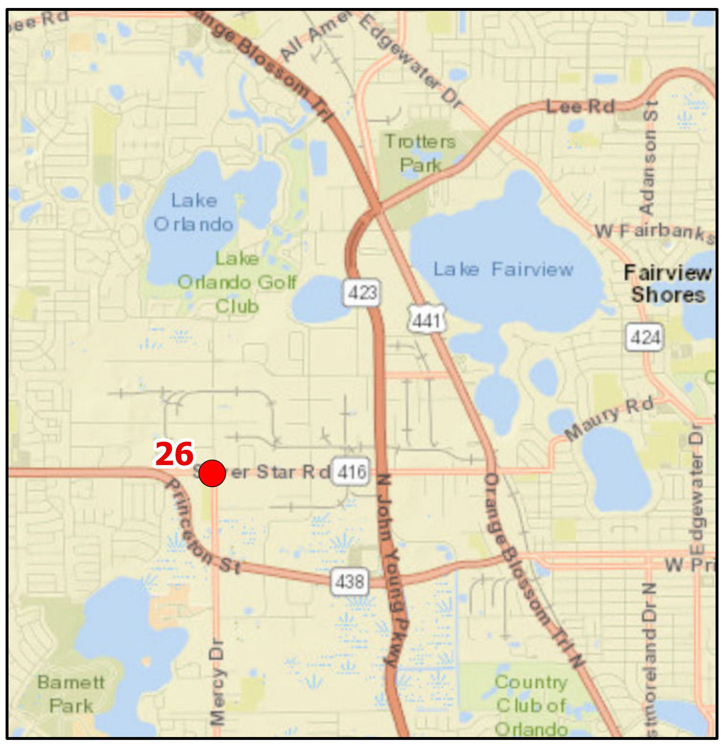
Feature Type: ADA - Safety

Comment:

Lat: 28.57795 **Long:** -81.43094

http://maps.google.com/maps?q=28.57795,-81.43094

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150
Feet

Field Observations
Silver Star Freight
Existing Bike and Ped Transit Infrastructure

Feature ID: 27

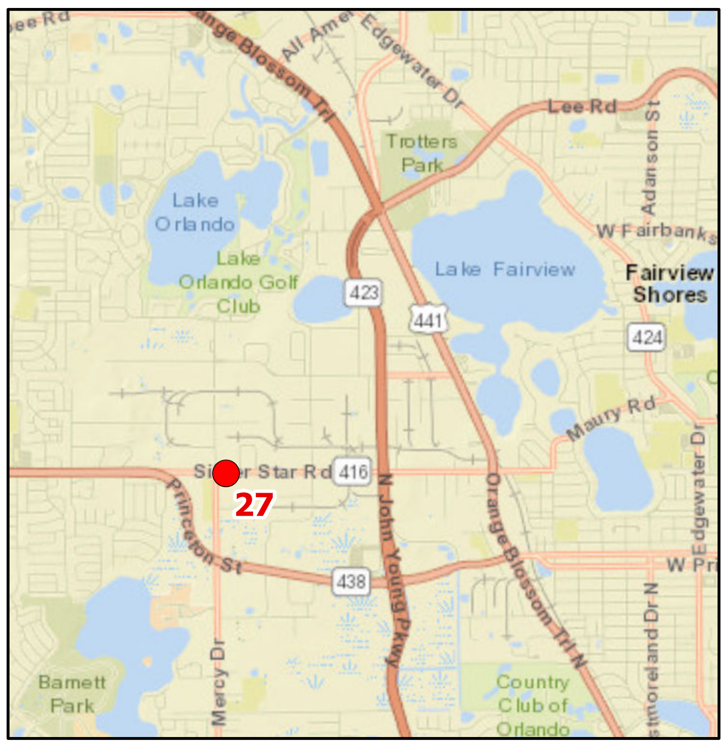
Feature Type: ADA - Safety

Comment: sidewalk ends

Lat: 28.57793 **Long:** -81.42984

http://maps.google.com/maps?q=28.57793,-81.42984

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

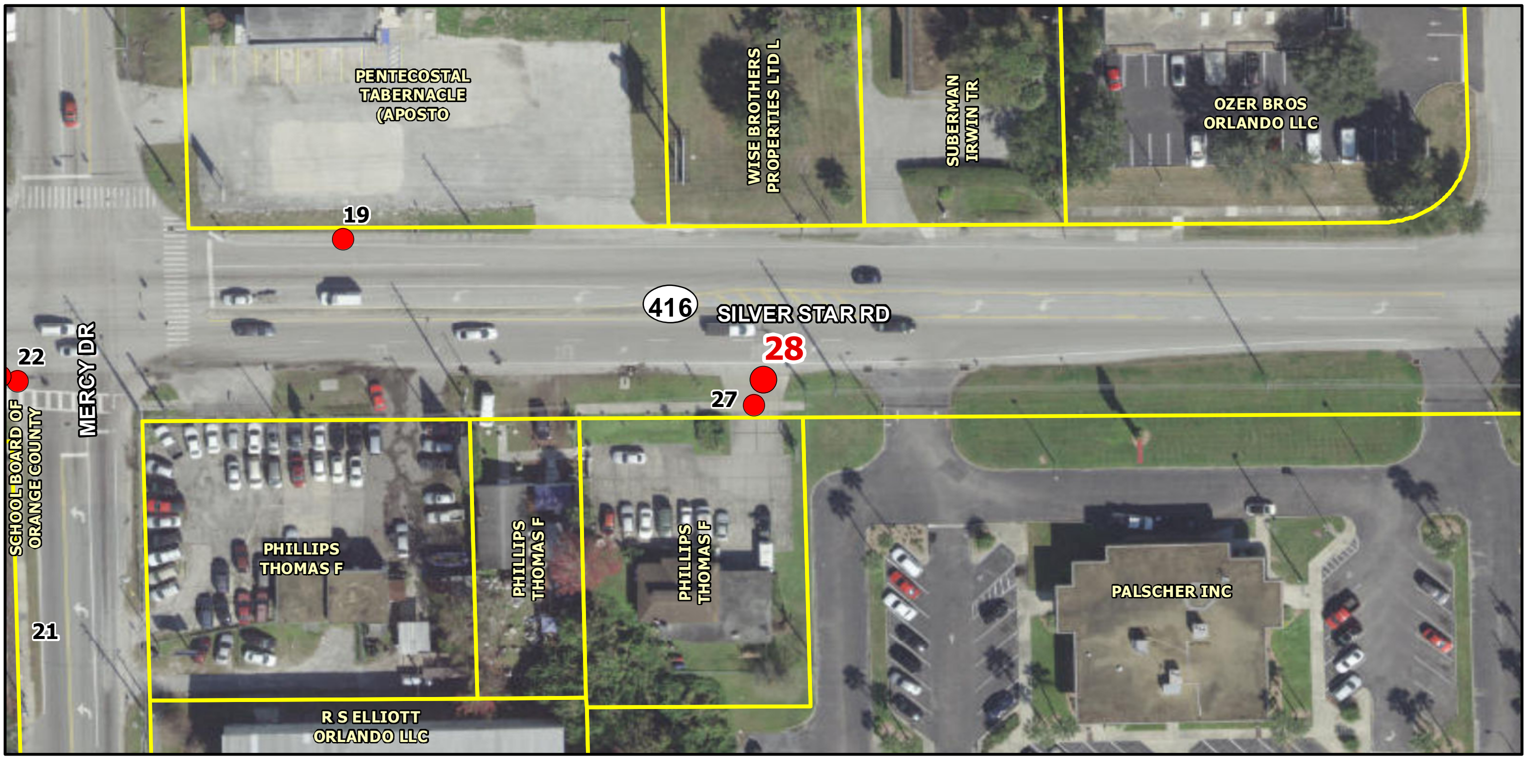
Feet

FDOT

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 28

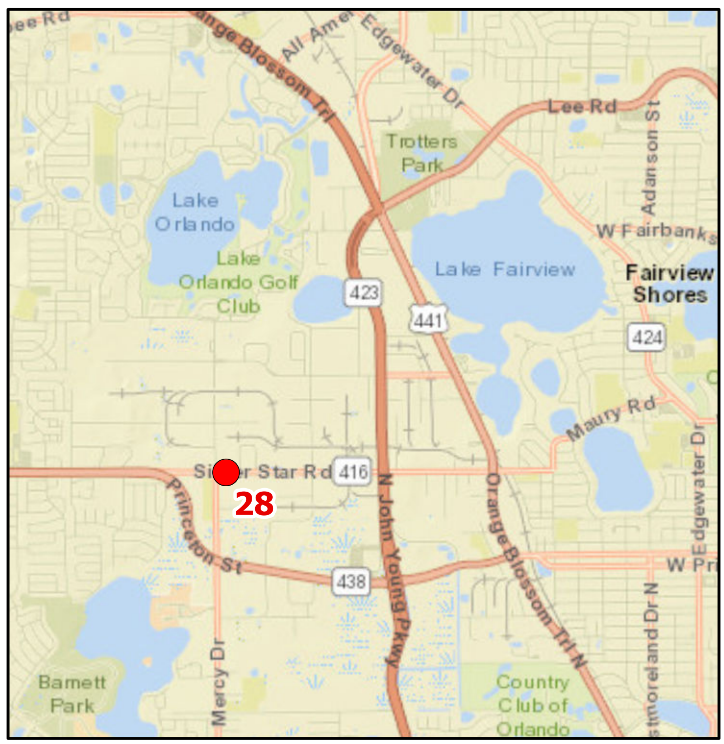
Feature Type: ADA - Safety

Comment:

Lat: 28.57797 **Long:** -81.42983

http://maps.google.com/maps?q=28.57797,-81.42983

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021

Feature ID: 29

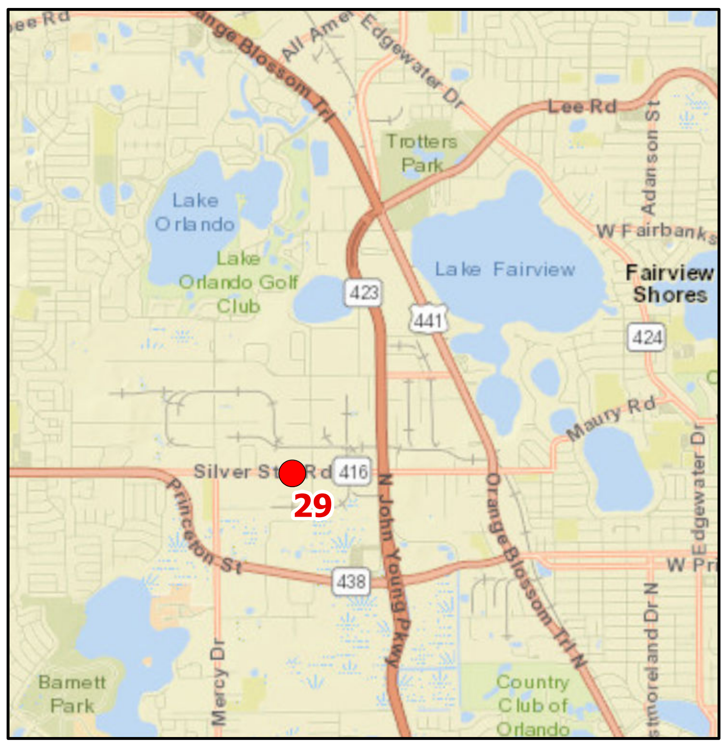
Feature Type: ADA - Safety

Comment:

Lat: 28.57796 **Long:** -81.42415

http://maps.google.com/maps?q=28.57796,-81.42415

ADA - Safety | Transit
Damaged Infrastructure | User



Map Scale: 1 Inch = 100 Feet

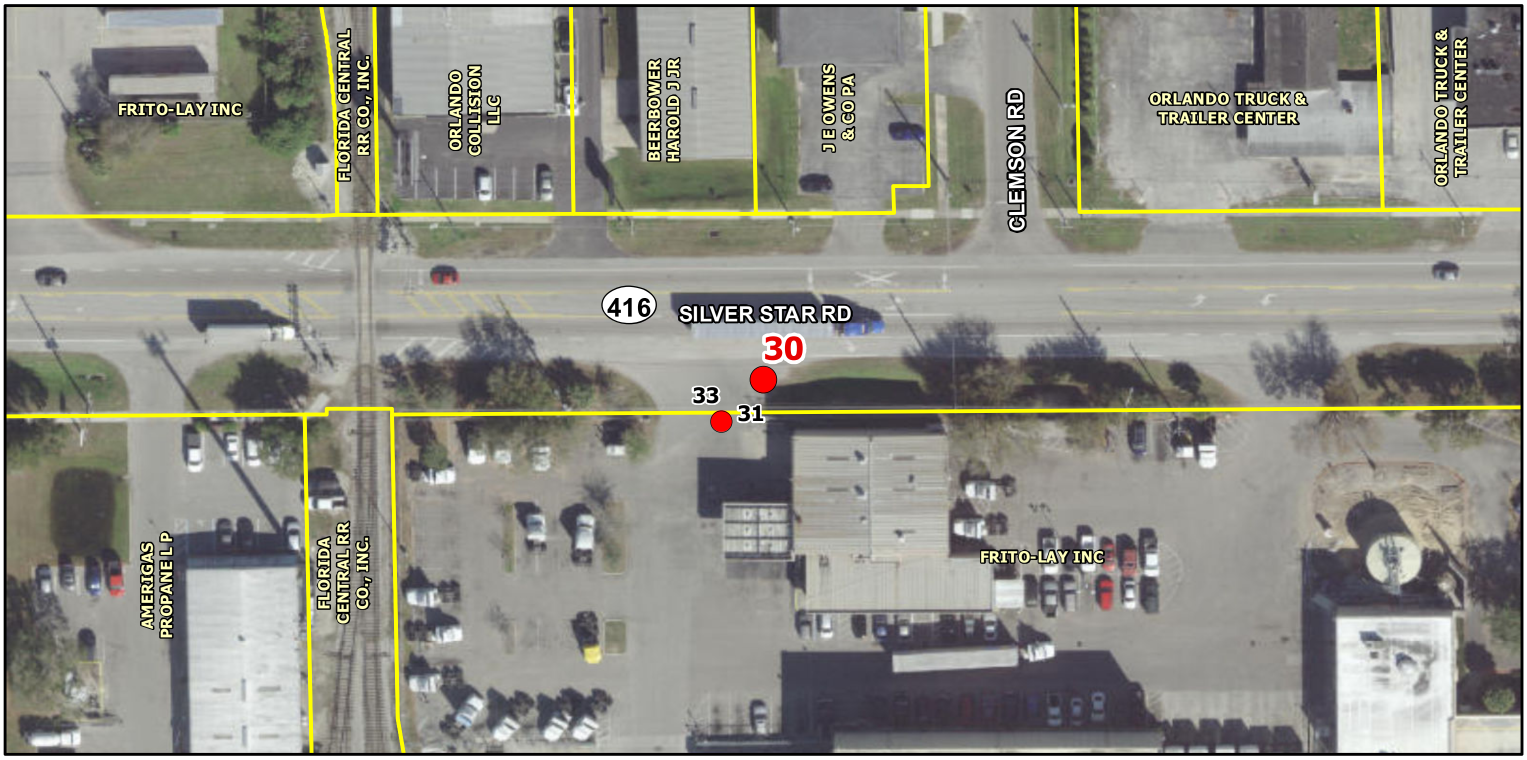
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 30

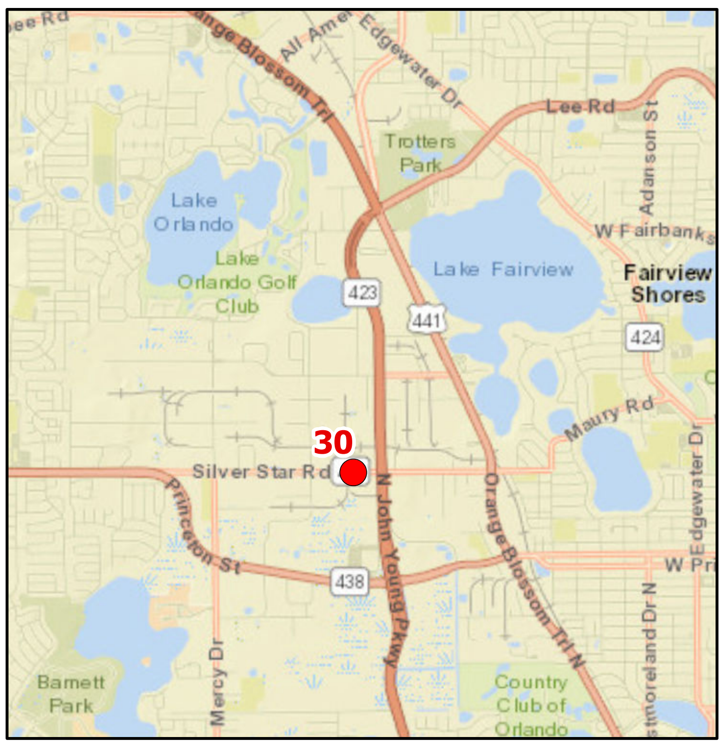
Feature Type: ADA - Safety

Comment: no sidewalk

Lat: 28.57801 **Long:** -81.41881

http://maps.google.com/maps?q=28.57801,-81.41881

- ADA - Safety
- Damaged Infrastructure
- Transit
- User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

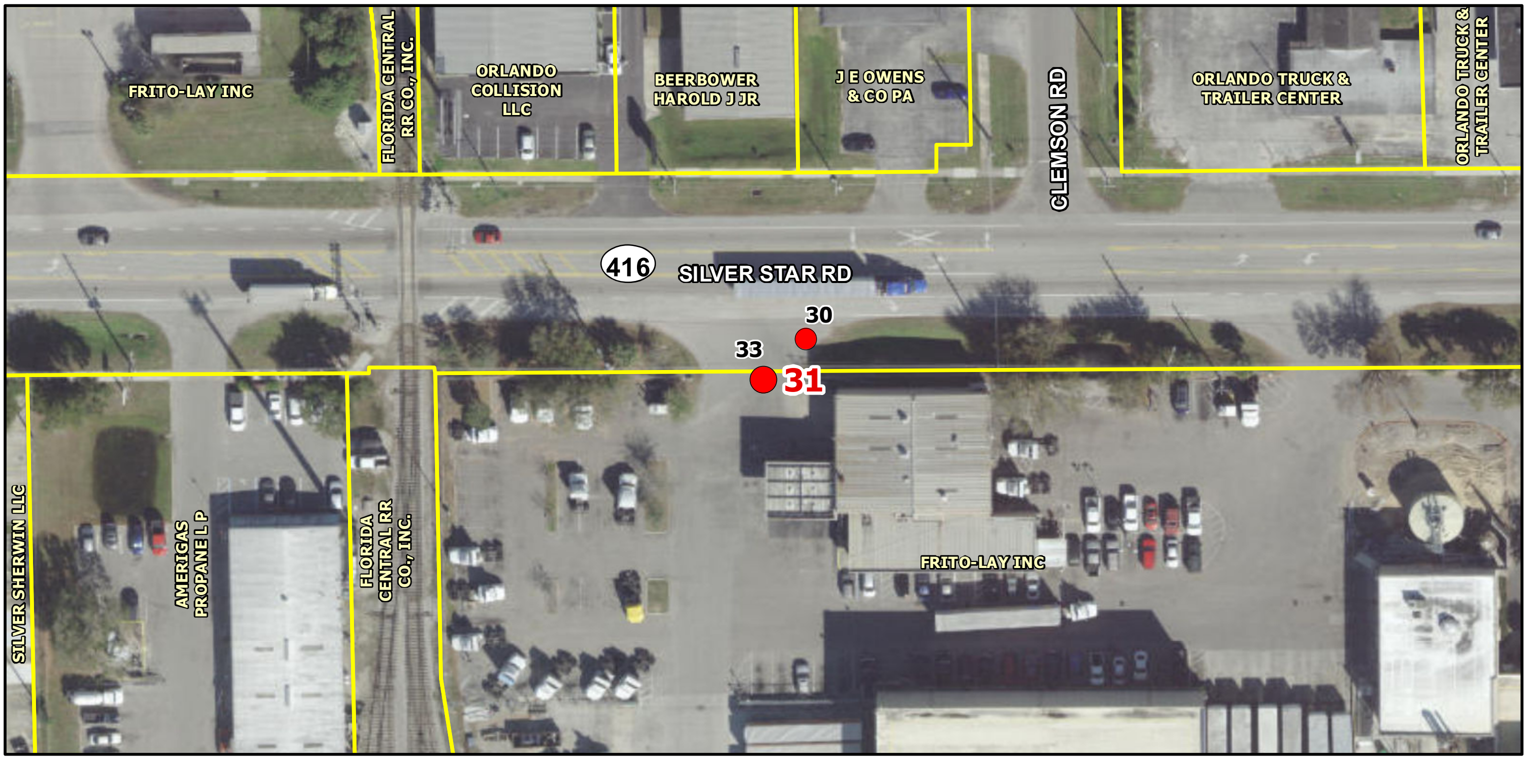
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: \\orl-gis01\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 6/1/2021



Feature ID: 31

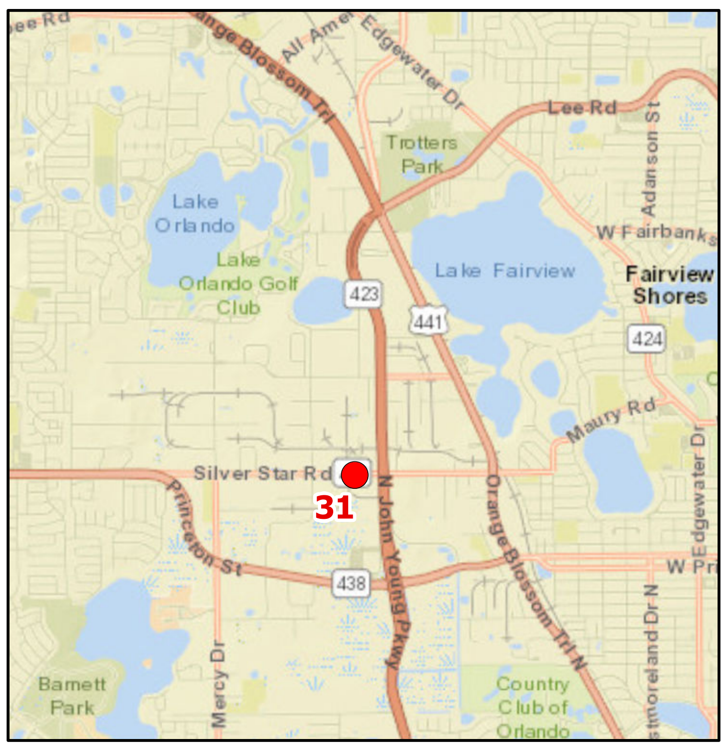
Feature Type: ADA - Safety

Comment: no sidewalk

Lat: 28.57795 **Long:** -81.41887

http://maps.google.com/maps?q=28.57795,-81.41887

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

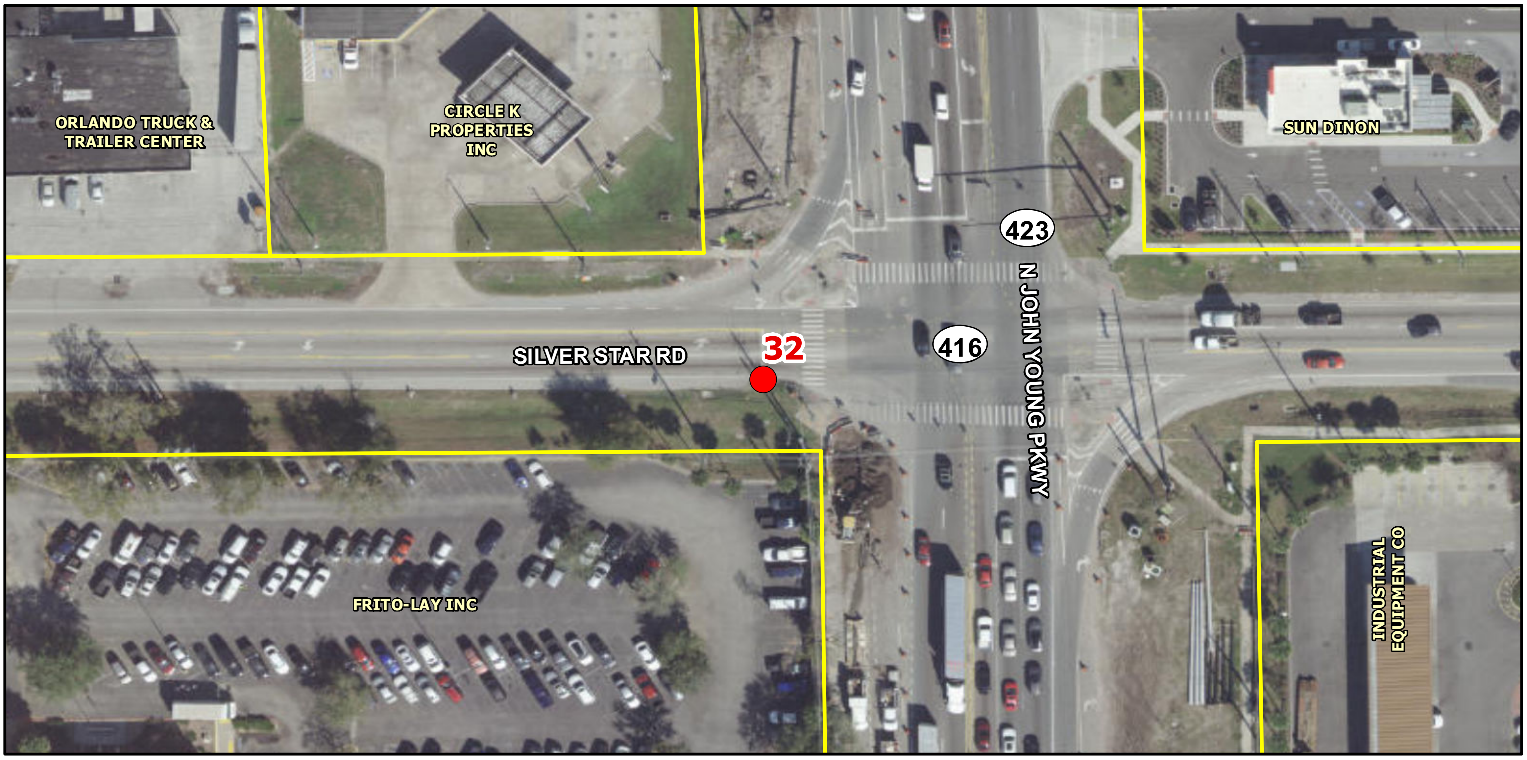
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 32

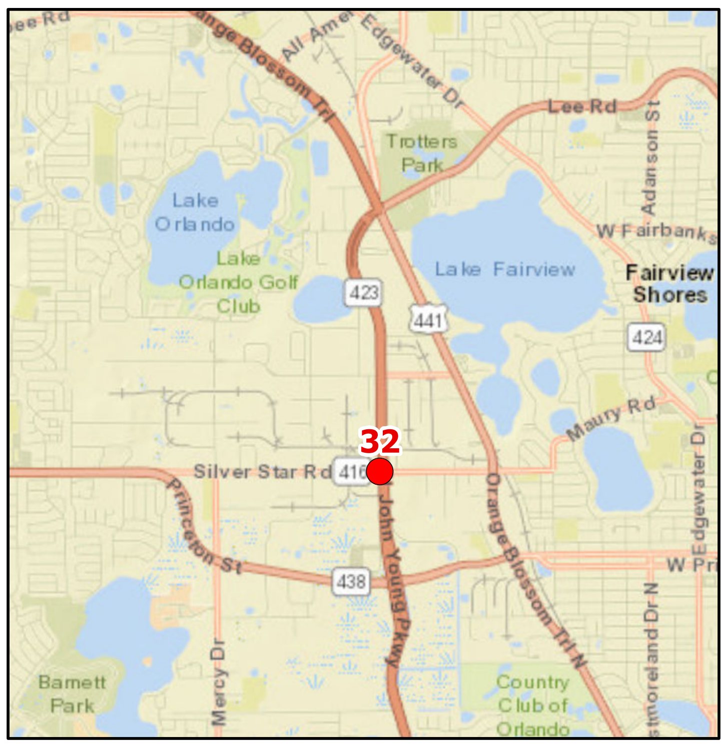
Feature Type: ADA - Safety

Comment:

Lat: 28.57808 **Long:** -81.41672

http://maps.google.com/maps?q=28.57808,-81.41672

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

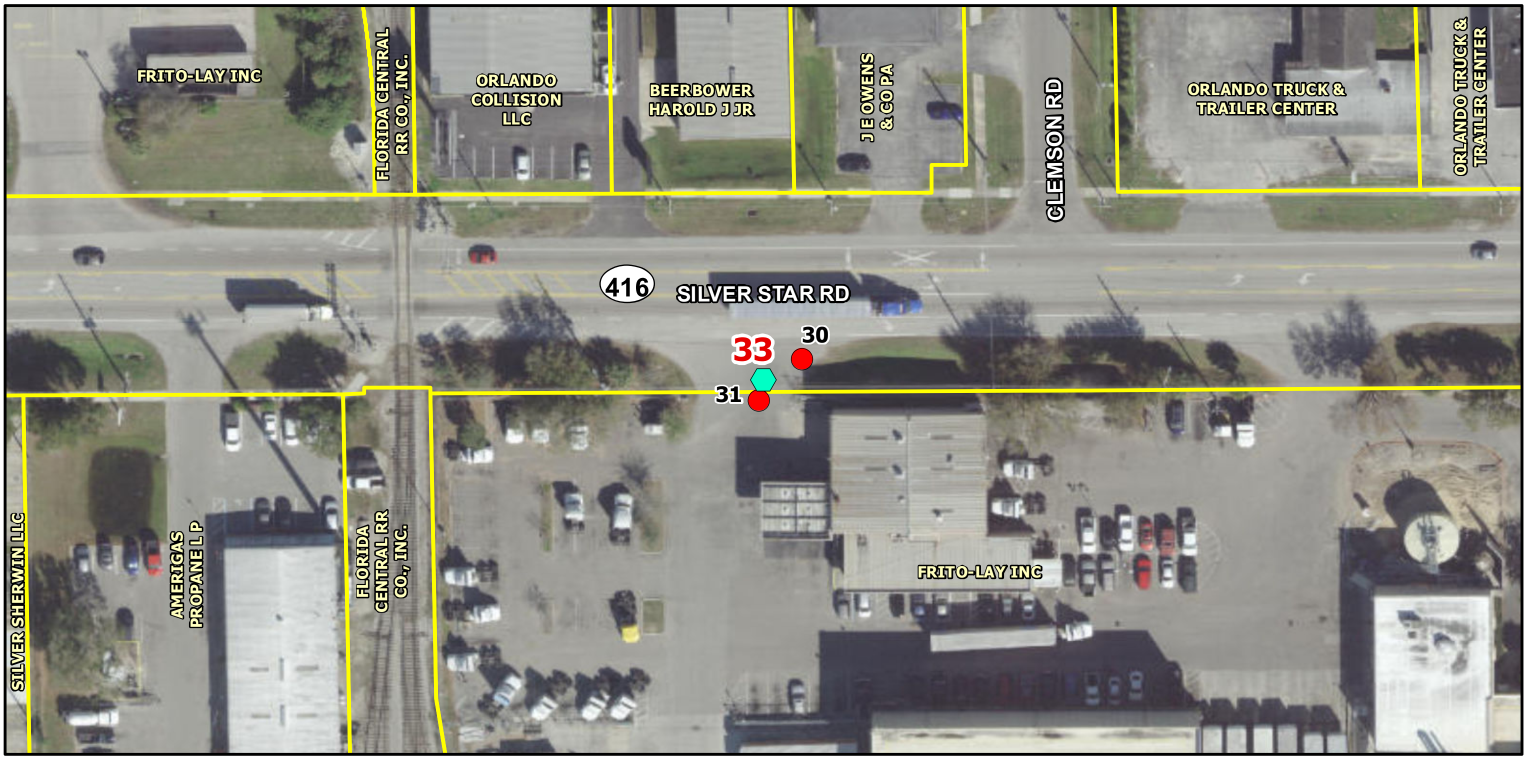
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: \\orl-gis01\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 6/1/2021



Feature ID: 33

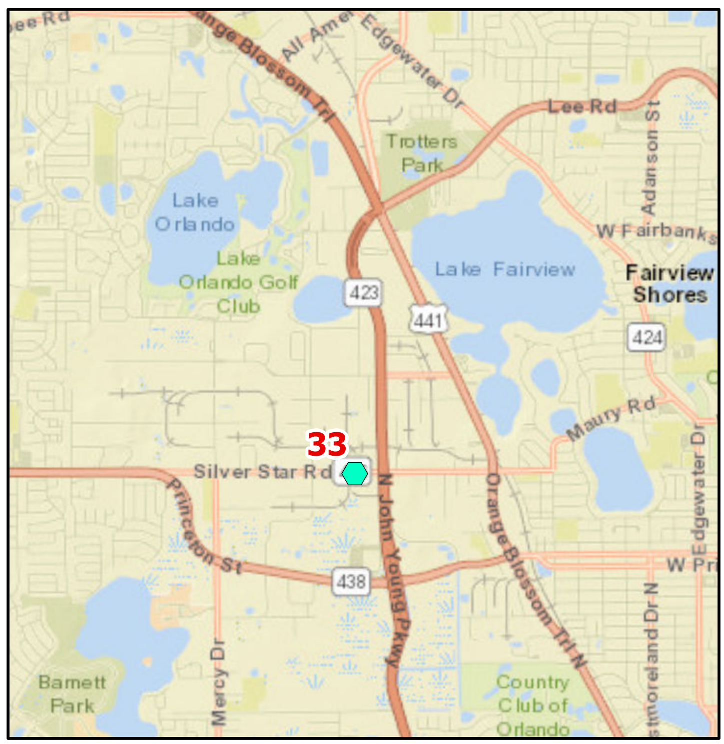
Feature Type: Transit

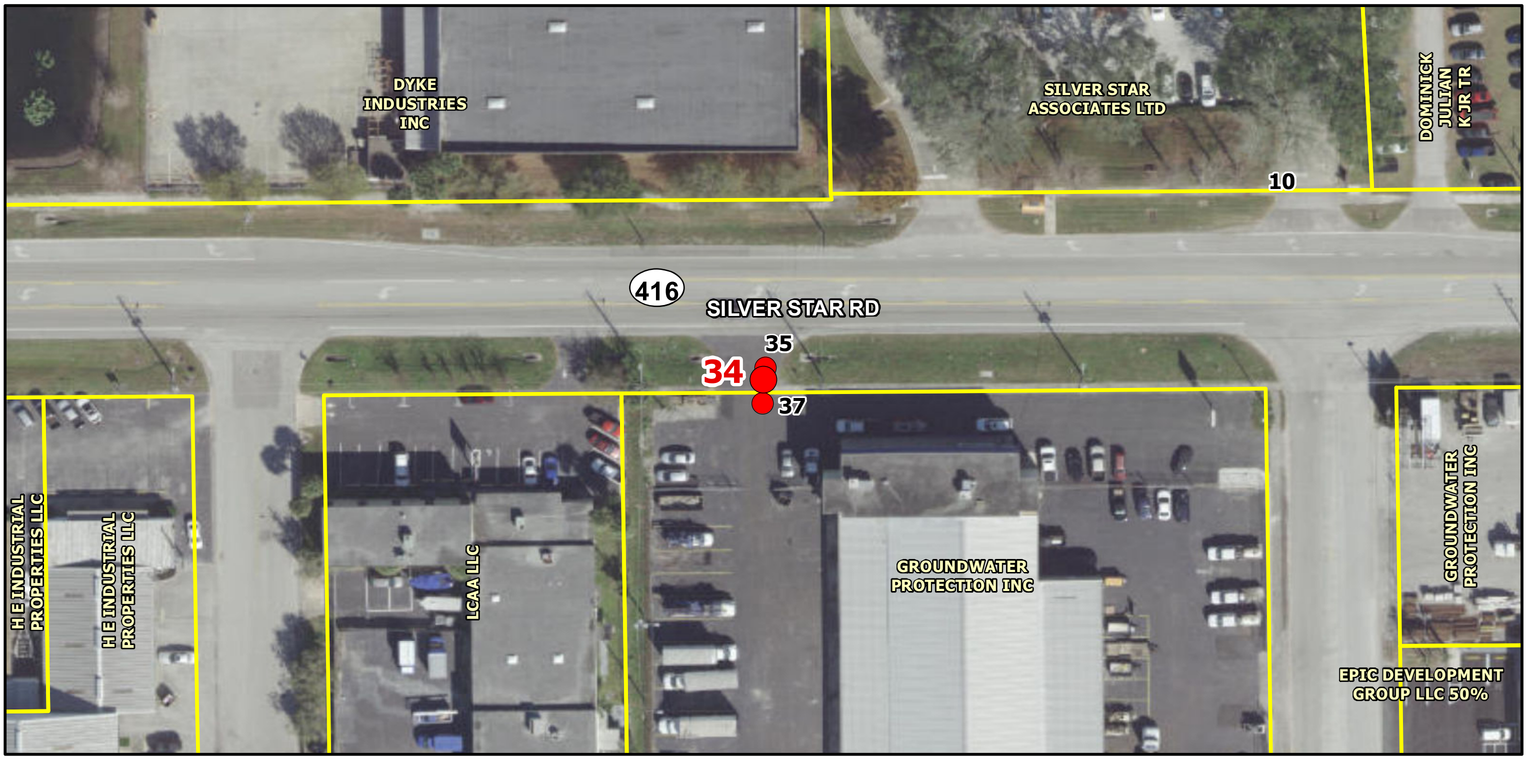
Comment: bus stop, no platform

Lat: 28.57798 **Long:** -81.41886

http://maps.google.com/maps?q=28.57798,-81.41886

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User





Feature ID: 34

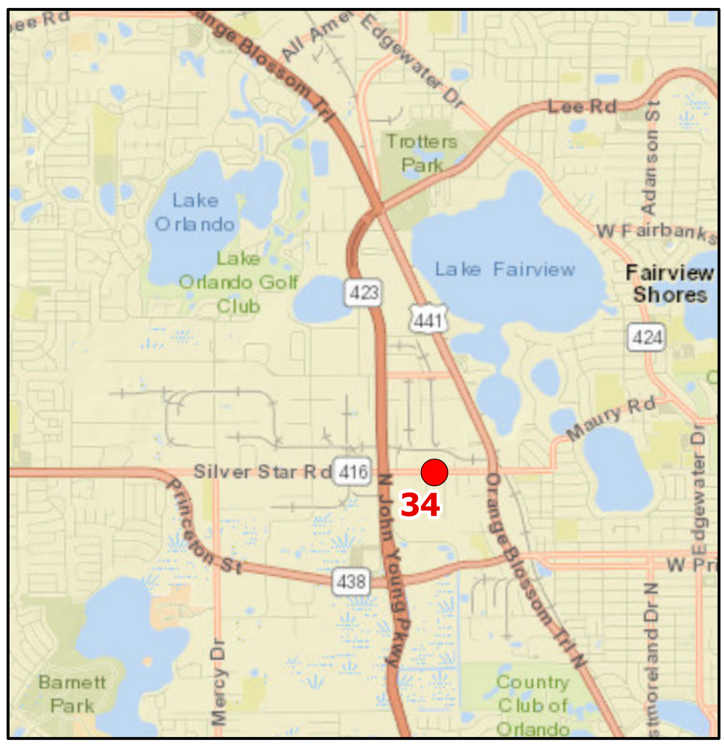
Feature Type: ADA - Safety

Comment:

