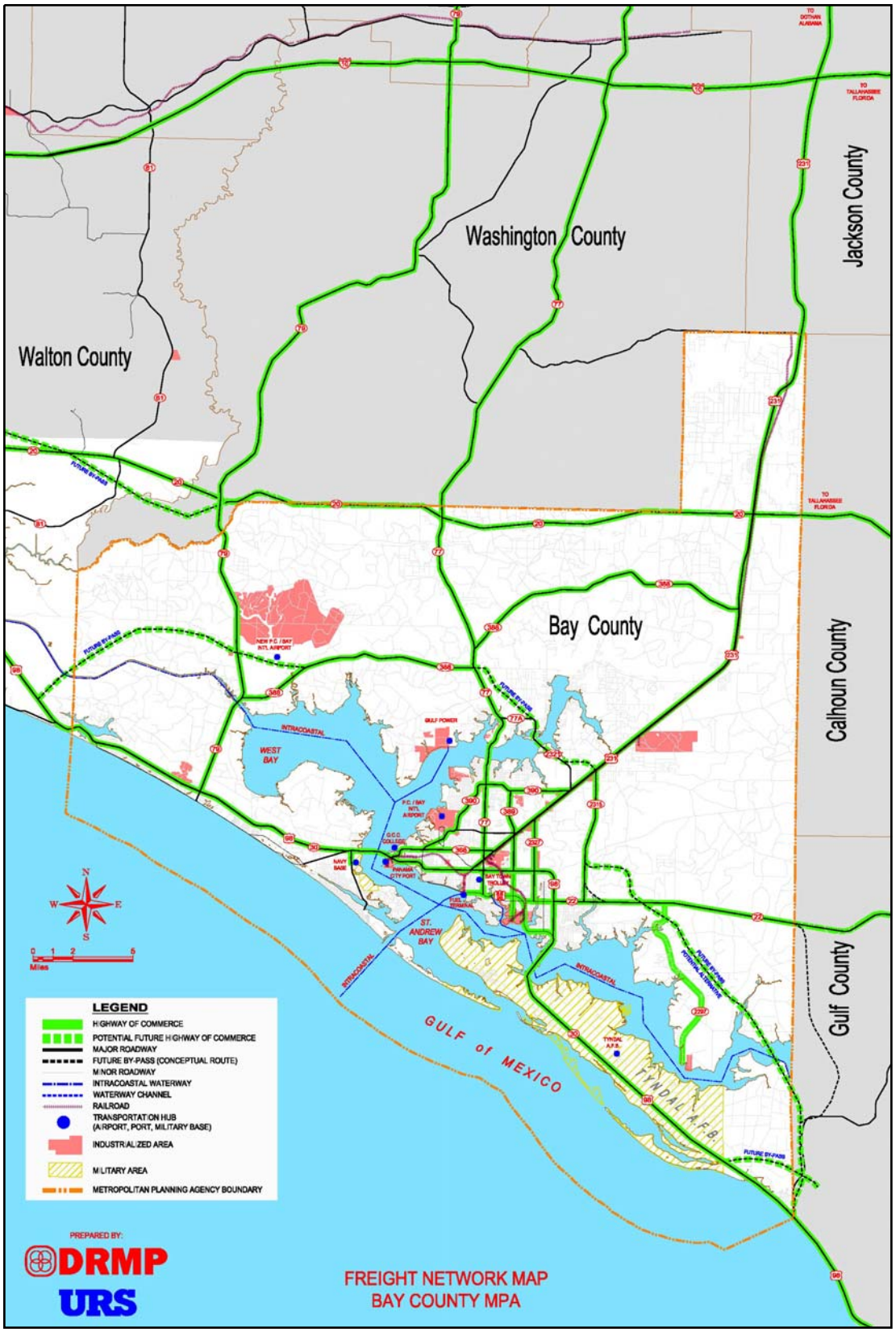

Washington County
Walton County
Jackson County
Bay County
Calhoun County
Gulf County
GULF of MEXICO
WEST BAY
ST. ANDREW BAY
INTRACOASTAL
INTERCOASTAL
TYNDALL A.F.B.
LEGEND
HIGHWAY OF COMMERCE
POTENTIAL FUTURE HIGHWAY OF COMMERCE
MAJOR ROADWAY
FUTURE BY-PASS (CONCEPTUAL ROUTE)
MINOR ROADWAY
INTRACOASTAL WATERWAY
WATERWAY CHANNEL
RAILROAD
TRANSPORTATION HUB (AIRPORT, PORT, MILITARY BASE)
INDUSTRIALIZED AREA
MILITARY AREA
METROPOLITAN PLANNING AGENCY BOUNDARY
PREPARED BY:
DRMP
URS
FREIGHT NETWORK MAP
BAY COUNTY MPA

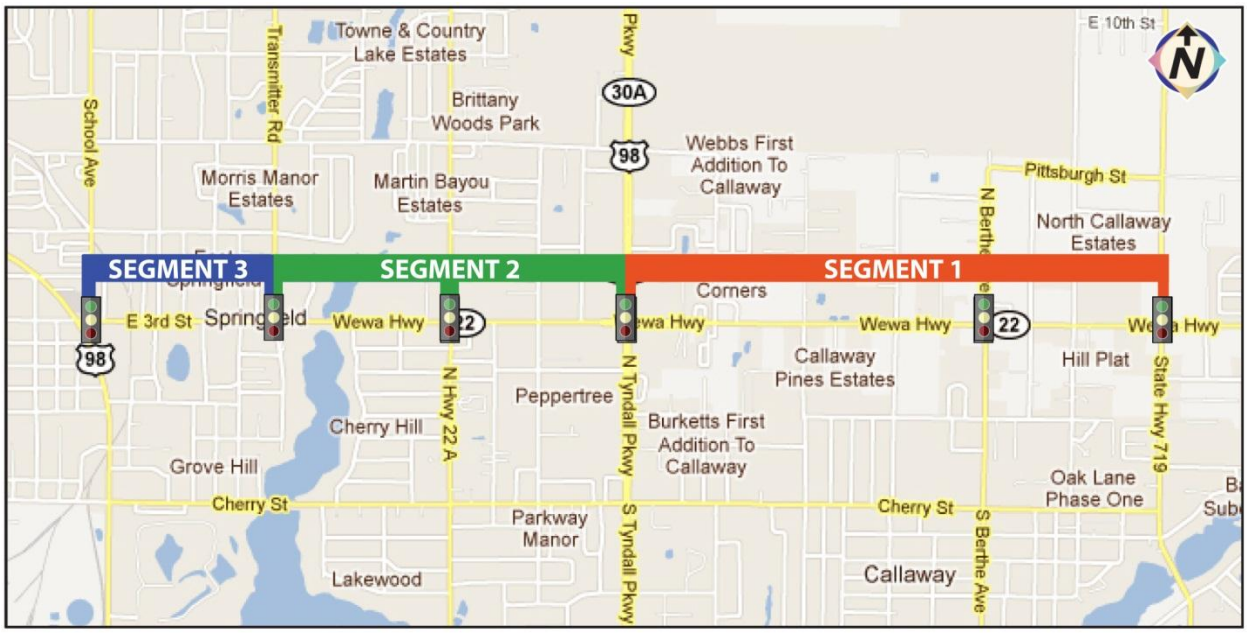
SR 22 (Wewa Highway) from Star Avenue to US 98 Business

PRELIMINARY FREIGHT CORRIDOR SCREENING
SR 22 (Wewa Highway) from Star Avenue to US 98 Business

INTRODUCTION

A preliminary freight corridor screening evaluation was conducted on SR 22 (Wewa Highway) from SR 719 (Star Avenue) to US 98 Business, located within the boundaries of Bay County, Florida on September 8-9, 2011. This screening is part of a broader effort to screen a sample of the regional freight corridors as designated in the *Regional Freight Network Plan: Highways of Commerce*, adopted April 2010, for freight related operational and physical issues. **Figure 1** shows the corridor location map and the segmentation used during the evaluation. The total distance of the corridor was 3.1 miles and includes six signalized intersections.

FIGURE 1
PROJECT LOCATION MAP



As shown on the map and in **Table 1** below, the corridor was divided into three segments.

TABLE 1
PROJECT SEGMENTATION

Segment	From	To	Distance	Intersections	Signalized Intersections	Estimated Driveways
1	Star Ave.	Tyndall Pkwy.	1.5	10	2	48
2	Tyndall Pkwy.	Transmitter Rd.	1.0	10	2	46
3	Transmitter Rd.	US 98 Bus	0.6	10	2	20

RELEVANT FREIGHT-RELATED ISSUES

The following freight-related issues were identified during the screening process:

- There are no sidewalks throughout most of the corridor. Florida Department of Transportation (FDOT) Work Program (WP) 4281231, scheduled for 2012, will add sidewalks from Bob Little Road to Star Avenue.
- Deep rutting throughout the corridor, especially at Transmitter Road, US 98/Tyndall Parkway, and US 98 Business. FDOT WP 4216401 (funded) and WP 4307881 (unfunded) should fix this problem.
- Pavement markings at the signalized intersections are worn through to the pavement due to the deep rutting and turning movements.
- Left-turn signal timing at US 98 Business and US 98/Tyndall Parkway are inadequate to support truck turns.
- There are no accurate truck classification counts or truck turning movement counts along SR 22, a designated Regional Highways of Commerce.
- The railroad crossing located east of US 98 Business is a major cause of delay during train crossings. This causes trucks to use Cherry Street, a residential corridor, as an alternative route.

PHYSICAL CHARACTERISTICS

General Characteristics

SR 22 (Wewa highway) is a two-lane facility with dedicated left turn lanes at all signalized intersections and dedicated right-turn lanes at Tyndall Parkway, Transmitter Road, and US 98 Business. Located between Callaway Elementary School and Berthe Avenue (Segment 1) there is a 1,800-foot continuous two-way left-turn lane. The typical section is primarily rural in nature with 4- to 5-foot paved shoulders. There are additional left-turn lanes located at N. Kimbrel Avenue (Segment 1) and Detroit Avenue (Segment 3), both of which are non-signalized intersections.

There are no dedicated bike lanes on the corridor. The speed limit throughout the corridor is 45 miles per hour (mph).

Signalized Intersections

There are six signalized intersections along this corridor.

- **Star Avenue**. This intersection is used by trucks to connect to US 231 north of Panama City. (See Aerial 1, Appendix 1)
- **Berthe Avenue**. This intersection connects residential neighborhoods north and south of SR 22. (See Aerial 2, Appendix 1)
- **Tyndall Parkway (US 98)**. US 98 is the only east-west corridor that spans all of Bay County. Tyndall Parkway becomes 15th Street after making a turn to the west north of SR 22. (See Aerial 3, Appendix 1)

- **Bob Little Road (SR 22A)**. This intersection connects residential neighborhoods north and south of SR 22. (See Aerial 4, Appendix 1)

- **Transmitter Road**. This intersection is used by trucks to connect to US 231 approximately 4 miles to the north. (See Aerial 5, Appendix 1)

- **US 98 Business**. Used by trucks to connect from SR 22 to the paper mill and Arizona Chemical 0.5 miles south of the intersection. (See Aerial 6, Appendix 1)

Pedestrian Features

There are no sidewalks except on the north side between Star Avenue (Segment 1) and Berthe Avenue and at the intersection of Tyndall Parkway (Segments 1 and 2). The sidewalk between Star Avenue and Berthe Avenue provides a safe environment for children walking to Callaway Elementary School. At the Tyndall Parkway intersection, the sidewalk is located immediately adjacent to the curb and roadway for approximately 350 feet to the west of the intersection on the north side of the roadway. On the east side of the intersection, the sidewalk extends approximately 300 feet and is located 10 to 12 feet from the roadway.

Crosswalks are included at all signalized intersections as well as in front of Callaway Elementary School, located 1,000 feet to the west of Star Avenue in Segment 1 and Helen Avenue, located east of the railroad crossing in Segment 3.

Pavement Conditions

The pavement along the entire corridor is in fair condition that is free of pot holes. However, rutting, deep in some locations, is evident throughout the corridor especially at the signalized intersections. Rutting is a particular problem as the ruts tend to keep all vehicles running over the same footprint of the pavement, resulting in even deeper ruts over time. In the case of this corridor, the rutting is primarily caused by heavy log trucks that carry logs from the forest to the paper mill located south of SR 22 on US 98 Business. Rutting also causes water to pool during heavy rains resulting in dangerous hydroplaning. The shoulder pavement is in generally good condition except at some intersection corners and at locations, where there are long continuous driveways.

In addition to the lanes on SR 22, both the northbound and southbound lanes of Tyndall Parkway are also deeply rutted. This condition is carried through the intersection resulting in a checker board or picket fence affect for vehicles on SR 22. There are curbs and gutters present along all approaches to the intersection with Tyndall Parkway. None of the curbs and gutters appeared to be damaged, indicating that trucks are able complete turning movements without encroaching or off-tracking.

