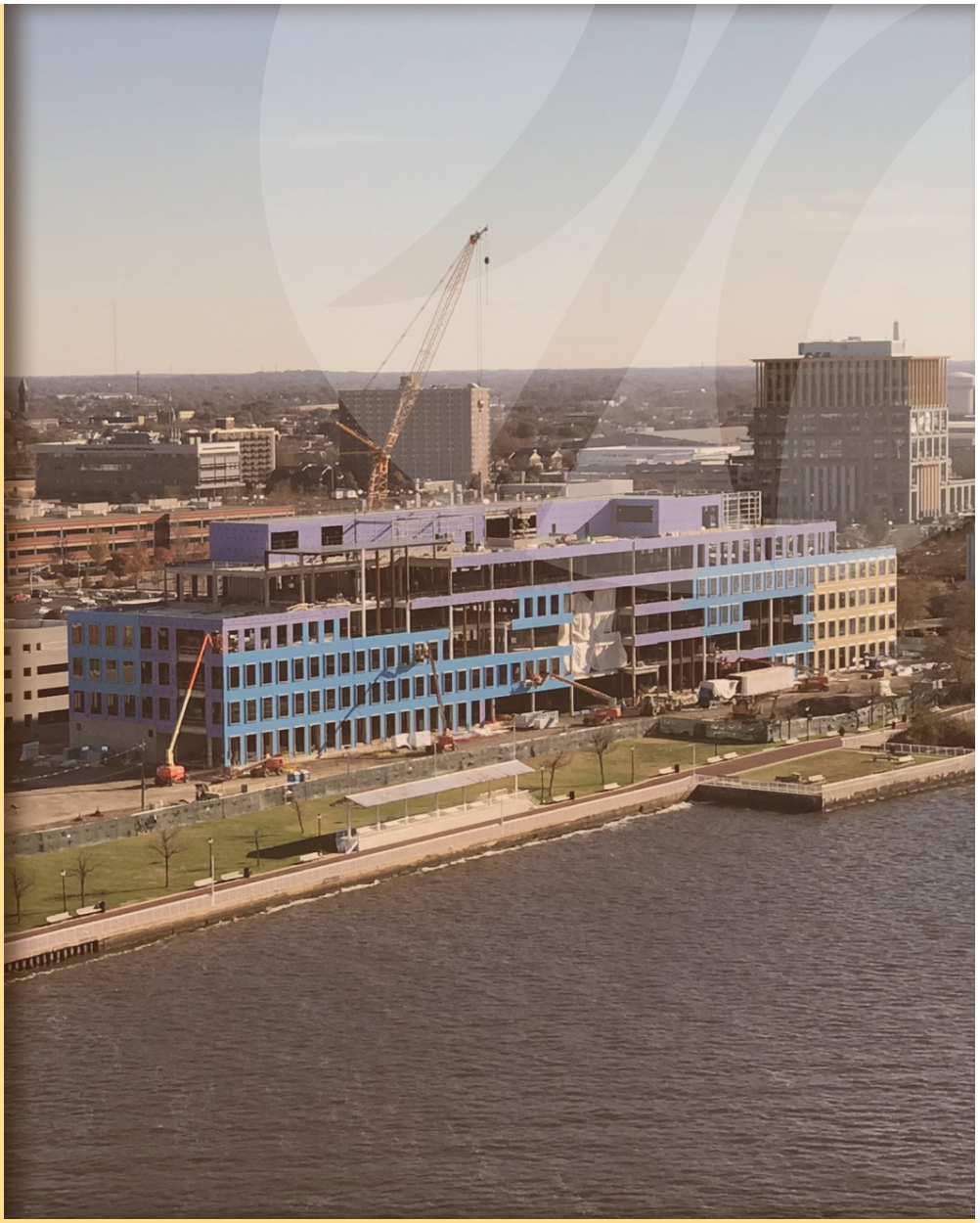

DELAWARE VALLEY
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REGIONAL
PLANNING COMMISSION

March 2018

City of Camden
Access Study

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Executive Summary

The City of Camden has experienced several decades of declining population and industry. However, more recently, Camden has seen a resurgence of activity. Several large-scale developments are currently under construction, and several more are planned. Lower crime rates, the renovation of vacant properties, and a tax-friendly business climate are among the factors serving as catalysts in attracting residents, businesses, and developers.

Camden is currently served by a robust transportation system. Major highways feed into Camden from places across South Jersey. The nearby Walt Whitman and Ben Franklin bridges provide quick access to Philadelphia. Camden is also a hub of transit activity, with several agencies operating heavy rail, light rail, and local and regional bus services.

The rapid growth of Camden will burden the existing transportation system's ability to move people, freight, vehicles, goods, and services. The purpose of this study is to determine the degree to which the current and future development will strain the study area's transportation infrastructure and to identify potential improvements.

With the use of traffic engineering software, a traffic impact analysis was performed. Future trips, predicted in association with the planned development, were inventoried and overlaid on existing traffic volumes to estimate future traffic conditions.

A quantitative analysis of 21 key intersections was completed. The evaluation summarizes existing conditions, as well as conditions for a 2026 horizon year. In general, the analyses found that the city's transportation infrastructure currently operates with sufficient levels of available capacity. However, several intersections will begin to perform below standard as development proceeds. Mitigation strategies have been identified to effectively accommodate new vehicular trips. A detailed examination of key intersections is presented.

Other aspects of Camden's transportation network were also assessed for this study, including bicycle infrastructure, pedestrian amenities, public transportation, goods movement, and parking.

CHAPTER 1

Purpose and Introduction

Purpose

The purpose of this study is to assess development impacts on the transportation infrastructure in the study area. Through a systematic process, the effects of the many new developments planned for Camden's central business district were measured. Although the area is well served by transit, additional vehicular activity related to this new development will strain the roadway system.

In order to understand the extent of the development's anticipated effects, a traffic impact model was developed. Through a process of data collection and analysis, existing conditions were understood and quantified. With the assistance of the traffic impact model, future conditions were predicted.

By comparing existing conditions to future conditions, the measure of change can be calculated and mitigation strategies can be developed. The primary focus of this study's recommendations deals with ways to maintain vehicular mobility, although elements of bicycle, pedestrian, and transit mobility are also examined, as are the impacts of heavy vehicles.

Using the findings of this study, county and city officials can direct transportation investments toward projects that will bring the most long-term benefit. In addition, this document provides a tool to look beyond the limits of individual traffic impact studies and towards a comprehensive understanding of traffic impacts.

Introduction

The City of Camden is currently experiencing a rebirth. In recent years, several major developments have been constructed, and many other significant developments are in varying stages of planning and construction. The planned developments are located throughout the central business district and will affect the city's transportation infrastructure. This study assesses those impacts.

Seeing the potential for future transportation challenges, the Camden County Division of Planning, in conjunction with the City of Camden, requested that the Delaware Valley Regional Planning Commission (DVRPC) conduct this study.

The strategic intersections that will experience the effects of traffic generated by the new developments were examined. The intersections were selected from the city's major arterials and from routes that provide connections to the regional highway network.

In addition, new developments have the potential to increase demand for pedestrian, bicycle, and transit use in the city. This study also recognizes the impact of increased demand on each of these modes.

This document builds off of findings from a prior DVRPC report, *City of Camden Access Study*, published in July 2012. The *Access Study* developed mitigation strategies to maintain vehicular mobility and improve the pedestrian and bicycle environments. This study primarily explores the impact of new developments on the transportation system.

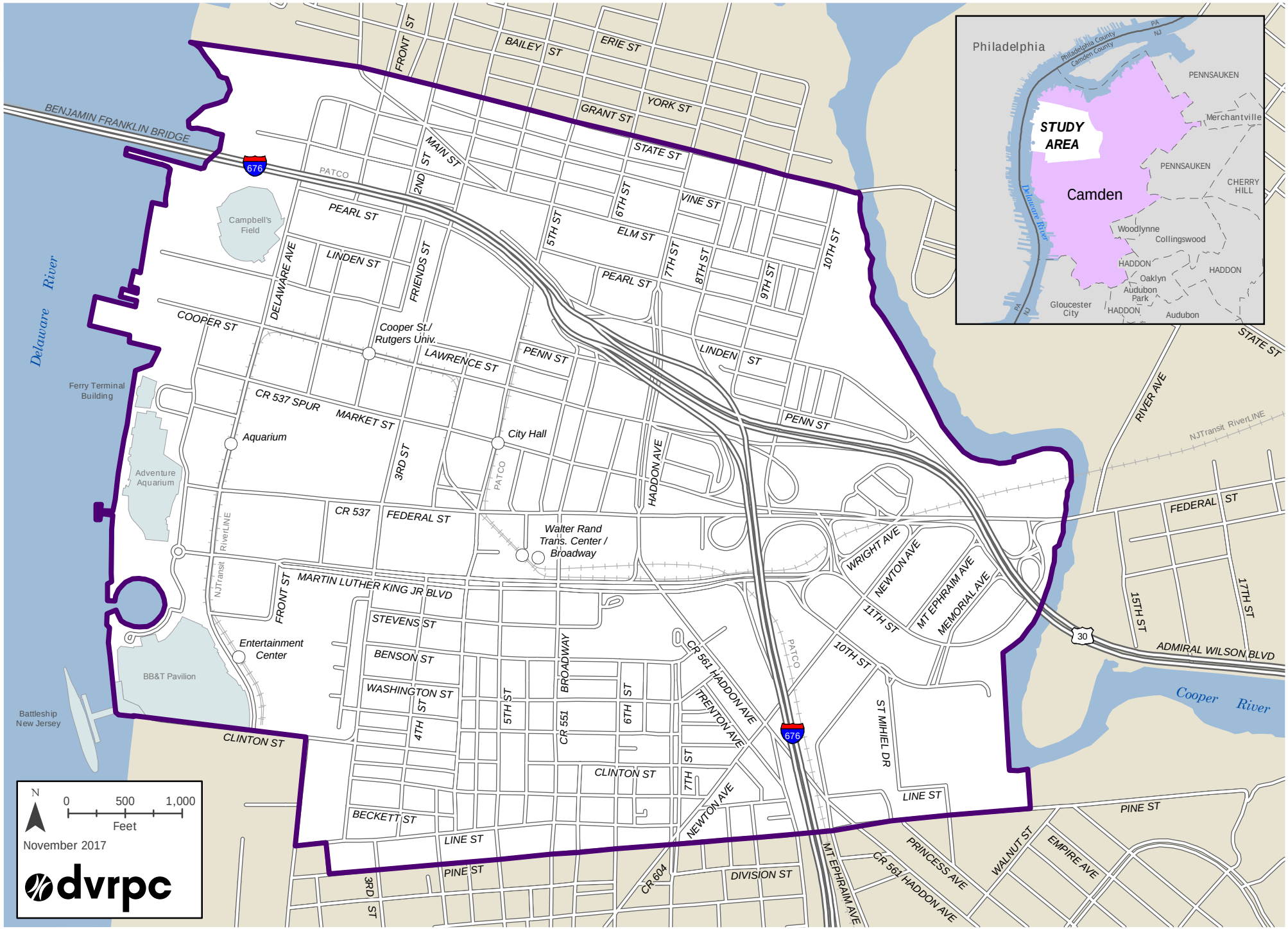
Study Area

The study is focused on the central business district of Camden, which is generally the area between the Delaware and Cooper rivers, with State Street serving as the northern boundary and Pine Street serving as the southern boundary. The study area contains all or parts of seven Camden neighborhoods: Cooper Point, Cooper Grant, Pyne Poynt, Central Waterfront, Downtown, Lanning Square, and Gateway. **Figure 1** illustrates the extent of the study area.

The study area contains a wide range of large employers, including Campbell's Soup Company, Cooper University Hospital, Camden City Hall, Camden County College, Rutgers University–Camden/Rowan University, L3 Communication Systems, and the Camden County legal complex. Future developments include the Liberty Property Trust Development campus near the Delaware River, the relocated Subaru headquarters, and the planned Knights Crossing complex. Several regional attractions are also located in the study area, including the BB&T Pavilion, Wiggins Waterfront Park, the Adventure Aquarium, and the Battleship New Jersey Museum and Memorial.

The study area is well served by a multitude of transportation options. I-676 and US 30 provide the primary highway access in and out of Camden. The Walter Rand Transportation Center is situated in the heart of the central business district. There are 24 New Jersey Transit (NJ Transit) bus routes feeding into and out of the study area, and one bus line operated by Greyhound. The NJ Transit River LINE light rail and the Port Authority Transit Corporation (PATCO) Speedline provide frequent rail service for residents, visitors, and commuters in and out of Camden.

Figure 1: Study Area



CHAPTER 2

Demographics

Population and Employment

Demographic data is an important aspect of any transportation study. Where people live, where they work, and how they make the connection to these and other destinations creates demand on the transportation network. Additionally, understanding demographic trends and forecasts allows for the development of plans that seek to accommodate demographic change. For this study, a tabulation of population and employment within the study area was conducted.

The primary study area includes all or portions of seven Camden neighborhoods shown in **Figure 2**. Typical Census subdivisions do not necessarily align with a study area's boundaries, as is the case here. Population and employment data have been presented at the neighborhood level and are shown in **Table 1**.