Lat: 28.57804 **Long:** -81.41198

http://maps.google.com/maps?q=28.57804,-81.41198

- ADA - Safety
- Damaged Infrastructure
- Transit
- User



Map Scale: 1 Inch = 100 Feet

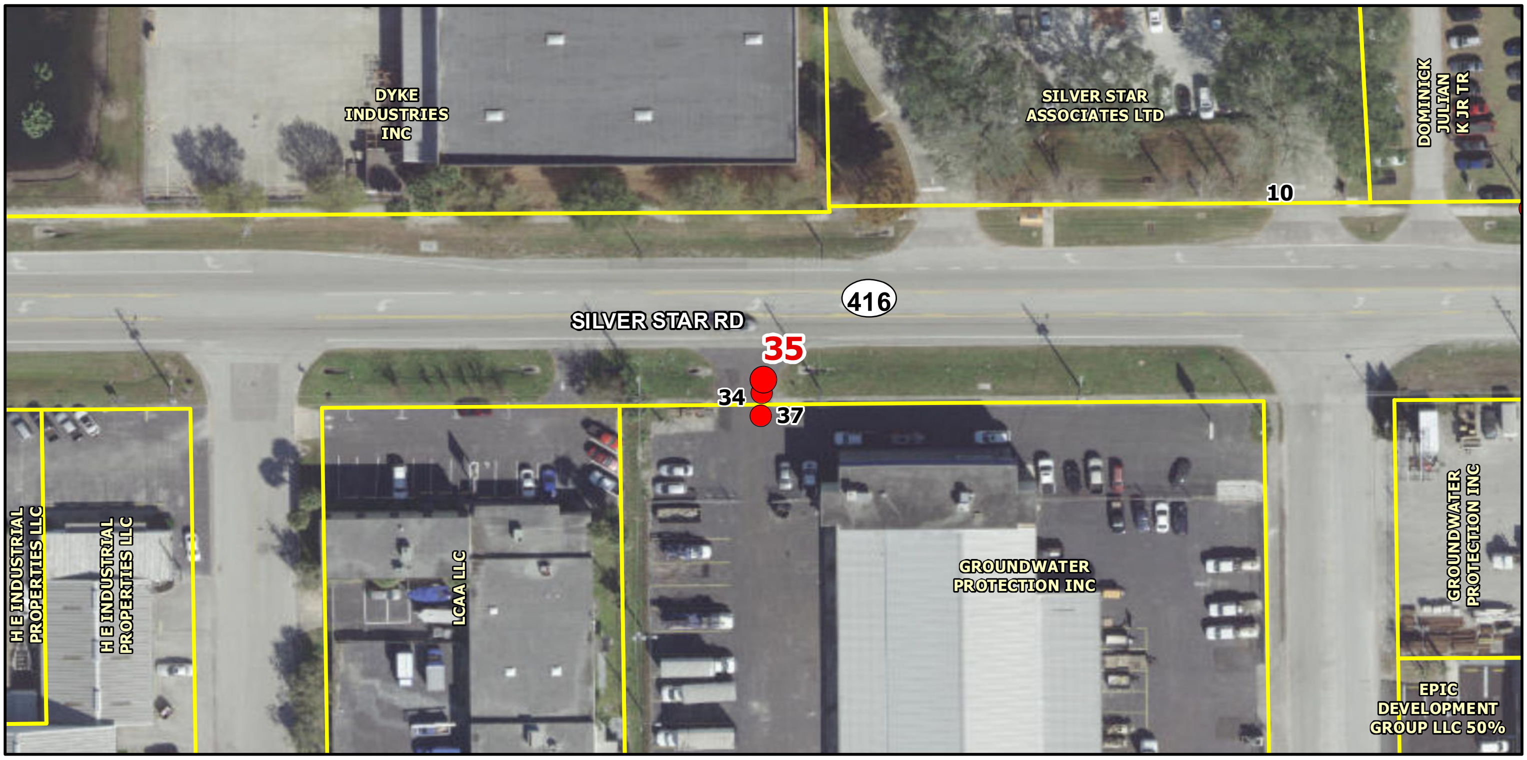
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 35

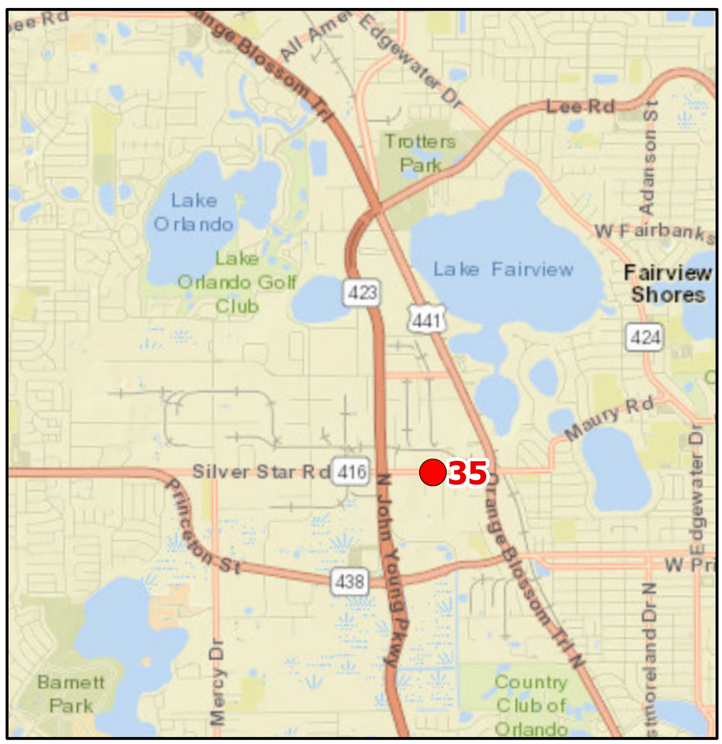
Feature Type: ADA - Safety

Comment:

Lat: 28.57805 **Long:** -81.41198

http://maps.google.com/maps?q=28.57805,-81.41198

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Feature ID: 36

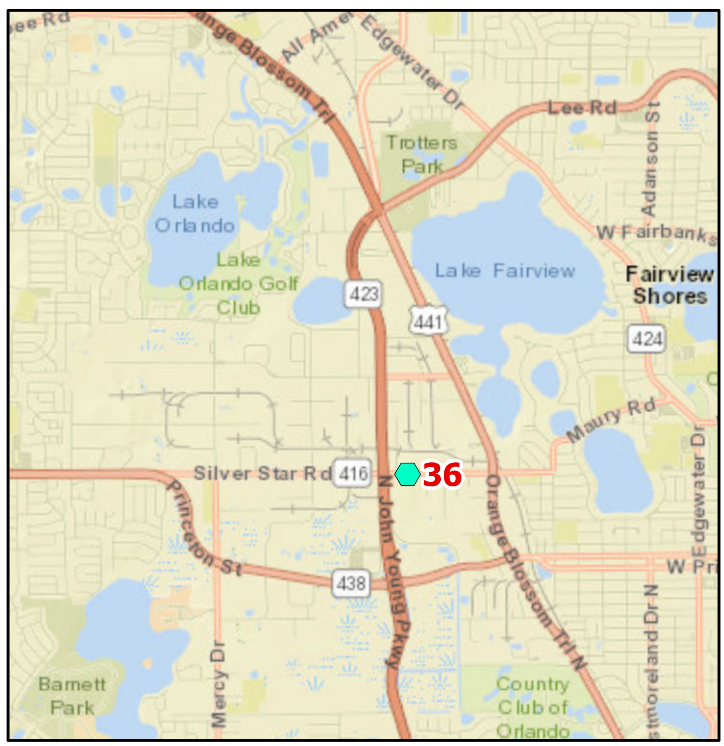
Feature Type: Transit

Comment: bus stop, sidewalk ends

Lat: 28.57802 **Long:** -81.41428

http://maps.google.com/maps?q=28.57802,-81.41428

- ADA - Safety
- Damaged Infrastructure
- Transit
- User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021

Feature ID: 37

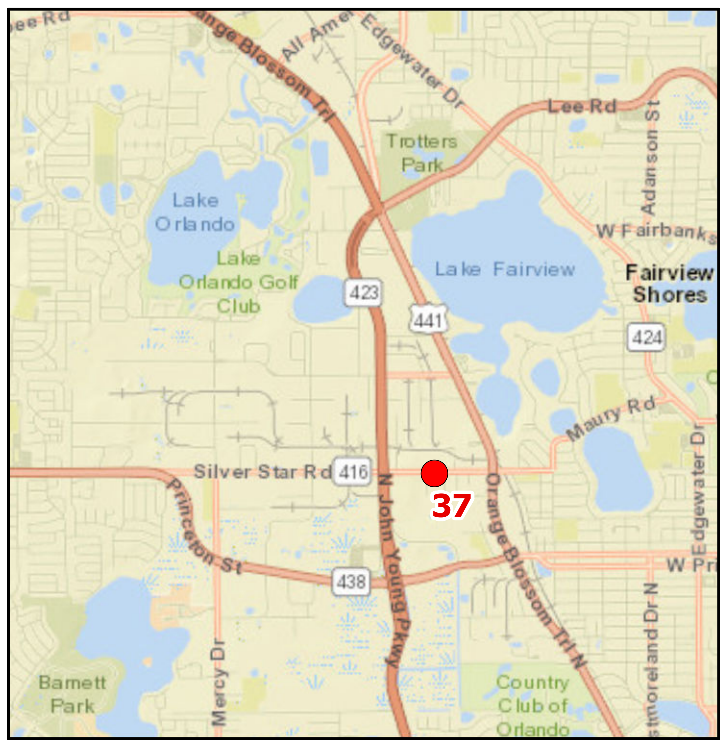
Feature Type: ADA - Safety

Comment: sidewalk begins

Lat: 28.578 **Long:** -81.41198

http://maps.google.com/maps?q=28.578,-81.41198

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

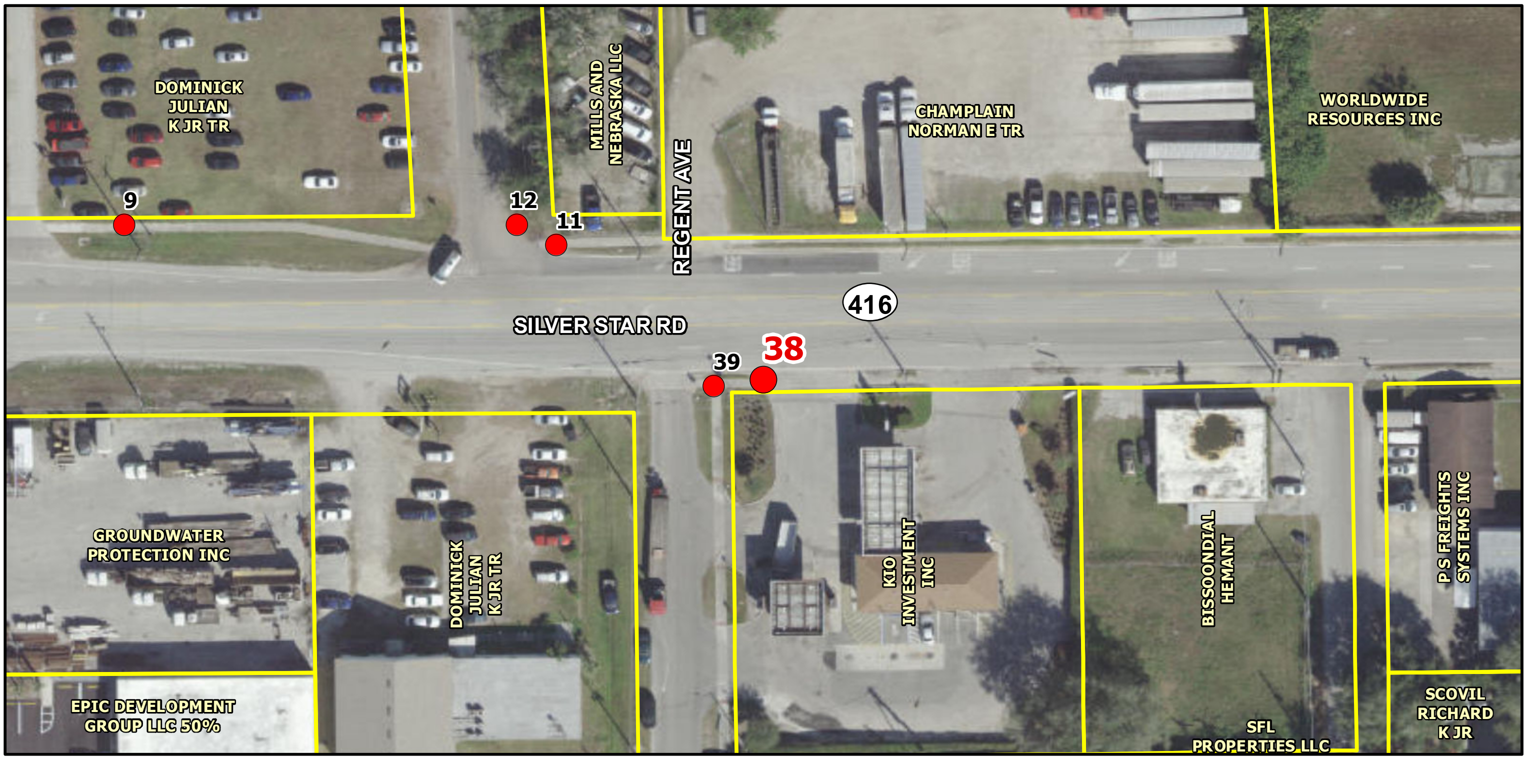
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 38

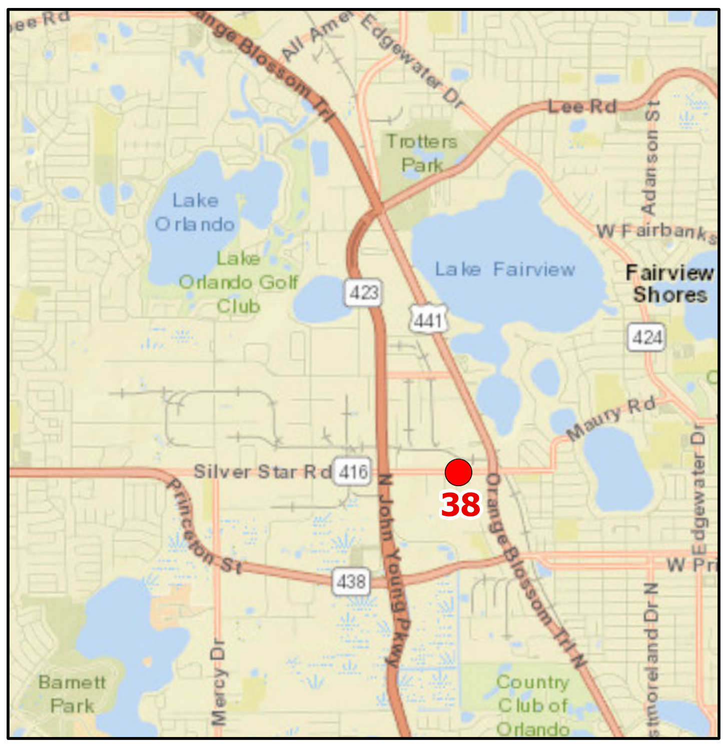
Feature Type: ADA - Safety

Comment:

Lat: 28.57808 **Long:** -81.40997

http://maps.google.com/maps?q=28.57808,-81.40997

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

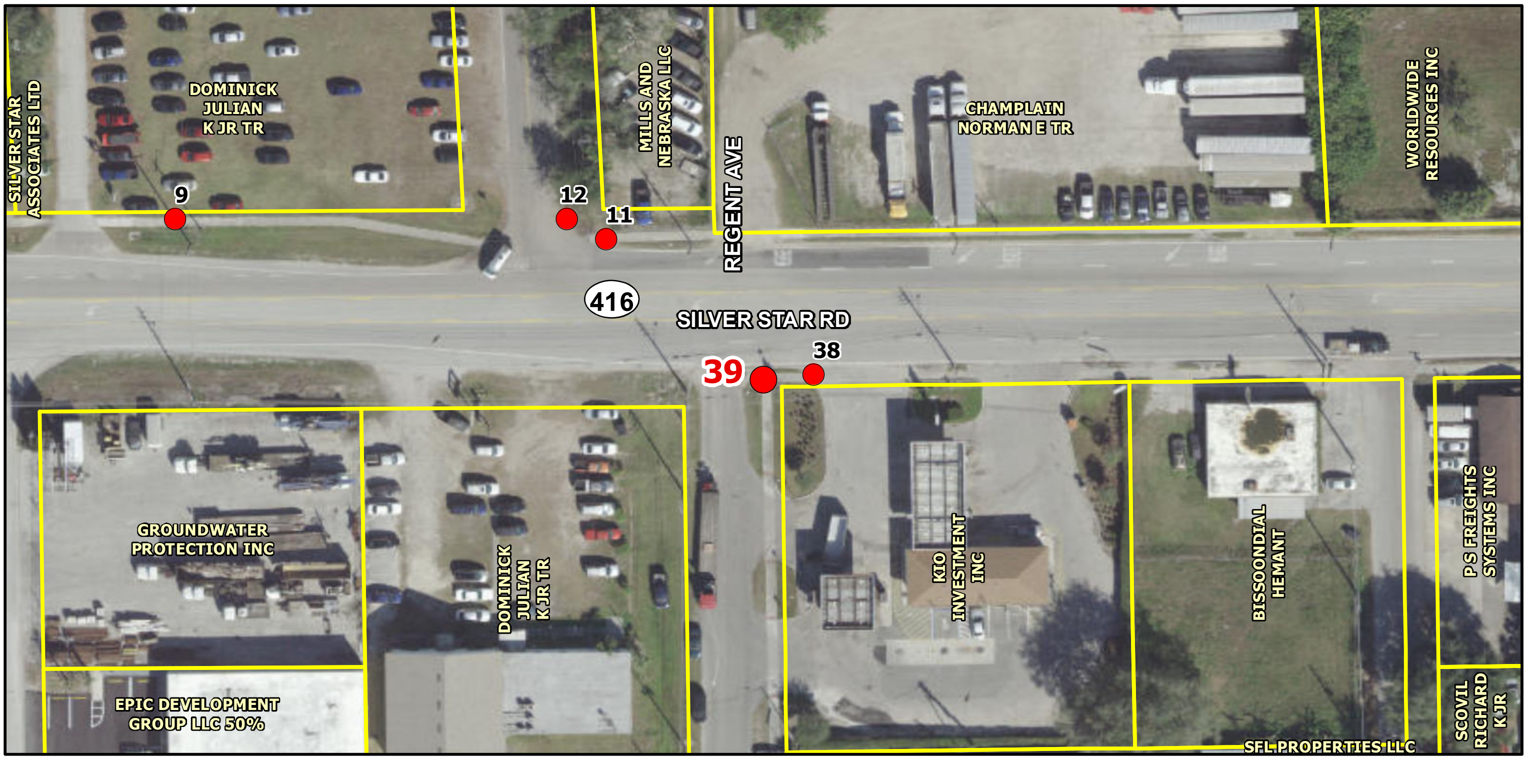
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 39

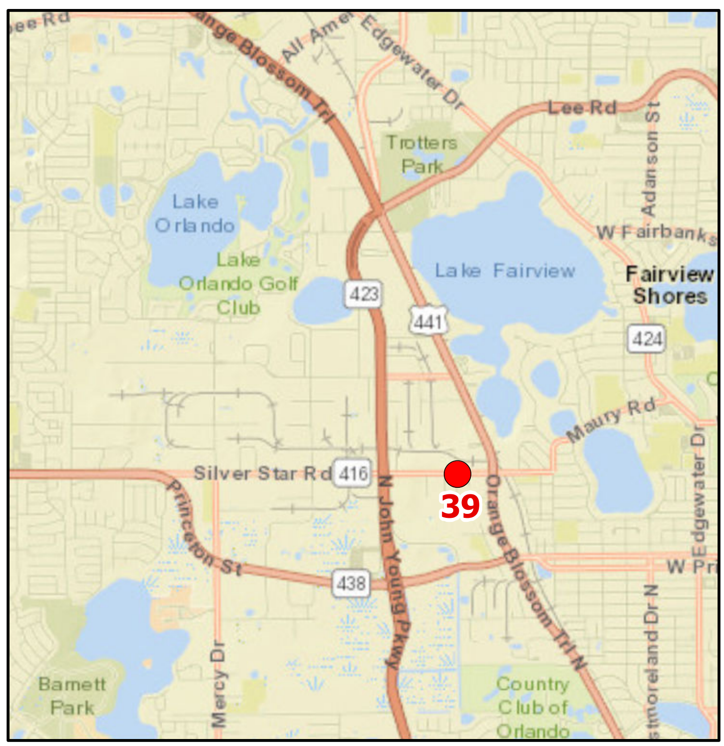
Feature Type: ADA - Safety

Comment:

Lat: 28.57807 **Long:** -81.41004

http://maps.google.com/maps?q=28.57807,-81.41004

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

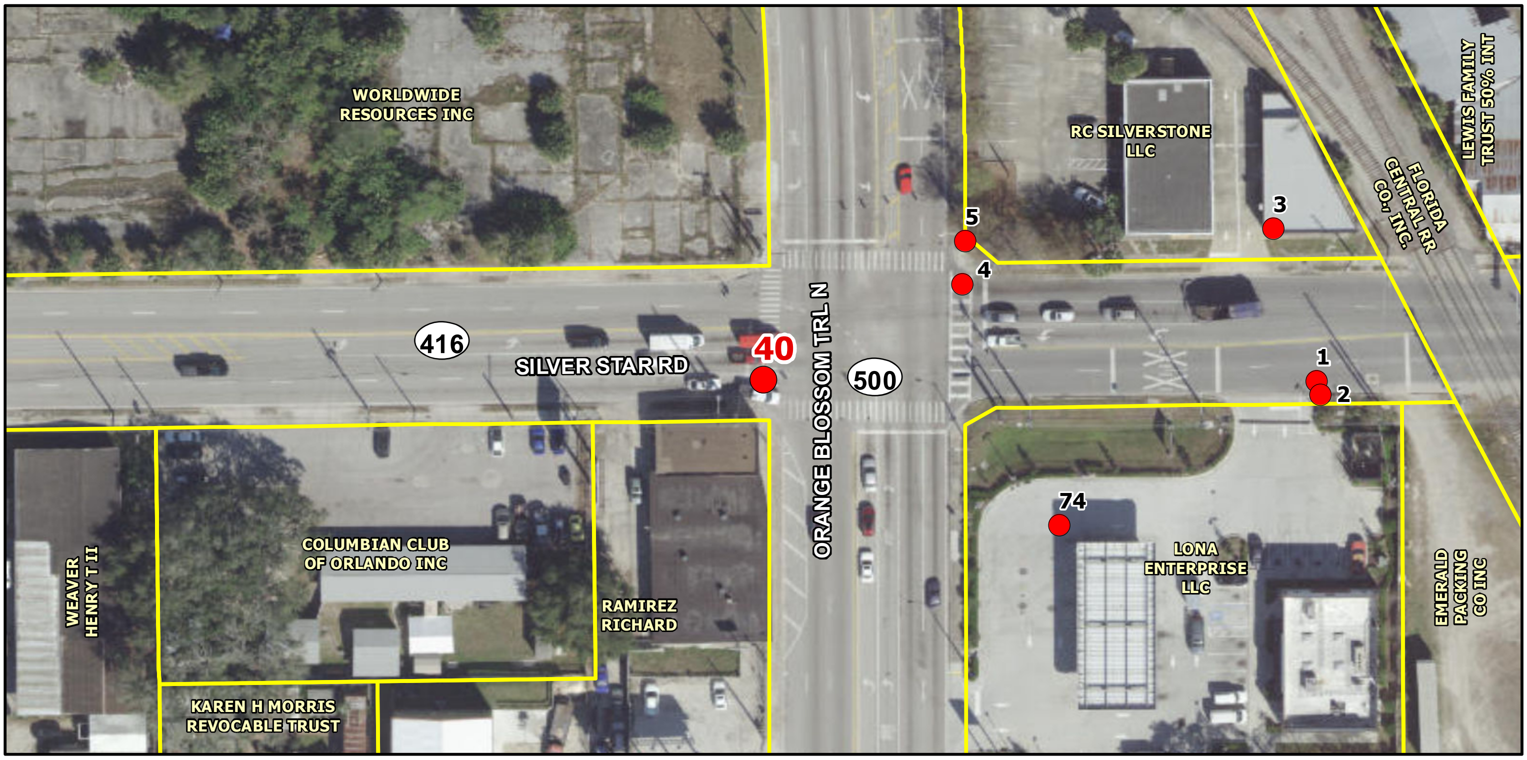
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021



Feature ID: 40

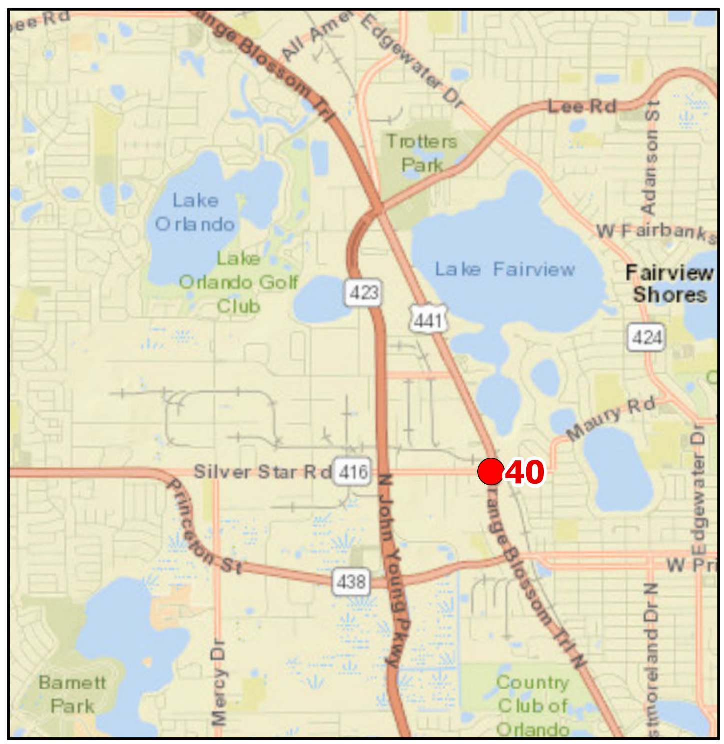
Feature Type: ADA - Safety

Comment:

Lat: 28.57815 **Long:** -81.40719

http://maps.google.com/maps?q=28.57815,-81.40719

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

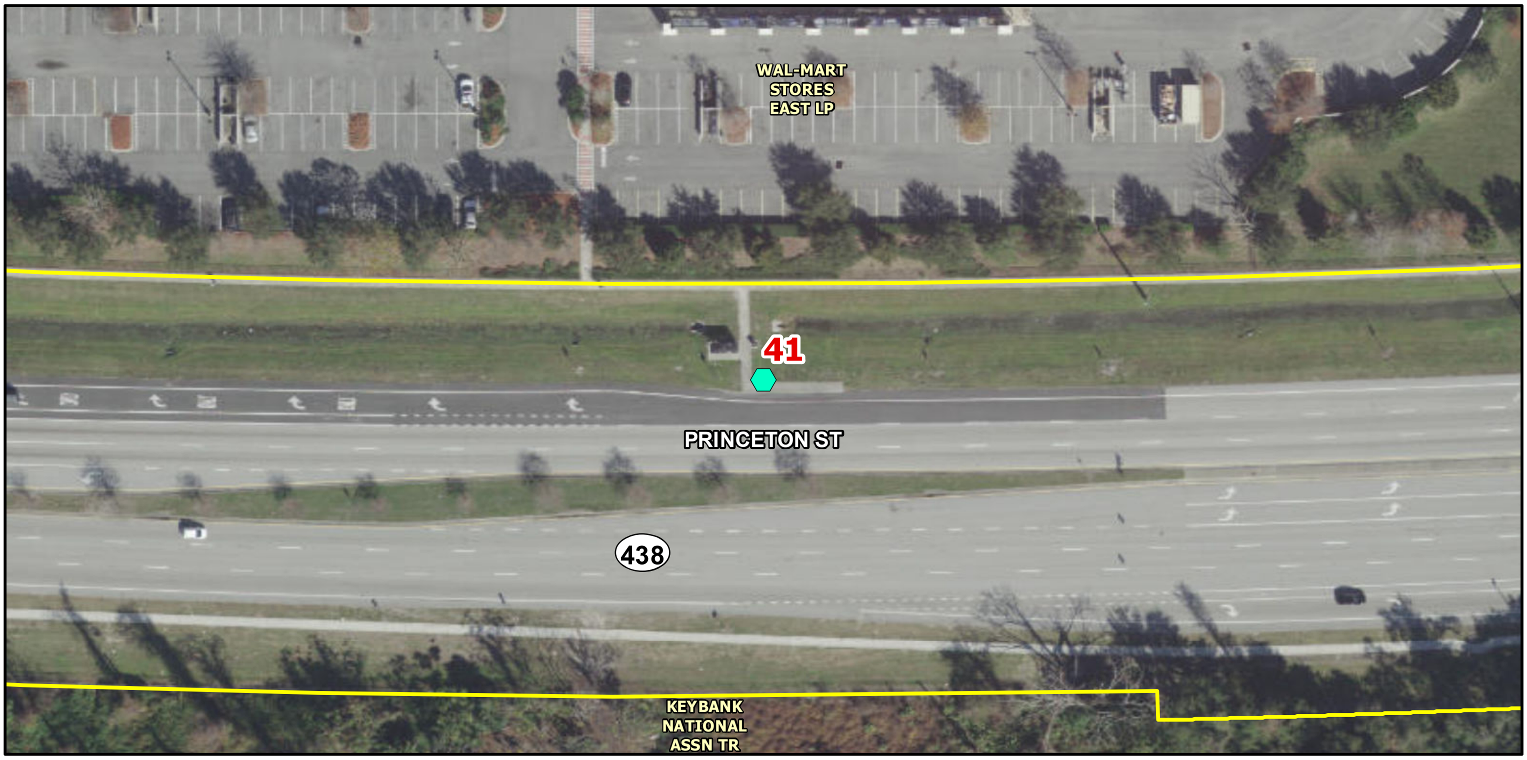
Feet

FDOT

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 41

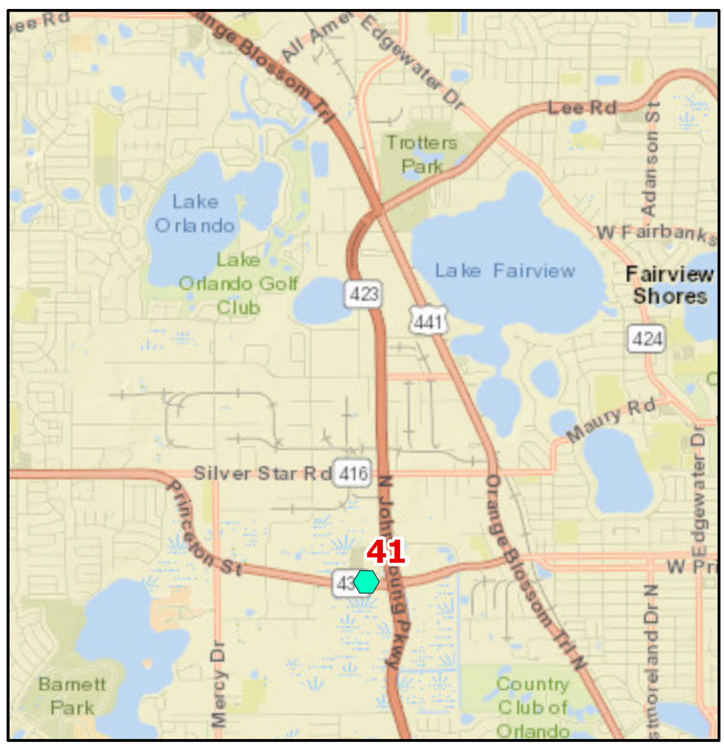
Feature Type: Transit

Comment:

Lat: 28.56988 **Long:** -81.41783

http://maps.google.com/maps?q=28.56988,-81.41783

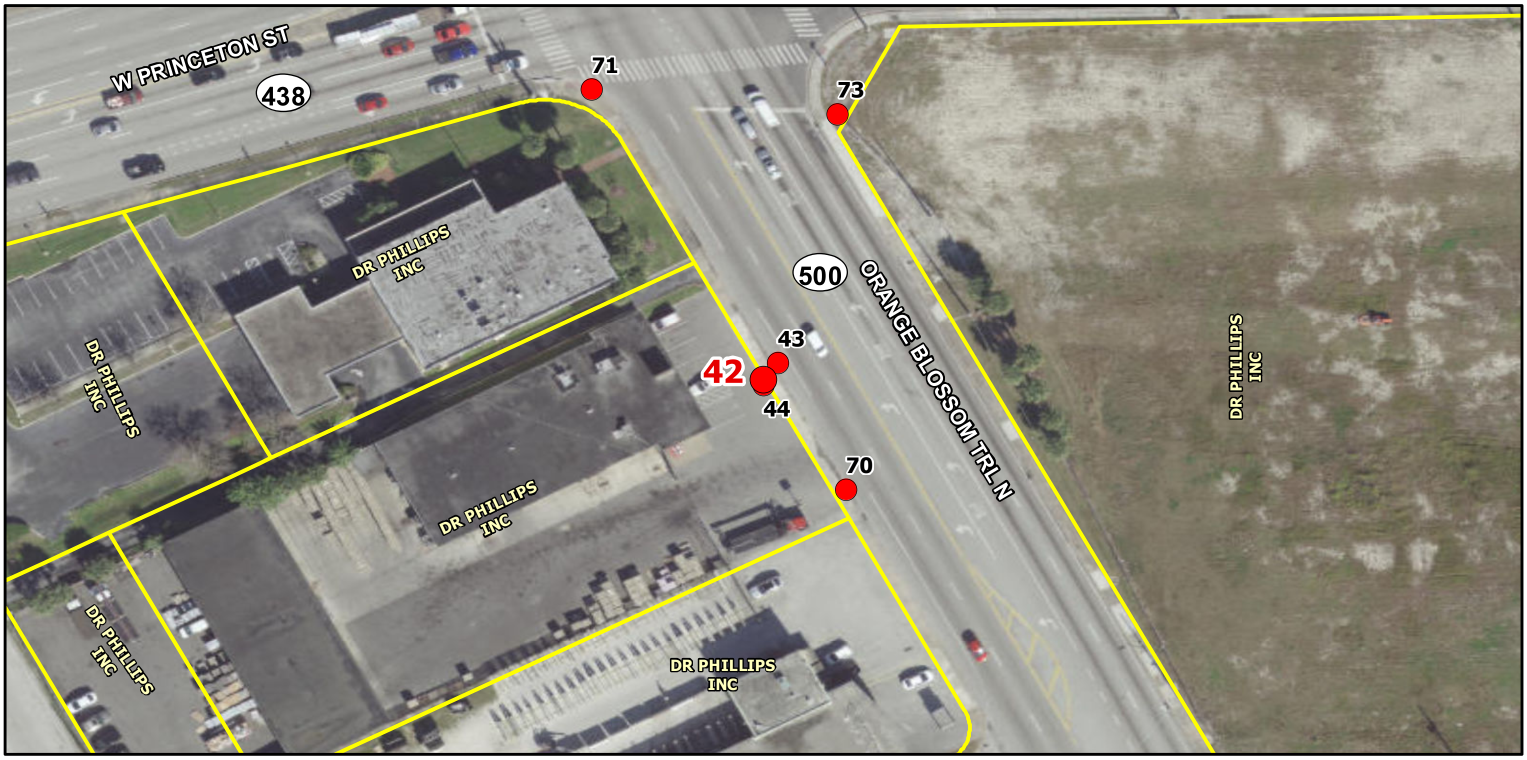
ADA - Safety | Transit
Damaged Infrastructure | User



Map Scale: 1 Inch = 100 Feet

0 50 100 150
Feet

Field Observations
Silver Star Freight
Existing Bike and Ped Transit Infrastructure



Feature ID: 42

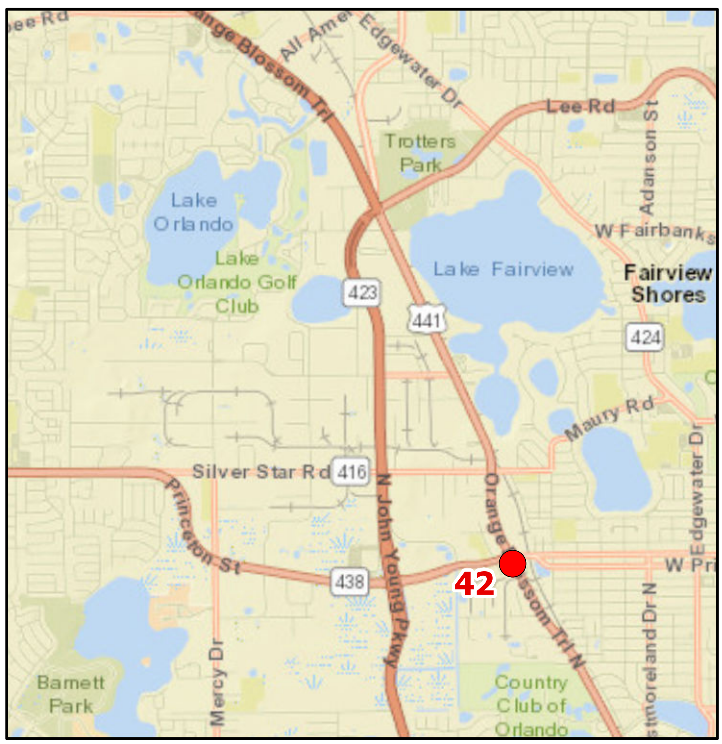
Feature Type: ADA - Safety

Comment:

Lat: 28.57119 **Long:** -81.40519

http://maps.google.com/maps?q=28.57119,-81.40519

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

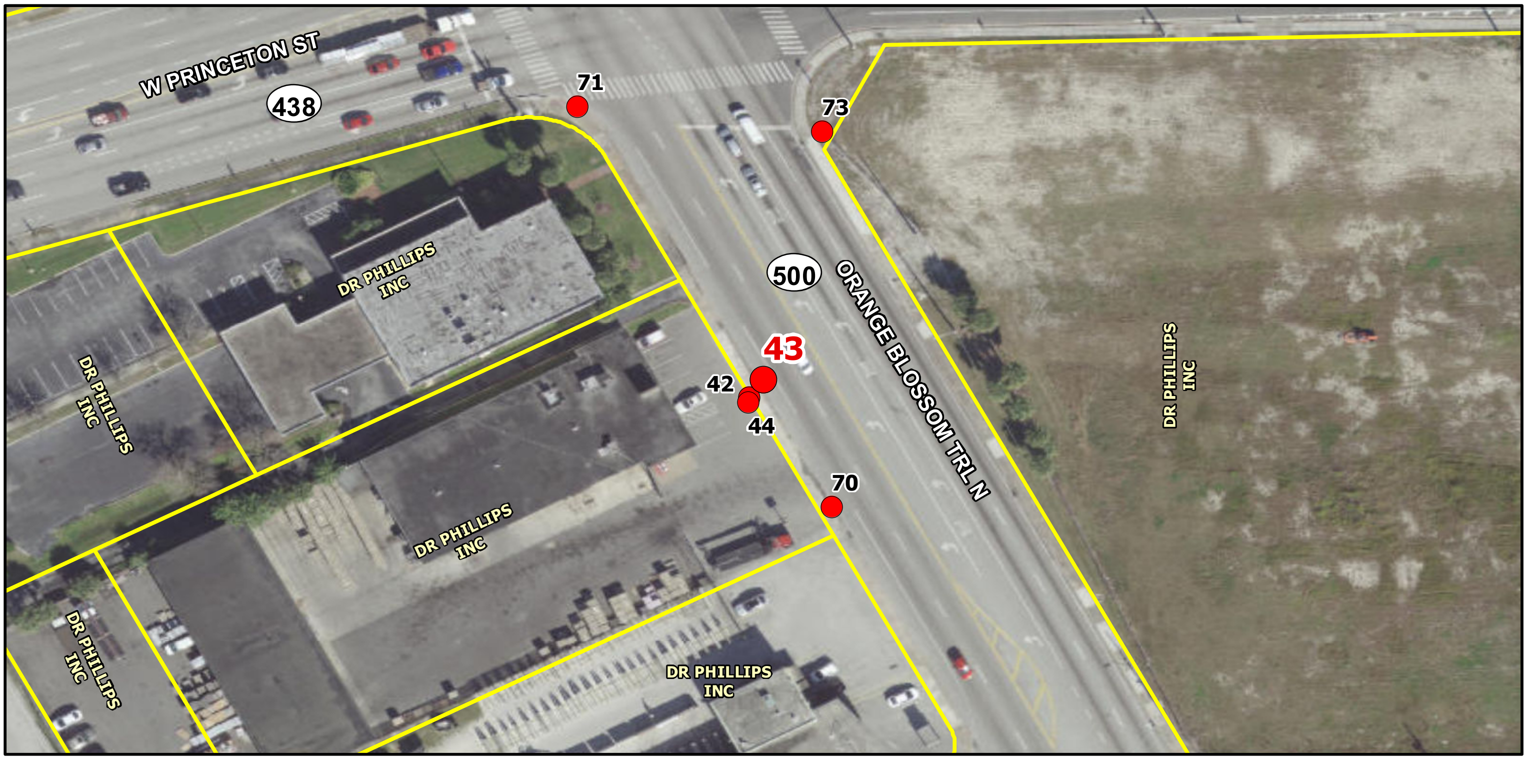
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021



Feature ID: 43

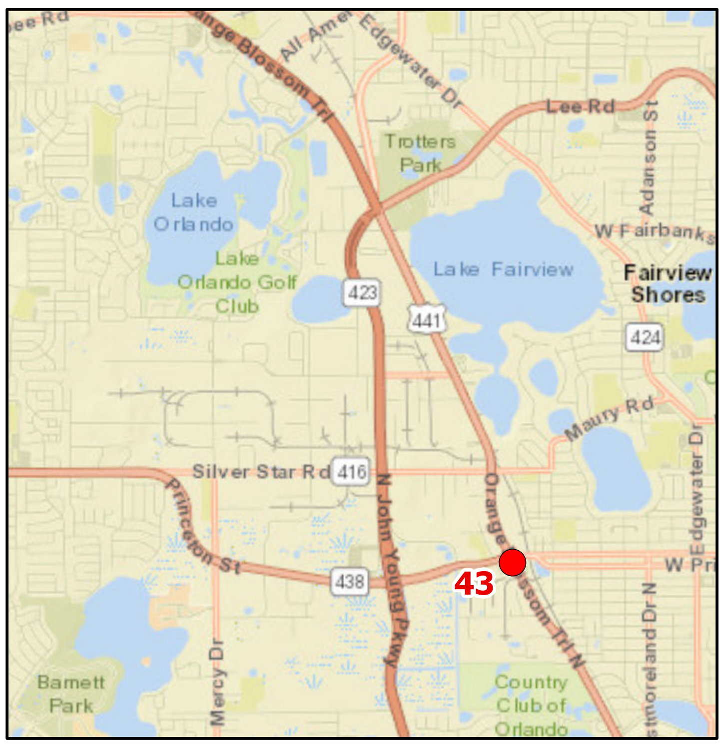
Feature Type: ADA - Safety

Comment:

Lat: 28.57122 **Long:** -81.40517

http://maps.google.com/maps?q=28.57122,-81.40517

	ADA - Safety		Transit
	Damaged Infrastructure		User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Feature ID: 44

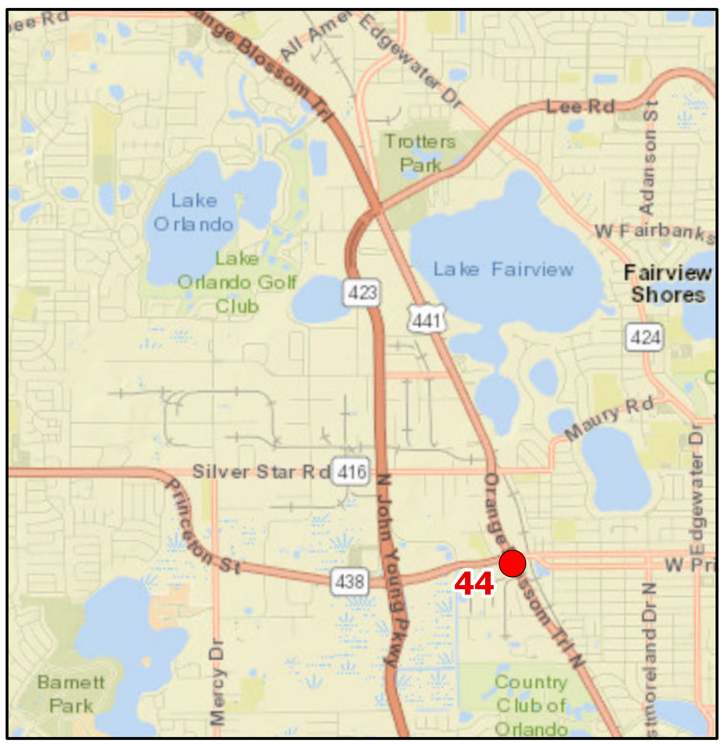
Feature Type: ADA - Safety

Comment:

Lat: 28.57119 Long: -81.40519

http://maps.google.com/maps?q=28.57119,-81.40519

ADA - Safety
Transit
Damaged Infrastructure
User



Map Scale: 1 Inch = 100 Feet

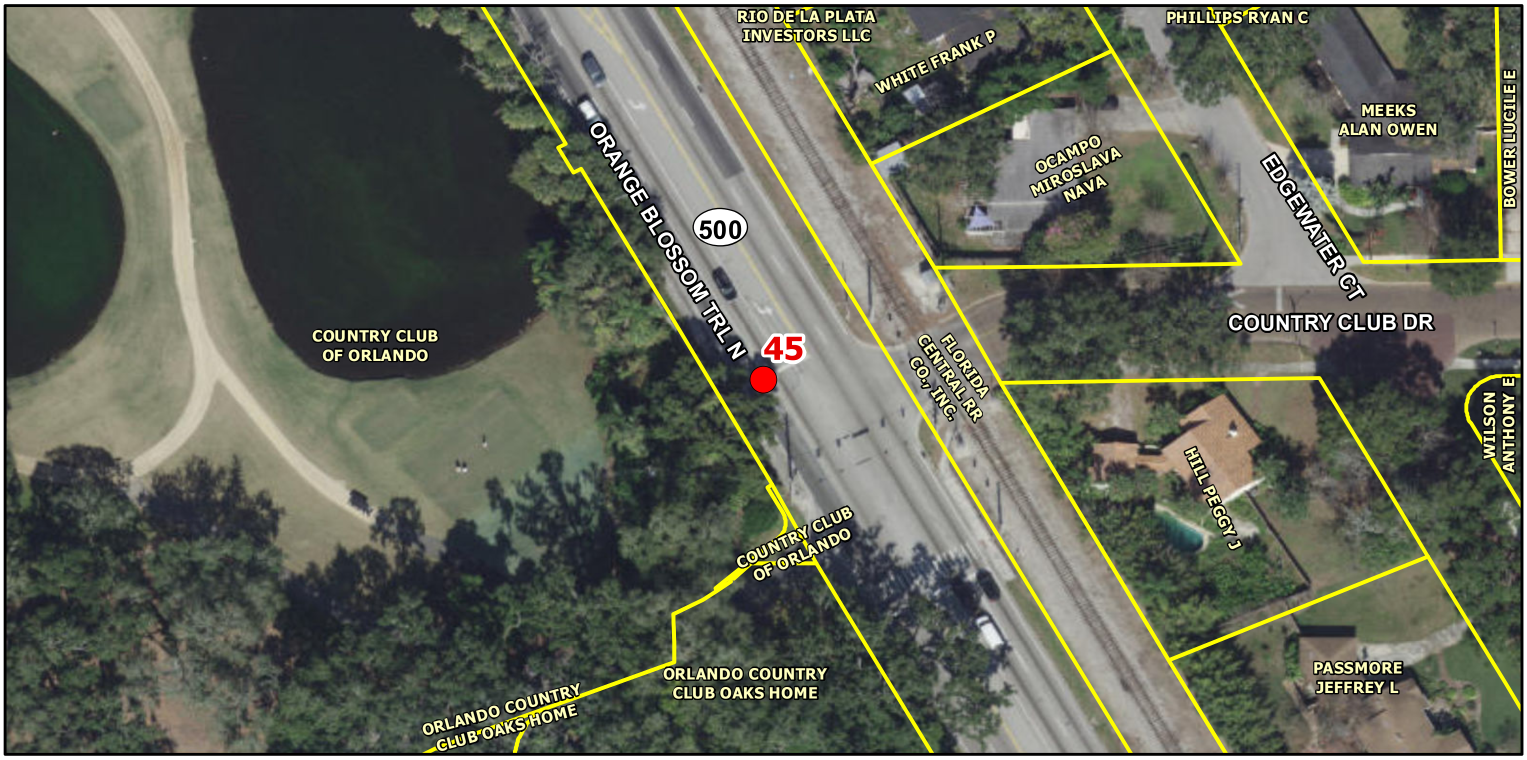
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 45

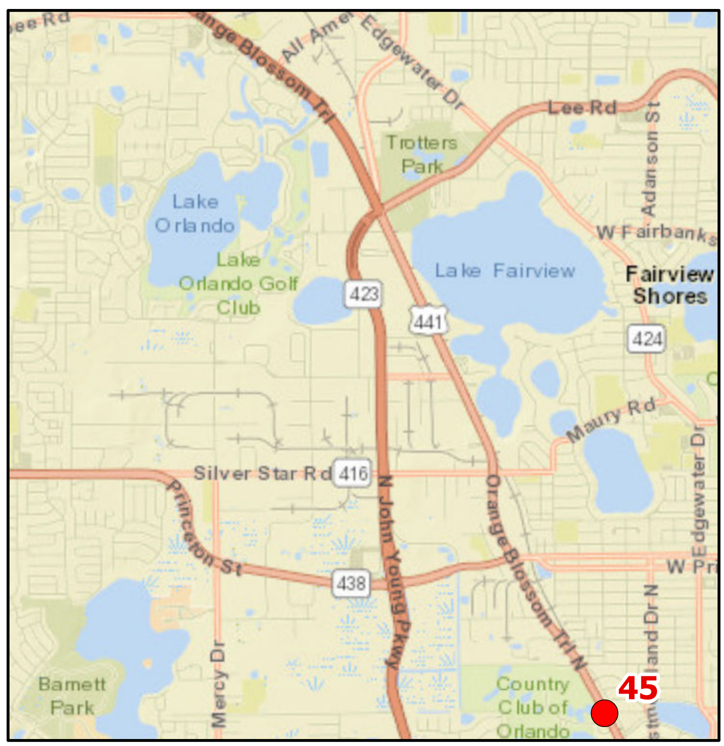
Feature Type: ADA - Safety

Comment:

Lat: 28.56003 **Long:** -81.3974

http://maps.google.com/maps?q=28.56003,-81.3974

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

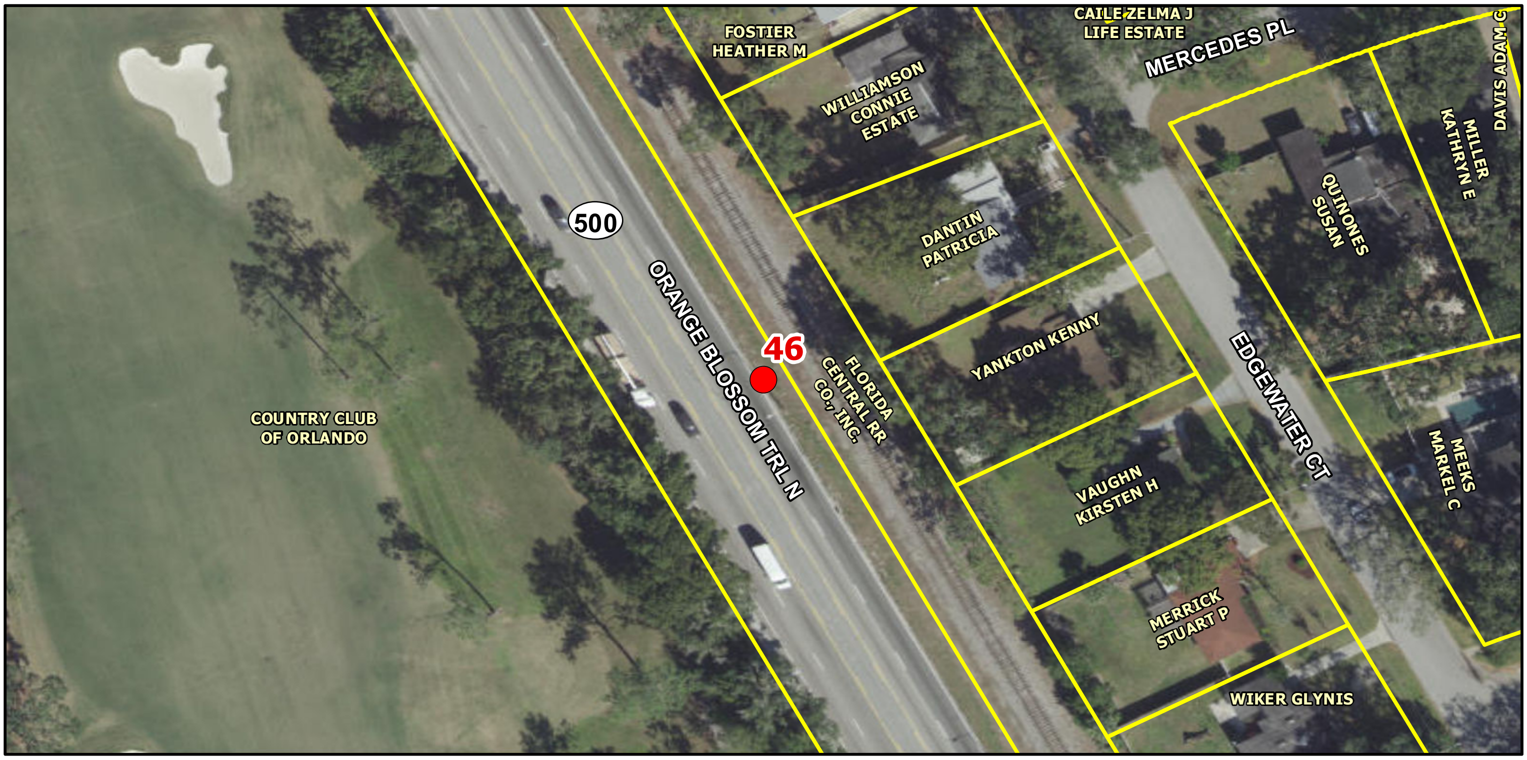
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021



Feature ID: 46

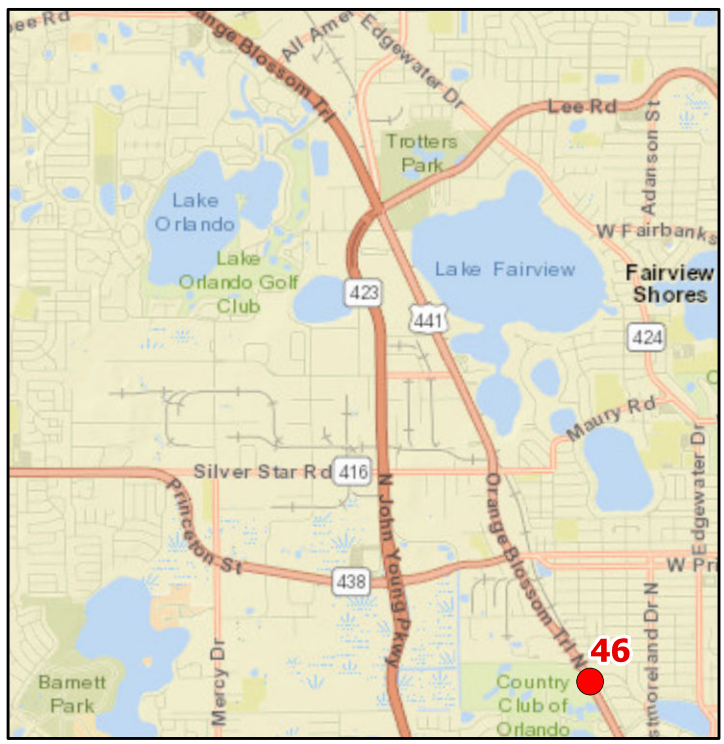
Feature Type: ADA - Safety

Comment:

Lat: 28.56228 **Long:** -81.3986

http://maps.google.com/maps?q=28.56228,-81.3986

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Feature ID: 47

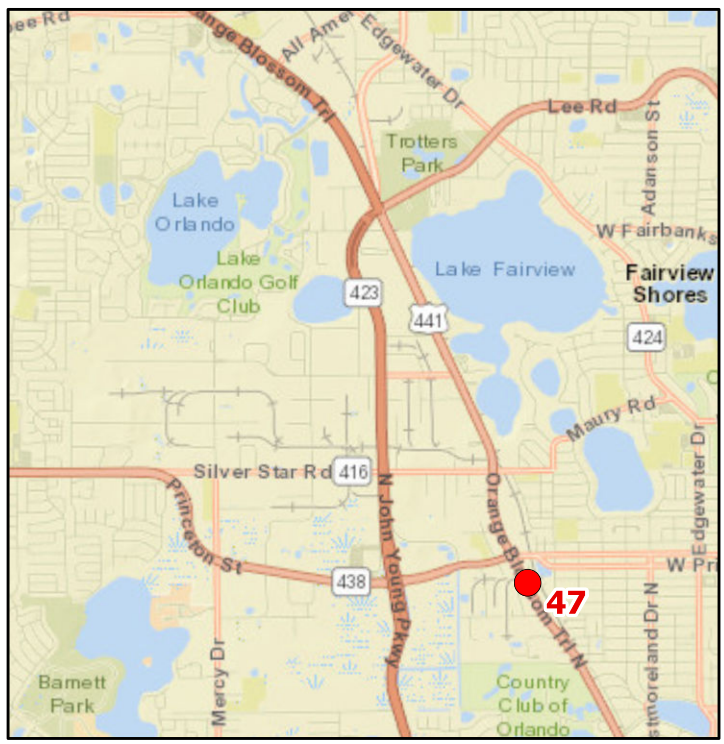
Feature Type: ADA - Safety

Comment:

Lat: 28.5697 **Long:** -81.40396

http://maps.google.com/maps?q=28.5697,-81.40396

ADA - Safety
Transit
Damaged Infrastructure
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Feature ID: 48

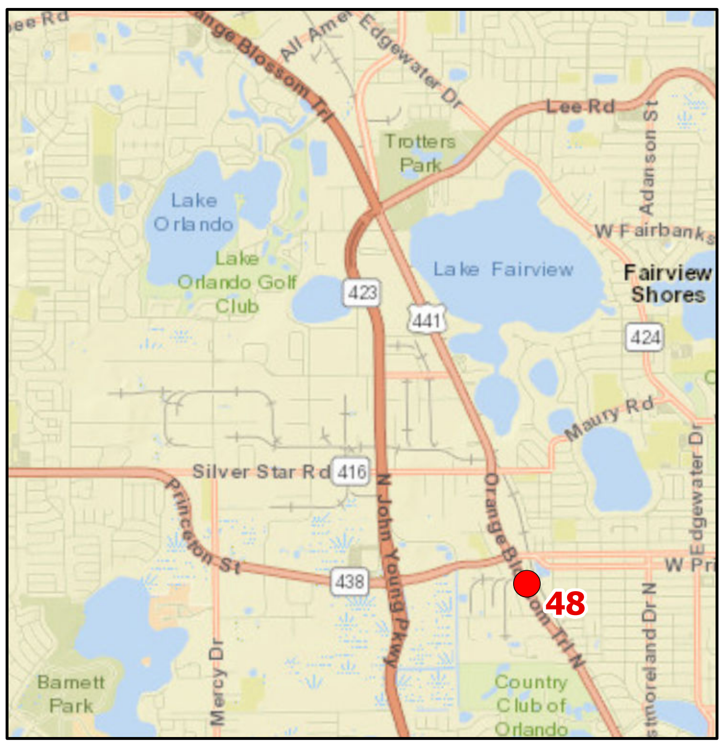
Feature Type: ADA - Safety

Comment: no sidewalk

Lat: 28.56969 **Long:** -81.40395

http://maps.google.com/maps?q=28.56969,-81.40395

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021

Feature ID: 49

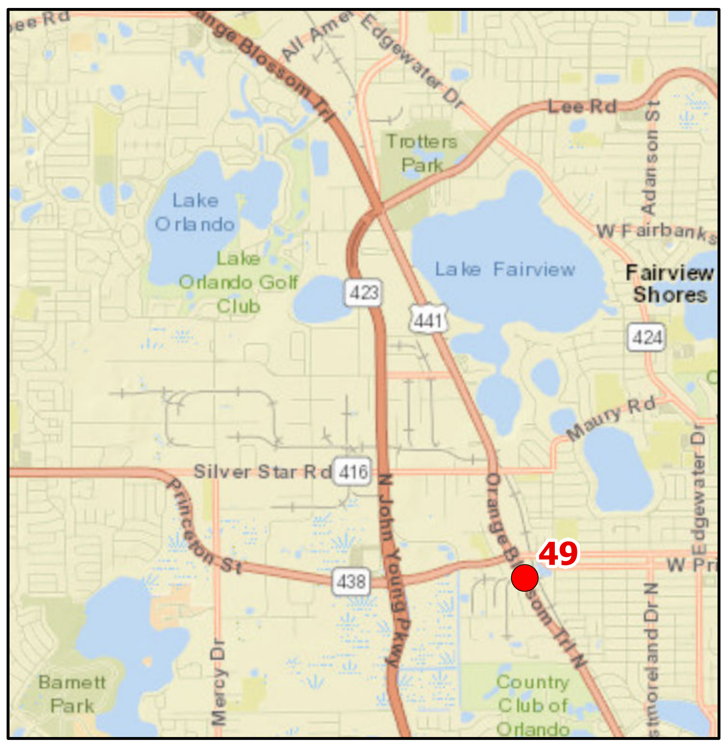
Feature Type: ADA - Safety

Comment:

Lat: 28.57007 **Long:** -81.40428

http://maps.google.com/maps?q=28.57007,-81.40428

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021

Feature ID: 50

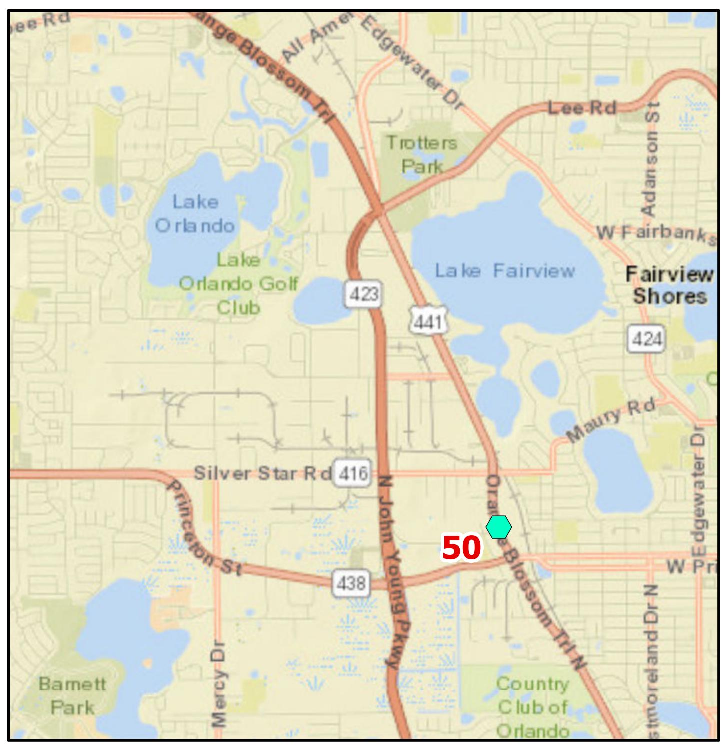
Feature Type: Transit

Comment:

Lat: 28.57407 **Long:** -81.40648

http://maps.google.com/maps?q=28.57407,-81.40648

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

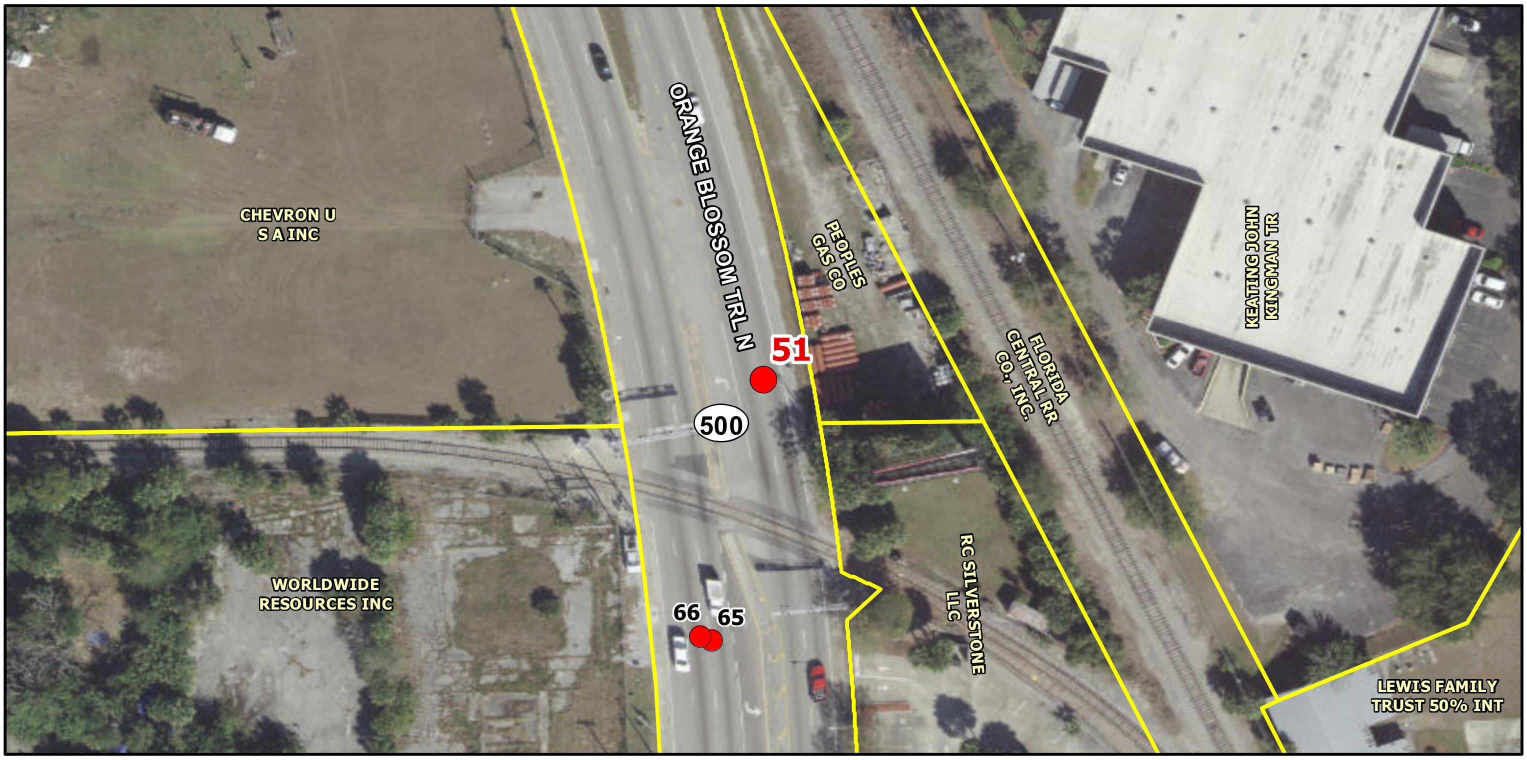
0 50 100 150

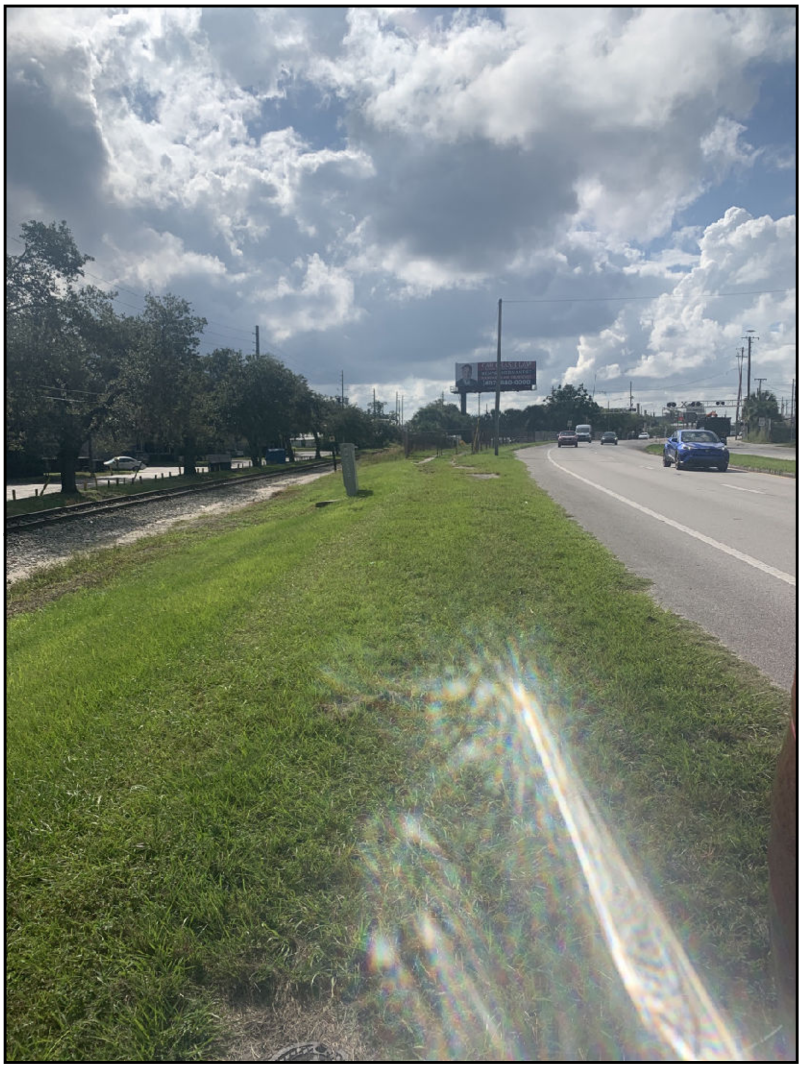
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure





Feature ID: 51

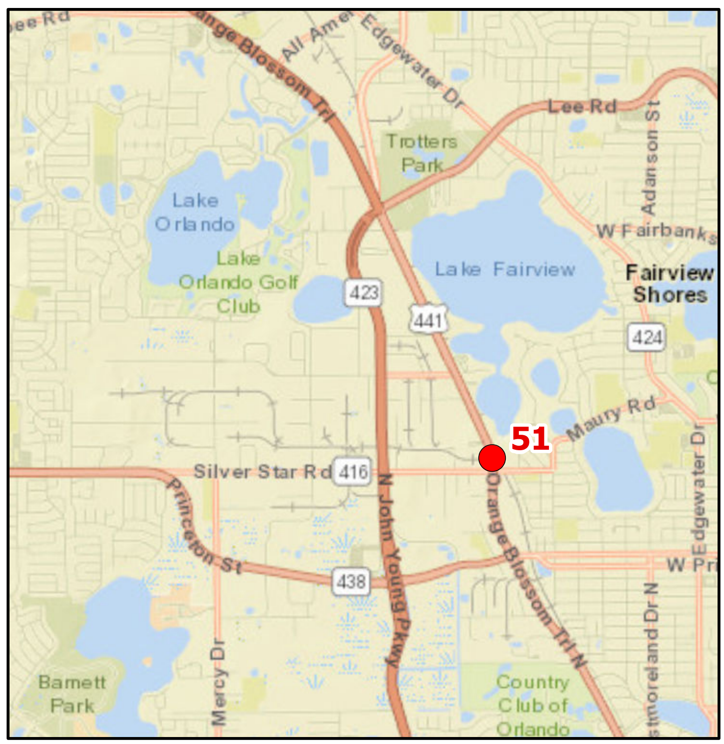
Feature Type: ADA - Safety

Comment:

Lat: 28.57918 **Long:** -81.40704

http://maps.google.com/maps?q=28.57918,-81.40704

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

FDOT

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021

Feature ID: 52

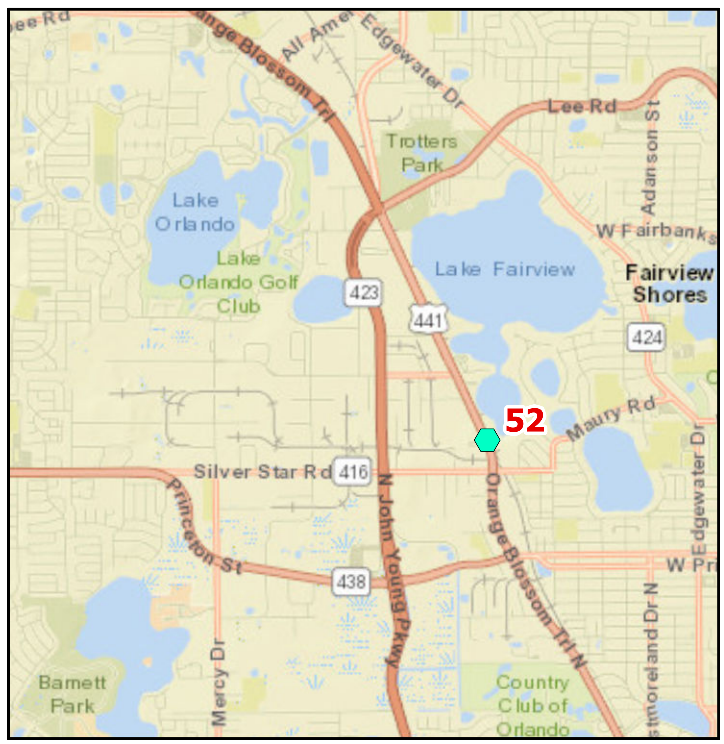
Feature Type: Transit

Comment:

Lat: 28.58057 **Long:** -81.40752

http://maps.google.com/maps?q=28.58057,-81.40752

ADA - Safety		Transit	
Damaged Infrastructure		User	



Map Scale: 1 Inch = 100 Feet

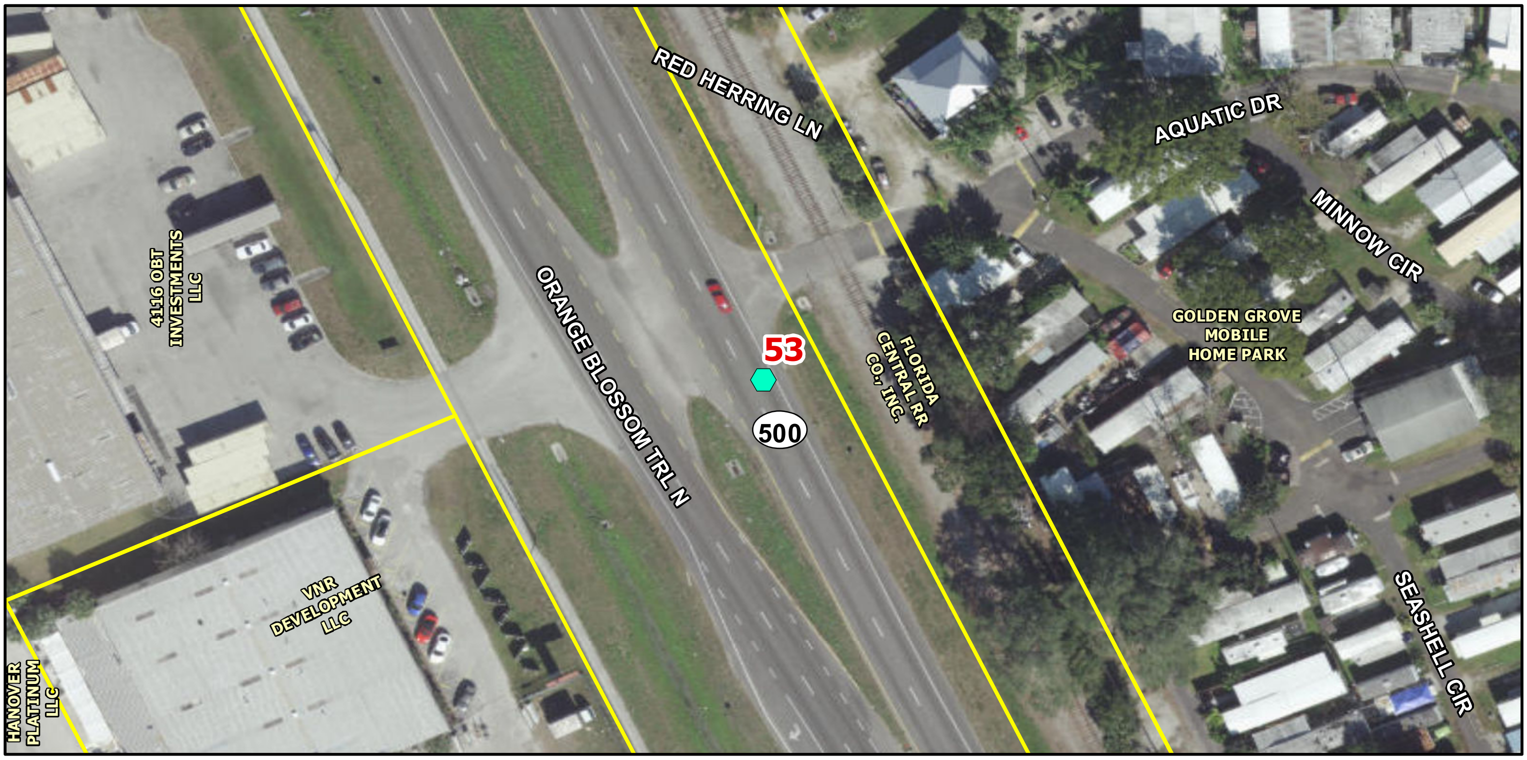
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 53

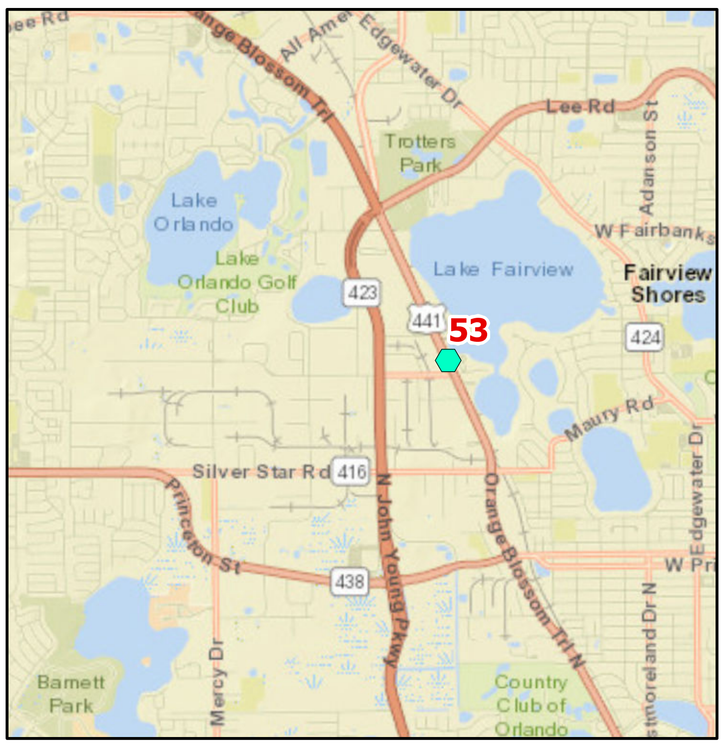
Feature Type: Transit

Comment:

Lat: 28.58655 **Long:** -81.41074

http://maps.google.com/maps?q=28.58655,-81.41074

ADA - Safety | Transit
Damaged Infrastructure | User



Map Scale: 1 Inch = 100 Feet

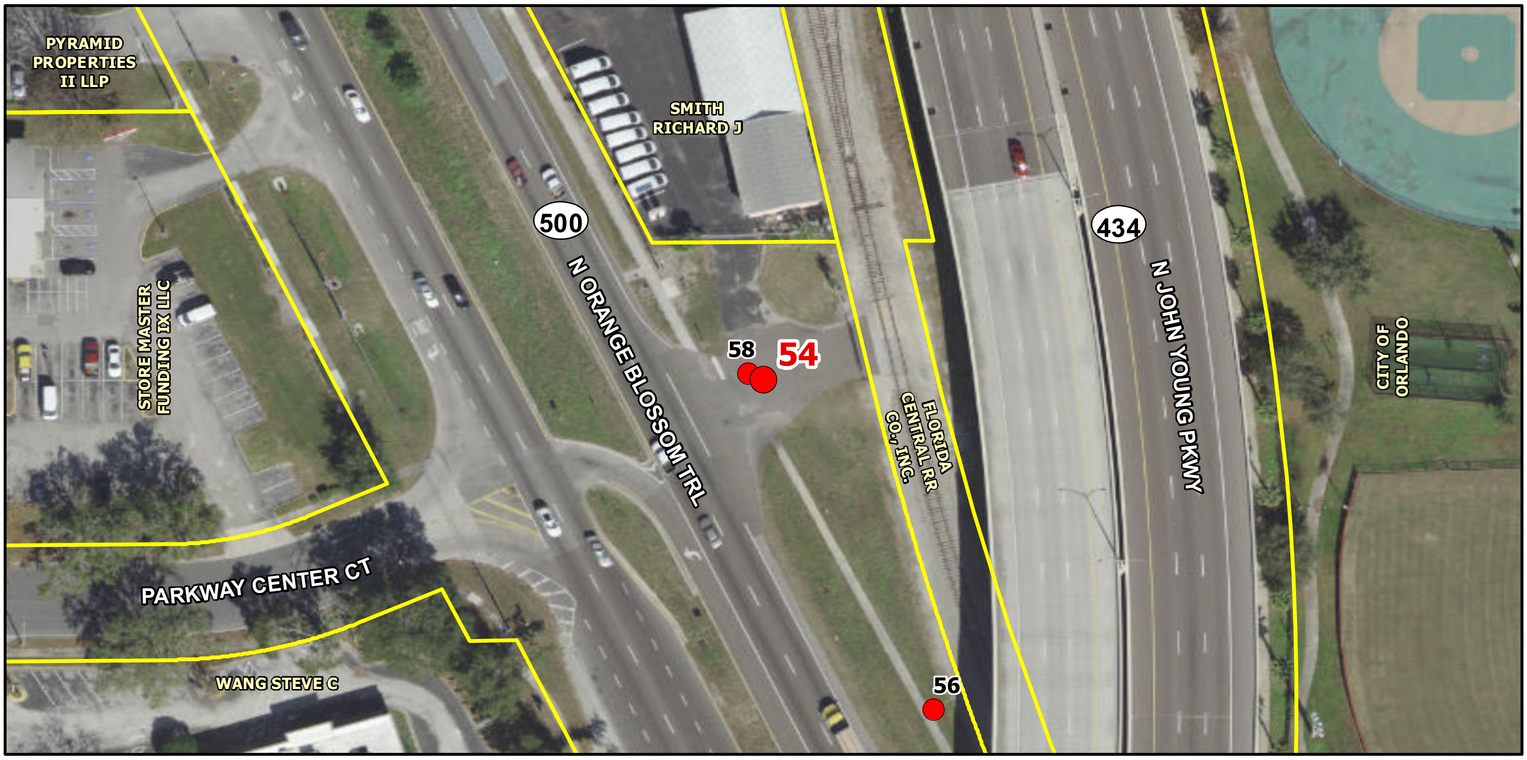
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 54

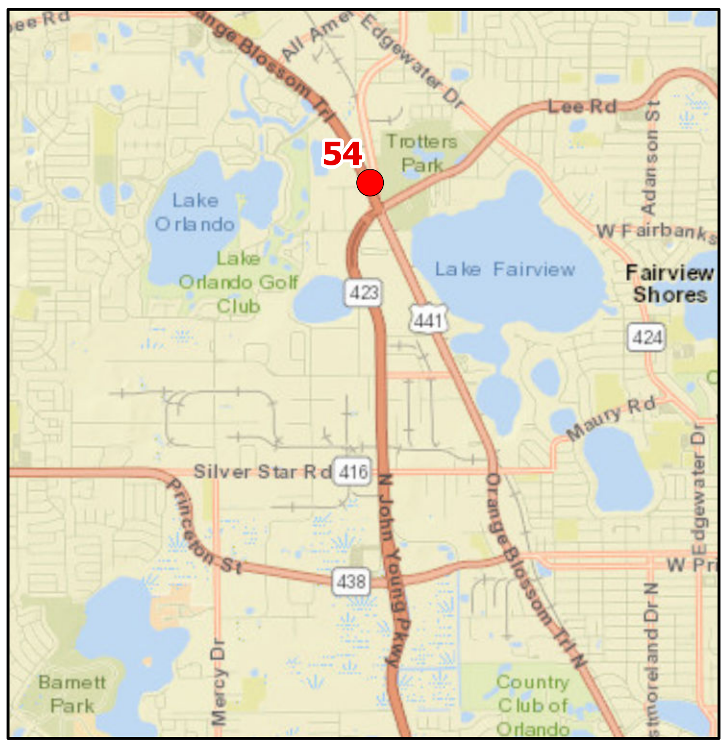
Feature Type: ADA - Safety

Comment:

Lat: 28.59993 **Long:** -81.41763

http://maps.google.com/maps?q=28.59993,-81.41763

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021

Feature ID: 55

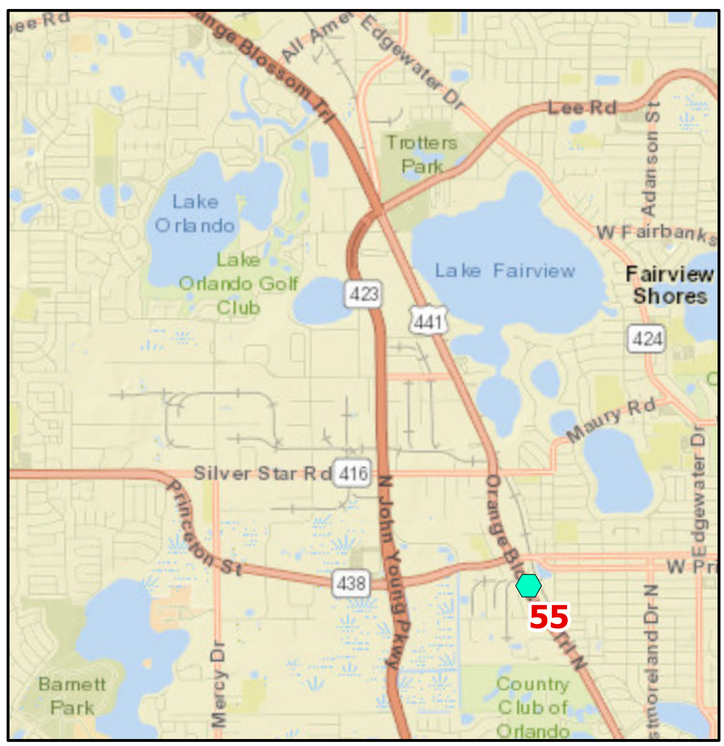
Feature Type: Transit

Comment: bus stop with platform

Lat: 28.56968 **Long:** -81.40395

http://maps.google.com/maps?q=28.56968,-81.40395

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

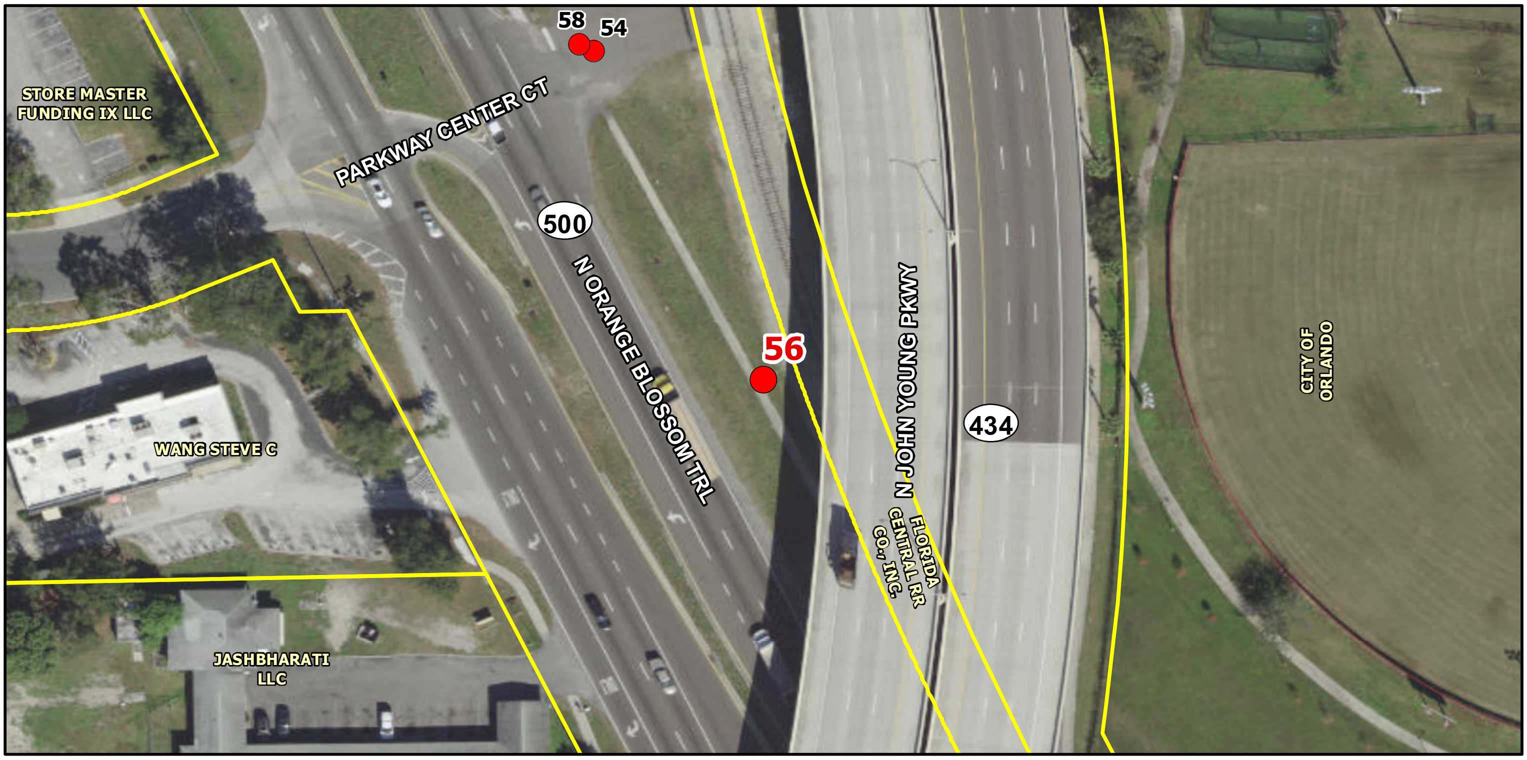
Feet

FDOT

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 56

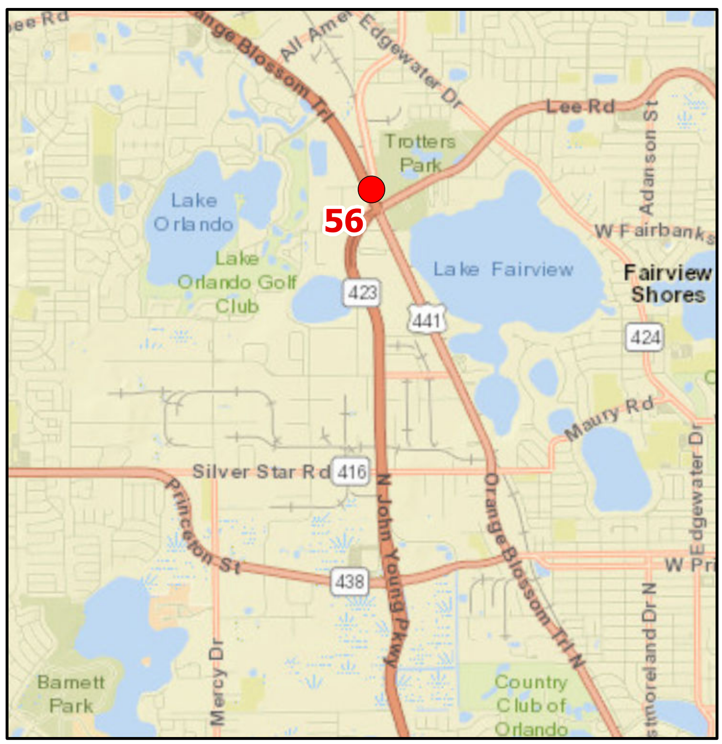
Feature Type: ADA - Safety

Comment:

Lat: 28.59946 **Long:** -81.41738

http://maps.google.com/maps?q=28.59946,-81.41738

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

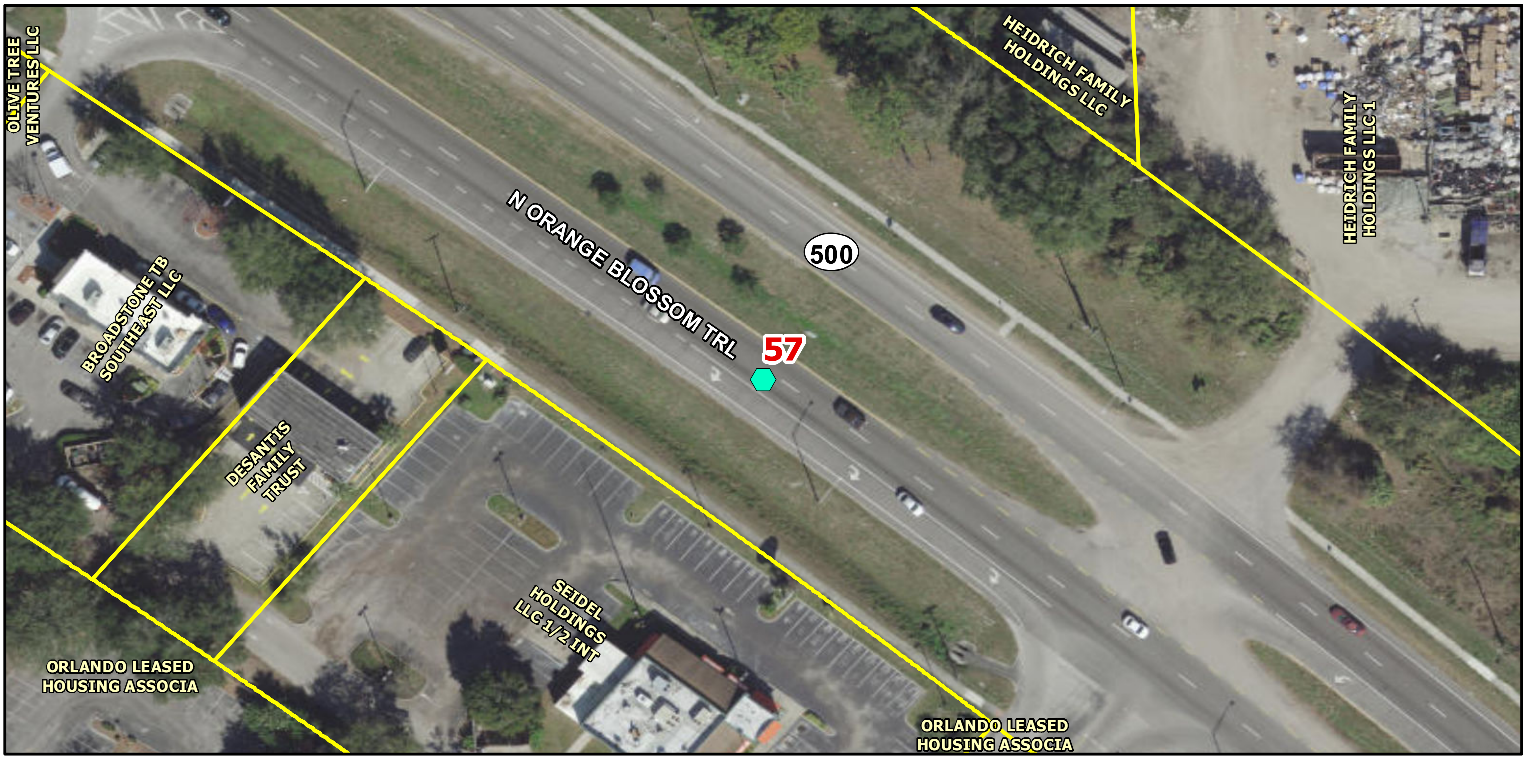
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021



Feature ID: 57

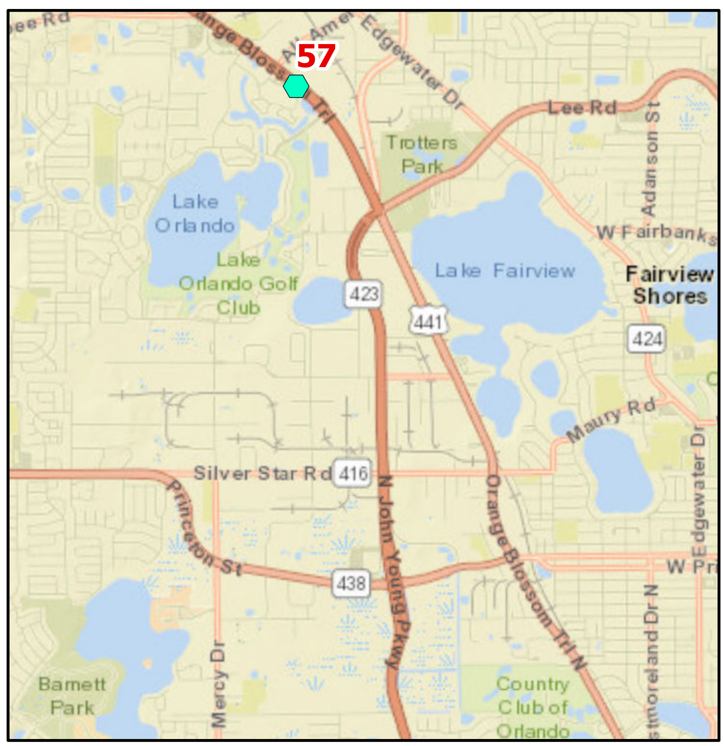
Feature Type: Transit

Comment:

Lat: 28.60735 **Long:** -81.42396

http://maps.google.com/maps?q=28.60735,-81.42396

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

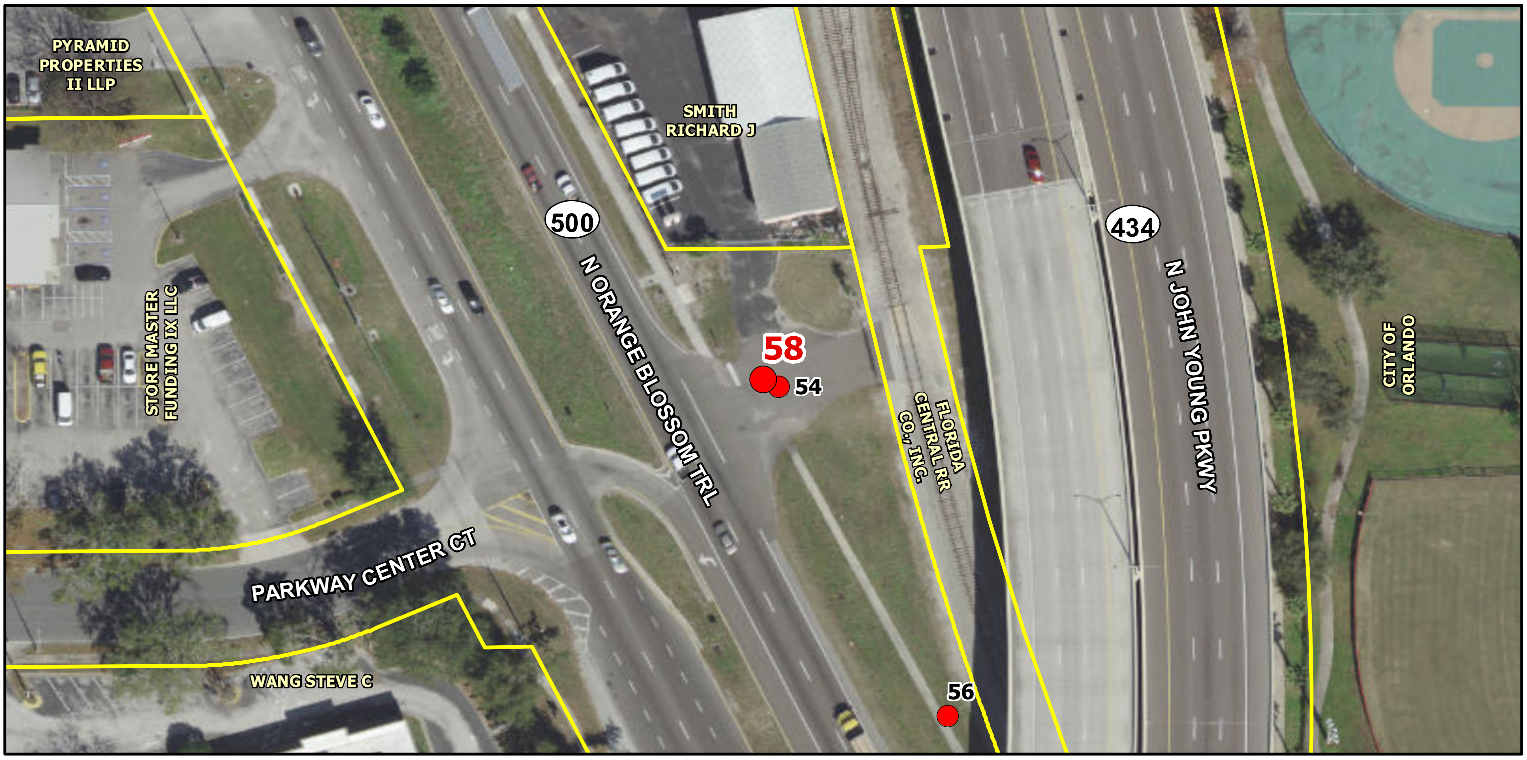
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 58

