



Chapter 4:

TRANSPORTATION ANALYSIS SUMMARY



INTRODUCTION

Developing an integrated, well connected transportation network requires infrastructure investments that all users of the network to be able to seamlessly transition from one mode to the next. The purpose of the Transportation Analysis contained within this chapter is to summarize the analyses conducted to assess the existing transportation network conditions along the corridor.

This chapter contains analysis on the following topic areas:

- Traffic Volumes - focuses on identifying segments within the corridor that are currently experiencing higher levels of vehicular traffic and congestion.
- Multimodal Network - focuses on identifying where current multimodal network investments (sidewalks, bike lanes, paths) are located and where future investments may be needed.
- Transit Network - focuses on the existing transit network within the corridor and understanding how transit, especially stop-level ridership, can be used to prioritize future infrastructure investments.
- Crash History - includes an assessment of recent crash data and includes identifying where locations with a high re-occurrence of injury and fatal crashes, as well as a history of pedestrian and bicycle crashes.

TRANSPORTATION ANALYSIS

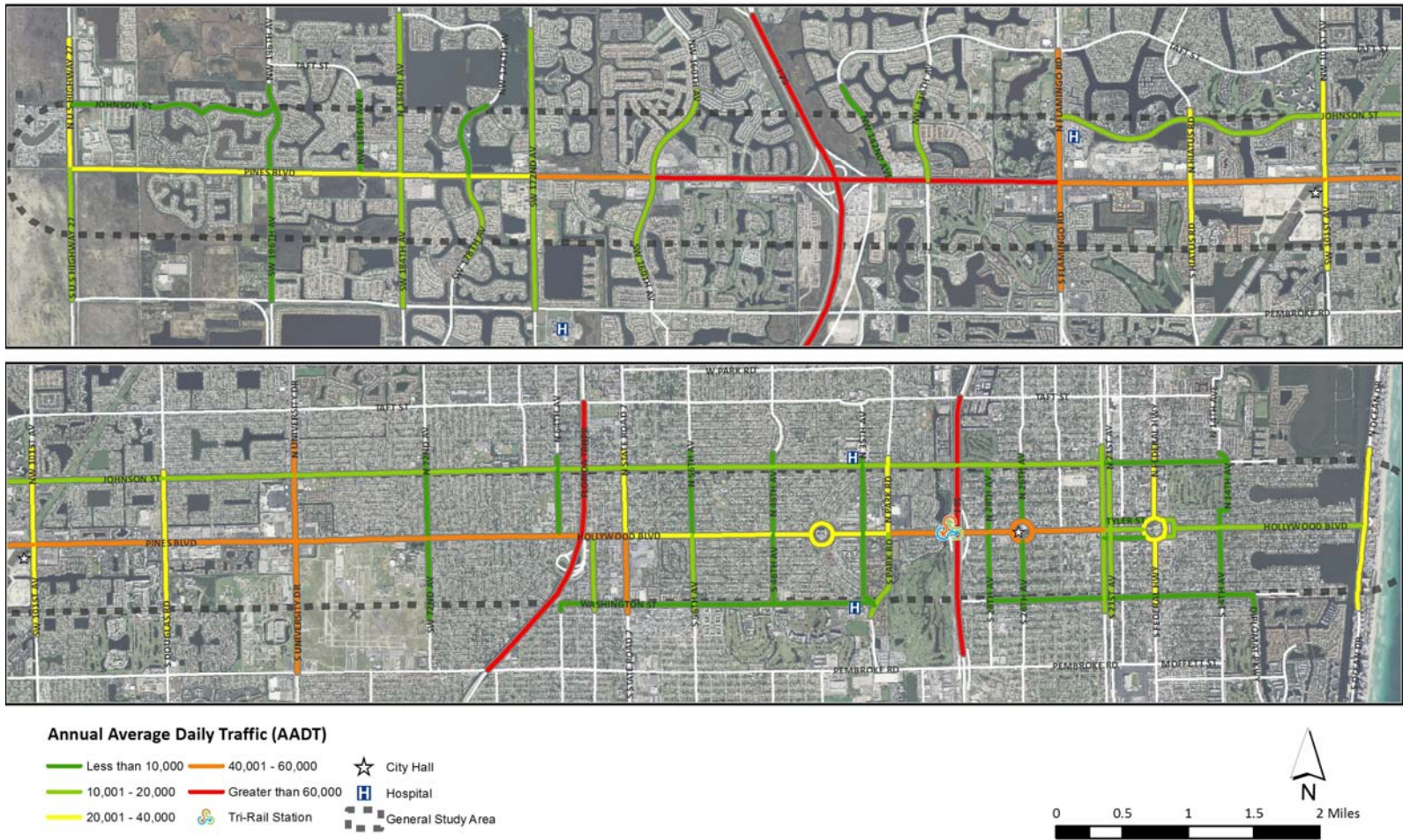
TRAFFIC VOLUMES:

To understand which elements of the roadway system had the greatest congestion and prioritize efforts to develop congestion management solutions, overall traffic volumes and estimated roadway level of service was analyzed. Figure 4-1 shows existing Annual Average Daily Traffic (AADT) or traffic volumes. This map is based on the most recent system-wide counts available from the Broward MPO (2009) and available State Highway System counts provided by the FDOT Transportation Statistics Office. As shown the map, the highest traffic volumes in the corridor along non-limited access roadways are along Pines Boulevard in the vicinity of I-75.

While it is important to understand overall roadway traffic volumes, AADT alone does not indicate the extent to which roadways are congested. Short of performing detailed intersection analyses, daily roadway volume-to-capacity (v/c) ratios can be used to identify roadway segments and intersections that are likely to be congested. Figure 4-2 shows the existing v/c ratios within the corridor. Generally roadway segments with v/c ratios less than 0.80 will have little to no congestion while segments with a v/c ratio above 1.0 may be congested depending on more detailed operational and travel demand characteristics. Segments with v/c ratios above 1.2 are almost certain to be congested regardless of operational factors. As shown in Figure 4-2 there are many roadway segments within the corridor that exhibit congestion.