At Transmitter Road, the shoulder pavement has been extended at both the northeast and northwest corners (See Aerial 5, Appendix A). The intention is to prevent over tracking vehicles from creating deep ruts and pot holes in the area adjacent to the pavement. However, when this intersection is repaved or improved, consider extending the roadway pavement at these corners, as well as the shoulder pavement.

At US 98 Business, there is deep rutting in the shared through/left-turn lane, as well as on the through lanes and northbound right-turn lane of US 98 Business. This corresponds to the most heavily made truck movements. This intersection should be rehabilitated and repaved with stronger pavement in order to

withstand the weight of the trucks. This will reduce the rutting and extend the time between rehabilitations.

Pavement Markings

Pavement markings are generally in good condition throughout the corridor except at the signalized intersections where deep rutting and turning movements have worn through to the pavement. (See the aerials in Appendix 1.)

Infrastructure

Traffic signals along the corridor are mounted on mast arms that are generally located well back from the intersection corners (see Photo 5 in Appendix 3). Power poles are also located back from the edge of pavement, except in the vicinity of the Tyndall Parkway intersection.

There are curbs and gutters present along all approaches to the intersection at Tyndall Parkway. Some damage to the curbing at Tyndall Parkway due to over-tracking by large trucks was noted. The northeast corner shows rutting beyond the curb where the sidewalk ends. If the corner radius cannot be improved, consider changing the curbs to a mountable version. Corner curbs with storm sewer drains are included at the corners of US 98, but none extend beyond a few feet in either direction. This infrastructure is showing signs of damage from truck off-tracking (see Photo 6 in Appendix 3) with one drain opening having been recently replaced.

Land Use

The land use throughout the corridor is a mixture of residential, commercial, light industrial, and municipal uses.

There are three churches: The High Praise Worship Center (Segment 1), First Baptist Church of Callaway (Segment 1), and the Springfield Baptist Church (Segment 3). The Callaway Elementary School is located on the north side of the roadway between Star and Berthe Avenues in Segment 1, and there are two municipal buildings, Callaway City Hall in Segment 1 and Springfield City Hall, located immediately west of the railroad crossing in Segment 3. The Springfield Municipal Park is located at the southwest corner of Detroit Avenue.

The intersection with Tyndall Parkway has commercial uses including a supermarket and two chain drug stores. There is also a Holiday Inn Express located on the north side to the east of Tyndall Parkway with entrance on SR 22. Care, Inc. operates a professional medical office building at the southeast corner of Transmitter Road. The US 98 Business intersection includes a shopping center, fast food restaurant, and auto repair shops.

The residential is low-density and most of the houses or mobile homes are located on larger parcels. All parcels have direct access to the roadway.

OPERATIONAL CHARACTERISTICS

The corridor appears to be operating satisfactorily; although, there is minor congestion at the intersections of Tyndall Parkway and US 98 Business. Nearly all truck turning movements take place at four intersections: Star Avenue, Tyndall Parkway, Transmitter Road, and US 98 Business.

The signal timing along SR 22 ranges from 90 seconds at Star Avenue to 22 seconds at Tyndall Parkway. Signals at the intersections of Berthe Avenue and Bob Little Road are sometimes shorter, but appear to be working on dynamic activation that turns the signal when a vehicle approaches from the cross street. When there are no vehicles on the cross street the signal remains green longer. The left-turn signal timing appears adequate at Transmitter Road and Star Avenue to support truck movements. However, at Tyndall Parkway the left-turn signals were timed at 10 seconds of green with 4 seconds of yellow. This is inadequate for loaded trucks. Similarly, the left-turn from eastbound SR 22 to southbound US 98 Business was only 15 seconds of green with 4 seconds of yellow. Due to the accuracy of the field measurements, it is recommended that the exact progression timing be reviewed and consideration given to increasing the left turn protection at these two intersections.

The vast majority of large trucks operating on this facility are loaded log trucks that travel from east to west. The field team asked one driver how many trips an individual driver makes a day hauling logs from the forest to the paper mill. He stated three to four. There are four reasons for this: 1) Federal trucking rules prohibit drivers from driving more than 10 hours in a single day, 2) the amount of delay along the route caused by traffic signals and train crossings, 3) and 4) are the loading and unloading time at the beginning and end of the trip. Note that drivers normally get paid by the trip, so trip time is important to them. One additional trip is worth an additional third more pay.

Traffic

Figures 2 and 3 show the annual average daily traffic (AADT) and annual average daily truck traffic (AADTT), respectively across SR 22 from US 98 Business to Star Avenue along with the cross street traffic. Although the percent trucks was approximately 6.2 percent of the total traffic, annual classification counts were not available so it is difficult to ascertain the actual large truck (Class 6-13) that use this corridor. Classification counts on US 98 immediately south of the SR 22 intersection indicate that approximately 32 percent of the total trucks are large trucks. However, based on the nature of the trucking use of SR 22 (log and wood chip trucks), the percentage of large trucks is probably in excess of 50 percent.

Because SR 22 has been designated as a Regional Highway of Commerce, vehicle classification counts should be taken along this facility and large truck (Class 6-13) turning movement counts should be taken at the major signalized intersections to gain better knowledge of the actual trucking operations along this corridor.

FIGURE 2
SR 22 AADT

Source: FDOT Traffic On-line, accessed September 2011.

FIGURE 3
SR 22 AADTT

Source: FDOT Traffic On-line, accessed September 2011.

FREIGHT FACILITIES AND FREIGHT OPERATIONS

There are no freight-related facilities along this corridor; however, the Arizona Chemical Company and the Southwest Forest Industries paper mill are located less than a mile south of the western end of the corridor on US 98 Business. These manufacturing facilities generate hundreds of truck trips and several train trips daily. In addition, Waste Management has a yard for their trucks located on the north side of SR 22 between N. Kimbrel Avenue and Berthe Avenue. These truck trips are generated primarily early in the morning and when the trucks return in the evening.

Trucking operations are dominated by large log trucks and bulk wood chip haulers. These trucks make several round trips daily between the loading areas and paper mill. Other trucks use the facility to reach northbound connection to US 231, including Transmitter Road and Star Avenue.

PLANNED IMPROVEMENTS

There are several planned/funded improvements for this corridor in the FDOT 5-Year WP.

- **Preliminary Engineering (PE) for Future Capacity Improvements (WP 4258031).** It includes conducting “PE for Future Capacity” between SR 30 (US 98), also known as

Tyndall Parkway and Star Avenue. This project falls within Segment 1 of this freight corridor screening.

- **Resurfacing (WP4216401).** This project includes the resurfacing of SR 22 from west of Star Avenue to the Gulf County line and includes the intersection at Star Avenue, which is within Segment 1 of this freight screening.

- **Bridge Repair/Rehabilitation (WP 4284751).** This project is for the repair of the Callaway Bayou Bridge (N0. 460045). Work on this project is scheduled for 2012. This project lies within Segment 3 of this freight corridor screening.

- **Sidewalk (WP 4281231).** Add a sidewalk between Bob Little Road and Star Avenue. The work is scheduled for 2012 and this project falls within Segment 1 of this freight corridor screening.

In addition, FDOT has an unfunded project (WP 4307881) to resurface SR 22 from US 98 Business to US 98/Tyndall Parkway on its prioritized list of unfunded projects.

The first two listed projects and the unfunded project provide an opportunity to improve this corridor to meet the demands of heavy truck movement. The design should include consideration for truck turning movements at US 98/Tyndall Parkway and at Star Avenue. The pavement should be upgraded to support heavy truck movement through the corridor and to prevent/mitigate premature rutting, especially at signal controlled intersections. Corner radii should be increased, if possible without acquiring additional right-of-way, to accommodate right-turn movements by trucks. If curb and gutters are included, all curbs should be truck mountable at intersection corners and median bull noses.

OTHER ISSUES

Railroad Crossing

The Bay Line Railroad crosses SR 22 800 feet to the east of US 98 Business. The trains are generally long and slow moving though this crossing. The field team measured one gate closure to be 5 minutes and 30 seconds. During this time, the queue backed up through the US 98 Business intersection and along the northbound to eastbound right-turn lane on US 98 Business. The turn lane from southbound US 98 Business to eastbound SR 22 also showed some backup. There was a comparable backup on the westbound lane of SR 22, east of the crossing.

Note that it appears that a large number of trucks use Cherry Street as an alternate route to Star Avenue where they turn north to reach SR 22 or continue onto US 231. This route avoids the railroad crossings on US 98 and SR 22. However, it is not recommended for truck travel due to the residential nature of this local roadway. The T-factor on this road is 10.88 percent (or approximately 550 AADTT) at the Callaway Bayou Bridge. **Figure 4** shows the AADTT on both SR 22 and on Cherry Street between US 98 Business and Star Avenue.

FIGURE 4
SR 22 VS CHERRY STREET AADTT

Source: FDOT Traffic On-line, accessed September 2010.

If, in fact, Cherry Street is being used as a local truck route it should be signed as such and considered for truck-related improvements. Otherwise, heavy truck travel on this route should be discouraged.

Safety

The railroad crossing gates located east of US 98 Business are not long enough and there are no other safety features, such as delineators to prevent vehicles from circumventing the gates prior to train arrival (see Photo 8). Longer gates should be installed on both sides of the tracks or the following other options should be considered to prevent vehicles from weaving through the gates:

- Install delineators along the road centerline a short distance back from the gate stop bar.
- Add a raised concrete divider with delineators to the center of the roadway a short distance back from the gates.

Pedestrian safety is an issue due to the lack of sidewalks throughout the corridor, especially in the area immediately in front of the elementary school. While there are crosswalks at nearly all the intersections and pedestrian features at some of the intersections, there is no place for pedestrians to walk except along the side of the road or in the non-paved areas bordering the highway. FDOT WP 4281231 will add sidewalks from Bob Little Road to Star Avenue, which will be a significant safety improvement; however, additional sidewalks should be added to complete the entire corridor from US 98 Business to Bob Little Road.

RECOMMENDATIONS

The following recommendations were identified during the screening process:

- Rehabilitate the pavement along the entire corridor to eliminate the deep rutting, especially at signalized intersections. The flexible surface pavement is too soft to support the weight of heavy trucks and should be replaced with a more rigid composition. (BA1)

- Extend the roadway pavement at the northeast and northwest corners of Transmitter Road during the pavement rehabilitation project WP 4216401 (unfunded) to replace the current paved shoulder extensions. The road surface extension would provide a stronger surface at these corners. (BA2)

- Rehabilitate the intersection of US 98 Business and SR 22 using more rigid pavement materials that can support heavy trucks. (BA3)

- Reapply all pavement markings that are worn through to the pavement including stop bars, crosswalks, and lane dividers. (BA4)

- Review and adjust the left-turn signal progression timing to a minimum of 20 seconds at US 98 Business and at Tyndall Parkway. Trucks take much longer to complete these maneuvers, especially when loaded. Also, after a train crossing, increase the westbound SR 22 through and left-turn time at US 98 Business to help clear the queue, as well as the left-turn time from southbound US 98 Business to eastbound SR 22. (BA5)

- Conduct 72-hour vehicle classification counts along the corridor and truck turning movement counts at US 98 Business, Transmitter Road, Tyndall Parkway, and Star Avenue to determine the actual number of large trucks using this corridor and their access point. This is critical to gaining complete knowledge of the number of trucks, as well as the type of trucks operating within the corridor and on the adjacent streets. Consider classification counts on Cherry Street to determine the extent that this facility is used as an alternate truck route. (BA6)

- Ensure that trucks and truck operations are considered as part of the design process for FDOT WP 4258031, WP 4216401, and WP 4307881 (when funded). This is especially critical at the signalized intersections of Star Avenue, Transmitter Road, US 98/Tyndall Parkway, and US 98 Business. Because of the recent trends in the trucking industry to longer trailers, using a WB-66 tractor-trailer combination as the minimum design vehicle is recommended. (BA7)

- Determine the status of Cherry Street, which appears to be used as an alternative to SR 22. If this is a desired truck route, it should be signed to indicate its status. Otherwise truck travel on this route should be discouraged. Consider conducting vehicle classification counts per the recommendations above. (BA8)

- The following safety improvements should be considered for the railroad crossing located east of US 98 Business (BA9):

    - Extend the length of the railroad crossing gates to prevent vehicles from entering the crossing when the gates are down,
    - Add lane delineators extending back from the crossing gate stop bar on both sides of the crossing, or
    - Add a concrete divider along the center of the roadway extending back a short distance from the crossing stop bar on both sides of the crossing.