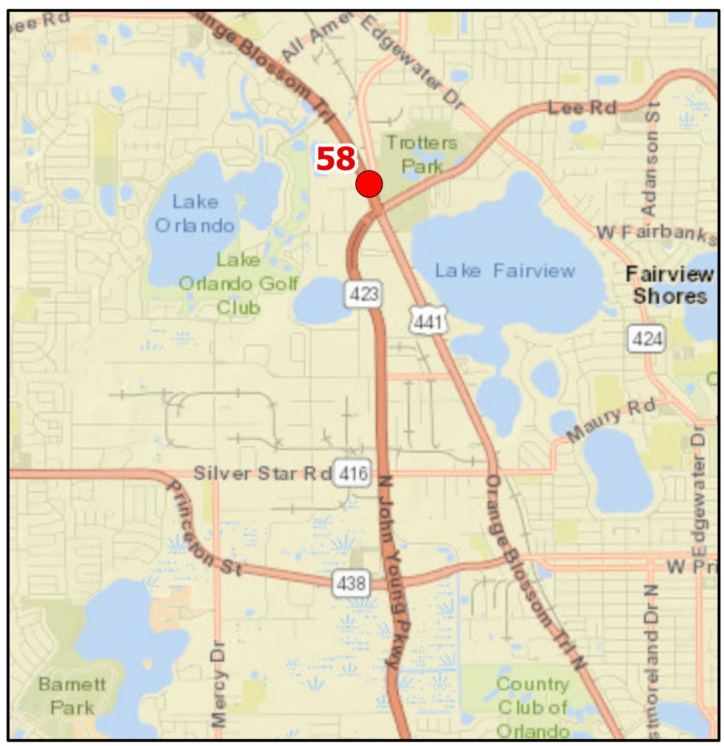
Feature Type: ADA - Safety

Comment: sidewalk

Lat: 28.59994 **Long:** -81.41765

http://maps.google.com/maps?q=28.59994,-81.41765

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

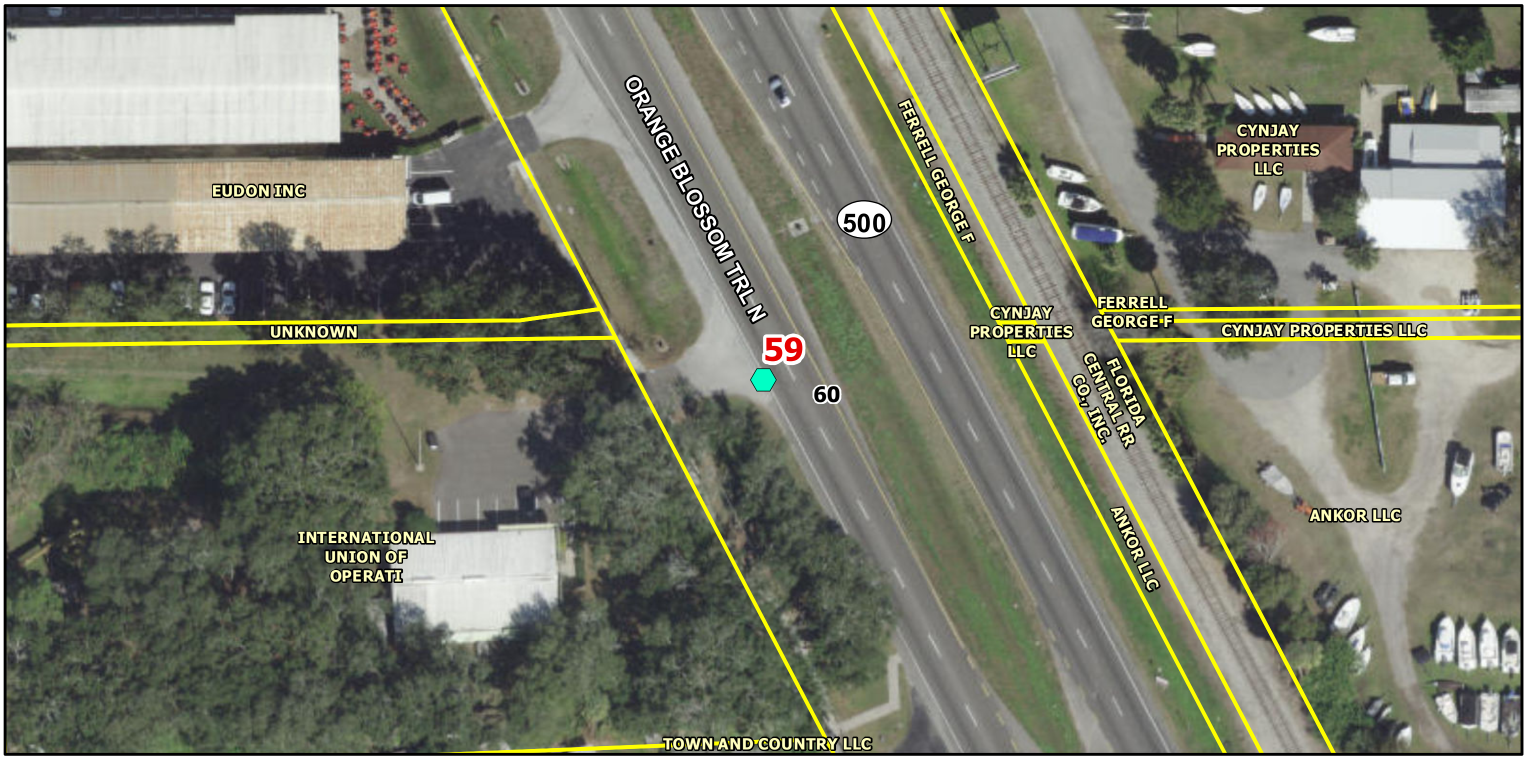
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 59

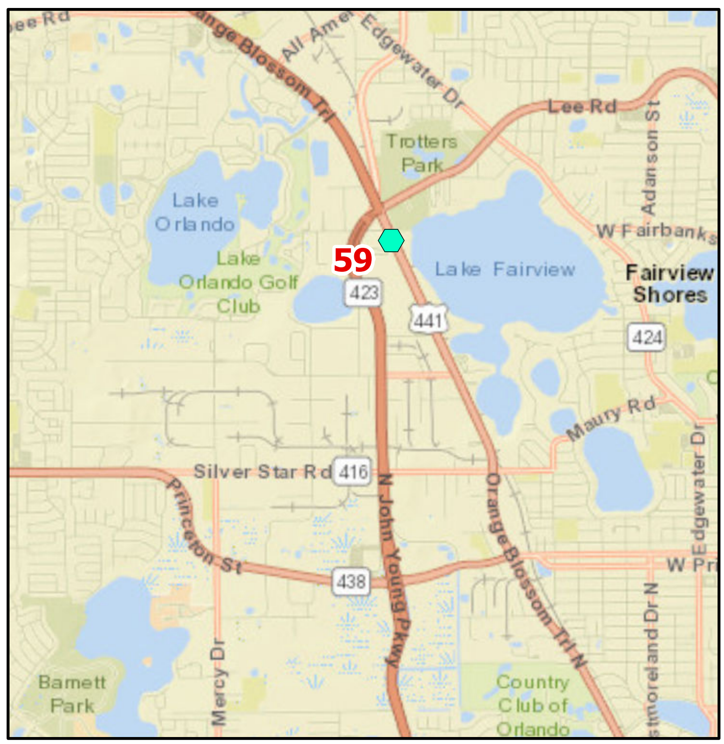
Feature Type: Transit

Comment: people sitting at stop on grass

Lat: 28.59565 **Long:** -81.41581

http://maps.google.com/maps?q=28.59565,-81.41581

ADA - Safety
Damaged Infrastructure
Transit
User



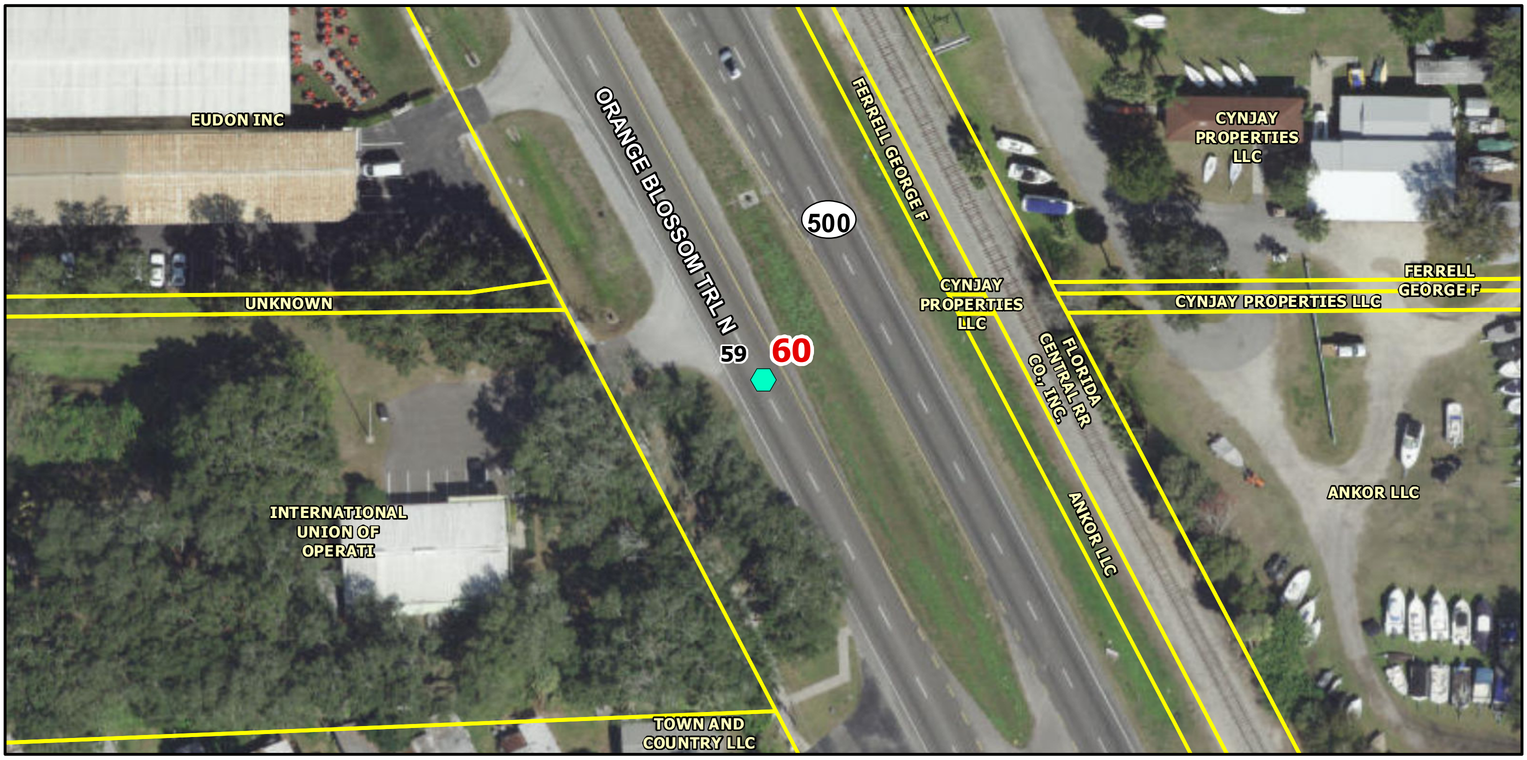
Map Scale: 1 Inch = 100 Feet

0 50 100 150
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 60

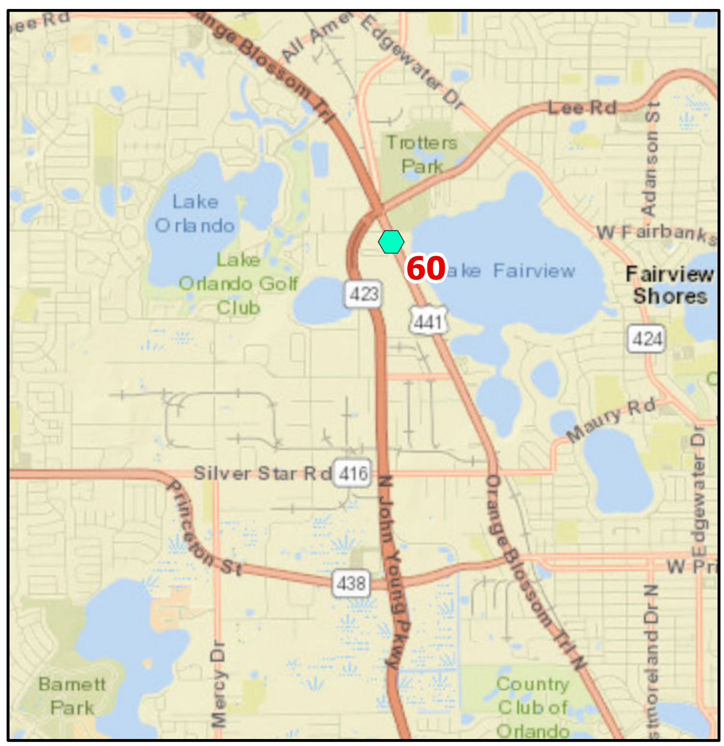
Feature Type: Transit

Comment:

Lat: 28.59561 **Long:** -81.41574

http://maps.google.com/maps?q=28.59561,-81.41574

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

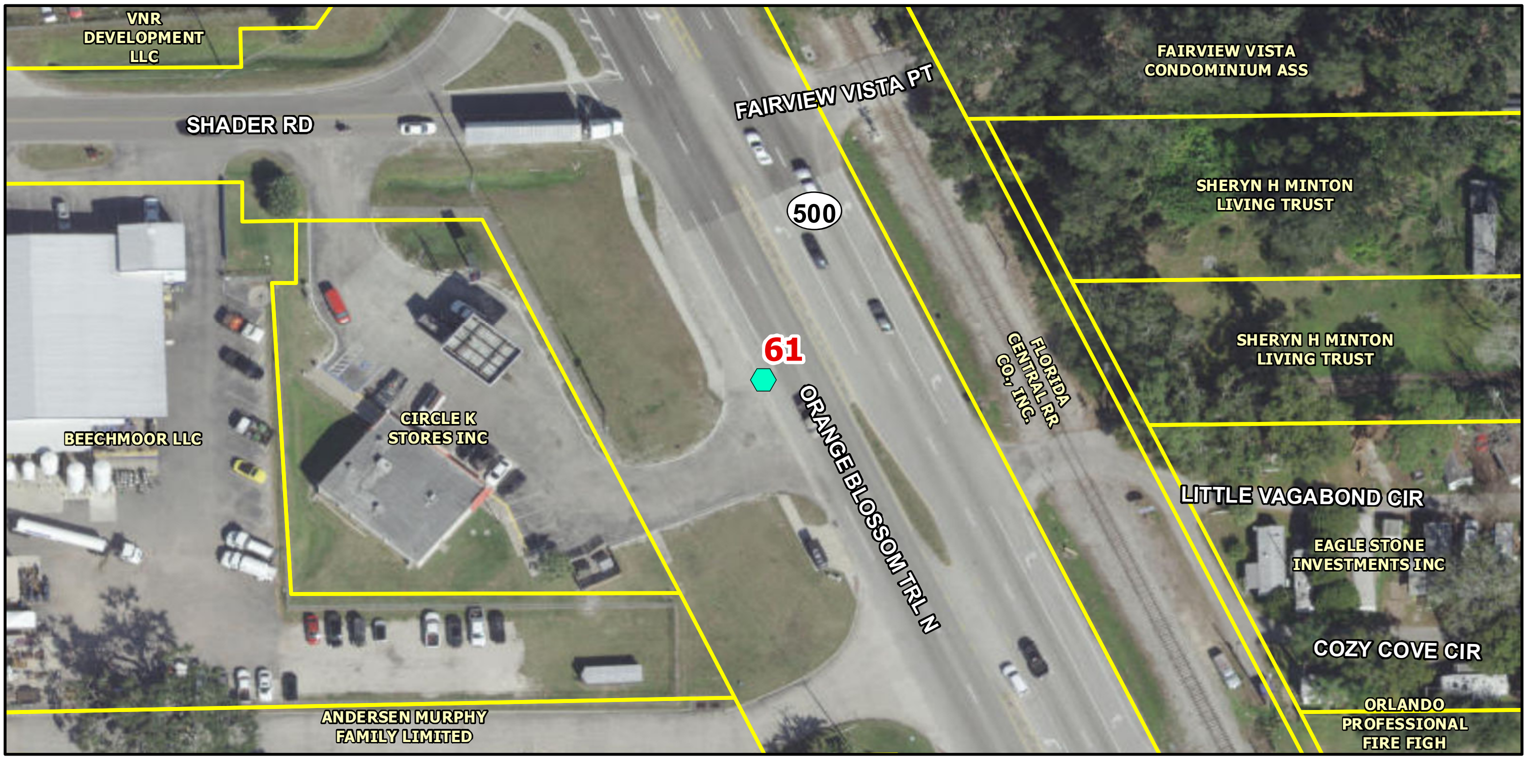
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 61

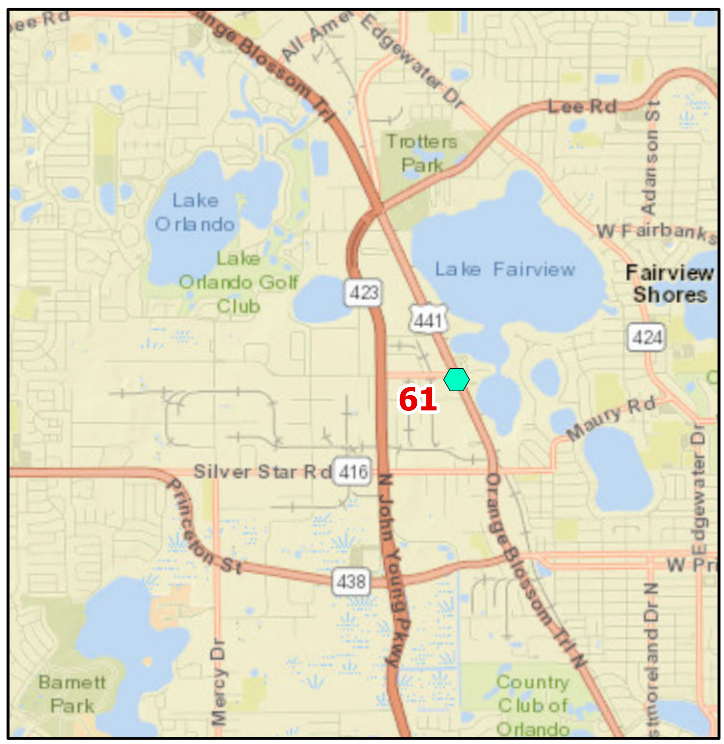
Feature Type: Transit

Comment:

Lat: 28.5851 **Long:** -81.41016

http://maps.google.com/maps?q=28.5851,-81.41016

ADA - Safety | Transit
Damaged Infrastructure | User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

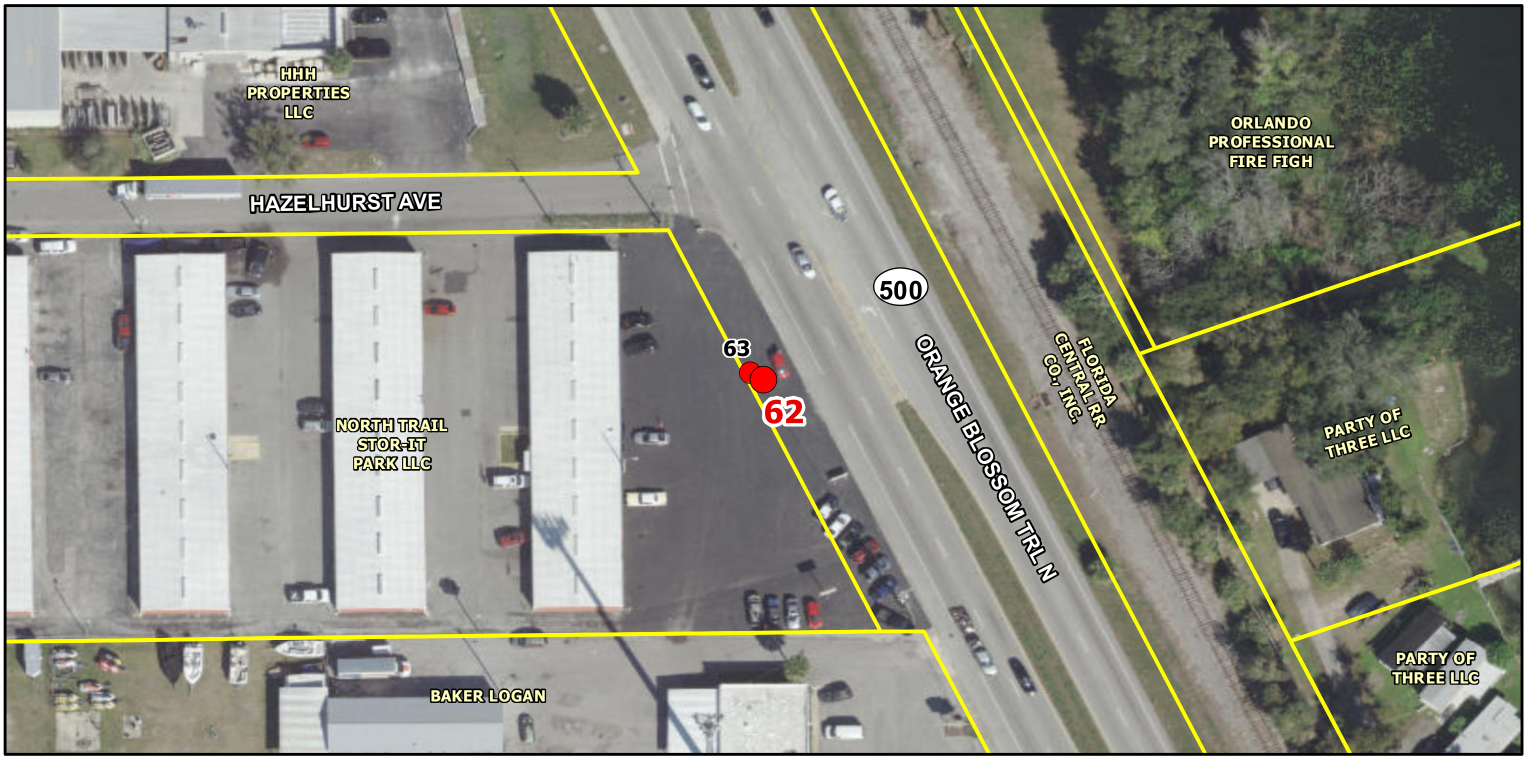
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021



Feature ID: 62

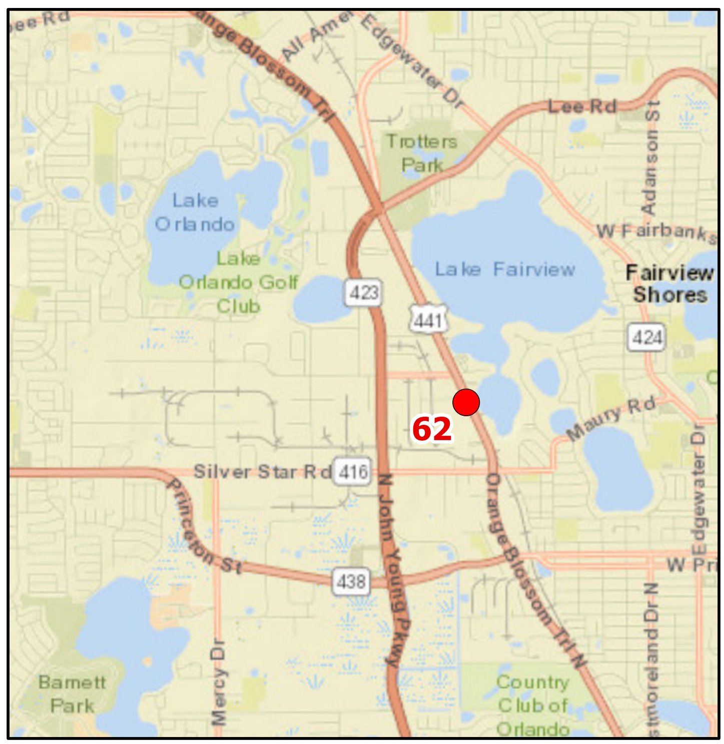
Feature Type: ADA - Safety

Comment: sidewalk transfers from concrete to asphalt parking lot

Lat: 28.58339 **Long:** -81.40933

http://maps.google.com/maps?q=28.58339,-81.40933

ADA - Safety
Transit
Damaged Infrastructure
User

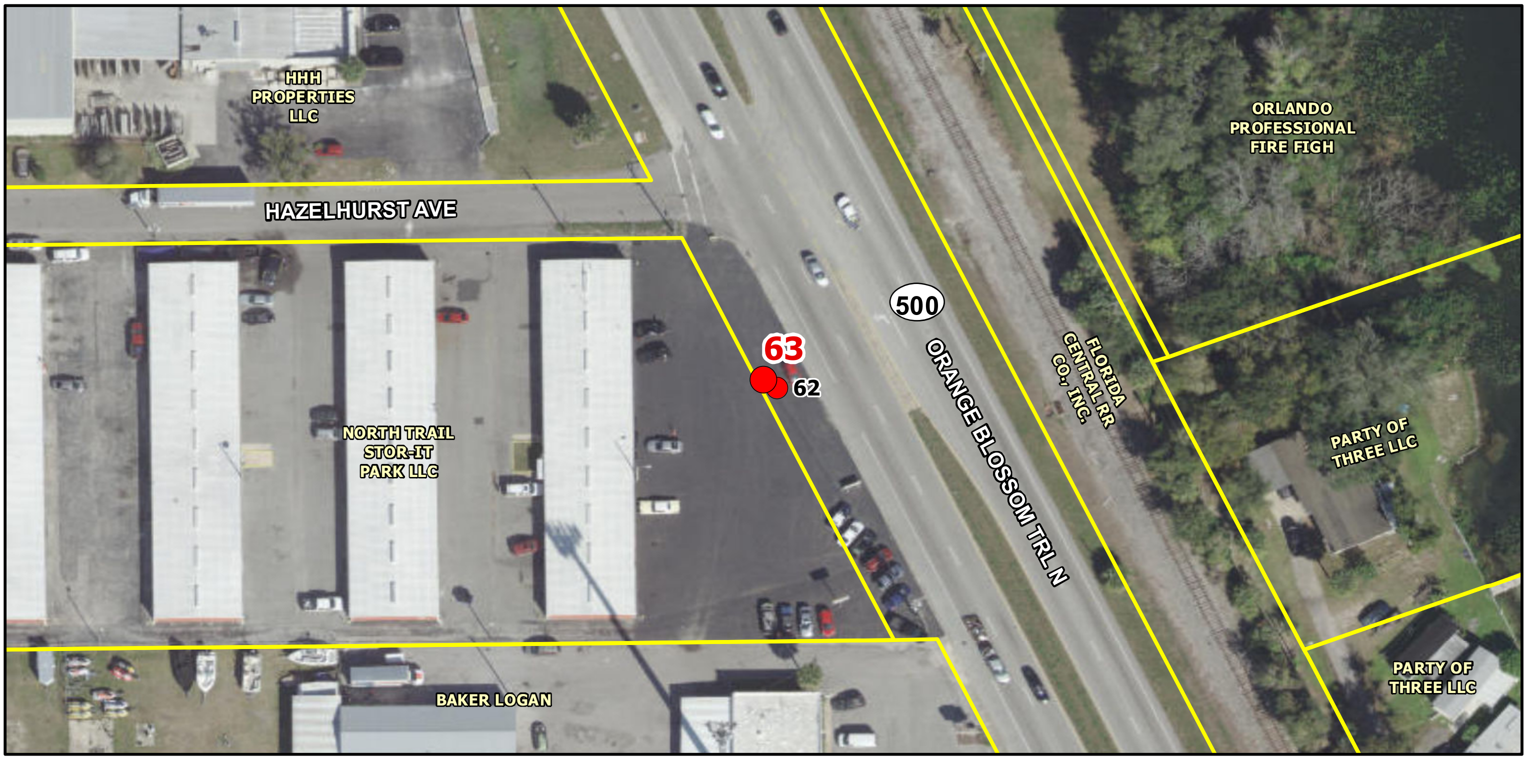


Map Scale: 1 Inch = 100 Feet

0 50 100 150
Feet

Field Observations
Silver Star Freight
Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021



Feature ID: 63

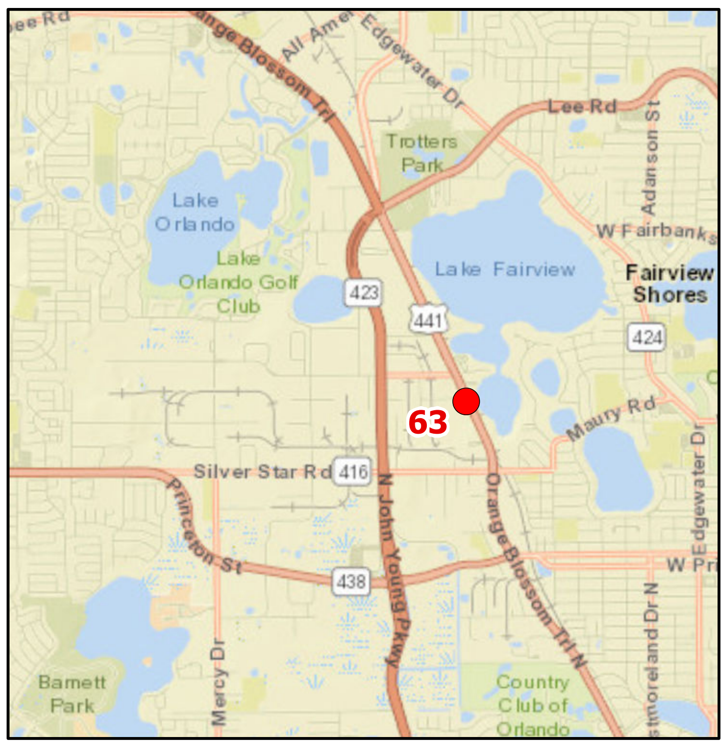
Feature Type: ADA - Safety

Comment:

Lat: 28.5834 **Long:** -81.40935

http://maps.google.com/maps?q=28.5834,-81.40935

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021

Feature ID: 64

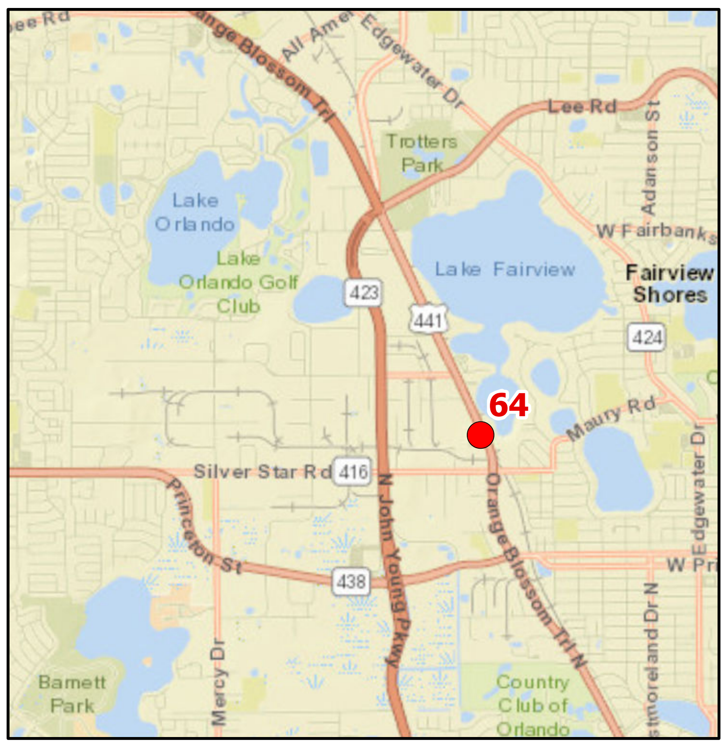
Feature Type: ADA - Safety

Comment:

Lat: 28.5809 **Long:** -81.40804

http://maps.google.com/maps?q=28.5809,-81.40804

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

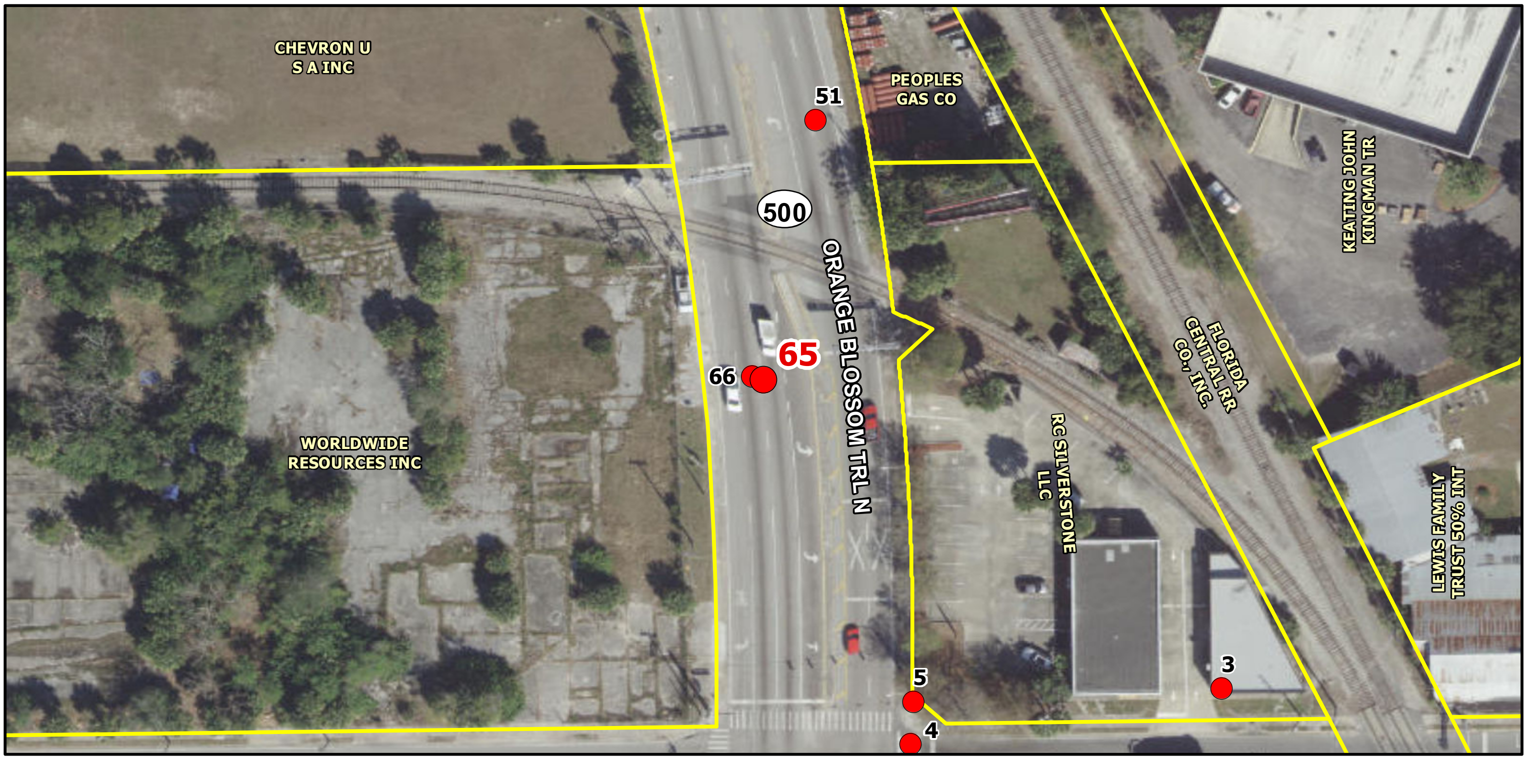
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 65

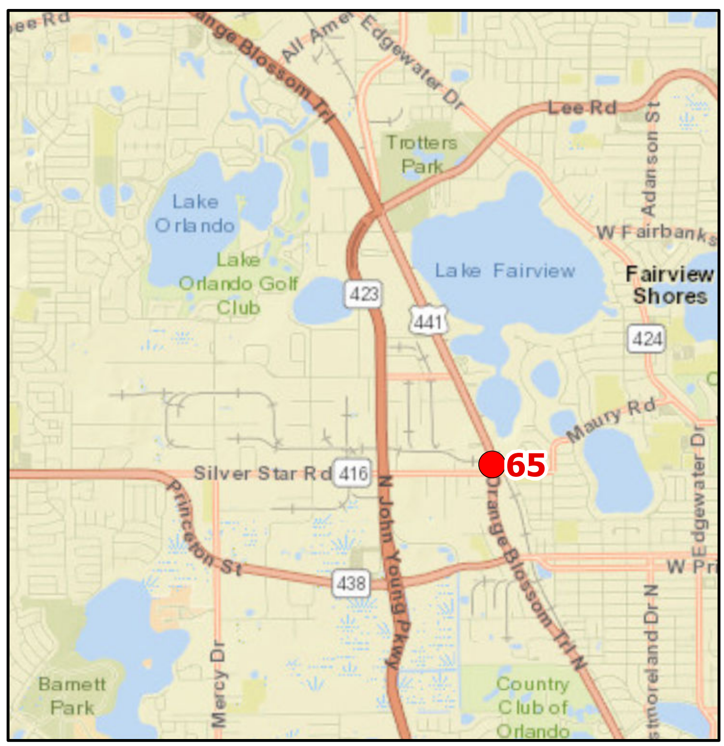
Feature Type: ADA - Safety

Comment:

Lat: 28.57881 **Long:** -81.40712

http://maps.google.com/maps?q=28.57881,-81.40712

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150
Feet

FDOT

Field Observations

Silver Star Freight
Existing Bike and Ped Transit Infrastructure

Feature ID: 66

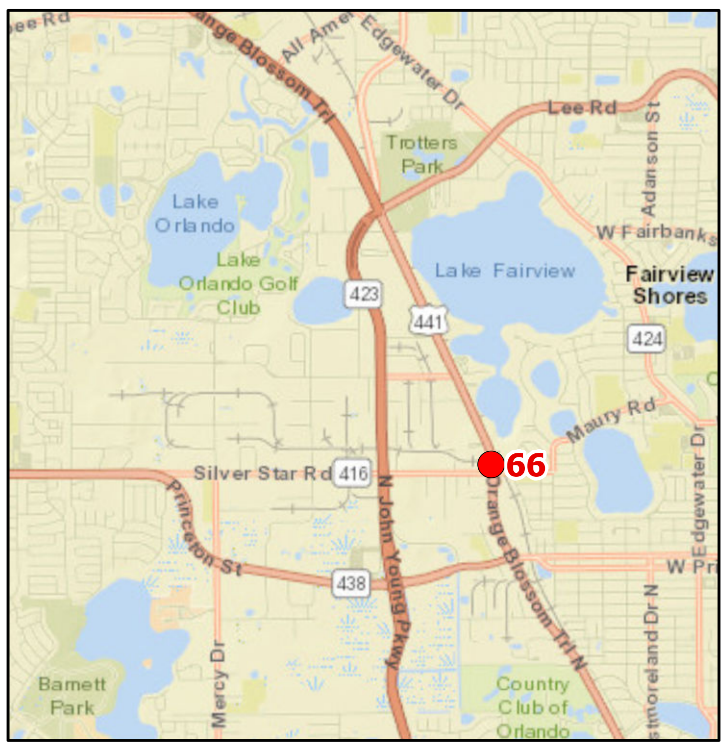
Feature Type: ADA - Safety

Comment:

Lat: 28.57881 **Long:** -81.40714

http://maps.google.com/maps?q=28.57881,-81.40714

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

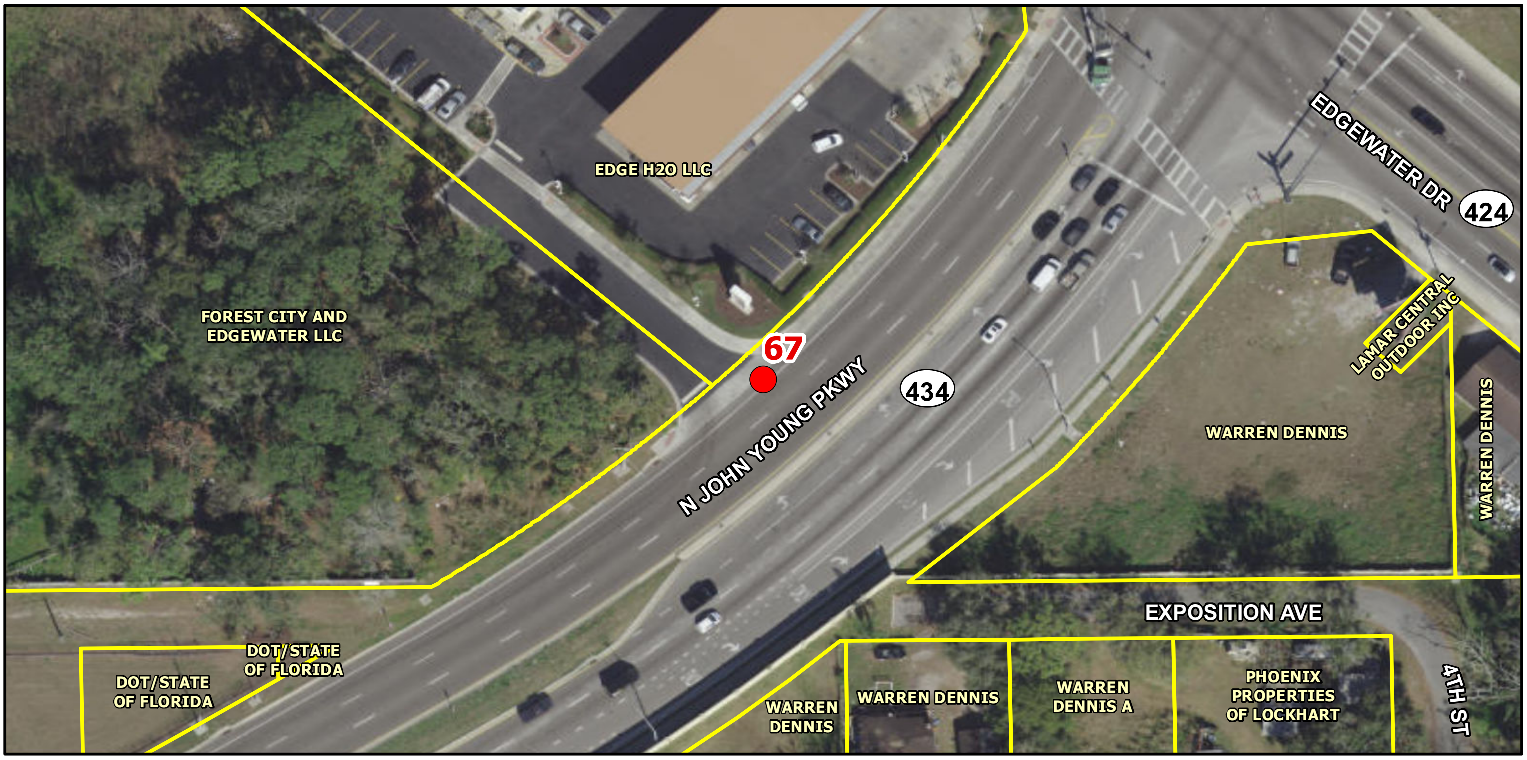
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 67

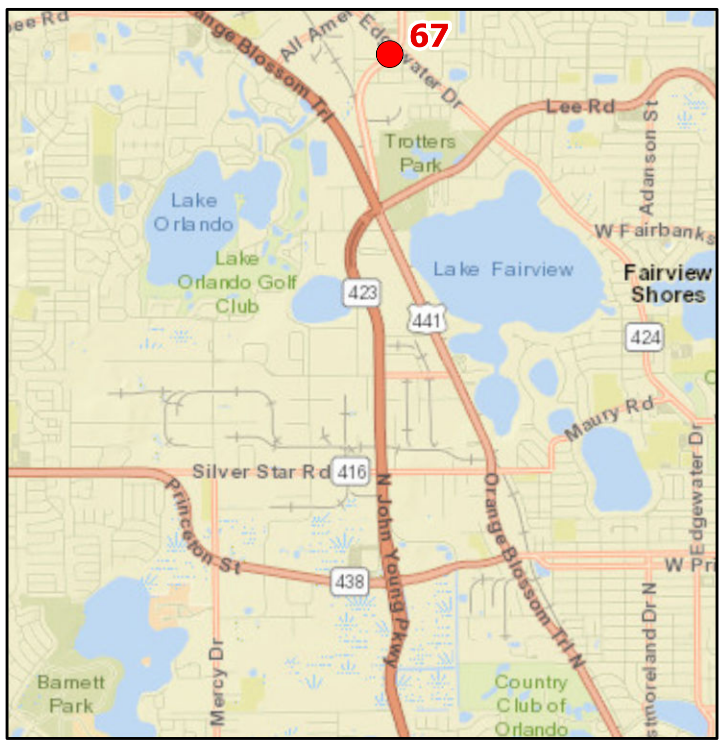
Feature Type: ADA - Safety

Comment:

Lat: 28.60967 **Long:** -81.41579

http://maps.google.com/maps?q=28.60967,-81.41579

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

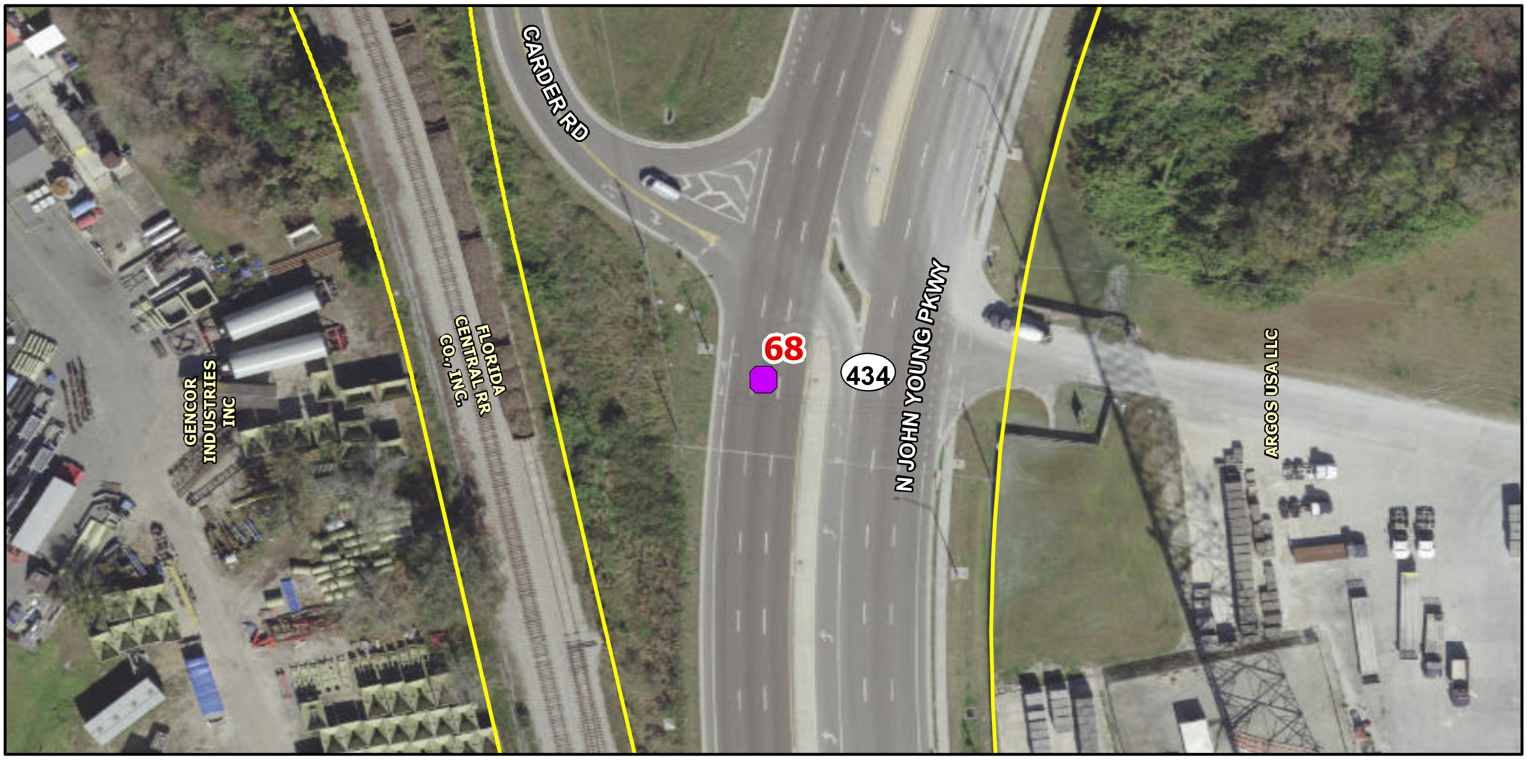
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 68

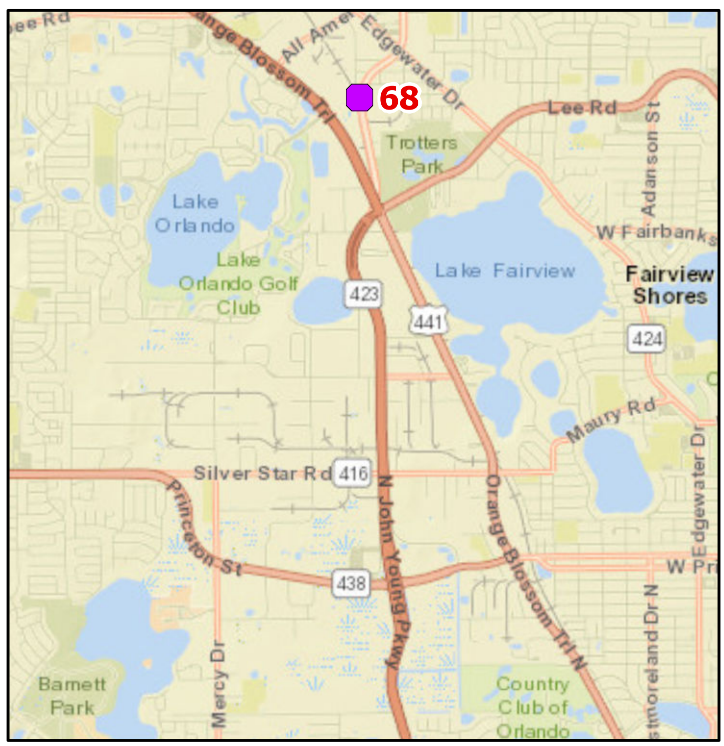
Feature Type: User

Comment:

Lat: 28.60649 **Long:** -81.41858

http://maps.google.com/maps?q=28.60649,-81.41858

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Feature ID: 69

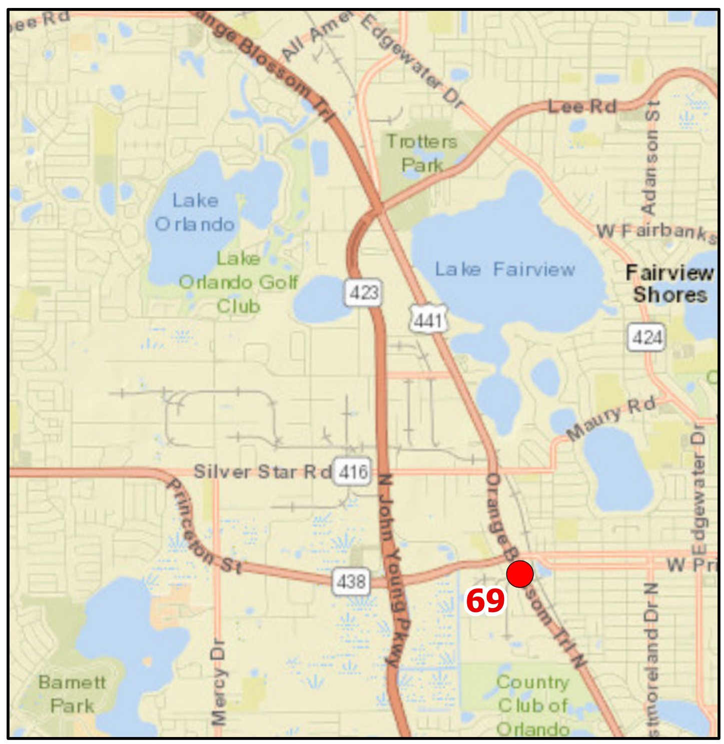
Feature Type: ADA - Safety

Comment:

Lat: 28.57041 **Long:** -81.4047

http://maps.google.com/maps?q=28.57041,-81.4047

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Feature ID: 70

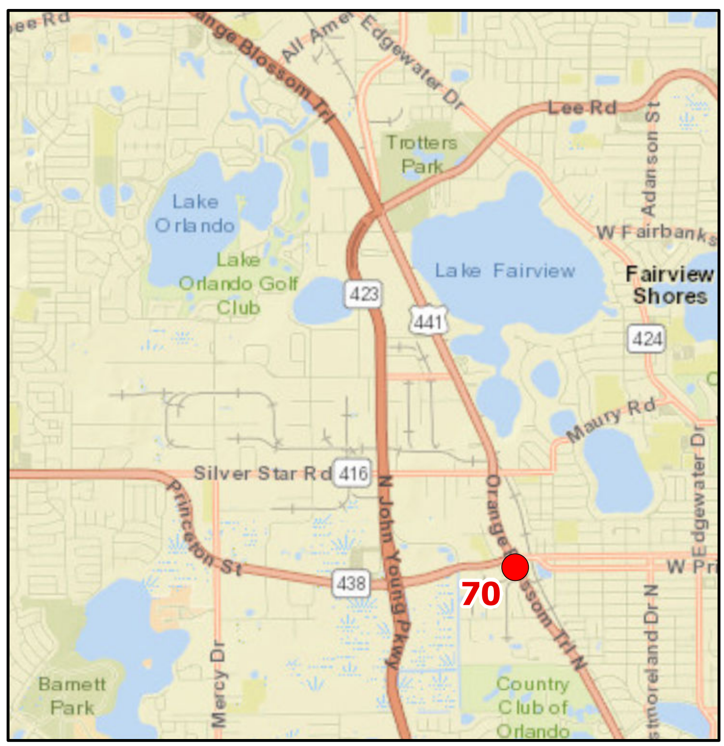
Feature Type: ADA - Safety

Comment:

Lat: 28.57104 **Long:** -81.40508

http://maps.google.com/maps?q=28.57104,-81.40508

ADA - Safety | Transit
Damaged Infrastructure | User



Map Scale: 1 Inch = 100 Feet

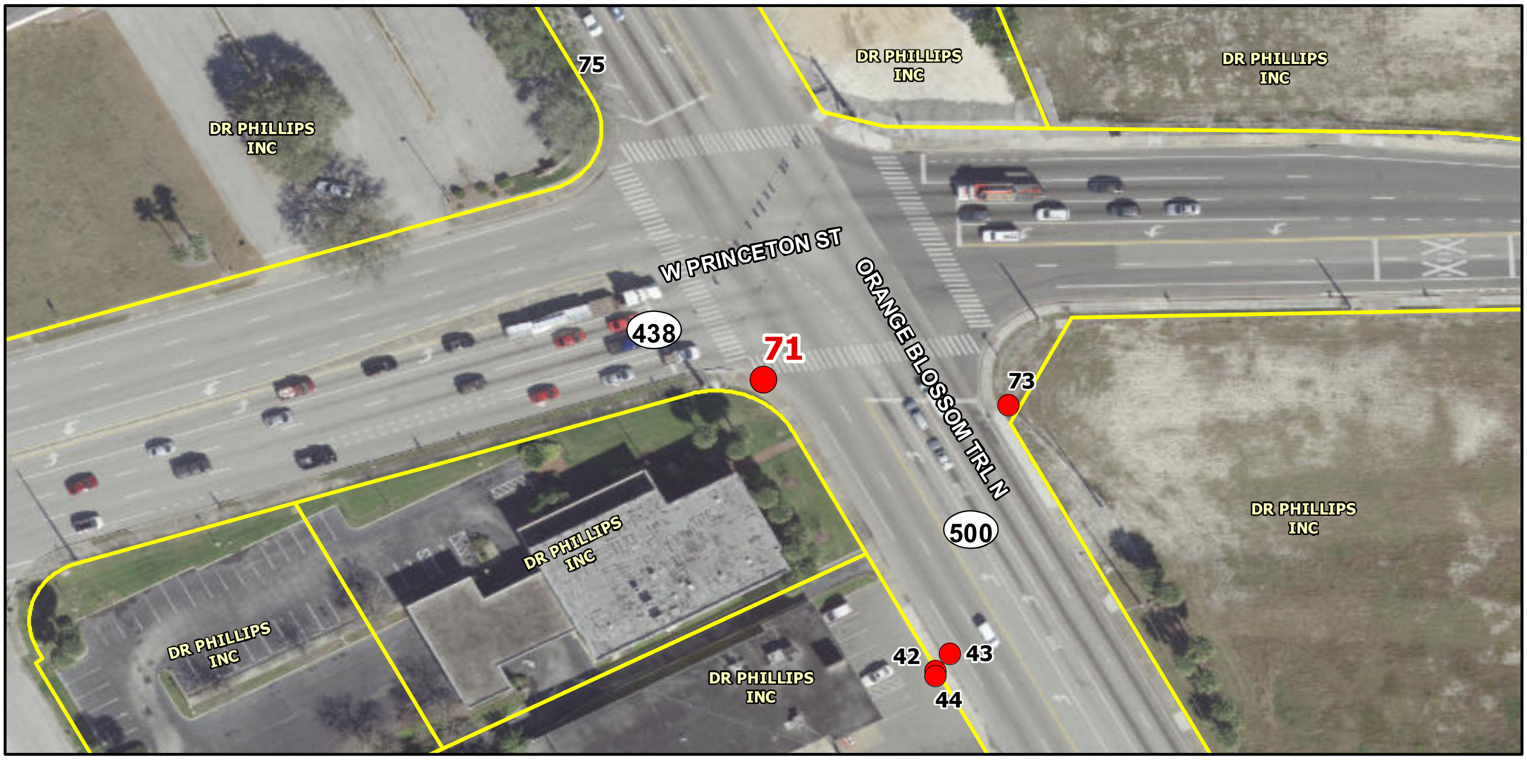
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 71

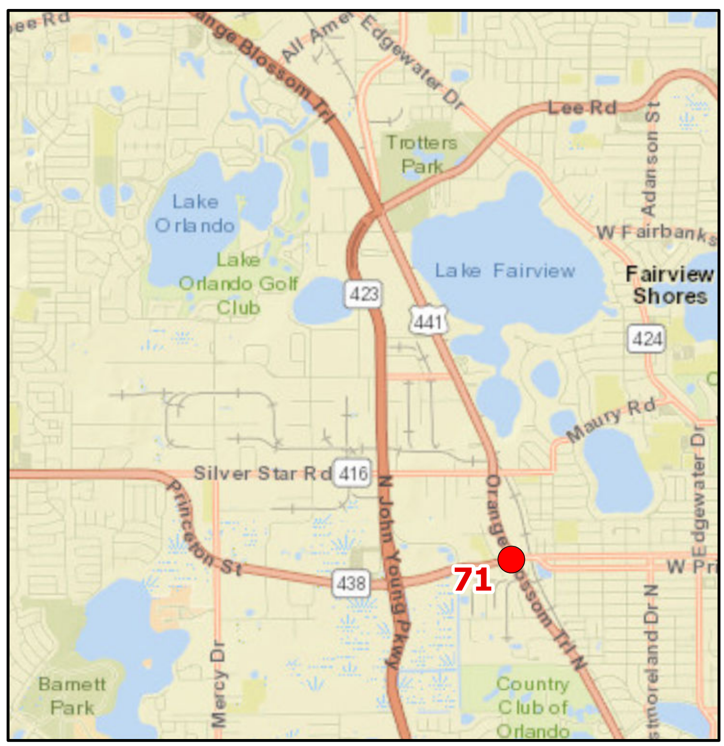
Feature Type: ADA - Safety

Comment: crosswalk

Lat: 28.57161 **Long:** -81.40543

http://maps.google.com/maps?q=28.57161,-81.40543

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Feature ID: 72

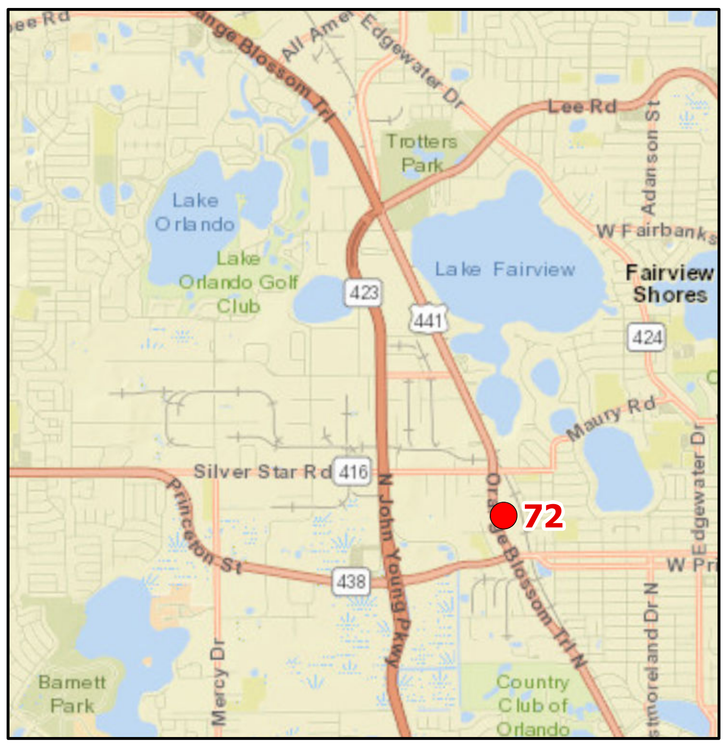
Feature Type: ADA - Safety

Comment:

Lat: 28.57478 **Long:** -81.40609

http://maps.google.com/maps?q=28.57478,-81.40609

- ADA - Safety
- Transit
- Damaged Infrastructure
- User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021

Feature ID: 73

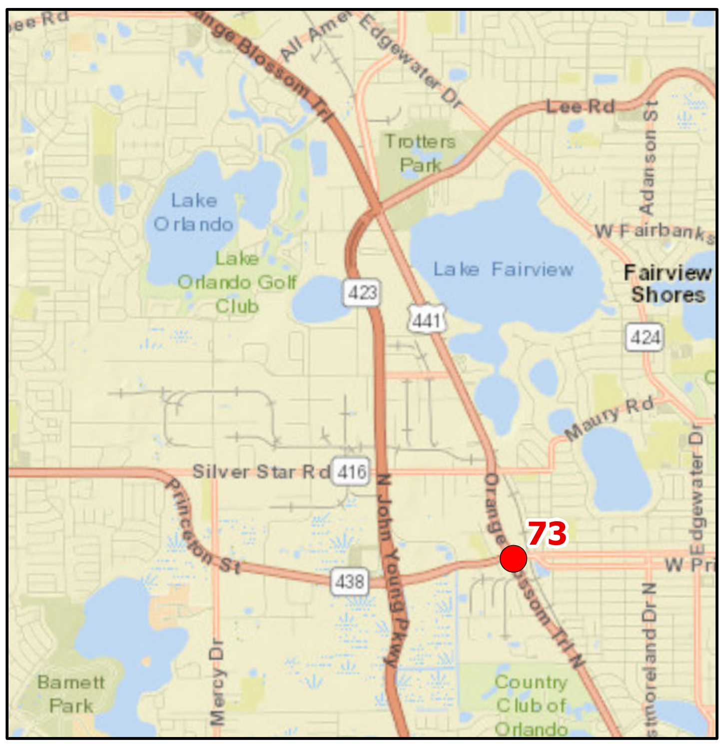
Feature Type: ADA - Safety

Comment:

Lat: 28.57157 **Long:** -81.40508

http://maps.google.com/maps?q=28.57157,-81.40508

ADA - Safety
Damaged Infrastructure
Transit
User

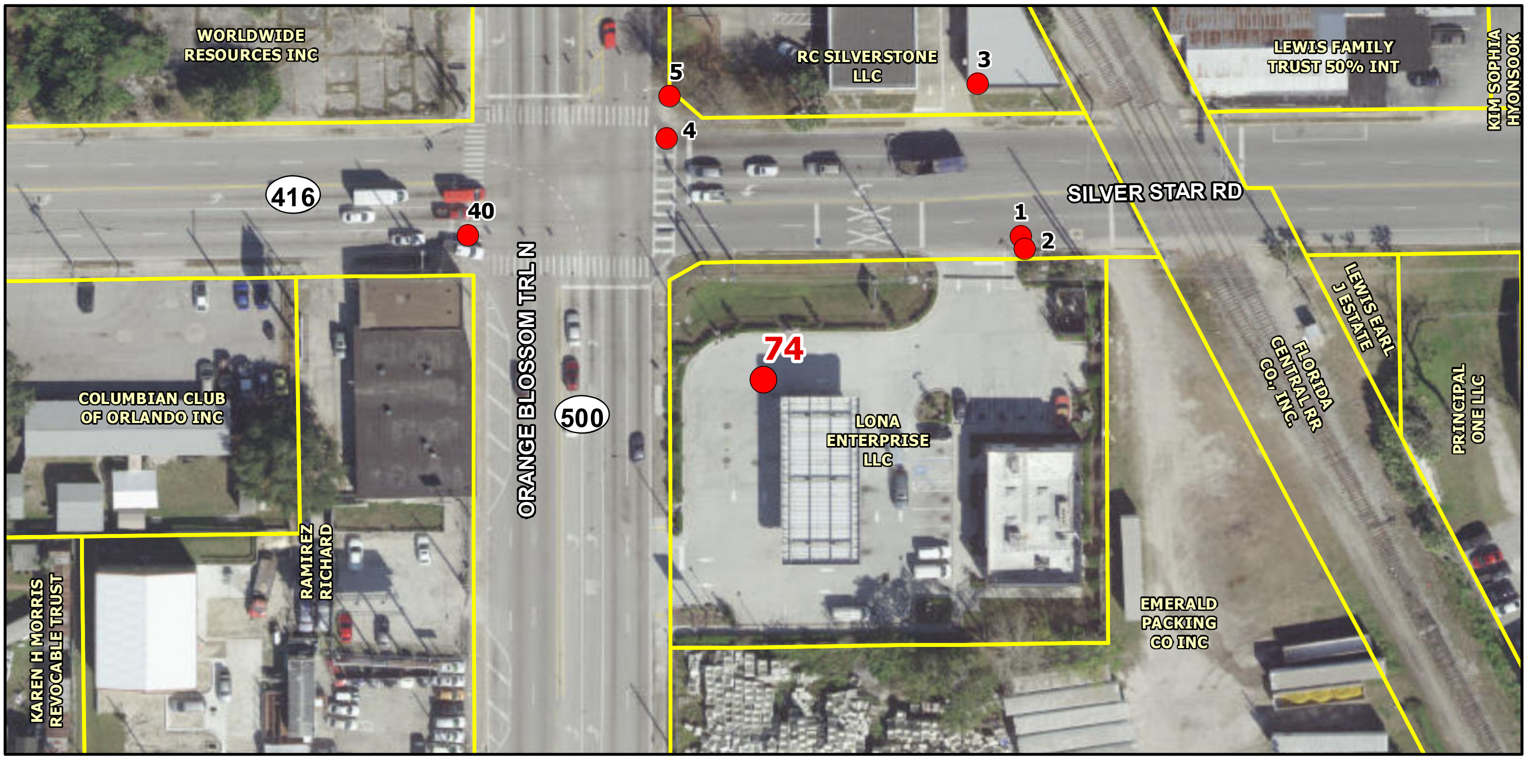


FDOT

Map Scale: 1 Inch = 100 Feet

0 50 100 150
Feet

Field Observations
Silver Star Freight
Existing Bike and Ped Transit Infrastructure



Feature ID: 74

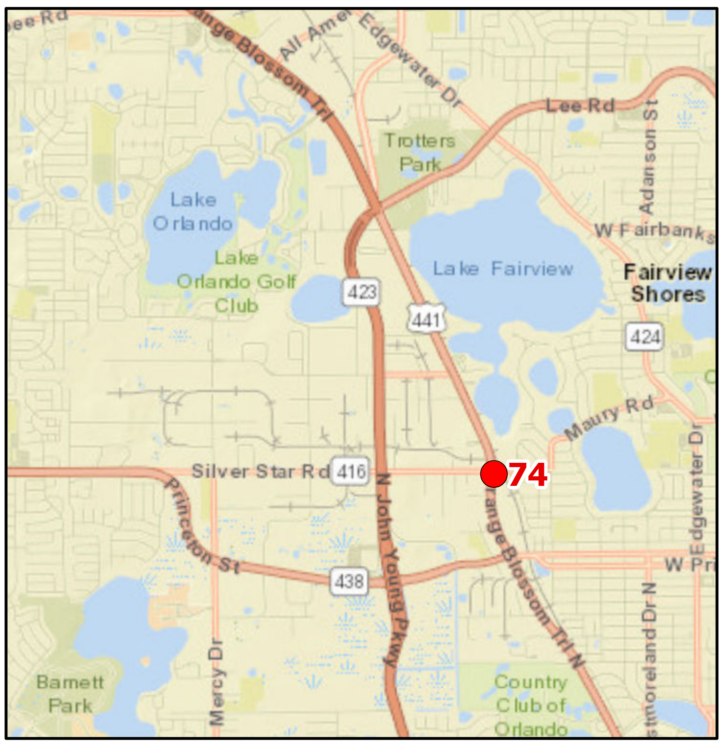
Feature Type: ADA - Safety

Comment:

Lat: 28.57794 **Long:** -81.40677

http://maps.google.com/maps?q=28.57794,-81.40677

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

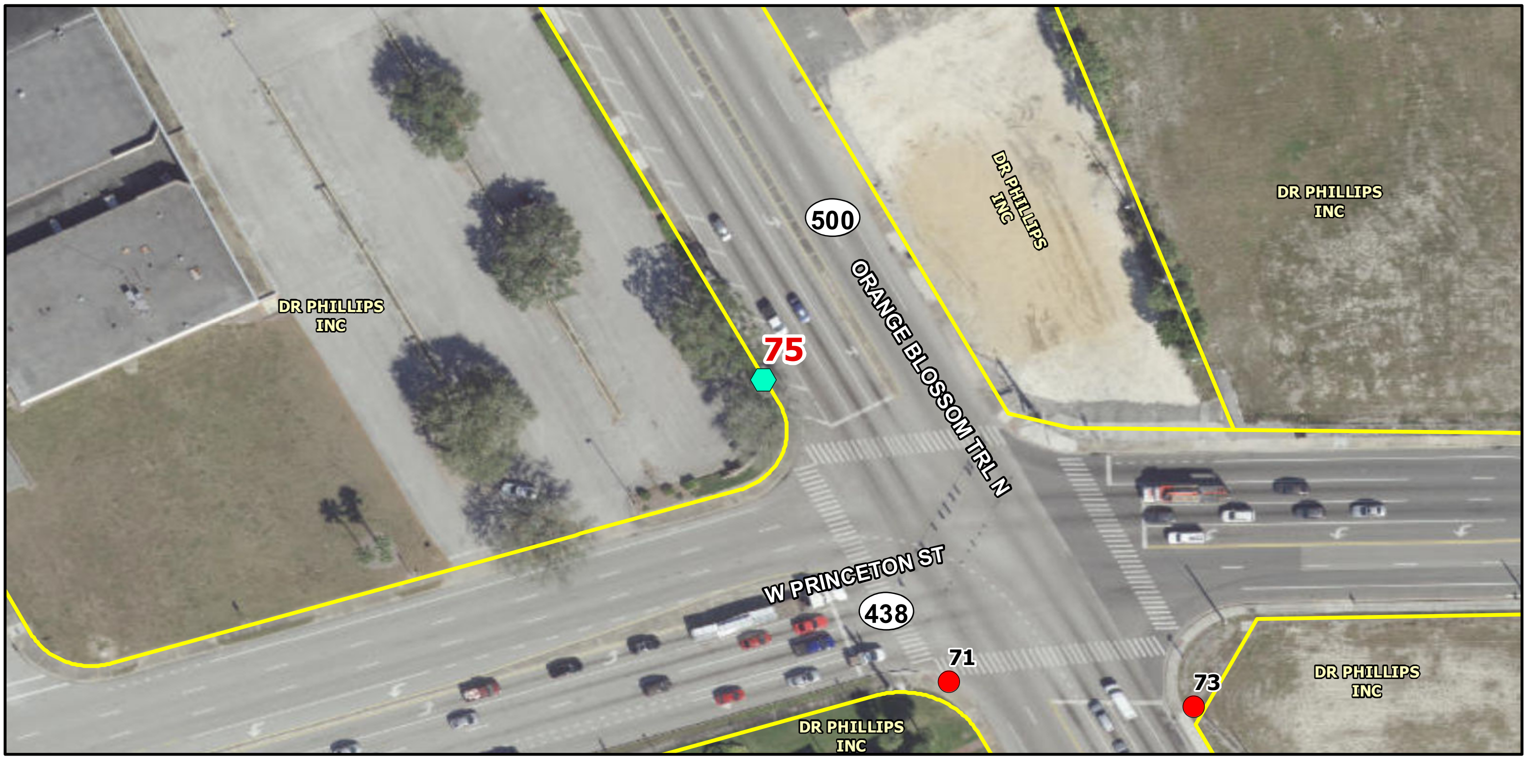
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 75