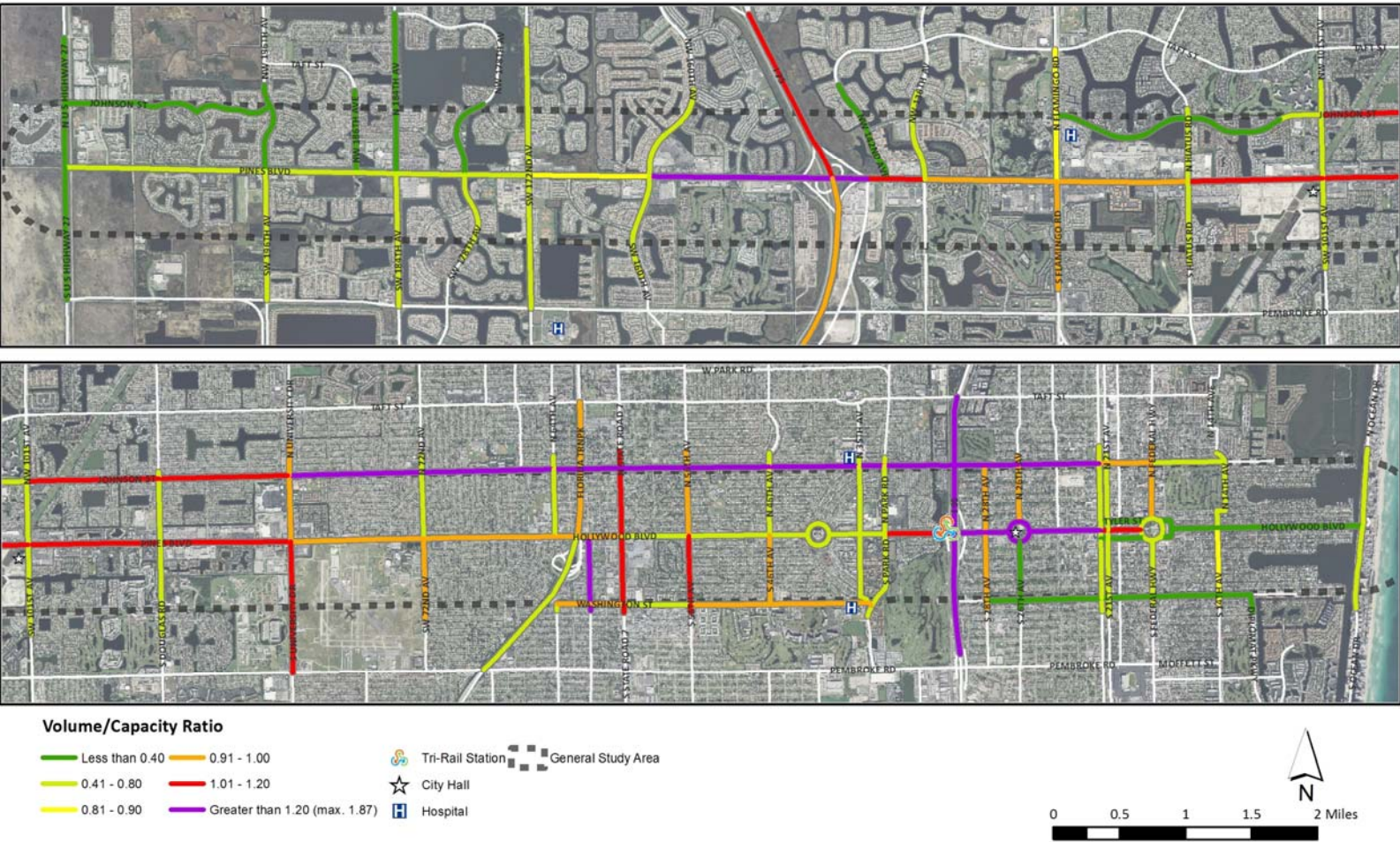
Figure 4-1: Annual Average Daily Traffic (AADT)



2009 Annual Average Daily Traffic - data from the Broward MPO roadway inventory GIS data



Figure 4-2: Volume to Capacity Ratio



Roadway volume and capacity data (2009) from the Broward MPO roadway inventory GIS data



MULTIMODAL NETWORK:

Through a review of recent aerial photography and limited field reviews, existing multimodal network was identified. The review process was used to identify gaps in the existing bicycle and pedestrian facility network (bike lanes, sidewalks, and trails) and was used to help identify and prioritize locations for potential multimodal network enhancements.

Figure 4-5 shows the identified sidewalk network along the major roadway system within the study corridor. While much of the corridor network has existing sidewalks, there are still some roadway segments that have either incomplete sidewalks or no sidewalks.

Figure 4-6 shows the identified bicycle facility (bike lane) network. Unlike the existing sidewalk network, many of the roadway segments within the corridor do not have existing on-street bicycle facilities. Issues such as missing right-turn lane bike lane “key-holes” were also identified through the field review process but are not shown on the Map. These are however included in recommendations as part of Chapter 6.

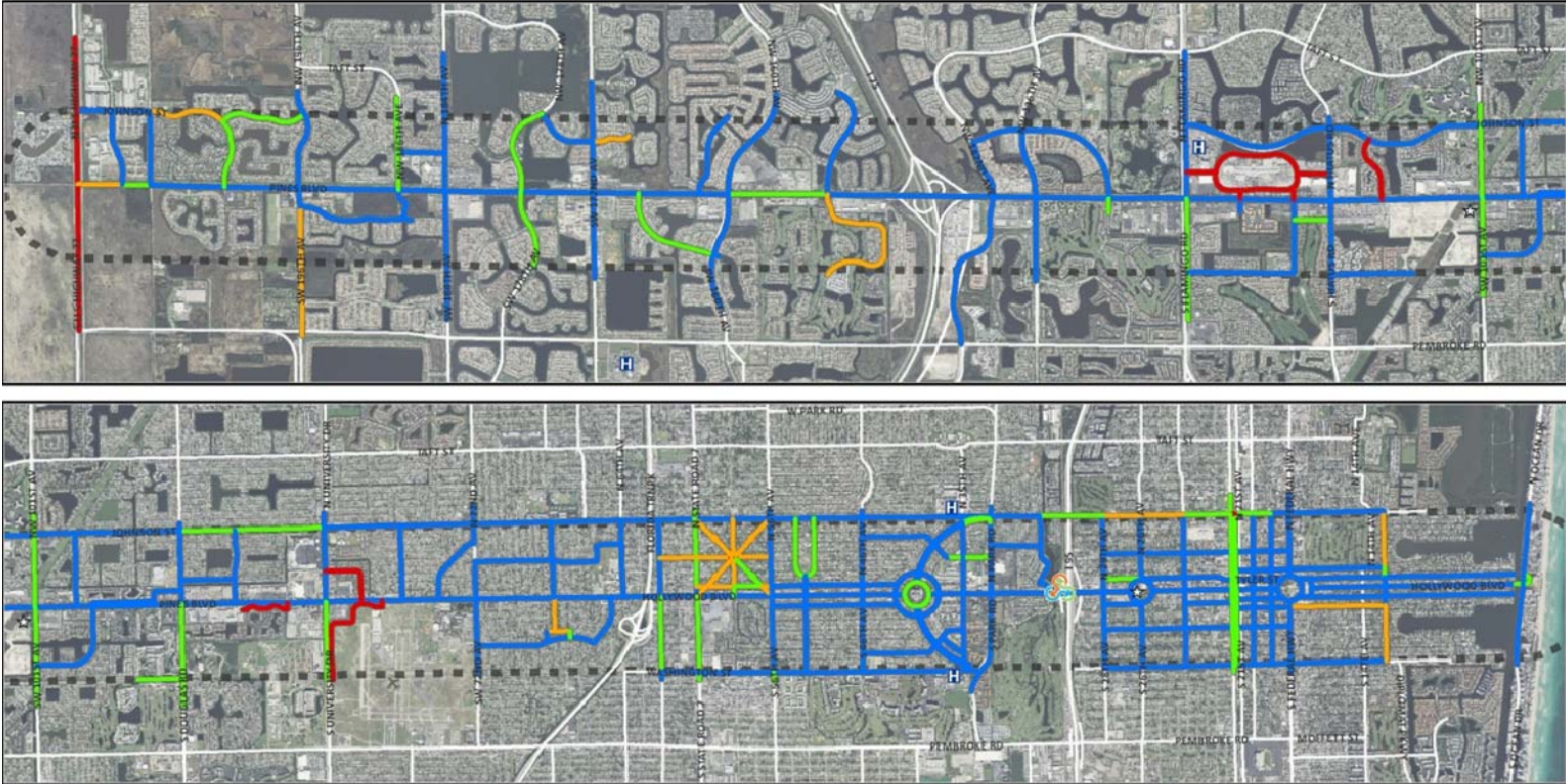


Figure 4-3: Example of a sidewalk along Hollywood Boulevard



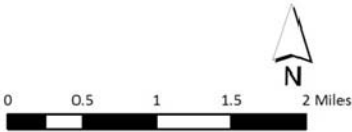
Figure 4-4: Bicycle lane along Pines Boulevard near University Avenue