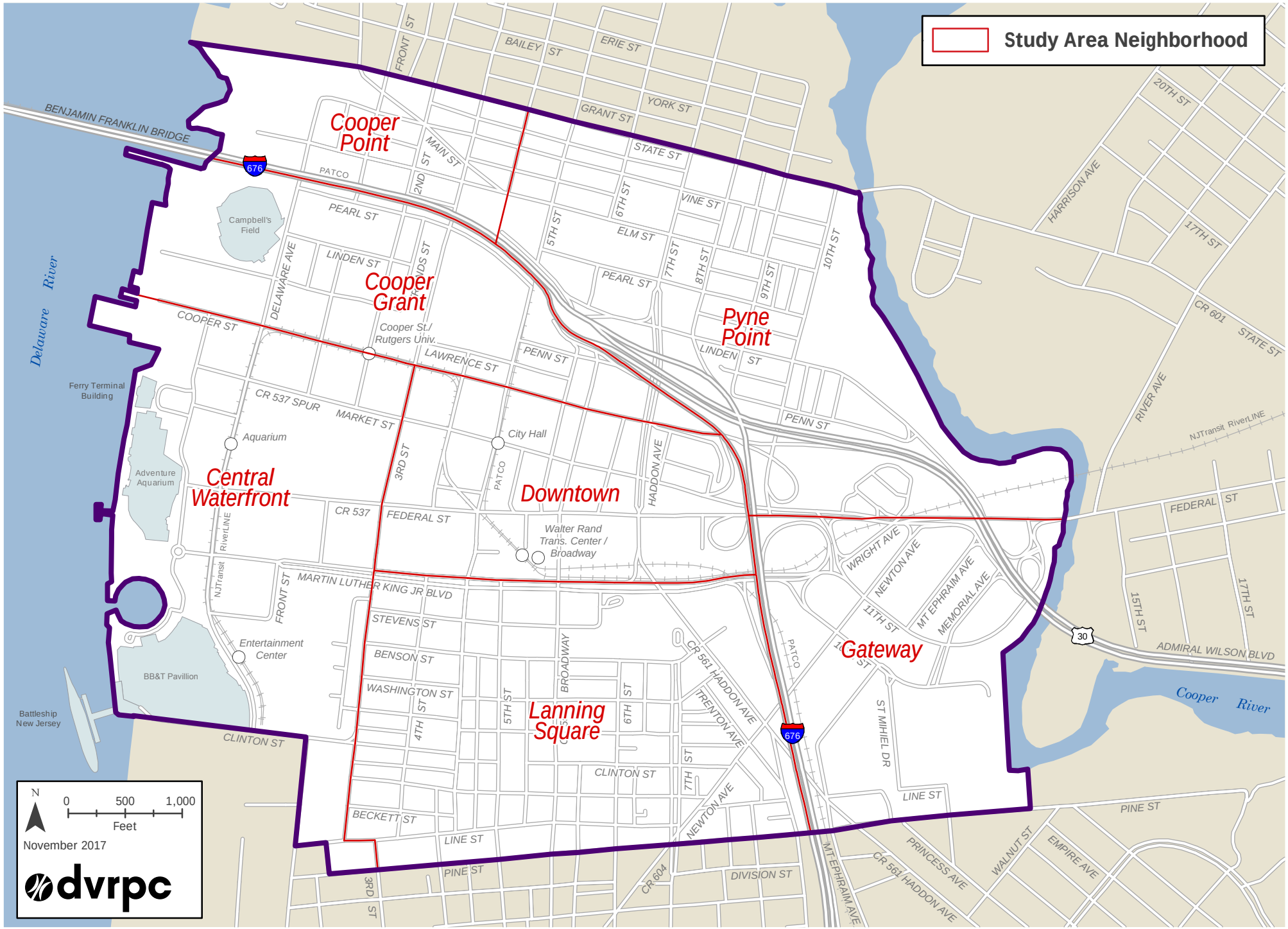
Table 1: Current Study Area Population and Employment

Neighborhood	Population	Employment
Downtown	1,834	7,963
Central Waterfront	1,485	4,055
Cooper Point	1,452	281
Cooper Grant	806	1,729
Gateway	2,097	2,432
Lanning Square	3,650	8,495
Pyne Poynt	4,973	1,215
Greater Study Area	**16,297**	**26,170**

Sources: U.S. Census, 2010; DVRPC, 2017

In the whole of Camden, estimated employment for 2015 stood at 41,786. By 2045, this number is expected to increase by over 10 percent. However, with a number of new developments planned since these forecasts were developed, this is likely a conservative estimate.

Figure 2: Study Area Neighborhoods



CHAPTER 3

Land Use and Future Development

Land Use

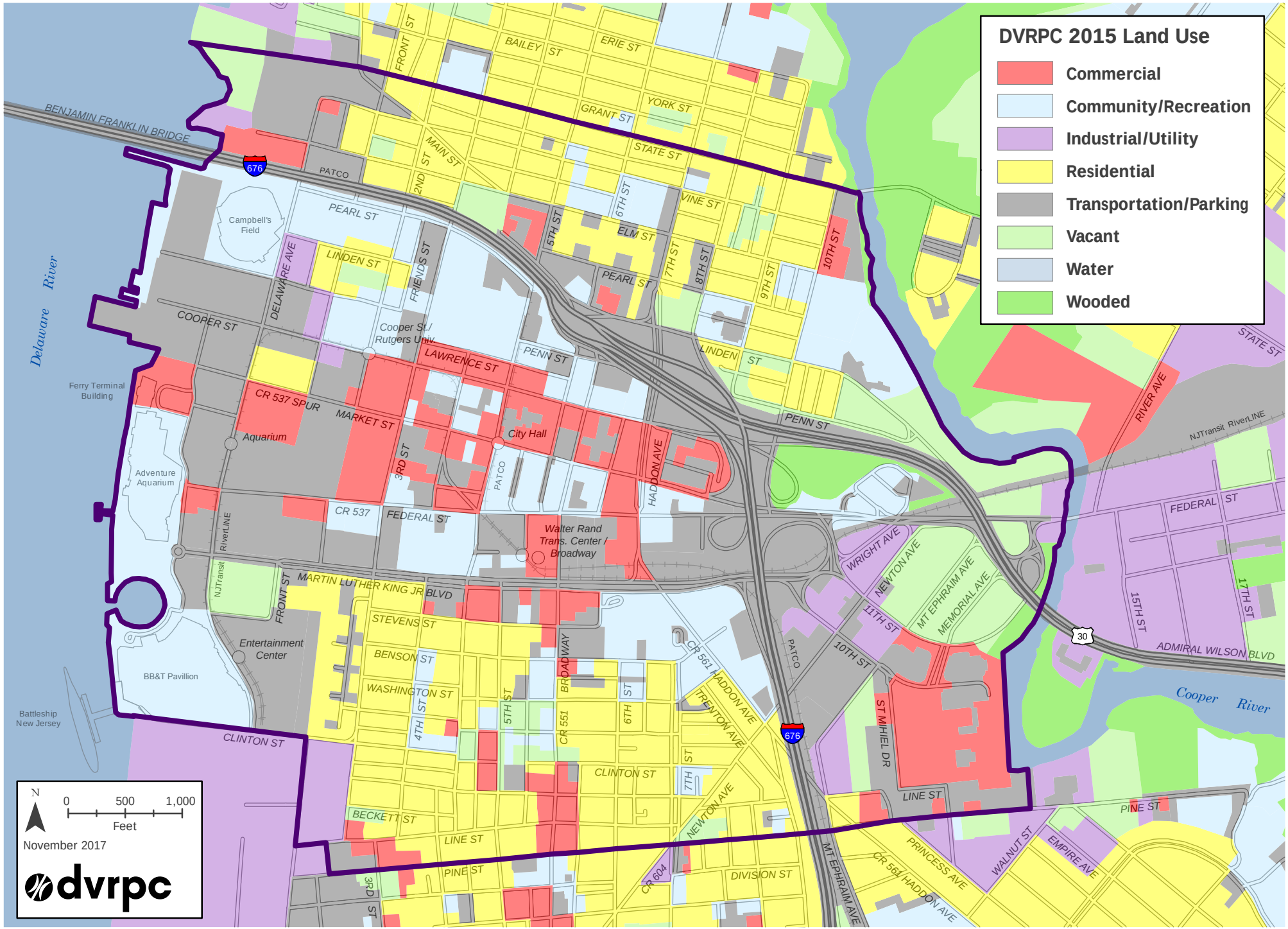
The relationship between land use and transportation facilities is central to any traffic study. The use of the land—where people live, work, and play—and its intensity are responsible for the generation of trips. The spatial spread of these uses, and the transportation facilities connecting or serving those uses, is responsible for how trips are made (e.g., by highway, transit, walking, etc.).

Existing land uses are shown in **Figure 3**. Institutional and commercial land uses are dominant throughout much of the study area. Residential land uses in the study area are largely found in the Lanning Square and Central Waterfront neighborhoods. Vacant and undeveloped lands are abundant in most neighborhoods.

As detailed in the following pages, many significant developments in the study area are currently in varying stages of planning and construction. The developments will constitute a range of uses, including residential, hotel, office, research and development, retail, and academic. Much of the development will be built on vacant land or surface parking lots. The increased density and mixed-use environments that these developments will eventually help bring about can create a more vibrant and walkable place.

As discussed further in Chapter 6, there will likely be a net increase in parking spaces due to minimum parking requirements, as well as plans for new parking structures in the central business district. The city may consider revising parking policy in order to best capitalize on the potential for increased pedestrian activity and urban vibrancy, as is suggested in this and in previous studies.

Figure 3: DVRPC 2015 Land Use



Future Development

Gaining an understanding of the wide range of planned developments within the study area enables an effective analysis of the overall traffic impact. The study team, with input from project stakeholders, identified 16 developments within the study area. The developments are listed below in **Table 2**. The largest of these, Liberty Property Trust Development, will include offices, condominiums, and a hotel.

Depending on the development, the trip generation model used either the size of the property or the number of anticipated jobs as inputs. The location of each development is shown in **Figure 4**. The map number listed in Table 2 corresponds to the development location shown in Figure 4.

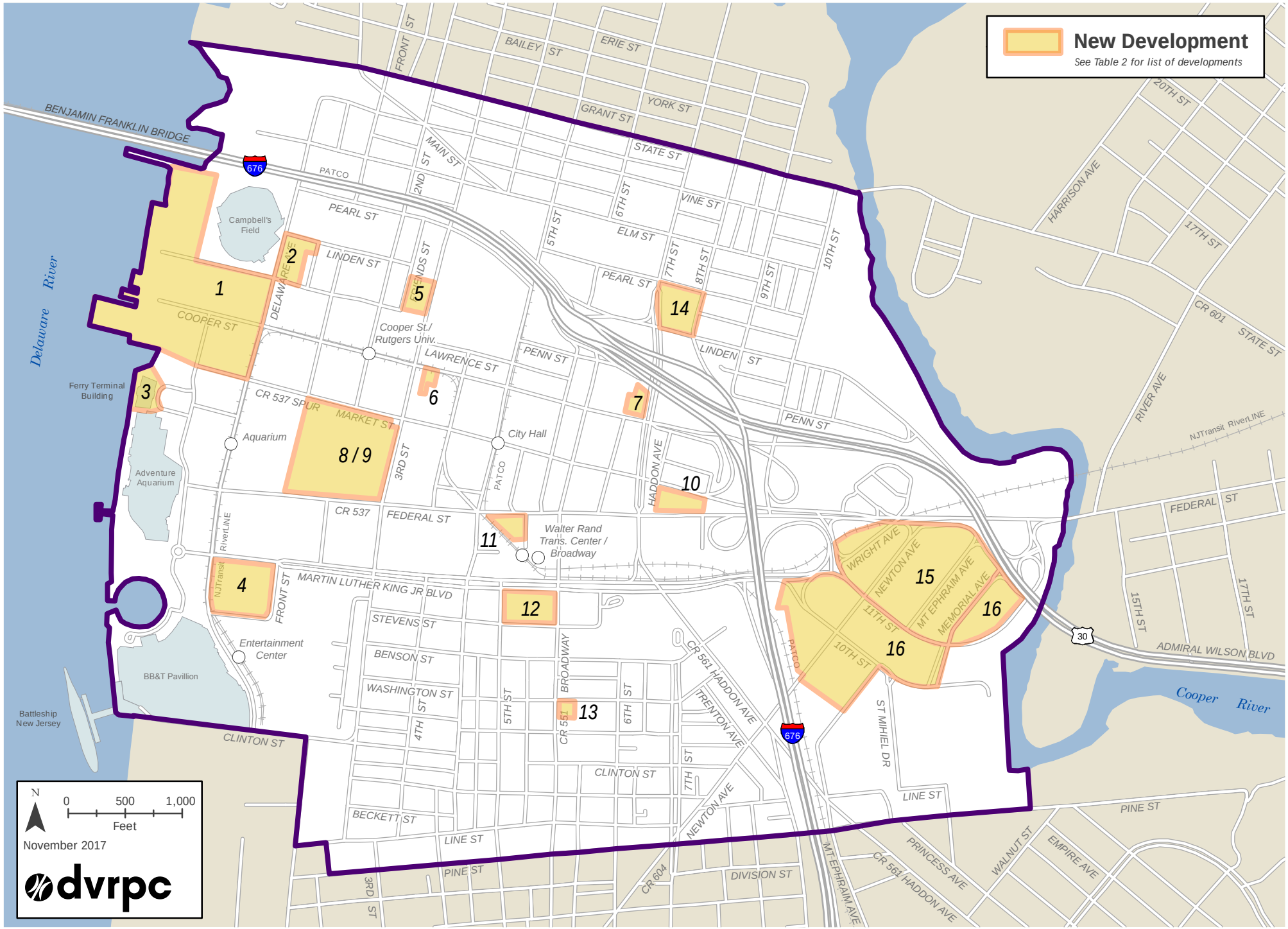
Table 2: Future Developments

Map No.	Name	Primary Land Use	Size
1	Liberty Property Trust Development		
		Office	1,362,000 s.f.
		Hotel	180 rooms
		HQ office	222,000 s.f.
		Condominiums	316 units
2	Ruby Match Factory Building	Office/mixed use	47,000 s.f.
3	WebiMax	Internet marketing	12,500* s.f.
4	Philadelphia 76ers Practice Facility	Training facilities	70,000 s.f.
5	Rutgers School of Business	School	65,000* s.f.
6	Pierre Building	Apartments	30 units
7	Leap Academy	School	73,000 s.f.
8	Cooper University Health Care	Office	115,000 s.f.
9	Lockheed Martin	R&D–aeronautic laboratory	50,000 s.f.
10	DioGenix	R&D–molecular diagnostics	17,750* s.f.
11	Rutgers School of Nursing	School	101,000 s.f.
12	Rowan/Rutgers–Camden Joint Board	R&D–biomedical research	65,000 s.f.
13	Cooper Village Apartments	Apartments	42 units
14	Family Dollar	Retail	9,200 s.f.
15	Subaru of America Headquarters	HQ offices & training center	333,000 s.f.
16	Knights Crossing		
	Building A	Office	350,000 s.f.
	Building B	Office	150,000 s.f.
	Building C	Office	160,000 s.f.
	Building D	Office	120,000 s.f.
	Building E	Office	250,000 s.f.
	Building F	Office	800,000 s.f.
	Building G	Office	120,000 s.f.

*Estimated

Source: DVRPC, 2017

Figure 4: New Development



CHAPTER 4

Circulation and Traffic Model

Highway Network

Numerous limited-access and arterial highways provide connections throughout the city, as well as to and from regional destinations. A brief description of the study area's major highways follows.

Limited-Access Highways

I-676 (Ben Franklin Bridge & North-South Freeway)

Completed in 1980, I-676 bisects the study area traversing from the northwest to the southeast. The interstate highway is limited access and composed of between six and eight travel lanes. The Ben Franklin Bridge portion of I-676 is dual designated with US 30. US 30 merges/diverges just east of the toll plaza.

US 30 (Admiral Wilson Boulevard)

US 30 traverses the northern extent of the study area. On the Ben Franklin Bridge, US 30 is also designated as I-676. Near the bridge toll plaza, US 30 merges/diverges along an east-west alignment north of the Downtown and Gateway neighborhoods. Throughout the study area, US 30 is a six- to eight-lane, primarily limited-access freeway.

Arterial Highways (East-West)

Cooper Street

Cooper Street is the northernmost of the four major east-west Camden thoroughfares. It extends between the Delaware River and the 10th Street/US 30 interchange area. Between Delaware Avenue and Eighth Street, there are two travel lanes in each direction. East of Eighth Street, only eastbound travel is offered. The River LINE operates in both directions along Cooper Street between Delaware Avenue and Fourth Street. Signalized intersections along Cooper Street include the following streets (west to east): Delaware Avenue, Front Street, Second Street, Third Street, Fourth Street, Fifth Street, Broadway, and Haddon Avenue. Stop signs are present for intersecting streets at Riverside Drive, Sixth Street, and Seventh Street.

