Township of Bordentown Burlington County

Circulation Plan Element

December 2019

Adopted by the Bordentown Township Planning Board on December 12, 2019

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INTRODUCTION

The Circulation Element of the Master Plan is intended to provide guidance to the Township to facilitate the movement of goods and people within and around the Township of Bordentown. This Element is prepared in accordance with the New Jersey Municipal Law.

Circulation and land use are intertwined as both have a direct impact upon the vitality and viability of the Township of Bordentown. Understanding circulation patterns and issues within the Township is a critical component of the development of land use policies and the establishment of design and development standards. Decisions and recommendations regarding circulation issues have a direct impact on public safety and the overall quality of life for the community.

Bordentown Township is traversed by two US Highways (Routes 130 and 206), the New Jersey Turnpike, and Interstate 295. Both the Turnpike and I-295 have full interchanges within the Township. These roadways provide north to south accommodations. Rising Sun Road, Dunns Mill Road, Crosswicks Road (CR 528), and Georgetown Road (CR 545) provide east/west access across the Township.

It is important to have a safe, efficient and comprehensive circulation system within a municipality. Typically, the issue of motor vehicle traffic is the dominant factor when issues of circulation are discussed. Cars are a significant element of a community's circulation system and lifestyle. Due to Bordentown Township's location, traversed by Route 206, Route 130, I-295 and the NJ Turnpike, tractor trailers and other large vehicles impact motor vehicle circulation. However, other modes of transportation, including mass transit, bicycling and walking, should also be included within the Township's circulation framework.

PUBLIC OUTREACH

As part of the 2018 Master Plan Reexamination Report, two public meetings were held in October to provide members of the community an opportunity to voice their concerns about issues in Bordentown Township. Of the issues raised by the public, transportation was one of the most discussed topics during both meetings. Public comments regarding circulation included:

- The Township serves as a "road hub" due to the location of several major roadways traversing the jurisdictional limits of the Township, including Route 130, Route 206, I-295, and the New Jersey Turnpike.
- Limited access to I-295 has resulted in increasingly heavy truck traffic on State, County, and local roadways, further hindering vehicle circulation in the Township. Roads that consistently have traffic problems are the following:

- Fort Dix traffic along Georgetown Road
- Residential traffic along Cemetery Lane and Crosswicks Road
- Speeding along West Constitution Road near the cemetery
- Incoming traffic from Chesterfield Township
- Traffic along Grainger Avenue cut-through
- Visibility issues due to on-street parking along Crosswicks Road and Chesterfield Road.
- Existing roadway barriers that divide north/south traffic on Route 206 and Route 130 have had negative impacts on businesses.
- Roadway maintenance was raised for specific segments of roads, such as the replacement of the Car U-turn sign at Farnsworth Avenue and Route 130/206.
- Sidewalks are not well maintained, and along some roads there are no sidewalks. This is
 especially problematic when there are bus stops along roads with no sidewalk. Similarly,
 residents want well-maintained bike infrastructure, including a connected network of bike
 paths and trails throughout the Township.

Based on these comments, it is evident that traffic remains a problem for the Township due to roadway infrastructure limitations, and the associated congestion that results from these hindrances.

EXISTING PLANNING DOCUMENTS

In the last decade there have been several reports relating to transportation in Bordentown Township. Three of these plans have been produced by the Delaware Valley Regional Planning Commission (DVRPC), the Metropolitan Planning Organization (MPO) for the Township. MPO's are federally funded and mandated transportation planning organizations charged with creating and carrying out transportation policy for regional jurisdictions. These plans are discussed further in detail and illustrated with maps in the later sections of this report as they relate to specific issues and recommendations.

US 130/US 206 Road Safety Audit, DVRPC (2012)

This study was conducted to identify safety concerns at five intersections along the US 130 and US 206 roadways: Farnsworth Avenue (CR 545) at US 130, Farnsworth Avenue at US 206, Butts Drive at US 130, Crosswick Street/Bordentown-Chesterfield Road (CR 528), and Park Street (CR 662) at US 206. The study analyzed crash data, identified crash concentration areas and trends, and areas shown to be unsafe for pedestrians and cyclists. Based upon the analysis, several

recommendations were identified. These recommendations were separated by the level of time, effort, and resources it would take to carry out each action.

Traffic Calming Alternatives for Routes 130 & 206 in Bordentown, NJ DVRPC (2012)

The 2012 Traffic Calming Alternatives Report built off of the recommendations contained in the 2012 Road Safety Audit and produced five scenarios that affect US 130 and US 206. One scenario was the existing conditions, and the other four scenarios included implementing a road diet, installing roundabouts, designating left-hand turn lanes, and installing new T-signals at certain intersections. Based off of these scenarios, DVRPC put forth its "preferred alternatives" for this stretch of roadway.

Bordentown Township Redevelopment: Proposed Connector Road, DVRPC (2014)

In August 2013, The Bordentown Township Planning Board voted to amend the Township Master Plan Circulation Element. This amendment called for the construction of a two-way road that would connect Rising Sun Road and Dunns Mills road to reroute "excessive motorist and truck traffic" from Farnsworth Avenue and Georgetown Road (CR 545) between US Routes 130 and 206. According to the amendment, this connector road was necessary due to environmental constraints and the prohibition of a full I-295 interchange at Rising Sun Road, and NJDOT development conditions that prohibits a signalized intersection at US Route 130 and Rising Sun Road. This DVRPC Study took the recommendation to construct a connector road between Dunns Mill Road and Rising Sun Road to provide trucks an alternative route to Farnsworth Avenue, and conducted a study to determine its feasibility. Through an in-depth analysis of truck movement in the area and traffic simulations, DVRPC determined that the connector road is feasible, but also recognizes that there would still be congestion at the intersection of US 130 and Dunns Mill Road. DVRPC also proposed other improvements that would improve circulation in the immediate area and complement the connector road, including a road connecting US 206 to the Turnpike, extending the left-hand turn lane at the US 206 and Farnsworth Avenue intersection to accommodate future increases in congestion, and completing the I-295 and Rising Sun Road interchange by adding north-bound on and south-bound off ramps.

EXISTING TRAFFIC CONDITIONS AND PLANNED/PROPOSED IMPROVEMENTS

Vehicular Traffic Circulation

Bordentown Township is unique compared to other municipalities in New Jersey because of its proximity to some of the most highly trafficked roadways in the State. Combined with its central location, Bordentown Township lies at the crossroads of several state and regional arterials that

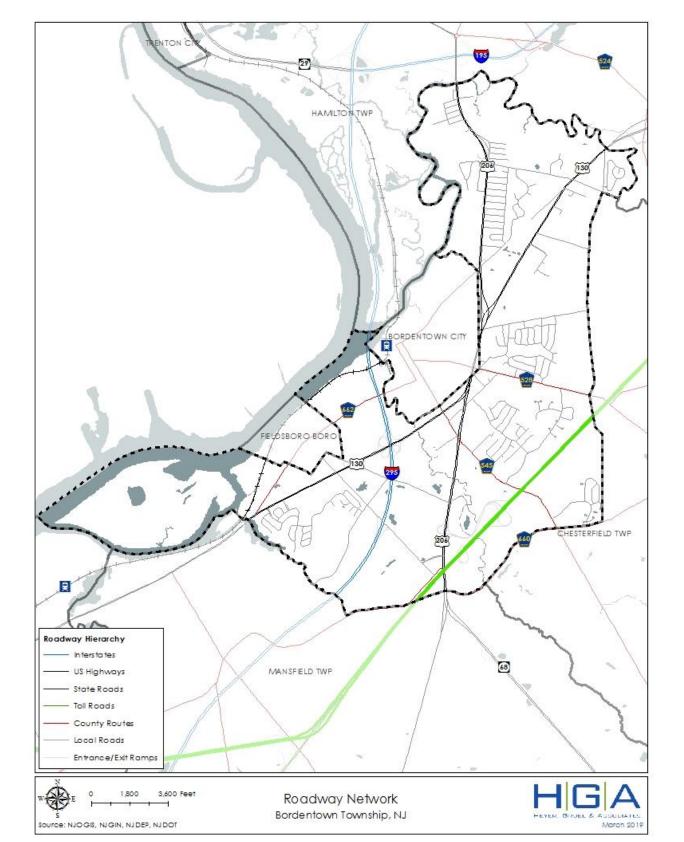
transport people to all corners of the state. As a result, Bordentown Township has considerable vehicle traffic that includes both passenger vehicles and freight trucks. A list of the key roads that traverse the Township and who owns them is included below.