Figure 4-5: Multimodal Network - Sidewalks



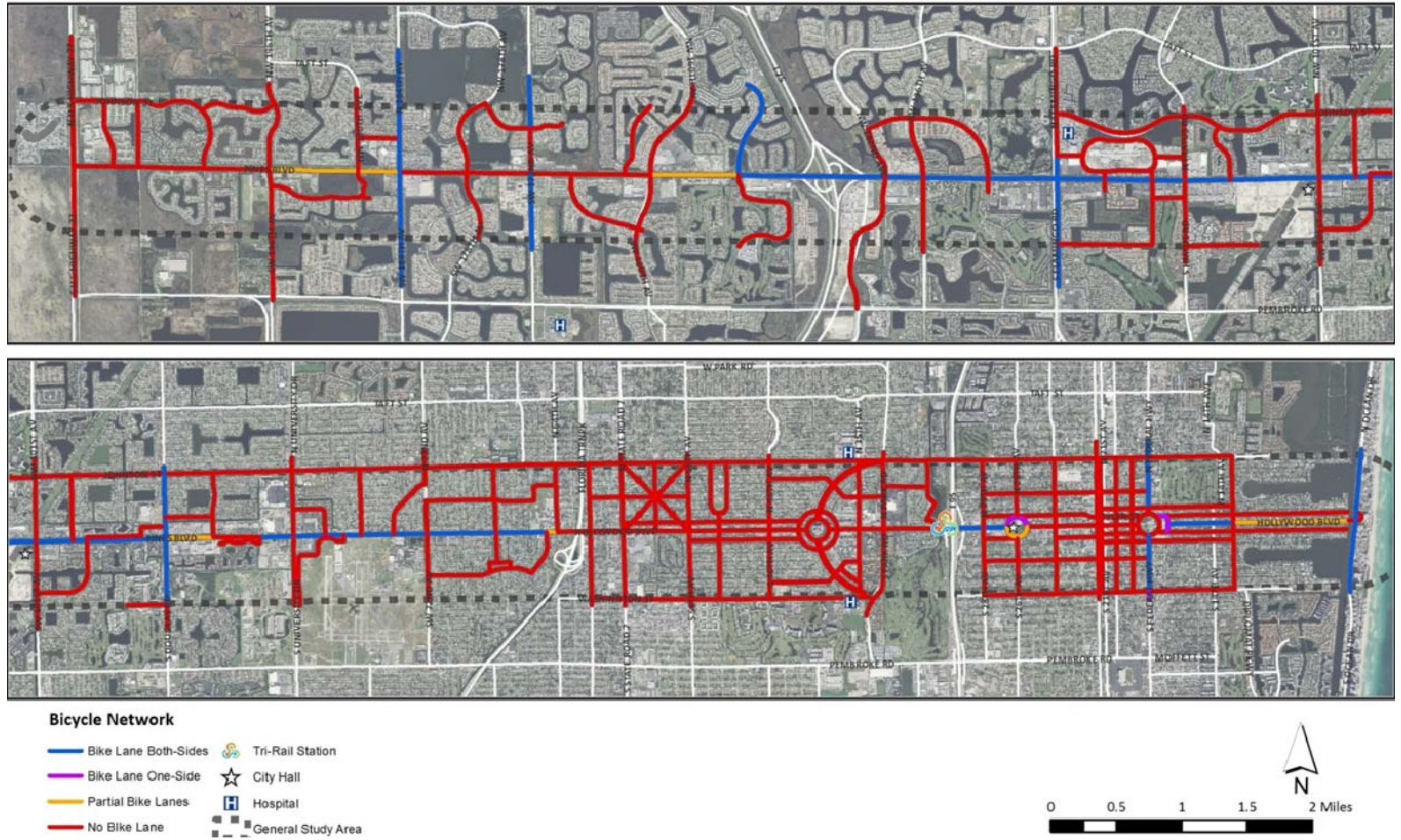
Sidewalk Network

- Complete Sidewalk Both-Sides
- Complete Sidewalk One-Side
- Incomplete Sidewalk
- No Sidewalk
- Tri-Rail Station
- City Hall
- Hospital
- General Study Area



Source: Aerial imagery and field data review

Figure 4-6: Multimodal Network - Bicycle Lanes



Source: Aerial imagery and field data review

TRANSIT NETWORK:

This section provides an evaluation of existing transit service within the corridor and summarizes existing fixed-route service, community bus route service, and commuter rail services.

Existing Fixed-Route Bus Service

Broward County Transit (BCT) is the main transit service provider within the corridor and serves the corridor with 11 local routes, 2 express route, and 3 breeze (commuter) routes. Route 7 (Hollywood/Pines Blvd) is the main east/west route that serves the corridor, and runs between US 27 to the west and Young Circle to the east. Most of the other BCT routes within the corridor provide north-south transit service. Figure 4-9 shows the existing route alignments within the corridor. Table 4-1 provides summary information on all of the BCT routes that serve the corridor. Included in Table 4-1 is information on route frequency and span, and average daily and hourly ridership figures.

Figure 4-10 displays stop-level ridership figures throughout the corridor. As shown in Map 4-6 some of the highest ridership areas along the corridor are located where Hollywood/Pines Boulevard intersects US 1, State Road 7, University Avenue, and 24th Avenue. Table 4-2 lists the top 20 stops within the corridor in terms of daily ridership.



