



# 2

## Existing and Future Transportation Conditions

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### 2.1 Introduction

This chapter summarizes the existing and potential station access conditions for the NJ 124 Corridor Transit Access Improvement Study including:

- Transit Infrastructure and Service
- Roadway Infrastructure and Automobile Access
- Station Area Parking and Utilization
- Bicycle/ Pedestrian Infrastructure and Access
- Safety Analysis

Land use conditions in the study area are documented in Chapter 3 of this report.

In documenting study area conditions, particular attention was paid to areas with potential deficiencies that hinder access to NJ TRANSIT stations such as sidewalk network gaps, parking deficiencies, or roadway transit service that does not connect with NJ TRANSIT commuter rail service. An assessment of future demand provided insight on whether current conditions will continue or worsen in the future.

Existing conditions were documented based on site visits and review of existing studies in addition to public feedback (see Chapter 4) through interviews with various stakeholders, a public open house meeting, and data received from two transportation surveys.

## 2.2 Rail Infrastructure and Service

The NJ 124 study area is served by the Morristown Line of combined NJ TRANSIT Morris and Essex Lines route, with stations at Chatham Borough (Chatham Station), Madison Borough (Madison Station), and Morris Township (Convent Station). The study area is also served by three NJ TRANSIT bus routes (873, 878, 879), and the Madison Avenue Direct (MAD) Shuttle. The locations of each station are as follows:

- Chatham Station: Front Street between Fairmount and Washington Avenues (Figure 2-1)
- Madison Station: Kings Road between Prospect Street and Green Avenue/ Waverly Place (Figure 2-2)
- Convent Station: Convent Road and Old Turnpike Road (Figure 2-3)

**Figure 2-1: Chatham Station**



Figure 2-2: Madison Station



Figure 2-3: Convent Station







Each of these stations is located approximately one block south of NJ 124.

All three commuter rail stations have station buildings and low-level platforms. Madison Station is the only station that is handicapped accessible (through the use of mini-high platforms). Each station has side-platforms, with a fence separating the eastbound and westbound platforms for safety reasons. Due to this fence, cross-platform movements are limited at each of the stations and crossings are provided via below-grade tunnels at the stations as well as via adjacent roads (which pass underneath the tracks). Cross-platform movements at Convent Station must be done via Convent Road, which crosses the rail line at grade to the east of the station. Grade crossing safety equipment is in place at this crossing.

The Chatham and Madison ticket offices are open from 5:30 AM to 9:00 AM on weekdays only. The Convent Station ticket office is open from 4:30 AM to 12:30 PM on weekdays only. Ticket vending machines are available on the platforms at all of the stations in the study area.

Each of the stations has designated parking facilities comprised of permit-only and daily spaces. Details about these facilities and parking utilization are provided in Section 2.4 of this report. Additionally, each station includes bicycle storage facilities, which are described in detail in Section 2.5 of this report. Pedestrian walking paths to the stations are also described in Section 2.5 of this report.

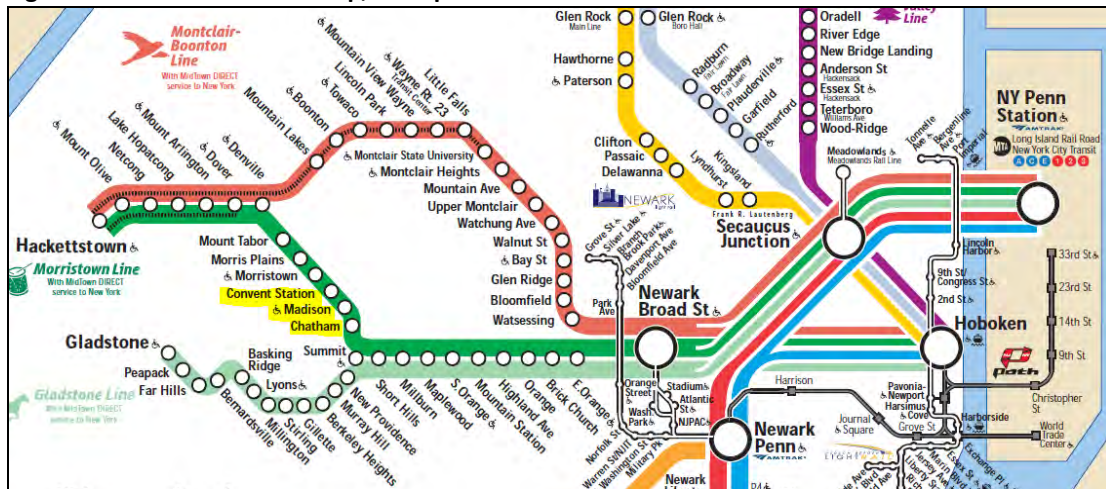
The Morris and Essex Line trains that originate at either Hackettstown or Dover stop (in the eastbound direction) at Convent, Madison, and Chatham Stations and then proceed express, semi-express, or local to either Hoboken or New York's Pennsylvania Station (PSNY) (shown in Figure 2-4) in the AM peak hours. The majority of daily train service at these stations terminates or originates at PSNY (26 out of the 38 weekday eastbound trains terminate in New York, and 27 out of the 37 weekday westbound trains originate in New York). Running times between the three stations and the eastern terminals are shown below:

- Convent Station to PSNY: 48-70 minutes
- Convent Station to Hoboken: 48-69 minutes
- Madison to PSNY: 44-66 minutes
- Madison to Hoboken: 46-65 minutes
- Chatham Station to PSNY: 40-55 Minutes
- Chatham Station to Hoboken: 40-58 minutes

Train service is available from all three stations on all seven days of the week, between approximately 4:30 AM and 2:30 AM.



Figure 2-4: NJ TRANSIT Rail Map, Excerpt



Train fares between the three stations and PSNY and Hoboken are listed in Table 2-1.

Table 2-1: NJ TRANSIT Rail Fare Structure

	New York Penn Station				Hoboken Station			
	One-Way	One-Way (Reduced)	Weekly	Monthly	One-Way	One-Way (Reduced)	Weekly	Monthly
Chatham Station	\$10.00	\$4.50	\$85.50	\$284.00	\$9.00	\$4.00	\$75.50	\$248.00
Madison Station	\$11.00	\$5.00	\$93.00	\$308.00	\$9.75	\$4.50	\$82.50	\$273.00
Convent Station	\$11.50	\$5.25	\$98.00	\$324.00	\$10.00	\$4.50	\$85.50	\$284.00

College students that participate in NJ TRANSIT’s University Partnership Program may purchase monthly student passes online and save 25 percent off regular monthly pass fares. All three institutions in the study area (Drew, College of St. Elizabeth, and Fairleigh Dickinson) participate in this program. Stakeholder interviews identified a demand for daily, weekly, or multi-use discounted tickets for college students. There was also a desire to have a “one stop shop” information center about transit service on campus.

Additionally, senior citizens and disabled persons are entitled to fare discounts throughout the NJ TRANSIT system. Monthly rail passes valued at \$54 or more include a free trip for at least one zone of travel on all NJ TRANSIT buses (the number of zones you can travel on a bus varies depending on the value of your monthly rail pass). Weekly rail passes valued at \$16.50 or more include a free trip for one zone of travel on all NJ TRANSIT buses.



### 2.2.1 Bus Service

The NJ 124 Transit Study Area is also served by three NJ TRANSIT bus routes, NJ TRANSIT #873, #878, and #879 buses, and the Madison Avenue Direct (MAD) Shuttle.

#### **#873 Bus Route**

The #873 bus runs parallel to the rail corridor along Route 124 between Parsippany-Troy Hills and Livingston (this route does not stop adjacent to the stations, but in close proximity along NJ 124). This route serves multiple malls, hospitals, and government office buildings. There are also connections available to other buses east of the study area at Livingston Mall and west of the study area in Morristown. NJ TRANSIT has looked at extending this route into the Drew and Fairleigh Dickinson University campuses but found that this would increase the travel time too much.<sup>1</sup>

The #873 bus operates from 6:50 AM to 6:19 PM on weekdays, and from 9:00 AM to 6:18 PM on weekends. It has an end-to-end running time of one hour, and headway of one-to-two hours on both weekdays and Saturdays.

The #873 bus is split into two fare zones (the dividing line being located just east of Convent Station). Bus fares are listed in Table 2-3.

**Table 2-2: NJ TRANSIT Route #873 Fare Structure**

	<b>Travel in One Zone</b>	<b>Travel in Two Zones</b>	<b>Transfer</b>
Adult	\$1.50	\$2.35	\$0.70
Children/Senior Citizens	\$0.70	\$1.05	\$0.35

#### **#878 and #879 Bus Routes**

The #878 and #879 buses are circulator routes designed to distribute and collect rail passengers. These two bus routes serve Convent Station. Stakeholders indicated that the operating times of the NJ TRANSIT buses are not compatible with evening classes at the colleges/ universities nearby. The #878 bus operates via a loop (serving Campus Drive in Florham Park), and the #879 bus terminates at Florham Park near the AT&T Campus. The #878 bus operates from 6:49 AM to 9:48 AM and 3:51 PM to 5:59 PM, weekdays only. Its end-to-end running time is approximately 23 minutes, and it operates on a 30 minute headway. The #879 bus operates from 6:48 AM to 5:57 PM, weekdays only. Its end-to-end running time is 19 minutes and it operates on a 30 minute headway. NJ TRANSIT noted that taxi cabs/ food vendors often occupy the bus staging area at Convent Station (and occasionally the handicapped parking area), which is an issue requiring improved enforcement.

<sup>1</sup> Interview with NJ TRANSIT conducted on April 4, 2012



The #878 and #879 buses are only one fare zone. Bus fares for both routes are listed in Table 2-3. There are no intersecting routes so there is no transfer fare.

**Table 2-3: NJ TRANSIT Routes #878 & #879 Fare Structure**

Adult	\$0.70
Children/Senior Citizens	\$0.35

### **Madison Avenue Direct (MAD) and Private Shuttles**

TransOptions provides a circulator bus along NJ 124 and Convent Road called the Madison Avenue Direct (MAD). This circulator route serves the three colleges in the NJ 124 Corridor, along with Madison Station. This route overlaps with NJ TRANSIT's #873 bus, and NJ TRANSIT has expressed interest in allowing TransOptions to run the MAD shuttle in place of #873. This bus runs from NJ 124 and Union Ave (approximately) and in front of the College of St. Elizabeth's Annunciation Center on Convent Road. The MAD bus runs from 1:00 PM to 8:30 PM on weekdays and 4:30 PM to 9:00 PM and has a headway of approximately one hour. The fare is \$1.50 per trip (the fare is kept identical to the NJ TRANSIT bus fare to discourage competition).

This route stops at the Madison Station eight times in the PM (between 1:27 and 8:16). The span-of-service (the route begins around noon) does not facilitate bi-directional travel (using the bus for both the AM and PM commutes). Although this bus does stop at Madison Station, any timed connections it makes with the train are assumed to be coincidental.

As a result of this study's community outreach efforts, it was confirmed that several private shuttles operate between the stations and businesses in the study corridor, including Pfizer in Giralda Farms, the Wyndham Hotel, and Maersk Inc. As of March/ April 2012 when meetings with the project's stakeholders were conducted, the fiscal state of the Pfizer shuttle was tenuous. The stakeholder meetings also identified potential new traffic generators that may want shuttle service, including Realogy, Bayer, Lyons Hospital, and Atlantic Health. NJ TRANSIT indicated that each of the bus routes in the study area is operated with a single vehicle. Adding stops along the routes would likely require the addition of a bus; therefore, an additional subsidy would be required to add vehicles to the routes.

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## **2.2.2 Intermodal Transfers**

Timed transfers between existing bus service and the rail line are limited. This is perhaps due to the multiple variables involved in the scheduling of bus service. According to the web travel survey conducted for this project, less than one percent of the survey respondents reported use of the local bus system as their mode of access to rail stations, indicating a potential disconnect between these





corridor transit services. Further survey feedback indicated interest in improved/ increased shuttle services/ intermodal connections in this corridor ranked as the second highest potential access improvement by respondents; although, that survey result contradicts some feedback received in the stakeholder meetings and other public outreach conducted for this study.

There are two main types of connections that can occur between trains and buses, with two sub-types depending on the direction of travel on the train.

- Type 1
  - Serve local businesses (train to bus in AM, bus to train in PM)
  - Origins west of Convent Station to destinations located near Convent/ Madison/ Chatham (inbound, eastbound train to bus)
  - Origins east of Chatham Station to destinations located near Convent/ Madison/ Chatham (outbound, westbound train to bus)
- Type 2
  - Serve local residences (bus to train in AM, train to bus in PM)
  - Origins near Convent/ Madison/ Chatham to destinations west of Convent Station (bus to outbound, westbound train)
  - Origins near Convent/ Madison/ Chatham to destinations east of Chatham Station (bus to inbound, eastbound train)

Each of the bus routes in the study corridor was assessed for their ability to enable the above described transfers.

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### **2.2.2.1 Route #879 (connects to Convent Station)**

This route primarily serves local businesses (Type 1) and makes six trips in the AM (between 7:01 and 9:44) and six trips in the PM (between 3:39 and 6:00).

In the AM:

- 67 percent of buses arrive within 15 minutes after an eastbound train arrives at Convent Station
- 33 percent of buses arrive within 15 minutes after a westbound train arrives at Convent Station

In the PM:

- 67 percent of buses arrive 15 minutes prior to an eastbound train's arrival at Convent Station
- 100 percent of buses arrive within 15 minutes prior to a westbound train's arrival at Convent Station



Connections in the other directions are sparse and coincidental (for example: in the PM peak, only one bus arrives 15 minutes prior to the departure of an eastbound and westbound train, making it unreliable for trips serving local residences (Type 2). The bus only makes stops at/ in front of major centers of employment. Providing stops in residential areas, as well as adjusting the schedule so some additional buses arrive prior to the departure of trains might allow this route to serve local residences (Type 2).

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### **2.2.2.2 Route #878 (connects to Convent Station)**

This route primarily serves local businesses (Type 1) and makes six trips in the AM (between 7:01 and 9:44) and five trips in the PM (between 3:39 and 6:00).

In the AM:

- 56 percent of buses arrive within 15 minutes after an eastbound train arrives at Convent Station
- 56 percent of buses arrive within 15 minutes after a westbound train arrives at Convent Station

In the PM:

- 67 percent of buses arrive 15 minutes prior to an eastbound train's arrival at Convent Station
- 100 percent of buses arrive within 15 minutes prior to a westbound train's arrival at Convent Station

Connections in the other directions are sparse and coincidental, although slightly better than on the #879. The #878 bus only makes stops at/ in front of major centers of employment. Providing stops in residential areas, as well as adjusting the schedule so some additional buses arrive prior to the departure of trains might allow this route to serve local residences (Type 2).

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### **2.2.2.3 Route #873 (connects near Convent, Madison, and Chatham Stations)**

Towards the Livingston Mall, this route stops at each station five times in the AM (between 6:59 and 11:56) and four times in the evening (between 1:08 and 6:14). Towards Parsippany-Troy Hills, this route stops at each station four times in the AM (between 6:08 and 11:06) and five times in the PM (between 2:05 and 6:01). Because this route intersects with the Morris & Essex Line nearby multiple stations, it is difficult to make timed connections between trains and buses at every station.

The span-of-service (the route ends in the evening around 5:30/ 6:00PM) does not facilitate bi-directional travel (using the bus for both the AM and PM commutes).



With an enhanced span-of-service, transfers of passengers leaving from office parks in the western part of the study area after 5:30 PM and destined for residences along the Morris & Essex Line could be accommodated. A systematic approach to connections that looks at both this route and the MAD shuttle would be beneficial.

### 2.2.2.4 Summary of Intermodal Connections

Table 2-4 summarizes the percent of total bus trips that meet the train within 15 minutes (in each direction). In some cases, the percent of total trips that meet the train is higher for the peak hour, but not consistently across all bus routes and stations. While there are numerous variables involved in the scheduling of bus service, creating connections by scheduling buses in concert with rail service would improve station accessibility.

Table 2-4: Summary of Bus to Rail Trip Connections

	Bus Route	#873		#878	#879	MAD Shuttle
	Direction	<i>EB</i>	<i>WB</i>	<i>Loop</i>	<i>Loop</i>	<i>Loop</i>
Convent Station	<b>From NYC/HOB</b>	33%	67%	41%	38%	
	<b>To NYC/HOB</b>	44%	22%	82%	75%	
Madison Station	<b>From NYC/HOB</b>	44%	33%			25%
	<b>To NYC/HOB</b>	44%	56%			38%
Chatham Station	<b>From NYC/HOB</b>	22%	44%			
	<b>To NYC/HOB</b>	44%	56%			

### 2.2.3 Ridership

In 2005, NJ TRANSIT conducted a comprehensive rail rider survey of the NJ TRANSIT system, including the Morristown Line. Data collected at that time represents the most recent ridership validation effort. NJ TRANSIT ridership information for 2005 was provided to Morris County and is included in Table 2-5.





**Table 2-5: NJ TRANSIT 2005 Study Area Station Daily Ridership**

Station	2005 Daily Boarding Riders (Eastbound and Westbound)
Chatham	1,286
Madison	1,429
Convent	1,146
<b>Total</b>	<b>3,861</b>

Source: NJ TRANSIT, 2005

NJ TRANSIT also provided 2011 AM Peak ridership data at the three stations, as presented in Table 2-6.

**Table 2-6: NJ TRANSIT 2011 AM Peak Passenger Volumes**

STATION	ON	OFF	Total
Chatham	798	71	869
Madison	672	123	795
Convent	582	334	916
<b>Total</b>	<b>2,052</b>	<b>528</b>	<b>2,580</b>

Source: NJ TRANSIT, 2012

In 2008, NJ TRANSIT provided the NJTPA and Morris County with 2030 ridership forecasts and passenger mode of access (how patrons get to the train station) forecasts for Chatham, Madison, and Convent Stations. Those forecasts included future projected parking demand at each of the three study area stations. However, that analysis and the forecasts provided are no longer valid. The forecasts were based upon a Morristown Line service schedule that assumed construction of a new Hudson River rail tunnel to New York City and pre-recession demographic forecasts, and did not include major fare increases that were subsequently implemented in 2010. Since the 2008 forecasts, the Hudson River tunnel project was cancelled, and in 2010, service was reduced on the Morris & Essex lines by seven trains and fares were increased by approximately 25 percent.

### 2.2.3.1 Rail Ridership Forecasts

NJ TRANSIT has provided new ridership forecasts for 2020 for the combined three study area stations to support the NJ 124 Transit Access Study effort. Updated mode of access forecasts and individual ridership projections for the study area stations are not available. The ridership forecasts were performed using an updated NJ TRANSIT Demand Forecasting Model (NJTDFM) which includes:

- 2010 Census Data (Population and Households)
- 2010 NJ TRANSIT fare increases and service cuts



- Increased Trans-Hudson crossing (Port Authority), NJ Turnpike and Garden State Parkway tolls (including additional increases to 2015)
- 2012 PATH Fare Increase
- Updated NJTPA demographics reflecting recession job losses
- NYMTC forecasts for NYC employment growth including reopening of the World Trade Center

NJ TRANSIT provided Morris County with base 2010 daily ridership data by station from the NJTDFM. This information is included in Table 2-7.

**Table 2-7: NJ TRANSIT 2010 Study Area Station Daily Ridership**

Station	2010 Daily Boarding Riders (Eastbound and Westbound)	Change in Daily Ridership (2005-2010)
Chatham	1,471	+185 (14.3%)
Madison	1,467	+38 (2.7%)
Convent	1,224	+78 (6.8%)
<b>Total</b>	<b>4,162</b>	<b>+301 (7.8%)</b>

Source: NJ TRANSIT, 2012, NJTDFM 2010 Base Year

For the purposes of this study, these 2010 ridership forecasts are considered to be the existing ridership at each of the study area stations.

The daily ridership forecast, presented in Table 2-8, is for all day boarding riders at Chatham, Madison, and Convent Stations in 2020. This ridership forecast assumes that the 2010 service cuts have been restored.

**Table 2-8: NJ TRANSIT 2020 Study Area Station Daily Ridership Forecast**

	2020 Daily Ridership Forecast (Chatham, Madison, and Convent Stations)	Change in Daily Ridership (2010-2020)
<b>Total</b>	<b>4,702</b>	<b>+540 (13%)</b>

Source: NJ TRANSIT, 2012, NJTDFM 2020 Forecast Year

NJ TRANSIT is studying potential service enhancements on the Morristown Line to better serve the reopened World Trade Center employment market in Lower Manhattan. This potential service is summarized as:

- Increased local service between Hoboken and Summit (four trains)
- Four (two AM and two PM peak) local trains from Dover to Hoboken will run as semi-express trains, reducing travel time to/ from Chatham, Madison, and Convent Stations to Hoboken in the peak periods
- Four (two AM and two PM peak) new Hoboken express trains, serving Chatham, Madison, and Convent Stations



Table 2-9 presents the 2020 forecasts using the updated NJTDFM and these service enhancements.

**Table 2-9: NJ TRANSIT 2020 Study Area Station Ridership Forecast with Hoboken Service Enhancements**

	<b>2020 Daily Ridership Forecast (Chatham, Madison, and Convent Stations)</b>	<b>Change in Daily Ridership (2010-2020)</b>	<b>Change in Daily Ridership (2005-2020)</b>
<b>Total</b>	<b>4,822</b>	<b>+660 (15.9%)</b>	<b>+961 (24.9%)</b>

Source: NJ TRANSIT, 2012, NJTDFM 2020 Forecast Year

### 2.2.3.2 Parking Demand and Capacity

As part of this study, a parking inventory was performed at all three of the study area stations in April 2012. The results of this field inventory are fully documented in Section 2.4 of this report. Table 2-10 summarizes the total available parking spaces, in official parking lots only, at each of the three stations.

**Table 2-10: Parking Usage and Capacity at Study Area Stations**

<b>STATION</b>	<b>Total Spaces (Daily and Permit)</b>	<b>Station Parking Utilized</b>	<b>Percent Utilized</b>
Chatham	402	394	98%
Madison	401	389	97%
Convent	589	442	75%
<b>Total</b>	<b>1,392</b>	<b>1,225</b>	<b>88%</b>

Source: VHB, April 2012

This field inventory varies from the data presented on the NJ TRANSIT website for these stations (1,346 total spaces) but is generally consistent. Station parking utilization and demand at the NJ 124 corridor stations vary as a result of current parking management strategies. At each of the station lots, spaces are allocated between permit and daily parking. The municipalities that manage the parking facilities vary the mix of permit and daily parking based upon demand and other policies. As presented in Table 2-10 above, Chatham and Madison Station lots are utilized to capacity, while there is currently some parking availability at Convent Station.

In addition to utilization, parking demand analysis factors in the turnover of spaces. The parking analysis revealed that there is minimal turnover of spaces, with average parking durations ranging from 9-12 hours per day. However, some parking turnover can be expected and thus it has been estimated that two percent of the parking is available/ utilized by a second parker during the day.





In June 2012, NJ TRANSIT conducted a system-wide rail rider ScoreCard survey. Survey respondents who indicated that they boarded or alighted at Chatham, Madison, and Convent Stations were asked additional questions relating to station access. The results of that survey indicate that about four percent of the eastbound (EB) rail boarders at the three stations park in unofficial parking lots. The location and permanency of unofficial parking is not known; however, the practice is acknowledged and is considered in the calculation of potential parking deficits in the corridor. The customer satisfaction data from the ScoreCard survey is considered by NJ TRANSIT to be the only representative of peak period riders, as the sample size for off-peak riders is not large enough to reach any conclusions.

Since Chatham, Madison, and Convent Stations are proximate to each other, it might be assumed that daily parkers will board at the station where daily parking is most available. To the contrary, based on survey data Chatham and Madison stations are more desirable locations to board the M&E line for the commuters in the corridor. There are many factors that contribute to this preference including the desire to board at the most eastern station, the difference in the fare structure between the stations, parking restrictions for residents/ non-residents, and access considerations. However, for the purposes of this parking analysis, the three stations were considered as a composite for ridership, parking capacity, parking demand, and parking deficit.

Approximately, 81 percent of the total daily riders boarding at these three stations are eastbound (EB) boarders and this percentage is assumed to remain constant through the forecast period. Historically, westbound (WB) boarders have little to no impact on parking demand. NJ TRANSIT Forecasting Department staff recommends that a factor of 48 percent, which represents the percentage of boarders that drive and park at the station per day, be used to estimate peak and off peak period parking demand at the three corridor stations. Since WB boarders have no impact on parking demand, this factor would be applied to EB boarders only.

Table 2-11 provides current and future estimated parking demand and deficits. By 2020, between 250 and 500 official parking spaces would be needed across the three stations; the higher end of the range assumes the four percent (75 parkers) who would use unofficial parking spaces would instead use official parking lots. The lower end of the range assumes that unofficial parking is still being used and that the current deficit (121 parkers) will find alternate official parking by 2020. Which station area(s) should accommodate this demand is based upon many factors including the factors described above, land availability, traffic impact, and accessibility.

Shortages of existing and future parking may result in a lowering of the number of future rail riders. Shortages may also shift rail customers to access the stations



by other non-parking modes (bus, walk, bicycle, drop-off) than are reported and forecasted for these stations. Recommended infrastructure improvements and strategies to encourage alternative mode access are included in Chapter 5 of this report. Parking availability, travel times, fares, and other policies may also encourage residents in the study area to access the rail system at other stations not in the study area, or to drive to further stations east (such as the PATH stations in Jersey City) as reported by respondents through this study's outreach efforts.

**Table 2-11: Current (2010) and Forecasted (2020) Parking Demand and Deficit**

	Daily Ridership (Corridor Stations)	EB Boarders (80.5% of total)	Actual or Forecast Parking Demand (48% of EB)	Parking Needed (incorporates turnover and private parking)	Parking Capacity	Estimated Current & Forecast Parking Deficit (Corridor Stations) <sup>2</sup>	Change from 2010 Parking Deficit
<b>Current 2010</b>	4,162	3,350	1,608	1,513	1,392	-121	
<b>2020 Forecast</b>	4,702	3,890	1,867	1,757	1,392	-365	-244 <sup>3</sup>
<b>2020 Forecast Hoboken Service Enhancements</b>	4,822	4,020	1,925	1,812	1,392	-420 <sup>4</sup>	-299

### 2.2.3.3 Ridership on other Corridor Transit Services

Table 2-12 provides March 2012 ridership for the #878 and #879 routes. The 2012 data is consistent with March 2011 data including sustained monthly ridership at approximately 2,000 passengers. The average passengers per trip are 5.9 for the #878 bus and 3.3 for the #879 bus.

NJ TRANSIT also provided monthly and annual 2011 ridership data for the #873 route. In 2011 this route averaged 193 riders per weekday and 94 riders per weekend day (Saturday). The #873 bus runs along NJ 124. The bus does not stop directly at any of the corridor stations, but does stop approximately one block from each station on NJ 124. The #878 and #879 primarily serve alighting passengers at Convent Station that are destined to the employment centers in close proximity to the corridor. These buses do not serve as feeder buses and thus have little to no impact on parking utilization.

TransOptions provided ridership for the Madison Avenue Direct (MAD) Shuttle. The average weekday boardings for the 139 days of reported operation from September 5, 2011 to December 22, 2011 was 5.3. Since the MAD Shuttle does not

<sup>2</sup> Assumes four percent park in unofficial lots

<sup>3</sup> Low end of future deficit range assumes unofficial parking and that existing deficit is met

<sup>4</sup> High end of future deficit range is without unofficial lot parking is 420+75=495 (~500)



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operate in the AM peak period, the shuttle has no effect on parking utilization. Average weekday ridership for the MAD shuttle ridership for the 11 day period between January 17, 2012 and January 28, 2012 was two boarding passengers and two alighting passengers.

In September 2012, TransOptions operated the MAD Shuttle free of charge (temporarily removing the \$1.50 fare). Table 2-13 reports the results for the three weeks of operation.

These results indicate that a combination of the free fare and extensive advertising during this period resulted in higher average daily ridership on the MAD Shuttle than the reported fall 2011 and January 2012 periods.