Roadway Hierarchy					
Road Type	Road Type Road Name Directio				
Toll Roads	NJTP	N-S			
Interstate	I-295	N-S			
	206	N-S			
US Highways	130	N-S			
	660	E-W			
County Douton	545	N-S			
County Routes	662	E-W			
	528	E-W			

Key among these roadways is the New Jersey Turnpike (NJTP) which is a toll road spanning the entire state from the George Washington Bridge in the north to the Delaware Memorial Bridge in the south, providing an interstate highway between New York, New Jersey, Delaware, and Pennsylvania. Though a toll road operated by the New Jersey Turnpike Authority, the NJTP is part of the National Highway System and is designated as I-95 north of Exit 6. The Exit 7 Interchange is located within the Township's jurisdictional boundaries, making Bordentown a suitable place for truck drivers and long-distance travelers to stop over.

I-295 is also part of the National Highway System and spans from Ewing Township and the Delaware River to the north to the Delaware Memorial Bridge in the south. I-295 has one interchange in the southern portion of the Township, about 1.5 miles from the NJTP toll entrance. Because of their proximity of each of these interstate highways, there is considerable traffic in the southern portion of the Township.

Routes 206 and 130 are US highways that span several counties in northern and southern New Jersey. The United States Numbered Highway System is an integrated network of highways across the nation (not to be confused with the Federal Highway System), but these roads are mainly built and maintained by state or local governments. Route 206 begins in New Jersey at Hammonton in Atlantic County, and ends in Montague Township at the border of Pennsylvania and New Jersey along the Delaware River. Route 130 begins at I-295 adjacent to the Delaware Memorial Bridge and stretches north into Middlesex County until turning into State Route 171 in North Brunswick. Both of these highways are highly trafficked inter-municipal arteries that transport people throughout the State. A key feature of both Route 130 and Route 206 is the presence of concrete barriers that separate traffic going north and south. During the public meetings, residents raised



the issue that these barriers were having negative impacts on the businesses located along these roadways because they were less visible and accessible for drivers on the other side of the road.

Traffic Volumes

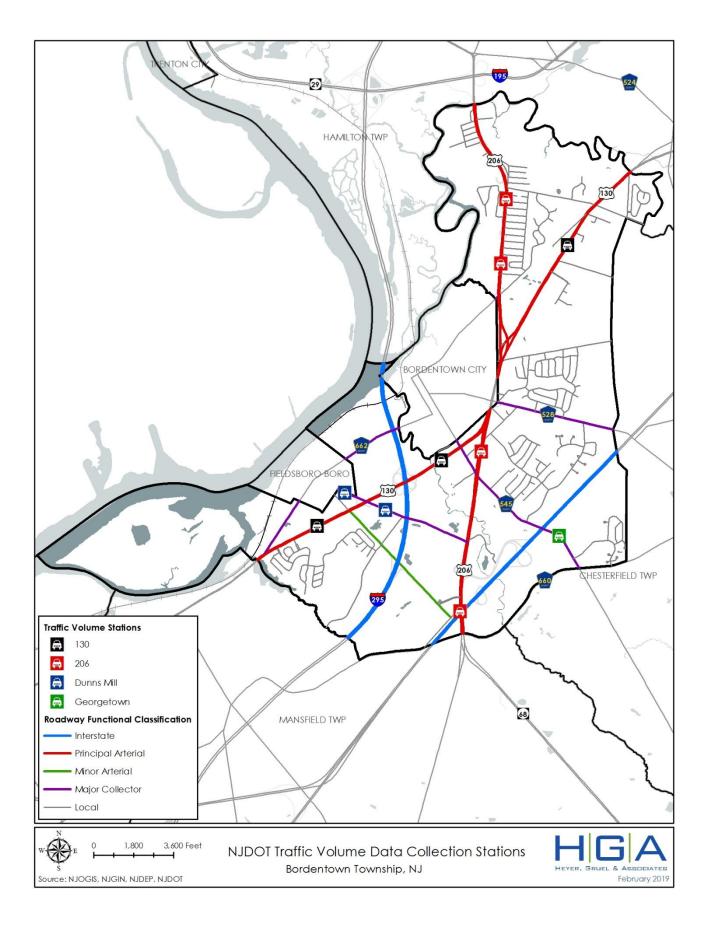
The New Jersey Department of Transportation (NJDOT) collects traffic volume data through its traffic monitoring program. The program uses 48-hour short-term counts to produce estimates of Annual Average Daily Traffic (AADT) at 6,000 sites along key roads throughout the State.

NJDOT operates four 48-hour short-term traffic counting stations. Data is provided for each of these stations and associated roads and traffic volumes for 2017 are outlined below.

Road Name	Location	2017 AADT
U.S. Rt. 206	Between Spruce Ave. and Oak Ave.	19,944
U.S. Rt. 130	Between High Bridge Rd. And Roosevelt Ave.	27,597
Georgetown Rd.	Between Clifton Mill Dr. and Williamsburg Dr.	8,026
U.S. Rt. 206	Between County Route 660 Old York Road and CR 660 Old York Road	31,672
Source: NJDOT Traffic Monitoring System		

The NJDOT collects traffic volume data at different locations in various years. Typically, data is gathered every three years for one station to illustrate how traffic volume changed over time. The table below shows traffic volume data for each roadway across station location and year. Traffic Volume on US 206 appears to stay relatively constant between 2011 and 2017, but US 130 has seen greater fluctuations in volume. After experiencing an increase between 2011 and 2013, traffic volume decreased in 2017 between High Bridge Road and Roosevelt Avenue. There was also a significant increase in traffic volume on Dunns Mill Road has stayed relatively constant between 2012 and 2016, but Georgetown Road (CR 545) has seen a significant increase in traffic volume (6,856 to 8,026).

	Bordentown Traffic Volume by Roadway, Year, and Station Loca		
	Station Location	Year	AADT
	Between Spruce Ave. and Oak Ave.	2011 2014 2017	19,388 20,070 19,944
U.S. 206	Between CR 660 Old York Road and NJTP	2011 2014 2017	30,079 31,600 31,672
	Between Stanton Ave. and Poplar Ave.	2012 2015	22,294 20,658
Between CR 545 and U.S. Rt. 130 merge		2012 2015	19,661 19,965
US 130	Between High Bridge Rd. And Roosevelt Ave.	2011 2014 2017	25,982 30,090 27,597
	Between I-295 and CR 545	2012 2015	29,057 34,201
	Between Taconia Rd. and Rising Sun Rd.	2012	32,183
Dunns Mill Road	Between U.S. Rt. 130 and Hedding Road	2012 2016	8,338 8,634
	Between U.S. Rt. 130 and CR 662	2010	7,145
Georgetown Road	Between Clifton Mill Dr. and Williamsburg Dr.	2011 2014 2017	6,856 7,726 8,026
	Source: NJDOT Traffic Monitoring System	I	1



The Roadway Functional Classification

In addition to the jurisdictional differences between the roads in the Township, it is important to recognize how each of these roads operate functionally within the context of vehicular transportation. Roadways are classified according to a hierarchy that identifies the function of each roadway by the expected amount of traffic and level of access provided. The following section contains the various roadway classifications and their location in the Township. Each subsection briefly describes the roadway classification and identifies the roadways that meet each classification's criteria. The Road Classification Map provides a visual representation of where each of these roadway classifications are located in the Township.