Figure 4-7: BCT Route 7, stop along Pines Boulevard near Flamingo Avenue



Figure 4-8: BCT Route 7, stop along Hollywood Boulevard near State Road 7



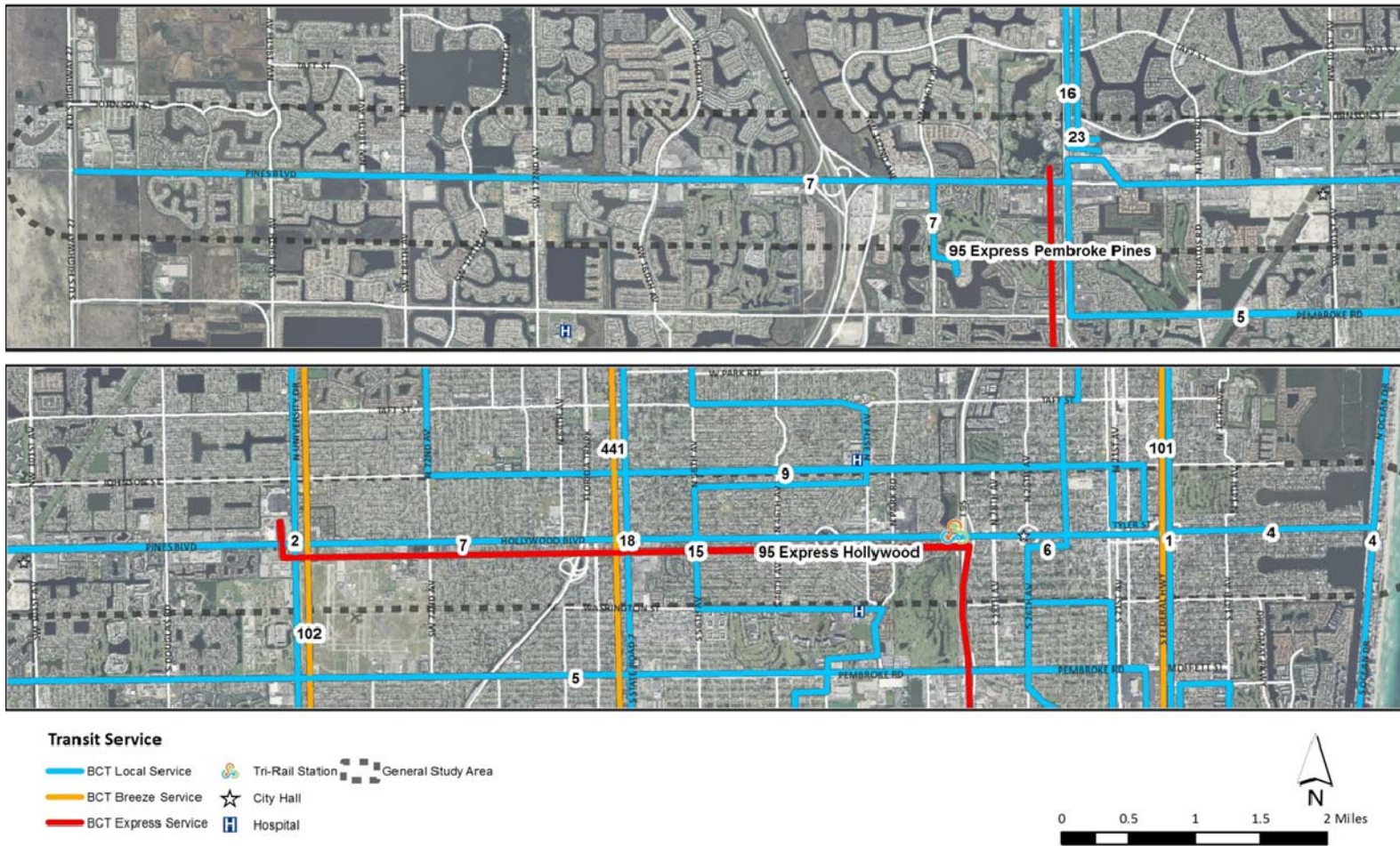
Table 4-1: BCT Route Service and Ridership Summary

Routes	Service	Corridor	Service Days	Weekday Span (hours)	Weekday Peak Headway (minutes)	Weekday Off-Peak Headway (minutes)	Average Weekday Ridership (Sept. '13)	Weekday Passengers per Hour (Sept. '13)
1	Local	US 1 - South of Broward Terminal	Weekday, Weekend	18.75	15	15	7,320	44.2
2	Local	University Drive	Weekday, Weekend	19.00	20	30	6,547	38.5
4	Local	A1A - Dania Beach Blvd to Hallandale	Weekday, Weekend	17.00	45	45	919	18.8
5	Local	Pembroke Rd - Hallandale Bch City Hall	Weekday, Weekend	16.00	30	45	1,610	27.8
6	Local	Broward Terminal - SR 84 - County Line Rd	Weekday, Weekend	17.50	30	30	2,340	25.6
7	Local	Hollywood/Pines Blvd	Weekday, Weekend	18.00	20	20	4,734	37.9
9	Local	Broward Terminal - Davie Rd - Johnson St	Weekday, Weekend	16.50	45	45	2,215	34.4
15	Local	N 56th Ave - Griffin Road	Weekday	13.00	60	60	182	11.6
16	Local	Stirling Rd - Pembroke Lakes Mall	Weekday, Saturday	14.75	30	60	1,047	25.4
18	Local	State Road 7	Weekday, Weekend	19.50	15	15	14,813	48.4
23	Local	Sawgrass Mills - Pembroke Lakes Mall	Weekday	12.75	60	60	284	18.5
101 - (US 1 Breeze)	Breeze	US 1 Breeze	Weekday	6.50	30	30	1,154	31.2
102 - (University Breeze)	Breeze	University Breeze	Weekday	7.75	30	30	1,063	27.8
441 - (441 Breeze)	Breeze	441 Breeze	Weekday	14.75	30	30	2,389	45.1
95 Express Pembroke Pines	Express	95 Express - Pembroke Pines - Miami	Weekday	8.25	30	30	618	25.1
95 Express Hollywood	Express	95 Express - Hollywood - Miami	Weekday	8.25	30	30	203	10.1



Source: BCT and the BCT September 2013 Ridership Report

Figure 4-9: Existing BCT Bus Service



Source: Broward County Transit (BCT)