**Table 2-12: NJ TRANSIT March 2012 #878 and #879 Bus Ridership**

Line No.	Date	#878	#879	Total
Thursday	1	70	40	110
Friday	2	58	29	87
Monday	5	73	24	97
Tuesday	6	75	23	98
Wednesday	7	73	40	113
Thursday	8	58	45	103
Friday	9	57	27	84
Monday	12	78	21	99
Tuesday	13	67	34	101
Wednesday	14	62	30	92
Thursday	15	60	34	94
Friday	16	58	38	96
Monday	19	51	30	81
Tuesday	20	70	44	114
Wednesday	21	66	36	102
Thursday	22	67	32	99
Friday	23	65	32	97
Monday	26	72	30	102
Tuesday	27	72	40	112
Wednesday	28	63	30	93
Thursday	29	59	32	91
Friday	30	64	30	94
<b>Total Passenger Trips</b>		<b>1,438</b>	<b>721</b>	<b>2,159</b>
<b>Avg. Psgrs./Veh. Trip</b>		<b>5.9</b>	<b>3.3</b>	<b>4.7</b>
<b>Avg. Psgr. Trips/Day</b>		<b>65</b>	<b>33</b>	<b>98</b>

Source: NJ TRANSIT; routes do not operate on weekends





**Table 2-13: MAD Shuttle “Free Fare” Ridership September 2012**

Week	Riders per Week	Average Riders per Day
1	44	9
2	60	12
3	133	27

Source: TransOptions

## 2.3 Roadway Infrastructure and Automobile Access

The Morris and Essex commuter rail line is a major factor in the “dual peak” characteristics of roadways in the study corridor. The NJ 124 corridor experiences the typical morning and evening commuter-based peak operating roadway characteristics of a suburban region with its own local and regional employment centers. Rail commuters departing from these stations for trips to employment destinations out of the corridor (i.e. New York City, Newark, and the Hudson River waterfront) travel to and from these stations primarily by automobile. Rail commuters who access these stations by auto typically arrive at the stations before the morning peak and depart the stations after the evening peak traffic conditions of the corridor. While riders from origins outside of the corridor arrive at these stations during the typical peaks. However, they do not contribute to traffic in the corridor since they complete their commute to destinations in the corridor most typically by walking or transit/ shuttle modes.

Most of the roadways in this five-mile study corridor are typical of suburban arterials and collector streets, with one travel lane per direction, on-street parking in the town centers, and turning lanes at some key intersections. This length of NJ 124 in this corridor has a total of 20 signalized intersections, with additional signalized intersections throughout the network on surrounding roadways. NJ 124 parallels the NJ 24 freeway through this study area, with NJ 24 serving as the primary east-west highway for regional traffic east of I-287 and NJ 124 serving as a local access route for the suburban area south of NJ 24.

This assessment of existing roadway and traffic conditions is based on an extensive review of the traffic data and technical analyses from the previous reports on corridor conditions that were reviewed for this project. Regional baseline traffic volumes were obtained from the NJTPA’s North Jersey Regional Transportation Model- Enhanced (NJRTM-E).



### **2.3.1 Regional Traffic Conditions**

Information obtained from the NJRTM-E regional transportation model indicates that NJ 24 carries approximately 15,000 vehicles eastbound in the morning peak period (6:00 to 9:00 AM), while NJ 124 carries about 2,700 vehicles eastbound in the same period. In the evening peak period (3:00 to 6:00 PM), baseline traffic volumes for these two roadways are about 12,000 and 3,000 vehicles, respectively.<sup>5</sup> The traffic volumes for each period from the NJRTM-E for both NJ 24 and NJ 124 are shown in Table 2-14. Older two-way annual average daily traffic (AADT) volumes for NJ 24 and NJ 124 are shown in Table 2-15.

As shown in Table 2-14, the traffic volumes on NJ 124 generally represent about 15 to 18 percent of the combined NJ 24 and NJ 124 volumes in the study corridor between Summit and Morristown (I-287). The NJ 124 traffic volumes listed in Table 2-14 are somewhat lower than the NJDOT data for comparable locations listed in Table 2-15. Data obtained from the Morris County traffic count program for the period from 2003-09 are consistent with the NJDOT data. Two-way AADT volumes reported in the Morris County traffic count database for the segment of NJ 124 just east of downtown Madison ranged from 20,900 (2008) to 23,950 (2004). West of the point where Park Avenue splits from NJ 124 at the western end of downtown Madison, the AADT volumes reported in the Morris County traffic data records ranged from 13,350 (2003) to 16,600 (2009).

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<sup>5</sup> The NJRTM-E peak periods are defined independent of any considerations for the dual “local” and “commuter” peak periods described previously. The 6:00-9:00 AM morning period includes both travel peaks, while the data documented in the Task 6 parking memorandum developed for this study indicated that at least 50 percent of the spaces at the commuter lots at these three stations are still occupied at 6:00 PM when the NJRTM-E evening peak period ends.



**Table 2-14: 2011 Vehicular Volumes by Time Period (NJRTM-E Model)**

			Time of Day (Peak Periods)				
Roadway	Location	Direction	AM 6-9 AM	MD 9 AM to 3 PM	PM 3-6 PM	NIGHT 6 PM to 6 AM	TOTAL (24 hours)
NJ 24	West of JFK Parkway (Summit)	WB	8,537	16,002	15,116	10,825	50,480
		EB	15,377	17,140	12,404	10,325	55,246
	Western Terminus (near Interstate 287)	WB	9,538	18,438	16,161	12,872	57,009
		EB	14,903	15,820	11,664	9,668	52,055
NJ 124	Chatham / Madison Area	WB	1,895	2,906	2,468	2,343	9,612
		EB	2,699	2,737	2,647	1,912	9,995
	Morris Township Area	WB	3,305	3,340	3,512	2,613	12,770
		EB	2,751	2,695	3,380	1,937	10,763

**Table 2-15: NJDOT AADT Volumes<sup>6</sup>**

Roadway	Area	Location	AADT	Year
NJ 24	Summit	East of NJ 124	101,132	2009
	Florham Park	South of Brooklake Road	84,956	2009
	Morris Twp	North of Columbia Tpk. (CR 510)	86,545	2009
NJ 124	Madison	East of Rosedale Avenue	18,763	2010
	Madison	Between Elm St. and Kings Rd.	11,436	2010
	Convent Station	North of Dodge Drive	12,539	2009

The NJRTM-E transportation model contains projected forecasts of volumes on a roadway link-by-link basis for the 2035 future horizon year. Along NJ 24 and NJ 124 in the study corridor, projected increases in daily traffic volumes on individual roadway links range from 5 to 30 percent between 2011 and 2035. Traffic volume growth is projected to be lower on NJ 24 (5 to 11 percent) than on NJ 124 (11 to 30 percent), with the off-peak midday and night periods seeing the highest growth on both roadways. On NJ 24, the average morning and evening peak period traffic volume growth forecasts for the 2011-2035 horizon are about 6.6 and 4.7 percent, respectively. These growth factors correlate to very low annual (compounded) growth rates in the 0.2 to 0.3 percent range. On NJ 124, the

<sup>6</sup> NJ Department of Transportation - [http://www.nj.gov/transportation/refdata/roadway/traffic\\_counts/](http://www.nj.gov/transportation/refdata/roadway/traffic_counts/)



corresponding average morning and evening peak period traffic is projected to increase by 18.7 and 18.3 percent, respectively, from 2011 to 2035. This correlates to a low compounded annual growth rate of about 0.7 percent. For both roadways, the projected growth rates are indicative of traffic volume growth in a heavily-developed region with minimal roadway capacity to accommodate substantial increases in peak period traffic volumes.

In 2010 the County of Morris Division of Engineering published a review of existing and future conditions associated with the potential redevelopment of the former Exxon Research Facility in Florham Park.<sup>7</sup> While not situated directly on NJ 124, this site influences travel in the study area because of access constraints along Park Avenue in Madison and Florham Park, at a number of intersections in the study corridor along NJ 124, and around the NJ 24 interchange at Columbia Turnpike (CR-510). The “2010 Exxon Site Report” summarized the operations and impacts on the local network in this study corridor for both baseline conditions (2010) and for the future forecast year (2028). Summaries for each municipality are included in the sections following the corridor-level overview in the next section of this document.

The data and findings of the 2010 Exxon Site Report were used extensively in this documentation of existing traffic conditions in the study corridor, since the report contains recent (2010) and detailed (intersection-level volumes and operating conditions) information about traffic circulation at key intersections in the immediate vicinity of each of the three study area stations.

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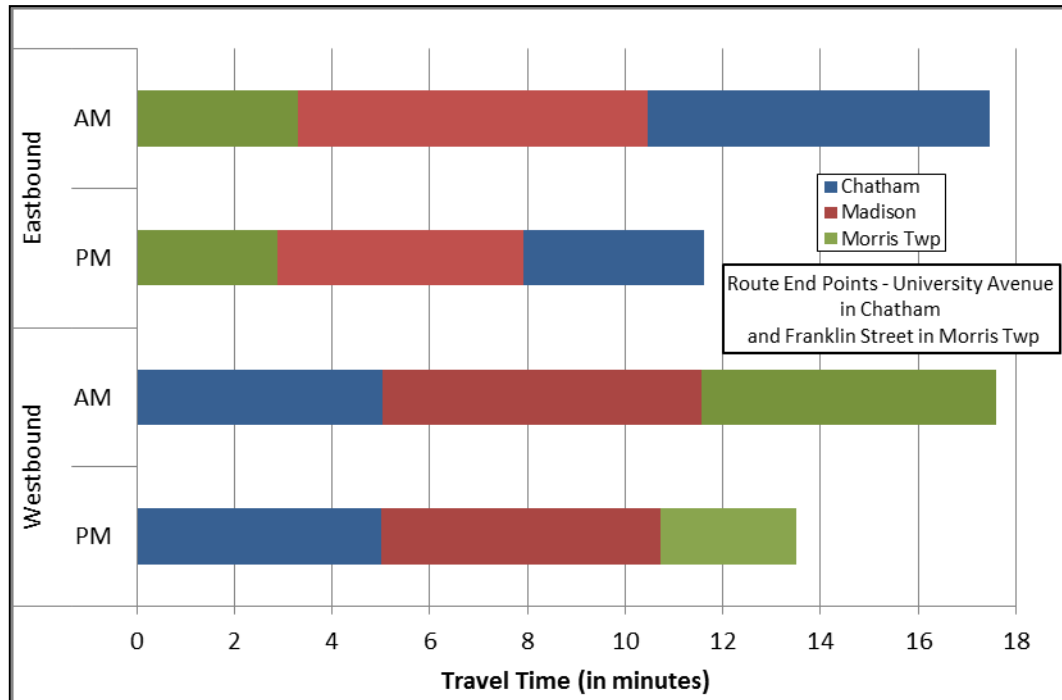
### **2.3.2 NJ 124 Corridor**

Travel time runs were also conducted on NJ 124 in 2012. The results of this data collection effort are summarized in Figure 2-5. The AM peak period (6:00 – 10:00 AM) was the most congested period, with an average travel time in excess of 17 minutes to traverse the corridor in either direction. The PM peak period (3:00 – 7:00 PM) was not as congested as the AM peak, but corridor-length travel times exceeded 11 minutes in both directions during the PM peak.

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<sup>7</sup> *Review of Existing & Future Conditions to Various Intersections within the Borough of Florham Park, Borough of Madison, Hanover Township, Morris Township, Chatham Borough and the Town of Morristown Due to the Potential Redevelopment of the Former Exxon Research Facility on Park Avenue in the Borough of Florham Park*, The Louis Berger Group, Inc., January 2010

Figure 2-5: NJ 124 Eastbound and Westbound Travel Time (Chatham Borough to Morris Township)



The following sections document existing conditions on NJ 124 through the three primary study area municipalities as related to the three NJ TRANSIT stations.

### 2.3.3 Chatham Station

NJ 124 traverses 1.4 miles through Chatham Borough and is primarily a two-lane roadway through the downtown with no dedicated left turn lanes, and on-street parking on both sides of the road. This section has four non-coordinated signalized intersections and seven stop-controlled intersections, with speed limits ranging from 30 to 35 mph within the downtown area (see Figure 2-6). The area directly around the train station consists of stop-controlled intersections, with one lane in each direction of travel. This section discusses existing conditions as well as mitigation measures and access constraints at Chatham Station.

#### 2.3.3.1 Existing Conditions

Intersection analyses documented in the 2010 Exxon Site report for intersections along NJ 124 show that the roadway operates at or over capacity with slow speeds and congested conditions. These conditions are due to the volume of



traffic and the existing roadway configuration. Currently there is approximately 40 feet of right-of way width on NJ 124 from Fairmont Avenue to Passaic Avenue, with one travel lane in each direction and on-street parking on both sides of the roadway. Field observations indicate that the congested conditions on NJ 124 in Chatham Borough are exacerbated by the close spacing of several T-intersections in the downtown area (Elmwood Avenue and Center Avenue from the north, Fairmount Avenue from the south) and the offsetting intersections of north-south arterial roadways. These conditions force drivers to make a series of turns onto and off of NJ 124 to complete a north-south travel path. For example, Fairmount Avenue serves as the major north-south arterial south of NJ 124, while North Passaic Avenue provides connections to the north from Chatham to Florham Park and Livingston (refer to Figure 2-7); this means that vehicles traveling along this route must negotiate their way through the Borough via a combination of a left and right turn (or the reverse) onto and off of NJ 124 at these two intersections.

The local street network around the train station in Chatham Borough consists of the following streets:

- Washington Avenue
- Lum Avenue
- Railroad Plaza South
- Railroad Plaza North
- Fairmount Avenue (County Route 638)
- South Passaic/ North Passaic (County Route 607) Avenue (NJ 124 defines the two segments)



0 500 1,000 Feet

- Town Line
- Railroad Line
- Train Station
- Parks
- School, College or University

- Signalized
- Stop-Controlled



Morris County NJ 124  
Transit Access Study

## Intersection Types in Chatham Borough

FIGURE 2-6



**Figure 2-7: Eastbound NJ 124, East of Fairmount Avenue**



Chatham Station is accessed directly by three of these roadways, as shown in Figure 2-8: Fairmount Avenue, Railroad Plaza North, and Railroad Plaza South. Fairmount Avenue is designated as County Route 638, and carries one travel lane in each direction with restricted on-street parking on both sides. Fairmount Avenue is also the main access point to the commuter parking lot on the eastbound (south) platform of the station. Railroad Plaza South is a narrow street with a 26-foot right-of-way and no parking, used primarily by the residents of that neighborhood to access the station. Railroad Plaza North is a somewhat wider street at about 50 feet, which serves as access to the westbound (north) platform of the station. This street contains daily and permit parking spaces on both sides of the road.

The north/ south streets, Washington Avenue, Fairmount Avenue, and Passaic Avenue experience some levels of congestion, mainly due to the queues at their intersection with NJ 124 at traffic lights. One note of concern for these local streets is the congestion in the morning and evening school hours. The ECLC School, located south of the train station, receives students from a number of communities in northern New Jersey, with many of these students arriving in buses, mini-buses, and passenger vans. These buses typically line up on Fairmount Avenue and through the main station parking lot located on the eastbound platform side of the station. The operation is well organized and does not cause substantial traffic backups on the surrounding streets. However, it does result in some additional traffic circulation through the parking lot. Upon exiting the school in the rear of the building, many of the buses will take Lum Avenue to Railroad Plaza South and cut back through this parking lot to reach Fairmount Avenue and NJ 124.<sup>8</sup>

<sup>8</sup> This activity has little or no impact on parking operations in this lot at the station because the parking lot is usually filled by the time students arrive at the ECLC School.



0 250 500 Feet



Morris County NJ 124  
Transit Access Study

## Chatham Train Station Access Roadways

FIGURE 2-8



Currently, the intersections of Passaic Avenue, Fairmount Avenue, and Lafayette Avenue along NJ 124 are congested in both the AM and PM peak periods, as shown in Figure 2-9. This congestion is caused by high vehicular traffic volumes and long queuing on the local streets related to parking maneuvers and left-turning vehicles. Since this area has a narrow right-of-way along NJ 124, there is currently no striping for dedicated left turn lanes along NJ 124. At one intersection (Passaic Avenue), a dedicated lead green phase on the southbound Passaic Avenue approach allows traffic from Passaic Avenue to turn left onto eastbound NJ 124. There is no dedicated left turn lane at this approach, however.

Data from the travel time runs conducted along NJ 124, which were summarized in Figure 2-5 for the length of the corridor, were refined to illustrate specific intersection-by-intersection delays in each municipality along NJ 124. Figures 2-10 through 2-13 are the time-space diagrams for all of the travel time runs conducted through Chatham for NJ 124 eastbound and westbound, respectively. The y-axis is the distance in feet from the start of the run (Division Avenue in the eastbound direction and University Avenue in the westbound direction), while the x-axis shows total time traveled in minutes. Flat horizontal segments along a line from left to right (and bottom to top) indicate elapsed time with no movement, or delays in traffic due to traffic signals or vehicles stopped for other reasons (e.g., parking maneuvers and pedestrian crossings). Straight lines on a time-space diagram with no horizontal segments correspond to travel time runs with good signal progression along the corridor. These are illustrated on these figures as an estimated “Free-Flow Travel Time.”

The “Free-Flow Travel Time” of this corridor serves as a baseline for comparing individual runs; eastbound and westbound progression is around 2.4 minutes. Average travel times in the eastbound direction range from 2.4 to 6 minutes in the AM peak and 3.5 to 9.5 minutes in the PM peak. The westbound travel times range from 2.4 to 9.4 minutes in the AM peak, while the PM peak has a narrower range of 4 to 5.5 minutes.





0 500 1,000 Feet

*Congested intersections have a Level of Service of D, E, or F as reported in the 2010 Exxon Site Report.*

Town Line  
 Railroad Line  
 School, College or University

Train Station

No Congestion AM/PM  
 No Congestion AM/Congestion in PM  
 Congestion in AM/No Congestion PM  
 Congestion Both AM/PM



Morris County NJ 124  
Transit Access Study

## Congested Intersections in Chatham Station

FIGURE 2-9



Figure 2-10: NJ 124 Eastbound Travel Times Runs - AM Peak

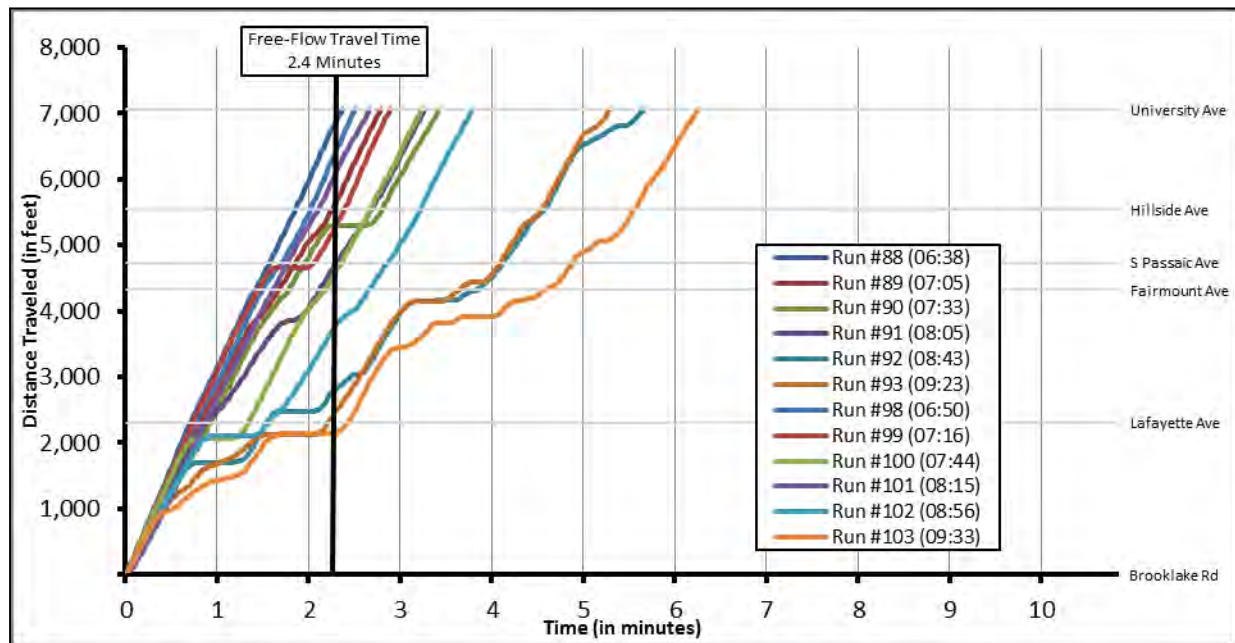


Figure 2-11: NJ 124 Eastbound Travel Times Runs - PM Peak

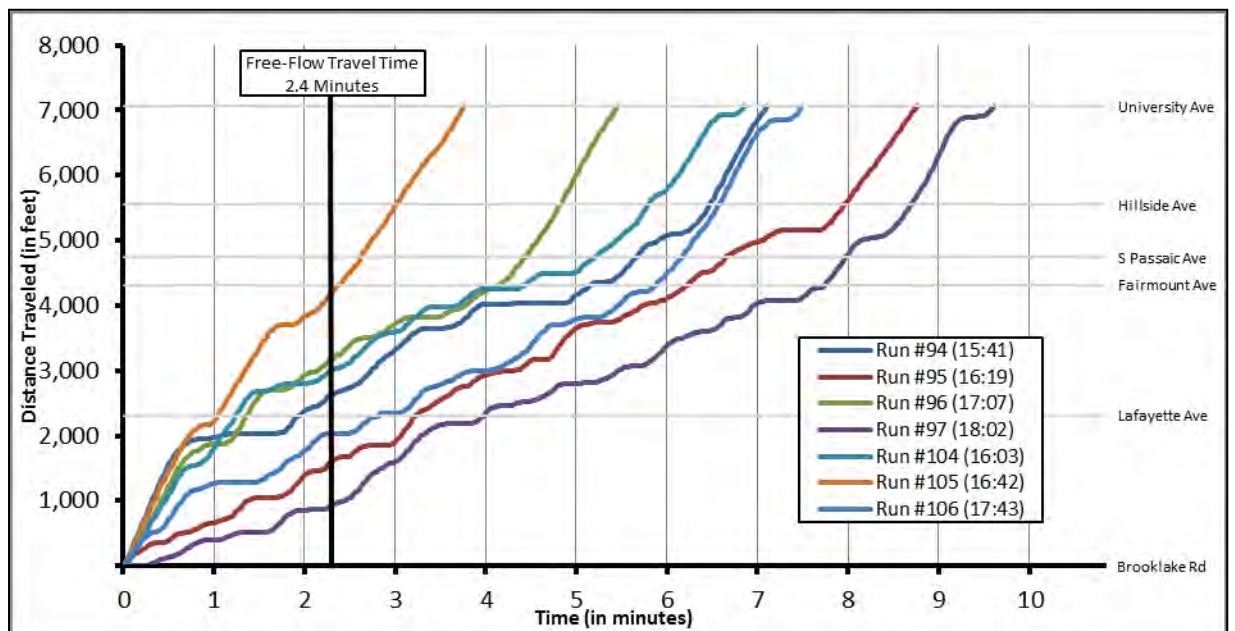






Figure 2-12: NJ 124 Westbound Travel Times Runs – AM Peak Period

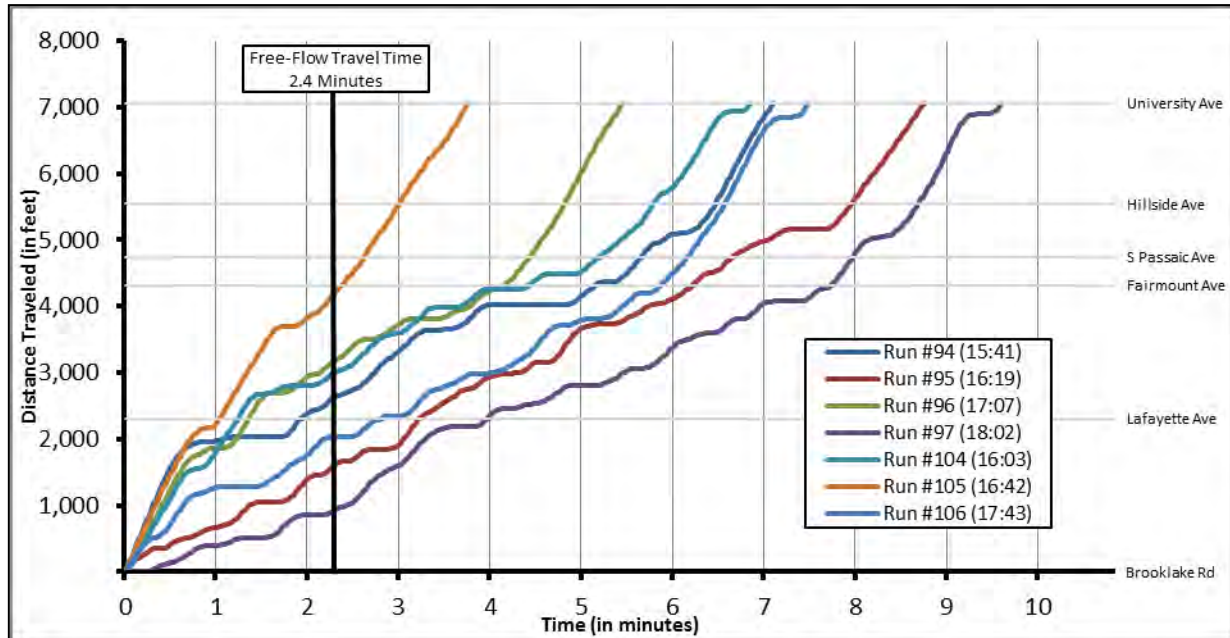
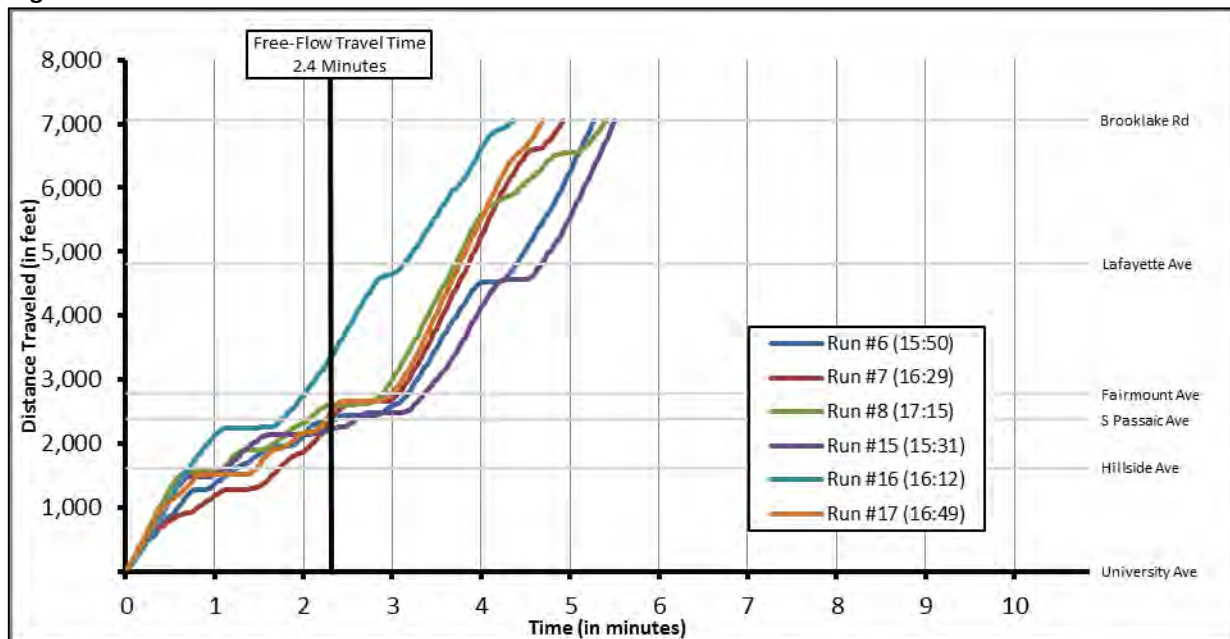


Figure 2-13: NJ 124 Westbound Travel Times Runs – PM Peak Period





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### **2.3.3.2 Existing Mitigation Measures**

Mitigation of the existing traffic conditions has been examined in previous reports with a majority of the recommendations from the 2010 Exxon Site report. The report called for the removal of parking spaces in the downtown area to accommodate exclusive turning lanes, and modifying the signal timing in the corridor to provide signal progression. These measures are all short-term improvements to alleviate queues that extend between intersections; however they have not been implemented.