Market Street

Market Street (County Route 537 Spur) provides one-way, westbound travel between 10th Street in the Gateway neighborhood and Riverside Drive. There are two and three travel

lane sections, as well as on-street parking. The River LINE crosses Market Street at Delaware Avenue and Fourth Street. Signalized intersections include (east to west): 10th Street, Haddon Avenue, Broadway, Sixth Street, Fifth Street, Fourth Street, Third Street, and Delaware Avenue. Stop signs for intersecting streets are present at: Second Street, Front Street, and Riverside Drive. Southbound I-676 has an exit onto Market Street and therefore is the primary city access for Ben Franklin Bridge traffic.

Federal Street

Federal Street (County Route 537) is an eastbound one-way street traversing the central business district. The street runs from Riverside Drive to US 130 near the border with Merchantville Borough. East of I-676, Market Street joins with Federal Street, and two-way travel is offered. The southbound I-676 exit ramp merges onto eastbound Federal Street. Signalized intersections include: Delaware Avenue, Third Street, Fifth Street, Hudson Street, Broadway, Haddon Avenue, and 10th Street. Stop signs for intersecting streets are located at: Riverside Drive, Front Street, Second Street, and Fourth Street. There are two travel lanes and on-street parking along the one-way portion. The River LINE crosses Federal Street at Delaware Avenue and Fifth Street.

Dr. Martin Luther King Jr. Boulevard (a.k.a. MLK, or Mickle)

MLK Boulevard is a two-way boulevard between Riverside Drive and I-676. There is a planted center median along much of its alignment. MLK Boulevard is the southernmost of the four major east-west arterials serving Camden. I-676 connects with MLK Boulevard with a southbound on-ramp and a northbound off-ramp. Signalized intersections include (west to east): Third Street, Fifth Street (West Street), Broadway, Seventh Street, Haddon Avenue, and 11th Street. A stop sign for entering traffic is located at the Front Street intersection. The western terminus of MLK Boulevard is a traffic circle at the intersection with Riverside Drive. Delaware Avenue is grade separated as it crosses MLK Boulevard.

State Street

State Street serves as the northern boundary of the project study area. It is a two-way street that extends from 10th Street in the east to Point Street in the west, bisecting the Cooper Point and Pyne Poynt neighborhoods of North Camden. There are signalized intersections at Seventh and Eighth streets, and the rest of the corridor is stop controlled. At the eastern edge of the study area, State Street crosses the Cooper River and provides access into Cramer Hill and points beyond.

Arterial Highways (North-South)

Delaware Avenue

Delaware Avenue runs alongside the Delaware River in Camden's Waterfront neighborhood. It is the primary north-south road in the Waterfront area, extending between the BB&T Pavilion and a short distance north of the Ben Franklin Bridge. Between Harbor Boulevard and Penn Street it has a four-lane cross-section. South of Harbor Boulevard and north of Penn Street there are two travel lanes. The River LINE operates on

Delaware Avenue between Hudson Boulevard and Cooper Street, with stations at the Adventure Aquarium and BB&T Pavilion, where the line terminates. Signalized intersections include: Harbor Boulevard, Federal Street, Market Street, and Cooper Street. All other intersections are controlled by stop signs, except MLK Boulevard, which is grade separated.

Broadway

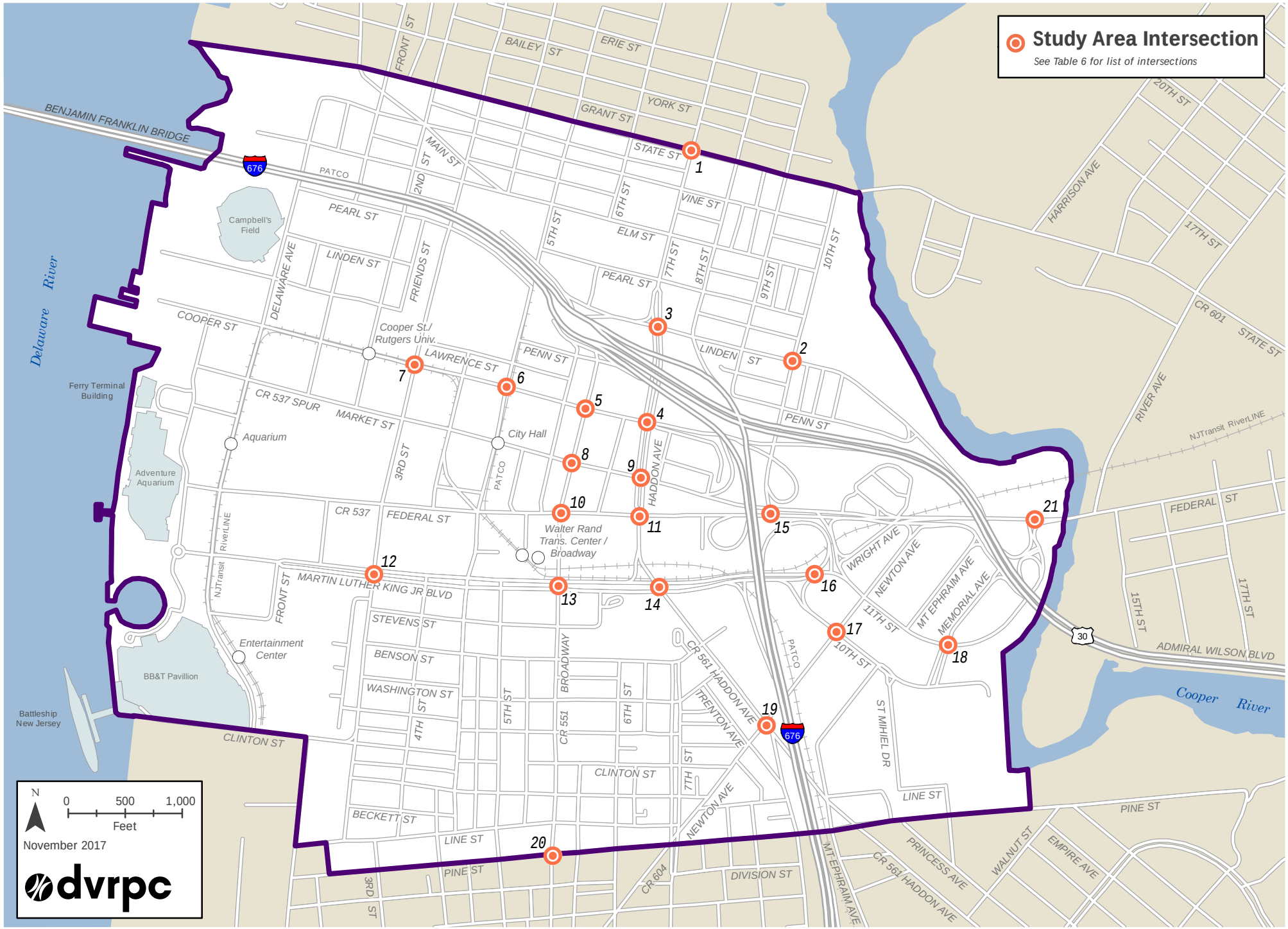
Broadway (County Route 551) is a north-south arterial traversing the heart of the central business district. The road extends from Brooklawn Borough, south of Camden, to the Ben Franklin Bridge. Two-way travel on a primarily two-lane configuration is available. Short segments with three and four travel lanes are present. Signalized intersections within the study area include (south to north): Pine Street, Line Street, Royden Street, Clinton Street, Berkley Street, Washington Street, Benson Street, Stevens Street, MLK Boulevard, Federal Street, Market Street, and Cooper Street. A stop sign is present at the intersection with Penn Street. There is a grade crossing with the River LINE just north of MLK Boulevard.

Haddon Avenue

Haddon Avenue (County Route 561) extends from Haddonfield to just north of the Ben Franklin Bridge. Within the study area, Haddon Avenue crosses under I-676 on a northwesterly alignment, turns north at MLK Boulevard, and proceeds north to its northern terminus. South of MLK Boulevard, there is one travel lane for each direction. North of MLK Boulevard, there are segments with two and three travel lanes per direction. There is a grade crossing with New Jersey Transit's River LINE just north of MLK Boulevard. Signalized intersections within the study area include (south to north): Pine Street, Mount Ephraim Avenue, Newton Avenue, Benson Street, MLK Boulevard, Federal Street, Market Street, Cooper Street, and Linden Street.

From the study area's highway network, a sample of intersections was selected for performance reporting. These intersections were chosen based on a variety of factors, including high traffic volume, proximity to important current and future developments, and locations of ingress and egress patterns. These 21 intersections are shown in **Figure 5**.

Figure 5: Study Area Intersections



Modeling Background

A traffic analysis was conducted for the project study area. DVRPC's count database served as the primary source of traffic data. However, to update counts at key locations and to fill in gaps of missing data, over 30 manual turning movement counts (MTMC) and approximately 15 automated traffic recorder (ATR) counts were taken.

All of the arterial highways previously listed and some of the local streets were included in the modeled network. Although much of the street network was built into the model, the focus was to evaluate conditions at the key signalized intersections across the different scenarios. After examining the turning counts, the network peak hours were determined to be 8:00 to 9:00 in the AM and 4:00 to 5:00 in the PM. This served as the respective hour for which performance data was collected.

Vistro Model

PTV's Vistro was used to perform a comprehensive AM and PM peak hour traffic study for this project. Vistro is an all-in-one software tool that allows users to perform traffic analysis, evaluate new development impacts, optimize signal timings, and identify mitigation strategies.

The Vistro network was built on top of scaled aerial photos provided through the software. Geometric parameters, including lane widths, channelization, lane configurations, and major driveways were entered. Detailed traffic signal information was incorporated for the respective time period. Where available, heavy vehicle percentages and pedestrian crossing data were added to the networks.

The MTMCs were entered into the Vistro program for the respective peak-hour conditions. Because the turning movement and ATR counts were not all counted on the same day, efforts were made to keep the integrity of peak-hour conditions. However, small adjustments were made to the raw counts for balance and flow within the network.

Once all of the background information was entered into the traffic model, current conditions were evaluated. Intersection Level of Service (LOS) was used as the primary performance measure. At signalized intersections, average delay per vehicle is the definitive parameter of LOS. A letter grade of A through F is assigned in the *Highway Capacity Manual* (HCM) to convey a qualitative measure for specified ranges of delay. **Table 3** shows the LOS scale as found in the 2010 HCM used in this study.

Table 3: Signalized Intersection Level of Service

2010 HCM Criteria		Qualitative Description of Traffic Operations
LOS	Control Delay (sec per vehicle)	
A	≤ 10	Stable and Predictable
B	> 10 - 20	
C	> 20 - 35	
D	> 35 - 55	Predictable, but Approaching Unstable
E	> 55 - 80	Unstable and Unpredictable
F	> 80	

Source: *Highway Capacity Manual*, 2010

Future Development

In order to gauge the impacts of new developments, a thorough inventory of both in-progress and proposed developments was undertaken. With the assistance of project stakeholders, the size and location of each planned development was inventoried. This information included the square footage of the site, the number of employees or residents anticipated, the type of development, and where the site would have access to the roadway network. All of the developments listed in **Table 2** (page 11) and shown in **Figure 4** (page 12) are included in the modeling analysis. A total of 16 individual developments were identified within the project's study area, adding over 4.7 million square feet of growth.

The following descriptions summarize the largest development sites.

- Subaru of America – Company headquarters and training center with 333,000 square feet of office.
- Liberty Property – A mixed-use development consisting of 1.3 million square feet of office, a 180-room hotel, and 316 condominium units.
- Knights Crossing – 1.9 million square feet of offices spread over seven individual buildings in a campus-style setting.

- Ruby Match – 47,000 square feet of office and mixed use, located near the Camden Waterfront.

From the information that the study team collected, the developments identified in Table 2 will generate approximately 3,500 new jobs. This figure does not include the anticipated jobs at Knights Crossing as the final design of the site has yet to be determined.

Modeling Process

An exercise was conducted to distribute the estimated vehicular trips generated by planned development across the city's transportation network. Trip generation was conducted for all of the known new developments in the study area. Once the number of new trips was determined, those trips were distributed through the network. This distribution was based on various factors, including existing trip patterns, magnitude and location of individual planned developments, and the type of development. Through an automated tool within the software, those trips were then assigned a specific path through the network. This was conducted for both the AM and PM peak hours. A detailed explanation follows.

Trip Generation

The trip generation process was conducted in several steps. First, the *Trip Generation Manual* (9th Edition: Washington, DC: Institute of Transportation Engineers, 2012) was used to estimate the number of future trips that will be generated by each new development. The manual estimates trips based on samples of similar land uses. Where applicable, each component use was generated as an individual and isolated use, and then summed for the total development. This step yields the expected number of total vehicular trips that would be generated by each completed development. The number of inbound and outbound trips for the AM and PM peak hour can then be calculated.

Second, to capture internal trips inherent with mixed-use development for the Liberty Property Trust Development, DVRPC employed the spreadsheet tool supported by the *NCHRP Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments* (Washington, DC: Transportation Research Board, 2011). The *NCHRP Report* documents trip-sharing interactions between complementary uses in planned, compact, and walkable developments. The methodology is based on survey and count data from existing mixed-use developments and applies to the weekday AM and PM peak hours. This step reflects a reduced number of vehicular trips that will enter/exit based on characteristics of the mixed-use development.

Third, vehicle trips were further reduced due to the availability of transit. The study area is served by NJ Transit buses and the River LINE light rail system, as well as the PATCO Speedline. Journey-to-Work travel characteristics found in the 2010 Census Transportation Planning Package (CTPP), disaggregated by traffic analysis zone, were used for this step. Current commuting patterns found in the CTPP were applied to the new developments to account for non-vehicular journey-to-work travel characteristics (transit, taxi, bike, and walk).

Fourth, the model took into account the addition of the proposed Glassboro-Camden light rail line, currently in the planning process, which includes a joint Camden station with PATCO at Cooper-Campbell. This new station will provide employees of Subaru of America and those working at Knights Crossing with the opportunity to commute via transit. A prior study, led by DVRPC's travel demand forecasting unit, quantified the additional vehicular trip reduction for this area based on the new transit line.

Table 4 summarizes the total number of inbound and outbound trips generated by the new development and discounted through a combination of the four steps described above. The first column represents direct output when using the *Trip Generation Manual*. The second column represents the discount for mixed-use developments and Journey-to-Work travel patterns. The third column shows a further reduction in vehicular trips based on the anticipated completion of the Glassboro-Camden light rail line.

Table 4: Projected 2026 Trip Totals

Time and Direction	*Trip Generation Manual*	*NCHRP Report 684* and Journey-to-Work	Availability of future transit
AM Inbound	3,530	3,069	2,922
AM Outbound	849	744	717
PM Inbound	1,063	925	887
PM Outbound	3,399	2,952	2,711

Source: DVRPC, 2017

Trip Distribution

During the trip distribution step, the total number of trips attracted to (inbound) and produced from (outbound) was estimated. For this Vistro model, the flow of vehicular trips generated by the new developments largely mimicked current traffic patterns in and out of Camden.