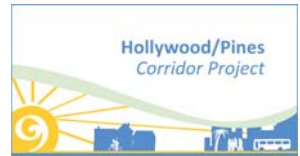


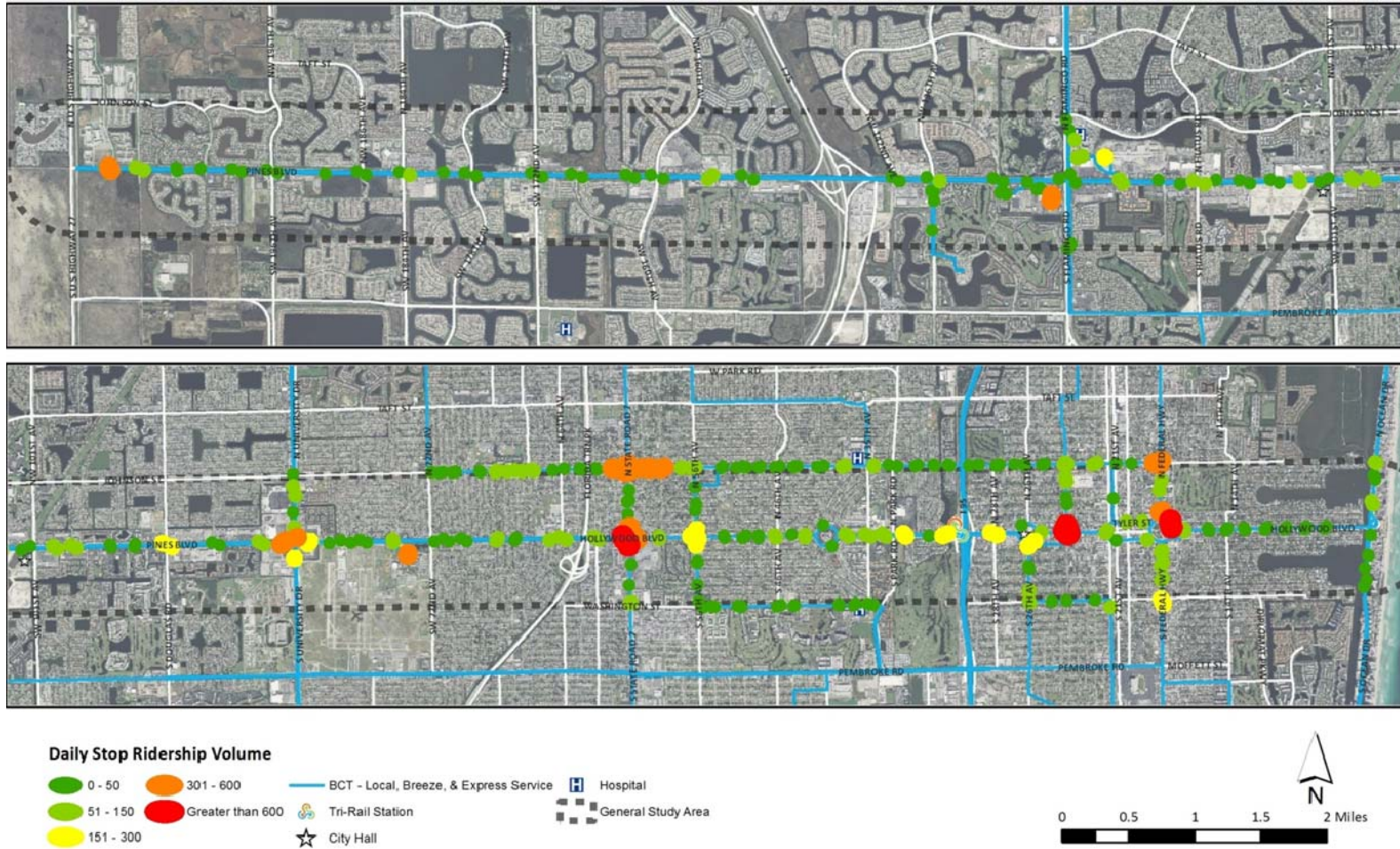
Table 4-2: Top 20 Ridership Volume Stops with Amenity Information

Stop ID	Stop Area	Routes	Route Direction	Daily Riders	Transit Shelter (Y/N)	Bench (Y/N)	Sidewalk (Y/N)	Bike Rack (Y/N)	ADA Accessible (Y/N)	Existing Bus Bay (Y/N)
608	Tyler St at Young Cir	4; 7; 9	WB	1,741	N	Y	Y	Y	Y	Y
34	Young Cir Publix	1; 101	NB	1,562	N	Y	Y	Y	Y	Y
5041	Pines Blvd at US 27	7	EB	499	N	Y	N	N	N	N
4566	University Dr at Pines Blvd	2; 102	NB	348	N	Y	Y	N	N	Y
4743	SR 7 at Tyler St	18; 441	NB	306	N	Y	Y	N	N	N
1540	Pines Blvd at University Dr	7; 107	WB	265	Y	Y	Y	N	N	Y
4583	Hollywood Blvd at SR 7	7	EB	258	N	Y	Y	N	N	N
4249	SR 7 at Hollywood Blvd	18; 441	SB	222	N	Y	Y	N	N	N
3811	Hollywood Blvd at N 24th Ave	6; 7	WB	220	Y	Y	Y	N	N	N
1542	Broward Community College Library	7	EB	212	N	Y	Y	N	N	Y
340	Hollywood Blvd at SR 7	7; 107	WB	211	N	Y	Y	N	N	N
4621	Hollywood Blvd at SR 7	7	WB	209	N	Y	Y	N	N	N
3003	Flamingo Plaza Publix	5	SB	199	N	Y	NA	N	N	N
3517	Pembroke Lakes Mall	5; 7; 23	WB	198	N	Y	Y	N	N	Y
2449	Broward Community College Library	7	WB	191	Y	Y	Y	N	N	N
300	University Dr at Pines Blvd	2; 102	SB	185	N	Y	Y	N	Y	N
33	US 1 at Polk St	1	SB	184	N	Y	Y	Y	Y	N
3486	N 24th Ave at Polk St	6	SB	177	N	N	Y	N	N	N
4769	Pines Blvd at University Dr	7	EB	176	Y	Y	Y	N	N	N
3161	Flamingo Plaza Publix	5	SB	167	Y	Y	NA	N	N	Y



Data source: BCT May 2012 Stop GIS shapefile

Figure 4-10: BCT Stop-Level Daily Ridership



Data source: BCT May 2012 Stop GIS shapefile. Stops within 200 ft of each other were grouped to show high volume stop areas.



Community Bus Service

In addition to the regular fixed-route service provided by BCT, there are six community bus routes that serve the Hollywood/Pines corridor (Figure 4-12) The six community bus routes are operated by BCT in partnership with the Cities of Pembroke Pines, Miramar, and Hallandale Beach. The community bus routes primarily serve residential areas and help connect riders to the routes that serve the major thoroughfares. Table 4-3 provides a service summary for each community bus route, including a list of the BCT “fixed” routes that each community bus route connects to along with the average monthly ridership and average weekday passengers per hour figures for each route.

Hollywood Downtown/Beach Trolley Service

In addition to Community Bus Service, the City of Hollywood Community Redevelopment Agency (CRA) operates a trolley bus system funded by a Public Transport Service Development Grant from the Florida Department of Transportation with matching funds from the Hollywood Community Redevelopment Agency and its funding partners: City of Hollywood, Broward County, Children's Services Council and South Broward Hospital District.

The trolley operates Wednesday through Sunday from 10am - 10pm Wednesday, Thursday, and Sunday and from 10am - 11pm Friday and Saturday. A map of the trolley system showing the three routes is included as Figure 4-13.

Commuter Rail Service

Commuter rail service (Tri-Rail) is provided by the South Florida Regional Transportation Authority (SFRTA). Tri-Rail operates 7 days a week and provides service between Palm Beach County and Miami-Dade County. Hollywood Station is the Tri-Rail stop within the corridor. Figure 4-11 shows the historic annual Tri-Rail ridership for Hollywood Station from the 2011 SFRTA Annual Report. Ridership at Hollywood Station peaked in 2008 with over 220,000 riders and while it has declined some since, it has still seen a nearly 20 percent increase in annual ridership since 2002. Weekday service to Hollywood Station operates from 5 am to 10 pm and while headways vary throughout the day trains typically run 20-30 minute headways during the AM and PM peak hours and hourly throughout the remainder of the day.