APPENDICES

1 Intersection Aerials

2 Screening Checklist

3 Photos

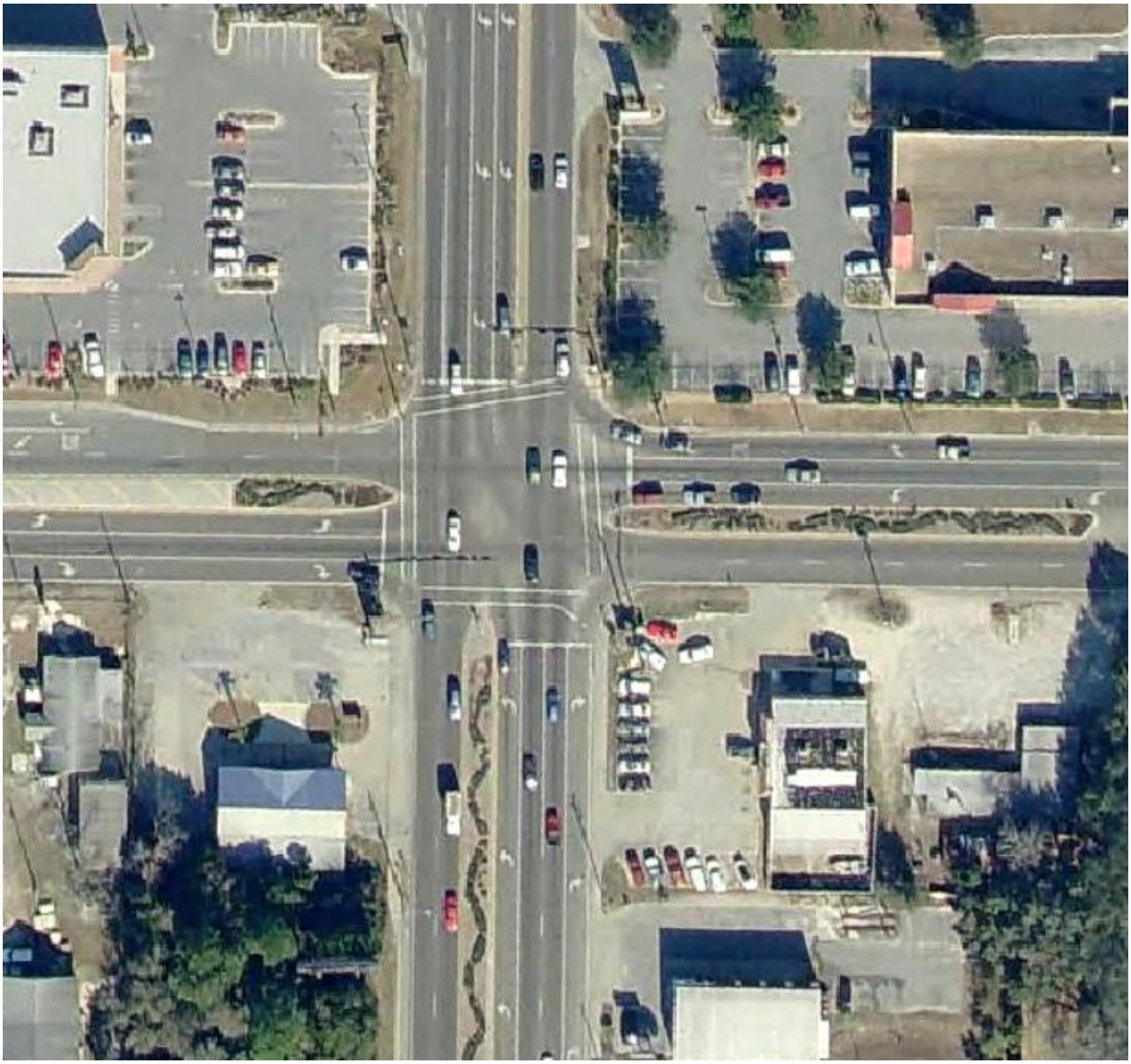
APPENDIX 1

INTERSECTION AERIALS

Aerial 1
SR 22 at Star Avenue

Aerial 2
SR 22 at Berthe Avenue

Aerial 3
SR 22 at Tyndall Parkway



Aerial 4
SR 22 at Bob Little Road

Aerial 5
SR 22 at Transmitter Road

Aerial 6
SR 22 at US 98 Business

APPENDIX 2

SCREENING CHECKLIST

APPENDIX 3

PHOTOS

Photo 1
SR 22 typical section, two-lane with 5-foot paved shoulders and open drainage.

Photo 2
SR 22 intersection typical section. Includes signal-protected left-turn lane and mast arm mounted on traffic signals.

Photo 3
Deep rutting across all lanes at Star Avenue indicated by the uneven pavement markings. This is typical of the conditions at all intersections on the corridor.

Photo 4
Curb damage at the northeast corner of SR 22 and Tyndall Parkway caused by truck off-tracking. Note the ruts beyond the curb and the black tire rubs on the curb.

Photo 5
Infrastructure located at the northeast corner of Bob Little Road, including power poles, telephone poles, signal mast arm, and signal control box. Note the rutting in the eastbound approach lanes.

Photo 6
Truck off-tracking over storm sewer drain and sidewalk at southeast corner of US 98 Business.

Photo 7
Recently replaced storm sewer opening at the northeast corner of US 98 Business. Note new tire rubs on the face of the opening.

Photo 8
Safety issue at the railroad crossing. The gates are too short to prevent vehicles from circumventing them immediately prior to train arrival.

SR 368 (23rd Street) and SR 390 (St. Andrews Boulevard/Beck Avenue)

PRELIMINARY FREIGHT CORRIDOR SCREENING
SR 368 (23rd Street) and SR 390 (St. Andrews Boulevard/Beck Avenue)

INTRODUCTION

The *Regional Freight Network Plan* was adopted April 2010 by the Florida-Alabama, Okaloosa-Walton, and Bay County Transportation Planning Organizations (TPOs). This plan is also knows as *Highways of Commerce*. "Highways of Commerce," as used in this plan, is a term that describes major freight corridors connecting the nation and even the world to the region covered by the three TPOs. The first step of implementing this plan is to conduct preliminary freight corridor screenings on identified Highways of Commerce.

The scope for the project includes screening two corridors within the Bay County TPO region and three each in the Florida-Alabama and Okaloosa-Walton TPOs. Factors used to determine which corridors would be screened included:

- Location on a designated Regional Corridor of Commerce.
- The potential for influencing scheduled improvement projects in the current Transportation Improvement Program (TIP)/Florida Department of Transportation (FDOT) Work Program (WP).

Based on the criteria above, only one corridor was ready for screening: SR 22 from Star Avenue to US 98 Business. Therefore, preliminary screenings were conducted at several intersections identified as freight hot spots within the plan as an alternative to a second corridor. Each intersection is reported upon separately. The intersections identified on **Figure 1** include:

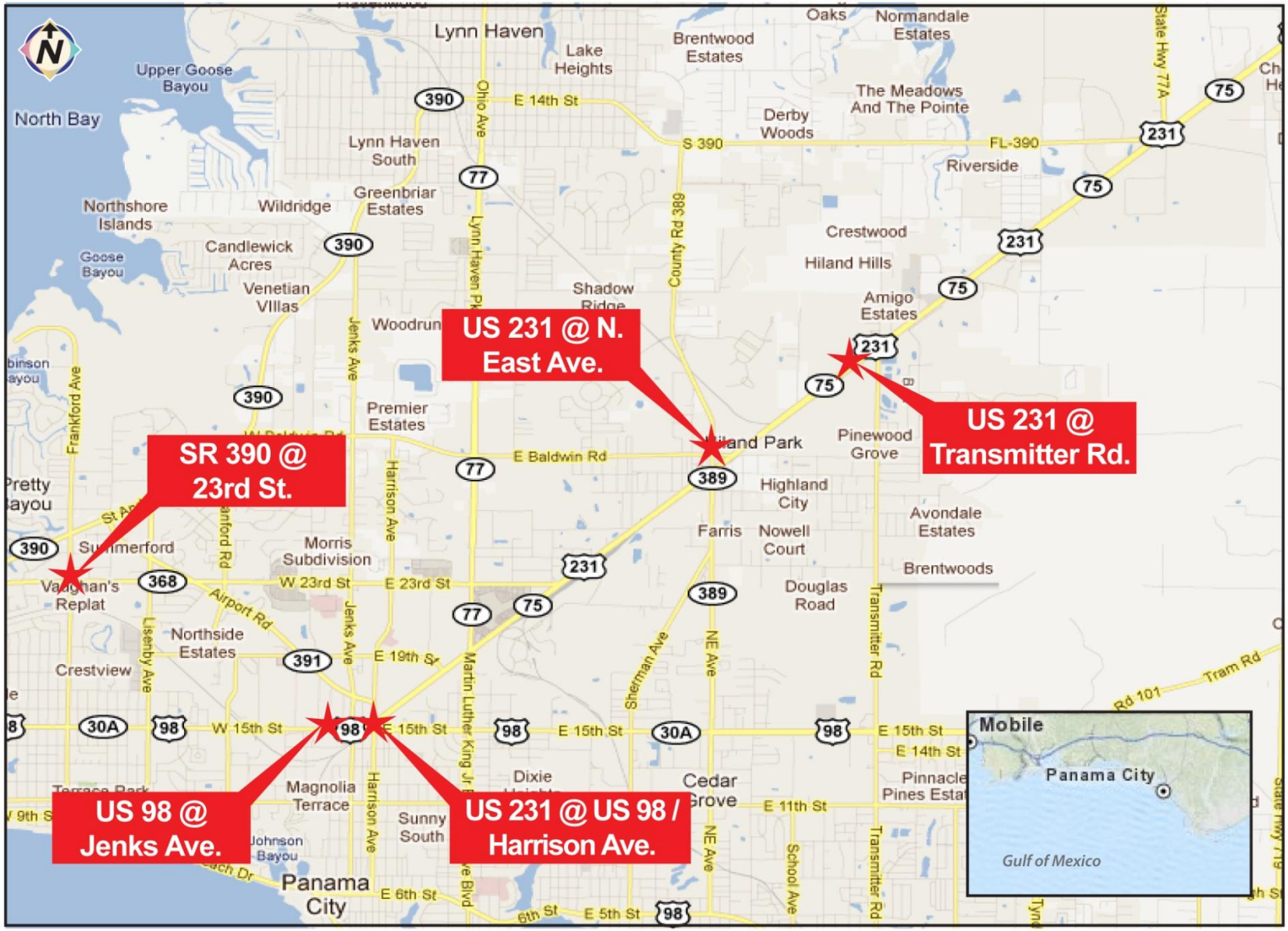
- SR 368 (23rd Street) and SR 390 (St. Andrews Boulevard/Beck Avenue)
- US 98 (15th Street) and Jenks Avenue, US 98 and Harrison Avenue, and US 231 and Harrison Avenue
- US 231 and N. East Avenue
- US 231 and Transmitter Road

RELEVANT FREIGHT-RELATED ISSUES

The freight-related issues associated with this intersection are as follows:

- There is minor pavement rutting on SR 368 (23rd Street). The rutting is found in the through lanes of both directions, as well as the eastbound to northbound left-turn lane.
- Eastbound and westbound traffic signals are difficult to see during low sun angles due to lack of back plates.
- There are no medians to channel and protect the integrity of the eastbound to northbound left-turn lane. The use of a continuous left-turn lane allows vehicles to break up the intersection queue causing spillover into the inside through lane.
- SR 390 is the Strategic Intermodal System (SIS) route for northbound through trucks but there are no "Truck Route" signs.
- The crosswalk across SR 390 from the northeast to northwest corners is long (166 feet) with no pedestrian refuge.

FIGURE 1
PROJECT LOCATION MAP



PHYSICAL CHARACTERISTICS

Figure 2 shows an aerial view of the intersection under evaluation. SR 390 (St. Andrews Boulevard/Beck Avenue) runs north and south and SR 368 (23rd Street) runs east and west.

FIGURE 2
INTERSECTION AERIAL VIEW

Source**:** Bay County Property Appraiser

General Characteristics

The intersection of SR 390 (St. Andrews Boulevard/Beck Avenue) and SR 368 (23rd Street) has skewed geometry, as shown in Figure 2. SR 368 runs along 23rd Street from US 98 (18th Street) to US 231. SR 390 is a north-south corridor, also known as Beck Avenue to the south of the intersection and St.

Andrews Boulevard to the north. SR 368 (23rd Street) from US 98 to SR 390 and SR 390 from SR 368 (23rd Street) to SR 77 are designated as part of the Florida SIS and provide connectivity between the Port of Panama City and I-10.

West of the intersection, SR 368 (23rd Street) is a five-lane undivided highway with a continuous left-turn lane in the center that is striped as a signal-controlled left-turn lane at various intersections. The typical section also includes sidewalks and paved shoulders on both sides designated as bike lanes. Lane widths are adequate for truck operations. The outside lanes are 13 feet wide and the inside lanes are 11 feet wide. The recommended ideal width for trucking operations is 12 feet. This typical section continues to the east of the intersection, with the exception of the designated bike lanes.