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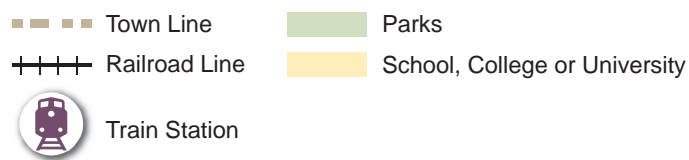
### **2.3.3.3 Access Constraints**

The primary roadway access constraint for Chatham Station is the general congestion along the NJ 124 corridor. This represents a particular constraint for transit riders who use NJ 124 to access the station parking lots, and for riders who drive to the station from points north of NJ 124 through the congested intersections at Passaic Avenue and Elmwood Avenue. Observations conducted at the station indicate that some queuing takes place in the two main station parking areas during brief intervals in the evening after passengers disembark from westbound trains. This is caused primarily by left-turning vehicles exiting from the station lots onto Fairmount Avenue.

---

### **2.3.4 Madison Station**

NJ 124 traverses the Borough of Madison for 3.1 miles, mainly consisting of two lanes of traffic with no dedicated left turning lanes and on-street parking through the downtown area. There are six non-coordinated signalized intersections on NJ 124 through Madison, along with additional signalized intersections on Park Avenue and on local streets south of the railroad alignment. There are also two mid-block pedestrian crossings. See Figures 2-14 and 2-15 for illustrations of these features. The mid-block crossing of NJ 124 between Alexander Avenue and Rosedale Avenue consists of a painted crosswalk with signage and pavement markings about 50 feet from either side of the crosswalk, consistent with current MUTCD standards. While this crosswalk appears to be designed primarily for school access, it provides pedestrian access across NJ 124 not far from the train station.



## Intersection Types in Madison Borough

FIGURE 2-14



Figure 2-15: Mid-block Crossing at Madison Junior School on NJ 124 (looking Westbound)



### 2.3.4.1 Existing Conditions

As with Chatham, NJ 124 in Madison experiences frequent congestion related to parking maneuvers and no storage lanes for left turning vehicles. Although most intersections operate at an acceptable overall level of service (LOS) in Madison, queues and delays can be lengthy on several intersection approaches. NJ 124 has a 43-foot right-of-way through downtown Madison, with one travel lane in each direction and parking on both sides of the street. Figure 2-16 shows the intersection of NJ 124 and Green Village Road, which is one of two locations in downtown Madison where special treatment is given to allow for left turns from NJ 124. Although there are no lane markings for a dedicated left-turn lane, a lead left-turn green phase is provided at this traffic signal for westbound traffic on NJ 124. A similar condition exists at the next intersection to the west, where NJ 124 curves to the southwest underneath the Morristown Line tracks and Park Avenue splits off to the northeast. At that location, westbound NJ 124 is striped to accommodate “left” turns on NJ 124 (traffic continuing to the west on NJ 124 via the curved section underneath the railroad bridge) and right turns on Park Avenue toward Florham Park. A lead left-turn phase is provided at this location for westbound NJ 124 traffic.

**Figure 2-16: Westbound NJ 124 at Green Village Road**



The local street network in Madison consists of the following streets (from west to east) and is shown in Figure 2-17:

- Park Avenue (County Route 623)
- Green Village Road (County Route 647)
- Kings Road
- Green Avenue / Waverly Place / Central Avenue (County Route 608)
- Maple Avenue
- Prospect Street / Greenwood Avenue

Kings Road serves as the access roadway for both the main commuter parking lot (Lot 1) and the lot east of Prospect Street (Lot 3). Minimal delays and queues were noted on the local street network during long stretches of the peak periods. However, queues form for brief periods during the PM peak by Kings Road / Prospect Street and Kings Road / Green Avenue when a westbound train drops off passengers returning home in the evening. These queues are caused by high traffic volumes exiting the parking lots during short periods of time.

Figure 2-18 shows the major signalized intersections and congestion levels documented in various previous study documents reviewed as part of this project.



# **NJ 124 Corridor**

## **Transit Access Improvement Study**

Final Report

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Morris County NJ 124  
Transit Access Study

**Madison Train Station  
Access Roadways**

FIGURE 2-17



# **NJ 124 Corridor**

## **Transit Access Improvement Study**

Final Report

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0 500 1,000 Feet

*Congested intersections have a Level of Service of D, E, or F as reported in the 2010 Exxon Site Report.*

- Town Line
- ++++ Railroad Line
- Parks
- School, College or University



Train Station

- No Congestion AM/PM
- No Congestion AM/Congestion in PM
- Congestion in AM/No Congestion PM
- Congestion Both AM/PM



Morris County NJ 124  
Transit Access Study

## Congested Intersections in Madison Borough

FIGURE 2-18



As noted in the Exxon Site Report, specific intersection operation issues are as follows:

- *NJ 124 at Rosedale Avenue / Cross Street*  
Volume exceeds capacity for the southbound, eastbound and westbound approaches.
- *NJ 124 at Green Village Road*  
Morning rush hour volume exceeds capacity for left turns from Green Village Road onto Main Street.
- *NJ 124 at Central Avenue / Waverly Place*  
Although the measured levels of service are acceptable, queues exceed the storage length between intersections; in particular, queuing eastbound traffic impacts the intersection of Green Village Road and Main Street (NJ 124).

Data from the travel time runs conducted along NJ 124 were refined to illustrate specific intersection-by-intersection delays in each municipality along NJ 124. Figures 2-19 through 2-22 are the time-space diagrams for all of the travel time runs conducted through Madison for NJ 124 eastbound and westbound, respectively. The y-axis is the distance in feet from the start of the run (Dodge Drive in the eastbound direction and Division Avenue in the westbound direction), while the x-axis shows total time traveled in minutes. Flat horizontal segments along a line from left to right (and bottom to top) indicate elapsed time with no movement, or delays in traffic due to traffic signals or vehicles stopped for other reasons (e.g., parking maneuvers and pedestrian crossings). Straight lines on a time-space diagram with no horizontal segments correspond to travel time runs with good signal progression along the corridor. These are illustrated on these figures as an estimated “Free-Flow Travel Time.”

The “Free-Flow Travel Time” of this corridor serves as a baseline for comparing individual runs; eastbound and westbound progression is around 4 and 4.4 minutes, respectively. Average travel times eastbound range from 4.8 to 8.5 minutes in the AM peak and 6.5 to 8.5 minutes in the PM peak. The westbound travel times ranged from 4 to 7 minutes in the AM peak, while PM ranged from 5 to 10 minutes. As shown in the time-space diagrams on the following pages, the most extensive delays along the NJ 124 corridor in Madison are experienced in the downtown area between Greenwood Avenue and Kings Road. The step-like configuration of many of the data lines in the graphs generally indicates poor signal progression through a series of intersections through the downtown area.



# NJ 124 Corridor Transit Access Improvement Study

## Final Report

Figure 2-19: NJ 124 Eastbound Travel Times Runs – AM Peak Period

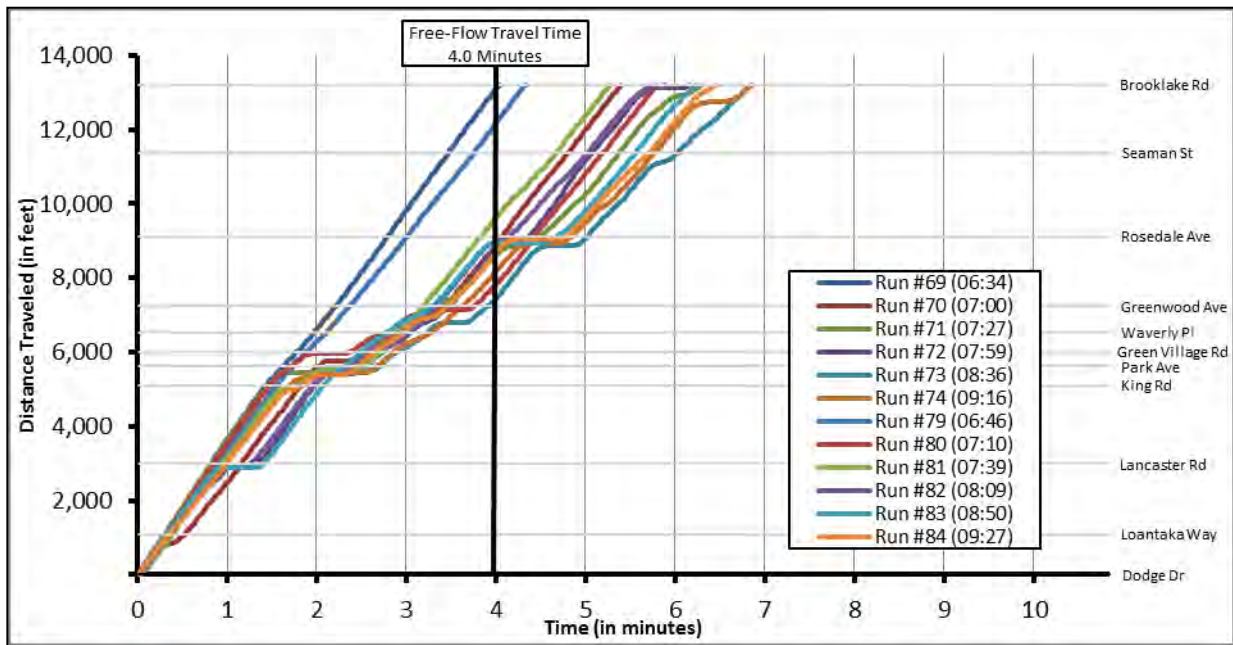


Figure 2-20: NJ 124 Eastbound Travel Times Runs – PM Peak Period

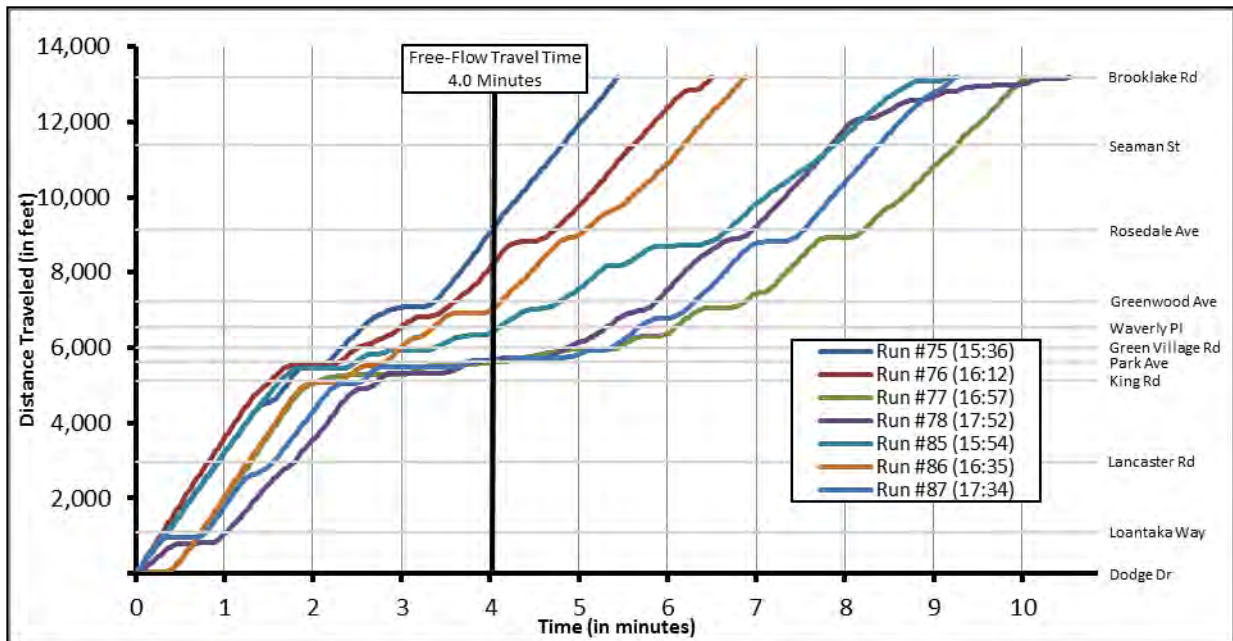






Figure 2-21: NJ 124 Westbound Travel Times Runs – AM Peak Period

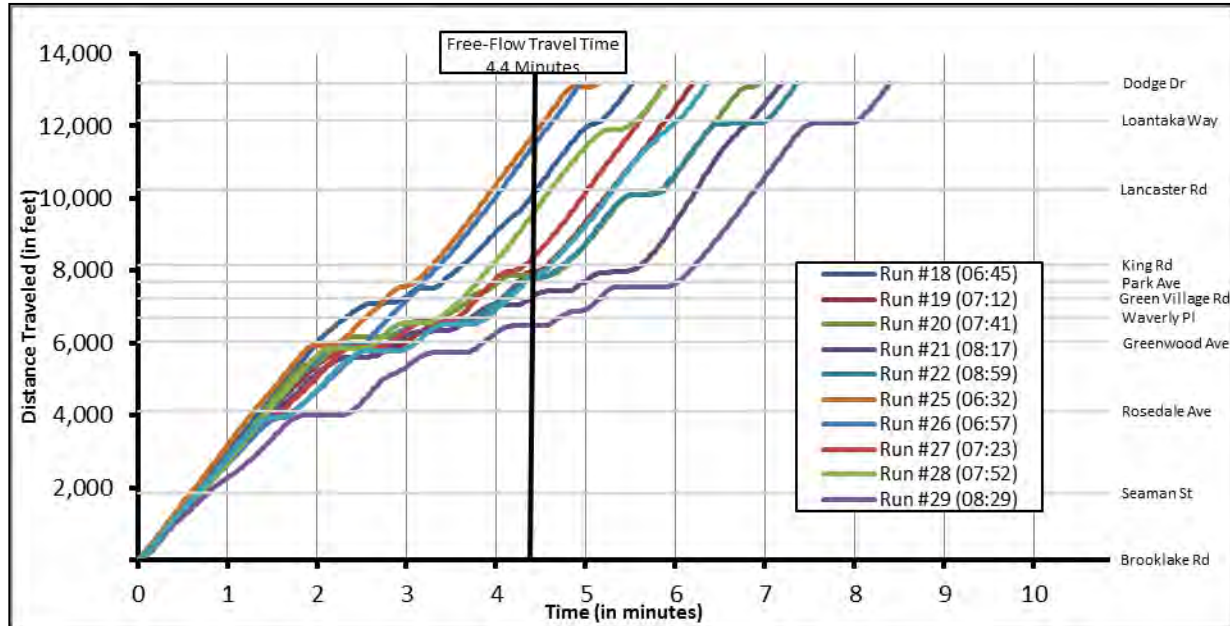
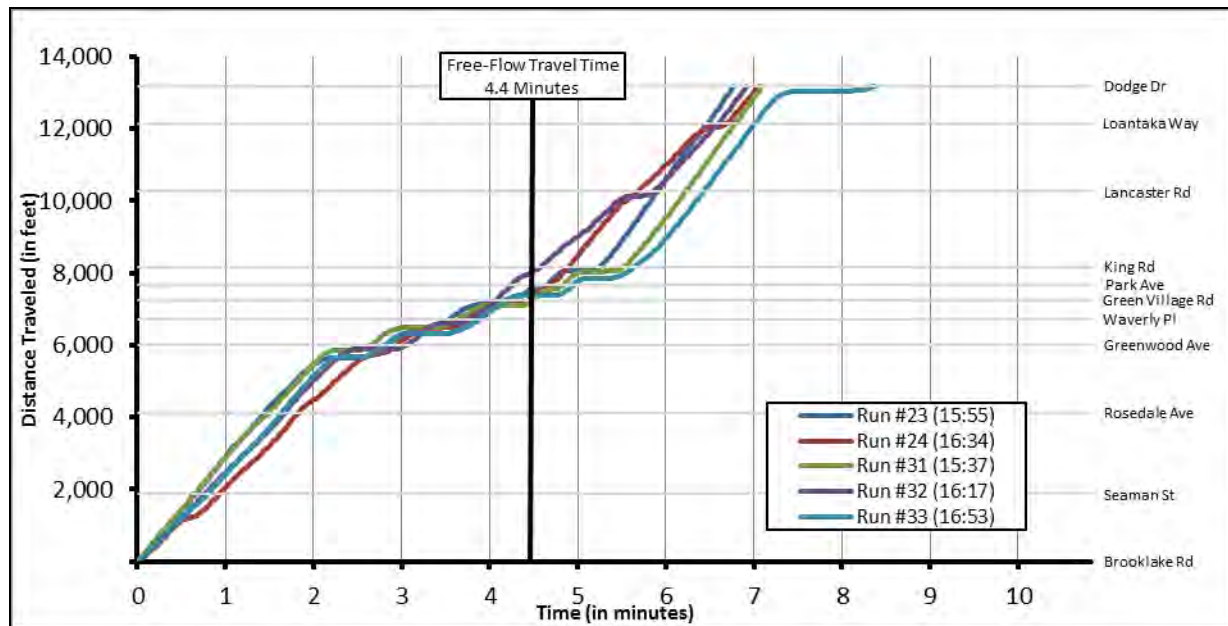


Figure 2-22: NJ 124 Westbound Travel Times Runs – PM Peak Period





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### **2.3.4.2 Existing Mitigation Measures**

A number of short-term mitigation measures for existing traffic conditions were proposed in the 2010 Exxon Site Report. This report concluded the following:

- Main Street & Green Village Road
  - Restripe westbound approach from one (1) lane to two (2): provide an exclusive left-turn bay and an exclusive through lane.
  - Modify signal timing to decrease overall intersection delay.
- Main Street & Rosedale Avenue/ Cross Street
  - Restripe the eastbound and westbound approaches from one (1) to two (2) shared lanes: provide a left/ through lane and a right/ through lane. Restripe receiving lanes to two (2) lanes, followed by a right lane merge.
  - Modify signal timing to decrease overall intersection delay.

Currently, these measures have not been implemented.

---

### **2.3.4.3 Access Constraints**

The primary roadway access constraints for Madison Station are described previously in this section. The intersections through the heart of Madison along NJ 124 between Rosedale Avenue and Kings Road are typically congested during morning and evening peak periods, as well as on weekends when the central business district of Madison is quite active. The roadway geometry and lack of signal coordination at the closely-spaced intersections on NJ 124 at Park Avenue and Kings Road can be problematic when a westbound vehicle on NJ 124 turns left onto Kings Road against oncoming traffic; there is insufficient horizontal clearance for following westbound traffic to pass a vehicle stopped at this location when oncoming (eastbound) traffic volumes on NJ 124 are heavy.

---

### **2.3.5 Convent Station**

NJ 124 traverses Morris Township for almost 1.3 miles, mainly consisting of two lanes of traffic with dedicated turning lanes at larger intersections, and no on-street parking for most of the section. Unlike the other two study area municipalities, Morris Township does not have a town center and the traffic delays associated with on-street parking maneuvers and closely-spaced intersections. There are five non-coordinated signalized intersections on NJ 124 in Morris Township, as shown in Figure 2-23. There is approximately 40 feet of

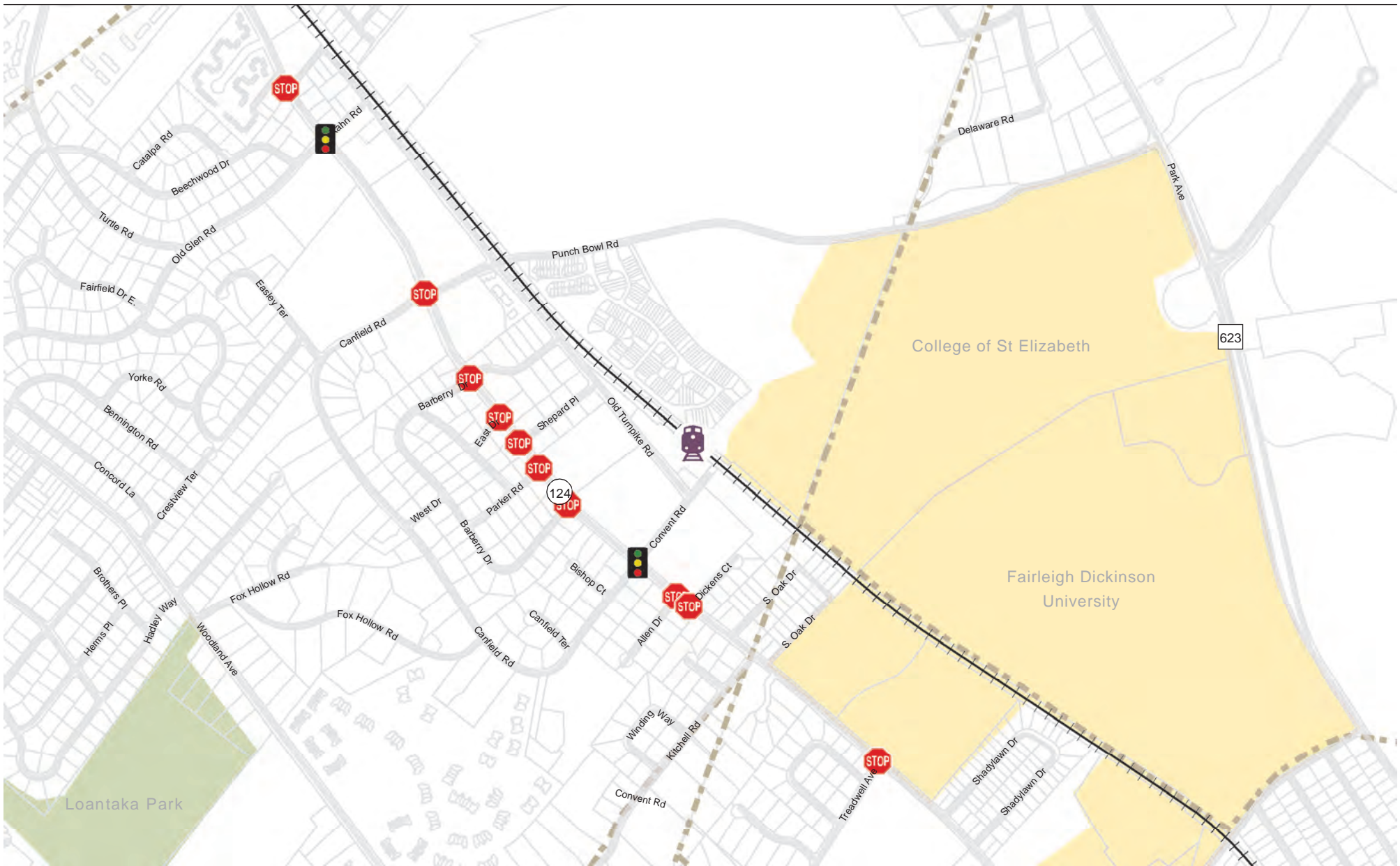


# **NJ 124 Corridor**

## **Transit Access Improvement Study**

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0 500 1,000 Feet

- Town Line
- +
+
+
+
 Railroad Line
- Train Station
- Parks
- School, College or University
- Signalized
- Stop-Controlled



Morris County NJ 124  
Transit Access Study

## Intersection Types in Morris Township

FIGURE 2-23



right-of-way at the intersections in Morris Township with no on-street parking along NJ 124 for sufficient horizontal clearance for dedicated turning lanes.

### 2.3.5.1 Existing Conditions

Generally, most of the Morris Township intersections operate at acceptable levels of service. As noted in the 2010 Exxon Site report, several movements at the unsignalized intersection of NJ 124 and Punch Bowl Road exceed capacity and queue lengths. This intersection also has heavy eastbound left-turning traffic from NJ 124 onto Punch Bowl Road in the AM peak period, which causes sudden stops and unsafe maneuvers (see Figure 2-24).

**Figure 2-24: Westbound NJ 124, east of Punch Bowl Road**



The local network around Convent Station consists mainly of unsignalized intersections with about 25 feet of right-of-way, carrying one travel lane in each direction. West of the station there is a residential street network between the rail alignment and NJ 124, though most of the vehicular traffic accessing the train station uses the following local streets as shown in Figure 2-25:

- Punch Bowl Road
- Old Turnpike Road
- Convent Road

The key congested intersections within Morris Township along NJ 124 are shown in Figure 2-26. The 2010 Exxon Site Report indicated that the unsignalized intersection of NJ 124 and Punch Bowl Road is one of the most heavily-congested locations in the study area during peak periods, especially when traffic is exiting the station during the evening peak. Punch Bowl Road carries heavy traffic volumes due to being the closest major north-south connection between NJ 124





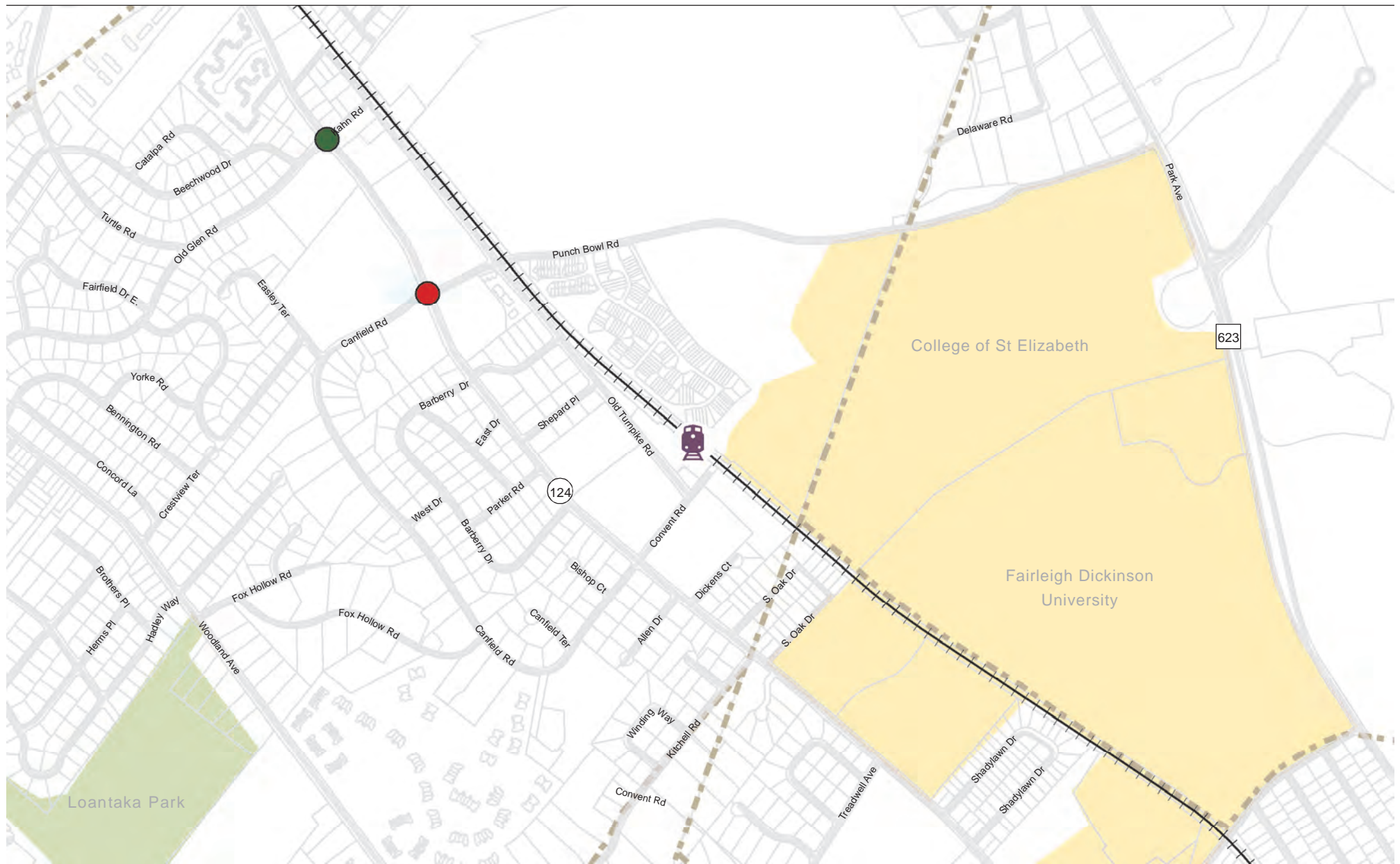
# **NJ 124 Corridor**

## **Transit Access Improvement Study**

Final Report










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0 500 1,000 Feet

*Congested intersections have a Level of Service of D, E, or F as reported in the 2010 Exxon Site Report.*

-  Town Line
-  Parks (100-2.5k)
-  No Congestion AM/PM
-  Railroad Line
-  School, College or University
-  No Congestion AM/Congestion in PM
-  Train Station
-  Congestion in AM/No Congestion PM
-  Congestion Both AM/PM



Morris County NJ 124  
Transit Access Study

## Congested Intersections in Morris Township

FIGURE 2-26





and Park Avenue west of the Fairleigh Dickinson and College of St. Elizabeth campuses. The Punch Bowl Road and Old Turnpike Road intersection is used by many commuters departing the station by car in the evening. This unsignalized intersection is located immediately south of the adjacent Morristown Line and Traction Line Recreational Trail bridges over Punch Bowl Road. The two streets do not intersect at a right angle, and as a result, there is insufficient sight distance to the right for vehicles at the westbound Old Turnpike Road approach at this intersection.