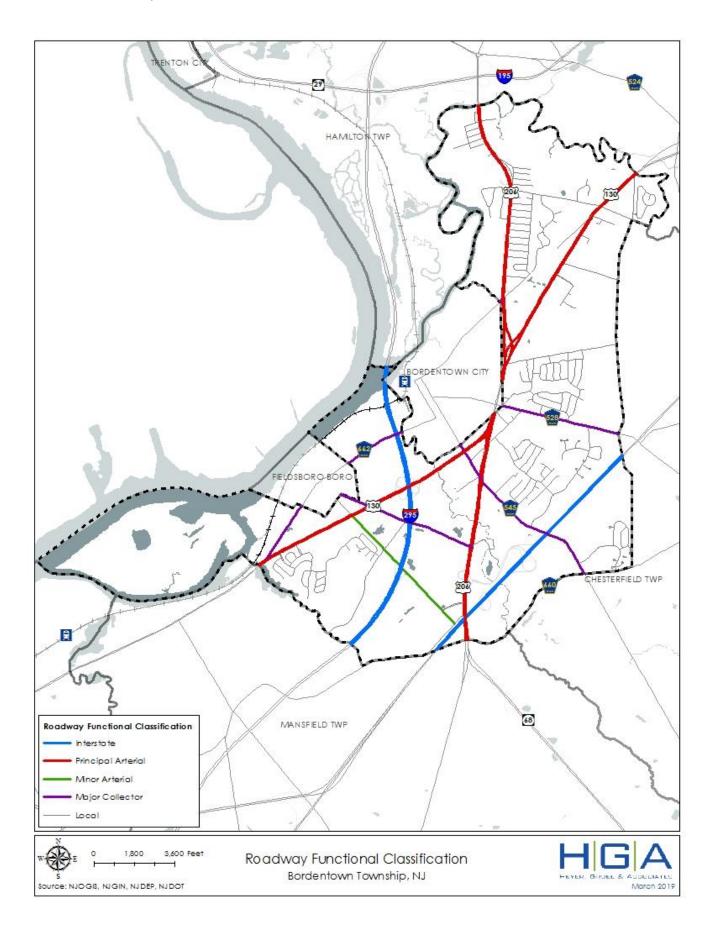
FREEWAYS

Freeways are high speed, high capacity, limited access highways devoted entirely to the movement of motor vehicles and provide no direct access to abutting properties. They generally span across large areas, often an entire state, and connect with freeways of adjoining states. Given the amount of noise generated by the high traffic volume, properties abutting freeways are typically set back several hundred feet and zoned for industrial, commercial, or agricultural uses to minimize the effect of noise on the surrounding land uses. In areas where residential development abuts a freeway, it is common for noise attenuating walls to be constructed between the development and the freeway to reduce the amount of noise pollution affecting the residents. A key design feature of freeways is the separation of opposing traffic lanes by a center barrier or median strip. Freeways have multiple lanes of traffic that are generally designed for a capacity of 1,000 to 1,500 vehicles per lane per hour. Interstate 295 and the New Jersey Turnpike are two freeways that run north-south through the Township.

PRINCIPAL ARTERIALS

Principal arterials take traffic from freeways and direct it to other areas. These roads are primarily designed for automobile traffic and provide significant local and inter-municipal movement opportunities, as well as access to freeways. In order to best preserve their traffic capacity, the number of intersections, driveways, and frontage activity are generally minimized on these roadways. Similar to freeways, access to abutting properties is limited, but a greater number and wider variety of uses can be found along principal arterials. U.S. Routes 130 and 206 are principal arterials that run north-south through the Township. Section 25:515 of the Bordentown Township Land Development Ordinance outlines standards for streets curbs and sidewalks, including minimum right-of-way (ROW) and cartway widths for roadways in the Township. Per the Township ordinance, the minimum ROW for arterials is 80 feet to 100 feet, and the minimum cartway is 60 feet to 76 feet.

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MINOR ARTERIALS

Minor arterials handle a larger share of access to local uses and are typically under County or local jurisdiction. The minor arterials serve to connect the principal arterials with the lower level local roads, and also act as alternative routes to the principal arterials. As opposed to the principal arterials and freeways, minor arterials are designed with narrower rights of way with lower speed limits. These roads typically provide access to and serve residential and commercial districts with shallower building setbacks than principal arterials. Despite their smaller rights of way and reduced speeds, high intensity nonresidential uses are commonly zoned on properties along minor arterials, meaning these roadways can experience high truck traffic depending on local land use policies. The only minor arterials in the Township is Rising Sun Road, which runs northwest-southeast through the Township between the New Jersey Turnpike and U.S. Route 130. Per Section 25:515 of the Township Land Development Ordinance, the minimum required ROW for minor arterials is 72 feet to 80 feet, and the minimum required cartway is 40 feet to 48 feet.

Collector Streets

Collector streets provide access between the local roads and destinations and the large arterials. They have lower speed limits than minor arterials, and are typically more pedestrian-friendly. Collector roads are frequently used as alternative routes to arterial roadways, which help diffuse larger traffic volumes on the larger arterials. Collector streets are generally maintained by municipalities, though some do fall under County jurisdiction. Portions of a few major collector roads fall within the boundaries of Bordentown Township. These collector roads include:

- Dunns Mill Road (east-west) between Route 206 and the municipal border with Fieldsboro Borough
- Burlington County Route 662 (north-south) which runs through Fieldsboro and Bordentown Township between Route 130 and the border with the City of Bordentown.
- Georgetown Road/Burlington County Route 545 (north-south) between the municipal border with Chesterfield Township and the municipal border with the City of Bordentown.
- Bordentown Chesterfield Road/Burlington County Route 528 (east-west) between the municipal border with Chesterfield Township and the municipal border with the City of Bordentown.

Per Section 25:515 of the Township Land Development Ordinance, the minimum required widths for collector street ROW's and cartways are 60 feet to 66 feet and 36 feet to 40 feet, respectively.

Local Roads

The remaining roads in Bordentown Township are classified as local roads. This is the lowest classification in the hierarchy of roadways and is characterized by low traffic, low speed limits, and narrow driving lanes. While they are the lowest classification, local roads make up the majority of roadways in a municipality and are essential for a safe and efficient roadway network. Trucks are typically prohibited on local streets to protect the tranquility of residential neighborhoods and create an environment friendly for pedestrians. These roads are typically short in length and provide direct access to individual properties. Because they have lower speed limits and carry less traffic, they typically have smaller rights of way and even shallower setbacks compared to collector streets. Additionally, the safe design of local roads serves to preserve residential neighborhood character and promote non-motorized forms of transportation such as biking and walking. According to Section 25:515 of the Township Land Development Ordinance, the minimum required ROW for local roads is 50 feet to 56 feet, and the minimum cartway width is 36 feet.

Truck Routes

N.J.A.C. 16:32 "Truck Access" outlines the regulations for truck operations in New Jersey. Specifically, these regulations establish a hierarchy of roadways on which trucks double-trailer truck combinations and 102-inch wide standard trucks should travel. The hierarchy of roadways includes the following roadway classifications:

- 1. The National Network
- 2. The New Jersey All Access Network
- 3. All other unrestricted roadways in New Jersey

The New Jersey Large Truck Map identifies all of the roads included within the New Jersey Access Network, National Network, and roadways segments on which trucks are prohibited. Roadways that are included in the National Network and NJ Access Network are available for truck use, unless otherwise prohibited. In Bordentown Township, there are two roadways in the National Network: I-295 and the New Jersey Turnpike (I-95). Route 130, Route 206, CR 545 Georgetown Road (trucks prohibited between the NJTP and Route 206), and CR 528 Crosswicks Road are part of the NJ Access Network.