The typical section of the north approach to the intersection, SR 390 (St. Andrews Boulevard) includes one through lane and dedicated left- and right-turn lanes in the southbound direction. The northeast corner includes a long radius that permits all vehicles to easily maneuver the right turn. Approximately 450 feet north of the intersection, SR 390 narrows to a two-lane typical section with 4-foot paved shoulders. The south approach typical section includes a dedicated left-turn lane and combination through/right-turn lane. There is a single southbound lane.

There are pedestrian features at all four corners and designated cross walks on the north, east, and south approaches. There are commercial driveways in close proximity to all four corners as well.

Pavement Condition

Minor rutting exists in the left turn lane on the eastbound approaches of SR 368 (23rd Street) (see Photo 1 of Appendix 2). There is also minor rutting, but to a lesser extent on the eastbound and westbound through lanes. Rutting is a problem in that it causes a railroad track effect on the travel lanes and results in water retention during rainy periods that could result in hydroplaning. Trucks crossing heavily rutted intersections encounter load shift issues that could result in damaged goods. There are no potholes or major cracking. No shoulder or curb damage exists because of the long turning radii, which allows all vehicles to make the turns without encroaching on the corners.

Infrastructure

Traffic signals are mounted on mast arms located on all four corners. The signal lights in the eastbound and westbound directions do not include back plates (see Photo 2 of Appendix 2). As a result, they are difficult to see during low sun angles. The mast arms and telephone poles are located outside of the sidewalks, which decreases the chances of damage from turning trucks. The crosswalk from the northeast to the northwest corner is approximately 166 feet in length without a pedestrian refuge due to the lack of a raised median or raised island at the northeast corner (see Figure 2).

There are no raised medians on the intersection approaches to channel and provide storage for left-turning vehicles (see Figure 2). Instead, the continuous left-turn lane is painted to indicate the protected left-turn storage lane. This presents a problem in that vehicles entering this lane to turn into the driveways could block and interrupt the queue for the left-turn lane, resulting in spillover into the inside through lane. Due to the number of commercial driveways in the immediate vicinity of the intersection, a raised median could provide for an extended left-turn storage lane in the eastbound direction, as well as a

left-turn storage lane in the westbound direction for vehicles turning into the large parking lot approximately 850 feet to the west. All other driveways between these two locations would be changed to right turns in/out only.

Land Use

The existing land use is commercial on all four quadrants. Uses include a gas station/convenience store at the northeast corner, and abandoned gas station at the northwest corner that is located in front of a shopping plaza. The southeast and southwest corners contain a restaurant and a bank, respectively.

OPERATIONAL CHARACTERISTICS

At the time of observation (11:00 a.m.), the intersection appeared to be operating in a satisfactory condition. Although this intersection was identified as a congested intersection, particularly during the peak periods, no congestion was noted although, the left-turn queues occasionally backed up beyond the painted end of the left-turn lane. A return visit was made during the expected evening peak and only minor congestion was noted. Note that Gulf Coast State College is located approximately 1.5 miles to the west on SR 368 (23rd Street), which contributes to high commuter traffic throughout the day, but particularly to congestion during the morning peak traffic period.

The primary truck movement is expected to be from eastbound SR 368 (23rd Street) to northbound SR 390 and the reverse, since this is the designated SIS corridor and the preferred truck route that connects to SR 77 and eventually to I-10. However, most trucks continued east along SR 368 (23rd Street) during the observation. This route appears to be favored for several reasons: 1) it is a direct route to US 231 and avoids the congested intersection at US 98 and US 231, 2) this corridor is four lanes with a turning lane throughout that helps the flow of traffic, and 3) the corridor is a highly developed commercial corridor that results in a high percentage of truck deliveries. Additionally, SR 390 is currently only a two-lane facility through mostly residential neighborhoods. It is assumed that this situation will change when future capacity improvements (currently unfunded SIS) to SR 390 are completed (see Planned Improvements section). If, in fact, this is the preferred truck route north, consider adding directional "Truck Route" signs to direct northbound through trucks onto SR 390.

The signal progression appeared to be adequate although the eastbound to northbound left-turn lane (230 feet) was not long enough to support the queue. The left-turn protected green was approximately 23 seconds followed by a 3-second yellow condition.

The location of the stop bars in the left-turn lanes permitted trucks to complete the turns without encroaching on the left-turn lanes.

Traffic

Table 1 shows the annual average daily traffic (AADT) and the annual average daily truck traffic (AADTT) for the intersection.

TABLE 1
TOTAL TRAFFIC (AADT) VS. TRUCK TRAFFIC (AADTT)

	SR 368 East Side	SR 368 West Side	SR 390 North side	SR 390 South Side
AADT	36,500	27,500	19,000	7,400
AADTT (Class 6-13)	1,212	775	802	274
T-Factor/% Trucks	3.32	2.82	4.22	3.70

Source: Florida Department of Transportation (FDOT) Traffic Online (2010)

Nearby Freight Facilities and Freight Operations

The nearest freight activity center is located at the Port of Panama City, located approximately 1.8 miles to the west on SR 368 (23rd Street). A new freight activity center is being developed at the old Panama City airport, located approximately 2 miles to the north on SR 390. The port generates several hundred truck trips daily and this number is expected to increase as the container business expands. The preferred route for trucks between the Port and I-10 is the designated SIS corridor of SR 368 (23rd Street)/SR 390/SR 77. However, until this route is improved to at least four lanes, it appears that the truck trips will be split among US 98, SR 368 (23rd Street), and SR 390/SR 77.

PLANNED IMPROVEMENTS

SR 390 (SIS) between SR 368 (23rd Street) and Baldwin Road is ranked third on the priority list for capacity improvements within Bay County. The proposed improvement is for six lanes. FDOT Work Program ID 2178753 is funded for Preliminary Engineering in 2012/2013. During the design phase of this project, engineers must consider the turning movement geometries of long tractor trailer vehicles. This is especially true for the westbound to northbound right turn, which is an acute angle. The design vehicle should be a WB-66 and all corner curbs and median noses should be mountable.

OTHER FACTORS

Safety

There is a potential safety issue with the crosswalk from the northeast to northwest corners across SR 390. This crosswalk is approximately 166 feet long and there are no pedestrian refuge islands due to the lack of a center median on SR 390. This situation could be easily remedied at minimal cost by adding a small raised island at the northeast corner separating the right-turn lane from the northbound through lane and adding an additional pedestrian crossing signal. In order to ensure that the island does not interfere with truck turning movements, it may be necessary to pull back the southbound left-turn lane stop bar slightly to prevent lane encroachment or mounting of the island. At a minimum, this should be included as part of the design for the capacity improvement.

RECOMMENDATIONS

The following are recommendations for this intersection:

- During the PE for the SR 390 capacity improvement, ensure that all turning movements are designed for highway standard tractor trailers. Recommend that WB-66 tractor trailers be used as the design standard for all intersections that support routine truck turning movements. All corner curbs must be mountable and median bull noses must be mountable or set back to accommodate turning trucks. (BA10)
- Conduct an engineering study to add a median (approximately 850 feet) along SR 368 (23rd Street) west of the intersection in order to construct a left-turn lane of approximately 600 feet to store vehicles waiting to turn left at SR 390. Driveways along this segment should be right turn in/out only. Add a westbound left-turn lane at the west end of the median to facilitate turns into the large parking lot on the south side of the road. (BA11)
- Remove existing pavement and repave the surface along the SR 368 (23rd Street) intersection. Pavement composition should be able to withstand the weight of heavy trucks without developing rutting. (BA12)
- Consider adding a raised pedestrian refuge island at the northeast corner separating the right-turn lane from the northbound through lane. This will reduce the long crossing from 166 feet to 90 feet. (BA13)
- Add back plates behind traffic signals on SR 368 (23rd Street) to enhance visibility during low sun angle situations. (BA14)
- Consider adding “Truck Route” signs directing northbound through trucks to SR 390 (SIS). (BA15)

APPENDICES

1 Screening Checklist

2 Photos

APPENDIX 1

SCREENING CHECKLIST

APPENDIX 2

PHOTOS

Photo 1
Minor rutting on the SR 368 (23rd Street) eastbound approach

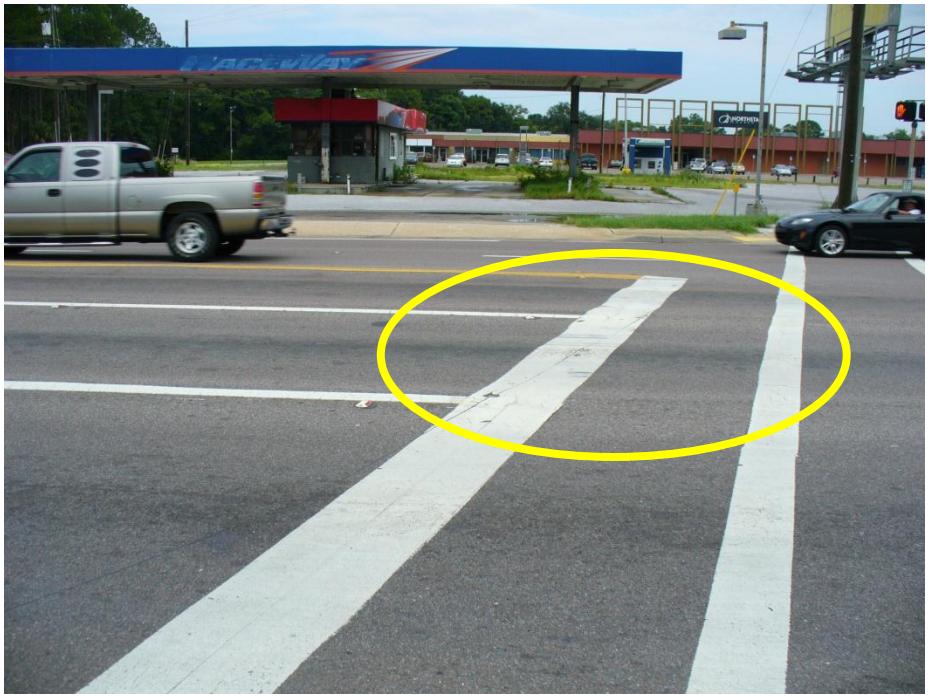


Photo 2
Eastbound traffic signals with no back plates.
Infrastructure outside sidewalks away from road and corners.

Photo 3
Long pedestrian crossing

US 98 (15th Street) at Jenks Avenue, US 98 Harrison Avenue, and US 231 and Harrison Avenue

PRELIMINARY FREIGHT CORRIDOR SCREENING
US 98 (15th Street) and Jenks Avenue, US 98 and Harrison Avenue, and US 231 and Harrison Avenue

INTRODUCTION

The *Regional Freight Network Plan* was adopted April 2010 by the Florida-Alabama, Okaloosa-Walton, and Bay County Transportation Planning Organizations (TPOs). This plan is also knows as *Highways of Commerce*. "Highways of Commerce," as used in this plan, is a term that describes major freight corridors connecting the nation and even the world to the region covered by the three TPOs. The first step of implementing this plan is to conduct preliminary freight corridor screenings on identified Highways of Commerce.

The scope for the project includes screening two corridors within the Bay County TPO region and three each in the Florida-Alabama and Okaloosa-Walton TPOs. Factors used to determine which corridors would be screened included:

- Location on a designated Regional Corridor of Commerce.
- The potential for influencing scheduled improvement projects in the current Transportation Improvement Program (TIP)/Florida Department of Transportation (FDOT) Work Program (WP).