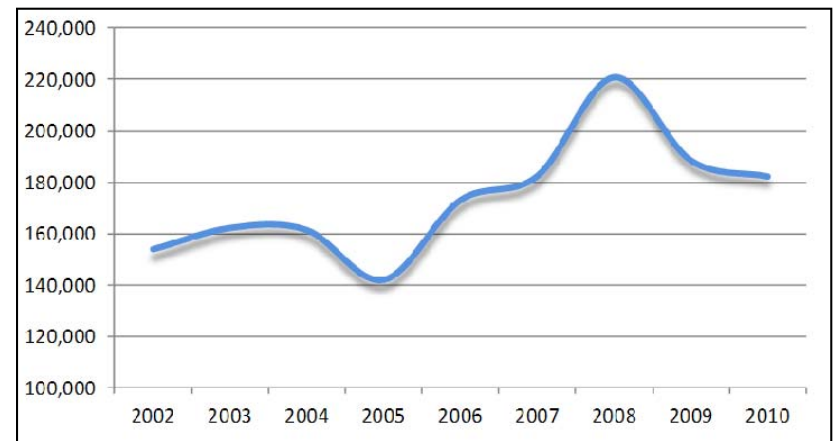
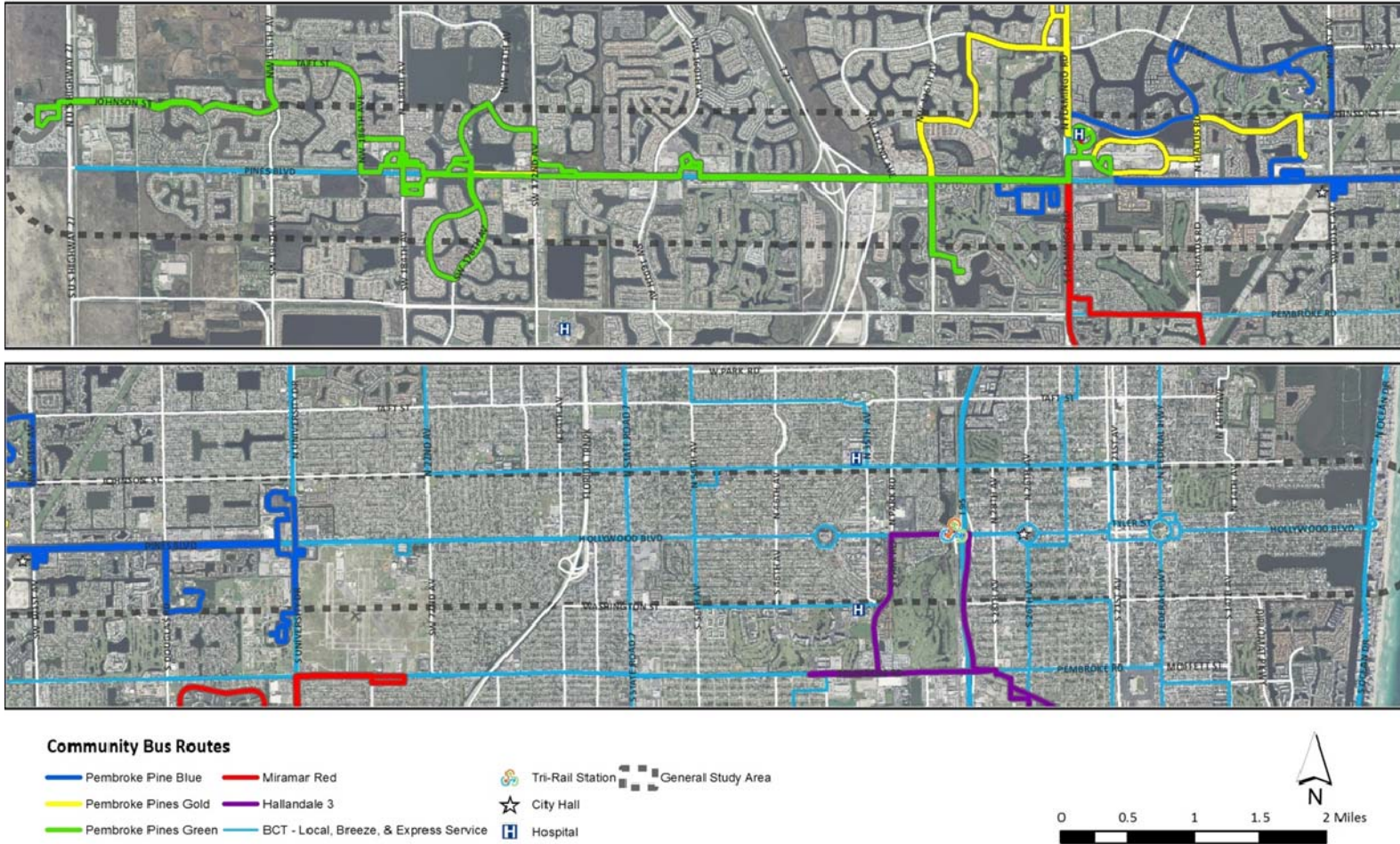


Figure 4-11: Hollywood Station Annual Ridership



Figure 4-12: Community Bus Routes



Source: Broward County Transit (BCT)

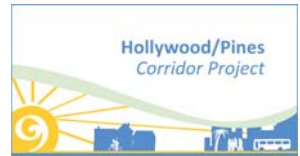


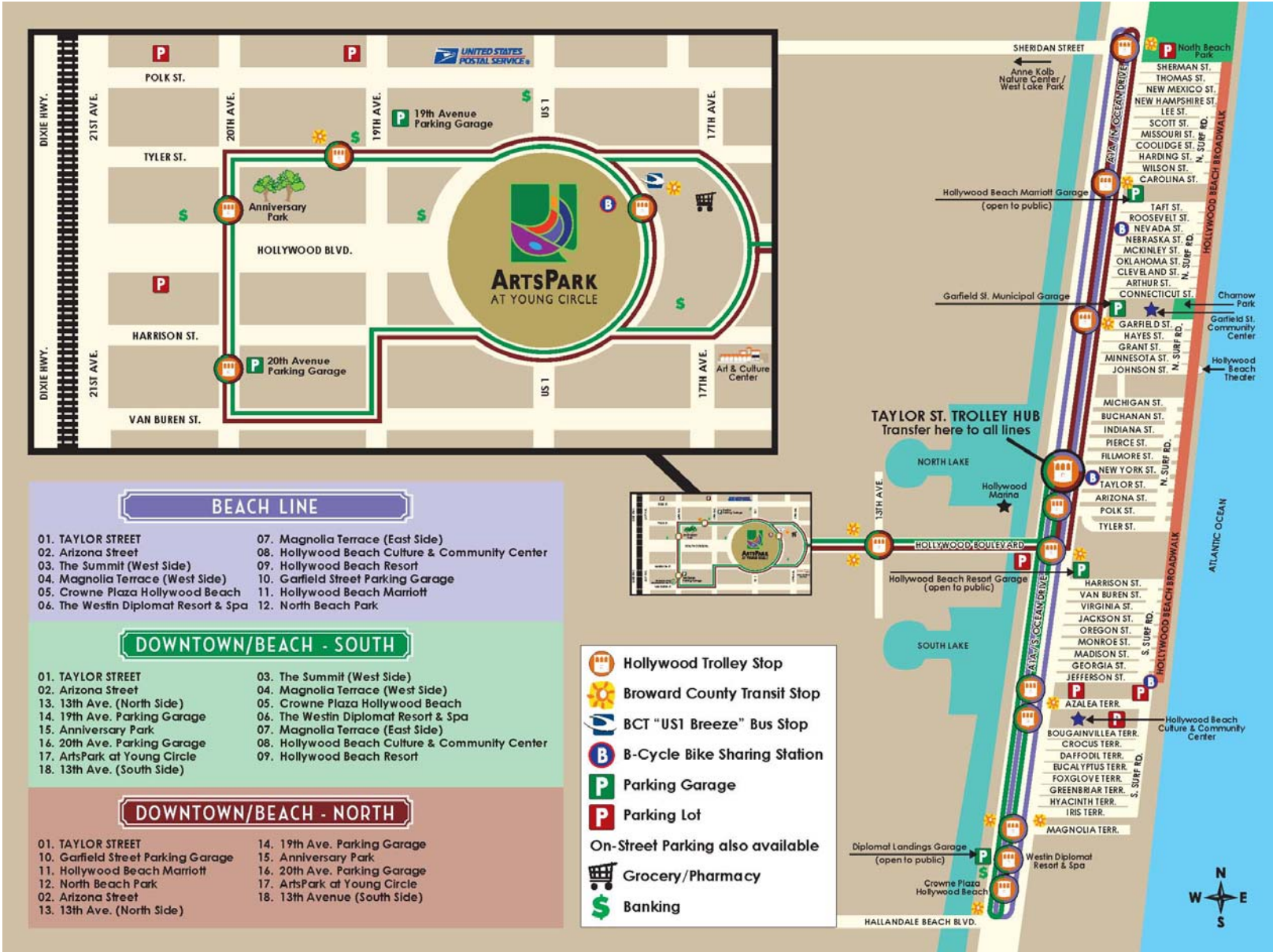
Table 4-3: Community Bus Route Service and Ridership