The convergence of several of these routes in the Township make Bordentown an ideal place to locate truck-related uses such as truck stops and distribution centers. There are a few distribution and warehousing facilities, as well as two truck stops along Rising Sun Road between I-295 and the NJTP. Because of this, there is considerable truck traffic on the Township's local roads as there is limited access to I-295.

PUBLIC TRANSPORTATION

Light-Rail Service

While there are no rail stations located directly in Bordentown Township, the River Line does provide service to a station in Bordentown City. The River Line provides local residents transit access to regional employment centers including Trenton, which also has transit connections to Pennsylvania and New Jersey via SEPTA and NJ Transit, as well as Camden, which has transit connections to Philadelphia via PATCO.

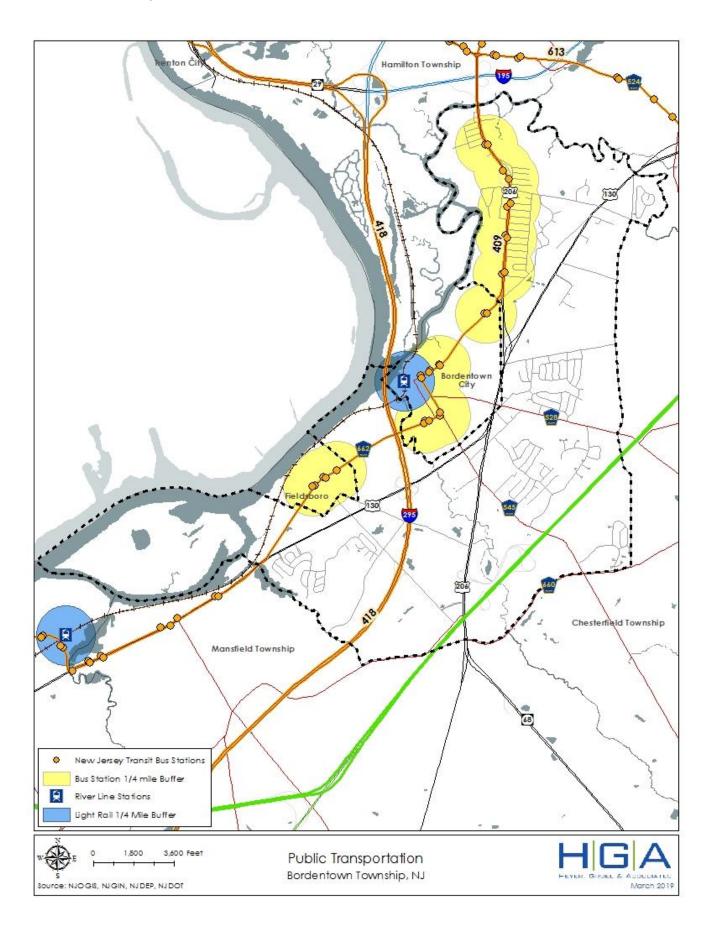
NJ Transit Bus Service

New Jersey Transit operates several bus lines that run through and provide service in Bordentown Township- Bus Route 409 and 418.

Bus route 409 connects Trenton, Willingboro, and Philadelphia and has several stops along Route 206 in the northern portion of the Township. The line switches from Route 206 to County Route 662 and continues into Bordentown City and Fieldsboro Borough making several stops within these adjacent municipalities.

Bus route 418 runs through the Township on I-295 providing express service between Trenton and Philadelphia. This line does not make any stops within the Township.

The following map shows the location of the public transportation network within the Township. The bus stops and train stations within and around Bordentown Township are buffered with a quarter-mile radius which represents a 15- to 20-minute walk. As shown on the map, access to bus transportation is limited within the Township. Only those properties along the northern portion of the Route 206 have adequate access to public transportation.



DEMOGRAPHICS

Commute to Work

Understanding the travelling patterns of residents is essential for effective transportation planning in the Township. Commuting characteristics for Bordentown Township residents, according to the 2013-2017 American Community Survey 5-Year Estimates, are shown below. Data for Burlington County and the entire state of New Jersey are included in the table for reference.

Residents' Commute to Work - Bordentown, Burlington County, and New Jersey						
Mode of Transportation	Bordentown Twp.		Burlington County		New Jersey	
	Estimate	Percent	Estimate	Percent	Estimate	Percent
Car, truck, or van - drove alone	4,927	82.2%	185,111	83.1%	3,074,062	71.5%
Car, truck, or van - carpooled	515	8.6%	15,870	7.1%	344,646	8.0%
Public transportation	296	4.9%	7,931	3.6%	493,428	11.5%
Walked	19	0.3%	3,164	1.4%	128,622	3.0%
Other means	38	0.6%	2,240	1.0%	78,727	1.8%
Worked at home	197	3.3%	8,396	3.8%	181,388	4.2%
Total	5,992	100.0%	222,712	100.0%	4,300,873	100.0%
Source: 2013-2017 American Community Survey 5-Year Estimates						

As indicated in the table, approximately 82% of all Bordentown Township residents drive alone to work, 8.6% carpool, and just 5% use public transportation. Burlington County experiences a similar trend- approximately 83.1% of County residents drive alone and 3.6% use public transportation. However, both the Township and the County have higher rates of people driving alone when compared to the State, where approximately 71.5% drive alone to work, 8.0% carpool, and 11.5% of the population utilizes public transportation. The data indicates that the commuting characteristics for Bordentown Township are mostly reflective of Burlington County as a whole, but differ substantially from the rest of New Jersey residents.

Travel time to work data was also examined and is represented below. The mean travel time of Bordentown Township residents to work was 30.9 minutes in 2017. Approximately 9% of all Bordentown Township residents had a commute of 10 minutes or less, and approximately 15% of residents had a commute time longer than 60 minutes. Approximately 59% of residents had a commute time that was less than 30 minutes. Г

Travel Time to Work Bordentown Township, 2017 Estimates			
	Number	Percent	
Workers who did not work at home	5,795	100.0%	
Less than 5 minutes	59	1.0%	
5 to 9 minutes	463	8.0%	
10 to 14 minutes	373	6.4%	
15 to 19 minutes	1,066	18.4%	
20 to 24 minutes	1,091	18.8%	
25 to 29 minutes	344	5.9%	
30 to 34 minutes	757	13.1%	
35 to 39 minutes	111	1.9%	
40 to 44 minutes	152	2.6%	
45 to 59 minutes	497	8.6%	
60 to 89 minutes	582	10.0%	
90 or more minutes	300	5.2%	
Mean travel time to work (minutes) Source: 2013-2017 American Community Survey 5-Year Estim	ates 30	.9	

In addition to mode of travel, the location of residents' jobs heavily influences the amount of time spend travelling to work. The following table shows the work location trends for residents in Bordentown Township and Burlington County. Given the Township's proximity to Pennsylvania and large employment centers such as Philadelphia and Trenton, it's not surprising that a large percentage of Township residents commute outside of Burlington County for work (75.2%). A much larger percentage of Burlington County residents work inside the County (54.6%), but a larger proportion of County residents also work outside the State (14.5%).