To simplify the presentation of this data, locations where vehicles enter and exit the study area, commonly known as cordons, were grouped into four directional categories. This process identifies current patterns and aggregates them by direction for both the AM and PM peak hour time periods. The summary of trips is shown in **Table 5**. The volumes in Table 5 set the basis for where new inbound and outbound trips will likely enter and exit the study area at the cordons.

More detailed trip distribution information can be found in **Appendix A**.

Table 5: Trip Distribution Summary

Time Period and Direction		Volume	Percent
AM Inbound	From the East:	2,906	39.0%
	From the West:	728	9.8%
	From the North:	373	5.0%
	From the South:	3,444	46.2%
	Total	**7,451**	**100.0%**
AM Outbound	To the East:	1,665	41.9%
	To the West:	466	11.7%
	To the North:	295	7.4%
	To the South:	1,547	38.9%
	Total	**3,973**	**100.0%**
PM Inbound	From the East:	2,077	41.7%
	From the West:	600	12.1%
	From the North:	352	7.1%
	From the South:	1,948	39.1%
	Total	**4,977**	**100.0%**
PM Outbound	To the East:	2,711	40.4%
	To the West:	603	9.0%
	To the North:	428	6.4%
	To the South:	2,976	44.3%
	Total	**6,718**	**100.0%**

Source: DVRPC, 2017

Trip Assignment

Trip assignment is the process of assigning vehicular trips on actual paths through the study highway network. This was done for all of the new trips based on the current distribution summarized in Table 5. Once the cordon has been identified (where individual trips enter and exit the study area), the actual path of any particular vehicle is assigned by identifying the shortest distance. Within the Vistro software, origin/destination paths are created through an automated process. Paths were created from the cordons to the developments for the inbound trips and from the developments to the cordons for the outbound trips. All totaled, nearly 500 unique paths were created.

Some adjustments were made to the paths to account for route balancing, circuity, prohibited turning movements, and the limitations of one-way streets within the network. Once the trip assignment process is complete, various performance measures can be collected from the Vistro model.

Assessment of Peak Hour Traffic Operations

Existing Condtions

Traffic volumes were gathered, processed, and balanced to reflect 2016 conditions. This scenario represents base conditions by which future scenarios can be compared. The LOS, defined by the parameters in **Table 3** (page 18), for each of the signalized intersections is shown in **Table 6**. The map number in Table 6 is shown graphically in **Figure 5** on page 16.

Table 6: Existing Intersection Level of Service (2016)

Map No.	Intersection	AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
1	State St & Seventh St	12.4	B	13.0	B
2	Linden St & 10th St	13.9	B	7.7	A
3	Linden St & Seventh St	**65.3**	**E**	29.1	C
4	Cooper St & Haddon Ave	28.7	C	24.2	C
5	Cooper St & Broadway	15.8	B	16.1	B
6	Cooper St & Fifth St	9.6	A	11.2	B
7	Cooper St & Third St	16.7	B	13.1	B
8	Market St & Broadway	15.8	B	14.2	B
9	Market St & Haddon Ave	31.7	C	24.8	C
10	Federal St & Broadway	21.9	C	24.0	C
11	Federal St & Haddon Ave	14.3	B	16.1	B
12	MLK Blvd & Third St	13.3	B	13.4	B
13	MLK Blvd & Broadway	19.1	B	20.5	C
14	MLK Blvd & Haddon Ave	79.1	E	79.6	E
15	Market St/Federal St & 10th St	33.5	C	14.7	B
16	MLK Blvd & 11th St	17.4	B	17.5	B
17	Newton Ave & 10th St	28.2	C	29.0	C
18	Flanders Ave/Campbell Pl & 11th St	31.6	C	34.4	C
19	Newton Ave & Haddon Ave	20.4	C	18.1	B
20	Pine St & Broadway	12.3	B	12.5	B
21	Flanders Ave & Federal St	7.5	A	14.9	B

Source: DVRPC, 2017

No-Build Scenario

Traffic volumes for the future scenarios were developed using an area-wide growth rate to reflect 2026 conditions. This factor was based on an examination of current and forecast traffic volumes, historical trends in traffic volumes, and DVRPC's Board-adopted population and employment forecasts in the study area. From this, a total growth rate of 1.5 percent was added to existing traffic volumes to reflect background traffic growth for the year 2026. Because the change in volume between the existing conditions and the No-Build scenario is negligible, performance measures for the No-Build scenario are not shown.

Build Scenario

The Build scenario represents 2026 conditions that reflect when the identified developments will be completed. This scenario captures the background growth from the No-Build and the additional traffic volumes generated by the new developments.

Despite the availability of transit, the impact of the new developments on Camden's local highway network is significant. Many of the key intersections will see 30 to 40 percent increases in volumes during the peak hours. Some of the intersections currently have low volumes and will be able to handle the additional volumes. Other intersections already at or near capacity will see a significant increase in delay. A summary of the 2026 Build conditions for the key intersections is shown in **Table 7**.

Table 7: Future-Year Intersection Level of Service (2026)

Map No.	Intersection	AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
1	State St & Seventh St	12.7	B	13.4	B
2	Linden St & 10th St	19.6	B	20.3	C
3	Linden St & Seventh St	**449.5**	**F**	**54.2**	**D**
4	Cooper St & Haddon Ave	**182.3**	**F**	**57.8**	**E**
5	Cooper St & Broadway	21.2	C	24.5	C
6	Cooper St & Fifth St	12.8	B	**459.4**	**F**
7	Cooper St & Third St	**58.1**	**E**	66.9	C
8	Market St & Broadway	21.7	C	15.8	B
9	Market St & Haddon Ave	**47.3**	**D**	29.3	C
10	Federal St & Broadway	22.5	C	**49.5**	**D**
11	Federal St & Haddon Ave	16.8	B	20.4	C
12	MLK Blvd & Third St	13.6	B	13.3	B
13	MLK Blvd & Broadway	26.3	C	21.5	C
14	MLK Blvd & Haddon Ave	**293.7**	**F**	**146.7**	**F**
15	Market St/Federal St & 10th St	**154.9**	**F**	15.1	B
16	MLK Blvd & 11th St	22.4	C	54.4	E
17	Newton Ave & 10th St	32.8	C	29.1	C
18	Flanders Ave/Campbell Pl & 11th St	27.1	C	**36.9**	**D**
19	Newton Ave & Haddon Ave	21.2	C	20.4	C
20	Pine St & Broadway	13.4	B	14.0	B
21	Flanders Ave & Federal St	9.7	A	**455.7**	**F**

Source: DVRPC, 2017

The intersection data shown in Table 7 represents an unmitigated scenario. All of the demand during the peak hours are flowed according to the shortest path. In reality, this may result in vehicles seeking alternate routes to avoid problematic intersections. However, the purpose of the Build scenario is to identify where this demand will occur and should be interpreted as a worst-case condition.

CHAPTER 5

Mobility Improvements

Intersection Analysis

Several study area intersections will experience congested conditions under the Build scenario. A more detailed examination of the expected conditions and mitigation strategies are presented.

Linden Street & Seventh Street

In terms of total volume, this is one of the busiest intersections in the study area. Exit ramp volume from both I-676 and US 30 collects onto Linden Street and proceeds westbound to the Seventh Street intersection. A significant proportion of this volume turns left from Linden Street onto Seventh Street in order to access Camden's central business district. The high volumes in the westbound direction also create queues that spill back into both the Eighth Street intersection and onto the I-676 exit ramp. During the AM peak hour, queuing can reach back onto mainline I-676.

The pavement markings at this intersection are in poor condition. Many of the lane-use arrows, stop lines, edge lines, crosswalks, and lane designation lines are either faded or completely worn. This can lead to driver confusion and last-second lane changes.

It was noted during field visits that the southbound approach on Seventh Street is prone to ponding and high water during heavy rain events. This creates a hazardous condition for pedestrians and unnecessary delay for vehicles. Standing water also accelerates the deterioration of the pavement.

Based on field observation during the AM peak, the cycle length at this intersection was measured at 70 seconds. The cycle length at Eighth Street and Linden Street was measured at 75 seconds. This difference in cycle length creates inconsistent and unbalanced traffic flow between the two intersections. The flow of traffic, primarily in the westbound direction during the AM peak, can be significantly improved by using similar cycle lengths and balancing the offset between these adjacent intersections.

Providing more green time to the westbound movement during the AM peak period is critical to maintaining mobility amid future traffic growth. By 2026, the anticipated traffic demand will increase volumes at this intersection by nearly 40 percent. Low-cost improvement strategies were investigated with the use of the Vistro software.

Mitigation Strategies

1. Optimize the intersection signal timing for overall intersection traffic flow. Coordinate the cycle length and offset with the Eighth Street & Linden Street intersection to ensure minimal impact of queuing onto I-676.

2. Reconfigure the lanes on the northbound approach to allow for a second northbound left turn movement. The middle northbound lane could be changed to a shared left/thru lane. Because the northbound and southbound approaches operate on a split-phase cycle, this improvement could be implemented within the current signal timing pattern.

3. Adjust the signal phasing to allow for a protected-only northbound left turn. Once the protected phase ends, northbound and southbound traffic movements would run concurrently.

Haddon Avenue/Seventh Street & Cooper Street

The primary source of congestion at this intersection stems from the southbound right-turning volumes, primarily during the AM peak period. Traffic coming off US 30 and I-676 makes its way down Linden Street, onto Seventh Street, and across the bridge. Cooper Street is the first access point into Camden's central business district for vehicles on southbound Seventh Street, providing access to Rutgers University–Camden/Rowan University. To complicate matters, the student drop-off location for the LEAP Academy is located on Cooper Street, very close to the Seventh Street intersection. The stopped and queued cars and buses dropping off students clog the area. This situation impedes the southbound right-turning vehicles, resulting in long queue lengths. It was observed during field visits that queues reached back to the Linden Street intersection on the north side of the bridge over I-676 and US 30, a distance of nearly 800 feet.

Extending the center curbed median from Seventh Street to Haddon Avenue would improve safety conditions by eliminating unnecessary turning movements. The pedestrian crossing at this location could be restriped and a median refuge could be introduced. This would also improve congestion around the LEAP Academy.

Because the signal phasing and timing is not the source of congestion, adjusting the signal timing is not an effective strategy for this location. Typically, the phase timings can be adjusted to allocate more green time to the more congested approaches. In this case, southbound Seventh Street is congested due to school activity, not improper signal timing.

Much of the pavement markings in the area are badly faded, worn, or illegible, especially on Cooper Street. Between Sixth Street and Seventh Street on Cooper Street, it is difficult to see the lane striping or know the configuration of the formal travel lanes. The drop-off area at the LEAP Academy is largely informal, with little signage or striping. These conditions result in the further deterioration of traffic flow.

There is on-street parking on the north side of Cooper Street between the LEAP Academy and Broadway. This parking may be better utilized as additional drop-off space. Shifting or extending the drop-off area farther down Cooper Street closer to Broadway would reduce the impacts of school activity on the Cooper Street and Seventh Street intersection.

There is a right-turn overlap signal on the southbound Seventh Street approach. However, the right lane is not a designated right-turn-only lane. On occasion, a vehicle will be in this lane making the through movement and block the lane during the overlap phase.

Mitigation Strategies

1. Redesignate the right lane of southbound Seventh Street as a turn-only lane in order to maximize the utility of the right-turn overlap.

2. Formally designate the LEAP Academy drop-off zone with more visible signage and striping.

3. Remove the parking on the northbound side of Cooper Street between Sixth Street and Seventh Street. This would allow for a longer drop-off zone for the LEAP Academy.

Cooper Street & Fifth Street

Cooper Street provides the most direct access route from the Waterfront developments to connections with I-676 and US 30. In the 2016 Base Year conditions, traffic flow on Cooper Street during peak hours is relatively stable, with levels of service in the B and C ranges. However, in future-year conditions when the Liberty Property Trust Development and other developments are completed, volumes along Cooper Street are expected to increase significantly, jumping 200 percent in the AM peak hour and 250 percent during the PM peak hour.

Cooper Street will not be able to handle future demand the way it is currently configured. The right lane, between Delaware Avenue and Fourth Street, is shared with the River LINE right-of-way. In the eastbound direction, Cooper Street operates with only one through lane between Fourth Street and Sixth Street.

The eastbound reduction in through lanes at Fourth Street will likely cause a bottleneck condition, especially during the PM peak. Excessive queues and congestion could impact River Line operations along Cooper Street and force drivers to seek other routes through Camden's residential areas.

In this instance, isolated signal optimization will not alleviate future traffic congestion. The primary flow of traffic on Cooper Street is westbound in the AM and eastbound in the PM. The traffic signals along the Cooper Street corridor can be timed to facilitate directional traffic flow. This can be done using offsets for fixed-timed operations, or preferably a more advanced adaptive signal control.

Mitigation Strategies

1. Adjust the traffic signals along Cooper Street with a coordinated offset scheme to minimize congestion and delay. This can be accomplished for both the AM and PM peak directional flows.

2. Refer to the improvements identified in the Cooper Street Pedestrian Access Project funded by a Transportation Infrastructure Generating Economic Recovery (TIGER) grant. The scope of work includes upgraded pedestrian infrastructure, new traffic signals, turn prohibitions, Americans with Disabilities Act (ADA) curb ramps, lighting, and signage.

MLK Boulevard & Haddon Avenue

In terms of its design, this is one of the most complex intersections in Camden's central business district. The approaches on MLK Boulevard operate with protected lead lefts. The northbound and southbound approaches on Haddon Avenue operate in a split phase (non-concurrent). The River LINE runs parallel to MLK Boulevard and traverses through the north side of the intersection. Preemption from transit vehicles disrupts normal operations of the signal and can exacerbate delay. The intersection is also plagued by high volumes on all approaches.

The angle at which MLK Boulevard and Haddon Avenue intersect creates long crossing distances for pedestrians. On the western side of the intersection, the pedestrian crosswalk is over 140 feet. With a standard walking speed of 3.5 feet per second, it takes 40 seconds to safely cross the street. The default signal timings do not accommodate pedestrians. Pedestrians also must activate the pushbutton in order to activate the pedestrian signal.

There are curbed medians on both approaches on MLK Boulevard. These medians could be extended to provide mid-block pedestrian or refuge islands. They would allow pedestrians a safe place to stop at the mid-point of the roadway before crossing the remaining distance.

There is available right-of-way on the westbound approach for additional capacity. A gore area can be restriped to extend the right turn lane.

High approach volumes and the River LINE limit the range of improvements that can be done at this location. Therefore, in order to maximize efficiency at this location, it is imperative that only the necessary green times are given to each movement. A fully actuated signal, with detection on all approaches, can accomplish this.

Mitigation Strategies

1. Implement a fully actuated traffic signal. This would ensure that approaches with no demand can be skipped and only minimum green times are needed to process demand. Unused time within the cycle can be dedicated for other movements.