Routes	Service Days	Service Hours	BCT Route Connections	Monthly Ridership	Passengers per Hour - Weekday
Pembroke Pines Blue East	Tuesday, Wednesday, Friday	8:00am - 3:30pm	5, 7, 23	939	10.6
Pembroke Pines Blue West	Tuesday, Wednesday, Friday	8:00am - 3:30pm	5, 7, 23	1,275	17.0
Pembroke Pines Gold	Monday - Saturday	7:00am - 7:30pm	5, 7, 23	8,843	10.9
Pembroke Pines Green	Monday - Saturday	7:30am - 7:30pm	3, 5, 7, 23	6,051	11.0
Miramar Red	Monday - Friday	6:30am - 6:30pm	2, 3, 5, 7, 16, 23, 28, University Breeze	3,662	15.3
Hallandale Beach 3	Monday - Friday	7:00am - 7:00pm	1, 4, 5, 6, 28, US 1 Breeze	5,457	18.2



Source: BCT and the BCT September 2013 Ridership Report

Figure 4-13: Hollywood Downtown/Beach Trolley System Map



CRASH HISTORY:

An analysis of crash data from 2007—2011 was completed in order to identify locations (segments and intersections) that may be in need of safety enhancements. Data was gathered from FDOT’s Crash Analysis and Reporting (CAR) system for State Highway System Crashes and from the FDOT “All Roads” GIS crash database for local roadway crashes.

Total Crashes

Figure 4-14 shows overall crashes with nearby crashes aggregated in “clusters” to indicate areas with high-crash frequency. This methodology helps to compare areas with tight intersection spacing but fewer crashes at each intersection with locations with isolated, high-volume intersections with many crashes. Overall high-crash areas include:

- Pines Boulevard at Flamingo Road
- Pines Boulevard at University Drive
- Hollywood Boulevard at the Florida Turnpike
- Hollywood Boulevard at State Road 7
- State Road 7 in the vicinity of Johnson Street

Injury Crashes

Next, the location and frequency of injury crashes (including fatalities) along the corridor were mapped. While a goal is to reduce all crashes, it is important to understanding where injury and fatal crashes are occurring, in order to help identify and prioritize safety concerns within the corridor. Map 4-15 shows the location and frequency of injury crashes within the corridor, similar to in Figure 4-14 (total crashes), the injury crashes were aggregated to identify high-crash clusters. A few locations within the study area that stand-out as having higher frequencies of injury and fatal crashes are:

- Pines Boulevard at Hiatus Road
- Pines Boulevard at University Drive
- Hollywood Boulevard at State Road 7
- Johnson Street at State Road 7

Pedestrian and Bicycle Crashes

Finally, pedestrian and bicycle crashes were plotted on a map, and then similar to the assessment of injury crashes, pedestrian and bicycle crashes were used to help identify potential safety issues and to prioritize concerns within the corridor. Because pedestrian and bicycle crashes are typically not as concentrated geographically a larger buffer was used to each pedestrian and bicycle crash, as opposed to the 50 foot buffers that were given to both total and injury crashes. The location and frequency of pedestrian and bicycle crashes are shown in Figure 4-16. Some of the areas with higher frequencies of pedestrian and bicycle crashes are:

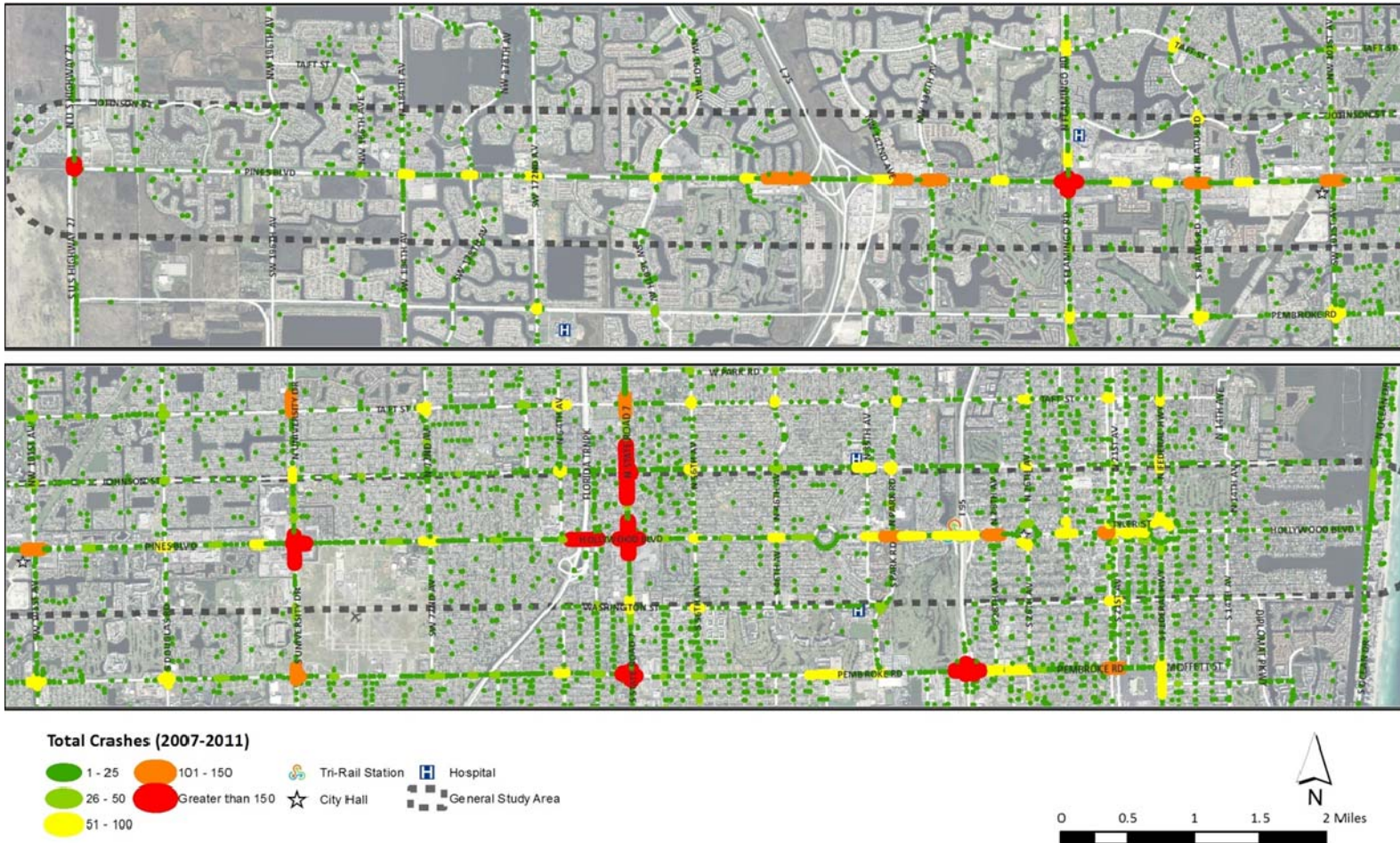
- Johnson Street at US 1
- Hollywood Boulevard at State Road 7
- Washington Street at 56th Avenue