Data from the travel time runs conducted along NJ 124 were refined to illustrate specific intersection-by-intersection delays in each municipality along NJ 124. Figures 2-27 through 2-30 are the time-space diagrams for all of the travel time runs conducted through Morris Township for NJ 124 eastbound and westbound, respectively. The y-axis is the distance in feet from the start of the run (Franklin Street in the eastbound direction and Dodge Drive in the westbound direction), while the x-axis shows total time traveled in minutes. Flat horizontal segments along a line from left to right (and bottom to top) indicate elapsed time with no movement, or delays in traffic due to traffic signals or vehicles stopped for other reasons (e.g., parking maneuvers, pedestrian crossings). Straight lines on a time-space diagram with no horizontal segments correspond to travel time runs with good signal progression along the corridor. These are illustrated on these figures as an estimated “Free-Flow Travel Time.”

The “Free-Flow Travel Time” of this corridor serves as a baseline for comparing individual runs; eastbound and westbound travel time is around 3.2 minutes.

Average travel times eastbound range from 3 to 5.2 minutes in the AM peak and 3.7 to 10 minutes in the PM peak. The westbound travel times ranged from 3.2 to 4.8 minutes in the AM peak, while PM ranged from 4.5 to 9.4 minutes. As indicated in Figures 2-27 through 2-30, there are intermittent periods of slow-moving traffic at the eastern and western segments of the study corridor in Morris Township during the evening peak period.



# NJ 124 Corridor Transit Access Improvement Study

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Figure 2-27: NJ 124 Eastbound Travel Times Runs – AM Peak Period

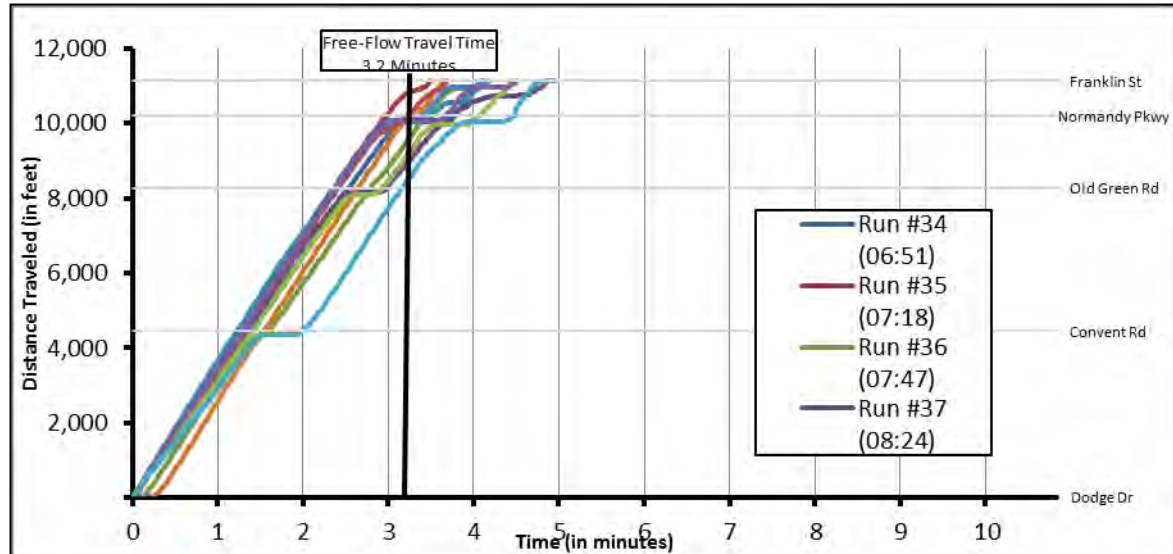


Figure 2-28: NJ 124 Eastbound Travel Times Runs – PM Peak Period

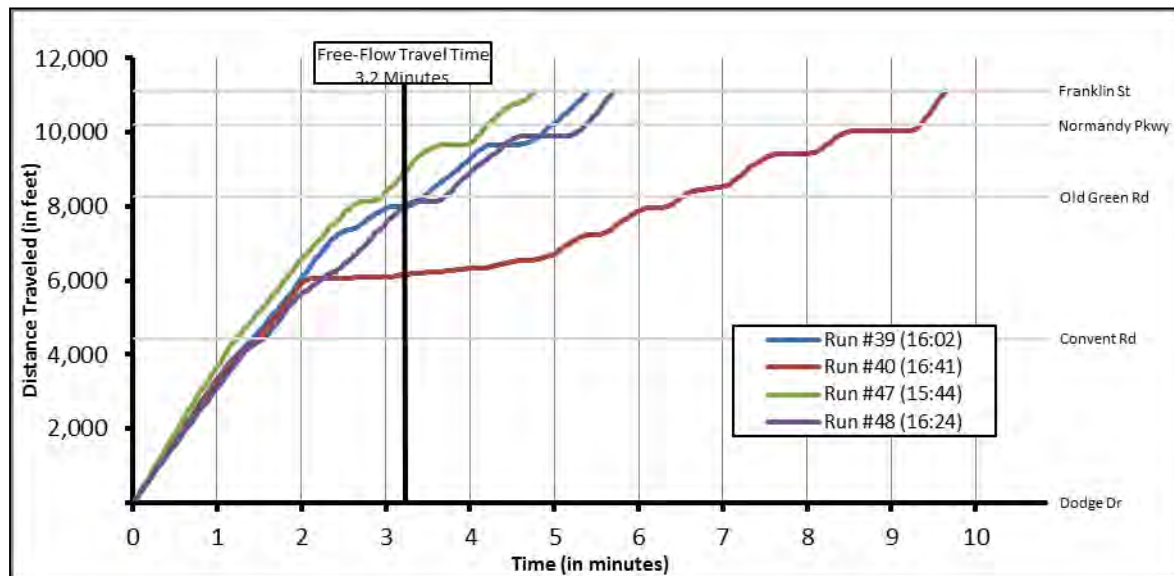




Figure 2-29: NJ 124 Westbound Travel Times Runs – AM Peak Period

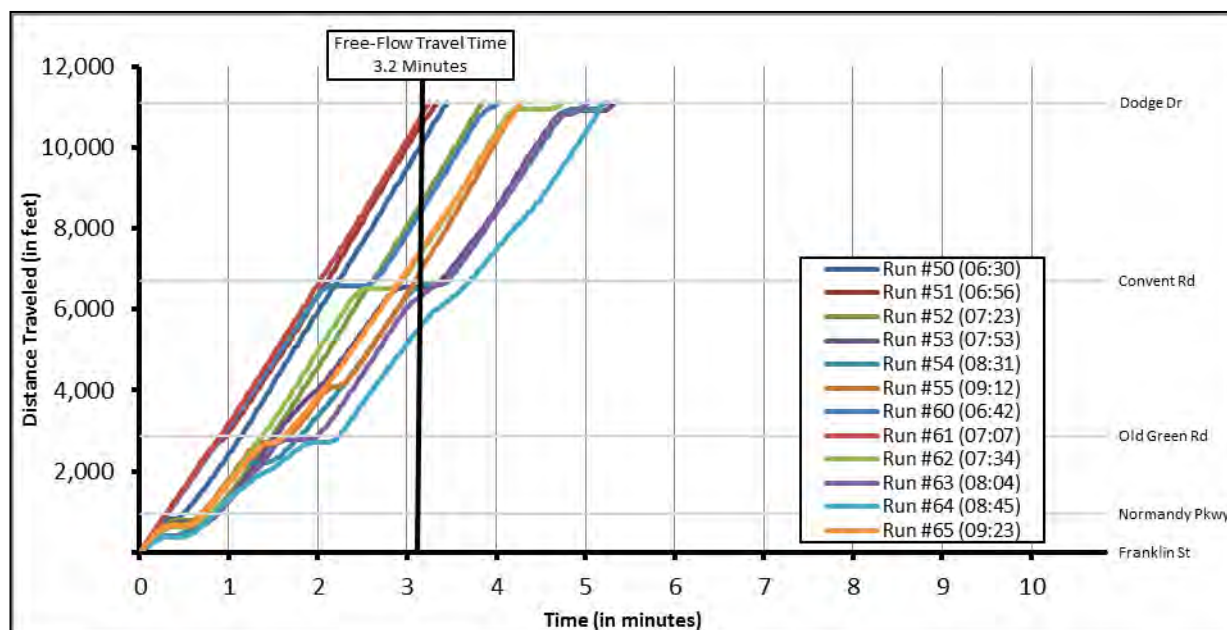
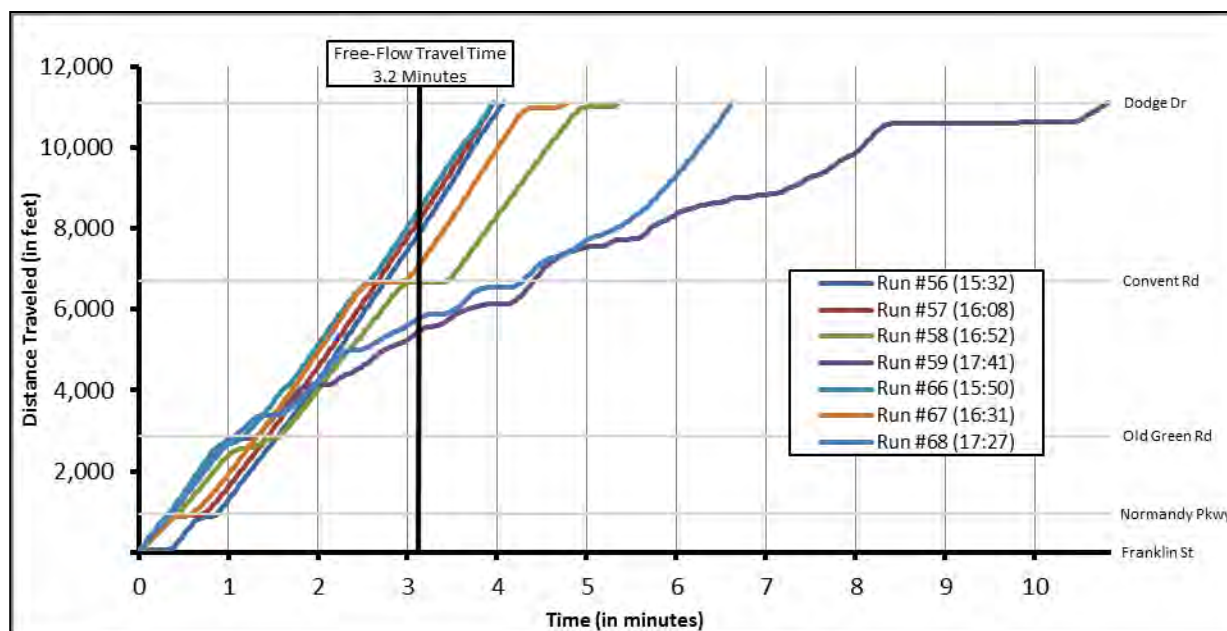


Figure 2-30: NJ 124 Westbound Travel Times Runs – PM Peak Period



### 2.3.5.2 Existing Mitigation Measures

A number of short-term mitigation measures for existing traffic conditions were proposed in the 2010 Exxon Site Report. This report recommended the following:

- NJ 124 & Old Glen Road / Kahn Road
  - Modify signal timing to decrease overall intersection delay.
- NJ 124 & Punch Bowl Road / Canfield Road
  - Restripe eastbound approach from one (1) lane to two (2) lanes: provide an exclusive left-turn bay.
  - Clear and trim trees and shrubs to increase intersection sight distance.
  - Provide advance intersection warning signs.
- NJ 124 & Normandy Parkway
  - Modify signal timing to decrease overall intersection delay.
  - Modify phasing for the EB left turn lane to protected plus permitted.

Currently, these measures have not been implemented.

### 2.3.5.3 Access Constraints

The intersections along NJ 124 between Franklin Street and Dodge Drive are typically congested during evening peak periods, as well as on weekends. As shown in Figure 2-31, the intersection of Old Turnpike Road and Punch Bowl Road is currently a three-way stop controlled intersection that has inadequate sight-distance underneath the rail bridge.

**Figure 2-31: Westbound Punch Bowl Road, West of Old Turnpike Road**





## **2.4 Station Area Parking and Utilization**

This section summarizes station area parking utilization and duration, which is based on a field data collection effort conducted during the week of April 23, 2012. The following provides information on parking capacity and utilization levels at the three stations in the study area by lot and by time of day, and to provide insight into turnover rates and parking duration throughout a typical weekday at these locations. This represents a level of detail above and beyond the periodic parking data collected by TransOptions and the municipalities themselves, which tend to focus on periodic “snapshot” parking occupancy counts that do not include parking duration or occupancy by time of day.

Lot numbers were obtained from the NJ TRANSIT website and confirmed (where applicable) in the field. As a result, each of the three stations in the study area has its own set of independently numbered lots (i.e., there is a Lot 1 in Chatham, a Lot 1 in Madison, and a Lot 1 in Convent Station.).

Additional research was conducted to identify discrepancies among the three main sources of data used for parking conditions in this study: (1) the NJ TRANSIT website; (2) TransOptions parking data;<sup>9</sup> and (3) the April 2012 VHB field survey. With few exceptions, most of the parking capacity figures were reasonably close, and minor discrepancies could be attributed to Americans with Disabilities Act (ADA) accessible spaces that may not be included in some of the published parking capacity totals because they are not specifically assigned as daily, permit/ resident, permit/ non-resident, etc. There are some discrepancies for individual lot capacity figures at Convent Station, but the overall total number of spaces obtained in the field survey (589 spaces) is reasonably close to the TransOptions total recorded capacity of 573 spaces. NJ TRANSIT only reports 525 total spaces at this station. This difference is almost entirely attributable to NJ TRANSIT recording only a 48-space capacity in Lot 4, compared to 100 recorded by TransOptions, and 114 identified in the VHB field verification. Since this lot is owned by St. Thomas More Church and operated as a commuter lot through formal arrangement with Morris Township, it is possible that the size of the church parking area used for commuter parking may have changed over the years.

Lot 1 at Chatham Station also has conflicting information among the three sources. There were 289 spaces identified in the field survey, which is reasonably consistent with the 297 posted on the NJ TRANSIT website. TransOptions reports 346 spaces, which may include on-street parking or additional commuter capacity in outlying municipal lots designated for shoppers but available under Chatham municipal parking regulations for permit holders when the main lot is full.

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<sup>9</sup> TransOptions indicated that their parking capacity data may be somewhat outdated and should be verified.



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### **2.4.1 Chatham Station**

The Chatham rail station has two primary parking areas for commuters, both of which are owned by the municipality. These are shown in Figure 2-32 and described below. The lots listed here only include those parking facilities that are used primarily by rail commuters at the station itself. There are a number of commercial buildings in the immediate vicinity of the station that have their own parking lots. The presence of extensive signage warning motorists that these are private parking lots indicates that illegal commuter parking may be a problem in the area.

- Lot 1: the main lot on the south side of the train station, primarily accessible via Fairmount Avenue (CR 638)
- Lot 2: the parking along the access street north of the station

In addition to these lots, there are several other municipal parking lots located around the downtown area of Chatham Borough. These are located along NJ 124, Center Street, and Bowers Lane. These lots are used primarily for local businesses and have parking time limits to ensure turnover during the course of the day, but some of the spaces can be used as “overflow” parking capacity for permit holders who arrive at the station after the two parking areas listed above are filled. Signage at the station directs permit holders to these lots. These supplemental lots were not included in the field survey.

Lots 1 and 2 accommodate customers that pay on a day-to-day basis as well as those that hold monthly permits. Lot 1 has capacity for 134 daily and 155 monthly commuters, whereas Lot 2 has 64 daily spaces and 49 monthly spaces. The total capacity of the two Chatham Station parking areas is 402 spaces, which includes 10 ADA accessible spaces for disabled customers. Table 2-16 summarizes the parking capacity of each lot and their associated fees. Customers that pay the daily fee use electronic payment boxes located at the main station building.



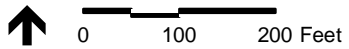
# **NJ 124 Corridor**

## **Transit Access Improvement Study**

Final Report

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- Daily
- Daily/Permit
- Permit



Morris County NJ 124  
Transit Access Study

**Chatham Train Station  
Commuter Parking Lots**

**FIGURE 2-32**



**Table 2-16: Chatham Station Parking Fees and Lot Capacity**

Parking Lot #	Fees		Parking Spaces	
	Daily	Permit (Annual)	Daily	Permit
1	\$5.00	\$355.00	134	155
2	\$5.00	\$355.00	64	49

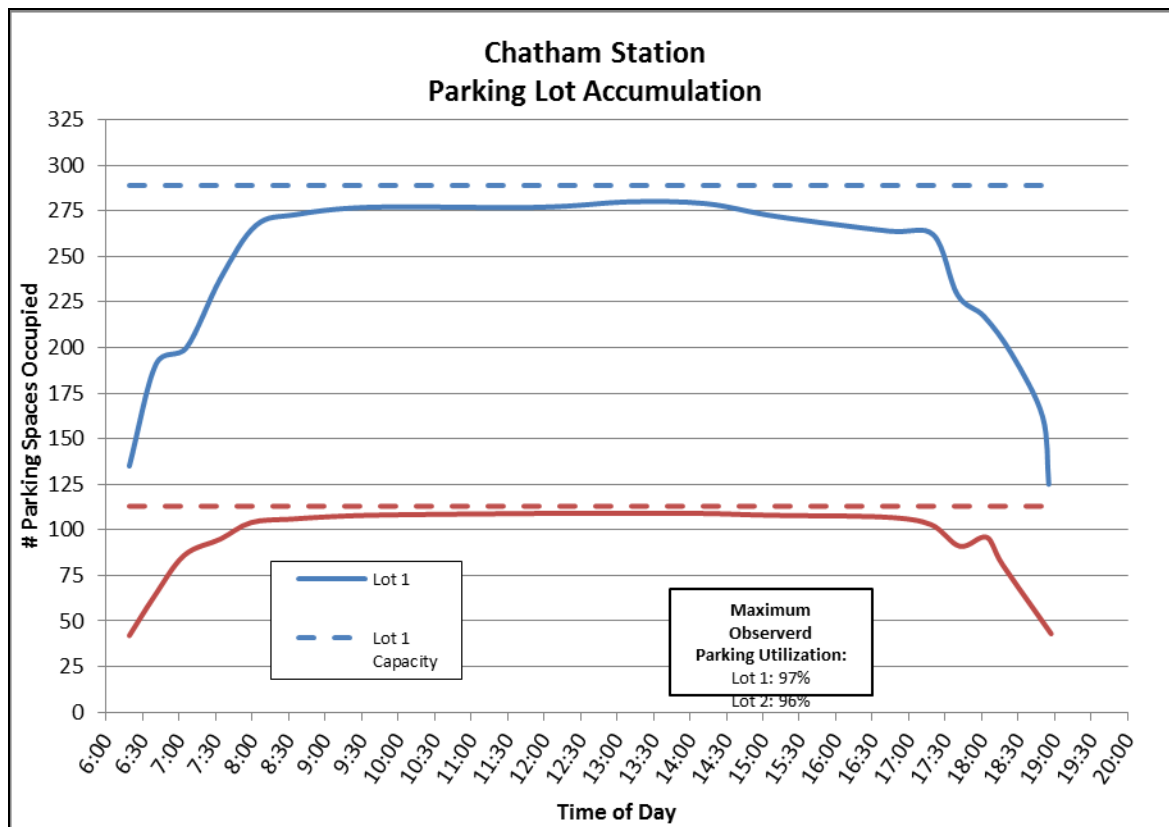
A field survey was conducted on Tuesday, April 24, 2012 to observe the capacity utilization of each lot during the course of a typical mid-week day. To ensure a normal distribution pattern of parking occupancy over the course of the day, the survey started at 6:00 AM and continued until the number of vehicles remaining in the lots was similar to the parking occupancy when the survey started. The parking accumulation profile for the two Chatham lots from 6:00 AM to 7:30 PM is shown in Figure 2-33. Both lots were consistently filled close to their capacity throughout the day until the utilization began to decline around 3:00 PM. The peak parking utilization observed for Lots 1 and 2 were 97 percent and 96 percent, respectively. The spaces used by commuters who park and pay on a daily basis was slightly higher than those reserved for monthly permit holders. Throughout the day, half of the ADA spaces were occupied.

During the field survey, a substantial level of school bus activity was observed in Lot 1 around 8:00 AM. The ECLC School located south of Lot 1 on Fairmount Avenue relies heavily on school buses to drop off and pick up students. A number of these buses operate wheelchair lifts, which requires additional dwell time. As a result, the buses waiting to drop off students begin to queue in front of the school, and it was observed that this queue spilled back onto Fairmount Avenue and into Lot 1. Additionally, some buses that had finished dropping off students cut through Lot 1 from the adjacent Lum Avenue (west of the station on the south side of the rail alignment) to gain access to Fairmount Avenue. Similarly, some buses use Lot 1 as a staging area as they wait to pick up students during the afternoon hours. This activity appears to have minimal impact on parking operations in Lot 1, since the lot is typically filled to capacity by the time the school day begins and remains filled throughout the course of the day.

A total of 24 spaces were sampled from the two lots to determine the parked time durations at each lot. Table 2-17 summarizes these findings and it shows that the average and 95<sup>th</sup> percentile parked time duration is about 12 hours for both lots. The lengthy parking durations, coupled with the minor incremental difference between the average and 95<sup>th</sup> percentile values, are indicative of a parking operation with minimal turnover over the course of a day. The 95<sup>th</sup> percentile defines the duration of time below which 95 percent of all sample vehicles park during the day, while the average parking duration roughly represents the 50<sup>th</sup> percentile. The small incremental difference between the average and 95<sup>th</sup>

percentile parking durations is typical of commuter parking facilities where most of the transit riders who park at the station pay their parking expenses on an annual, monthly, or daily basis (i.e., there is no difference in cost on a daily basis between short-term and long-term parking). The 95<sup>th</sup> percentile value represents a reasonable estimate of the maximum parking duration at this station for regular commuters.

**Figure 2-33: Chatham Train Station Parking Accumulation Profiles**



**Table 2-17: Chatham Station Parking Duration by Lot (hh:mm)**

Lot #	Parking Type	Minimum Duration	Average Duration	95 <sup>th</sup> Percentile Duration
1	Daily	11:44	12:10	12:23
	Permit	9:34	11:36	12:21
2	Daily	10:31	11:57	12:19
	Permit	10:25	11:31	12:08



### 2.4.2 Madison Train Station

The Madison train station has three parking lots that serve commuters (refer to Figure 2-34), as follows:

- Lot 1: adjacent to the train station on the south side of the rail alignment
- Lot 2: across Kings Road from Lot 1; entrance at Prospect Street
- Lot 3: east of Prospect Street on Kings Road

Lot 1 is a daily commuter lot with 73 parking spaces. Lot 2 has 127 spaces reserved for monthly permit customers only. Lot 3 accommodates 160 customers who either have monthly permits or pay on a day-to-day basis. It was observed that Lot 3 serves as a mixed-use parking lot for train commuters, the police and fire departments located in the adjacent public safety building, and local businesses. Vehicles for local businesses (identified with a temporary parking permit placard on their dashboards) tended to park by the eastern entrance of the lot along Kings Road (observed to occupy about 20 spaces), while vehicles for the police and fire departments tended to park by the northern entrance (observed to occupy about 10 spaces). Lot 1 is owned by NJ TRANSIT, while Lots 2 and 3 are owned by the municipality. The Madison Police Department is responsible for the oversight and enforcement of parking regulations in all three lots.

The total capacity of the three Madison train station parking lots is 401, which includes eight ADA accessible spaces in Lot 1. Table 2-18 summarizes the parking capacity of each lot along with the associated fees. Customers that pay the daily fee deposit their cash in payment boxes in the appropriate slots for the numbered spaces.

**Table 2-18: Madison Station Parking Fees and Lot Capacity**

Parking Lot #	Fees		Parking Spaces	
	Daily	Permit (Annual)	Daily	Permit
1	\$5.00	-	73	-
2	-	\$425.00	-	127
3	\$5.00	\$425.00	41	160

In addition to the commuter lots, there are several municipal lots located around the downtown area along Elmer Street, Cook Plaza, and Waverly Place where commuters are allowed to park. These lots are intended for use by customers and employees of local businesses, with distinctive parking regulations for each type of user (two-hour limits for customers, and municipal permits for employees). These supplemental lots were not included in the field survey.





0 100 200 Feet

- Green box: Daily
- Yellow box: Daily/Permit
- Orange box: Permit



Morris County NJ 124  
Transit Access Study

**Madison Train Station  
Commuter Parking Lots**

**FIGURE 2-34**



A field survey was conducted on Tuesday, April 24, 2012 to observe the capacity utilization of each lot during the course of a typical mid-week day. To ensure consistency with a normal distribution over the course of the day, the survey was started at 6:00 AM and continued until the number of vehicles remaining in the lots was similar to the parking occupancy when the survey started.

Parking accumulation profiles for the three Madison commuter lots from 6:00 AM to 7:30 PM are shown in Figure 2-35. Lots 1 and 2 (dedicated to train commuters) were consistently close to capacity for the majority of the day, whereas the utilization of Lot 3 declined slightly after 1:00 PM. Daily spaces filled earliest, since most of them are located closest to the station and the quantity of these spaces is more limited. The peak utilization rate observed for the lots ranged from 95 percent to 100 percent. Lot 1 was not at 100 percent capacity due to vacant handicap spaces. Lot 3 shows had a high percentage of turnovers mainly due to vehicles parked for local businesses. Lots 1 and 2 had a number of spaces filled by 6:00 AM, while peak activity at Lot 3 began at around 7:00 AM. The eight ADA spaces in Lot 1 were about half full throughout the duration of the day.

A total of 19 spaces were sampled from the three lots to determine the parking duration profiles at each lot; these findings are summarized in Table 2-19. The data indicates that the average parked time duration ranges from about 9.5 to 11.5 hours, with Lot 2 affected by several outliers with relatively short parking durations of one to two hours. The 95<sup>th</sup> percentile parking duration is about 12.5 hours for all three lots. As shown in Figure 2-35, the three Madison commuter lots was at or near their capacities before 8:00 AM, and remained nearly full throughout the course of the day. The 95<sup>th</sup> percentile defines the duration of time below which 95 percent of all sample vehicles park during the day, while the average parking duration roughly represents the 50<sup>th</sup> percentile. The parking profile at Madison Station is slightly different than Chatham; the somewhat larger gap between the average and 95<sup>th</sup> percentile parking durations indicates more short-term parking utilization at Madison than at Chatham. The 95<sup>th</sup> percentile value represents a reasonable estimate of the maximum parking duration at this station for regular commuters.