2. Ensure that non-conflicting movements are provided during transit preemption.

3. Provide a mid-block pedestrian refuge area on MLK Boulevard.

Federal Street & Flanders Avenue

This intersection is located on Federal Street between US 30 and the Cooper River and is configured as a stop-controlled T-intersection. Slip ramps to/from westbound US 30 are located immediately to the south of this intersection. With close proximity to the Subaru site and the eventual Knights Crossing, this intersection is a key access point into Camden. However, left turns are not permitted from Flanders Avenue onto Federal Street.

This intersection will experience growth in the future, although not quite to the extent as other study area intersections. However, the intersection provides only a single lane for all approaches. Additional future volumes are enough to push certain movements over capacity. Vehicles will have difficulty turning from northbound Flanders Avenue onto eastbound Federal Street. Even more difficult will be the left turn from westbound Federal Street onto southbound Flanders Avenue. The increased volumes on Federal Street will decrease the allowable gaps in traffic needed to make turns. This will create significant queues at the intersection, especially during the PM peak period.

In order to safely and efficiently provide for all movements and to better manage future traffic volumes, this intersection should be upgraded from stop control to a traffic signal. A traffic signal would also allow for northbound lefts, a movement that is currently prohibited.

Enhancing this intersection to provide the approaches with adequate turn lanes will have a positive impact on Camden's circulation. Providing a left turn from Flanders Avenue would provide an alternate route into Camden via Federal Street. This option would be less circuitous than using 11th Street. It also provides a more direct route into Camden from westbound US 30 than using Linden Street.

Improvements at this intersection are also identified in the Cooper's Ferry Partnership report, *City of Camden, New Jersey Downtown Corridors Traffic Feasibility Study* prepared by RWD Consultants and published in June 2016.

Mitigation Strategies

1. Upgrade the intersection from a stop control to signalization.

2. Reconfigure the intersection to allow left turns from northbound Flanders Avenue onto Federal Street.

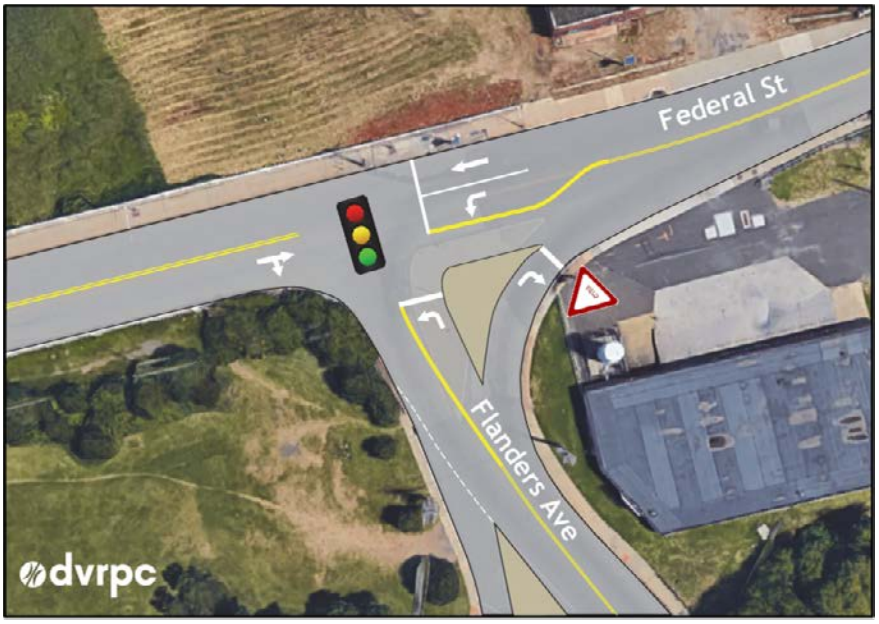
3. Expand the westbound approach on Federal Street to accommodate a left-turn lane.

Figure 6 and **Figure 7** illustrate the current and proposed intersection configurations at Federal Street and Flanders Avenue.

Figure 6: Flanders Avenue Current Configuration

Schematic not to scale Source: DVRPC, 2017

Figure 7: Flanders Avenue Proposed Configuration



Schematic not to scale Source: DVRPC, 2017

Market Street & Federal Street

The *City of Camden, New Jersey Downtown Corridors Traffic Feasibility Study* identifies providing two-way travel on Market Street and Federal Street as a preferred option. On Market Street, westbound traffic would be introduced between Haddon Avenue and Delaware Avenue. On Federal Street, eastbound traffic would run from Third Street to 10th Street. This new improvement, combined with intersection upgrades at Flanders Avenue and Federal Street, would relieve demand on MLK Boulevard. Overall, by providing more options for vehicular traffic, volumes would be spread more evenly throughout the network.

The conversion of Market Street and Federal Street was not evaluated as part of this study. From a planning perspective, this improvement carries both positive and negative implications.

Likely positives:

- Less circuity and decreased vehicle miles traveled
- The potential to alleviate congestion on parallel facilities
- Benefits local residents, not just commuters

Potential negatives:

- Loss of on-street parking
- Potential for more pedestrian and vehicular conflicts at intersections
- Potential loss of bike-only lanes

Several other projects throughout Camden are detailed below. These projects are either in design or currently under construction.

Cooper's Poynt Road Reconstruction Project

A 2016 TIGER award, this project will reconstruct 1.6 miles of roadway throughout North Camden. Other improvements include installation of new ADA-compliant curb ramps, the relocation of utility poles, bike lanes, decorative lighting, and the construction of three mini-roundabouts. This project is currently in progress.

Cooper's Poynt Park

This recently opened park, a five-acre green space with multi-use trails, playground, new lighting, and natural vegetation now stands on the site along the Delaware River that used to be the Riverfront State Prison. This project was completed with support from the Wells Fargo Regional Foundation, William Penn Foundation, the New Jersey Department of Community Affairs, the Fund for New Jersey, and the Camden Economic Recovery Board. Technical assistance was also provided from Cooper's Ferry Partnership.

Multi-Use Trails

- The Riverbirch Trail is located in the Gateway neighborhood, adjacent to Campbell's Soup Company headquarters and the Subaru of America complex. This trail will link existing sidewalks at each end, providing access to Cooper River Park.

- Cooper River Trail will connect trails proposed in Camden's Gateway Park to the existing trail along North Park Drive between Kaighn Avenue and South Crescent Boulevard (US 130/30). It will include a crossing of the Chandler's Run waterway and a bicycle and pedestrian crossing at Kaighn Avenue near N. Park Drive.

Area-Wide Recommendations

Traffic Signals

The city should continue its efforts to modernize and coordinate traffic signals, especially on key access links. This includes key corridors on Cooper Street, Market Street, Federal Street, and MLK Boulevard. Coordinated signal programs and actuated movements can increase traffic flow and significantly reduce delay.

Fixed-time signals work well in residential areas. They are low cost, low maintenance, and efficient. However, it was noted during field visits that many of Camden's interactions run on the same timing program all day. Typically, programs vary by time of day or day of the week to better accommodate peak travel patterns.

Moving forward, a Traffic Operations Center (TOC) could help manage future traffic conditions by acting as a focal point for traffic information. A TOC permits operators to more effectively use existing traffic management tools by providing a platform for the implementation of advances in traffic management. Traffic and transit data is collected from the transportation system in real time, and shared with operating agencies, enabling better management and informed decision making. As vehicles become technologically equipped, information can be shared with the public, notifying drivers of incidents, alternative routes, and upstream traffic conditions.

Roadway Conditions

Efforts should be made to maintain the public's investment and provide a safe driving environment. The construction of the River LINE provided an opportunity to upgrade the pavement and traffic signal infrastructure along its right-of-way. Many of the roads and sidewalks have been repaved recently within the vicinity of Rutgers University–Camden/Rowan University as part of an ongoing effort to enhance the student experience. However, in many other sections of Camden, the road and sidewalk infrastructure is a substandard hodgepodge of concrete, asphalt, and brick.

An asset management program developed for the roadway network could assist the City of Camden in identifying where pubic dollars are most needed. For assistance with asset

management, the city should look to the private sector. Engaging with the private sector in asset-management agreements can bring additional expertise into the process of infrastructure management. Firms that specialize in managing a particular asset possess economies of scale, experience, and knowledge of best practices that states or local governments may lack themselves.

Pavement Markings

Many of the pavement markings throughout Camden are worn, faded, or missing. As previously mentioned, this is a critical aspect of the road system. Pavement markings reduce driver confusion, aid in making pedestrian areas and crosswalks more visible, identify parking/no parking areas, and communicate roadway alignment information to users. From a safety standpoint alone, it is imperative to ensure pavement markings are present and clearly visible.

Pedestrian Infrastructure

As Camden continues to promote transit and non-motorized travel, it remains important to provide a safe environment for pedestrians. Crosswalks should utilize the highly visible continental style. Other infrastructure, such as countdown timers at intersections, should be standard, especially in areas that have large trip generators with pedestrian activity.

There are several mid-block pedestrian crossings within the study area. Of note, the crossing at Sixth Street and Cooper Street is marked with a visible crosswalk, but there are no signs to caution motorists. Furthermore, this crossing is not compliant with ADA standards as the median area has raised curbs. As infrastructure improvements continue, it is important to retrofit existing crosswalks with ADA adherence and known best-practice approaches.

Signage

Camden is a crossroads city, with drivers arriving from all four directions, via the Ben Franklin Bridge, highways, major arterials, and local roads. The projected new development will bring even more visitors, including both regular employees and the occasional business traveler. In order to assist circulation in Camden, the directional signage at the key gateways and access points into and out of the city should be reviewed, updated, or augmented as necessary to support driver navigation.

Parking

Inventory and Recommendations

The 2011 DVRPC study, *Finding Space: Balancing Parking Needs and Urban Vitality in the City of Camden (11030)*, included a detailed analysis of existing parking in Camden's central business district. The study found that while there are plenty of parking spaces available in numerous surface lots, parking structures, and on the street, there are safety concerns among users. Therefore, drivers tend to look for parking close to their destination to minimize the distance they must walk. This results in overcrowding in some parking lots while others are largely vacant. The *Finding Space* study recommended focusing on activity generation and adopting policies that support smart growth, such as eliminating minimum parking requirements in the zoning code. Minimum parking requirements have been found to create barriers for new developments and often lead to an oversupply of parking spaces. Minimums have been eliminated successfully in a number of cities, including parts of Pittsburgh, Pennsylvania, New Haven, Connecticut, and Jersey City, New Jersey.

Many of the new Camden developments will be constructed on the sites of existing surface parking lots and will result in a reduction in the total number of parking spaces. For the larger development sites, the number of displaced parking spaces is identified in **Table 8**. However, because the city's minimum parking requirements are still in place, most of the new developments will provide additional parking. Two new parking structures are also planned in the central business district, which is likely to result in an overall net increase in parking.

Table 8: Displaced Parking Spaces

Development	General Location	Displaced Spaces
Liberty Property Trust Development	Delaware Waterfront	2,291
Cooper University Healthcare and Lockheed Martin	3rd St & Market St	720
Rowan/Rutgers–Camden Joint Board	MLK Blvd & Broadway	126
Rutgers School of Nursing	5th St & Broadway	85
Subaru of America Headquarters	Federal St & Newton Ave	45
Knights Crossing	10th St & Newton Ave	502

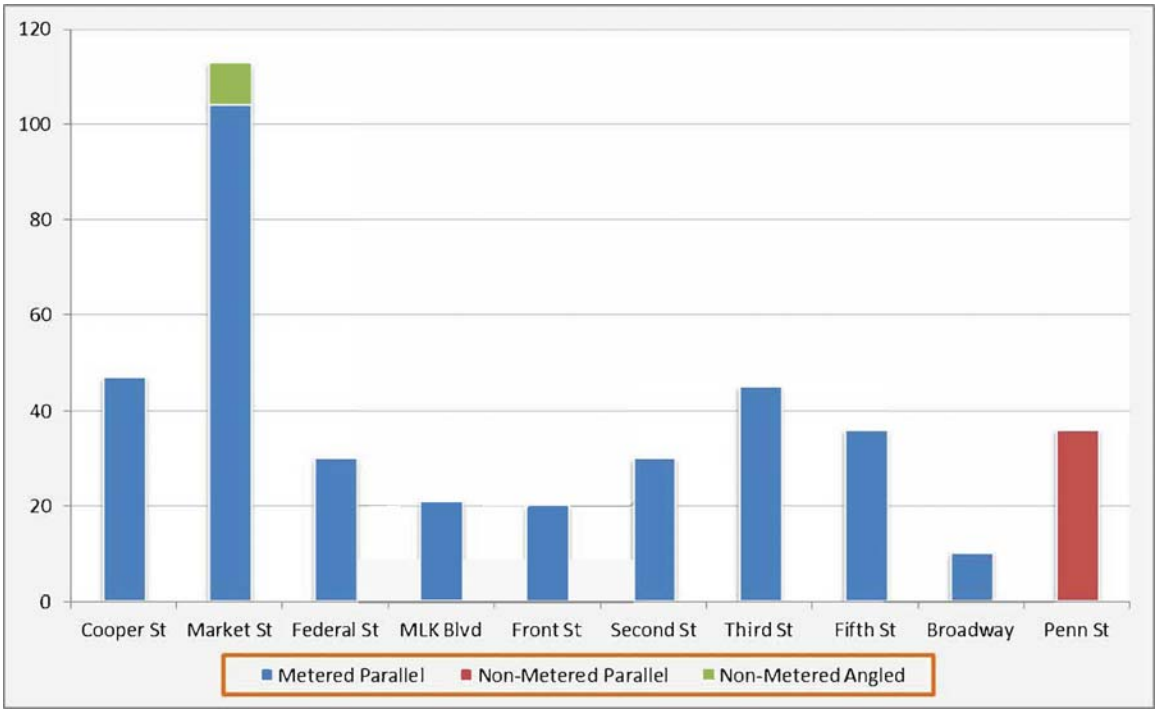
Source: DVRPC, 2017

Since the new developments are spread throughout and beyond the central business district, they have the potential to generate pedestrian activity and lead to a more vibrant city. However, abundance of on-site or nearby parking may reduce foot traffic and discourage the use of public transit, carpooling, biking, and walking as means of access.

Parking Inventory

An inventory of on-street parking was conducted for Camden's downtown area as an update to the *Finding Space* report. The number and location of metered parallel, non-metered parallel, and non-metered angle parking was tallied. This inventory, shown graphically in **Figure 8**, found that out of the 388 on-street parking spaces, 343 were metered parallel, 36 were non-metered parallel, and nine were non-metered angle. The spatial location of the various types of parking in Camden's downtown area is shown in **Figure 9** on the following page.