Less intense but also notable bicycle and pedestrian crash clusters appear at:

- Pines Boulevard at University Drive
- Johnson Street at University Drive
- Hollywood Boulevard at Park Road
- Hollywood Boulevard at US 1
- SR A1A from Fillmore Street to Johnson Street



Figure 4-14: Total Crash Cluster Map (2007-2011)



Crashes were located using X, Y coordinate data, crashes within 50 feet of each other were grouped to form crash areas. Data source FDOT Crash Analysis Reporting (C.A.R.) system

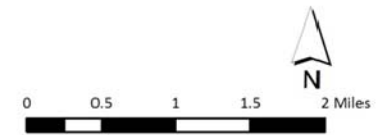


Figure 4-15: Injury and Fatal Crash Cluster Map (2007-2011)



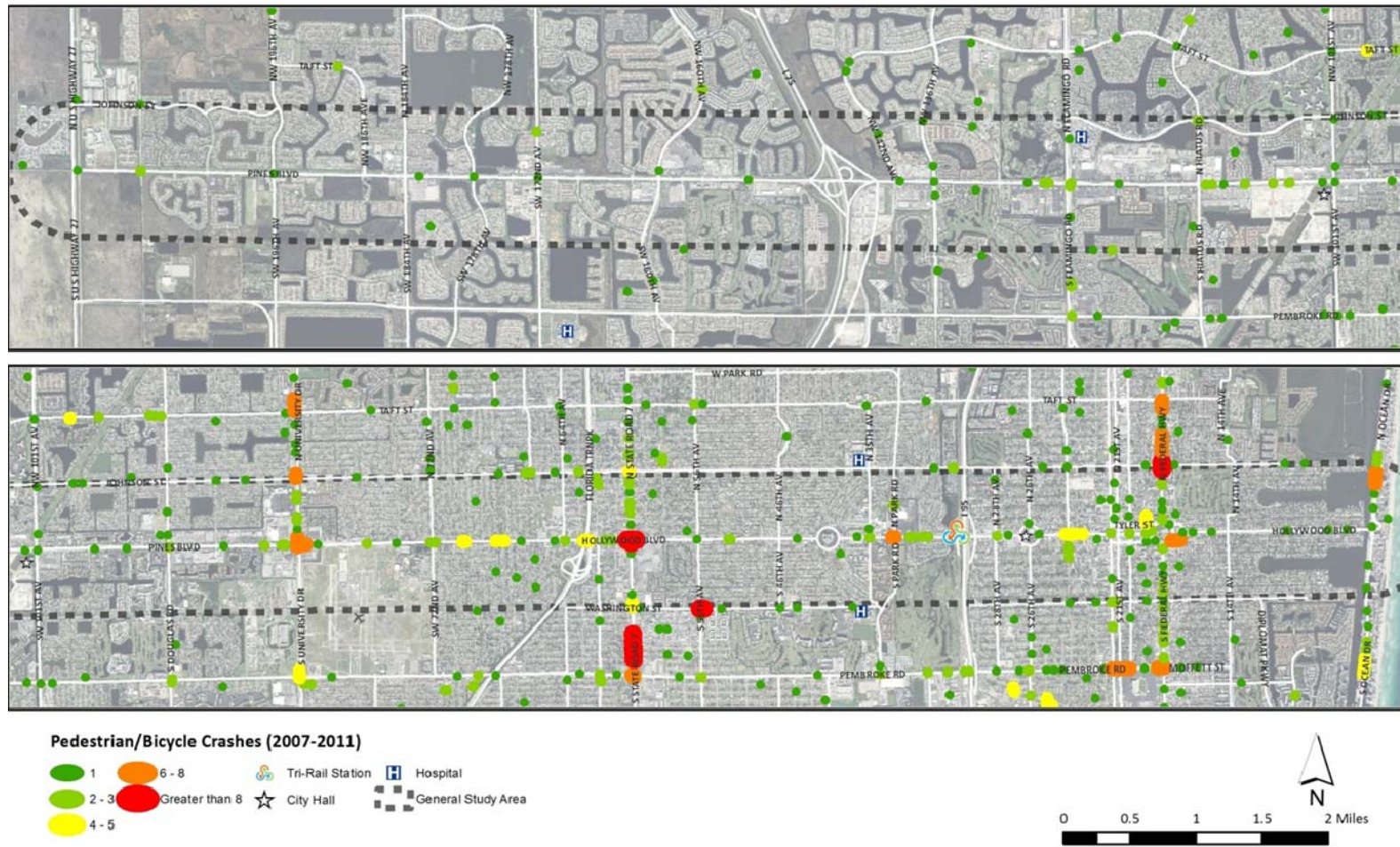
Injury & Fatal Crashes (2007-2011)

- 1 - 5
- 6 - 10
- 11 - 15
- Greater than 25
- Tri-Rail Station
- Hospital
- City Hall
- General Study Area



Crashes were located using X, Y coordinate data, crashes within 50 feet of each other were grouped to form crash areas. Data source FDOT Crash Analysis Reporting (C.A.R.) system

Figure 4-16: Pedestrian and Bicycle Crash Cluster Map (2007-2011)



Crashes were located using X, Y coordinate data, crashes within 150 feet of each other were grouped to form crash areas. Data source FDOT Crash Analysis Reporting (C.A.R.) system