Based on the criteria above, only one corridor was ready for screening: SR 22 from Star Avenue to US 98 Business. Therefore, preliminary screenings were conducted at several intersections identified as freight hot spots within the plan as an alternative to a second corridor. Each intersection is reported upon separately. The intersections identified on **Figure 1** include:

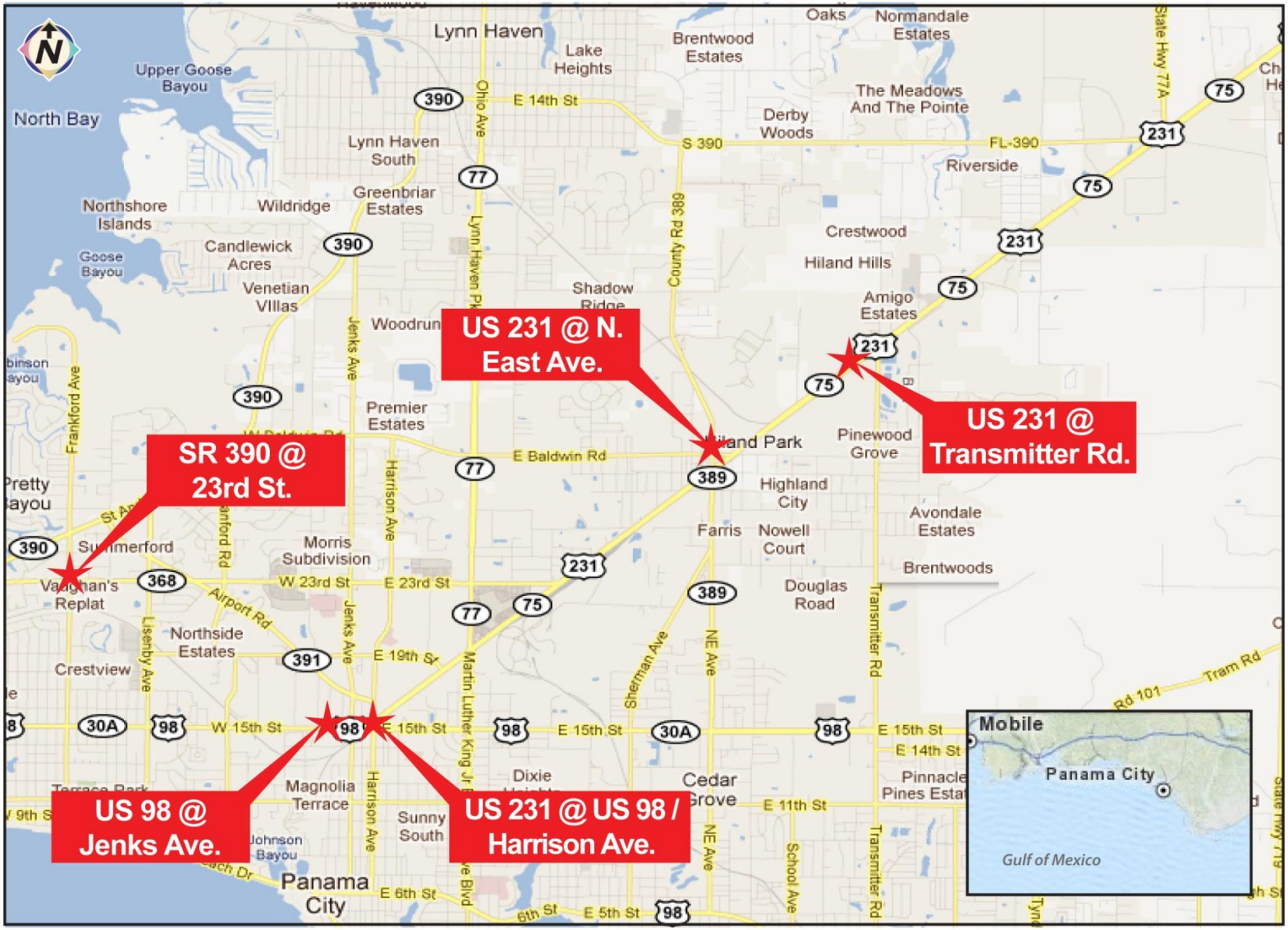
- SR 368 (23rd Street) and SR 390 (St. Andrews Boulevard/Beck Avenue)
- US 98 (15th Street) and Jenks Avenue, US 98 and Harrison Avenue, and US 231 and Harrison Avenue
- US 231 and N. East Avenue
- US 231 and Transmitter Road

RELEVANT FREIGHT-RELATED ISSUES

The freight-related issues associated with this intersection are as follows:

- Heavy congestion throughout the day.
- Lack of available left turn storage eastbound and westbound at Jenks Avenue and eastbound at US 231.
- Inadequate safe storage distance northbound between the railroad tracks and US 98 and southbound between the railroad tracks and US 231.
- Skewed roadway geometry at US 98 and US 231, as well as at Harrison Avenue and US 231.

FIGURE 1
PROJECT LOCATION MAP



- Railroad crossings between US 231 and US 98 (west of Harrison Avenue) and east of the US 98 to US 231 left-turn lane.
- Extreme rutting at US 98 and Jenks Avenue at all approaches, in all lanes, and through the intersection.

PHYSICAL CHARACTERISTICS

Figure 2 is an aerial of the three intersections evaluated in this report. US 98 is an east-west corridor, Jenks and Harrison Avenues are both north-south corridors, and US 231 is a northeast to southwest corridor that intersects US 98 at an acute angle immediately west of Harrison Avenue.

FIGURE 2
INTERSECTION AERIAL VIEW

Source**:** Bay County Property Appraiser

General Characteristics

As shown in Figure 2, this combination of intersections is extremely complicated with short distances between intersections, inadequate left turn storage lanes on US 98 (15th Street), and unsafe vehicle storage for trucks between US 231 and US 98 north and south of the railroad crossing. In combination this results in one of the most congested areas in Bay County and a major cause for truck delay.

US 98 (15th Street) is a five-lane undivided roadway with a continuous left-turn lane that is marked for dedicated left turns at various intersections including Jenks Avenue. US 98 becomes a divided four-lane facility with dedicated left-turn lanes east of Jenks Avenue. Between Jenks Avenue and the railroad crossing there is a dedicated 275-foot, non-signalized left-turn lane that leads to US 231 northeast bound and a signalized intersection at Harrison Avenue (see Photo 1A in Appendix 2).

Jenks Avenue is a five-lane undivided facility with a continuous left-turn lane and a painted dedicated left-turn lane on the north approach. The south approach has five lanes including a dedicated left-turn lane. There is a gated railroad crossing 440 feet south of the intersection.

Harrison Avenue is a five-lane undivided facility with a continuous left-turn lane and a painted dedicated left-turn lane south of US 98. North of US 98, there is a dedicated right-turn lane and a shared right-turn/through lane that merges onto US 231. The through lane segment is signalized. Southbound between US 231 and US 98, there are two through lanes and one left-turn lane. All three lanes are too short for trucks between the railroad crossing and the stop bar at US 98. The distances vary between 33 and 55 feet, while the length of a tractor trailer is approximately 74 feet.

US 231 is a five-lane undivided facility with a dedicated left-turn lane approaching Harrison Avenue. West of Harrison Avenue, US 231 intersects with US 98 via a short divided segment. This short segment is 195 feet long and consists of two through lanes and a left-turn lane. These lanes are separated by a landscaped median from a single southwest bound non-signalized right-turn lane that merges onto US 98 westbound. There is also a short service road separated by a small island that extends from US 231 to US 98 that permits right-turn in/out only access to Grace Avenue and some commercial properties.

To further complicate these intersections, there are two railroad crossings that occasionally block Harrison Avenue north of US 98, US 98 west of Harrison Avenue, and Jenks Avenue south of US 98 simultaneously for short periods. During the field evaluation, a train caused the gates to close for over 3 minutes at each of the crossing locations.

Pavement Condition

Deep rutting was noted on all approaches to the US 98/Jenks Avenue intersection (see Photos 1, 2, and 3 in Appendix 2). The rutting resulted in a checkerboard pattern inside the intersection resulting in a rough, almost railroad track-like crossing. The rutting continues east of the intersection to Harrison Avenue and the dedicated left-turn lane to US 231. South of the US 98 intersection, Harrison Avenue was recently repaved and is in good condition.

Rutting is a particular problem for trucks as its possible to cause load shifts and breakage of cargo. Tanker trucks experience a “sloshing” effect when carrying less than a full tank that could result in control

problems. In addition, these ruts hold water that could contribute to hydroplaning of both cars and trucks during emergency stops.

Infrastructure

There are mast arms located at all four corners at Jenks Avenue and US 98. The mast arm located at the southeast corner is damaged, as is the curbing and sidewalk (see Photo 4 in Appendix 2). This indicates a turning radius issue for trucks resulting from the traffic on US 98 that forces trucks to complete their turns within the outside lane, and the tracking of the rear trailer wheels over the curb.

At Harrison Avenue, the curb and gutter at the southeast corner are severely cracked for the same reasons stated previously (see Photos 5 and 6 in Appendix 2). Additionally, the curbing located at the front of the median on US 98 is damaged from vehicles turning left from Harrison Avenue (see Photo 7 in Appendix 2). There are mast arms with pedestrian features located at all four corners; however, the only crosswalk is located along the south side of US 98 southwest and southeast corners with Harrison Avenue. The mast arm located at the southwest corner has also been hit and is slightly damaged. The driveway entrance to the Tally Ho restaurant located at the southwest corner of US 98 has been blocked by delineators (see Photo 8 in Appendix 2). This was most likely to prevent right turn cut-throughs to Harrison Avenue.

Land Use

The land use along US 98 (15th Street) is commercial, consisting of shopping centers, restaurants, hotels, and other commercial activities. Jenks Avenue land use is also mostly commercial north of US 98 and a mixture of commercial and light industrial to the south, eventually becoming mostly residential. Harrison Avenue is the main business street for Panama City and leads to the City's marina. It includes commercial land use and a high school. The existing land use along US 231 is mixed-use on the north side becoming rural as it leaves the downtown area. The east side contains the railroad and associated yards, as well as pockets of light and heavy industrial uses.

Existing Right-of-Way

The existing right-of-way at the intersections of US 98 and Jenks Avenue and US 98 and Harrison Avenue is maxed-out. No capacity improvements can be made without taking additional right-of-way from commercial properties, which would include the removal of one or more structures.

OPERATIONAL CHARACTERISTICS

The intersections of US 98 (15th Street) and Jenks and Harrison Avenues are only 850 feet apart and operationally act in conjunction with one another. The following issues were noted during the field evaluation.

- **Congested conditions often back traffic from Harrison past Jenks Avenue (see Photo 9 in Appendix 2).**
  This multi-intersection area has a long and complicated signal progression that exceeds 3 minutes in length. This combined with the short distance (625 feet) between Harrison Avenue and Jenks Avenue results in queue lengths that back beyond the Jenks Avenue

intersection during peak travel times. The through lane queue often interferes with the entrance into the short left-turn lane to US 231, which adds to the delay of vehicles attempting to turn north on US 231. No left turns are permitted from eastbound US 98 to northbound Harrison Avenue. This movement is made via the non-signalized left-turn lane west of the railroad and the signalized intersection to the north.

- **The non-signalized left-turn lane to US 231 does not have adequate length to hold the queue.**
  Contributing to the overall congestion in the area is the non-signalized left-turn lane that crosses two westbound lanes of US 98. There is only a short period when the US 98 westbound through traffic and the northbound Harrison Avenue left-turn queue are not in a green condition. Field observations noted that it is difficult to clear the left-turn queue in this short period of time, which can result in spill-over and blocking of the eastbound left inside through lane. Adding to this delay situation is the inadequate turn lane length (275 feet) that cannot hold the queue during peak conditions and occasionally during non-peak conditions throughout the day. Unfortunately, the physical length is limited by the short distance from the stop bar back to the Jenks Avenue intersection (400 feet) and the length of the westbound to southbound left-turn lane at Jenks Avenue.

- **Skewed railroad crossing between US 98 and US 231 on Harrison Avenue.**
  To further complicate the intersection, there is a rail line that crosses both Harrison Avenue (north of US 98) and US 98 (west of Harrison Avenue). Slow moving freight trains block all vehicle movement at this intersection except for the non-signalized left-turn queue to US 231. Unfortunately, the crossing gates are immediately east of the left-turn stop bar. This causes the eastbound queue to extend beyond the entrance into this lane, cutting off what could be an extended free-flow period for vehicles turning north to US 231. The field team noted a passing train resulted in gate closure of over 3 minutes in this area.

- **Inadequate storage distance between railroad tracks and US 98 and US 231.**
  The distances between the railroad tracks and the edge of US 98 and US 231 are too short and are unsafe for trucks. Trucks stopping at the gate on northbound Harrison Avenue would extend back into the westbound through lane on US 98. A truck that stops at the red signal at US 231 would extend over the tracks to the rear.

Potential Solution(s)

As a first step, consider conducting a planning level study to determine the feasibility of constructing a flyover ramp from eastbound US 98 to northbound US 231 or other potential solutions. An enhanced solution would also include grade separations at Jenks and Harrison Avenues in the southbound to westbound directions. This potential solution would permit free-flow movement along the primary travel corridor from west of Jenks Avenue to US 231 east of Harrison Avenue. Based on the outcome of the planning study, the next step would be a Project Development and Environment (PD&E) Study.

Traffic

Tables 1 and 2 show the average annual daily traffic (AADT) and the average annual daily truck traffic (AADTT) for the intersections at Jenks and Harrison Avenues, respectively.