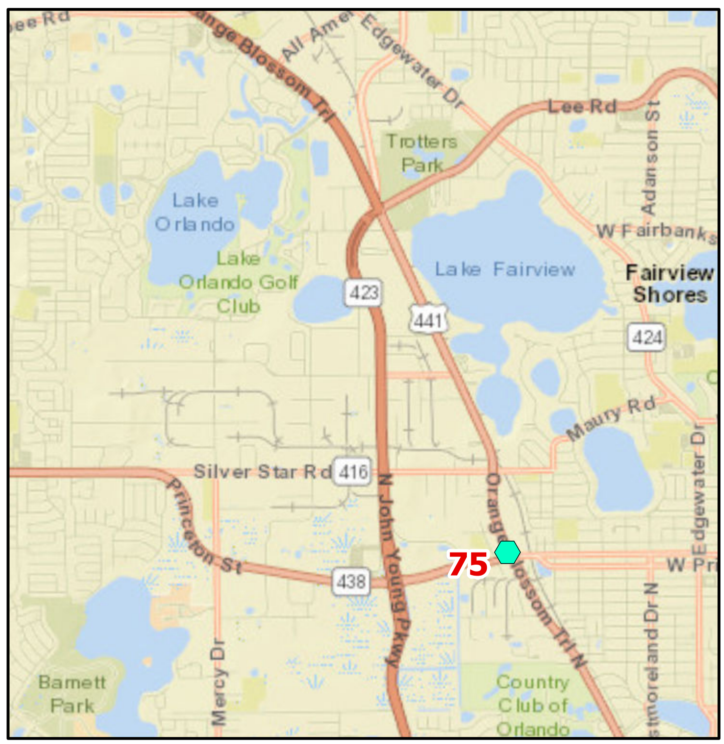
Feature Type: Transit

Comment:

Lat: 28.57204 **Long:** -81.4057

http://maps.google.com/maps?q=28.57204,-81.4057

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

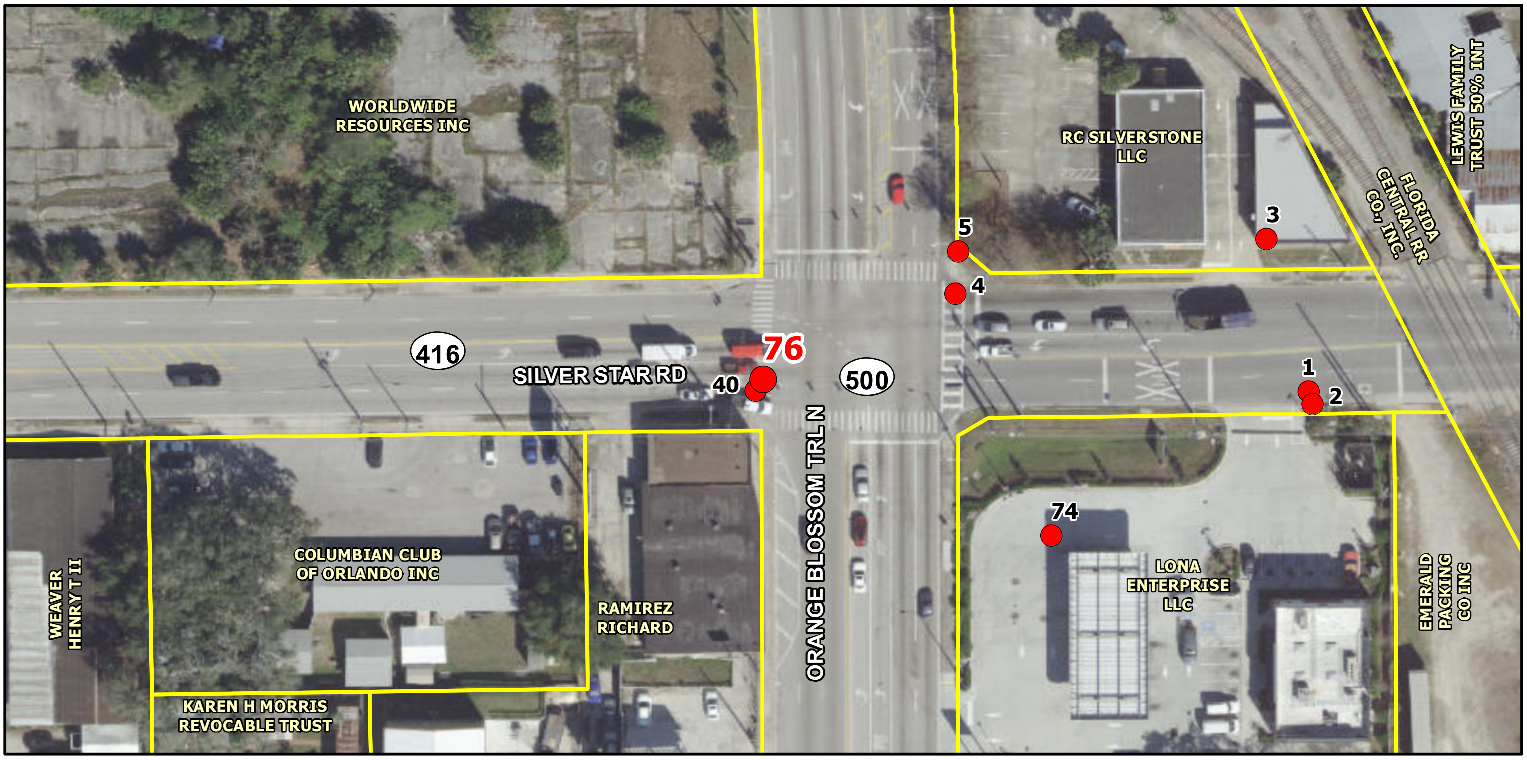
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series.mxd - User: CISENBERG - Date: 5/20/2021



Feature ID: 76

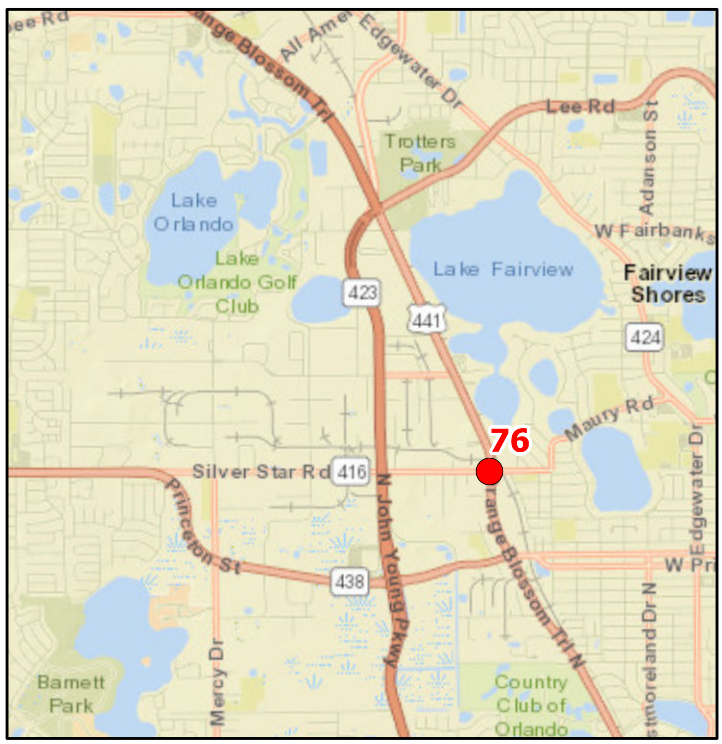
Feature Type: ADA - Safety

Comment:

Lat: 28.57817 **Long:** -81.40718

http://maps.google.com/maps?q=28.57817,-81.40718

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

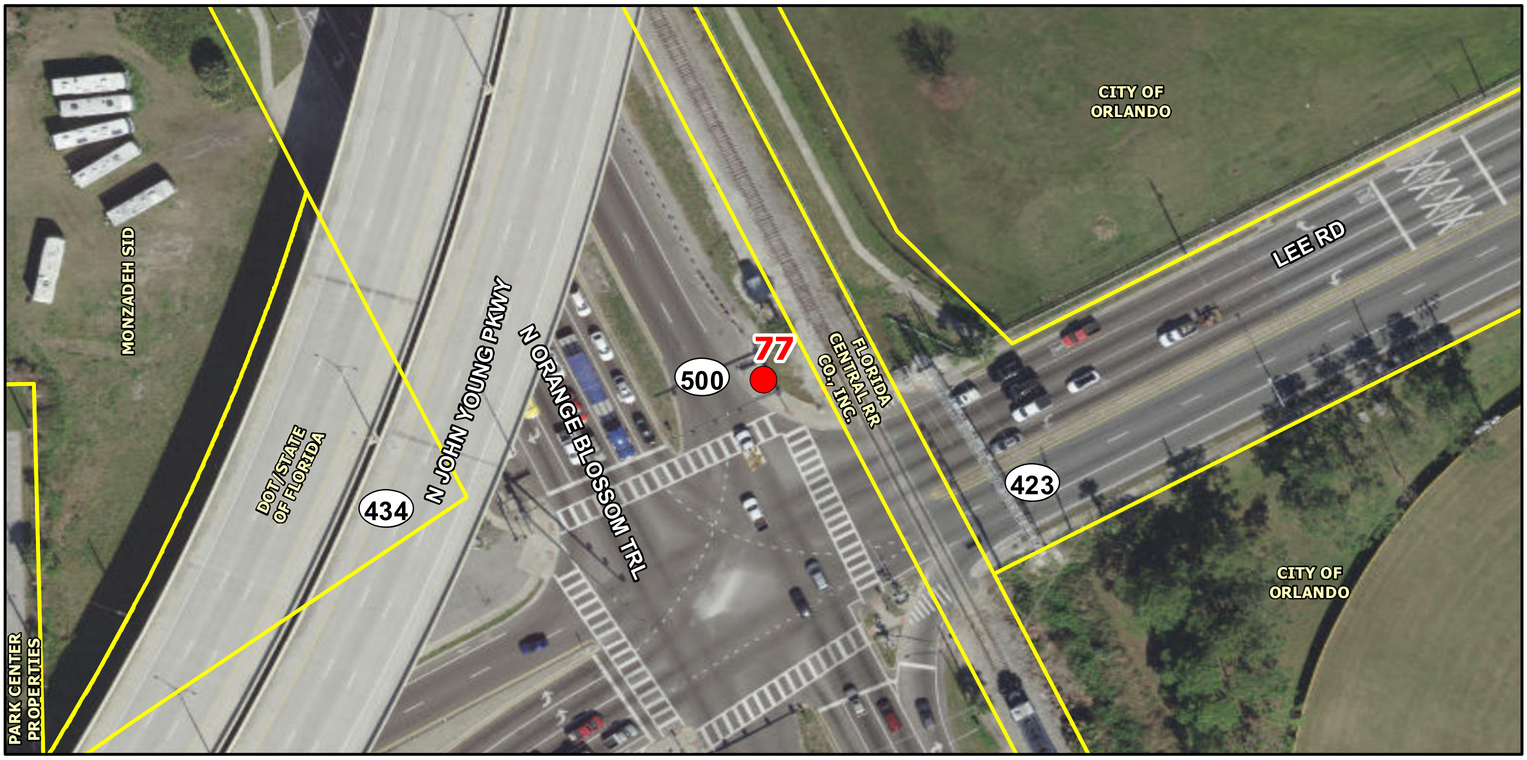
Feet

FDOT

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 77

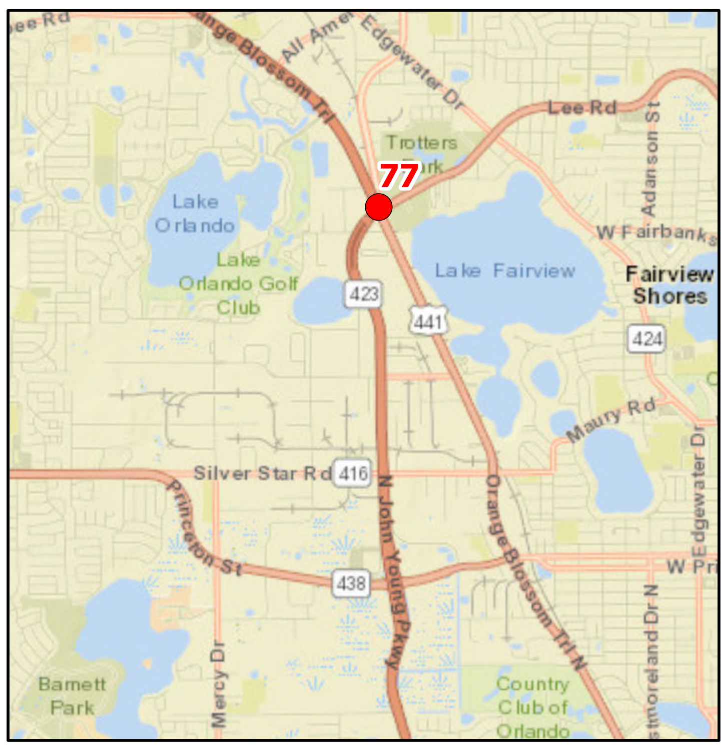
Feature Type: ADA - Safety

Comment:

Lat: 28.59824 **Long:** -81.41682

http://maps.google.com/maps?q=28.59824,-81.41682

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

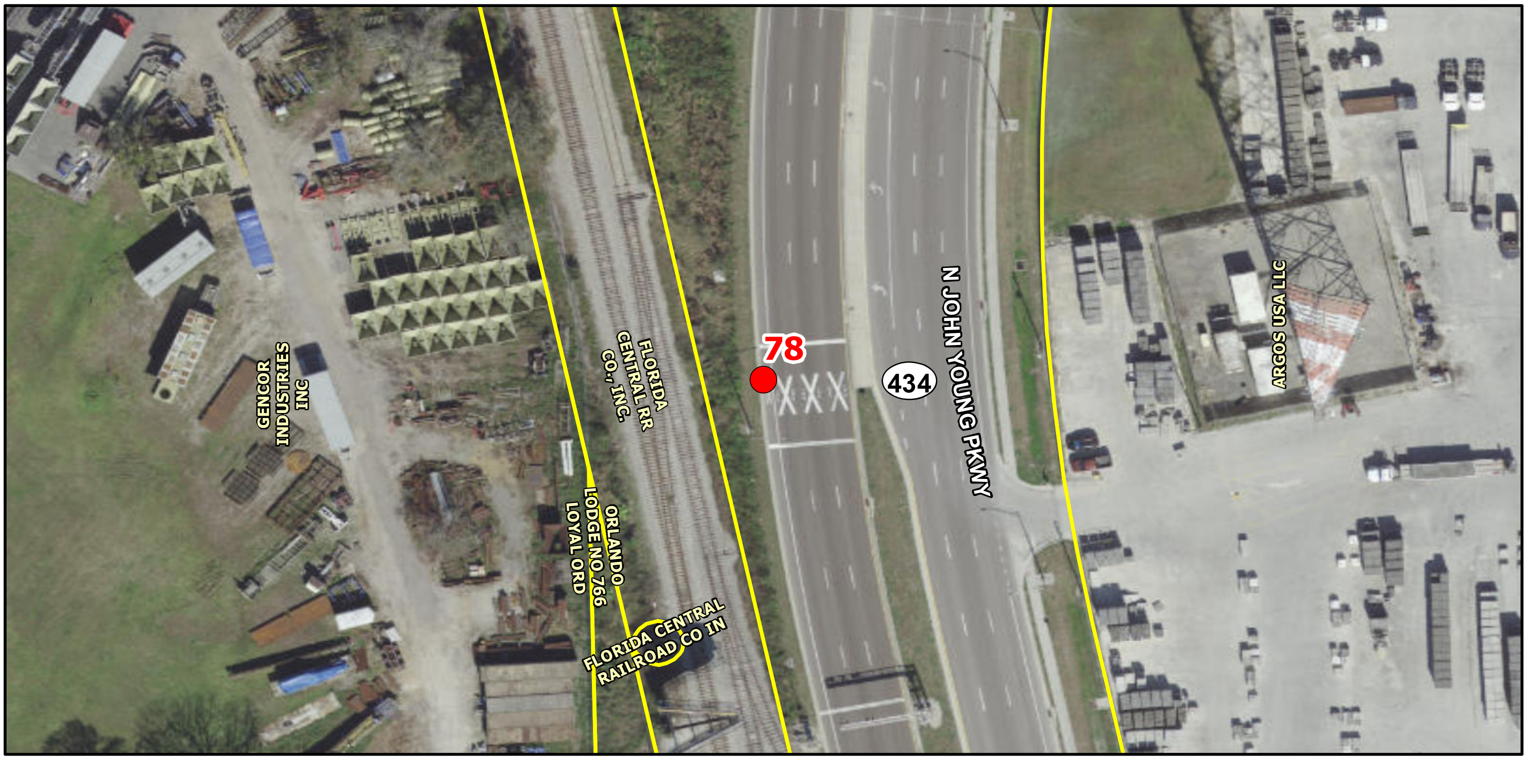
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series_Additional.mxd - User: CISENBERG - Date: 6/1/2021



Feature ID: 78

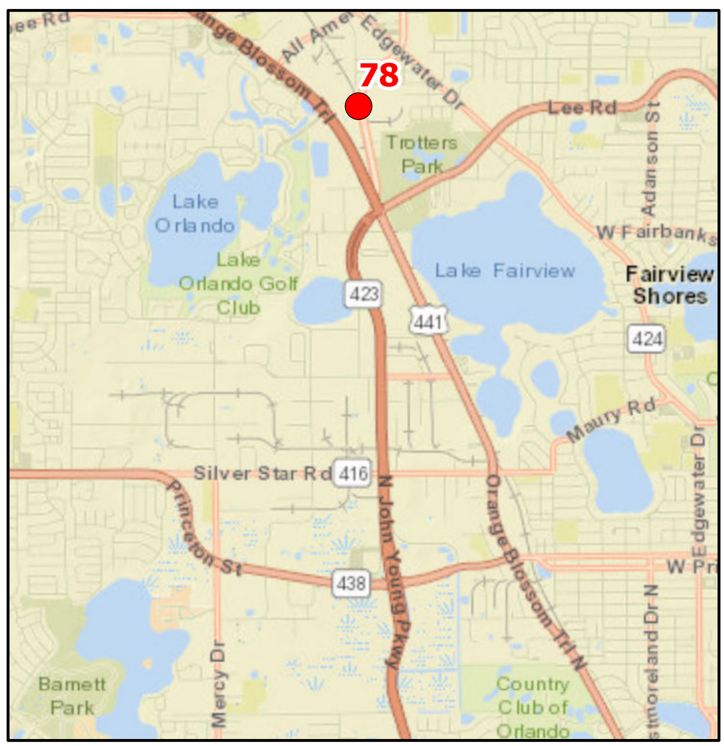
Feature Type: ADA - Safety

Comment:

Lat: 28.60586 **Long:** -81.41865

http://maps.google.com/maps?q=28.60586,-81.41865

ADA - Safety	Transit
Damaged Infrastructure	User



Map Scale: 1 Inch = 100 Feet

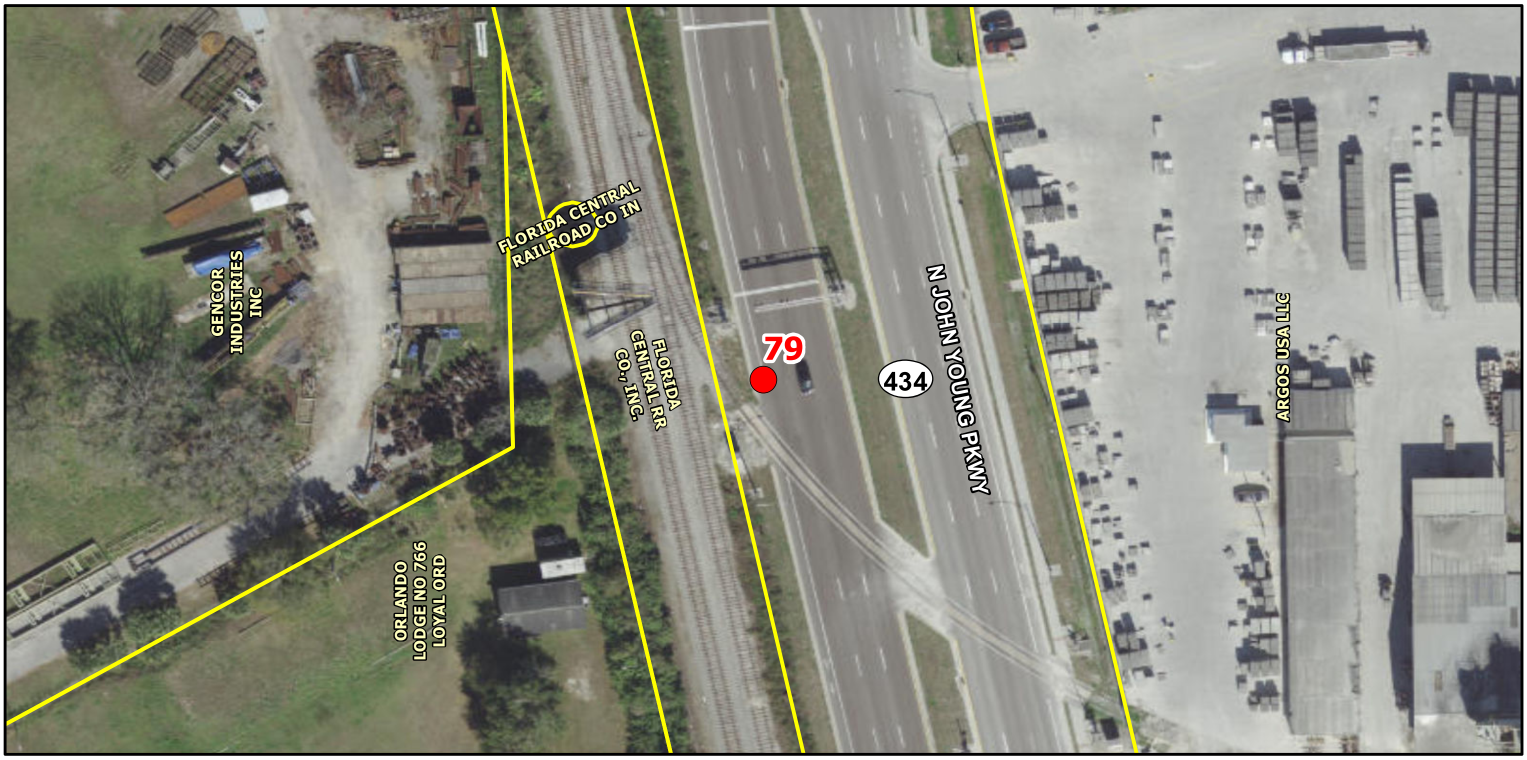
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 79

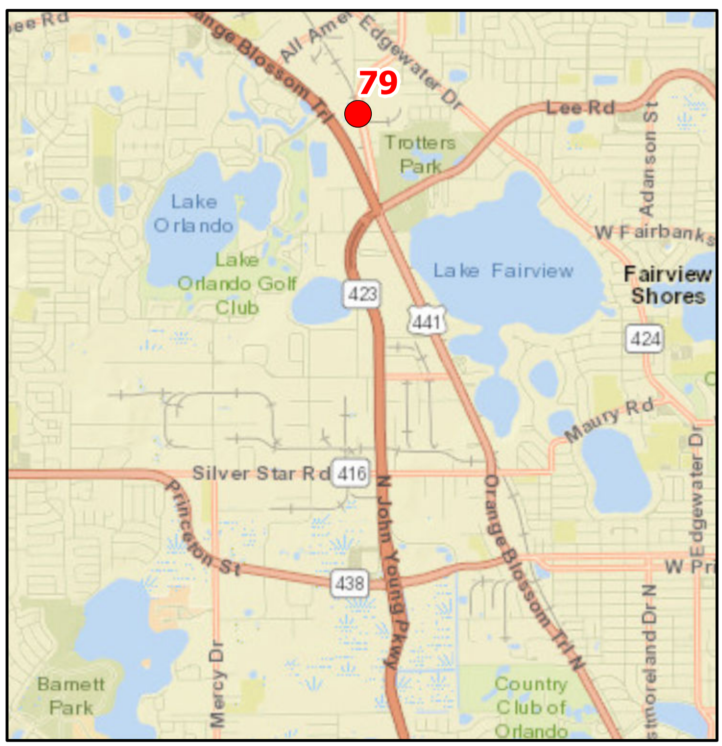
Feature Type: ADA - Safety

Comment:

Lat: 28.60526 **Long:** -81.41853

http://maps.google.com/maps?q=28.60526,-81.41853

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150
Feet

Field Observations
Silver Star Freight
Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series_Additional.mxd - User: CISENBERG - Date: 6/1/2021

Feature ID: 80

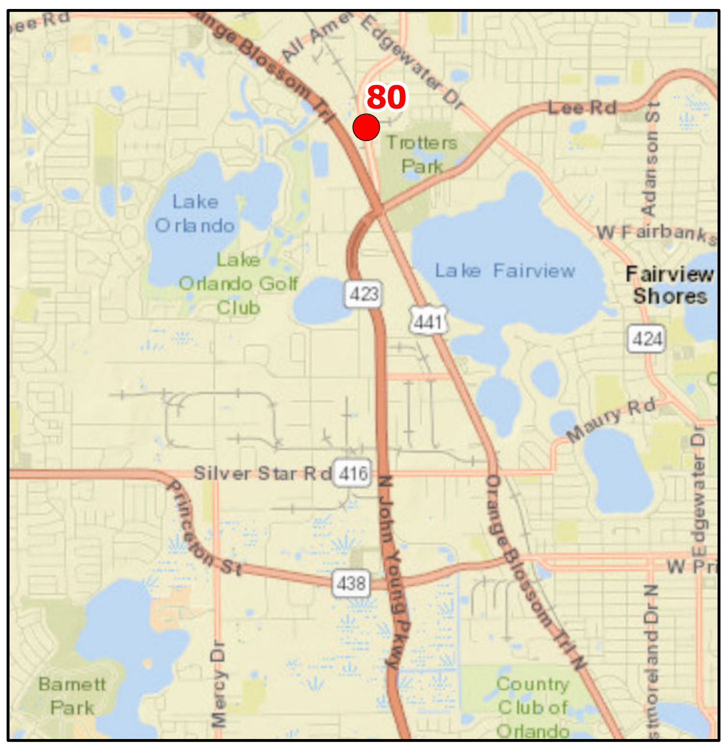
Feature Type: ADA - Safety

Comment:

Lat: 28.60423 **Long:** -81.41792

http://maps.google.com/maps?q=28.60423,-81.41792

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

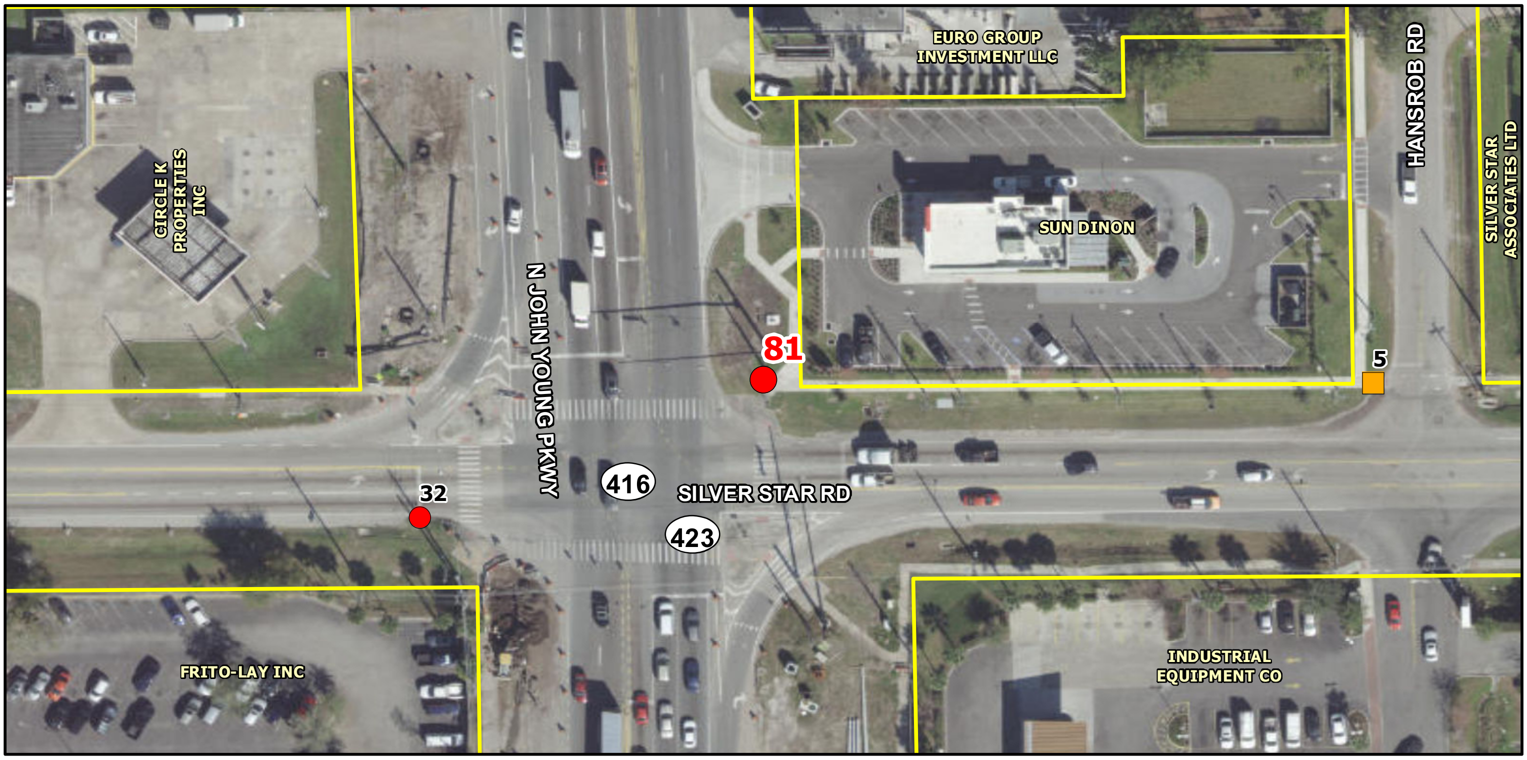
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 81

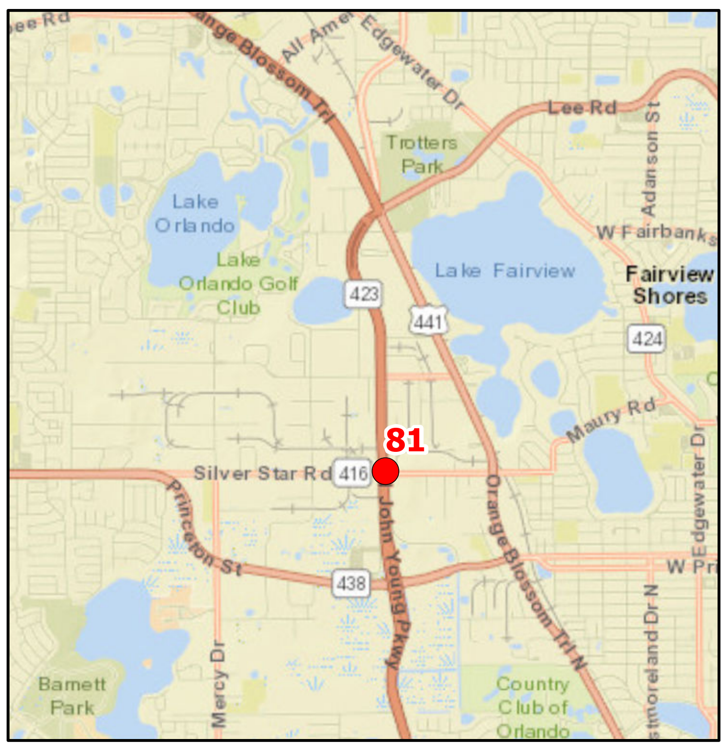
Feature Type: ADA - Safety

Comment:

Lat: 28.57828 **Long:** -81.41623

http://maps.google.com/maps?q=28.57828,-81.41623

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

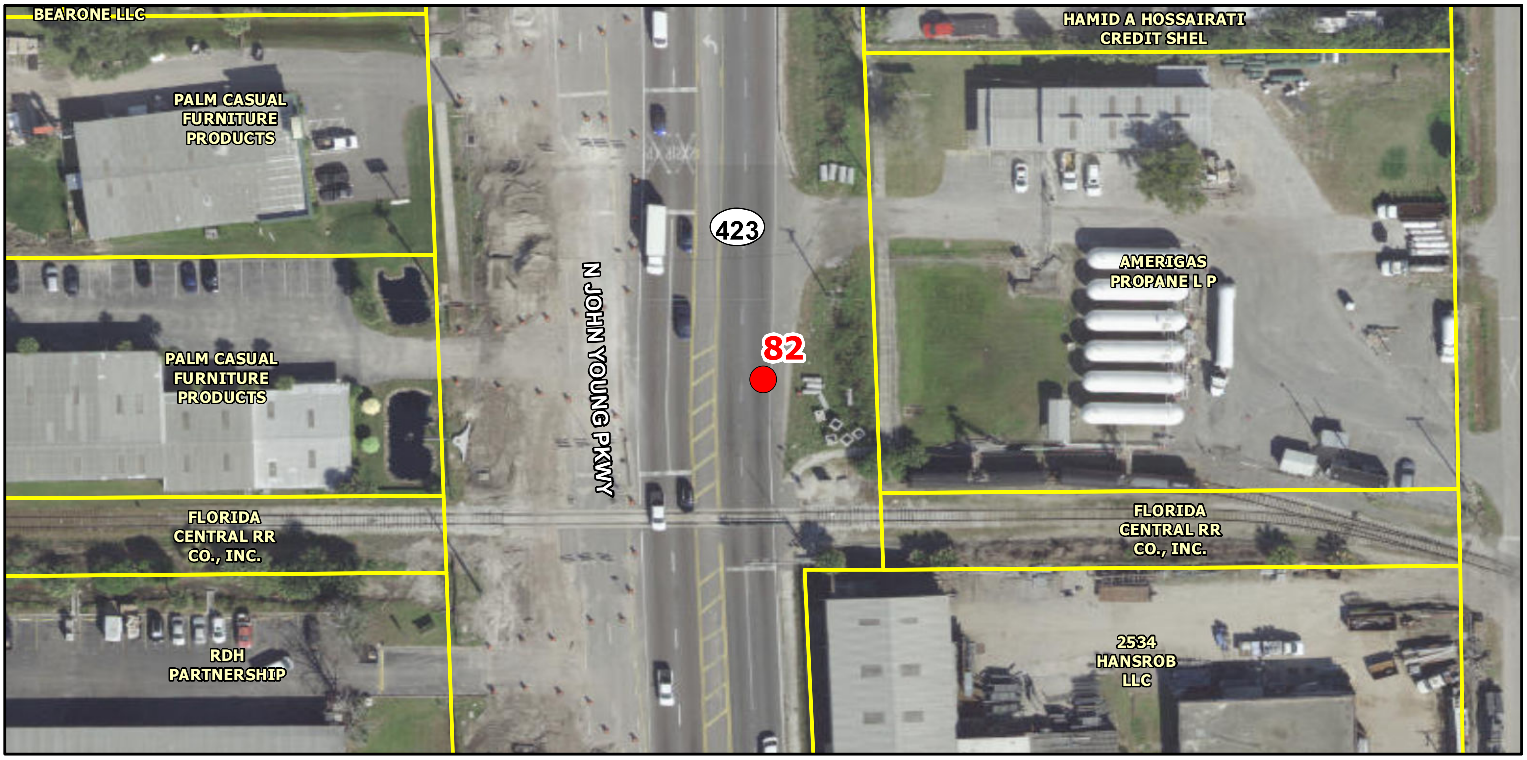
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series_Additional.mxd - User: CISENBERG - Date: 6/1/2021