	Bordentown Burlington Co.		iton Co.	
Place of Work	Number	Percent	Number	Percent
In New Jersey	5,386	89.9%	190,356	85.5%
In Burlington County	1,488	24.8%	121,613	54.6%
In Other NJ Counties	3,898	65.1%	68,743	30.9%
Outside of New Jersey	606	10.1%	32,356	14.5%
Total	5,992	100.0%	222,712	100.0%

ACTIVE TRANSPORTATION

Bike Paths and Trails

The 2017 Master Plan Reexamination Report recognized a need for more bike paths and sidewalks to complement the Township's open space and recreation resources, as well as to connect the northern and southern portions of the Township. In the last decade, the Township has strived to provide better pedestrian and bicycle connectivity between recreation resources and disparate parts of the Township. In 2005, a pedestrian and bikeway map was prepared and subsequently revised in 2008. The Pedestrian and Bikeway Map shows a 6-phase plan for the creation of a Township-wide bike and pedestrian plan that would connect the northern and southern portions of the Township. The phases are as follows;

- 1. Paved trail connecting Groveville Road with residential subdivision at Crescent Drive.
- 2. NJDOT funded project connecting Joseph Lawrence Park with the residential subdivision adjacent to Terry Field and Constitution Park via a paved path.
- 3. Bridge construction across Suckers Run and path connecting Georgetown Road and Dunns Mill Road.
- 4. Protected bike lane and sidewalk path on Dunn's Mill Road between Route 206 and the Meadow Run Road Subdivision.
- 5. Bike path and sidewalk connecting the Meadow Run Road subdivision with the Adirondack Road subdivision.
- 6. Protected bike path on Groveville Road connecting the paved trail (Phase 1) with Northern Community Park

To date, all of the phases of the bike and pedestrian map have been completed, with the exception of phase 3.

Complete Streets

In 2011, Michael Baker Jr. Inc prepared the Route 130/Route 206 Bicycle and Pedestrian Plan, which analyzed existing bicycling and pedestrian infrastructure along and surrounding Routes 130 and 206.. The Plan's study area included both Bordentown Township and Bordentown City where Routes 130 and 206 intersect between Farnsworth Avenue/Georgetown Road to Park Street/Amboy Road. The Plan recommended a phased installation of bike facilities and pedestrian improvements at existing and proposed crossing locations along Routes 130 and 206.

In 2014, Bordentown Township adopted a Complete Streets Policy which strives to safely accommodate all modes of transportation on public roads, including pedestrians, bicyclists,

motorists and public transit. Assessing the feasibility of alternative modes of transportation on the Township's most heavily trafficked arterials furthers the objective set forth in the Complete Streets Policy.

Public Access

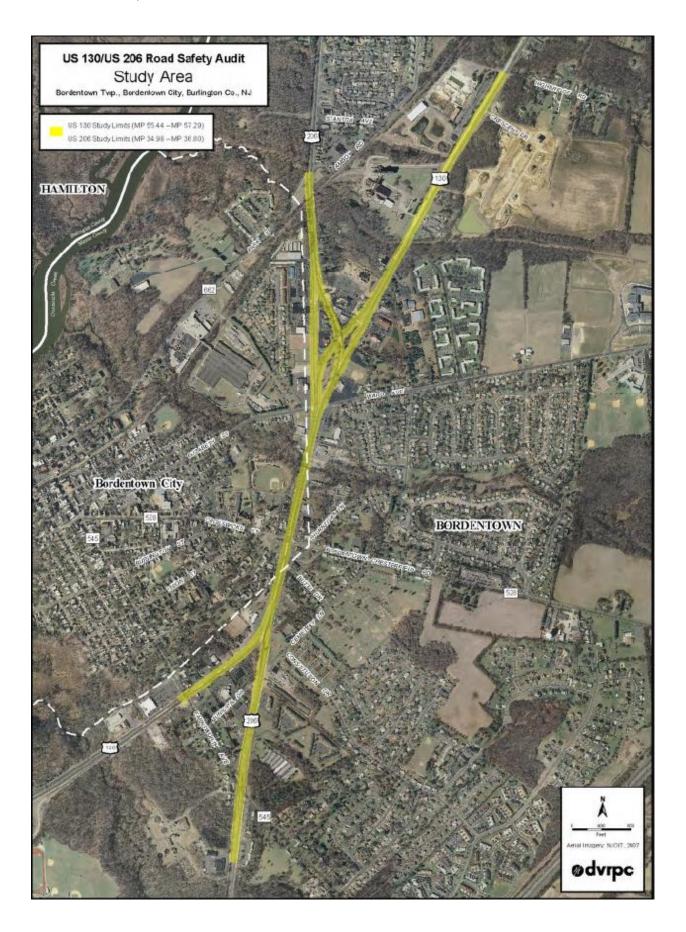
The Public Trust Doctrine dictates that certain natural resources should be preserved and maintained by the government for the public's use. In 2012, the New Jersey Department of Environmental Protection adopted new rules regarding public access that stipulated municipalities with tidal waters can adopt their Municipal Public Access Plan (MPAP) that identify, preserve, and enhance public access to and along those tidal waterways.

Bordentown Township also recognizes the lack of utilization of its scenic water views along the Delaware River and Crosswick Creek. Both waterways form natural boundaries between the Township and the State of Pennsylvania, and are currently underused for recreation purposes. Moreover, these areas along the river could be opportunities to expand the Township's bike and pedestrian trails network to include the riverfront, which would span from north to south through Bordentown and Fieldsboro as well. As a result, the Master Plan Update recommends development of a MPAP to be approved by the New Jersey Department of Environmental Protection.

Road Safety

Bordentown Township has a few high-trafficked freeways and arterials, making road safety a key concern for the Township especially when considering multi-modal transportation. Following the completion of the 130/306 Bicycle and Pedestrian Plan, the DVRPC conducted a *Road Safety Audit* (2012) for the same area. The 130/206 Bicycle and Pedestrian Plan recommended several improvements that are also found in the *Road Safety Audit*. A road safety audit (RSA) is a performance examination of an existing or future road or intersection to identify issues that could affect user safety and come up with improvement recommendations that make the study area safer. The *2012 RSA* analyzed crash data, identified crash concentration areas and trends, and unsafe areas for pedestrians, bicyclists, and motorists. The *RSA* analyzed five intersections:

- Farnsworth (CR 545) at US 130
- Farnsworth (CR 545) at US 206
- Butts Drive at US 130
- Crosswicks Street/Bordentown-Chesterfield Road (CR 528) at US 130
- Park Street (CR 662) at 206.



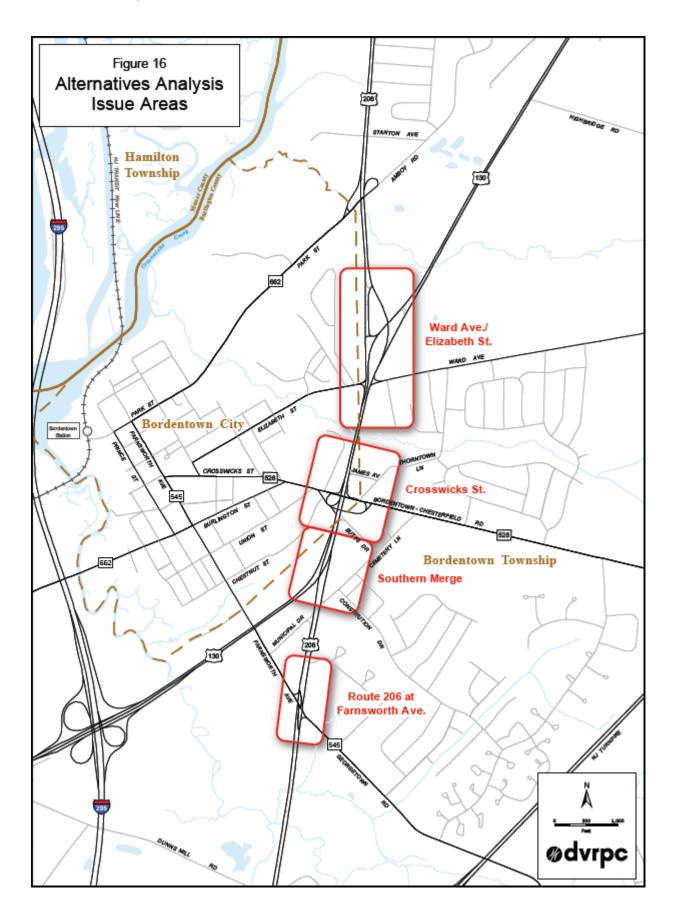
The 2012 RSA concluded with a number of recommendations to improve the safety and operations at specific sites along the corridor. In this section, the report identifies an issue, the action that can be used to address it, the level of effort behind each action, and the estimated safety benefit of addressing that issue. Several of the recommendations have a difficulty rating of "low," meaning it may be implemented through maintenance without requiring additional engineering or planning efforts. Other recommendations have a difficulty rating of "medium," requiring use of existing or new contract, some engineering, and funding, or "high," which are typically longer-term projects, possibly needing full engineering plans, right-of-way acquisition, and new funding. The report recommends addressing the "low" difficulty issues since the proposed solutions are relatively easy to implement and can have a high estimated safety benefit.