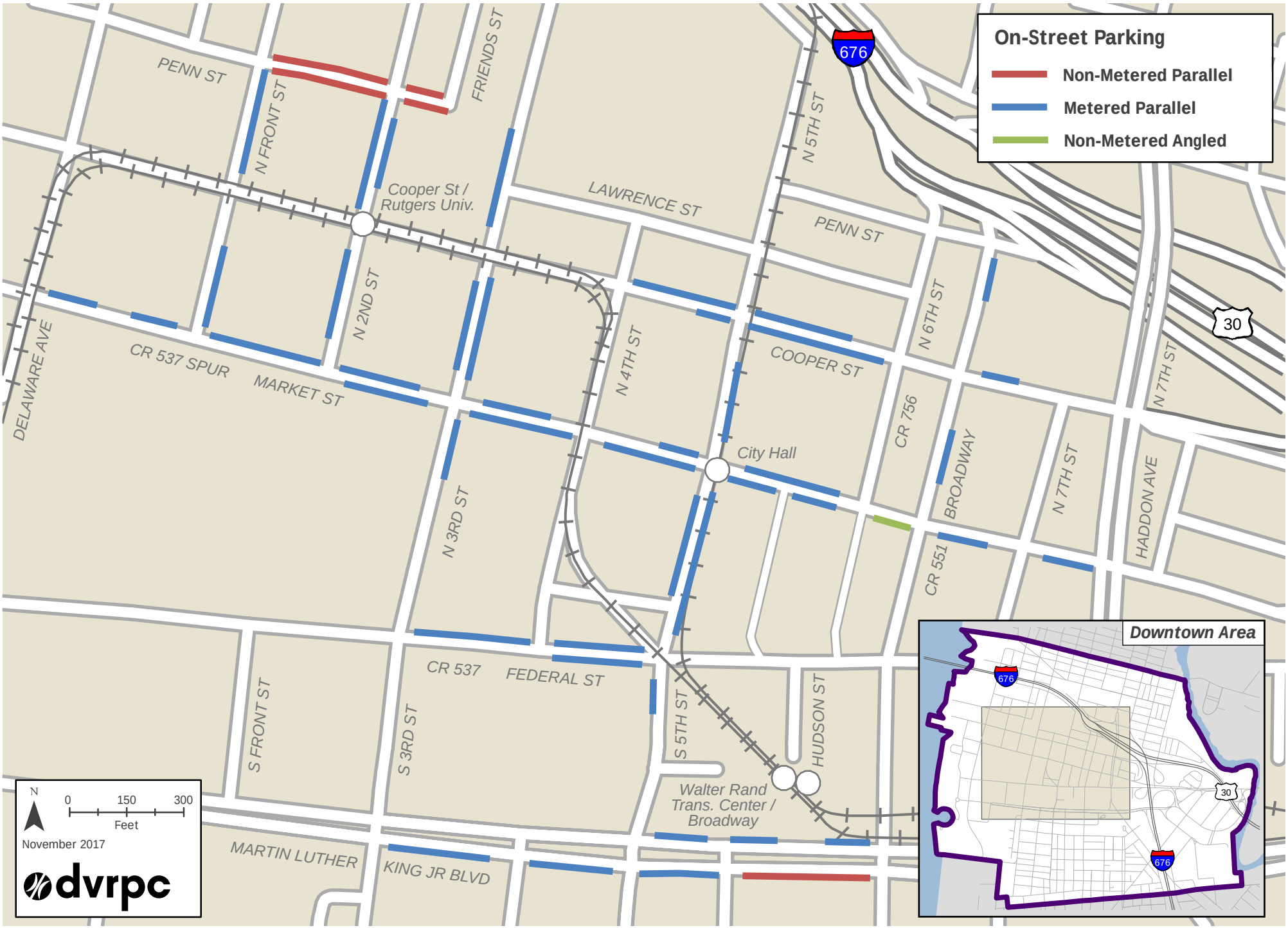
Figure 8: Downtown Camden's Parking Spaces



Source: DVRPC, 2017

Camden's parking meters accept only coins as payment at the rate of one dollar per hour, with a 10-hour maximum. This system is problematic for several reasons. First, the 10-hour maximum encourages patrons to leave their vehicle parked for extended periods of time. In a central business district, parking policy should encourage turnover. Second, the meters are spaced 20–22 feet apart, creating unused capacity when smaller vehicles use only a portion of the space. With "pay-and-display" parking, the size of parking stalls does not determine the spacing of meters, creating additional on-street parking capacity. An electronic parking system will also allow for easier adjustments to on-street parking prices, allowing for streamlined parking demand management. The meters currently in place do not allow for variations in price for different times of day. Furthermore, a single electronic kiosk can replace all meters along one side of a block.

Figure 9: Downtown Camden's On-Street Parking



In summary, introducing parking kiosks would have the following advantages:

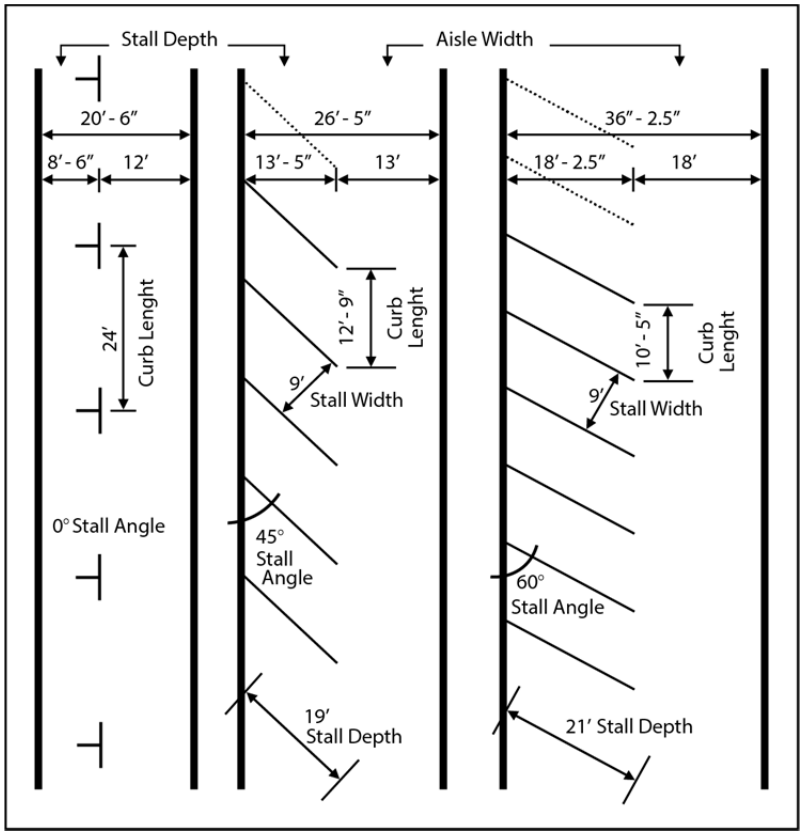
- Because vehicles typically use less space in an unmarked parking area than in a marked stall, parking capacity will increase by up to 15 percent.

- Flexible pricing can better capitalize on parking demand and/or encourage parking turnover.

- A fee system that accepts payment via credit cards, rechargeable parking card, or smart device can increase efficiency. Revenue from parking will increase as demonstrated in other cities. Labor costs associated with kiosks are significantly lower than those of cash meters.

Where applicable, parallel spaces should be converted to angle parking, especially in locations with low vehicular volumes and wide roadway cross-sections. Angled parking increases the number of parking spaces that can be created for a given area. **Figure 10** illustrates this point in detail. A 45–degree stall angle can fit 50 percent more parking spaces than parallel spaces. At 60 degrees, twice as many vehicles can fit within a given block. Angled parking also decreases the amount of surface lots that are needed and generates more revenue for the city. Finally, the time needed to park in an angled space is less than a parallel space as less maneuvering is required, resulting in less disruption to traffic flow.

Figure 10: Parking Space Comparison



Source: AASHTO Green Book, 2011

The Parking Authority of the City of Camden (PACC) has recently introduced a Pay-By-Cell service, which is currently operational in the University District. Where this service is offered, parking meters are individually labeled with cell phone parking instructions. Future plans include expanding the service to all on-street meters.

Recommendations

- Parking meters should be replaced with electronic kiosks.
- Performance-based pricing should be used to appropriately price long-term and short-term parking. Camden should charge at least as much as pay lots to increase turnover and free up on-street parking.
- To discourage long-duration parking, on-street parking should be priced higher for longer stays.
- Where applicable, on-street parking should be converted to angle parking.

CHAPTER 7

Multi-modal Mobility and Complete Streets

Pedestrian Mobility

The study area as a whole has a complete pedestrian network. Sidewalks are present along all streets and crossing amenities are present at most intersections. Portions of Camden streets have had brick sidewalks and decorative pedestrian-scale lighting installed. Cooper's Ferry Partnership has taken the lead on upgrading the pedestrian infrastructure and has an ongoing pedestrian wayfinding signage program. Cooper University Hospital recently upgraded the pedestrian infrastructure in the vicinity of its campus.

The City of Camden contains several major pedestrian generators within the study area. These are listed below.

- Rutgers University–Camden/Rowan University
- Cooper University Hospital
- Walter Rand Transportation Center
- Camden County College
- BB&T Pavilion
- Adventure Aquarium

Conditions between these generators are not all ideal for pedestrians making connections. Although central business district sidewalks are wide and complete, much of Camden lacks the pedestrian amenities found in other locations where pedestrians are abundant.

New development in the study area has the potential to increase the number of pedestrians using the existing amenities. If it is assumed that trips to new developments will follow existing trip patterns, many of these future trips will be made by means other than private motor vehicle. Increased transit usage also places demand on pedestrian amenities as transit users must be pedestrians on one or both ends of their trips.

As capacity relating to pedestrian mobility cannot easily be increased, nor might it be necessary on a large-scale basis, improvement focus should be directed toward pedestrian crossings and safety.

Sidewalks

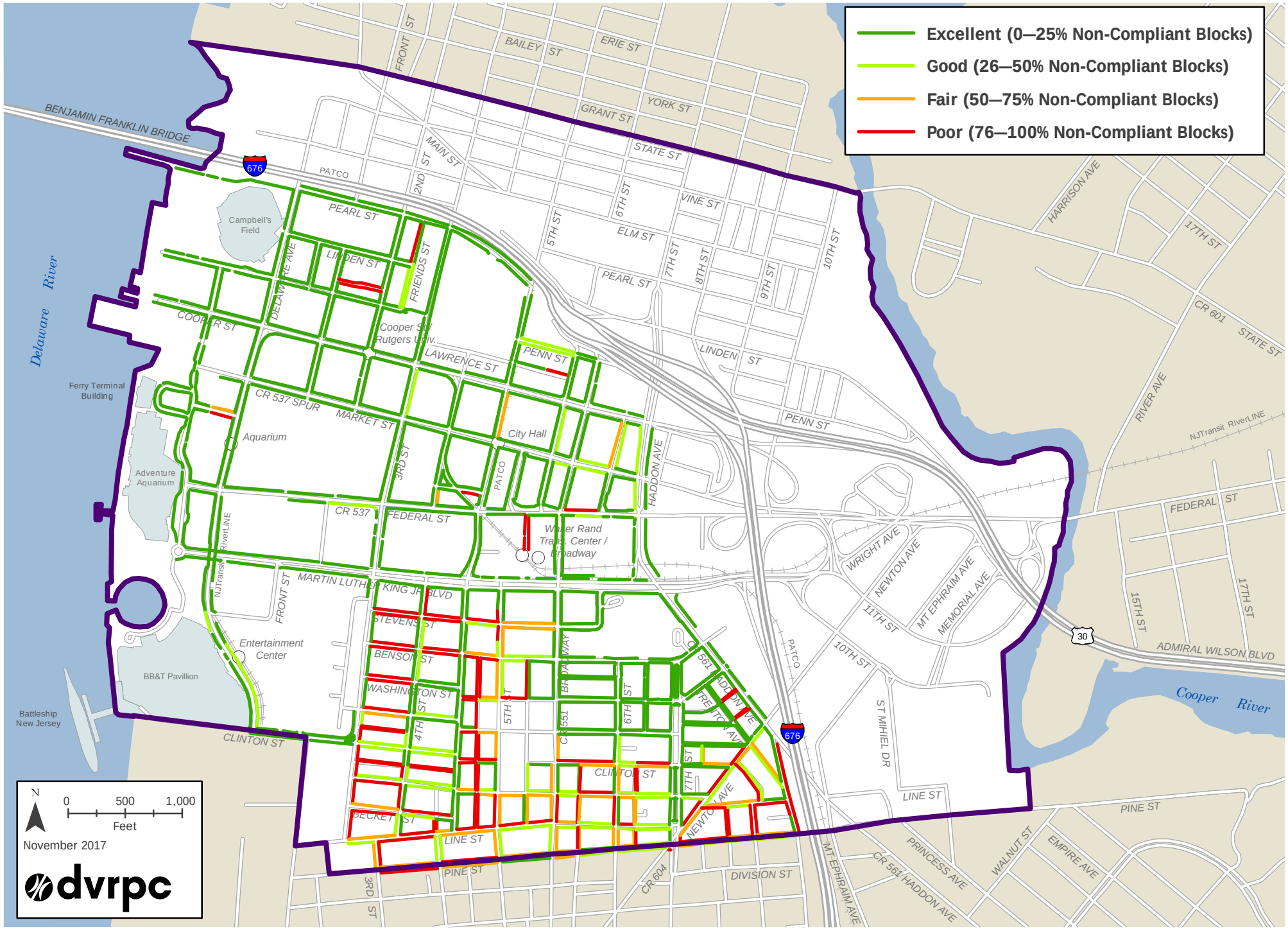
In February 2015, DVRPC completed an inventory of pedestrian amenities throughout much of Camden's central business district. Amenities such as curb ramps, sidewalks, and crosswalks were catalogued to determine existing conditions, identify deficiencies, and assess compliance with the ADA. In order to comply with ADA requirements, curb ramps must meet specific standards for width, slope, cross-slope, and placement. A summary of Camden's sidewalk conditions inventoried during the study is shown in **Figure 11.**

As part of this inventory, over 31 miles of sidewalk were assessed by DVRPC. Sidewalks were evaluated by determining what percentage of blocks along a section of sidewalk (squares created by concrete forms during construction) was deficient. This is a quick surrogate that is used to estimate the area of sidewalk that is deficient. Photographs were taken to provide additional documentation of sidewalk conditions.

The sidewalk inventory and assessment is a valuable resource that can be leveraged by the city in a variety of ways. The data collected can be used as part of the city's comprehensive asset system. As such, it is useful in setting priorities for construction, maintenance, and accessibility improvements. Camden can further take advantage of the opportunity afforded by the assessment to review design standards, maintenance cycles, signage, and funding sources related to pedestrian facilities as a whole. Finally, asset information can be used to prioritize improvements based on sidewalk conditions. These activities can set the foundation for a formal policy to adopt and maintain a public sidewalk management program.

In 2011, Camden was awarded funding through the Statewide Transportation Improvement Program, the Congestion Mitigation and Air Quality Improvement Program, and DVRPC for a streetscape project on Pearl Street. This project provided pedestrian and bicycle access along Pearl Street from the eastern terminus of the Ben Franklin Bridge stair tower to Camden County's Ulysses S. Wiggins Park at the Camden Waterfront. Improvements included marked bicycle sharrows, high-visibility crosswalks, reconstructed sidewalks, and extensive streetscaping. Pearl Street now serves as an example of implementing low-cost enhancements to improve the pedestrian experience in an urban environment.