Figure 2-35: Madison Train Station Parking Accumulation Profiles

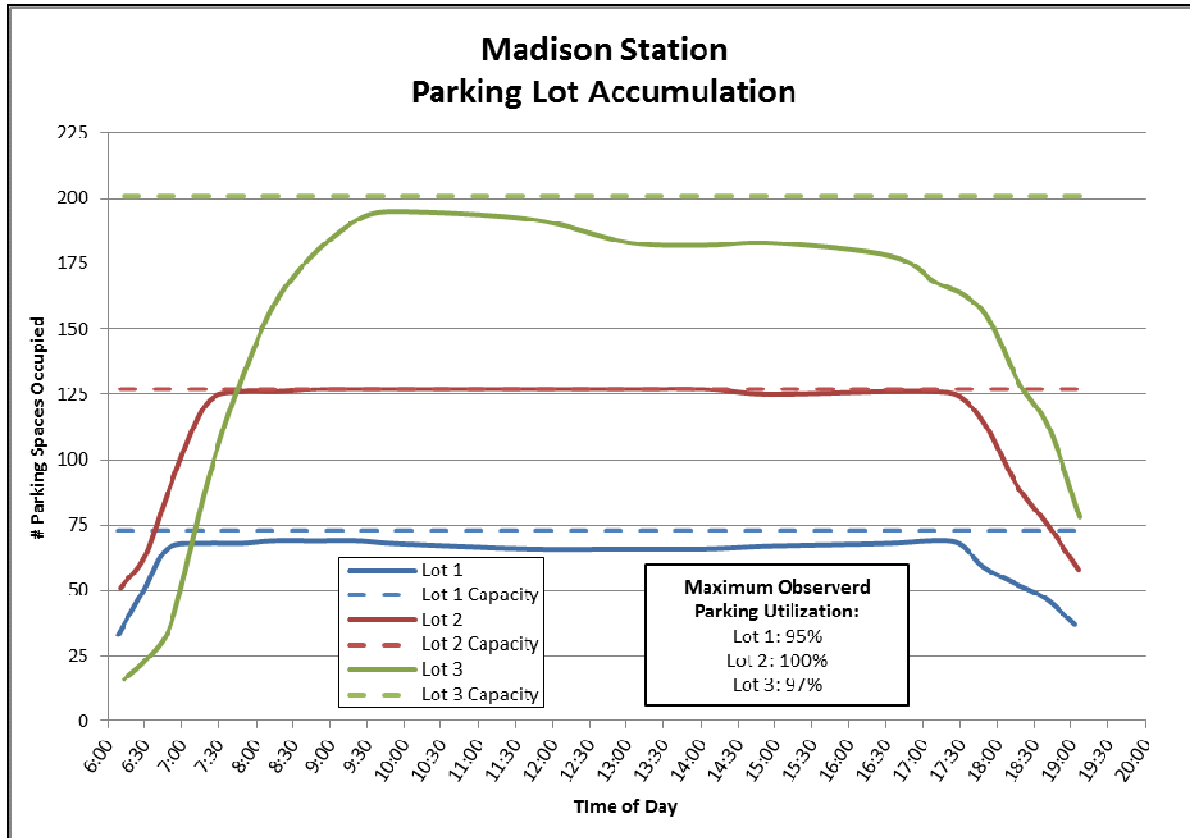


Table 2-19: Madison Station Parking Duration by Lot (hh:mm)

Lot #	Parking Type	Minimum Duration	Average Duration	95 <sup>th</sup> Percentile Duration
1	Daily	4:46	11:10	12:28
2	Permit	1:20	9:37	12:20
3	Permit	6:05	11:28	12:33

### 2.4.3 Convent Station

Convent Station has four parking lots that serve commuters, as shown in Figure 2-36. The lots listed here only include those parking facilities that are open to the public under the designated parking restrictions and/or permit structure for Morris Township residents and non-residents.



## **NJ 124 Corridor Transit Access Improvement Study**

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0 100 200 Feet

- Daily
- Daily/Permit
- Permit



Morris County NJ 124  
Transit Access Study

**Covent Train Station  
Commuter Parking Lots**

**FIGURE 2-36**



It does not include the main Saint Thomas More Church parking lot that is used by a limited number of church parishioners who make arrangements through the church administration for permission to park in the lot.

- Lot 1: adjacent to the train station on the south side of the rail alignment
- Lot 2: angled on-street parking along Old Turnpike Road
- Lot 3: located south of the soccer field between the field and the church parking lot
- Lot 4: located west of the soccer field adjacent to the Convent Road grade crossing

All four of the parking areas are operated by Morris Township. The Township owns Lots 1, 2, and 3. Lot 4 is owned by Saint Thomas More Church and operated by the municipality through a lease or operating agreement.<sup>10</sup> Among the three rail stations in the NJ 124 study area, Convent Station has the most complex parking regulations in terms of permit versus daily spaces, resident and non-resident users, and combinations of various users in the four lots. Spaces typically reserved for non-resident permit holders can be used by resident permit-holders if all of the resident permit-holder spaces are occupied.<sup>11</sup> Lot 1 accommodates all customers that pay on a daily (50 spaces) or monthly (190 spaces) basis, and those that require permits to park daily in specific stalls (40 spaces).<sup>12</sup> Lot 2 is the group of angled on-street parking spaces on Old Turnpike Road that accommodates customers who pay on a daily basis (80 spaces). Lot 3 contains 115 spaces for commuters who hold monthly permits. Lot 4 is for all customer types, including monthly (69 spaces) and daily (45 spaces). In addition, there are ten on-street parking stalls along the west (southbound) side of Convent Road just south of the Old Turnpike Road intersection; these spaces are available for commuters who pay daily.

The total capacity of the four Convent Station parking lots is 589, which includes nine ADA accessible spaces in Lot 1. Table 2-20 summarizes the parking capacity of each lot and their associated fees. The monthly parking rates differ considerably between residents and non-residents of Morris Township, with non-residents paying more than twice the annual permit fee as residents. All customers who pay the daily fee use electronic payment boxes.

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<sup>10</sup> As shown in Figure 5, the parking area delineated as Lot 4 includes about half of the paved area that also includes the adjacent church parking lot. This entire paved area is owned by St. Thomas More Church, but only about half of the area is included in Lot 4; the remainder is subject to the informal parking arrangement for parishioners described previously.

<sup>11</sup> Morris Twp. Municipal Code, §88-3.2(D)

<sup>12</sup> The Morris Township municipal website indicates that these spaces are primarily intended to be used by township residents who use the station infrequently and therefore would not use an annual permit.



**Table 2-20: Convent Station Parking Fees and Lot Capacity**

Parking Lot #	Resident Fees		Non-Resident Fees		Parking Spaces		
	Daily	Permit (Annual)	Daily	Permit (Annual)	Daily	Permit Monthly	Permit Daily
1	\$5.00	\$300.00	-	\$690.00	50	190	40
2	\$5.00	-	\$5.00	-	80	-	-
3	-	\$300.00	-	-	-	115	-
4	\$5.00	\$300.00	\$5.00	\$690.00	45	69	-

A field survey was conducted on April 25, 2012 to observe the capacity utilization of each lot during the course of a typical mid-week day. To ensure consistency with a normal distribution over the course of the day, the survey was started at 6:00 AM and continued until the number of vehicles remaining in the lots was similar to the parking occupancy when the survey started.

The parking accumulation profiles for the four Convent Station lots from 6:00 AM to 8:00 PM are shown in Figure 2-37, with detailed utilization and duration information for the 53 sample spaces shown in Table 2-21. The peak utilization observed for the lots ranged from 64 to 91 percent, with Lots 3 and 4 having the lowest and highest peak occupancy, respectively. During the survey numerous vehicles were observed entering Lots 3 and 4 around 4:00 PM. These were not rail customers but instead were parking to play on the soccer field. These vehicles parked in any open parking space, both permit and daily, and did not pay, even though regulations state that there is only free parking after 6:00 PM.

The utilization of Lot 1 averaged about 90 percent of its capacity. Based on the field observations, the remaining 10 percent of the available parking spaces were located at the northwestern corner of the parking area by Shephard Place, between the one-way exit driveways. The nine ADA spaces in Lot 1 were about half full during the course of the day.

As indicated in Table 2-21, most vehicles at Convent Station were parked for long intervals, on the sampled typical weekday. The average parking duration ranged from about 10.5 to 12 hours, with the 95<sup>th</sup> percentile at nearly 13 hours for all four lots. There was some turnover in the daily spaces in Lots 2 and 4 during the course of the day, but even the minimum observed parking durations were more than five hours in both lots. The 95<sup>th</sup> percentile defines the duration of time below which 95 percent of all sample vehicles park during the day, while the average parking duration roughly represents the 50<sup>th</sup> percentile. The parking profile at Convent Station is similar to Chatham in that the gap between the



average and 95<sup>th</sup> percentile parking durations is relatively small. This is indicative of a commuter parking facility with little turnover during the course of the day, where most or all of the users pay their parking fees on an annual, monthly, or daily basis, and therefore pay a flat rate for parking regardless of how long their cars are parked on any given day. As with Chatham and Madison, the 95<sup>th</sup> percentile value represents a reasonable estimate of the maximum parking duration at this station for regular commuters.

**Figure 2-37: Convent Train Station Parking Accumulation Profiles**

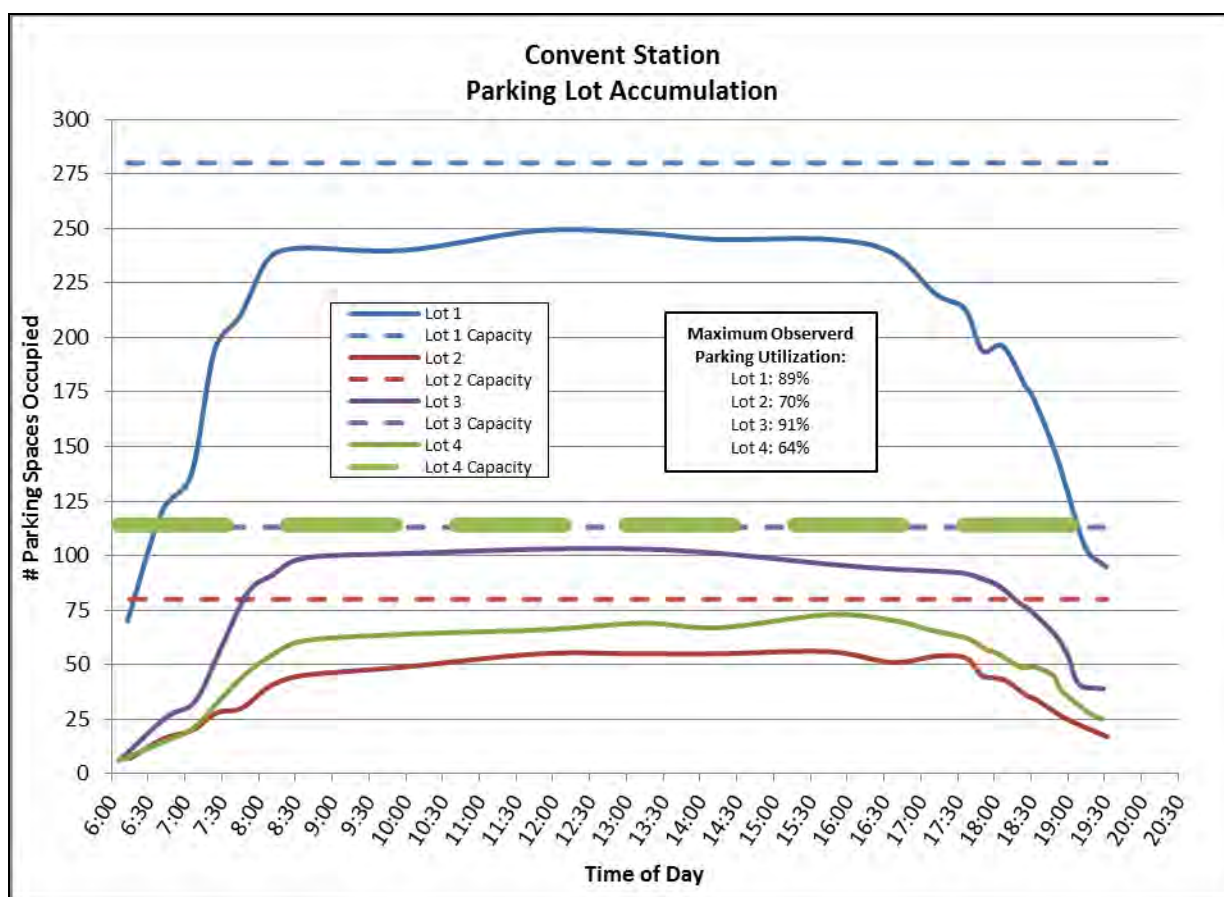






Table 2-21: Convent Station Parking Duration by Lot (hh:mm)

Lot #	Parking Type	Minimum Duration	Average Duration	95 <sup>th</sup> Percentile Duration
1	Daily	10:04	12:12	13:00
	Permit	10:09	12:08	13:03
2	Daily	7:42	11:58	12:58
3	Permit	9:10	12:01	12:53
4	Daily	5:19	10:23	12:56
	Permit	10:34	11:46	12:49

Unlike the other two stations in the study area, Convent Station has some excess parking capacity in all of these commuter lots. Anecdotal information provided by municipal officials indicates that this has been the case since the recent recession began in 2008, and Morris Township has been selling more non-resident parking permits to offset this decline in parking activity.

## 2.5 Bicycle/Pedestrian Infrastructure and Access

The infrastructure and information resources available to pedestrians and bicyclists regarding this corridor were reviewed with the intent of determining if improvements are required or would be effective in shifting auto users to non-motorized modes.

Pedestrian and bicyclist access to each of the three NJ TRANSIT stations was evaluated. Traditionally, it has been considered that about a quarter mile, or a five minute walk, is the longest distance most people are willing to walk to transit. However, a recent publication of the Transportation Research Board (TRB) indicates that most pedestrians are willing to walk at least a half mile to access transit stations. In the time it takes to walk a half mile (10 minutes), a bicyclist can travel more than two miles, which substantially increases the area from where potential bike riders may ride to access a station.<sup>13</sup> For perspective, two miles is the approximate distance, via NJ 124 between Chatham and Madison Stations, and between Madison and Convent Stations.

The examination of existing bicycle and pedestrian access to each of the three stations in this study was performed through three primary means: review of

<sup>13</sup> Kittleston & Associates, et al. *TCRP Report 153: Guidelines for Providing Access to Public Transportation Stations*. Transportation Research Board of the National Academies, Washington, D.C., 2012.



existing maps and documents, field visits, and examination of aerial photography. Existing conditions information for bicycle access is presented first for all three stations, followed by existing conditions for pedestrian access.

In addition, the information and comments provided by the general public, community organizations, and advocacy groups were invaluable in understanding the conditions and needs at and around each station. Bicycle and pedestrian related feedback was received from local organizations including TransOptions, the Morris Area Freewheelers, Friends of Madison Train Station, Marty's Reliable Cycles, Rose City Steppers, Senior Citizens Advisory Committee, Madison Senior Center Foundation, as well as from NJ TRANSIT and many different municipal departments and agencies, universities, and private individuals. Bicycle and pedestrian access issues were also attained through the web travel survey. Generally, the following bicycle and pedestrian-related feedback has been received regarding the study area:

- Many people walk or bicycle to the stations.
- There has been some reported bicycle theft at the stations.
- More bicycle lockers and bicycle racks are needed.
- Bicyclists would like the Traction Line Recreation Trail extended into Madison.
- Pedestrians are concerned about station lighting.
- Trailblazers and information signage is needed at the stations.
- Maintenance and repair of cracked and uneven sidewalks, as well as snow removal, is needed.

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### **2.5.1 Bicycle Access**

The existing conditions for bicycle access vary greatly throughout the entire corridor study area. The Borough of Madison, with an adopted bicycle plan, has implemented several bicycle routes. Within Chatham Borough, there are no designated bicycle routes except for NJ 124. Near Convent Station, the Traction Line Recreation Trail is a substantial amenity, but it is primarily a recreational trail and not connected to other bicycle or pedestrian routes. The trail extends from Morristown's Washington Headquarters to Convent Station, Academy College and Convent of St. Elizabeth, Fairleigh Dickenson University, and to Danforth Road in Madison. It does not currently connect to the center of Madison. Finally, NJ 124, although designated on maps as a bicycling facility, has intermittent signage and bicycle stencil markings.

TransOptions, a transportation-oriented non-profit organization that is one of the eight Transportation Management Associations (TMAs) in New Jersey, provides many bicycling related programs in northwestern New Jersey to improve mobility, the environment, and overall quality of life. They support biking



through a variety of programs including the Bike to Work program that includes Bike Right® Commute Route Planning where TransOptions staff work with individuals to plan the best route for that individual as well as tips on bicycle commuting, among other items. TransOptions also manages the bicycle locker rental program for the lockers located at the study area train stations, which is described in more detail below. More information is available at <http://www.transoptions.org/?p=bike-to-work>.

The primary source for information about bicycling facilities in this study area is the Morris County Bicycle & Pedestrian User Guide, 2nd Edition, which was published in 2004. This map shows existing and proposed bicycle and trail routes, however it needs to be updated to reflect current conditions. Nevertheless, this is the most complete map published for bicyclists and pedestrians in this area and the overall map provides a great deal of information about bicycle and pedestrian amenities. The full map can be found on the Morris County Division of Transportation website: <http://www.morrisdot.org/bikeped/bikeped-general.asp>. The Morris County map uses designations for bicycle and pedestrian facilities that are atypical from other maps of this kind. Typically, maps show the type of bicycle facility and distinguish between a striped bicycle lane or only signage without a designated lane. The Morris County map groups these, which may be confusing for bicyclists. For example, one description for “Bicycle Lanes” states that the lane may be “designated by striping, pavement markings, and/ or signage for bicycle use only.” This description indicates the route may be signed only, which would not provide a lane at all. Similarly, the “Shared Roadways” designation states these are “roads without designated bicycle lanes, sidewalks or paths...but which are utilized for bicycle and pedestrian activity.” Typically, a shared roadway would indicate the use of signage to alert bicyclists and drivers that this is a bicycle route. However, this description is unclear regarding whether these routes are signed, or if they are merely appropriate for bicycle use. Finally, the description of “Multi-use Paths or Trails” describes “trails as not paved and paths as paved,” however; the Traction Line Recreation Trail is paved.

The following map, Figure 2-38 was created to show the bicycle facilities that currently exist within the study area. Most are within the borders of Madison Borough. Similar maps were created for each station area, showing the location of the routes within close proximity to the railroad station.



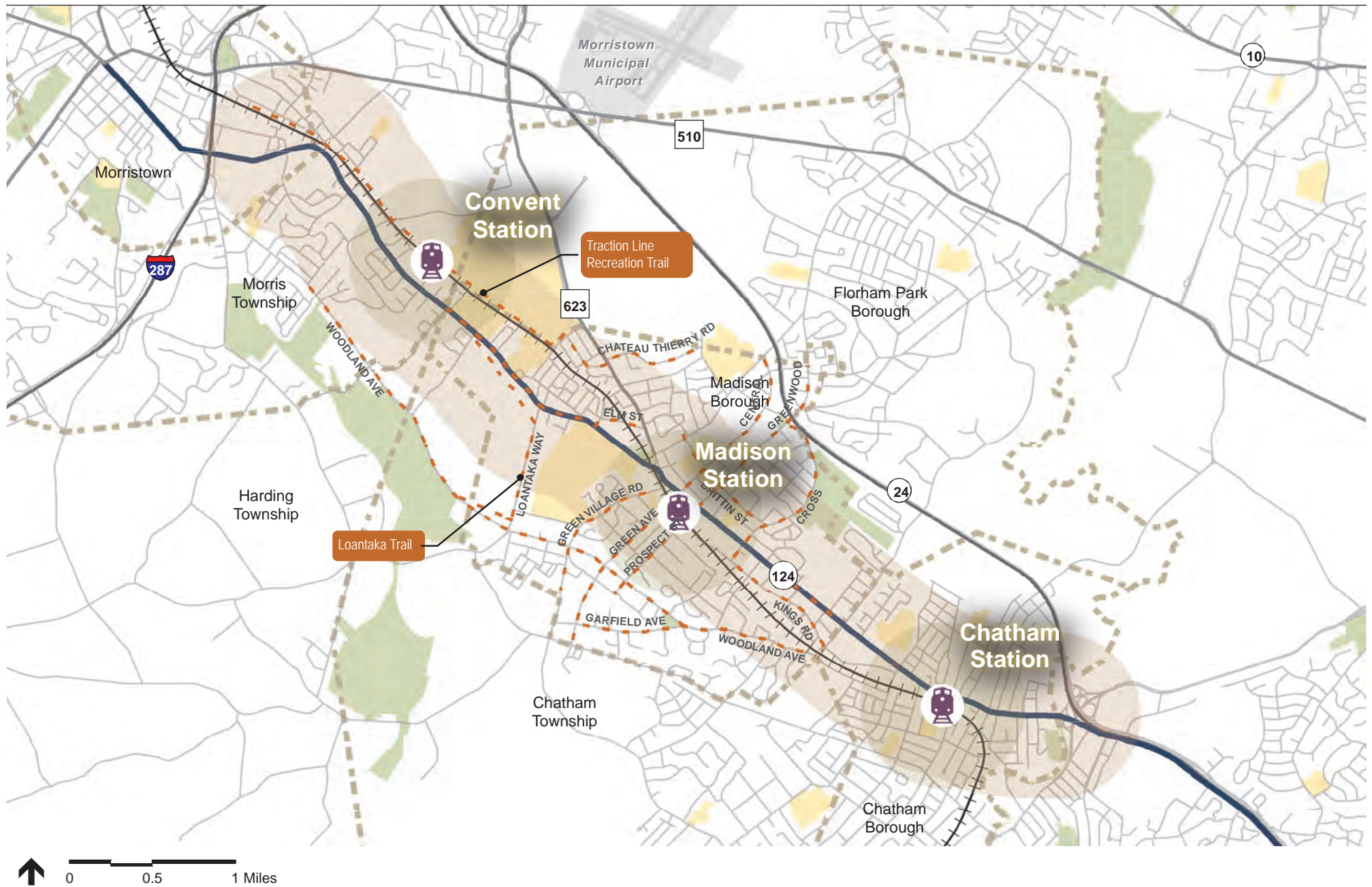
# **NJ 124 Corridor**

## **Transit Access Improvement Study**

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Morris County NJ 124  
Transit Access Study

## Bicycle Network In Study Area

FIGURE 2-38



The following provides information on bicycle racks and lockers and bicycle facilities within a ½ mile radius of the three station areas. Additional detail on specific crash locations involving bicyclists are discussed in the safety section of this report.

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### **2.5.1.1 Chatham Station**

At Chatham Station there are 22 bicycle racks which accommodate 44 bicycles and 16 single-bicycle lockers. The bicycle racks are located along the sides of the train station under the roof overhang (Figure 2-39), which provides some protection from the elements. During a site visit to the station on February 29, 2012, there were 17 bicycles and three scooters parked at the bicycle racks. In the summer, on July 30, 2012, there were 21 bicycles and five scooters parked at the racks.

The bicycle lockers are located on the inbound side of the station (Figure 2-40). According to TransOptions, as of January 2012, 10 of the 16 lockers were rented. Fees for lockers were the same as at Chatham and Convent Stations.

- Six Month Lease: Rental fee of \$45, plus key deposit of \$25 for a total of \$70
- One Year Lease: Rental fee of \$90, plus key deposit of \$25 for a total of \$115

The comments received from stakeholders and the public included requests for additional bicycles racks and lockers, suggesting that usage of these facilities in warm weather periods is higher than observed in February. It was also reported that bicycle theft is minimal.



Figure 2-39: Bicycle Racks at Chatham Station



Figure 2-40: Bicycle Lockers at Chatham Station





Figure 2-41 shows a one-half mile radius around the Chatham Station, and illustrates in green the location of nearby bicycle routes. It is notable that all bicycle routes to the west are terminated at the border of Chatham Borough.

Within Chatham Borough there are no signs or markings for any bicycle routes. However, there is some signage on the border of Chatham Borough and Madison (see Figure 2-42). The *Morris County Bicycle & Pedestrian User Guide* from 2004 shows two roadways, Fairmount (CR 638) and Watchung (CR 646) Avenues, as shared bicycle/ vehicle facilities, and identifies NJ 124 as a bicycle route. However, no signage to this effect was observed along these roads. Fairmount Avenue is the primary access roadway to Chatham Station and NJ 124 has shoulders outside of the downtown area that are generally wide enough to accommodate bicyclists.

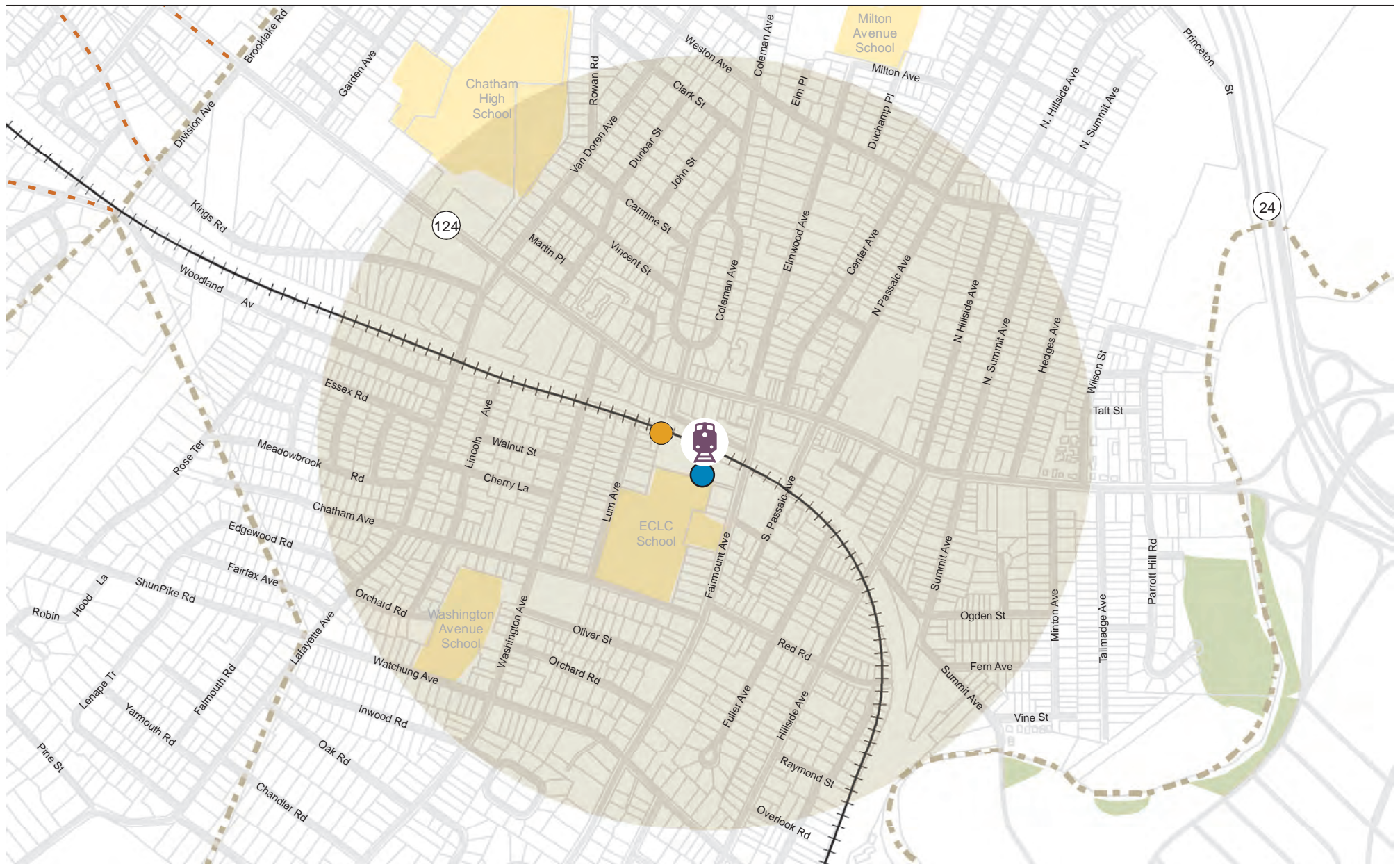
In March 2012, Chatham Borough adopted A Complete Streets Policy Plan: Final Report: An Amendment to the Chatham Borough Circulation Element/ Master Plan. Chatham's policy states:

“The New Jersey Department of Transportation's (NJDOT) Complete Streets Policy, which served as a guide for the Borough of Chatham, defines a complete street “as a means to provide safe access for all users by designing and operating a comprehensive, integrated, connected multi-modal network of transportation options”. (Chatham Borough, A Complete Streets Policy Plan, 2012, p.4)










The document does not provide a plan of bicycle facilities, but recommends the consideration of adding bicycle facilities as roadways are improved or reconstructed. It also sets the priority and intention of Chatham Borough to implement future bicycle and pedestrian amenities.

Additional comments from stakeholders included a request for improved bicycle and pedestrian access to the station to encourage those who live nearby to relinquish their parking permits.