For instance, to remedy the lack of space for bicyclists to cross the Butts Avenue/Crosswicks Street intersection, the RSA recommends restriping the intersection to provide a bicycle-friendly shoulder width and dedicated bike lane. This project is rated as a "low" difficulty project but has a medium estimated safety benefit.

The RSA paved the way for the DVRPC Traffic-Calming Alternatives for Routes 130 and 206, which was released in October 2012. The report builds off of the previous two studies conducted along this corridor, and proposes improvements for specific intersections within the study area. The Plan divides the Route 130/206 corridor into four issue areas- Ward Ave/Elizabeth Street, Crosswicks St, Southern Merge, and Route 206 at Farnsworth Avenue, and developed alternatives for each. The Report proposes five scenarios for future improvements along this stretch of the corridor, one being the existing conditions and the other four being potential alternative improvements strategies. Each scenarios has implications for the issue areas, so the report recommends "preferred alternatives" best address safety and congestion now.

The preferred alternatives include:

- Access and safety improvements along Route 130 and 206 near Mastoris Diner
- New one-way single lane road between Dunns Mill and Rising Sun Road to provide heavy vehicles an alternative to Farnsworth Road
- Road diet of the shared section of Routes 130 and 206
- Two-lane roundabout at the southern merge-diverge points of Routes 130 and 206
- Two-lane roundabout at the current signalized Routes 206 and Farnsworth/Georgetown Road
- Signalized intersection where Routes 130 and 206 intersect with Ward Avenue and Elizabeth Street



Key among these preferred alternatives is the road diet along the shared portion of US 130 and US 206, which the report identifies as a short-term, low cost, and effective solution that is scalable with the addition of longer-term improvements, such as the two-lane roundabout alternative at the southern merge point, and left turn lanes at the signalized intersection of Ward Avenue and Elizabeth Street.

Of these proposed preferred alternatives only the access and safety improvements along Routes 130 and 206 near the Mastori's Diner have been implemented and completed.

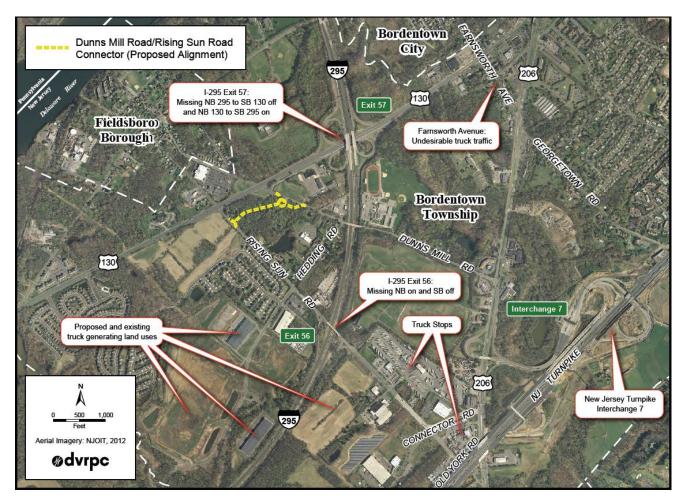
Following the 2012 Traffic Calming Alternatives report, DVRPC published another report that looked specifically at the feasibility of implementing the preferred alternative of a bypass road connecting Dunns Mill Road and Rising Sun Road entitled Bordentown Township Redevelopment: Proposed Connector Road. The Report addressed three main issues: the lack of connections for heavy vehicles between I-295 and NJTP; identification of possible improvements to the road network to improve consistency and efficiency, and to accommodate current and future capacity requirements; and use transportation improvements to promote development and job growth in the area.

To better understand the nature of transportation in this particular area of the Township, the Report first identified current and future freight truck trip generating land uses in the vicinity of the proposed road. Next, traffic counts were collected at various stations on US 130, US 206, Rising Sun Road, and Dunns Mill Road in 2013 to show current traffic conditions. The Report then examined crash data to determine the intersections were the least safe, and followed that with a truck origindestination analysis to see where the trucks were going and by which roadways.

To project the potential impact and feasibility of the connector road, simulations were conducted. First, roadway level of service simulations were performed on four intersections to analyze current roadway performance, and then future trip generation rates and roadway level of service simulations were conducted for two scenarios in 2040: one in which the road is built, and one in which the road is not built. The intersections analyzed are the following: US 130 and Farnsworth Avenue, US 206 and Farnsworth Avenue, US 206 and Connector Road, and US 130 and Dunns Mills Road.

The Report concludes that the connector road is feasible from a transportation perspective and would alleviate truck traffic on Farnsworth Avenue, but warns that there would still be significant congestion at the US 130 and Dunns Mill Road intersection that would need to be mitigated. The Study also puts forth a few other potential improvements that would complement the connector road, including a road connecting US 206 to the Turnpike, extension and lengthening of the left-

hand turn lane at the US 206 and Farnsworth Avenue intersection, and completing the I-295 and Rising Sun Road interchange by adding north-bound on and south-bound off ramps.



Source: Delaware Valley Regional Planning Commission, "Bordentown Township Redevelopment: Proposed Connector Road," 2012.

RECOMMENDATIONS

Pedestrian and bike path connections

ISSUES

While Bordentown has a highly connected road network, the majority of these roads are high speed and high-traffic freeways and arterials, which are unsafe for pedestrians and bicyclists. The Township has taken considerable steps to connect the Township's open space areas, as well as the communities in northern and south portions of the Township, but there is still work to be done.

Recommendations

- When redesigning new roads, the Township should ensure that all new roadways are supplemented by sidewalks for pedestrians and bike lanes for bicyclists. The Township's Ordinance is recommended to be amended to require a bikeway width 10 feet and a sidewalk width of 5 feet. A bike path may be reduced to 8 feet with justifications pursuant to the approval of the Township Engineer.
- The Township should collaborate with the State and County regarding the design of new bike/pedestrian pathways.
- The Township should convert a portion of the existing roadway shoulder on Crosswicks Road into a designated bike lane to provide residents of the adjacent developments safe access to US 206/130 and Bordentown City. The shoulder appears to be used for on-street parking for the dwellings that front Crosswicks Road, but parking is sparse. Furthermore, members of the public have voiced concern that this on-street parking limits sight distance when turning onto Crosswicks Road from the residential developments. Therefore, creating a bike lane in both directions could serve two purposes: providing better bicycle access and improving sight distance for turning vehicles at intersections.
- As a condition of approval, the Township should require all new development on the shared portion of US Routes 206 and 130 to provide on-site sidewalk improvements that connect and enhance the existing sidewalk network along the corridor.
- The Township should prepare a Municipal Public Access Plan (MPAP) that outlines the Township's strategy to preserve and enhance residents' ability to access the natural resources along the tidal waters of the Delaware River and Crosswick Creek. In developing the MPAP, which must be submitted to NJDEP for approval, the Township should consider opportunities for bicycle and pedestrian connections as a strategy to improve public access to the waterfront while also connecting disparate portions of the Township.
- The Township should coordinate with the City of Bordentown and the Borough of Fieldsboro to make inter-municipal bike and pedestrian connections. This will help connect

residents in all communities to more open space resources and amenities, while also providing more access to the waterfront for Township residents.