Figure 11: Condition of Sidewalk Segments



Vegetation Control

Periodic vegetation control maintenance should be scheduled to ensure that vegetation does not grow through sidewalk cracks and street trees do not interfere with pedestrian mobility. Vegetation overgrowth can also obstruct sidewalks from adjacent properties, reducing the passible widths. This may be accomplished through municipal code requirements along with meaningful enforcement.

Crosswalks

The city should adopt a uniform crosswalk style. The Continental style provides the most visible crosswalk, allowing drivers to more easily see where they can expect to encounter pedestrians crossing the street. This style also discourages drivers from encroaching into the crosswalk when stopping at intersections. At larger intersections, the spacing of vertical lines can be strategically placed to avoid the wheel paths of vehicles.

DVRPC found that only 55 percent of all of the inventoried crosswalks were marked. Furthermore, only 18 percent of the marked crosswalks were Continental design. This presents hazards for pedestrians and an opportunity for the City of Camden to install the preferred style of Continental crosswalks.

Pedestrian Crossing Controls

Pedestrian countdown signals should be consistent throughout the study area. Pedestrian phase timings should provide a minimum of one second per 3.5 feet of crossing distance as per the 2012 *Manual on Uniform Traffic Control Devices* (MUTCD). A pedestrian change interval countdown, as shown in **Figure 12**, informs the pedestrian of the number of seconds remaining in the interval.

The traditional pedestrian display has the WALK phase when pedestrians are permitted to use the crosswalk. This is followed by a flashing DON'T WALK phase. Its purpose is to allow a sufficient amount of time for people who entered the crosswalk during the WALK phase to cross the intersection safely. However, pedestrians entering the crosswalk during the DON'T WALK phase can create an unsafe condition as they are not sure how much time remains during the phase. Surveys have shown that people misinterpret the meaning of the flashing hand of the traditional pedestrian signal. Providing the pedestrian countdown device helps pedestrians better understand the pedestrian signals.

Figure 12: Pedestrian Timers at Signalized Intersections

Source: MUTCD, 2012: DVRPC, 2017

Pedestrian Improvements

The strategies listed below can also help improve pedestrian safety and mobility.

- Pedestrian crossings should have visual, tactile, or audible signals indicating to pedestrians when it is safe to cross the street.
- The color of the pushbutton, if present, should contrast with the color of the surrounding surface.
- The pushbutton should vibrate to indicate that it has been activated.
- Where a pushbutton is present, best practice is for the pushbutton to activate a longer walk phase or a lead pedestrian interval.
- Activating the pushbutton should not be required to trigger a walk phase on green.

- The ramp (sloped) portion leading from the sidewalk into the crosswalk should be made of an all-weather surface.

- Tactile arrows should be used to indicate crossing direction, particularly where pushbuttons are close together.

- Maintenance cycles for crosswalk restriping should be conducted regularly and established to ensure that markings are clear and highly visible to drivers and pedestrians.

- The sidewalk network inventory should be maintained and updated, allowing for ongoing prioritization based on up-to-date field data.

Complete Streets & Sustainable Site Plan

In July 2013, the City of Camden formally adopted New Jersey Department of Transportation Policy No. 703, *Complete Streets Policy*. This policy states that "all public streets projects, including new construction, reconstruction, retrofitting, extensive maintenance and operations, in the City of Camden, shall be designed and constructed as Complete Streets."

This policy stresses the importance of enabling safe access and mobility for all users, including pedestrians, bicyclists, automobile drivers, and transit users. This includes persons of all ages and abilities. As existing transportation infrastructure in Camden is improved or reconstructed, there will be opportunities to redesign networks using the best currently available standards and practices.

In February 2015, the City of Camden passed New Jersey's first Sustainability Site Plan Ordinance, which is one of just a handful of sustainability ordinances that address environmental justice and cumulative impacts passed in the United States. This ordinance requires that applicants seeking to erect new development must submit an Environmental Impact and Benefits Assessment (EIBA) that evaluates and addresses the impacts that the development activity could have on the public health and general welfare of Camden's residents. The EIBA is to be completed by the prospective developer and reviewed by the Camden City Planning Board and Zoning Board of Adjustment before project approval. The ordinance directly references the city's Complete Streets ordinance, encouraging applicants to address multi-modal impacts and possible improvements in their development applications.

With these two ordinances the city has set itself up for multi-modal success. Guided by these policies, the city can ensure that new developments are positively impacting pedestrian mobility throughout Camden.

Bicycle Mobility

Despite all of the new development in Camden, there remain few dedicated bike lanes. As more development takes place, the need to connect Waterfront destinations to business and

transit centers will become critical. For Camden to become a bicycle-friendly city, it must develop the necessary infrastructure to make bicycling easier and safer. This would include the development of (1) a connected bicycle lane network, (2) a range of storage options appropriate to different types of locations, and (3) a clear and consistent bicycle signage program.

Recommended bicycle infrastructure improvements were assembled in the *Connecting Communities: A Neighborhood Action Plan for Cooper-Grant/Central Waterfront* (July 2015) report prepared for Cooper's Ferry Partnership and are presented below.

- **Third Street**–Add bike facilities from Clinton Street north into North Camden using striped and buffered bike lanes where there is sufficient street width (such as between MLK Boulevard and Clinton Street), and sharrows where the street narrows. Over the long term, the proposed Third Street realignment south of Clinton Street could continue the bike route as the southern connection for the Camden GreenWay into the Waterfront South neighborhood.

- **Clinton Street**–Add bike facilities between Third Street and the Waterfront.

- **Second Street**–Add striped bike lanes south of Clinton Street to connect to the South Waterfront. This route may be considered as a short-term southern connection of the Camden GreenWay pending the realignment of Third Street.

- **Market Street**–Add bike facilities as part of a two-way conversion (potentially sharrows if it is not wide enough for bike lanes).

- **Kaighn Avenue**–Add striped and buffered bike lanes from Second Street east to connect neighborhoods with the northern route to the Camden GreenWay and Downtown.

- **Fifth Street–**Add bike facilities as part of a two-way conversion to connect from the Ben Franklin Bridge bike ramp and Rutgers/Rowan campus to MLK Boulevard.

- **Haddon Avenue–**Add bike facilities (striped and buffered where there is street width) to connect Downtown with Pyne Poynt, Cooper University Hospital, and the Gateway at I-676.

To further encourage more bicycling, safe places to park bicycles should be provided. It is recommended that bike racks and proper storage be installed at key locations. Short-term parking is typically accommodated by bicycle racks located on the sidewalk or on the street. Such racks should be installed at several strategic locations throughout the study area. Long-term bicycle parking can be accommodated using storage lockers at well-suited locations. Other long-term bicycle storage lockers could be situated at the sites of large businesses and throughout the area's college campuses. The City of Camden may also consider requiring bicycle storage plans as a requirement for new development.

Along with bicycle and parking storage infrastructure, an enhanced, consistent signage program on city streets will help to make bicycling a safer and more attractive transportation option. Bicycle signs, along with dedicated lanes and sharrows, let bicyclists and drivers alike know that bicycling is allowed and encouraged on a particular road. As seen in the photographs in **Figure 13** below, the signs themselves can be used to communicate a number of different messages, from clarifying road-sharing laws to guiding bicyclists to nearby bicycle-accessible destinations.

Figure 13: Bicycle Signage

Sources: MUTCD, 2012; DVRPC, 2017

Additional information on bicycle improvements and policy recommendations can be found in DVRCP's 2015 study, *Camden County Bicycling and Mulit-Use Trails Plan (13036).* This report identifies a network of trails and bicycle facilities that will connect bicyclists and other non-motorized users to attractions in Camden County, such as open space, schools, universities, train stations, shopping destinations, and employment centers.

Cooper's Ferry Partnership recently hired Rutgers Voorhees Transportation Center (VTC) to conduct a bike share feasibility study and pilot demonstration for the City of Camden. VTC joined forces with ofo, an app-based biking platform that connects users to specially designed bicycles equipped with GPS and a proprietary smart-lock technology. The ofo application enables users to locate nearby bicycles and rent them using smartphones.

Demonstrations of the bikes will be conducted throughout the city, followed by a bike share pilot in summer of 2018 where residents and community members can test out the bikes. Findings of the study will determine recommendations for next steps to implement a bike share program.

Wayfinding

A wayfinding system links different people together by guiding them through the same space with a single system of communication. This unifying language creates a public narrative of how people see, read, and experience a space. Each sign in this system serves a particular function and displays a specific type of content.

Wayfinding informs people of the surroundings in an unfamiliar built environment. It is important to display information at strategic points to guide travelers toward their respective destinations. Well-developed wayfinding creates a comprehensive, clear, and consistent visual communication system with concise messaging. To be effective, only relevant information pertaining to the space, location, or path should be displayed.

The below characteristics should be included in a wayfinding scheme.

- **Landmarks–**To create an understandable visual representation of an environment, it is necessary to mark specific, commonly known spaces and/or locations on wayfinding displays. This reinforces the recognition of places and helps users understand the larger area. With the use of landmarks and marking elements, an area becomes more visible. Landmarks are typically recognizable natural or man-made features that stand out from the near environment and are often visible from longer distances. They can be buildings, architectural features, water bodies, bridges, or historical features.

- **Orientation–**This refers to the process of users comparing features of their surroundings with the features represented on a map. Orientation signs offer an overview of the surroundings in the form of comprehensive site maps and directories. They typically show users their current location ("You Are Here") within the built environment. It is best to position the map in the direction that the user is facing. For example, if the map is situated so that the user is facing east on Cooper Street, the maps should be positioned so that its top is also facing east on Cooper Street. Maps not aligned this way can lead to confusion as a user must reorient themselves in order to follow the map's directions toward their desired destination.

- **Navigation–**A robust wayfinding system should also include further direction beyond comprehensive maps and directories. After users begin a trip from a map location to their desired destination, they should be further guided by strategically placed signage along the most common routes to notable destinations. This serves both to remind the user of the route and to confirm for them that they remain on course toward their destination.

In Camden, a number of different wayfinding sign programs have been developed and implemented throughout the city. Well-informed research and observation from other municipalities have helped to establish a set of best practices in developing and implementing wayfinding programs. Chief among these is design continuity. Although not every sign, map, or directory need look precisely like all others, certain elements of a

continuous design concept, such as specific colors, logos, and fonts, should appear throughout the wayfinding system. This continuity should extend to any website or mobile application employed as part of the system.

Wayfinding program developers should also be aware of any similar signage, banners, or gateways that may have been put in place by local institutions (e.g., college campuses or hospitals) or entities such as community development corporations. Every effort should be made to avoid creating cluttered and redundant visual environments as such conditions are harmful to user legibility and traffic safety.

Finally, the signs in a wayfinding system should be scaled to cater to the type of user anticipated at each sign. For instance, a large gateway-type sign is best used at the vehicular entrance to an area. Likewise, detailed maps and directories are suited to dense, pedestrian-rich downtown areas. At each level of density, legibility for the anticipated users should drive the size and typography of wayfinding signage.

Gateways

Gateways reinforce a sense of place and convey a message to the public that they have arrived somewhere that is important, well managed, and welcoming. Strategically placed and designed gateways can be used to brand a city, new academic buildings, and public spaces. Gateways offer a creative opportunity to set a positive and distinctive tone for Camden's unified central business district.

The project study team identified the Federal Street Bridge over the Cooper River as an ideal location for a gateway, citing the road's connectivity to I-676 and US 30 and its ease of access to Camden's neighborhoods. Using the Federal Street Bridge as the primary gateway also offers the opportunity to restore an existing historic landmark and otherwise enhance the site to create an engaging and attractive entrance. Furthermore, Federal Street is wide enough to recommend the installation of bicycle lanes and a landscaped median to enhance both the accessibility and aesthetic appeal of the gateway.

Another gateway currently in design is at the intersections of Mount Ephraim Avenue, Haddon Avenue, and Pine Street. This area is located in the Gateway neighborhood just east of I-676. As part of this project, one block of Mount Ephraim would be shifted along Pine Street and then onto Haddon Ave. The vacated block of Mount Ephraim would then be converted into a neighborhood park. Other improvements included in the scope of the project include streetscape enhancements, bicycle lanes, ADA-compliant sidewalks, and new traffic signals.

CHAPTER 8

Goods Movement

Industrial and Port Activity

The City of Camden, like many waterfront cities, has a rich history of industrial and port activity. Located primarily to the south of the study area, Camden's current industrial waterfront has a variety of freight and truck trip generating land uses. These facilities and businesses are vital to the economy of the city. However, the effects of heavy vehicle traffic are a cause for concern among area residents worried about the safety implications, as well as the noise and vibration that such traffic creates. In addition to industrial land uses, commercial and residential growth in the study area brings with it challenges related to urban deliveries.

The Balzano Marine Terminal, located directly south of the BB&T Pavilion, is a core generator of activity. This marine terminal handles a variety of cargo, including cocoa beans, wood products, and metals imported and exported all over the world. In 2016, this terminal received ship calls from 88 vessels. The port terminal is adjacent to a variety of additional truck trip generating facilities, including Camden Iron and Metal, Georgia-Pacific Gypsum, and Delaware Ship Supply, among others. The northern part of the Major Freight Center in which these facilities are located plays a significant role in the city's economy with 27 employers and 635 employees working in the construction, transportation and warehousing, manufacturing, and wholesale trade industry sectors.

The primary transportation challenge for the City of Camden related to these port and industrial developments is the access of trucks to I-676. Recently, the National Highway System Connector designation for Balzano Marine Terminal has been revised. In an effort to reduce conflicts between Camden's central business district and heavy truck traffic, the new route includes only the southern access to Interchange #4 via Second Street, Ferry Avenue, and Atlantic Avenue. The prior connection, which included Interchange #5 and MLK Boulevard, is no longer part of the official designation. Efforts are currently underway to further reduce conflicts with residential communities in the Waterfront South area of Camden through better signage and geometrical improvements to properly route trucks in and out of the industrial areas.

Urban Freight Deliveries

Through the evolution of consumer demand and logistics trends, port and industrial areas are no longer the only zones seeing increased truck activity. Commercial corridors, downtowns, and high-density residential developments are facing rising demand for freight deliveries. The increase in truck trips in and out of these areas demands that freight

delivery be considered as a part of Complete Streets design, as well as development regulations to ensure the safe, efficient delivery of goods in livable downtowns.

Urban Freight Demand

The core forces behind the growth of urban freight activity are the boom in e-commerce and omni channel activity. Consumers are increasingly demanding online ordering with direct home deliveries. In many cases, the expectation of delivery time has been greatly shortened with same- and next-day delivery becoming the industry standard for many e-commerce retailers. This type of activity leads to a marked increase in the number of trucks serving residential developments and businesses to process deliveries and pick-ups. In order to accommodate the velocity demanded by consumers, the same carrier (UPS, FedEx, etc.) may make multiple visits to the same location in a single day.