TABLE 1
US 98 AT JENKS AVENUE
TOTAL TRAFFIC (AADT) VS. TRUCK TRAFFIC (AADTT)

	US 98 West Side	US 98 East Side	Jenks Avenue North side	Jenks Avenue South Side
AADT	32,500	NA	11,900	11,700
AADTT (Class 6-13)	1,258	NA	1,295	1,273
T-Factor/% Trucks	3.87	NA	10.88	10.88

Source: Florida Department of Transportation (FDOT) Traffic Online (2010)

TABLE 2
US 98 AND US 231 AT HARRISON AVENUE
TOTAL TRAFFIC (AADT) VS. TRUCK TRAFFIC (AADTT)

	US 98 East Side	Harrison Avenue North side	Harrison Avenue South Side	US 231 North Side
AADT	24,000	5,700	10,300	15,300
AADTT (Class 6-13)	1,142	202	401	1,142
T-Factor/% Trucks	4.76	3.55	3.98	7.46

Source: FDOT Traffic Online (2010)

NEARBY FREIGHT FACILITIES

Potential freight generators are located approximately 0.75 miles northeast along US 231, 1.5 miles east on the north side of US 98 near Bay Avenue, and 0.5 miles southwest along the railroad between Mulberry Avenue and Bell Avenue. The first includes a large bulk materials operation with direct rail and Bay Line Railroad locomotive and railcar repair facility. The second area is mostly manufacturing, such as concrete pipes, building materials, concrete recycling, and a large cement plant that generates numerous truck trips. There is also a large postal facility located in this area that generates out-of-area large mail trucks. The third area consists of mostly light manufacturing and small warehousing.

PLANNED IMPROVEMENTS

There are no planned improvements for these intersections.

OTHER FACTORS

The primary safety concern is the relative position of the railroad tracks to both US 231 and US 98 (15th Street). None of the lanes provide enough storage for a tractor trailer during a train crossing. It is assumed that the traffic signals for certain traffic movements operate to interrupt traffic that would enter

the area between US 231 and US 98 on Harrison Avenue. To add another layer of safety for trucks, the intersection should be signed with "Trucks Stop Here For Train Crossings."

RECOMMENDATIONS

The recommendations for these intersections are:

- Consider adding a protected left-turn signal for vehicles turning left onto US 231 from eastbound US 98. As an alternative, conduct a signal timing study to determine if there is a potential for protecting this left-turn movement by adjusting the timing and sequencing of the signals at US 98 and US 231 at Harrison Avenue. CORSIM, Synchro, or other simulation software can be used to determine the best solution that would permit longer, unimpeded movement from US 98 to US 231. (BA16)

- Reconstruct and repave, at a minimum, the intersections at Jenks and Harrison Avenues. Use pavement materials that are resistant to rutting from the weight of heavy trucks. (BA17)

- Add ITS safety signage for trucks at the following locations (BA18):
  - Northbound Harrison Avenue at US 98,
  - Northbound Harrison Avenue to westbound US 98 left-turn lane,
  - Westbound US 98 to northbound Harrison Avenue right-turn lane,
  - Southbound Harrison at US 231, and
  - Southbound US 231 to southbound Harrison Avenue left-turn lane.

  The signs should require all trucks to stop prior to the intersection when the railroad gates are down or about to change to the down position.

- Conduct a planning level study to add a flyover ramp from US 98 (15th Street) eastbound to US 231 northbound and a grade separation on US 231 southbound over Harrison Avenue and at Jenks Avenue. While this would be a high-cost solution due to construction costs and right-of-way acquisition costs, it would permit free-flow movement of vehicles between US 98 and US 231 and reduce delay to zero. (BA19)

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Photo 1A
Railroad crossing on US 98, west of Harrison Avenue.
Note the unsignalized left-turn lane to US 231)

Photo 1
Deep rutting and some minor cracking in all eastbound lanes on US 98 at Jenks Avenue.

Photo 2
Deep rutting in westbound lanes of US 98 at Jenks Avenue

Photo 3
Rutting throughout the US 98/Jenks Avenue intersection forms a checker pattern, creating a rough intersection for travel in all directions.

Photo 4
Mast arm damage caused by turning truck at the southeast corner of US 98/Jenks Avenue intersection.

Photo 5
Curb damage caused by off-tracking trucks at the southeast corner of US 98 and Harrison Avenue.

Photo 6
Curb damage caused by off-tracking trucks.

Photo 7
Bull nose damage on US 98 at Harrison Avenue

Photo 8
Delineators block entrance to Tally Ho restaurant on eastbound US 98.

Photo 9
Traffic congestion at railroad crossing on US 98, looking east. Vehicles block the Jenks Avenue intersection, adding to the congestion.

US 231 at N. East Avenue

PRELIMINARY FREIGHT CORRIDOR SCREENING
US 231 and N. East Avenue

INTRODUCTION

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- The potential for influencing scheduled improvement projects in the current Transportation Improvement Program (TIP)/Florida Department of Transportation (FDOT) Work Program (WP).

Based on the criteria above, only one corridor was ready for screening: SR 22 from Star Avenue to US 98 Business. Therefore, preliminary screenings were conducted at several intersections identified as freight hot spots within the plan as an alternative to a second corridor. Each intersection is reported upon separately. The intersections identified on **Figure 1** include:

- SR 368 (23rd Street) and SR 390 (St. Andrews Boulevard/Beck Avenue)
- US 98 (15th Street) and Jenks Avenue, US 98 and Harrison Avenue, and US 231 and Harrison Avenue
- US 231 and N. East Avenue
- US 231 and Transmitter Road

RELEVANT FREIGHT-RELATED ISSUES

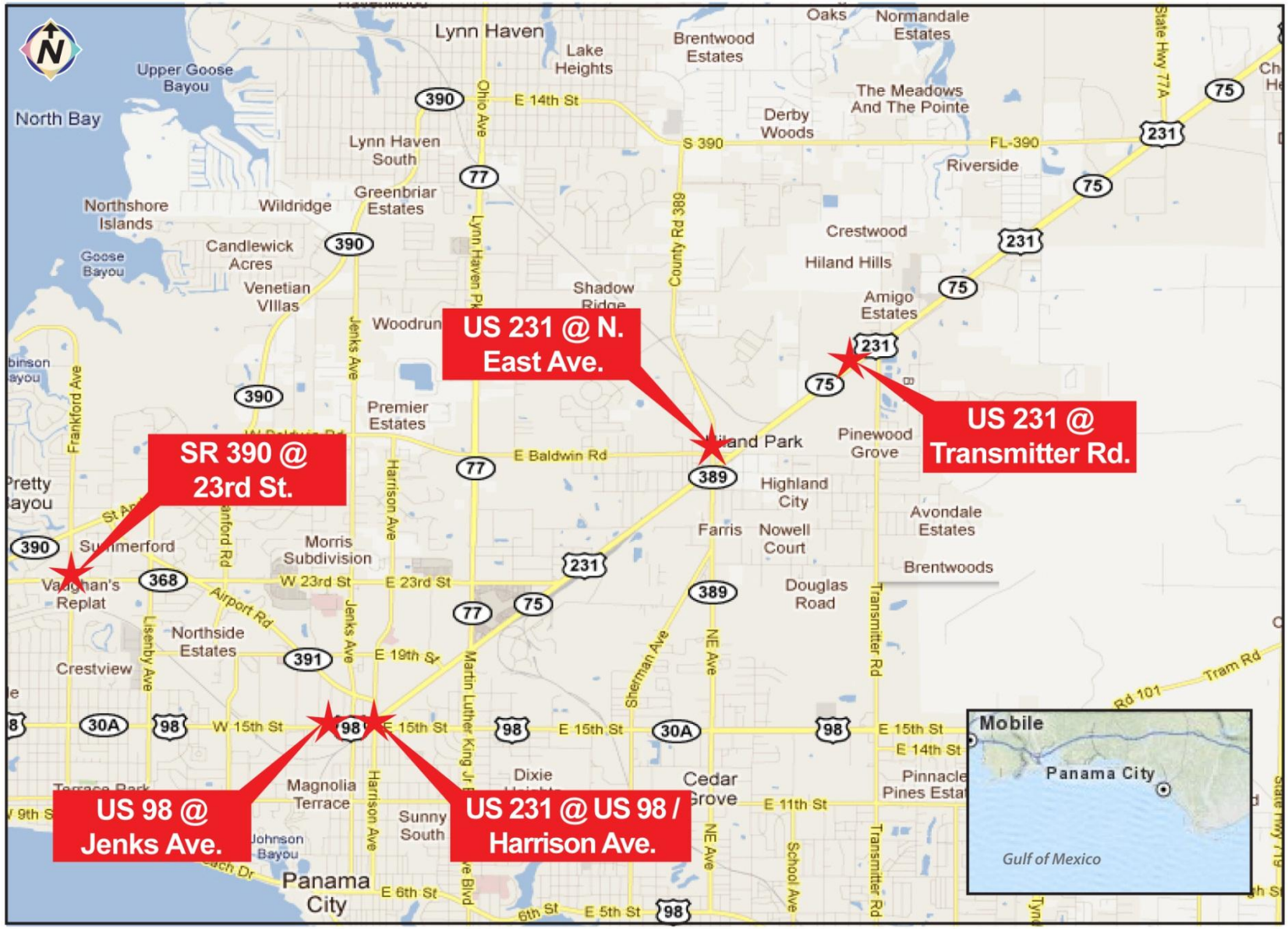
The freight-related issues associated with this intersection are as follows:

- The northeast corner at the intersection of Lafayette Road and N. East Avenue is heavily rutted due to off-tracking, specifically from fire vehicles (see Photo 1 in Appendix 2).

- Baldwin Road intersects US 231 approximately 800 feet north of N. East Avenue at a non-signalized intersection. Baldwin Road is used by trucks to connect between US 231 and SR 390 on the west side of Panama City (see Figure 3 in Recommendations).

- The Bay Line Railroad main line crosses N. East Avenue 75 feet south of US 231 resulting in less than required storage length for semi-trailers (74 feet minimum) between the railroad gates and the US 231 northbound lanes (see Photo 2 in Appendix 2).

FIGURE 1
PROJECT LOCATION MAP



- There is a Bay Line Railroad yard located south of this intersection and switching operations occasionally block the south approach to the intersection, causing delay (see Figure 3 in Recommendations).

- The power pole at the northwest corner has been damaged by turning vehicles and is located too close to the corner.

- The pavement markings on the north approach have been worn off and need repainting.

PHYSICAL CHARACTERISTICS

Figure 2 below shows and aerial view of the subject intersection under evaluation. US 231 runs from southwest to northeast and N. East Avenue runs north and south.

FIGURE 2
INTERSECTION AERIAL VIEW

General Characteristics

The intersection of US 231 and N. East Avenue has skewed geometry, as shown in Figure 2. To further complicate this intersection the main line of the Bay Line Railroad crosses N. East Avenue less than 75 feet from the northbound lanes of US 231. Additionally, the Bay Line Railroad has a multi-track yard located immediately south of the intersection. Also, Lafayette Road intersects with N. East Avenue immediately south of the railroad tracks between the tracks and the crossing gate on N. East Avenue.

US 231 is a five-lane undivided highway with a continuous left-turn lane in the center that is delineated for dedicated left- and right-turn lanes at this intersection. The continuous left-turn lane serves numerous driveways and minor side streets along the north side of US 231. There is also a sidewalk located along the north side of US 231. The dedicated right-turn lane includes a painted island separating it from the southbound lanes of N. East Avenue and a long turning radius to facilitate the acute turning movement for trucks. There is a railroad crossing gate located on the right-turn lane and the lane merges with N. East Avenue at the intersection of the railroad crossing (see Photo 3 in Appendix 2). N. East Avenue is a two-lane facility with northbound dedicated left- and right-turn lanes. The southbound approach includes a dedicated left-turn lane and a combination through/right-turn lane. There are pedestrian features on the west side of US 231 including a crosswalk on N. East Avenue and a crosswalk on US 231 to the west of the intersection.

Slightly to the north and northeast, Baldwin Road (average annual daily traffic (AADT) 7,000; average annual daily truck traffic (AADTT) 762; percentage of trucks 10.88) intersects with N. East Avenue and US 231 at a non-signalized intersection. Baldwin Road is used by trucks to connect to SR 77 and SR 390 to the west and because of the close proximity to N. East Avenue, consideration should be given to directing all trucks to the signalized intersection of N. East Avenue and US 231. This would require a small intersection improvement to the north approach of N. East Avenue and US 231 and directional signage, but would result in safer left-turn movements onto US 231 via a dedicated left-turn signal rather than a non-signalized median crossing.

Pavement Condition

The pavement condition on US 231 is in average condition with little sign of damage from rutting or cracking. The southbound approach on N. East Avenue is rutted and the pavement markings are worn off (see Photo 4 in Appendix 2). There is also some shoulder rutting at the northwest corner due to off-tracking. Shoulder rutting is also at the northeast corner of N. East Avenue and Lafayette Road, immediately south of the railroad crossing (see Photo 5 in Appendix 2). Shoulder pavement should be added to both of these corners to mitigate rutting caused by off-tracking.

Pavement markings are becoming worn. Consider a complete refurbishing of these markings as soon as possible, especially those on the north approach and the crosswalk on US 231.