- The Township should consider commissioning a Pedestrian Access Plan that identifies areas and roadways in the Township that need sidewalks, and outlines a strategy for funding and implementing improvements to improve walking conditions for pedestrians throughout the Township.
- It is recommended that all signalized intersections within the Township be reviewed and evaluated in terms of bicycle and pedestrian safety and that all intersections be ADA and Universal Design compliant. Techniques to consider include lighting enhancements at intersections to improve the visibility of bicycle/pedestrian connections, sight easements at intersections where there are existing bicycle and pedestrian crossings, and proper signage of bicycle and pedestrian crossings and lanes.
- Locations of the bicycle/pedestrian pathways to evaluate and improve include the crossings at Georgetown Road and Yorktown Road, Georgetown Road and Williamsburg Drive, crossing/bridge to the former Dix Drive-In Open Space property from Georgetown Road, crossing at Route 206 and Dunns Mill Road, crossing at Groveville Road and Route 130 and extending pedestrian/bicyclist access along Groveville Road to the Northern Community Park on Groveville Road, crossing at Route 130 and Groveville Road, crossing at Ward Avenue and enhancing the crossing at Crosswicks Road.
- The Township should connect the Township-wide pedestrian/bikeway with the former Dix Drive-In property that is currently owned by the Township and is part of its open space. The Dix Drive-In property is constrained with slopes and wetlands. It is recommended the Township work with the NJ Turnpike Authority and NJDOT to utilize a portion of the NJ Turnpike right of way, where feasible, to provide pedestrian/bicycle access that will connect with the Township's pedestrian/bikeway plan.
- Bikeways should be encouraged and incorporated into new or amended site plans and subdivisions which link to or expand the existing bicycle network. Traffic Calming

Traffic Calming

Issues

DVRPC has conducted several traffic studies concerning key arterials in the Township, including the US 130/US 206 Road Safety Audit (2012) and Traffic Calming Alternatives for Routes 130 & 206 (2012). Combined with the 130/206 Bicycle and Pedestrian Plan (2011), it is evident from these reports that these roadways need to be redesigned to improve the safety of motorists, bicyclists, and pedestrians. These recommendations are also meant to address the traffic and congestion

concerns raised by the public on a number of streets that intersect US 130 and US 206, including Georgetown Road, Cemetery Lane, and Crosswicks Road.

Recommendations

• The Township should begin addressing the issues identified as "low level of effort to implement" in the 2012 Road Safety Audit. These issues represent low effort and low-cost policy initiatives to make the Township's main arterials safer while potentially having farreaching safety impacts for its users. These issues include the following:

Farnsworth Avenue Intersection with US 130				
Issue	Recommendation			
Right-turn-on-red allowance onto US 130 from Farnsworth Avenue compromises safety for pedestrians crossing Farnsworth Avenue.	Add "no turn on red when pedestrians are present" sign to give pedestrians priority, and consider traffic calming to slow right- turning vehicles, which were observed taking these turns without slowing appropriately.			
Median opening located north of the intersection has an antiquated design and presents a safety hazard.	Close median opening—U turns can be made at the intersection or further north between existing opening and the Butts Avenue intersection;			
Crosswicks Road/Butts Avenue	Intersection with US 130/US 206			
Issue	Recommendation			
Stop bars currently aligned in center of pedestrian crosswalk (crossing US 130 at Butts, and crossing Crosswicks Road along eastbound approach.	Move stop bar back (north) at US 130 and Butts Avenue intersection, and move stop bar back (west) on Crosswicks Road. NJDOT			
No space for bicyclists to go through Crosswicks Road intersection at either approach;	Restripe intersection approaches to provide bicyclist-friendly shoulder width; dedicated bike lane.			
The section of median pedestrian fence near Denny's Restaurant has been hit repeatedly.	Reinstall pedestrian fence on jersey barriers; NJDOT.			
Left turns from Butts Avenue to US 130/US 206 SB present a potential conflict with Butts Avenue EB slip ramp to SB 206/130, and both have a relatively short roadway length in which to choose between US 130 SB or US 206 SB before the split;	Add elephant tracks for left turns from Butts Avenue to 130/206 SB; EB Crosswicks Road to 130 NB; and consider pavement markings to provide advanced warning of the US 130/US 206 split to provide drivers ample notice; NJDOT			
Signs to indicate turns made from jug handle only for motorists on US 130/US 206 are ineffective, and as a result, drivers sometimes make illegal left turns at the intersection rather than use the far-side jug handle.	Evaluate sign placement, adequacy of advance warning, and messaging to improve the information flow to motorists; reinstall overhead US 130/US 206 signs; add lane marking in left through lane to indicate through movements only.			

E. Park Street/Amboy Roa	d Intersection with US 206
Issue	Recommendation
Bicyclists are not accommodated along the east-west intersection approaches due to missing shoulders.	Restripe the approaches for narrower lanes to create a small shoulder for bicyclists. A long-term improvement to complement ground-level access involves utilizing the adjacent freight rail line ROW to provide east-west bike access.
Compromised sight distance due to vertical curve and overgrown vegetation of Amboy Road WB traffic for jug handle traffic entering Amboy Road WB. The right-turn movement from US 206 NB to	Cut back vegetation and install warning signs and pavement markings in advance of jug handle to warn of entering traffic; Move stop bar back (east) to provide
Amboy Road EB lacks proper clearance, as drivers frequently cross into the WB stop bar on Amboy Road while turning right.	needed clearance for right turns from US 206 NB NJDOT.
Hit-fixed-object crashes were noted as common by the study team, and this is consistent with the data analysis;	Upgrade crash attenuators under bridge, provide extra warning if necessary, and add elephant tracks for left turns from Amboy Road WB to US 206 SB;
It was noted by the study team that it is common for US 206 NB drivers to make an illegal left turn at the intersection rather than use the far-side jug handle.	Add signs to better communicate that left turns must be made via far-side jug handle; add lane marking in left- through lane to indicate through movements only NJDOT .
Intersection of US 130	and Highbridge Road
Issue	Recommendation
Highbridge Road is difficult to see from US 130 due to the surrounding wooded area and poor lighting conditions.	Install an intersection ahead warning sign or flashing beacon for Highbridge Road; consider additional street lighting; reinforce the no Uturn signage at and in advance of Highbridge Road for US 130 SB traffic.
Intersection of US 206 a	
Issue US 206 SB peak-period traffic queue blocks police access to cross-over median opening.	Recommendation Stripe roadway section as "Do Not Block the Box" and add appropriate signs;
The location of the Farnsworth Avenue EB approach stop bar currently allows queuing drivers to block access to the side road where the water authority is located.	Retain existing stop bar and install a second stop bar west of side road approach to create a gap that allows drivers from the side road access to Farnsworth Avenue.
Defunct weigh station, located in the median approximately 100 feet north of the intersection, inhibits safety and operational improvements opportunities.	Investigate future of the building and associated ROW issues.

Left turns from Farnsworth/Georgetown	Add elephant tracks for left turns and add
Avenues are not delineated, creating	arrow markings to center-of-left lane to
some confusion.	instruct drivers.