0 500 1,000 Feet

-  Town Line
-  Railroad Line
-  Train Station
-  1/2 Mile Radius
-  School, College or University
-  Parks
-  Bicycle Paths
-  Bicycle Racks
-  Bicycle Lockers



Morris County NJ 124  
Transit Access Study

## Chatham Station Bicycle Access

FIGURE 2-41



**Figure 2-42: Share the Road Signage on Westbound NJ 124 at Division Avenue/Brooklake Road**



### 2.5.1.2 Madison Station

At Madison Station there are 31 bicycle racks which accommodate 62 bicycles and six single bicycle lockers. The bicycle racks under the elevated train tracks and the station underpass are well situated in avoiding inclement weather. All 31 bicycle racks are located in the following locations:

- Inside the underpass tunnel under the station building (three racks/ capacity for six bicycles).
- On both sides of Green Avenue between Kings Road and Lincoln Place (north of train station – 22 racks/ capacity for 44 bicycles). Shown in Figure 2-43.
- On Prospect Street between Kings Road and Lincoln Place (south of train station – six racks/ capacity for 12 bicycles).

During a site visit to the station on Wednesday, February 29, 2012, of the bicycle parking on Green Avenue, half of the 44 bicycle parking spaces were filled. On Monday, July 30, 2012, there were 29 bicycles parked at the station.

**Figure 2-43: Bicycle Parking on Green Avenue at Madison Station**



The bicycle lockers are not located at the station, but in the Kings Road parking lot south of Prospect Street (Figure 2-44). According to TransOptions, as of January 2012, three of the six lockers were rented (additional information received in June 2012 shows five of the six lockers rented). Fees for lockers are the same as at Chatham Station. The remote location may discourage use and may be the reason why Madison Station, which is much busier than Chatham Station, has 10 fewer lockers.

**Figure 2-44: Remote Madison Station Bicycle Lockers in the King Street Lot**





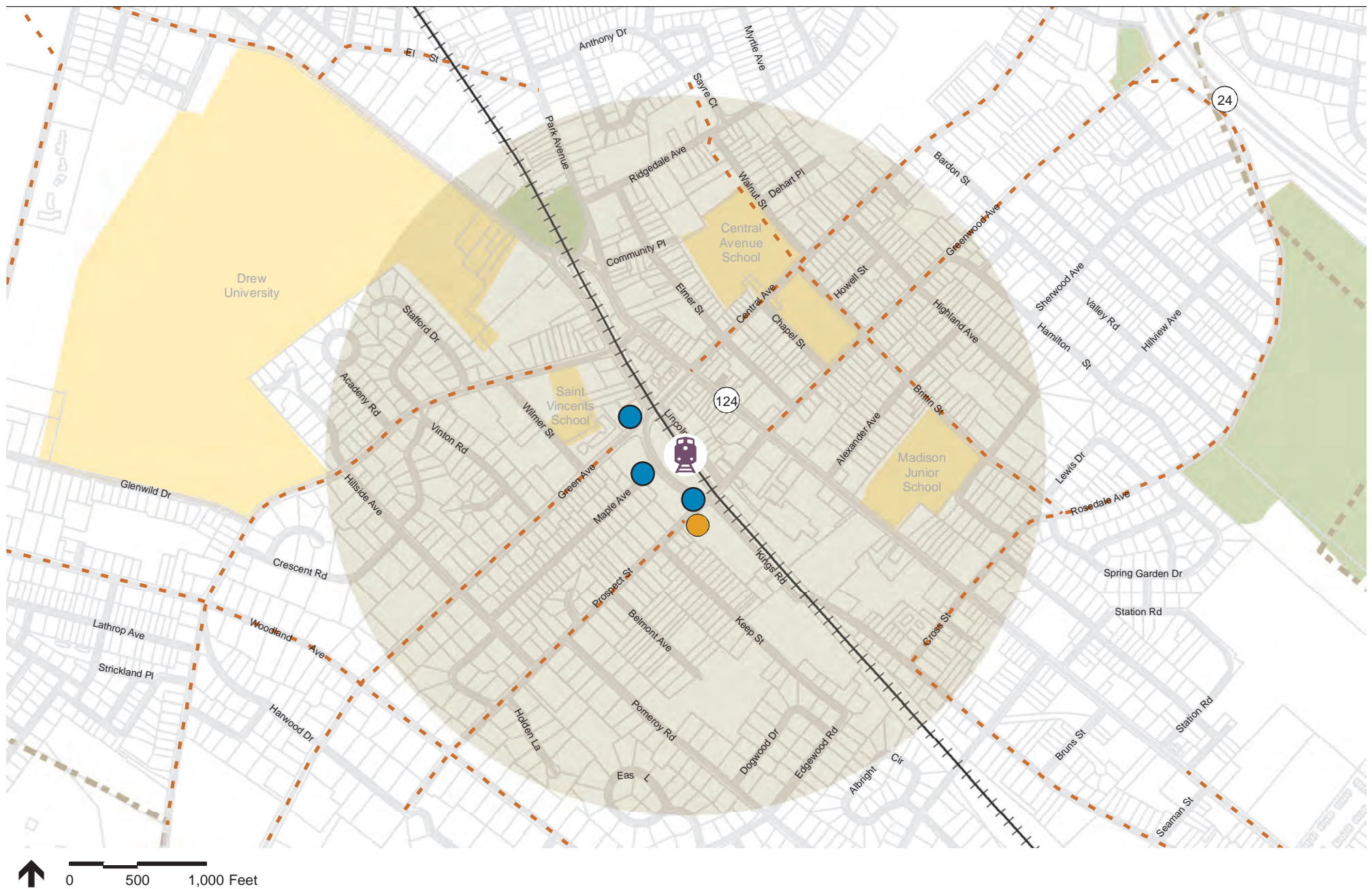
The Borough of Madison has a relatively robust bicycle facility network as compared to the two other station locations. Madison completed a bicycle route plan in 2005 and bicycle facilities have been implemented on many of the streets that are proximate to the Madison Station. Figure 2-45 shows the streets around Madison Station with bicycle route signage or bicycle lanes with “Share the Road” signage. These include the following streets:

- NJ 124/ Main Street outside of the downtown
- Green Avenue/ Central Avenue
- Prospect Street/ Greenwood Avenue
- Rosedale Avenue
- Woodland Road
- Brittin Street
- Kings Road
- Garfield Avenue
- Green Village Road
- Elm Street

The condition of the bicycle facilities and implementation vary. Signage and bicycle stencil markings are generally infrequent. The type of signage varies from a standard bicycle route sign to “Share the Road” signage. The quality of markings also varies significantly.

The Woodland Avenue bicycle lanes appear to be relatively new and provide an example of easy-to-see bicycle stencil street markings (Figure 2-46). It is important that drivers can see the markings so they are aware this is a bicycle route.





Morris County NJ 124  
Transit Access Study

## Madison Station Bicycle Access

FIGURE 2-45

**Figure 2-46: Visible Bicycle Stencil and Sign on Westbound Woodland Avenue at Green Avenue**



Figure 2-47 shows a bicycle stencil on Rosedale Avenue. From the driver's perspective, the stencil is nearly invisible; the driver is not aware this is a bicycle route.

**Figure 2-47: Southbound Rosedale Avenue Bicycle Marking is Barely Visible**





The photo below (Figure 2-48) shows a Share the Road sign and a bicycle stencil, but the stencil is not visible until the car is next to the sign, and the sign is obscured by trees.

**Figure 2-48: Southbound Rosedale Avenue Bicycle Facility**



This example (Figure 2-49) from northbound Greenwood Avenue illustrates poor placement of a Share the Road sign immediately behind a telephone poll. It is not visible to the drivers that it intends to inform. Bicyclists share the road with vehicles, but also contend with curbside parking as shown in the photo.

**Figure 2-49: Poor Placement of Share the Road Sign on Northbound Greenwood Avenue**



Despite these examples of improvements that are needed within Madison Borough, the municipality's efforts have been beneficial in encouraging bicycle use. Figure 2-50 highlights bicycle usage on Green Avenue. A mother and child riding together in an on-street bicycle lane (as faint as the bicycle stencil may be), is an excellent indicator this bicycle lane is perceived as useful and safe by area residents.

**Figure 2-50: Mother and Child Bike Riding on Northbound Green Avenue**



There is sparse bicycle signage or markings to guide bicyclists to or from the Madison Station. Presumably due to traffic congestion, the Bicycle Route Plan does not address the station area at all. As bicycle routes to the north and south of NJ 124 approach Madison Station, they end. On northbound Prospect Street and Green Village Road, it appears that bicycle routes end at green bicycle route signs directing riders toward “downtown”. In most cases, the bicycle routes end only a short block from Kings Road for routes south of the station, and a short block from NJ 124 for routes north of the station. Adding bicycle signage or designated bicycle routes to the station area would be beneficial.

Finally, along NJ 124 there is a great deal of inconsistency in bicycle markings and signage. Starting at the western edge of Madison, near Fairleigh Dickinson University at about Kitchell Road, the shoulders of NJ 124 are marked with bicycle stencils and Share the Road signage. This continues until just west of downtown Madison, when all stencils and signs abruptly cease, with no wayfinding or warning. East of the downtown, there are no bicycle markings or

signage. However, at Seaman Avenue, the bicycle stencils and signage resume. Continuing east on NJ 124, the shoulder bicycle markings and signage continue until reaching downtown Chatham, where they end at about Washington Avenue and NJ 124/ Main Street.

Additional comments received during the public outreach efforts regarding cycling in and around Madison Station include requests to extend the Traction Line Recreation Trail into Madison to connect with the Madison Station, make Park Avenue a complete street, and improve bicycle access from Drew University to Madison Station.

### 2.5.1.3 Convent Station

At Convent Station there are five bicycle racks with parking for 10 bicycles, as well as 10 single bicycle lockers. These facilities are located northwest of the station building, adjacent to the platform (Figure 2-51). According to TransOptions, as of January 2012 all 10 lockers were rented, and there were four people on a waiting list. During a site visit to the station on Wednesday, February 29, 2012, two bicycles were observed parked at the rack. On Monday, July 30, 2012, four bicycles were parked at the rack. Fees for lockers at Convent Station are the same as at Chatham and Madison Stations.

**Figure 2-51: Bicycle Parking & Lockers at Convent Station**



Figure 2-52 illustrates the bicycle routes near Convent Station.



# **NJ 124 Corridor**

## **Transit Access Improvement Study**

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- Town Line
- Railroad Line
- Train Station
- 1/2 Mile Radius
- School, College or University
- Parks
- Bicycle Route or Facility
- Racks
- Lockers



Morris County NJ 124  
Transit Access Study

## Convent Station Bicycle Access

FIGURE 2-52



One multi-use (bicycle and pedestrian) paved trail is located near Convent Station. The Traction Line Recreation Trail connects directly to the Convent Station and abuts the adjacent Liberty Greens townhouse residential development, and is located parallel to and north of the tracks (Figure 2-53). This 3.2 mile long path stretches from Morristown (Morris Avenue just east of I-287) to the intersection of Danforth Road and Dreyfuss Road within Madison. The trail covers about half of the distance between Convent and Madison train stations. An extension of the Traction Line Recreation Trail from Danforth Road to Elm Street (about 0.6 mile) in Madison is currently being planned by the Morris County Parks Commission.<sup>14</sup> This extension would not reach the Madison Station, but would close a portion of the gap. Comments received from stakeholders include the need to eliminate or ease the stairway along the Traction Line at Normandy Parkway, northwest of Convent Station, because it requires riders to dismount and carry their bicycles. The addition of a channel (see Figure 5-21 in Chapter 5) that runs along the stairway allowing a bicyclist to push the bicycle up and down the stairs was suggested.

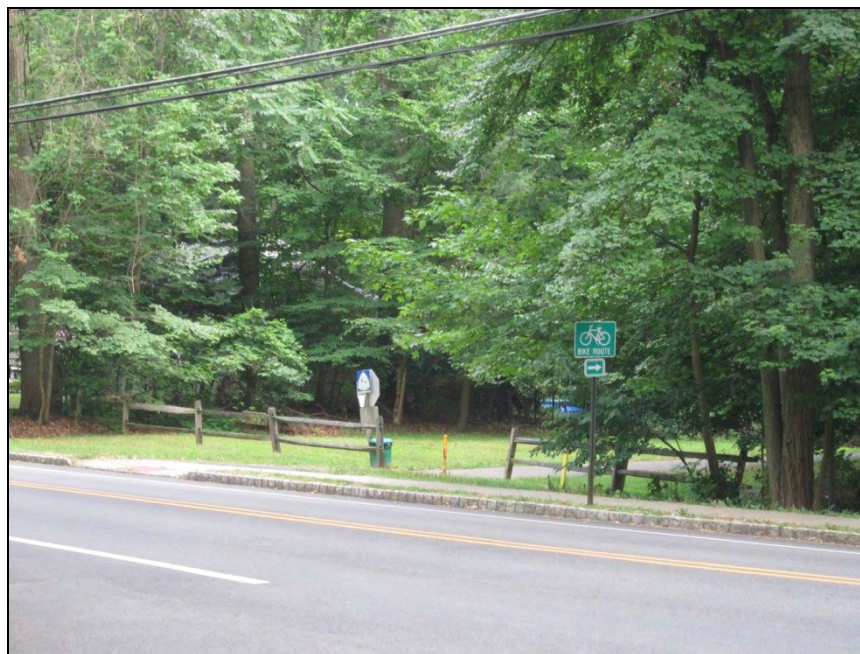
**Figure 2-53: Traction Line Trail at Convent Road Grade Crossing at Convent Station**



<sup>14</sup> The NJ.com news website reports that the Madison Borough Council rejected Morris County's request for support to submit a state grant application for the extension of the Traction Line. Citing safety and security concerns, the Borough Council further passed a resolution opposing the plan.

There is only one signed bicycle route near Convent Station. Convent Road, between the Traction Line Trail and NJ 124, has bicycle route signs posted. Presumably, the intent is to connect the Traction Line Trail with the bicycle route along NJ 124. This segment of NJ 124 is shown on the Morris County map as a bicycle route, however, there are no signs or markings/ bicycle stencils on NJ 124 near Convent Road. The map also shows a potential route along Fox Hollow Road that would connect from the station south to the Loantaka Brook Reservation, where a number of trails currently exist (entrance shown in Figure 2-54). Fox Hollow Road, however, is a steep and narrow two-lane road that would need bicycle improvements, such as the addition of shoulders, before it's designated as a bicycle route.

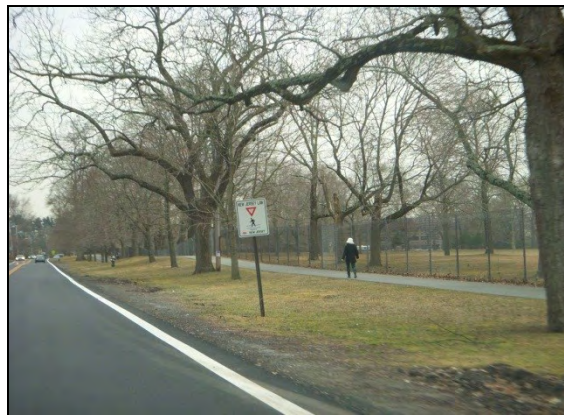
**Figure 2-54: Loantaka Brook Reservation Trail Head at Woodland Avenue and Canfield Way**



Woodland Avenue, which connects to the entrance to the Loantaka Brook Reservation, is a designated bicycle facility, with signs and occasional bicycle stencils. The Woodland Avenue bicycle facility connects to the east through the Borough of Madison and connects to routes within the Madison Station area. Refer back to Figure 2-38 for the Woodland Avenue connection through these communities. Additional bicycle facility markings and signage would be helpful to the cyclist and driver. In addition, located along the south side of NJ 124 between Convent Station and Madison Station, is a paved multi-use trail. The most westerly trailhead is located at the intersection of NJ 124 and Treadwell Avenue, a little over a half mile southeast of the Convent Station. This trail loops

around Giralda Farms, but no indication of a formal name was found. This trail heads southeast, paralleling NJ 124 (Figure 2-55), then south along Loantaka Way toward the Loantaka Brook Reservation. This path could connect residential neighborhoods to NJ 124 and the Convent and Madison Stations. The trail is located within the Borough of Madison; however it is more proximate to the Convent Station.

**Figure 2-55: Multi-Use Trail along the South Side of NJ 124**



### 2.5.1.4 All Stations

On June 11, 2012, NJ TRANSIT announced an expansion of the Bike Aboard Policy that allows bicycle boarding at all train stations. The expanded policy became effective July 1, 2012. This policy allows collapsible bicycles on all NJ TRANSIT trains at all times. Standard frame bicycles are also permitted at most times, however, there are several exceptions. Times when bicycles are not allowed include the following:

- Weekdays on trains inbound toward Hoboken, Newark, or New York from 6 AM to 10 AM, and on outbound trains that originate in those locations between 4 PM and 8 PM.
- Weekends on trains inbound toward New York between 9 AM and 12 PM, and on outbound trains from New York from 5 PM to 8 PM.
- Major holidays, and the business day before the holidays.
- Substitute bus service during rail service outages.



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### **2.5.2 Pedestrian Access**

The pedestrian conditions for transit access improvements for the three stations along NJ 124 were examined for a distance of a one-half mile radius from the station. This is the typical distance that many potential transit riders are willing to walk to access transit, however, some may be willing to walk further with appropriate connections. A detailed inventory of sidewalks, crosswalks, and pedestrian signals was prepared for each station area and are shown on maps. The following sections present a discussion of each station area, along with the pedestrian facility inventory maps. Additional detail on specific crash locations involving pedestrians are discussed in the safety chapter of this report.

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#### **2.5.2.1 Chatham Station**

The area around the Chatham Station is a highly walkable, pleasant environment. Figure 2-56 shows the pedestrian amenities located within a half mile of Chatham Station. There are short block lengths which create easy connectivity from and between each major street. As shown in the figure, most streets have sidewalks, and those that do not are residential streets with low traffic volumes that are consistent with the lack of sidewalks. Chatham Borough has employed a variety of pedestrian safety measures such as flashing pedestrian-activated signals, the Safe Routes to School program, and crosswalks at all key intersections. Many of these are visible in the following photos.

Some streets create ideal pedestrian environments, as shown in the pictures below. Coleman Avenue (Figure 2-57) is an example of a wider street with sidewalks and trees that makes for a welcoming walking environment. Essex Road (Figure 2-58), with a basketball hoop on the shoulder, does not provide sidewalks but is generally safe for play and walking due to low traffic. Nevertheless, it is important to note that many neighborhood streets are not lit, so some may find walking during early morning and evening hours difficult.



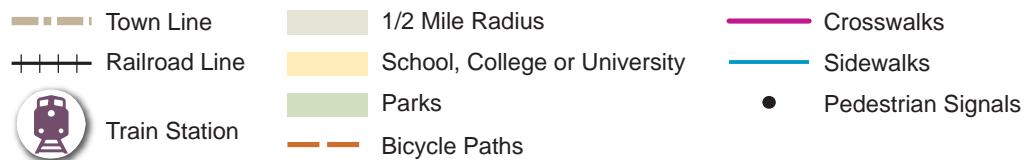
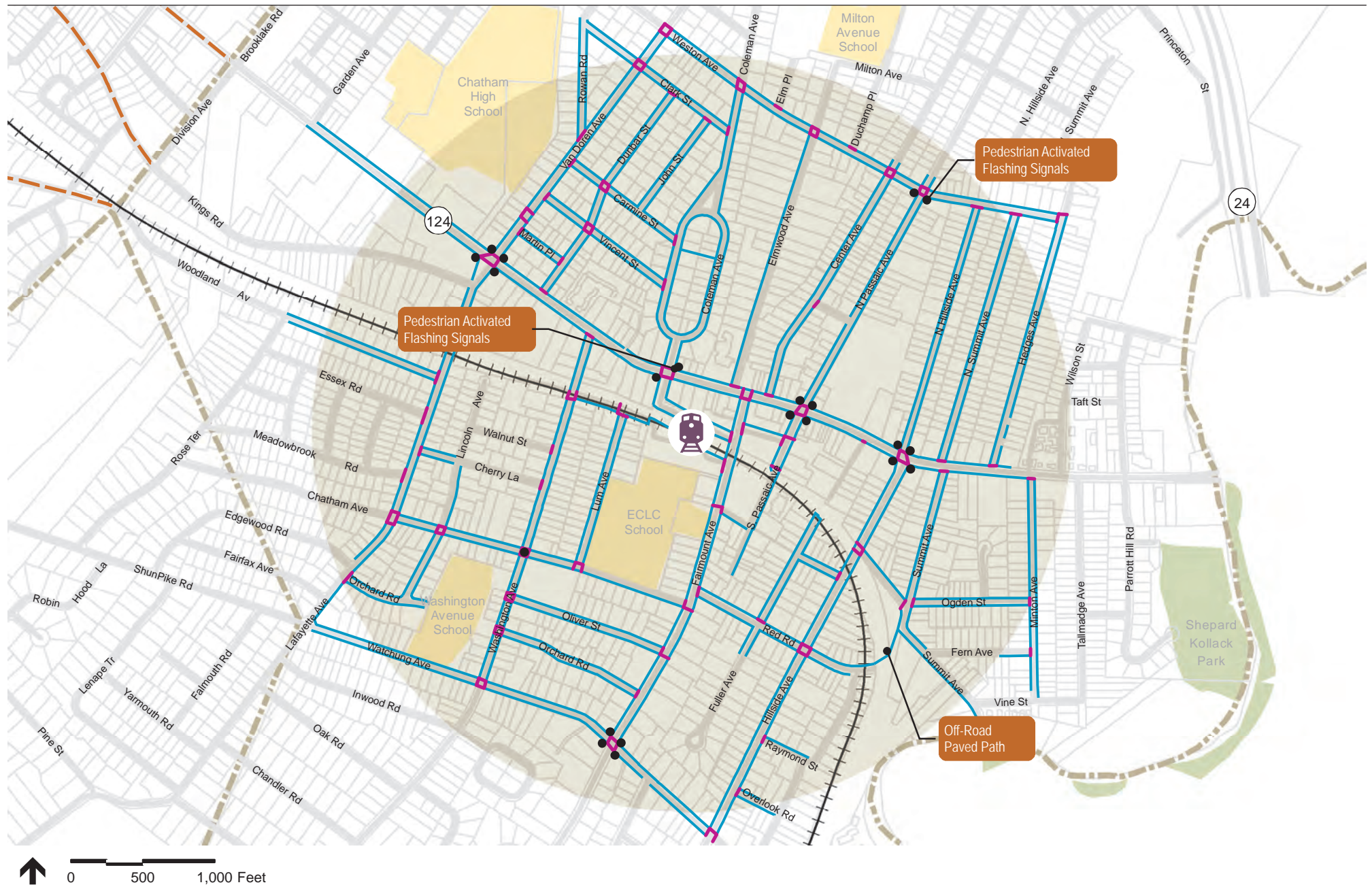


# **NJ 124 Corridor**

## **Transit Access Improvement Study**

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Morris County NJ 124  
Transit Access Study

## Chatham Station Pedestrian Amenities

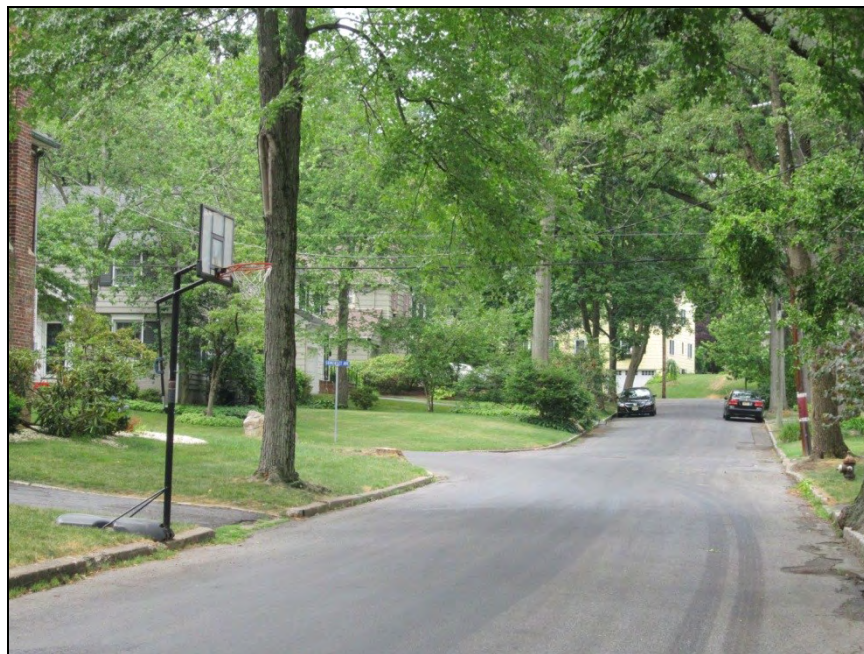
FIGURE 2-56



**Figure 2-57: Ideal Pedestrian Environment-Southbound Coleman Avenue at Weston Avenue**

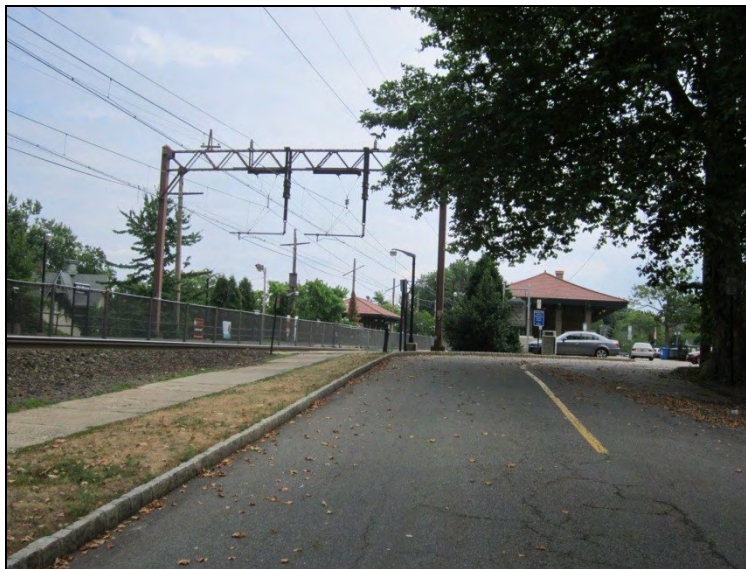


**Figure 2-58: Westbound Essex Road, with Basketball Hoop**



Although Chatham Station is generally pedestrian accessible (Figure 2-59), with sidewalks connecting to it from all sides, there are one or two exceptions. One gap in this connection is the lack of crosswalks at the intersection of NJ 124/ Main Street and Washington Avenue. This intersection provides residents of neighborhoods to the northwest of NJ 124 access to the station. The intersection of Coleman Avenue and NJ 124 is a heavy crossing point to access the station, and pedestrian activated flashing signals (Figure 2-60) have been installed to alert motorists of pedestrian crossings. Comments from stakeholders noted that there are many pedestrians that cross here in the evenings and that even the flashing signal can seem inadequate. The police department and NJDOT are evaluating if this location may meet a traffic signal warrant, which could improve pedestrian crossing safety<sup>15</sup>.

**Figure 2-59: Sidewalk to Chatham Station along Front Street**



<sup>15</sup> [Sidewalk ordinances in Chatham Borough to be consolidated](http://www.nj.com/independentpress/index.ssf/2013/06/sidewalk_ordinances_in_chatham.html#incart_river)  
[http://www.nj.com/independentpress/index.ssf/2013/06/sidewalk\\_ordinances\\_in\\_chatham.html#incart\\_river](http://www.nj.com/independentpress/index.ssf/2013/06/sidewalk_ordinances_in_chatham.html#incart_river)

“Collander also let the council know that the state will install a new crosswalk light at the Main Street and Coleman Avenue intersection this summer. The old crosswalk light will then be placed at Fairmount Avenue railroad crosswalk to promote pedestrian safety.”