Feature ID: 82

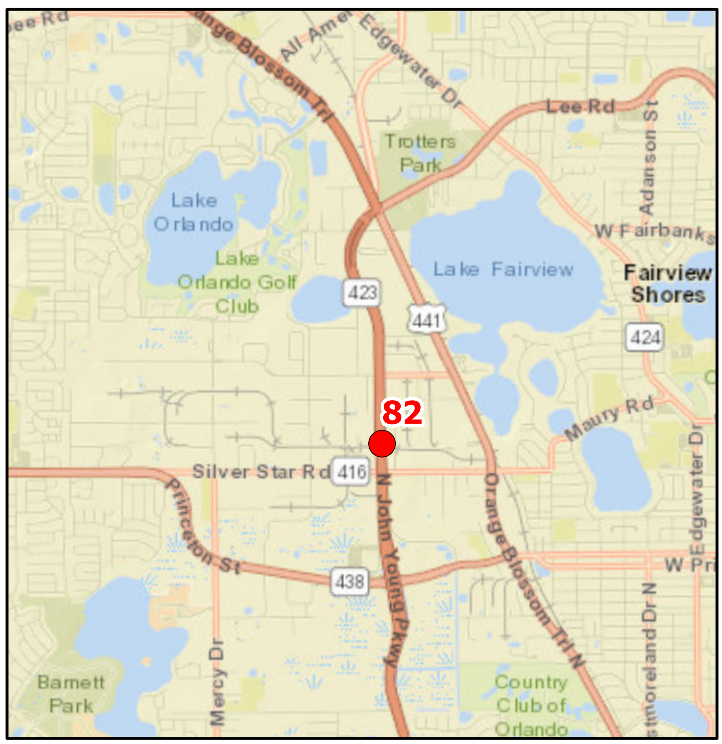
Feature Type: ADA - Safety

Comment:

Lat: 28.58022 **Long:** -81.41641

http://maps.google.com/maps?q=28.58022,-81.41641

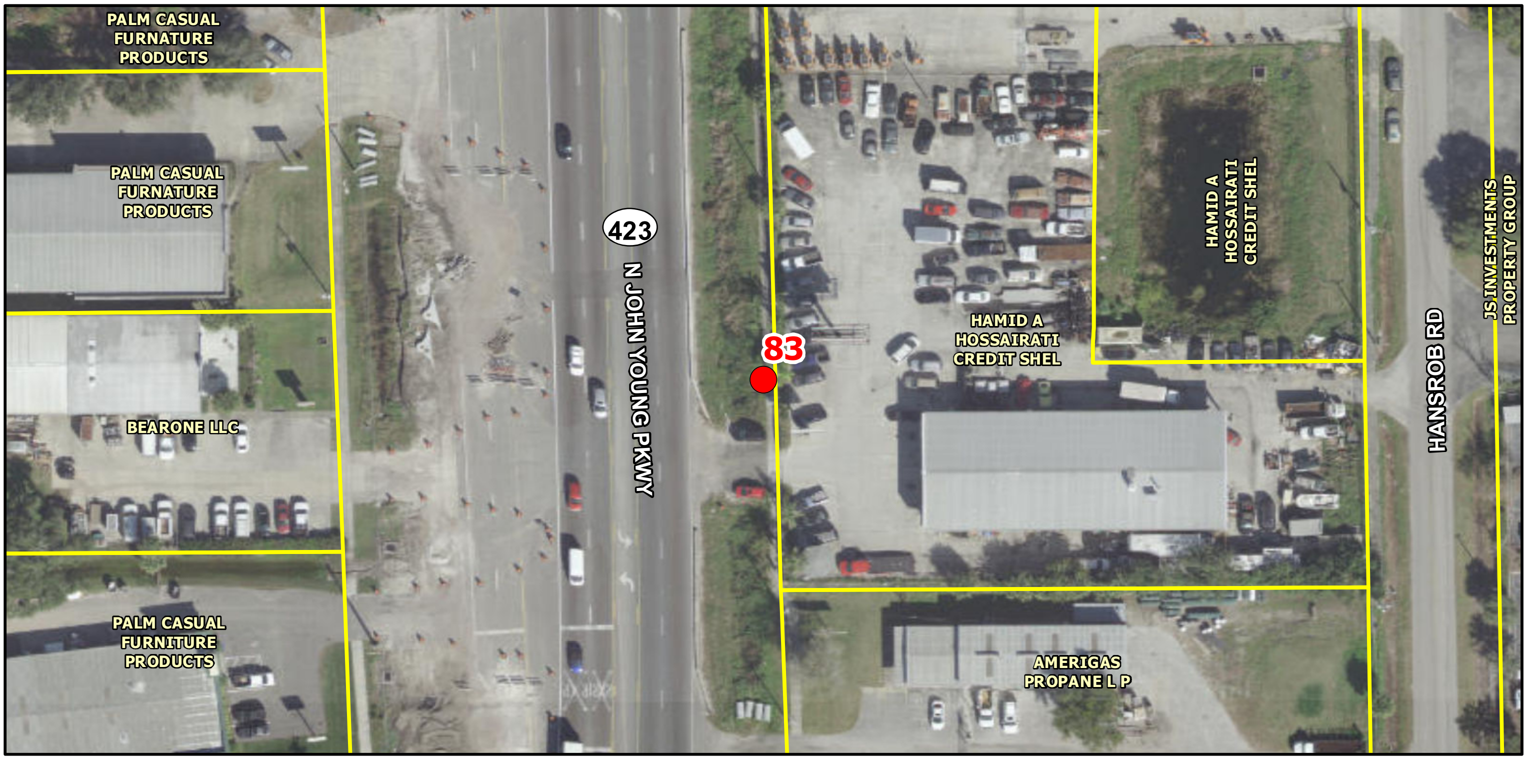
ADA - Safety
Transit
Damaged Infrastructure
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150
Feet

Field Observations
Silver Star Freight
Existing Bike and Ped Transit Infrastructure



Feature ID: 83

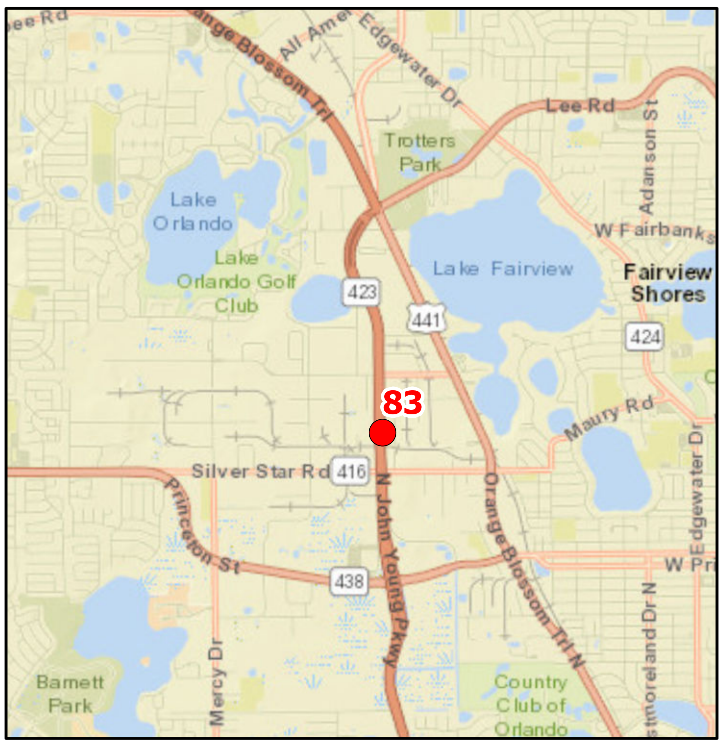
Feature Type: ADA - Safety

Comment:

Lat: 28.58099 **Long:** -81.41629

http://maps.google.com/maps?q=28.58099,-81.41629

ADA - Safety
Damaged Infrastructure
Transit
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

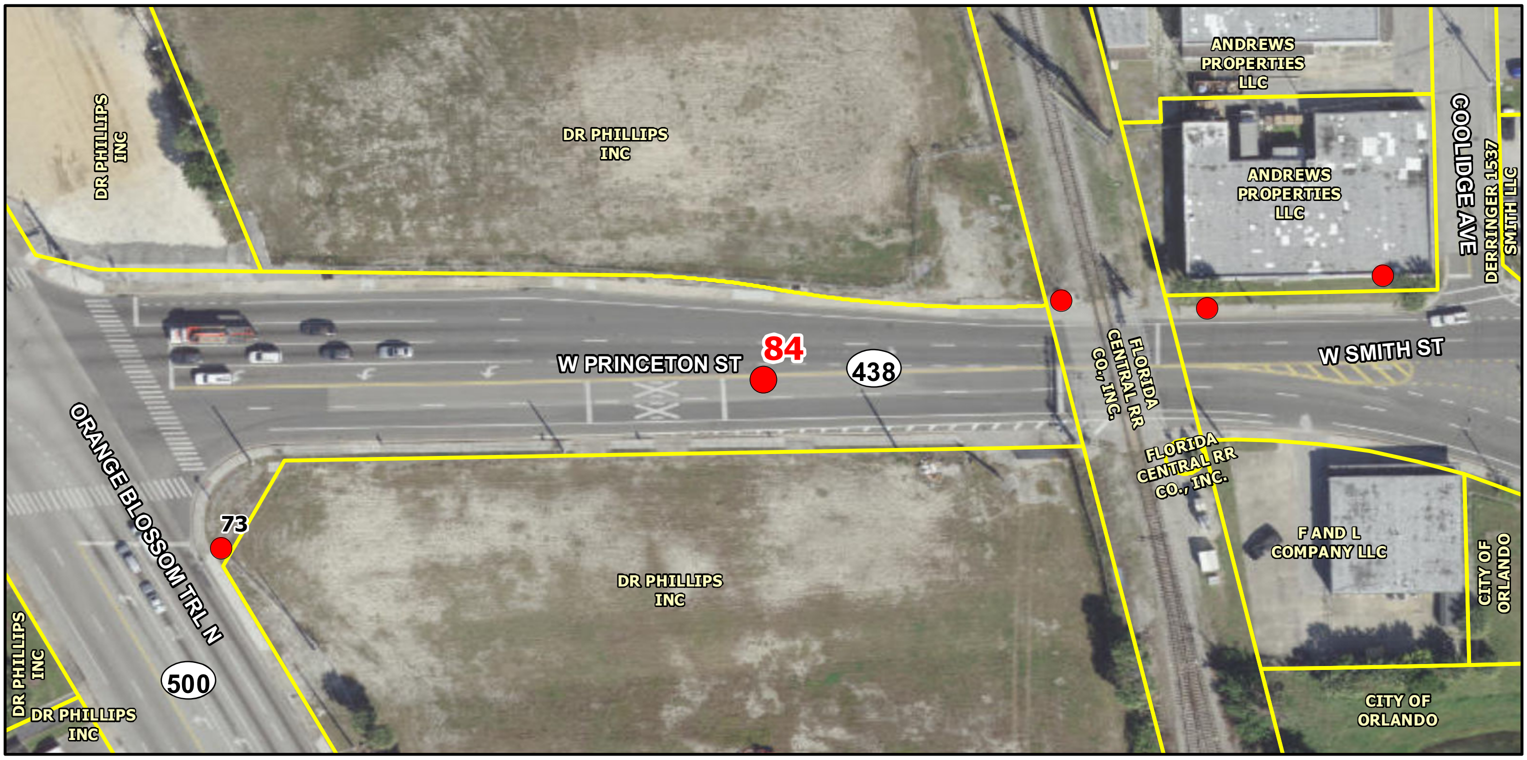
Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

Path: E:\Data1\FDOT_Dist-5_Silver_Star_Rd\Map_Docs\AGOL\SSF_Field_Observations_Map_Series_Additional.mxd - User: CISENBERG - Date: 6/1/2021



Feature ID: 84

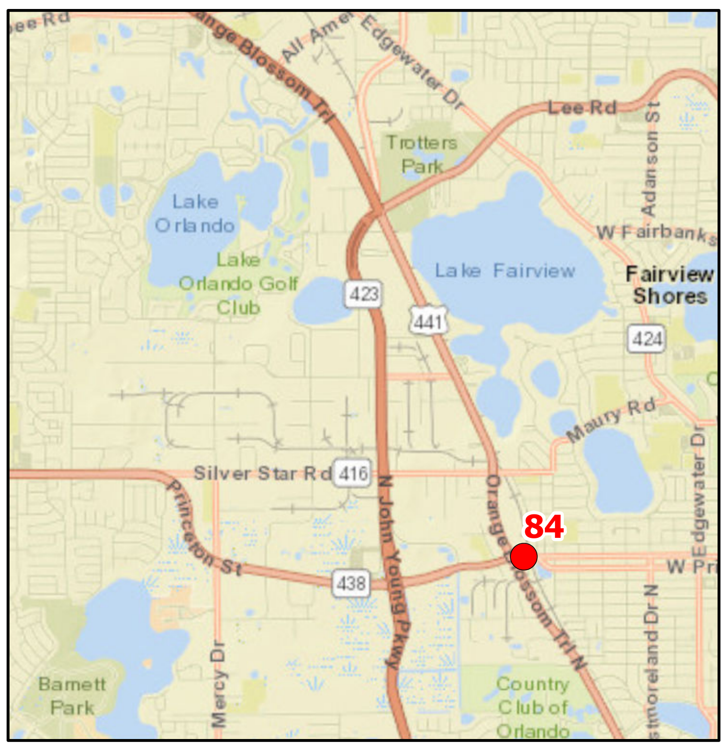
Feature Type: ADA - Safety

Comment:

Lat: 28.57181 **Long:** -81.40431

http://maps.google.com/maps?q=28.57181,-81.40431

- ADA - Safety
- Damaged Infrastructure
- Transit
- User



Map Scale: 1 Inch = 100 Feet

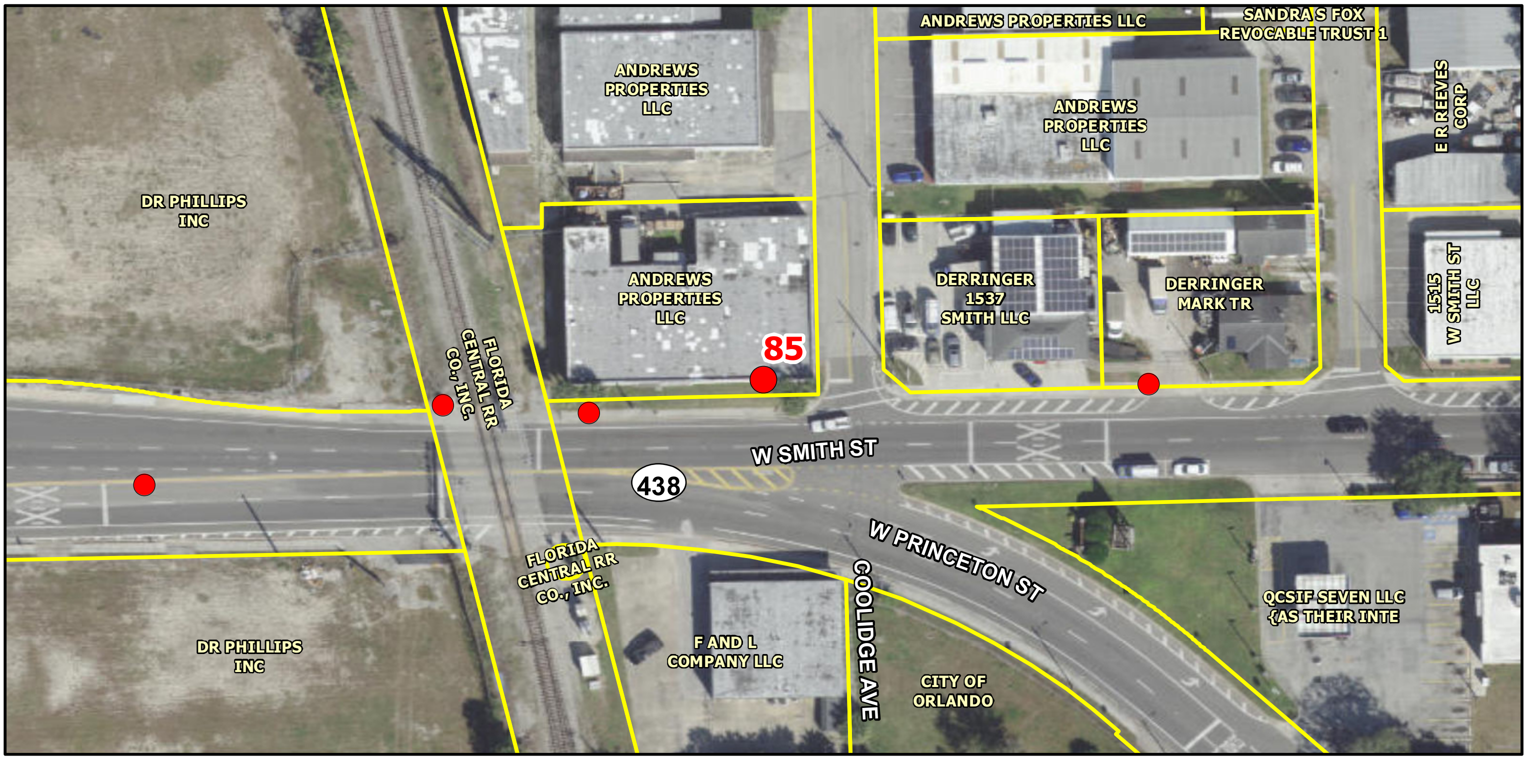
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 85

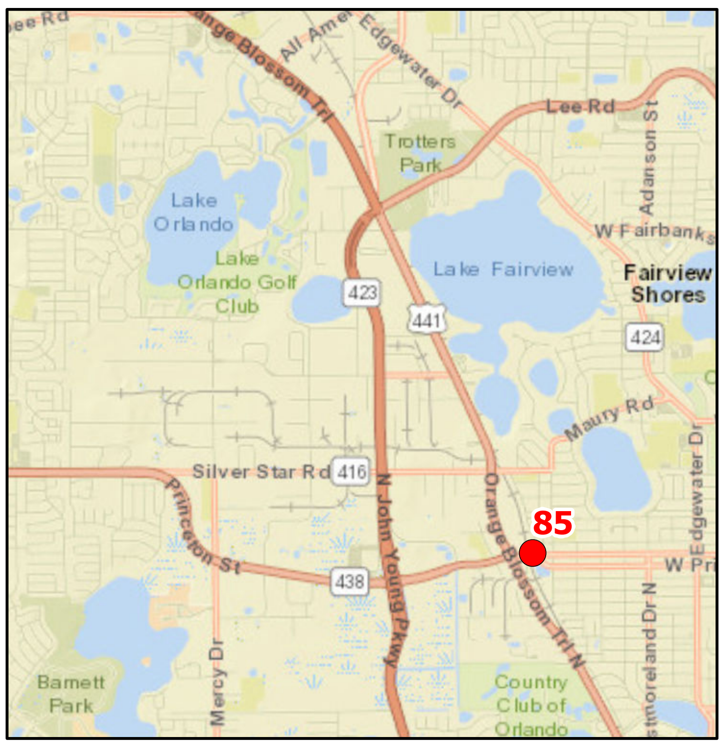
Feature Type: ADA - Safety

Comment:

Lat: 28.57196 **Long:** -81.40343

http://maps.google.com/maps?q=28.57196,-81.40343

- ADA - Safety
- Damaged Infrastructure
- Transit
- User



Map Scale: 1 Inch = 100 Feet

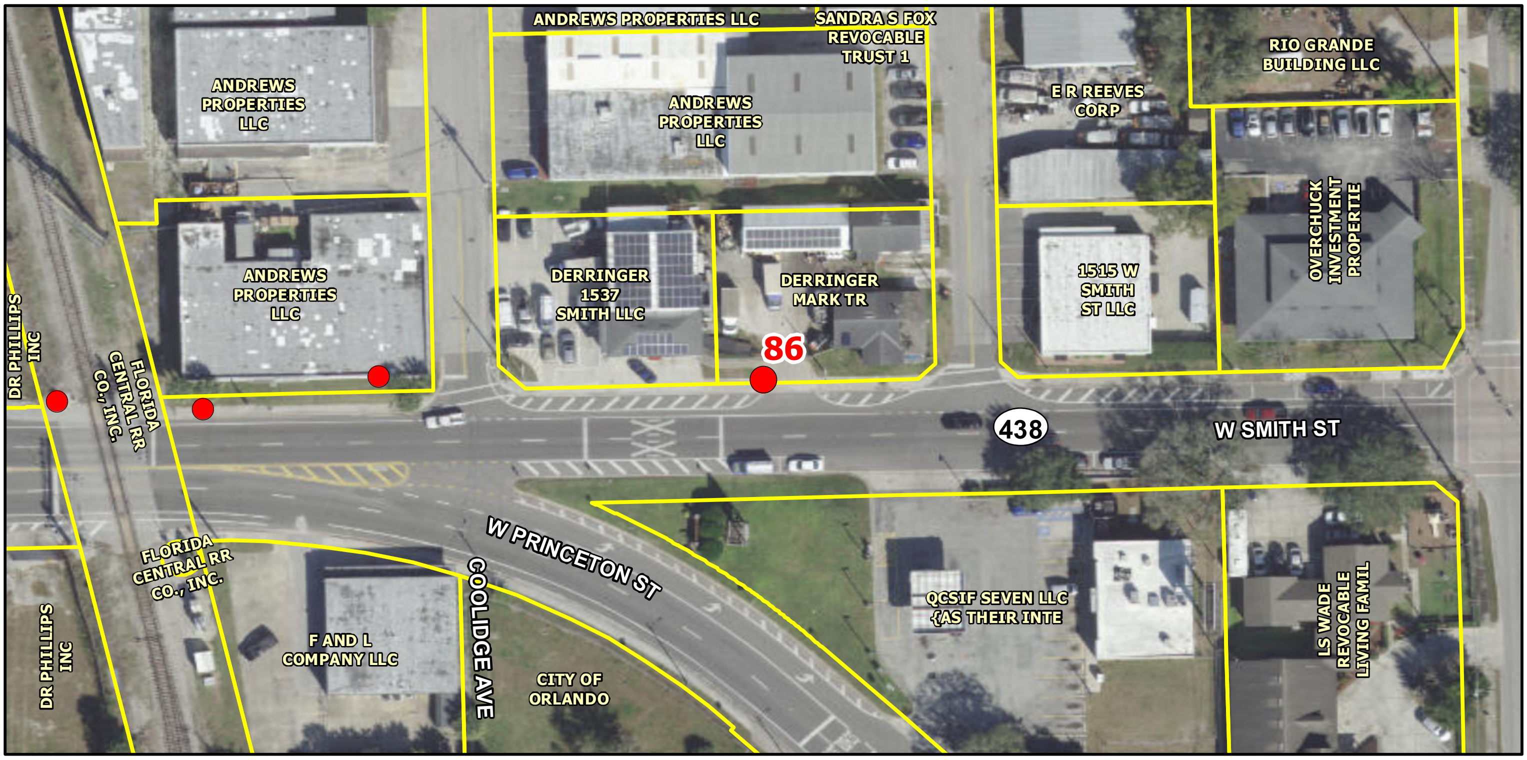
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 86

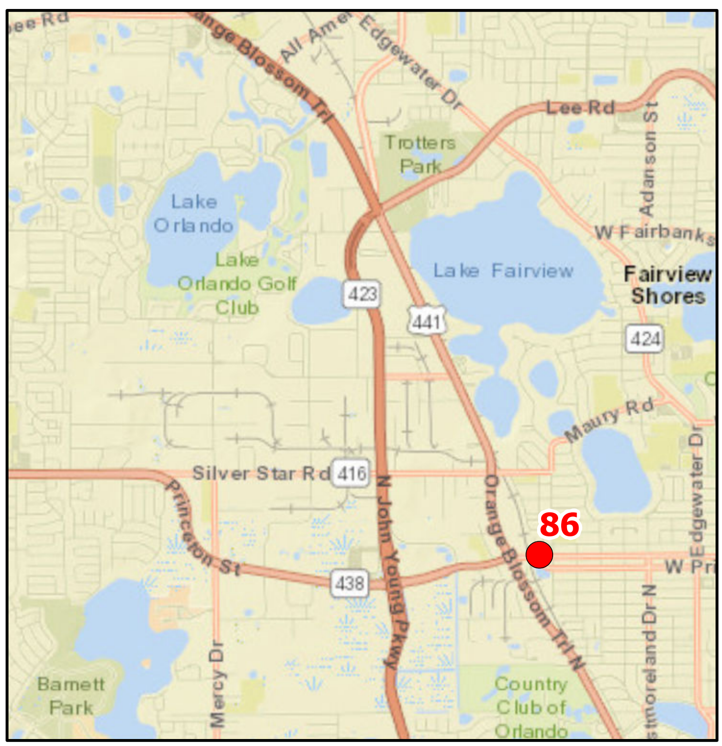
Feature Type: ADA - Safety

Comment:

Lat: 28.57195 **Long:** -81.40288

http://maps.google.com/maps?q=28.57195,-81.40288

●	ADA - Safety	⬢	Transit
■	Damaged Infrastructure	⬢	User



Map Scale: 1 Inch = 100 Feet

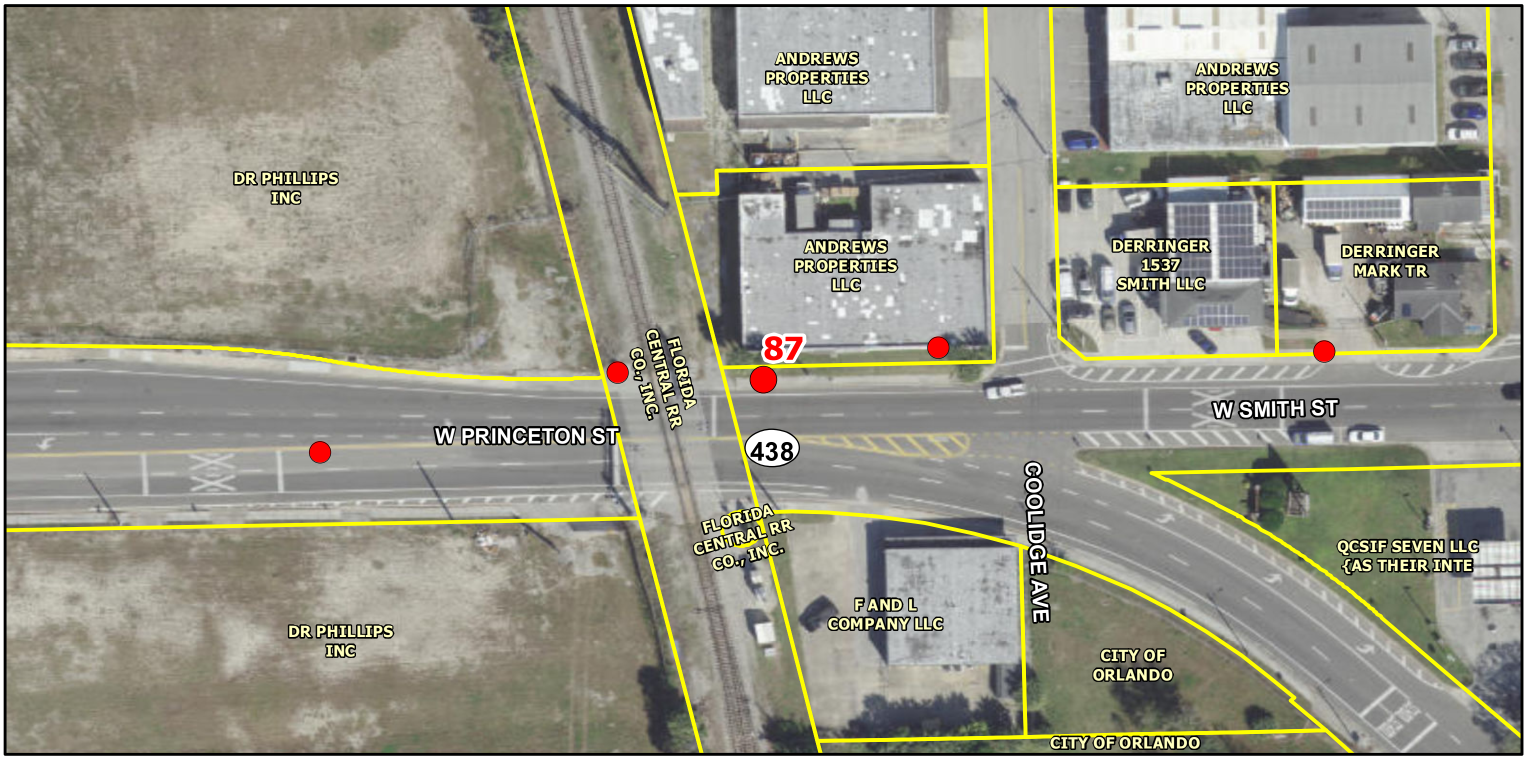
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 87

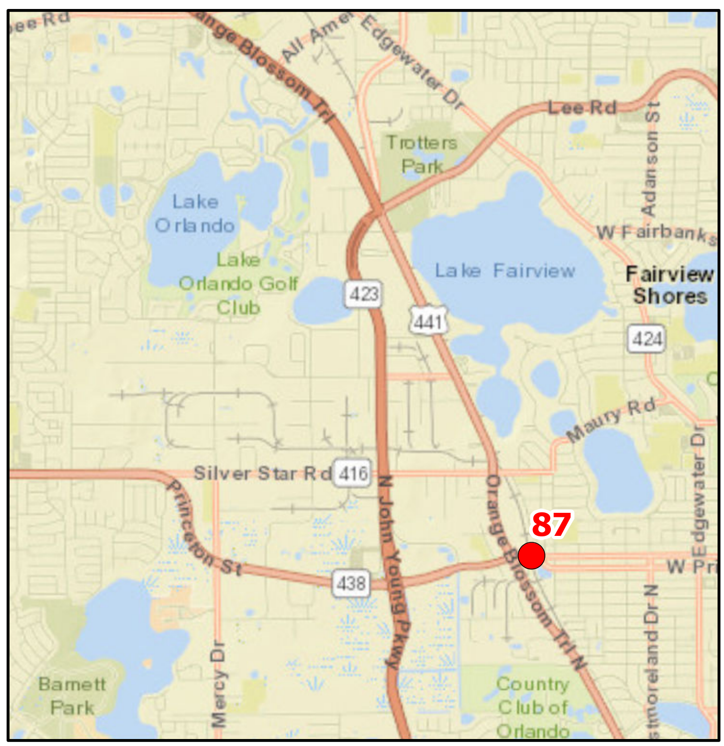
Feature Type: ADA - Safety

Comment:

Lat: 28.57191 **Long:** -81.40368

http://maps.google.com/maps?q=28.57191,-81.40368

ADA - Safety
Transit
Damaged Infrastructure
User



Map Scale: 1 Inch = 100 Feet

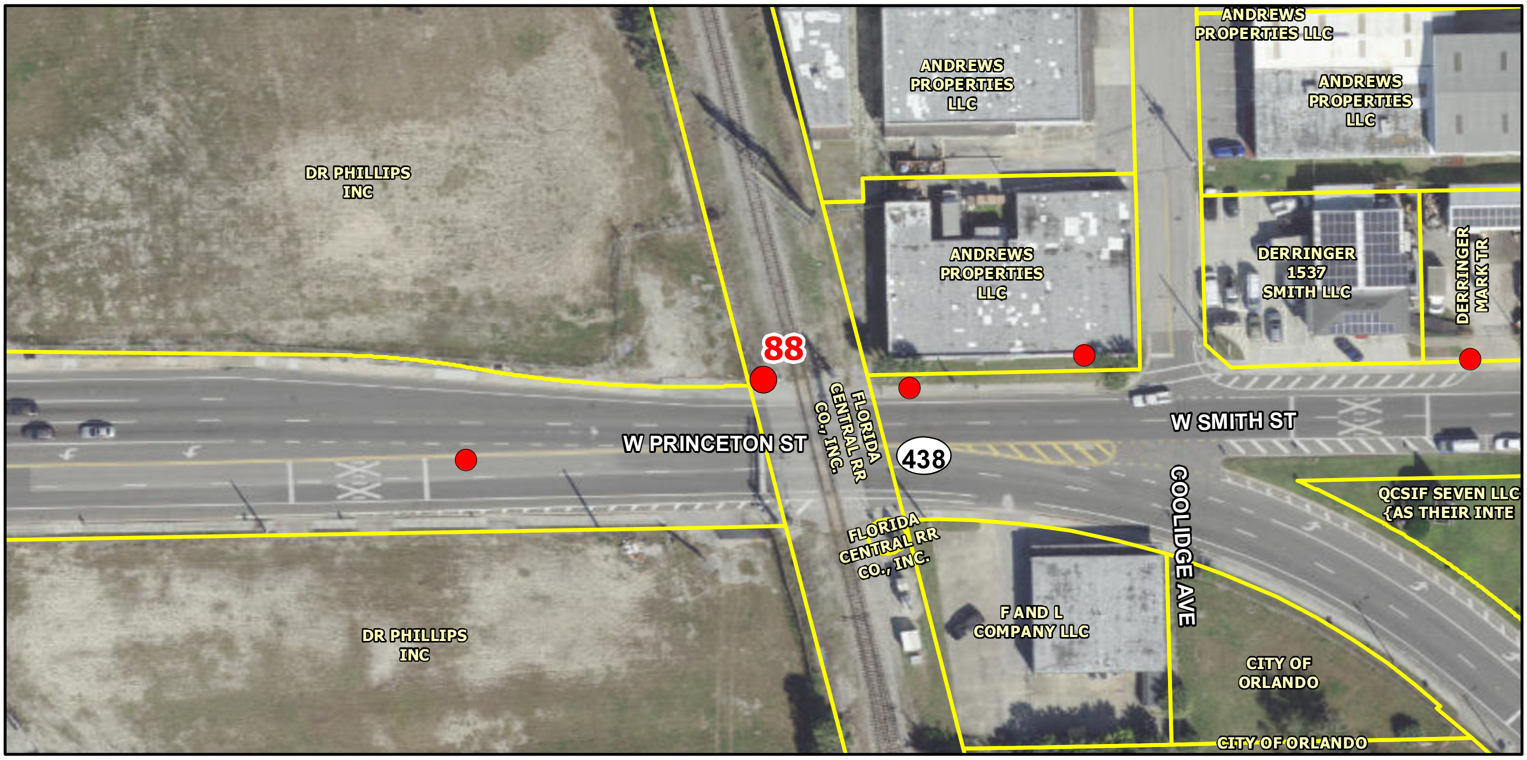
0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure



Feature ID: 88

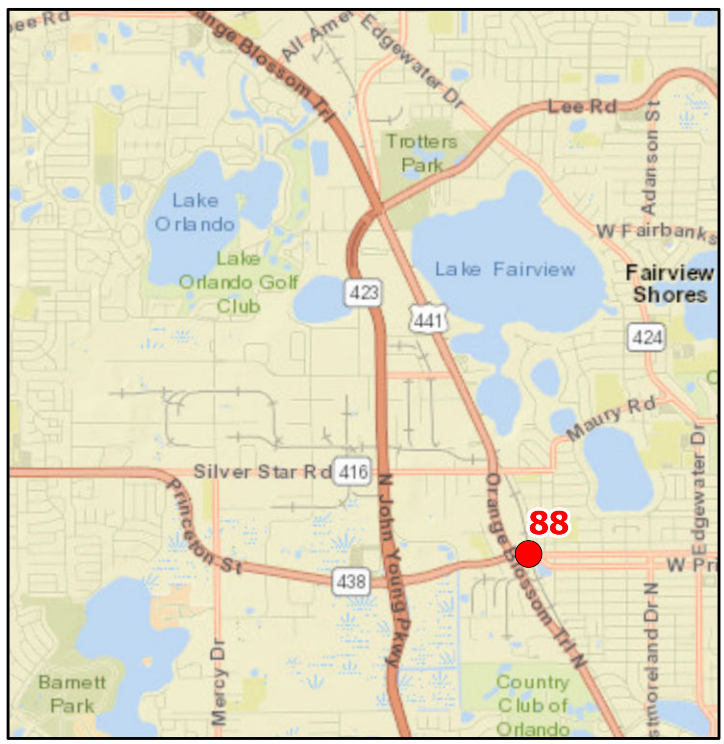
Feature Type: ADA - Safety

Comment:

Lat: 28.57192 **Long:** -81.40388

http://maps.google.com/maps?q=28.57192,-81.40388

ADA - Safety
Transit
Damaged Infrastructure
User



Map Scale: 1 Inch = 100 Feet

0 50 100 150

Feet

Field Observations

Silver Star Freight

Existing Bike and Ped Transit Infrastructure

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FDOT DISTRICT 5