- The Township should begin planning to design and implement the road diet for the portions of US 130 and US 206 that converge, as shown in the 2012 *Traffic Calming Alternatives Report*. The Township should consider the Road Diet design drawings included in the 2012 *Traffic Calming Alternatives Report* to see how the Road Diet may be implemented where the two roadways converge, and apply a similar design to each highway when they separate. The Township should explore additional funding opportunities to finance the project, and establish a timeline for implementing the road diet.
- The 2012 Traffic Calming Alternatives Report recognizes that the road diet will greatly enhance the safety conditions of this stretch of roadway, but also that this is a short-term solution. The Township should begin planning for and allocating funds for the more expensive, longer-term "preferred alternatives" recommended in the Report as well, including
 - New one-way single lane road between Dunns Mill and Rising Sun Road to provide heavy vehicles an alternative to Farnsworth Road;
 - Two-lane roundabout at the southern merge-diverge points of Routes 130 and 206;
 - Two-lane roundabout at the current signalized Routes 206 and Farnsworth/Georgetown Road;
 - A signalized intersection where Routes 130 and 206 intersect Ward Avenue and Elizabeth Street.
- In conjunction with the road diet, it is recommended that the barriers separating northbound and southbound traffic on Routes 130 and 206 should be removed. Township residents voiced concern that the barriers were having negative effects on the performance of businesses located along these roadways because they discourage potential customers from crossing the highway to use these businesses. This would increase the visibility and accessibility of these properties to users on the other side of the roadway.
- Additional traffic calming and safety measures should be reviewed and evaluated along Georgetown Road, Constitution Drive, Cemetery Lane, Groveville Road (pedestrian crossing), Crosswicks Road (improvement of bicycle and pedestrian crossing at Charles Bossert Drive), and Ward Avenue (bicycle/pedestrian crossing).

Congestion

Issues

Comments from the public have indicated that traffic congestion on local and County roads is a recurring issue. Given its location at the crossroads of several major roadways and the presence of two large truck stops off of the New Jersey Turnpike on Rising Sun Road and several distribution centers on Bordentown Hedding Road, truck traffic makes up a significant portion of this congestion. Currently, there are two interchanges by which trucks and passenger vehicles can access I-295. One interchange is located at Rising Sun Road, but trucks can only enter I-295 going southbound. Traffic going north on I-295 can only access Rising Sun Road at this interchange. The other interchange is located further north along Route 130. Trucks travelling north on Route 130 can access I-295 northbound, and traffic travelling south on Route 130 can access I-295 going north and south. Traffic going north on I-295 can exit north onto Route 130 north but not south, and traffic going south can exit onto Route 130 going north and south. Since trucks cannot access I-295 at Rising Sun Road, they are required to access I-295 using Route 130 via local feeder roads, mainly Farnsworth Avenue and Georgetown Road.

Recommendations

- The previous DVRPC studies indicate that a road connecting Dunns Mill and Rising Sun Road would help alleviate truck traffic and congestion in the immediate area. The Township should consider implementing this connector road between Rising Sun Road and Dunns Mill Road as recommended in the 2014 Proposed Connector Road Study.
- The 2014 Proposed Connector Road Study also recommended completing the I-295 interchange with Rising Sun Road by providing an exit ramp for I-295 southbound onto Rising Sun Road and an entrance ramp from Rising Sun Road to I-295 northbound. The Township should review truck routes in the Township to determine if additional exits or entrances to I-295 would be viable as a means to reduce congestion on Route 206 and Route 130.



 Comments from the public indicated that traffic along Georgetown Road going to and from Fort Dix is a recurring issue. Trucks are restricted from using the stretch of Georgetown Road between US 206 and the NJTP, according to the Large Truck Network Map. To help alleviate some of the congestion problems, presumably as a result of tractor trailers, additional signage should be installed to alert truck drivers that this stretch of road is restricted to truck access and that alternative routes need to be taken

It is further recommended that intersection improvements be considered at the following locations:

- Farnsworth Avenue and Route 130
- Extend the slip ramp for additional queueing on Route 206 southbound to allow for a left turn onto Georgetown Road
- Provide a left turn lane on Crosswicks Road at the jug handle entrance to allow through traffic to continue to Route 130 north.
- Improve the intersection of Dunns Mill Road and Route 206 to provide a safer pedestrian and bicyclist crossing.
- Improvements and enhancements along Route 206, including the decommissioned weigh station that is located within the median of Route 206 just north of the intersection

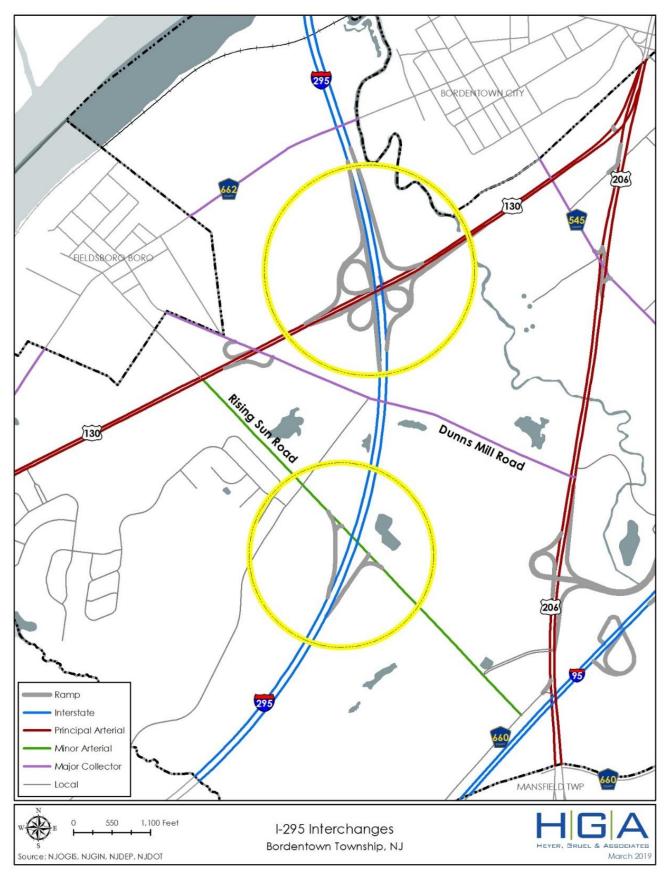
Farnsworth Avenue, Georgetown Road, and Route 206. The redevelopment of this weigh station should complement the Southern Gateway Redevelopment Area.

• Improve/expand the off ramp of Route 130 at Dunns Mill Road to allow additional queueing

Roadway Vacation

It is recommended that Township consider the vacation of the following roadways:

- Vacation of Stanton Avenue from Route 206 to the Bordentown Sewerage Authority pumping station, and transfer ownership to the State of New Jersey as a means to provide access to the Delaware and Raritan Canal State Park.
- Vacation of Mission Avenue in front of the existing shopping center located at Block 32 Lot
 2.
- Vacation of Taft Avenue where it does not impact the existing properties.



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Additional Recommendations

It is recommended that the Township continue to apply for State, Federal, and County funding and grants to assist with the above recommendations, including intersection improvements, pedestrian/bicycle improvements, and vehicular circulation.

The Township should work with the State and County to expand and promote public transportation, such as bus stops and bus routes along Route 130 focusing on areas of high-density housing, such as the Southgate and Rydel Apartment complex, Rivergate, and Bradford Pointe Apartments.

It is recommended the Township discourage additional circulation activity within the Abbott Marshland Preservation to limit the disturbance of the natural resources.

It is further recommended the Township consider adding electric vehicle charging stations at the new municipal building site and new community center that is proposed to be located on Block 92 Lot 8.01. The charging stations are recommended to be incorporated into the design of the site plan for the new municipal complex.