**Figure 2-60: Flashing Pedestrian Activated Signal on Westbound NJ 124 at Coleman Avenue in Chatham**

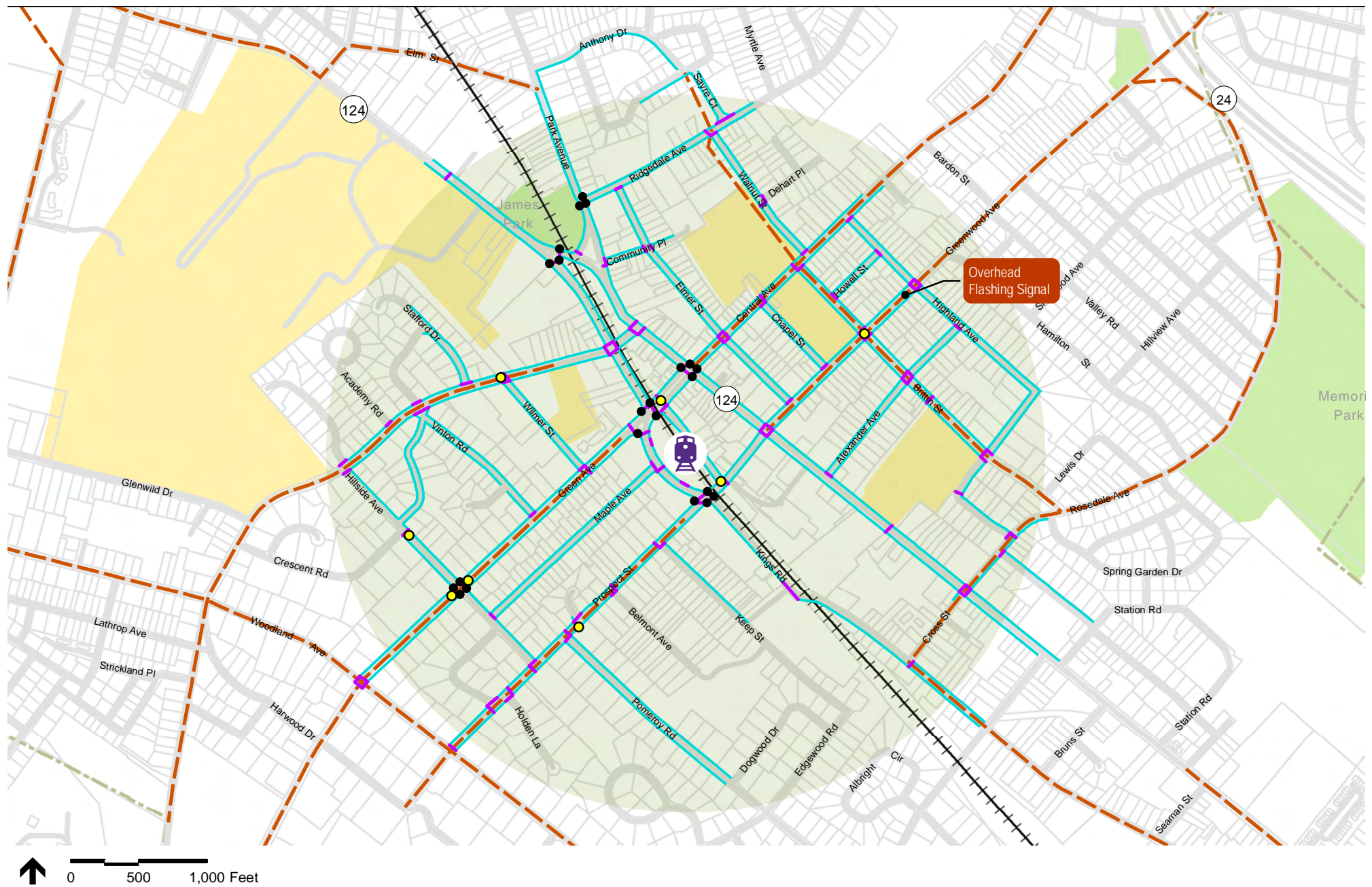


Another gap in pedestrian connectivity is the distance between the station and the residential neighborhood southwest of the station. Creating a direct connection for walkers and bicyclists through the school fields located directly south of the station could greatly reduce the time it takes to walk to and from the station.

Additional comments received include requests for lighted crosswalks under the railroad trestle.

### 2.5.2.2 Madison Station

The ½ mile area surrounding Madison Station is very pedestrian friendly. As shown in the Pedestrian Amenities map in Figure 2-61, almost all roadways in the area have sidewalks, with numerous crosswalks and pedestrian signals. Madison also employs a variety of traffic calming techniques to slow traffic and improve pedestrian safety. The photo in Figure 2-62 shows the use of a pedestrian bollard located in the middle of the street to alert motorists to possible pedestrians. The “Slow” marking with the chevrons also reinforces the pedestrian crossing.



- |  |               |  |                               |  |                    |
|--|---------------|--|-------------------------------|--|--------------------|
|  | Town Line     |  | 1/2 Mile Radius               |  | Sidewalks          |
|  | Railroad Line |  | School, College or University |  | Crosswalks         |
|  | Train Station |  | Parks                         |  | Pedestrian Signal  |
|  |               |  | Bicycle Route or Facility     |  | Pedestrian Bollard |



Morris County NJ 124  
Transit Access Study

## Madison Station Pedestrian Amenities

FIGURE 2-61



**Figure 2-62: Traffic Calming for Pedestrian Crossing on Green Avenue Northbound at Hillside Avenue**



On Greenwood Avenue, near the Central Avenue School athletic fields and a playground, the crosswalks are illuminated by an overhead flashing signal, a bright yellow “Safe Routes to School” sign, a “stop for a pedestrian in the crosswalk” signage, and a “Slow” markings with chevrons (Figure 2-63).

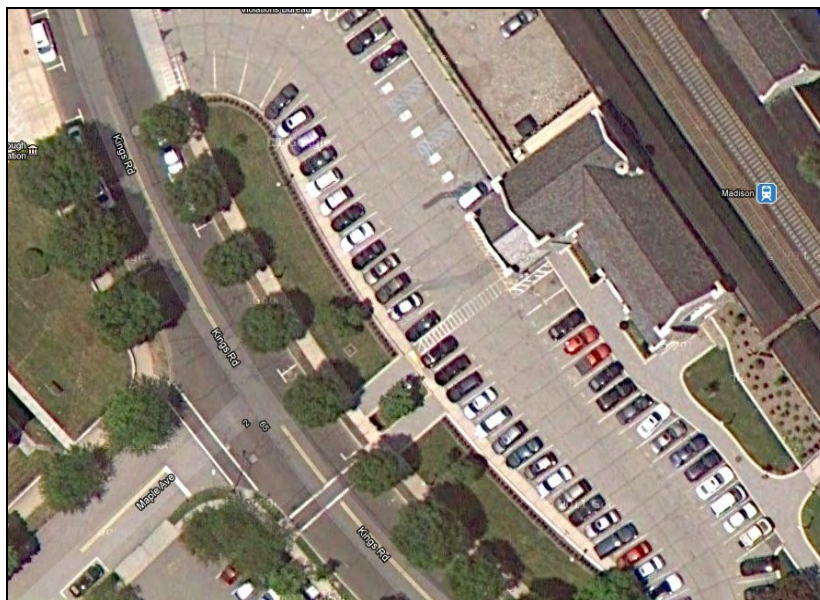
**Figure 2-63: Pedestrian Crossing Safety Items at Greenwood Avenue Northbound at Brittin Street**



Pedestrian access to Madison Station is generally good, however, as in the bicycle access section, more careful attention to planning connections could improve it.

For example, as shown in Figure 2-64, although there is a crosswalk from Maple Avenue across Kings Road to the station, this crosswalk leads to a pedestrian cut-through and straight into a parked car. As the aerial shows, the other pedestrian cut-through leads to a striped pedestrian path to the station. Careful planning and restriping of the parking lot can easily rectify this situation.

**Figure 2-64: Kings Road Crosswalk and Pedestrian Path**



Stakeholder comments have been received about Kings Road having a narrow sidewalk to provide shade, and that the walk from the Kings Road parking lot to the station is very dark at night and early morning.

### 2.5.2.3 Convent Station

Of the three stations in this study area along NJ 124, Convent Station is the least accessible by pedestrians. As shown in Figure 2-65, there are few connection opportunities, and very few sidewalks. The Traction Line Recreation Trail provides a major connection opportunity. A large residential development, known as Liberty Greens, is located northeast of the trail and station, and residents can use the trail to access the station. However, there are few other residents or workers located within ½ mile of the station. Access to the rail station from the Traction Line Trail is provided along the north side of the tracks. Pedestrians and bicyclists are required to cross the tracks to access the station.



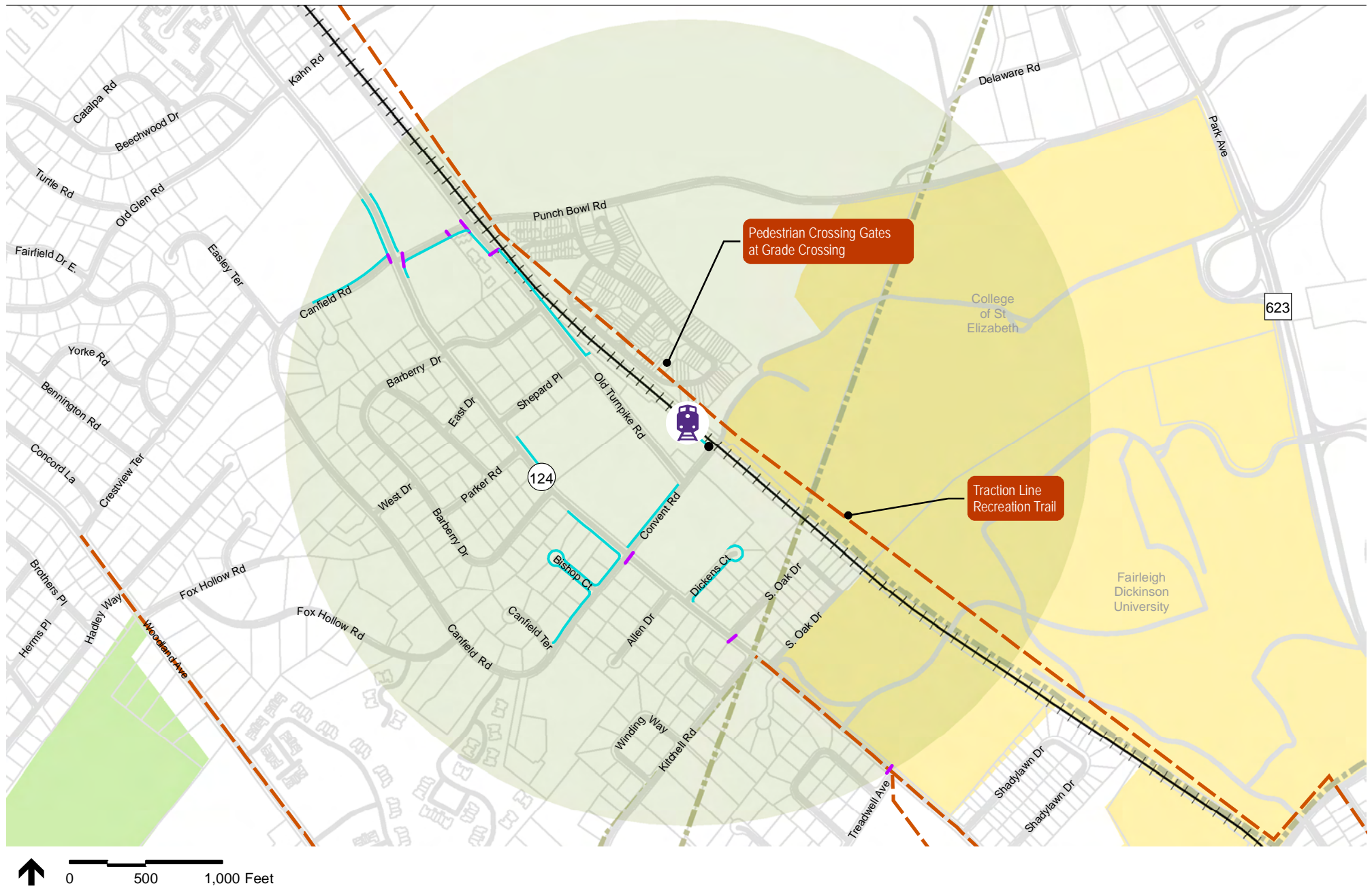


# **NJ 124 Corridor**

## **Transit Access Improvement Study**

Final Report

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Morris County NJ 124  
Transit Access Study

## Convent Station Pedestrian Amenities

FIGURE 2-65

There are pedestrian gates at the grade crossing (Figure 2-66) to prevent pedestrians from walking across the tracks when a train is arriving. However, pedestrians have been observed going under the pedestrian gate to access the train, and stakeholders suggested a public education effort such as Operation Lifesaver be employed.

**Figure 2-66: Pedestrian Crossing Gate at Convent Station**



There are generally few pedestrian amenities in the area. There are almost no sidewalks located within a half mile of the station, with the exception of around particular housing or corporate developments. In the low density residential neighborhoods south of NJ 124, sidewalks are not required. With little vehicular traffic, walking can still be safe in these neighborhoods. One exception is the sidewalk extending along Old Turnpike Road from Punch Bowl Road to the west end of the station parking lot. This sidewalk is located mostly adjacent to the rail right of way. There is a gap in the sidewalk as it crosses an unpaved driveway. Continuing the sidewalk across the driveway would enable pedestrians to connect directly to the station without being forced to walk (Figures 2-67a and 2-67b) through the parking lot to the station.



Figure 2-67a: Old Turnpike Road Sidewalk to Convent Station



Figure 2-67b: Old Turnpike Road Sidewalk to Convent Station



Old Turnpike Road near Convent Road is an unwelcoming street to pedestrians. With no sidewalk, pedestrians are required to walk behind parked cars (note the worn pedestrian path 2-67b). Public comments received suggested this roadway be improved for both pedestrians and bicyclists (Figure 2-68).



**Figure 2-68: Westbound on Old Turnpike Road from Convent Road**



At the intersection of NJ 124 and Convent Road/ Canfield Road there is a pedestrian crossing across NJ 124. This location, however, illustrates the lack of planning that has occurred. As shown in Figures 2-69 and 2-70, the crosswalk across NJ 124 is located on the southeast side of the intersection, whereas the sidewalk along Convent Road is located on the opposite side of the street. Although there are few walkers in the area, correction of these types of mistakes would improve pedestrian access to Convent Station.

**Figure 2-69: Mismatched Crosswalk and Sidewalk at Intersection of NJ 124 and Convent Road**



**Figure 2-70: Crosswalk in Foreground and Sidewalk in Background at Convent Road and NJ 124**



Feedback received from the public and stakeholders identified the following concerns:

- The pedestrian paths from Fairleigh Dickinson campus are not lit and make walking difficult at night.
- Additional marked crosswalks on NJ 124 are recommended.
- Old Turnpike Road should be improved for bicyclists and pedestrians.
- Frequent snow removal, as needed, on the sidewalks approaching all of the stations in the corridor is recommended.

## 2.6 Safety Analysis

Crash analyses and field investigations were performed at Chatham, Madison, and Convent Stations and are presented below. Plan4Safety was queried for crash data over a five year period (2006-2010). Plan4Safety is a web-based data mining tool built by the Rutgers Transportation Resource Safety Center (a division of the Center for Advanced Infrastructure and Transportation) for the New Jersey Department of Transportation to assist with crash analyses. It is recommended to use three to five years of crash data to perform crash analyses. At least three years of data are needed, but five years are preferred because individual years' data is influenced by annual and seasonal variations in travel, weather, and other factors. Using three to five years of data provides average conditions and enough data to analyze trends and uncover patterns.



## **NJ 124 Corridor Transit Access Improvement Study**

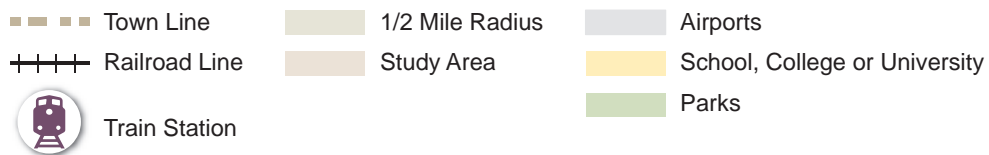
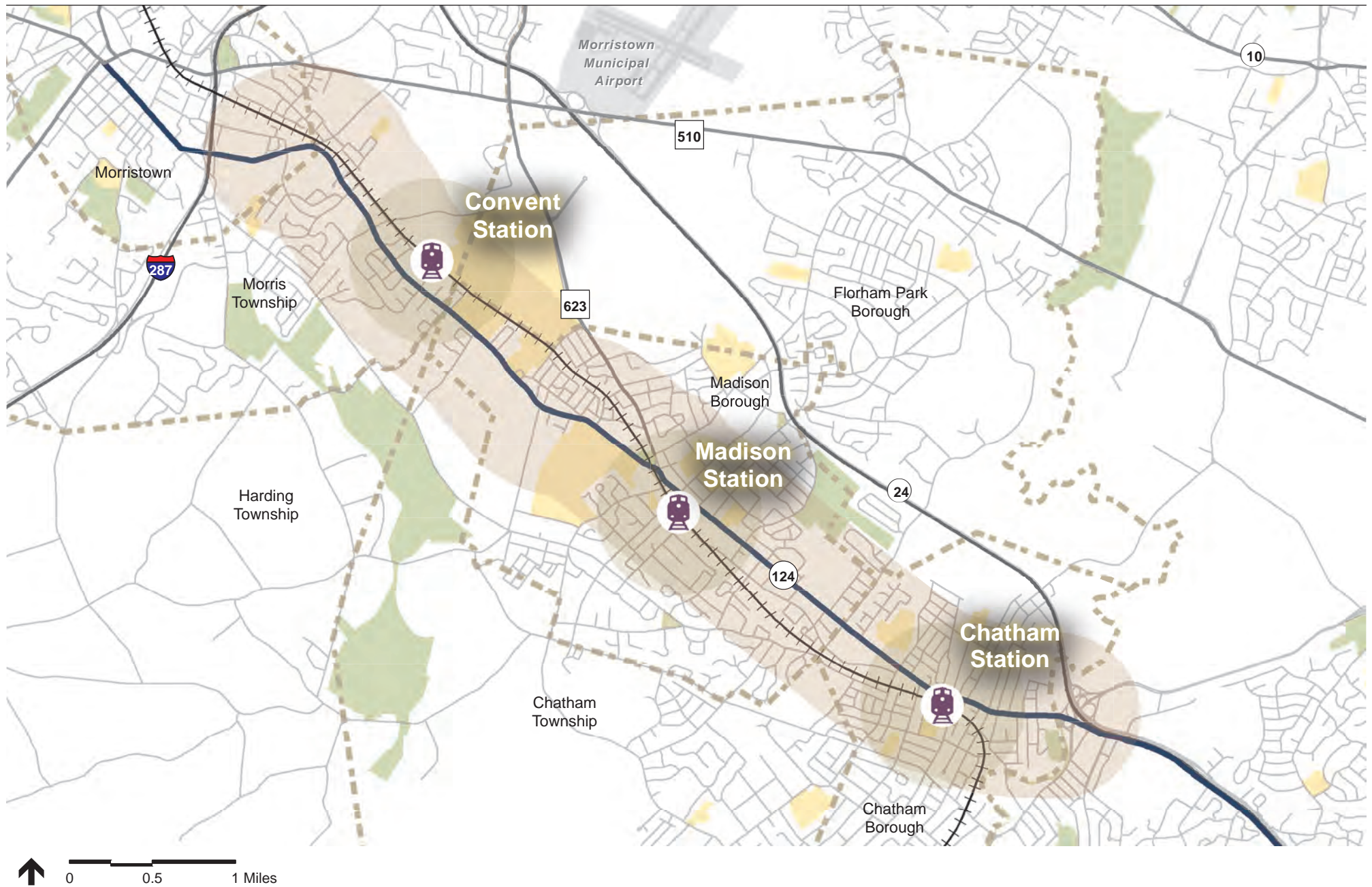
### **Final Report**

Crash data within a half mile of each station, along NJ 124 within the study area, and at select intersections and segments in Morris Township west of Convent Station were included as a result of stakeholder comments. The purpose of this roadway safety analysis is to determine if any safety issues exist within the study area for all modes of access to the stations, with an emphasis on pedestrian and bicycle safety.

The distance of one-half mile is generally accepted as the maximum distance from which pedestrians would typically walk to transit, so this survey area was searched for pedestrian crash locations. Bicyclists generally travel farther, so the entire Boroughs of Chatham and Madison and all of NJ 124 within the study area (extending to Convent Station) were analyzed for bicycle crash locations (See Figure 2-71: Roadway Safety Study Area Map).

The results of field investigations in these areas indicate that there are varying levels of vehicular, bicycle, and pedestrian roadway safety infrastructure, signage, and treatments along the NJ 124 corridor. However, within a half mile of each station, there is some consistency. In general, Chatham Borough has the most safety infrastructure and signage of the three municipalities in the survey area. Chatham has installed advanced pedestrian or school crosswalk warning signs at most crosswalks, and pedestrian signals at most signalized crosswalks, consistent with the Manual on Uniform Traffic Control Devices (MUTCD), although some of the signage does not conform to current standards. In Madison Borough, there are fewer adherences to the MUTCD, with many crosswalks appropriately striped, but lack pedestrian warning signs, and many signalized intersections with crosswalks are missing pedestrian signals. At several intersections in Madison, crosswalks are not striped on all legs of an intersection, forcing pedestrians to cross intersections multiple times. Both Chatham and Madison have adequate, but not complete, sidewalks and accessible pedestrian ramps connecting to striped crosswalks. West of Madison in Morris Township along NJ 124, including within the one-half mile radius around Convent Station, there are very few sidewalks and accessible pedestrian ramps (with the exception of the vicinity of I-287 and the Morristown Hospital), and most intersections do not have crosswalks. There are “Stop for Pedestrians” signs in Morris Township along NJ 124. Striped crosswalks are limited. Overall, there is some confusion over “Yield to Pedestrians” versus “Stop for Pedestrians” signage because of changes in state law. The current law requires drivers to stop for pedestrians in the crosswalks at unsignalized intersections. This signage is not necessary at signalized intersections, according to the MUTCD.





Morris County NJ 124  
Transit Access Study

## Roadway Safety Study Area

FIGURE 2-71





Different signage from the study area is shown in Figure 2-72. Clockwise from the top left, in Figure 2-72, are signs on northbound Fairmount Avenue at Watchung Avenue (Chatham), northbound Passaic Avenue just south of Main Street (Chatham), northbound Passaic Avenue about a block south of Main Street (Chatham), and eastbound Main Street (NJ 124) just west of Coleman Avenue (Chatham). Conversely, Madison has almost no pedestrian warning signage. It should be noted that only the signs listed below referring to “Stop for Pedestrian in the Crosswalk”, as opposed to “yield”, comply with state law. The other two signs are obsolete. Additionally, the second sign is improperly placed because it is intended for use at un-signalized crosswalks, and in this case the intersection is signalized.

The lack of consistent, standard pedestrian safety signage adjacent to Chatham Station, absence of pedestrian signals and crosswalks on all legs of NJ 124 intersections in Madison, and a void of pedestrian infrastructure near Convent Station negatively impacts pedestrian safety. The absence of bicycle infrastructure along NJ 124 is also a concern in regards to bicycle safety. Also, at signalized intersections within a half mile of Chatham and Madison Stations where pedestrian and bicycle crash locations have occurred, it was observed that the stop bars have been striped too close to crosswalks – in some cases as near as three or four feet. A general recommendation to improve pedestrian safety is to stripe advanced stop bars eight to ten feet from crosswalks in pedestrian areas. This also leaves room for bike boxes, (designated areas placed between the stop bar and crosswalk which provide left-turning bicyclists with the ability to get in front of stopped vehicles) to be added, which can increase bicyclist safety on all approaches near the stations.

The crash history adjacent to each station is discussed in the following sections, along with pedestrian and bicycle crash locations and contributing factors. When averaging the crash data over a five-year period, all locations within a ½ mile of Chatham and Madison Stations have fewer than one average pedestrian or bicycle crash per year, which is generally considered to be low. However, there are opportunities to increase pedestrian and bicycle safety, as noted in the field investigations above.

Figure 2-72: Examples of Disparate Pedestrian Signs in the Study Area





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### **2.6.1 Chatham Station**

Within a half mile of Chatham Station, there were eight pedestrian crashes and eight bicycle crashes in the five year study period (See Figure 2-73: Chatham Station Area Pedestrian and Bicycle Crash Location Map). There were no fatalities, but six of the eight pedestrian crashes and seven of the eight bicycle crashes involved injuries. Five of eight pedestrian and seven of eight bicycle crashes occurred at intersections. For reference, pedestrian and bicycle crash data were analyzed near six NJ TRANSIT stations in the FTA research paper titled “Evaluation of Pedestrian Improvements in the Vicinity of New Jersey Transit Rail Stations” by Brian N. Tobin, et al, using 2005-2008 crash data within 0.15-miles of stations, and Chatham Station had the fewest crashes. In this paper, Bay Street, Roselle Park, Chatham, Brick Church, Woodbridge, and Milburn Stations were compared, wherein Bay Street had 10 crashes, Roselle Park had one, Chatham had zero, Brick Church had 35, Woodbridge had five, and Millburn had 20. Therefore, the eight pedestrian and eight bicycle crashes within a half mile of Chatham over a period two years longer and an area much broader likely shows that crashes in and around Chatham Station appear to be fewer than at other nearby typical NJ TRANSIT stations. Pedestrian and bicycle crashes within a half mile of Chatham Station were concentrated along the NJ 124 and Fairmont Avenue corridors. Locations on NJ 124 included Lafayette/ Van Doren Avenue, Fairmont Avenue, Coleman Avenue, and Passaic Avenue. Fairmont Avenue locations included Watchung Avenue, Red Road, and Second Street. There was also one pedestrian crash at North Passaic Avenue (CR 607) and Weston Avenue.





- Town Line
- Railroad Line
- Train Station
- 1/2 Mile Radius
- School, College or University
- Parks
- (# of Ped, # of Bicycle) Crashes



Morris County NJ 124  
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## Chatham Station Pedestrian and Bicycle Crashes FIGURE 2-73





## **NJ 124 Corridor Transit Access Improvement Study**

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An analysis of these crash locations shows that the majority of pedestrian and bicycle crashes occurred during daylight conditions, on clear days and dry pavement. Individual location crash totals and the results of field observations are summarized below (crashes located at midblock are assigned to the nearest intersection):

- NJ 124 at Lafayette/ Van Doren Avenues: three pedestrian and three bike crashes in the five year study period. There are “No Turn on Red” restrictions from 7 AM to 6 PM Monday through Saturday, school crosswalk warning signage, crosswalks, pedestrian signals, sidewalks, and pedestrian ramps on all approaches. There is adequate lighting and a “Stop for Pedestrians in Crosswalk” sign on the northbound approach. There are already low-cost safety features in place, but increasing the “No Turn on Red” restrictions to all hours and days, removing the “Stop for Pedestrians in Crosswalk” sign (which is intended for unsignalized locations) and placing “Turning Vehicles Yield to Pedestrians” signs on all approaches would potentially improve safety for pedestrians. For bicyclists, unfortunately, the bikeable shoulder on NJ 124 disappears at the intersection because wider lanes are required for traffic capacity purposes. Placing “Share the Road” bicycle signs at the transition from a shoulder to no shoulder could potentially increase safety for bicyclists on NJ 124.
- NJ 124 at Coleman Avenue: one pedestrian and zero bike crashes in the five year study period. This is a two-way stop controlled intersection with adequate lighting, crosswalks, sidewalks, and pedestrian ramps. There are warning flashers to draw attention to the “Stop for Pedestrians” sign, but the flashers are not lighted in either direction on NJ 124. There are also no advanced pedestrian or school crosswalk warning signs, and occasionally, eastbound traffic queues back from the traffic signal at Fairmount Avenue which blocks the east and west crosswalks on NJ 124. Low-cost improvements may include lighting the flashers and installing “State Law: Stop for Pedestrians in Crosswalk” signs on the centerline and advanced school crosswalk signs.
- NJ 124 at Fairmount Avenue: zero pedestrian and one bike crash in the five year study period. There are “No Turn on Red” restrictions from 7 AM to 6 PM Monday through Saturday on the eastbound and northbound approaches. There are school crosswalk warning signs on the northbound, eastbound, and westbound approaches, but the eastbound and westbound signs are located too far from the intersection. There are crosswalks, pedestrian signals, sidewalks, and pedestrian ramps on all approaches. There is adequate lighting and there is a “State Law: Stop for Pedestrians in Crosswalk” sign on the northbound approach. There are already low-cost safety features in place, but increasing the “No Turn on Red” restrictions to all hours and days and



adding it to the westbound and southbound approaches, removing the “State Law: Stop for Pedestrians in Crosswalk” sign (which is intended for unsignalized locations) and placing “Turning Vehicles Yield to Pedestrians” signs on all approaches would potentially improve safety for pedestrians. For bicyclists, unfortunately, NJ 124 is narrow and there is on-street parking. Placing “Share the Road” bicycle signs approaching Fairmount Avenue would potentially increase safety for bicyclists on NJ 124.