Infrastructure

Traffic signals are mounted on four mast arms that also include pedestrian features, although the marked crosswalks located across the southbound approach on N. East Avenue and across the west side of US 231 are worn and hard to see. A telephone pole located at the northwest corner is too close to the intersection and has been damaged by turning vehicles (see Photo 6 in Appendix 2).

Land Use

The northeast and southeast quadrants are vacant. However, the Bay Line Railroad has a switching yard located immediately to the south of the southwest quadrant. The northwest quadrant contains a commercial building and there is a large church and school located approximately 400 feet south of the intersection on the north side of US 231. Beyond the intersection, the land use is residential.

OPERATIONAL CHARACTERISTICS

At the time of observation (1:30 p.m.), the intersection was operating satisfactorily. Signal progression included 30 seconds in the north-south directions with 4 seconds of yellow. The northbound left turn was 13 seconds. The green time on US 231 was 40 seconds with 5 seconds of yellow. All appeared adequate for the observed conditions. The southbound traffic on US 231 was higher than the other directions.

Train switching operations at the Bay Line switching yard occasionally block this intersection resulting in delays to northbound and southbound N. East Avenue, as well as the left-turn and dedicated right-turn lanes from US 231 to southbound N. East Avenue.

Traffic

Table 1 shows the AADT and the AADTT for the intersection.

TABLE 1
TOTAL TRAFFIC (AADT) vs. TRUCK TRAFFIC (AADTT)

	US 231 East Side	US 231 West Side	N. East Avenue North Side	N. East Avenue South Side
AADT	26,500	30,000	7,300	18,500
AADTT (Class 6-13)	2,040	1,794	794	1,071
T-Factor/% Trucks	7.70	5.98	10.88	5.79

Source: FDOT Traffic Online (2010)

NEARBY FREIGHT FACILITIES AND FREIGHT OPERATIONS

There is a small freight activity center located on the west side of N. East Avenue, approximately 0.75 miles south of the intersection.

PLANNED IMPROVEMENTS

N. East Avenue is planned for a capacity improvement to four-lanes from Baldwin Road south to Sherman Avenue. This improvement includes the subject intersection. When developing the plans for this improvement, consideration should be given to redirecting all truck traffic on Baldwin Road to N. East Avenue and the signalized intersection at US 231. Improvements at the intersection should include a dedicated right-turn lane with a wide turning radius to accommodate trucks through the acute turn from US 231 to northbound N. East Avenue. There also needs to be a dedicated right-turn lane from southbound N. East Avenue to westbound US 231. This updated configuration should be signed as a truck route. The intersection at US 231 should be changed to right-turn in/out only and a median should

be constructed to prevent left turns at this intersection. Alternatively, this intersection could be closed off requiring all traffic to use N. East Avenue.

OTHER FACTORS

Safety

The crosswalk markings are difficult to see, especially across the traffic lanes on the north approach of N. East Avenue and US 231. The length of the crossing on US 231 is 60 feet and there is no pedestrian safety refuge due to the lack of a raised median.

Railroad Crossing

The Bay Line Railroad crosses N. East Avenue 78 feet south of the US 231 edge-of-pavement (EOP) and only 68 feet from the intersection stop bar. The distance from the US 231 EOP to the railroad gate stop bar is only 59 feet. As a result, any truck that crosses US 231 and is stopped by the crossing gate will block the eastbound right lane. On the other hand, if a northbound truck stops at the intersection stop bar, the rear of the truck will encroach on the track. A sign has been posted to ensure trucks do not stop on the railroad crossing. While the second scenario is unlikely due to the signal progression on US 231, it is possible. Because the field team did not witness a train crossing at this intersection, the possibility of a signal interrupt in conjunction with the gate closure could not be verified. However, what generally occurs in this situation is that all movements toward the railroad crossing receive a red signal, including left turns. Through traffic parallel to the crossing should be allowed to flow for the duration of the gate closing. Once the gates are returned to the up position, the delayed traffic queue is typically cleared though an alternative signal progression. It is assumed that this is what happens at this intersection, as well as the others along US 231.

To provide additional safety to this intersection, consider locating “Trucks Stop Here on Red” signs on the northbound lanes at the gate stop bar. Additionally, adding a dedicated right-turn lane at the north approach during the planned road improvement would permit vehicles turning both left and right to do so without delay caused by the stopped through movement traffic.

RECOMMENDATIONS

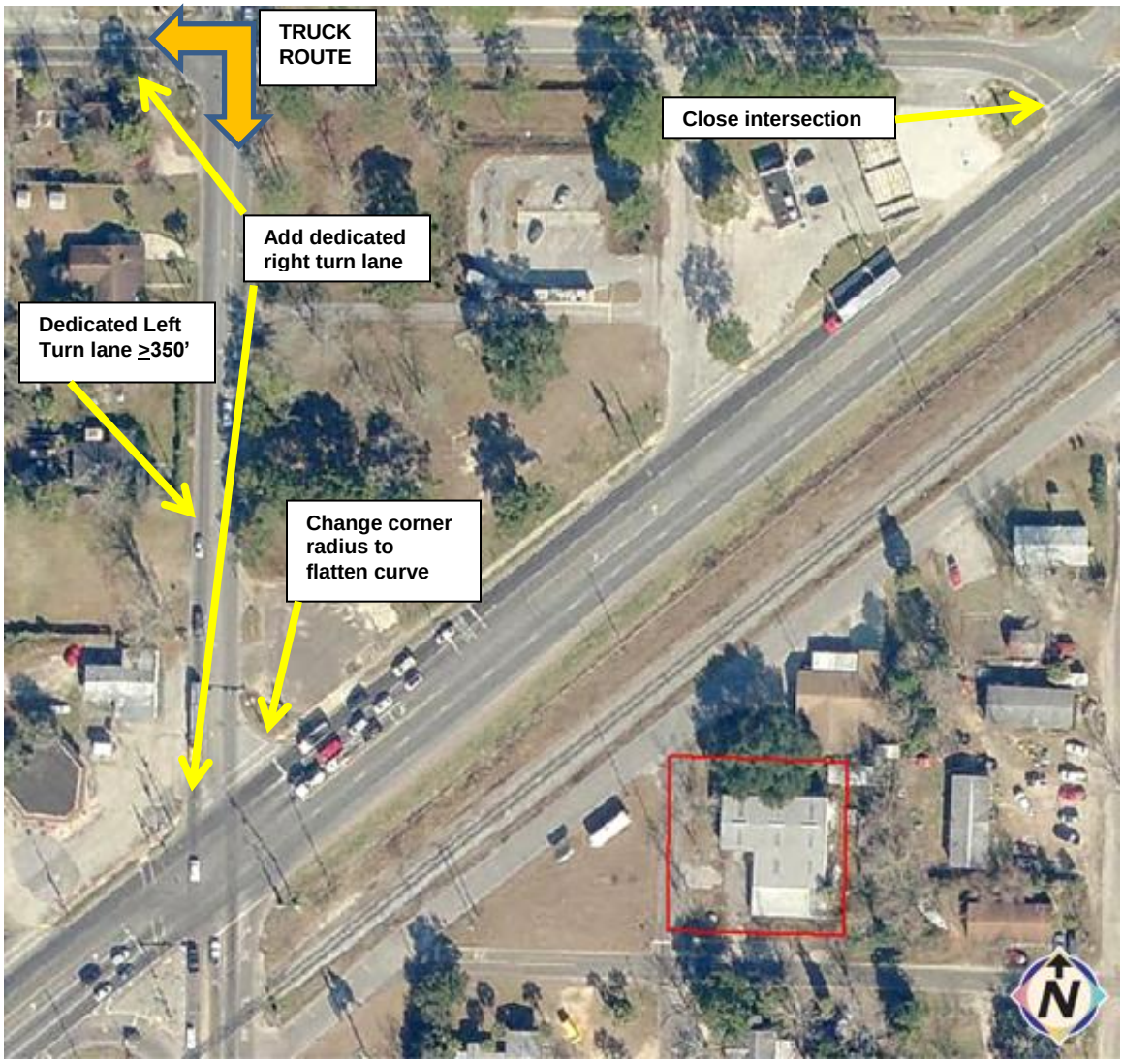
The following recommendations should be considered when designing the improvements to N. East Avenue between Baldwin Road and Sherman Avenue (see **Figure 3**).

- All traffic on Baldwin Road connecting to US 231 should be redirected to N. East Avenue to the signalized intersection at US 231. (BA20)
- Remove/close-off the intersection at Baldwin Road and US 231 or make it a right in/out only intersection. (BA21)
- Include a dedicated right-turn lane from southbound N. East Avenue to southbound US 231. (BA22)
- The acute geometry at the northeast corner should be modified by adding a dedicated right-turn lane with a long radius resulting in a flatter curve for trucks. (BA23)

- Include a dedicated right-turn lane from eastbound Baldwin Road to southbound N. East Avenue that continues south as one of the two southbound lanes. (BA24)

- A dedicated left-turn lane on southbound N. East Avenue should extend back at least 350 feet. (BA25)

FIGURE 3
RECOMMENDED IMPROVEMENTS



The following recommendations are minor in nature and can be accomplished at low cost:

- Extend the shoulder pavement at the northwest quadrant of US 231 and N. East Avenue. (BA26)

- Extend the pavement at the northeast corner of N. East Avenue and Lafayette Road. (BA27)

- Repaint all the pavement markings on N. East Avenue north of US 231. (BA28)

- Add “Trucks Stop Here on Red” sign(s) on northbound N. East Avenue prior to the crossing gates. (BA29)

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PHOTOS

Photo 1
Northeast corner is heavily rutted and the shoulder pavement is deteriorating.

Photo 2
Bay Line Railroad main line crosses N. East Avenue approximately 75 feet south of US 231 right-of-way

Photo 3
Right-turn lane is separated from the southbound lane of N. East Avenue by a raised concrete island. Note the railroad crossing gates on this turn lane.

Photo 4
Rutting on the southbound approach of N. East Avenue resulted in badly worn pavement markings.

Photo 5
Shoulder rutting at Lafayette Road. Curb appears to serve no useful purpose.

Photo 6
Pole at the northwest corner is too close to roadway.

US 231 at Transmitter Road

PRELIMINARY FREIGHT CORRIDOR SCREENING
US 231 and Transmitter Road

INTRODUCTION

The *Regional Freight Network Plan* was adopted April 2010 by the Florida-Alabama, Okaloosa-Walton, and Bay County Transportation Planning Organizations (TPOs). This plan is also knows as *Highways of Commerce*. "Highways of Commerce," as used in this plan, is a term that describes major freight corridors connecting the nation and even the world to the region covered by the three TPOs. The first step of implementing this plan is to conduct preliminary freight corridor screenings on identified Highways of Commerce.

The scope for the project includes screening two corridors within the Bay County TPO region and three each in the Florida-Alabama and Okaloosa-Walton TPOs. Factors used to determine which corridors would be screened included:

- Location on a designated Regional Corridor of Commerce.
- The potential for influencing scheduled improvement projects in the current Transportation Improvement Program (TIP)/Florida Department of Transportation (FDOT) Work Program (WP).

Based on the criteria above, only one corridor was ready for screening: SR 22 from Star Avenue to US 98 Business. Therefore, preliminary screenings were conducted at several intersections identified as freight hot spots within the plan as an alternative to a second corridor. Each intersection is reported upon separately. The intersections identified on **Figure 1** include:

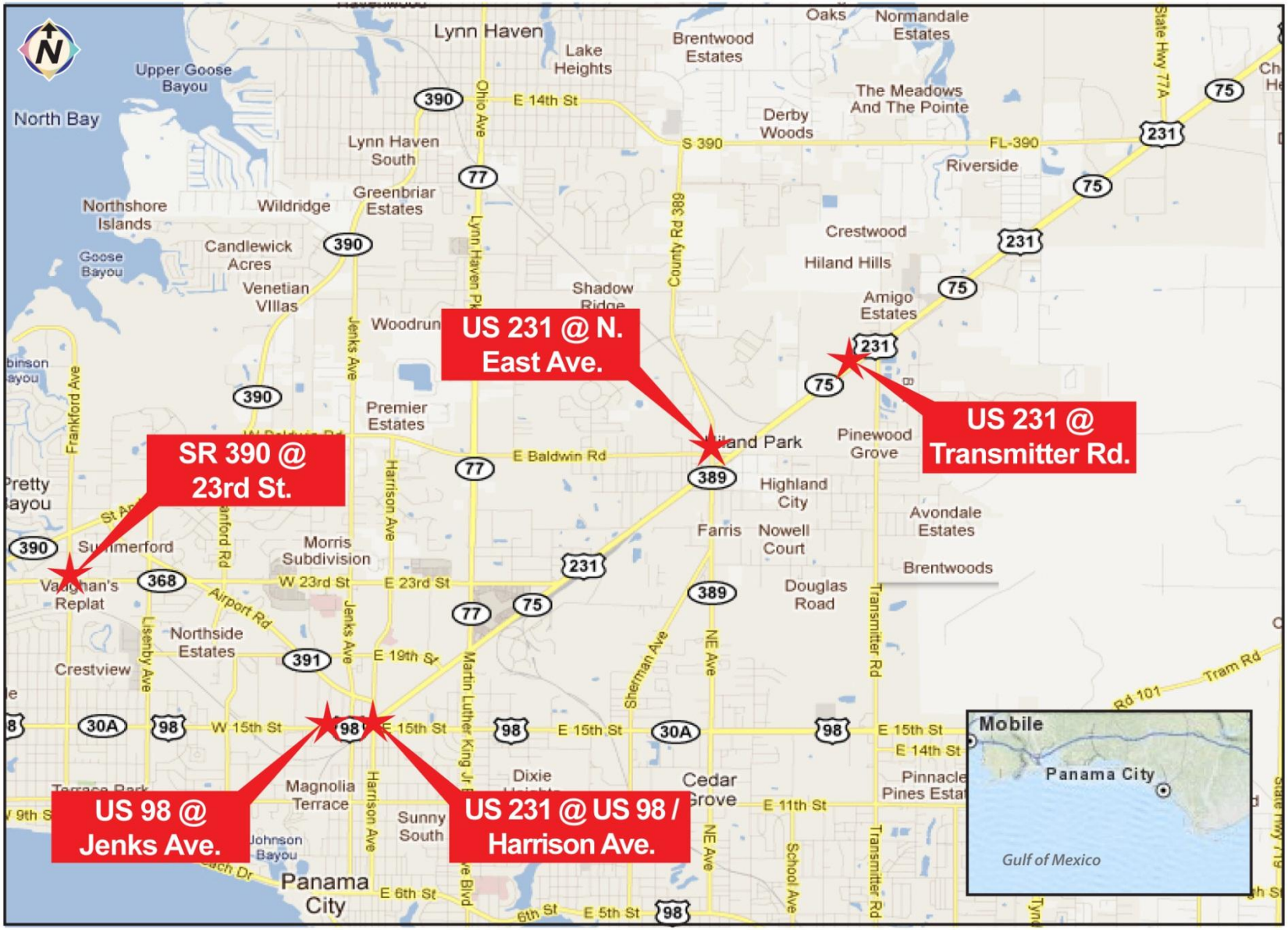
- SR 368 (23rd Street) and SR 390 (St. Andrews Boulevard/Beck Avenue)
- US 98 (15th Street) and Jenks Avenue, US 98 and Harrison Avenue, and US 231 and Harrison Avenue
- US 231 and N. East Avenue
- US 231 and Transmitter Road

RELEVANT FREIGHT-RELATED ISSUES

The freight-related issues associated with this intersection are as follows:

- Eight to 11 percent of total traffic on Transmitter Road is freight-related trucks (600 to 850 per day).
- There is a safety issue at the railroad crossing due to lack of distance for stopped trucks approaching the gates from the north and/or approaching US 231 from the south.

FIGURE 1
PROJECT LOCATION MAP



- Train switching operations cause occasional backups and delay, primarily on Transmitter Road but also on the US 231 left- and right-turn lanes to southbound Transmitter Road.

- There is no protected left-turn signal from Transmitter Road to US 231.

- There is some soft shoulder damage at the northwest corner of the intersection.

PHYSICAL CHARACTERISTICS

Figure 2 below shows an aerial view of the subject intersection under evaluation. US 231 is aligned from northeast to southwest and Transmitter Road is aligned from north to south.

FIGURE 2
INTERSECTION AERIAL VIEW

General Characteristics

The intersection of US 231 and Transmitter Road has skewed geometry as shown in Figure 2. To further complicate this intersection the main line of the Bay Line Railroad crosses Transmitter Road less than 75 feet from the northbound lanes of US 231. Additionally, the Bay Line Railroad has a double track passing siding (see Photo 1 in Appendix 2) located immediately south of the intersection. Also, there is a side street (Tammy Dawn Road) that intersects with Transmitter Road immediately south of the railroad tracks and the crossing gate on Transmitter Road.

The typical section for US 231 at this intersection is a four-lane divided rural highway with a grass median, open drainage, and no sidewalks or other pedestrian features (see Figure 2). There are dedicated left- and right-turn lanes in both directions. The dedicated right-turn lanes have long radii to mitigate the acute turning angle and a painted pork chop median separating the turns from the through lanes and railroad crossing gates. The eastbound to southbound right-turn lanes include a railroad crossing gate immediately before the merge point on Transmitter Road (see Photo 2 in Appendix 2). Additionally, there are short, unmarked merge lanes on US 231 for all left- and right-turn movements (see Photos 3 and 4 in Appendix 2). Immediately to the northeast is a right-turn only in/out entrance to a small shopping plaza.

Transmitter Road is a two-lane rural typical section with open drainage, an unprotected signalized left turn lane in both directions, and no sidewalks or other pedestrian features. The roadway is crossed by the Bay Line Railroad approximately 75 feet along the centerline from the US 231 edge-of-pavement (EOP). The northbound dedicated right-turn lane extends approximately 580 feet south of US 231 and 480 feet south of the railroad crossing gates. Tammy Dawn Road intersects on the northbound lanes, immediately south of the railroad crossing. There are driveway entrances to a commercial building and the County water plant 200 and 470 feet south of the railroad crossing. North of US 231, the southbound left-turn lane extends 400 feet to the north and is delineated from a left-turn lane into a shopping plaza by a painted median. There are commercial driveways located at 160, 350, and 550 feet from the intersection.

Pavement Conditions

Overall, the pavement conditions are average with some minor rutting on all lanes on US 231 and minor rutting and cracking on Transmitter Road. There is also some off-pavement rutting located at the northwest corner of the intersection.

Pavement markings are clearly visible on all approaches except for the northbound stop bar on Transmitter Road. Railroad approach pavement markings are located on the westbound left-turn lane and east bound right-turn lane of US 231 and the northbound approach to the railroad crossing on Transmitter Road. There are no railroad crossing markings on the southbound through lane north of US 231, even though the railroad crossing is located immediately south of the intersection.

Infrastructure

Traffic signals are mounted on strain pole cables. When practical, consider upgrading to mast arms due to the potential for hurricane wind damage (see Photo 5 in Appendix 2).

Land Use

The existing land use includes a grocery store and real estate office at the northeast corner, a medical rehabilitation center on the west side north of the intersection, a vacant commercial parcel at the northwest corner, a commercial sales building on the west side to the south of the railroad crossing, and the County water treatment facility on the east side south of the railroad crossing. There is also a Bay Line Railroad switching yard/passing track located to the west of Transmitter Road.

OPERATIONAL CHARACTERISTICS

The intersection appears to be operating in a satisfactory condition from a trucking point of view.

The signal timing is adequate and no congestion or delay was noted at the time of observation (3:00 p.m.). The through lanes on US 231 provided 30 seconds of green and 5 seconds of yellow. The through lanes on Transmitter Road were timed at 18 seconds with 4 seconds of yellow. The left-turn lanes on US 231 were protected for a short time but allowed unprotected left turns on green after yielding to through traffic. The left-turn lanes on Transmitter Road were yield only. As traffic grows on US 231 and Transmitter Road, it will become necessary to change the left-turn status to "protected only" in all directions. There is also an opportunity through implementation of Intelligent Transportation System (ITS) improvements to add extended green and/or yellow time to the US 231 through movement based on implanted upstream truck sensors. The sensors should be placed up stream at a distance established for a safe stopping distance for large trucks. This will allow trucks to proceed through the intersection without having to reduce speed or stop. In fact, this ITS improvement opportunity should be considered for all of the signalized intersection on US 231 from Star Avenue to US 98 Business.

Traffic

Table 1 shows the average annual daily traffic (AADT) and the average annual daily truck traffic (AADTT) for the intersection.

TABLE 1
TOTAL TRAFFIC (AADT) vs. TRUCK TRAFFIC (AADTT)

	US 231 West Side	US 231 East Side	Transmitter Road North Side	Transmitter Road South Side
AADT	26,500	27,000	5,600	10,200
AADTT (Class 6-13)	2,040	2,568	609	828
T-Factor/% Trucks	7.69	9.51	10.86	7.92

Source: FDOT Traffic Online (2010)

Because of the high percentage of trucks on both Transmitter Road and US 231, a vehicle classification count followed by a truck turning movement count should be conducted at this intersection to determine the exact nature of trucking operations. This information should be used to make adjustments to the signal progression, as necessary to minimize the truck delay due to constant stopping and starting after red signals by trucks.

NEARBY FREIGHT FACILITIES AND FREIGHT OPERATIONS

Currently, there are no freight generating facilities in the immediate vicinity. To the northwest along SR 390, there is a small industrial area that contains an American Standard factory, as well as a Jenson USA and Trane (air conditioning) factories. Overall truck trip generation is expected to be less than 100 trucks per day from this area.

The primary freight operation is the use of Transmitter Road by trucks connecting to and from SR 22 and US 98 to the south and SR 390 to the north.

PLANNED IMPROVEMENTS

Currently, there are no planned improvements at this intersection.

OTHER ISSUES

Railroad Crossing

The Bay Line Railroad crosses Transmitter Road 75 feet south of the US 231 EOP. The distance from the US 231 EOP to the railroad gate stop bar is only 59 feet. As a result, any truck that crosses US 231 and is stopped by the crossing gate will block the eastbound right lane (see Photo 6 in Appendix 2). On the other hand, if a northbound truck stops at the intersection stop bar, the rear of the truck will encroach on the track. While the second scenario is unlikely due to the signal progression on US 231, it is still possible. Because the field team did not witness a train crossing at this intersection the possibility of a signal interruption in conjunction with the gate closure could not be verified. However, what generally occurs in this situation is that all movements (including left turns) toward the railroad crossing would receive a red signal. Through traffic parallel to the crossing would not be stopped for the duration of the gate closing. Once the gates were returned to the up position, the delayed traffic queue would be cleared though an alternative signal progression. It is assumed that this is what happens at this intersection, as well as the others along US 231.

To provide additional safety to this intersection consider locating “Trucks Stop Here on Red” signs on the northbound lanes at the gate stop bar and “Trucks Do Not Stop on Tracks” sign at the northbound traffic signal stop bar. Additionally, adding a dedicated right turn lane at the north approach would permit vehicles turning both left and right to do so without delay caused by the stopped through movement traffic. Only a small amount of additional right-of-way would be required to accomplish this improvement.

RECOMMENDATIONS

The recommendations for this intersection are:

- Complete minor pavement sealing to prevent further cracking. Extend the pavement at the northwest corner to prevent off-road rutting due to off-tracking. Consider scheduling a complete rehabilitation of the intersection within the next 2 to 3 years. (BA30)

- Consider a complete rehabilitation of the existing pavement markings. At a minimum, reapply pavement markings to northbound Transmitter Road. (BA31)

- Consider replacing strain pole mounted signals with mast arms. (BA32)

- Conduct vehicle classification counts followed by turning movement counts at all approaches. Recommend 72-hour class counts to determine peak truck travel times prior to conducting the turning movement counts. (BA33)

- Review and possibly adjust signal timing to permit longer green time for the US 231 through movement for trucks. Based on the classification counts, consider extending the protected green time for the left-turn lanes on US 231 to accommodate turning trucks, which take longer to clear the intersection than other vehicles. If possible with the existing equipment, consider signal progression only when a vehicle is present on the crossing approaches. (BA34)

- Consider ITS upgrades to this intersection that would include extended green and yellow time for trucks traveling on US 231. This would not only improve the flow of trucks, but would minimize the delay caused by repeated stopping and restarting at intersections on this regional Highway of Commerce. It would also improve air quality due to the reduction of diesel idling. (BA35)

- Investigate adding a dedicated right-turn lane at the north approach on Transmitter Road. Include extending the existing merge lane into an acceleration lane on US 231 to give trucks additional room to reach a safe merging speed. (BA36)

- Add “Trucks Stop Here on Red” sign(s) on northbound Transmitter Road prior to the crossing gates. (BA37)

- Add “Trucks Do not Stop On Tracks” sign at the northbound signal stop bar. (BA38)

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PHOTOS

Photo 1
Right-turn only lane on US 231 with railroad warning pavement markings.

Photo 2
Railroad crossing gates on right-turn lane. Gate mounted on the raised island is for the southbound through traffic.

Photo 3
Inside merge lane on US 231 and northbound dedicated right-turn lane.

Photo 4
Outside merge lane on US 231.

Photo 5
Strain pole mounted traffic signals should be replaced with mast arm mounted signals due to potential for hurricane wind damage.

Photo 6
East side of US 231 at Transmitter Road showing raised island and crossing gates for the southbound traffic and the dedicated right-turn lane. The distance from the stop bar shown to the railroad tracks is too short for trucks.