- **NJ 124 at Passaic Avenue:** three pedestrian and zero bike crashes in the five year study period. There are “No Turn on Red” restrictions from 7 AM to 6 PM Monday through Saturday on the southbound and northbound approaches, and “No Turn on Red” restrictions during all hours and days on the eastbound and westbound approaches. There is no pedestrian or school crosswalk warning signage on any approach. There are crosswalks, pedestrian signals, sidewalks, and pedestrian ramps on all approaches. There is adequate lighting and there is a “State Law: Stop for Pedestrians in Crosswalk” sign on the northbound approach. There are already low-cost safety features in place with the exception of pedestrian warning signage. Increasing the “No Turn on Red” restrictions to all hours and days on the northbound and southbound approaches, removing the “State Law: Stop for Pedestrians in Crosswalk” sign (which is intended for unsignalized locations), and placing “Turning Vehicles Yield to Pedestrians” signs and advanced pedestrian or school crosswalk warning on all approaches would potentially improve safety for pedestrians. For bicyclists, unfortunately, NJ 124 is narrow and there is on-street parking. Placing “Share the Road” bicycle signs approaching Fairmount Avenue would potentially increase safety for bicyclists on NJ 124.
- **Fairmont Avenue at Watchung Avenue:** one pedestrian and zero bike crashes in the five year study period. There are “No Turn on Red” restrictions during all hours and days, school crosswalk warning signage, crosswalks, pedestrian signals, and pedestrian ramps on all approaches of the signalized intersection. There are sidewalks on all approaches with the exception of the east side of the south leg where there is a steep grade. There is adequate lighting and a “Yield to Pedestrians in Crosswalk” sign on the southbound approach. There are already low-cost safety features in place. Removing the “Yield to Pedestrians in Crosswalk” sign (which is not consistent with state law), and placing “Turning Vehicles Yield to Pedestrians” signs would potentially improve safety for pedestrians. For bicyclists, unfortunately, left-turn lanes on all approaches eliminate the bikeable shoulder at the intersection. Placing “Share the Road” bicycle signs on all approaches would potentially increase safety for bicyclists.



- Fairmount Avenue at Red Road: zero pedestrians and one bike crash in the five year study period. This is a two-way stop controlled intersection with no lighting. There are no crosswalks or pedestrian ramps on Fairmount Avenue, but there is a crosswalk and pedestrian ramps on Red Road. There are advanced school crosswalk warning signs on Fairmount Avenue on both approaches, even though there are no crosswalks. There are sidewalks on all approaches. More could be done to protect pedestrians and bicyclists at this location, including crosswalks on the north and south legs with pedestrian ramps, “State Law: Stop for Pedestrians in Crosswalk” signs on the centerline of Fairmount Avenue, shared lane markings/ sharrows or parking lane stripes to provide a safe riding area for bicyclists next to parked cars, and an additional streetlight.
- Fairmount Avenue at 2nd Street: zero pedestrians and one bike crash in the five year study period. This is a two-way stop controlled intersection with adequate lighting. There are crosswalks on the north and east legs, but there is only one pedestrian ramp on the southeast corner for the east crosswalk. There are no advanced pedestrian or school crosswalk warning signs on any approach. There are sidewalks on all approaches. Pedestrian and bicyclist improvements could include a crosswalk on the south leg, advanced pedestrian or school crosswalk signage on all approaches, pedestrian ramps on all corners, “State Law: Stop for Pedestrians in Crosswalk” signs on the centerline of Fairmount Avenue, and shared lane markings/ sharrows or parking lane stripes to provide a safe riding area for bicyclists next to parked cars.
- North Passaic Avenue and Weston Avenue: zero pedestrians and two bike crashes in the five year study period. This is a two-way stop controlled intersection with adequate lighting. There are advanced school crosswalk warning signs on all approaches, but the southbound approach sign is located too far from the intersection. There are crosswalks, sidewalks, and pedestrian ramps on all approaches. There is also a pushbutton-activated flashing sign on the northbound approach of the south crosswalk to draw attention to the school crosswalk warning sign, and there is a speed feedback sign on the southbound approach. The speed feedback sign was not lighted, so drivers could not see if they were driving above the posted 30 miles per hour speed limit. There are already several low-cost pedestrian safety treatments at this location. According to field observations, although North Passaic Avenue is not wide, the good sight distance and lack of on-street parking use encourages speeding. To reduce speeds and increase safety for bicyclists, recommendations may include lighting the speed feedback sign, and installing shared lane markings/ sharrows or parking lane stripes.



### **2.6.2 Madison Station**

Within a half mile of Madison Station, there were 13 pedestrian crashes and eight bicycle crashes in the five year study period (See Figure 2-74: Madison Station Area Pedestrian and Bicycle Crash Location Map). There were no fatalities, but all 13 of the pedestrian crashes and seven of eight bicycle crashes involved injuries. Ten of the 13 pedestrian crashes occurred at intersections, but only three of the eight bicycle crashes occurred at intersections. As summarized in the discussion of Chatham, the “Evaluation of Pedestrian Improvements in the Vicinity of New Jersey Transit Rail Stations” Study concluded that Chatham has lower than average pedestrian and bicycle crash rates than other NJ TRANSIT stations. Since the number of crashes within a half mile of Madison Station is comparable, it can be concluded that Madison also has fewer than average non-motorized crashes when compared to other NJ TRANSIT station areas. Pedestrian and bicycle crashes occurred at several intersections along the NJ 124 corridor within a half mile of the station, and included Kings Road, Central Avenue/ Waverly Place, Greenwood Avenue/ Prospect Street, Alexander Avenue, and Cross Street/ Rosedale Avenue. Other locations included Central Avenue and Brittin Street, Central Avenue and Elmer Street/ Cook Avenue, Greenwood Avenue and Brittin Street, Kings Road and Waverly Place, Kings Road and Maple Avenue, and Park Avenue and Ridgedale Avenue. An analysis of these crash locations shows that the majority of pedestrian and bicycle crashes occurred during daylight conditions, on clear days, and on dry pavement. Individual location crash totals and the results of field observations are summarized below (crashes located at midblock are assigned to the nearest intersection):

- NJ 124 at Kings Road: one pedestrian and one bike crash in the five year study period. There is adequate lighting, crosswalks on the south leg (Kings Road) and east leg (NJ 124), and pedestrian signals and curb ramps at these locations. However, right turn on red is allowed, there is no crosswalk on the west leg of NJ 124, and there is no pedestrian warning signage. Potential pedestrian safety improvements could include installing a west crosswalk, pedestrian signals and ramps, advanced pedestrian or school crosswalk warning signage and “Turning Vehicles Yield to Pedestrians” signs, and “No Turn on Red” restrictions on the eastbound and northbound approaches. There are striped bike lanes on the shoulders of NJ 124 west of the intersection and adequate width to continue bike lanes on NJ 124 through the intersection and underneath the railroad bridge.





# **NJ 124 Corridor**

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Morris County NJ 124  
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# **Madison Station Pedestrian and Bicycle Crashes** FIGURE 2-74



## **NJ 124 Corridor Transit Access Improvement Study**

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- NJ 124 at Central Avenue/ Waverly Place: one pedestrian and two bike crashes in the five year study period. There are “No Turn on Red” restrictions, crosswalks, pedestrian signals, sidewalks, and pedestrian ramps on all approaches. There is adequate decorative pedestrian scale lighting on sidewalks, but no overhead lighting to illuminate pedestrians in crosswalks. Placing “Turning Vehicles Yield to Pedestrians” and advanced pedestrian or school crosswalk warning signage on all approaches would potentially improve safety for pedestrians. For bicyclists, unfortunately, NJ 124 is narrow because of on-street parking. Placing “Share the Road” bicycle signs on all approaches would potentially increase safety for bicyclists.
- NJ 124 at Greenwood Avenue/ Prospect Street: four pedestrian and zero bike crashes in the five year study period. There is a “No Turn on Red” restriction on the westbound approach, adequate lighting, crosswalks, and pedestrian ramps on all approaches. However, there are no pedestrian signals or pedestrian warning signs. Installing pedestrian signals, placing “Turning Vehicles Yield to Pedestrians,” and advanced pedestrian or school crosswalk warning signage on all approaches would potentially improve safety for pedestrians. For bicyclists, unfortunately, NJ 124 is narrow because of on-street parking or wide lanes to increase traffic capacity. Placing “Share the Road” bicycle signs on all approaches would potentially increase safety for bicyclists.
- NJ 124 at Alexander Avenue: one pedestrian and zero bike crashes in the five year study period. NJ 124/ Alexander Avenue is a two-way stop controlled intersection with no crosswalks, pedestrian ramps, or pedestrian warning signage. However, there is adequate lighting, a crosswalk, and pedestrian ramps on the north approach, and there are sidewalks on all approaches. Pedestrian improvements could include crosswalks on the east and west legs, advanced pedestrian or school crosswalk signage on all approaches, pedestrian ramps on all corners, and “State Law: Stop for Pedestrians in Crosswalk” signs on the centerline of NJ 124. Because the shoulders are striped wide enough for bicyclists and there is “No Stopping or Standing” signs, bike lanes could be designated, which would increase safety for bicyclists.
- NJ 124 at Cross Street/ Rosedale Avenue: two pedestrians and two bike crashes in the five year study period. There is adequate lighting, crosswalks, pedestrian ramps, and sidewalks on all approaches. However, right turn on red is allowed. There are no pedestrian signals or pedestrian warning signage. Potential pedestrian safety improvements could include installing pedestrian signals, advanced pedestrian or school crosswalk warning signage, “Turning Vehicles Yield to Pedestrians” signs, and “No Turn on Red” restrictions on all approaches.



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For bicyclists, unfortunately, the striped shoulders on NJ 124 are eliminated at the intersection to provide wide lanes to increase traffic capacity. Placing “Share the Road” bicycle signs on all approaches would potentially increase safety for bicyclists.

- Central Avenue at Brittin Street: zero pedestrians and one bike crash in the five year study period. This is a two-way stop controlled intersection located within a school speed zone with an advanced school crosswalk warning sign and a “State Law: Stop for Pedestrians in Crosswalk” sign on the south leg, a crosswalk and pedestrian ramp on the south leg, and crosswalks and pedestrian ramps on the east leg. There is adequate lighting at this location and sidewalks on all approaches. Additional improvements such as a crosswalk and “State Law: Stop for Pedestrians in the Crosswalk” signage on the north leg could increase pedestrian safety. For bicyclists, unfortunately, Central Avenue is narrow because of on-street parking. Placing “Share the Road” bicycle signs on all approaches could potentially increase safety for bicyclists.
- Central Avenue at Elmer Street/ Cook Avenue: one pedestrian and zero bike crashes in the five year study period. This is a two-way stop controlled intersection with crosswalks, sidewalks, and pedestrian ramps on all approaches. There is decorative pedestrian lighting on the sidewalks, but no overhead lighting to illuminate pedestrians in the crosswalks. There is also no pedestrian warning signage. On Central Avenue, the speed limit is 35 miles per hour. Pedestrian safety improvements could include reducing the speed limit to 25 miles per hour, installing advanced pedestrian or school crosswalk signage on all approaches, and providing “State Law: Stop for Pedestrians in Crosswalk” signage on the centerline of Central Avenue in both directions. For bicyclists, unfortunately, Central Avenue is narrow because of on-street parking. Placing “Share the Road” bicycle signs on all approaches would potentially increase safety for bicyclists.
- Greenwood Avenue at Brittin Street: one pedestrian and one bike crash in the five year study period. This is a two-way stop controlled intersection with adequate lighting. The speed limit on Greenwood Avenue is 25 miles per hour and there is a “Keep Kids Alive – Drive 25” sign on the southbound approach. There are crosswalks and pedestrian ramps on the east, west and south legs, “State Law: Stop for Pedestrians in Crosswalk” signs on the northbound and southbound approaches, school crosswalk warning signs on the northbound and southbound approaches, a flashing beacon to supplement the stop signs, and “Slow” stencils and chevrons on all approaches. There are bike lanes north of the intersection (although curbside parking is allowed). Additional improvements could include a crosswalk and pedestrian ramps on the north leg.





- Kings Road and Waverly Place: one pedestrian and zero bike crashes in the five year study period. There is a “No Turn on Red” restriction on the eastbound approach, and crosswalks, pedestrian signals, sidewalks, and pedestrian ramps on all approaches. There is only adequate lighting above the west crosswalk, and a “State Law: Stop for Pedestrians in Crosswalk” sign on the south leg. Removing the “State Law: Stop for Pedestrians in Crosswalk” sign (which is intended for unsignalized intersections), placing “Turning Vehicles Yield to Pedestrians” and advanced pedestrian or school crosswalk warning signage on all approaches, and adding “No Turn on Red” restrictions to the northbound, southbound and westbound approaches would potentially improve safety for pedestrians. Adding overhead lighting to the north, east, and west crosswalks will also increase pedestrian safety. For bicyclists, unfortunately, all approaches are narrow because of on-street parking or turning lanes. Placing “Share the Road” bicycle signs on all approaches could potentially increase safety for bicyclists.
- Kings Road at Maple Avenue: zero pedestrians and one bike crash in the five year study period. This is a two-way stop controlled intersection with adequate lighting, crosswalks, and pedestrian ramps on the east and south legs, and a “State Law: Stop for Pedestrians in Crosswalk” sign on the east leg. Pedestrian improvements could include installing a west crosswalk and pedestrian ramps, a “State Law: Stop for Pedestrians in Crosswalk” sign on the west leg, and advanced pedestrian warning or school crosswalk signs on all approaches. To increase bicycle safety, it may be possible to stripe bike lanes on Kings Street between Prospect Street/ Greenwood Avenue and Green Avenue/ Waverly Place if there is adequate width to accommodate two five-foot bike lanes.
- Park Avenue at Ridgedale Avenue: one pedestrian and zero bike crashes in the five year study period. There are crosswalks, pedestrian ramps and pedestrian signals on the east and north legs, sidewalks on all approaches, and adequate lighting. On the southbound approach, there is a “Yield to Pedestrians in Crosswalk” sign located too far from the intersection. Pedestrian improvements could include removing the outdated “Yield to Pedestrians in Crosswalk” sign, installing a west crosswalk, pedestrian ramps and pedestrian signals, providing “Turning Vehicles Yield to Pedestrians” signage, advanced pedestrian or school crosswalk warning signage, and adding “No Turn on Red” restrictions on all approaches. Unfortunately for bicyclists, all approaches are narrow because of turning lanes. Placing “Share the Road” bicycle signs on all approaches could potentially increase safety for bicyclists.



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### **2.6.3 Convent Station**

Within a ½-mile of Convent Station, there were no pedestrian crashes and two bicycle crashes in the five year study period, which is a very low number when compared to Chatham and Madison Stations. See Figure 2-75: Convent Station Area Pedestrian and Bicycle Crash Location Map. The bicycle crashes occurred on Old Turnpike Road at Punch Bowl Road and Convent Road, and both involved injuries. The two bicycle crashes occurred during daylight conditions on clear days and on dry pavement. According to field observations, the speed limit on Old Turnpike Road is 25 miles per hour and no traffic control device or striping on the eastbound approach of Convent Road and Old Turnpike Road to indicate a yield or stop. At Convent Road, there is only a sidewalk on the west side of the south leg, but no adequate lighting, crosswalks, pedestrian ramps, or pedestrian warning signage. Safety improvements could include crosswalks, pedestrian ramps, pedestrian warning signage, bike lanes, placing the eastbound approach under stop control, and installing sidewalks and lighting. Old Turnpike Road and Punch Bowl Road is a two-way stop controlled intersection with adequate lighting, no crosswalks, sidewalks on the southeast corner (both legs), and a pedestrian ramp on the south leg of the southeast corner. Safety improvements could include crosswalks, pedestrian ramps, pedestrian warning signage, and bike lanes.

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### **2.6.4 NJ 124**

Although crash analyses for this study focused primarily on pedestrian and bicycle crashes within a ½-mile of the stations, an overview of all crashes along NJ 124 within Morris County is included below, along with site-specific analyses at locations resulting from stakeholder interviews. See Figure 2-76: NJ 124 Stakeholder-Based Crash Investigation Map.

Along the approximately seven-mile section of NJ124 from US 202 to the west and Morris County line to the east, over 1,400 total crashes occurred in the five year study period. Crashes were clustered near the western end of NJ 124 (the 1.5 miles from US 202 near the I-287 interchange to the Morris Township line at Normandy Parkway had over 40 percent of all crashes) and the eastern end (the 2.9 miles from Kings Road in Madison through Chatham to the Morris County line had just over 40 percent of all crashes). The middle three-mile section from Normandy Parkway to Kings Road had 15 percent of all crashes.

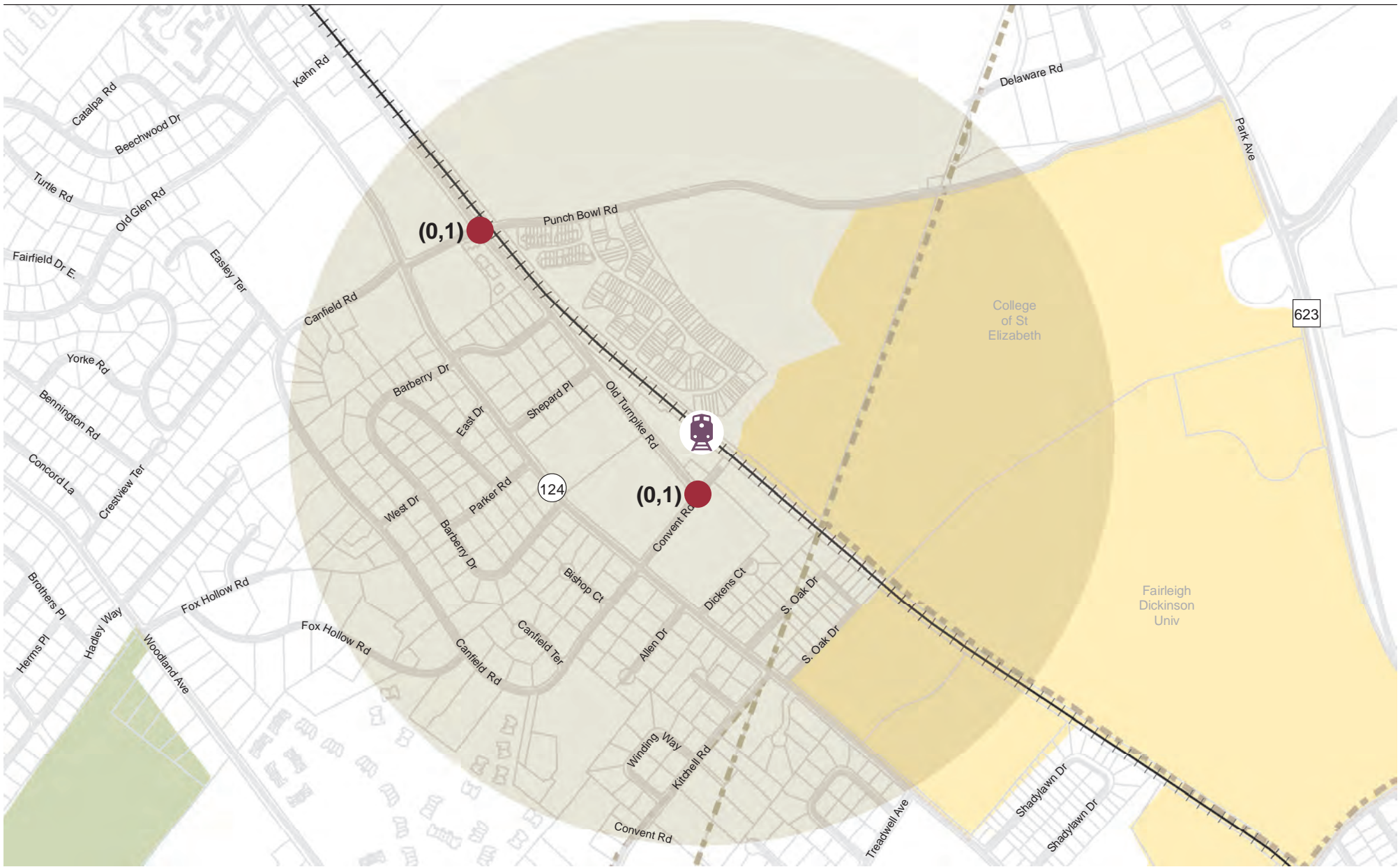









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-  Town Line
-  Railroad Line
-  Train Station
-  1/2 Mile Radius
-  School, College or University
-  Parks
-  (# of Ped, # of Bicycle) Crashes



Morris County NJ 124  
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## Convent Station Pedestrian and Bicycle Crashes

FIGURE 2-75



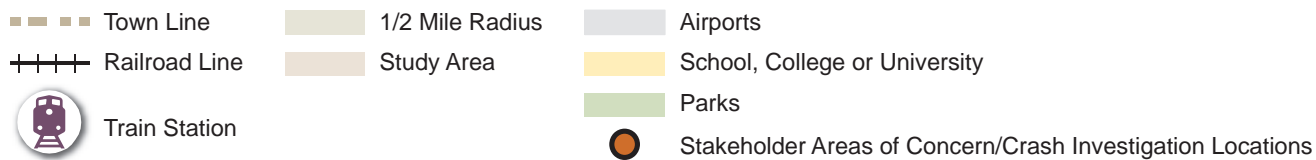
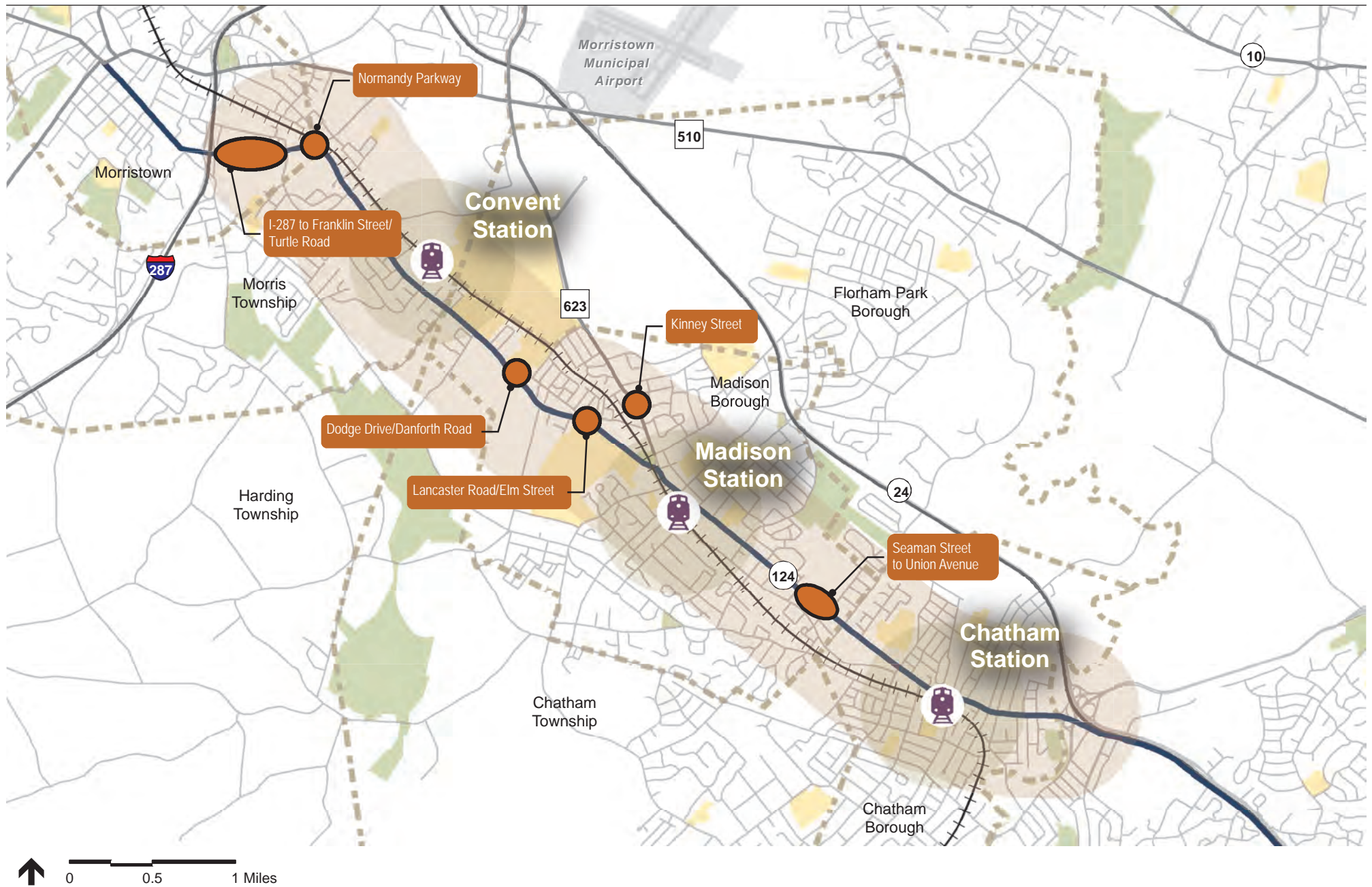


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Morris County NJ 124  
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## Stakeholder Crash Locations of Concern

FIGURE 2-76



In addition to the survey areas described above, the following crash analyses were performed at areas beyond a half mile of the stations as a result of stakeholder interviews and public feedback received during various outreach events for the project:

- NJ 124 at Lancaster Road/ Elm Street was identified as a dangerous location for bicyclists. Although there were no bicycle crashes within the study period here, there were 15 vehicular crashes in the five year study period including five right-angle, four rear-end, two fixed-object, two sideswipe (opposite direction), one head-on, and one left-turn crashes.
- NJ 124 at Dodge Drive/ Danforth Road was identified as a dangerous location for bicyclists. Although there were no pedestrian or bicycle crashes within the study period here, there were 11 vehicular crashes in the five year study period which included four right-angle, four rear-end, one same direction sideswipe, one animal, and one left-turn crashes.
- NJ 124 from the I-287 interchange to Franklin Street/ Turtle Road was identified as a difficult area for crossing NJ 124 on foot to get between medical visits. Although there were no pedestrian or bicycle crashes within the study period here, there were over 100 vehicular crashes in the five year study period along this segment, which mainly included right angle, rear-end, and same direction sideswipe crashes.
- NJ 124 at Normandy Parkway was identified as a dangerous location for bicyclists. Although there were no pedestrian or bicycle crashes within the study period here, there were 34 vehicular crashes in the five year study period which included 17 rear-end, seven right-angle, five left-turn, three same direction sideswipe, and two fixed-object crashes.
- Park Avenue at Kinney Street west of Madison Station had no crashes in the five year study period, but was identified as a location in need of a crosswalk. A field visit confirmed that there are no crosswalks on any of the three legs of this two-way stop controlled intersection, nor are there pedestrian ramps or advanced pedestrian warning signs.
- NJ 124 from Seaman Street to Union Avenue was identified as a difficult area for crossing NJ 124 on foot to get between commercial establishments. There was one pedestrian crash and one bicycle crash along this segment in the five year study period. There were also 25 vehicular crashes within the study period, which included 11 rear-end, eight right-angle, two fixed-object, two same direction sideswipe, one left-turn, and one sideswipe (opposite direction) crashes.



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#### **2.6.5 Summary of Crash Analysis**

Overall, within a ½-mile of the Chatham, Madison, and Convent stations, there are fewer pedestrian and bicycle crashes over the five year study period when compared to other NJ TRANSIT Stations according to the FTA research paper titled “Evaluation of Pedestrian Improvements in the Vicinity of New Jersey Transit Rail Stations” by Brian N. Tobin, et al. Furthermore, there are no locations with an average crash rate exceeding one pedestrian or bicycle crash per year which would indicate a trend of unsafe conditions. However, there are inconsistencies with signage and standards in the MUTCD and along NJ 124 from area to area. To maintain a high level of pedestrian and bicycle activity and safety along NJ 124 to and from the Chatham and Madison Stations and to grow non-motorized mode share at the Convent Station, improvements to pedestrian and bicycle signage, markings, and infrastructure are recommended.





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