For commercial corridors and downtowns, the presence of commercial enterprises adds to the intensity of activity. These businesses are often served not only by parcel delivery vehicles, but also by larger tractor-trailers. Some of the largest receivers in the study area include institutions like Rutgers University–Camden/Rowan University and Cooper University Health Care, as well as buildings like The Victor and Camden City Hall. In addition, some of these areas are facing increasing land and building rents coupled with a more efficient logistics system that is reducing the amount of inventory space many retailers maintain. The result is a shorter inventory between deliveries from suppliers or warehouses, meaning an increase in truck trips for these locations.

For both commercial corridors and downtowns, the competition for curb space and street area are critical factors in the ability of trucks to make safe, efficient deliveries. In any setting, the proper accommodation of freight deliveries is vital to vibrant, livable downtowns. If not properly accommodated, these delivery vehicles may be forced to block travel lanes to make deliveries, operate on streets not well designed for their vehicle size, or create safety conflicts with pedestrians and bicyclists.

Urban Deliveries

Forward-thinking cities are beginning to incorporate freight delivery considerations into planning initiatives and development requirements. Including these considerations in the planning process can help to reduce conflicts between freight delivery vehicles and other modes. The *Philadelphia Delivery Handbook*, completed in April 2017, serves as a guide for the City of Philadelphia to begin to address urban deliveries. There are several best practices that could be considered in the City of Camden as development continues in the study area.

The urban street, rich with activity and life, helps to dictate the character of many of Camden's neighborhoods. It is a finite commodity to be shared by passenger vehicles, transit, pedestrians, cyclists, and trucks. The management of curb space is crucial to influencing this character and managing the efficiency of the street.

Deliveries are increasingly important in our consumer economy. Access for delivery vehicles is, and will continue to be, an important component of the urban street. Providing loading zones at the appropriate locations with the necessary supporting infrastructure improvements can lead to a more livable street.

Below are some useful strategies for accommodating deliveries at the curb.

- Provide the appropriate number of loading zones to support the commercial activity and character of the street.
- Provide longer loading spaces to accommodate multiple vehicles and allow for better access.
- Assign preference to end-of-block loading zones.
- For mid-block loading zones, provide curb cuts and ramps to allow access for hand trucks and pallet jacks.
- Provide a buffer of at least five feet between loading zones and curbside bike lanes.
- For streets with wide sidewalks, develop shared-use space delineated by striping or textured pavements and pedestrian protection devices.
- Provide longer-term parking for general contractor vehicles (e.g., construction and utilities) that is separate from loading zones (and which may not be located immediately in front of a particular building).

Deliveries by Design

The density of activity on urban streets can limit opportunities for delivery zones and stopping areas. Land development strategies that seek to internalize delivery facilities can help to alleviate conflicts and improve the total capacity of right-of-way dedicated to other uses. Implementation of delivery considerations into the development process can create opportunities for builders to design alleys, off-street loading bays, and even internal or underground delivery facilities.

A regional best practice can be found in the City of Philadelphia. Provisions for off-street loading are required as a part of the City of Philadelphia Zoning and Planning Code under §14-806. The city mandates that new construction provide off-street loading spaces. The requirements are spelled out in the zoning ordinance and are based on the Gross Floor Area of construction.

Alternative Delivery Locations

As e-commerce continues to grow, improving efficiency and reducing the number of truck trips to residential delivery sites will be an important goal in many neighborhoods. Offering

alternate delivery sites is an effective means for consolidating trips to residential locations, while improving the security and reliability of deliveries.

Neighborhood Pick-Up Points (PPs)

These neighborhood locations can be formal retail outlets run by carriers or a third party. They provide a reliable location to receive packages for consumers. When returns are necessary, these locations also serve as a drop-off point for returned packages. An added benefit for PP operators, such as a family-owned shop, is the increased foot traffic of potential customers.

Automated Parcel Systems (APSs)

A technology-driven solution, APSs provide a fully automated, secure point of access for customers. As simple as getting money from an ATM, these locations offer a kiosk and attached lockers for consumers to pick up packages. While most APSs are unstaffed, hybrids between these and PPs do exist (e.g., Amazon@ locations).

Impact of Autonomous Vehicles

Autonomous vehicle (AV) systems comprise hardware and software, both remote and on-board, which perform the functions needed to drive a vehicle. The key hardware components include an on-board computer that makes decisions; a global positioning system (GPS) signal system; an inertial measurement unit for when the GPS is out of signal; radar sensors that detect nearby vehicles; ultrasonic sensors that detect other vehicles and objects alongside the AV; light detection and ranging (LiDAR) that identifies lane markings; and video cameras that read traffic signals and road signs, and scan for pedestrians and obstructions.

While the eventual timeline for AVs to show up in large numbers on area streets remains unknown, the region needs to begin planning for them now. Some initial considerations in planning for AVs are listed below.

- AVs are more likely to be electric, increasing the need to build out electric vehicle infrastructure.
- AVs use road markings for guidance. These need to be well maintained. Signs need to be kept clear and readable and will require additional tree trimming to ensure visibility.
- There is likely to be a long period where AVs and human-driven vehicles share the road.
- AVs will make the system more complex and reliant on advanced communications networks, increasing risk.

- While AVs will increase the capacity of existing facilities, the rebound effect suggests they will equally increase vehicle miles traveled. It is estimated that a 90 percent AV fleet would increase roadway capacity by 80 percent.

- There is the potential for zero-occupant vehicles to clog the road.

- Reduced braking and smoother accelerations can further reduce fuel consumption and vehicle emissions.

- The young, elderly, and disabled may experience increased mobility.

- AVs could alter the vehicle ownership model, with a decrease in privately owned cars and an increase in shared vehicle ownership, subsequently revolutionizing the car sharing model.

- AV technology could allow for narrower lanes, decreased demand for right-of-way, shorter travel times, and improved safety.

- AVs have the potential to eventually eliminate driver jobs.

Automated vehicle technologies have the potential to dramatically impact nearly all aspects of the freight industry. Responsibilities of truck drivers could dramatically shift. Operations may become more productive, freight may move faster, and federal regulations could be dramatically altered to accommodate a new driving environment.

Perhaps the largest impact on freight movement that AVs will have is related to hours of service. Simply put, if rest periods could be taken while the vehicle is in motion, there is no need to stop. Current regulations are collectively designed to ensure safe driving and reduce fatigue by limiting the number of hours a truck driver can work. These boundaries, by their nature, limit productivity levels.

Speeding, reckless driving, improper lane change, and inattention are all examples of unsafe driving. It is likely that the number of unsafe driving events will significantly decline with the introduction of AV fleets. Further implications are listed below.

- Route management improvements could be realized as navigation systems respond to traffic congestion, work zones, and weather conditions.

- Increased safety and reduced fatigue and stress associated with driving can lead to better driver retention.

- Real-time parking information and reservations systems could lead to better use and allocation of truck parking facilities.

- The adoption of AV technology could make tracking fleet vehicles easier, as well as producing AV travel logs.

- With the ability to move about inside of an AV, passengers are less sedentary.

- Opposition from the nation's 3.5 million commercial truck drivers may delay the rollout of technology.
- Assigning liability to a full AV in the event of a crash may become problematic.

CHAPTER 9

Public Transportation Accessibility

Existing Conditions

The City of Camden, particularly the area being studied, is richly served by transit. Existing services, as well as planned expansions, provide a viable alternative to the automobile.

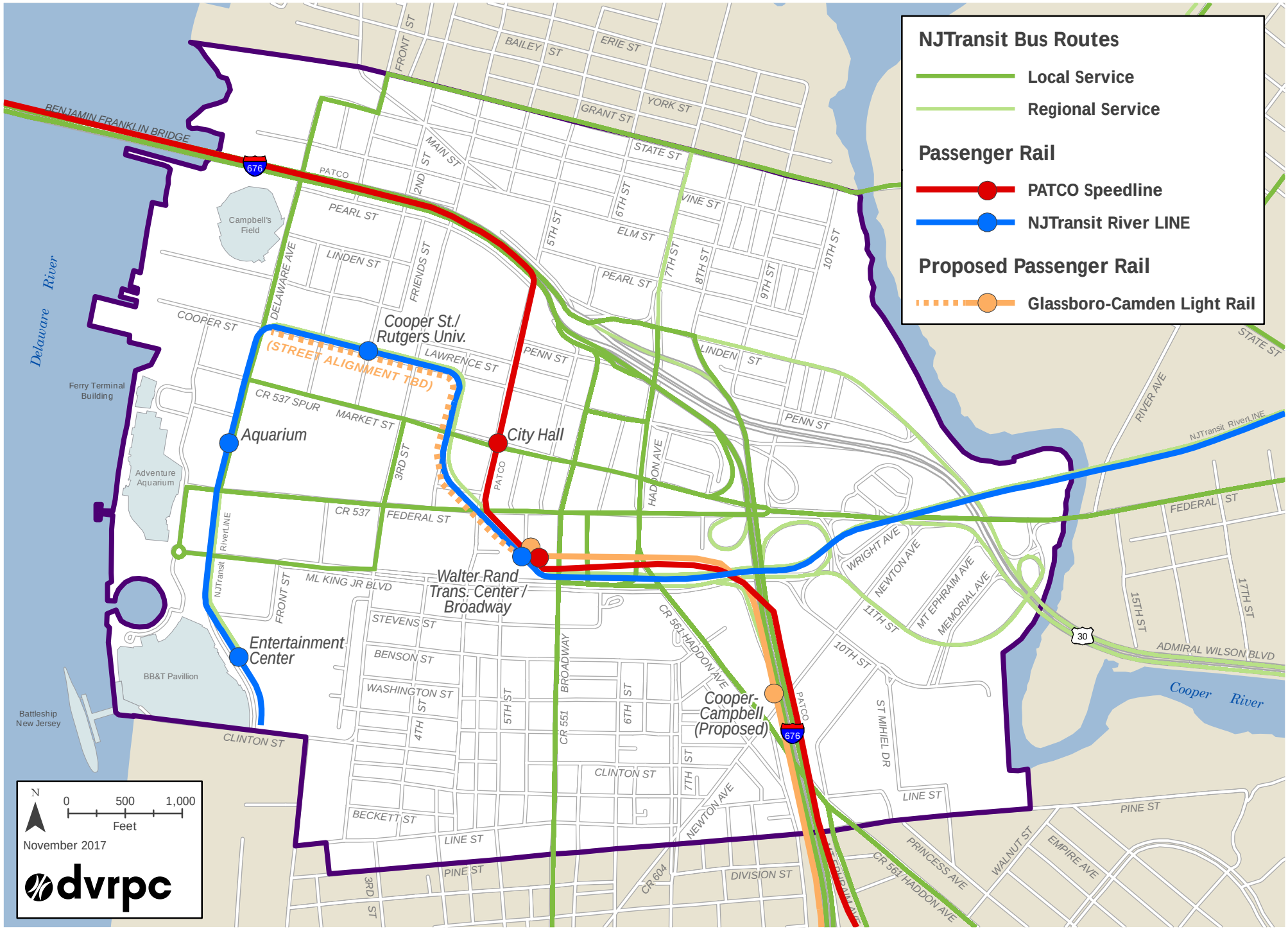
Scheduled public transit service to, from, and within the City of Camden is primarily provided by NJ Transit and PATCO. There are several modes of public transportation within the city, including: light rail, urban heavy rail, bus, and ferry. **Figure 14** illustrates the spatial distribution of regularly scheduled transit services serving the study area.

Light Rail

Light rail service is offered by the NJ Transit River LINE. The River LINE is a diesel light rail service that connects the cities of Trenton and Camden. Service began in 2004 on the 21-station alignment, four stations of which are in the study area: the Walter Rand Transportation Center, Cooper Street/Rutgers University, Aquarium, and Entertainment Center. Service is offered roughly between 6:00 AM and 10:00 PM, with 15-minute peak and 30-minute off-peak headways. Within the study area, the River LINE operates parallel to MLK Boulevard between 11th Street and Broadway, on Fourth Street between Arch Street and Cooper Street, on Cooper Street between Fourth Street and Delaware Avenue, and on Delaware Avenue between Cooper Street and Harbor Boulevard. The station at the Walter Rand Transportation Center offers transfer to NJ Transit buses and the PATCO Speedline.

Urban Heavy Rail

The PATCO Speedline provides urban heavy rail service between Lindenwold and Philadelphia, with intermediate service through Camden. Two stations, Broadway (at Walter Rand Transportation Center) and City Hall, are located within the study area. The Ferry Avenue Station is located a short distance south of the study area. The Speedline has four stations in Philadelphia, three in the City of Camden, and an additional six in suburban Camden County. Service is offered seven days a week, 24 hours a day, with frequencies ranging between three and 45 minutes. Within the study area and in Philadelphia, the Speedline operates in subterranean tunnels; elsewhere, it is above ground and entirely grade separated. Service along the existing alignment began in 1969.


NJTransit Bus Routes
Local Service
Regional Service
Passenger Rail
PATCO Speedline
NJTransit River LINE
Proposed Passenger Rail
Glassboro-Camden Light Rail
Cooper St./ Rutgers Univ.
(STREET ALIGNMENT TBD)
Aquarium
City Hall
Walter Rand Trans. Center / Broadway
Entertainment Center
Cooper-Campbell (Proposed)
Delaware River
Cooper River
BENJAMIN FRANKLIN BRIDGE
Campbell's Field
Ferry Terminal Building
Adventure Aquarium
BB&T Pavillion
Battleship New Jersey
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Bus

Bus service in the City of Camden is primarily provided by NJ Transit. Most NJ Transit bus routes serving the study area terminate at the Walter Rand Transportation Center. **Table 9** below provides an overview of the NJ Transit bus routes and schedules within the study area.

Table 9: Study Area New Jersey Transit Bus Routes

Route	Terminus	Terminus	Peak Frequency*	Local Service**
313	Philadelphia	Cape May	Low	No
315	Philadelphia	Cape May	Low	No
316	Philadelphia	Cape May	Low	No
317	Philadelphia	Asbury Park	Low	No
400	Philadelphia	Sicklerville	High	No
401	Philadelphia	Salem	Low	No
401	Philadelphia	Woodbury	High	Yes
402	Philadelphia	Pennsville	Medium	Yes
402	Philadelphia	Woodbury	High	Yes
403	Camden	Turnersville	High	Yes
404	Philadelphia	Cherry Hill	High	Yes
405	Camden	Cherry Hill	Medium	No
406	Philadelphia	Berlin	High	No
407	Camden	Moorestown	High	No
408	Philadelphia	Millville	Medium	No
409	Philadelphia	Trenton	High	No
410	Philadelphia	Bridgeton	Medium	Yes
410	Philadelphia	Woodbury	High	Yes
412	Philadelphia	Sewell	High	Yes
412	Philadelphia	Woodbury	High	Yes
413	Camden	Burlington	Medium	No
418	Philadelphia	Trenton	High	No
419	Camden	Riveside	Medium	Yes
450	Camden	Cherry Hill	Medium	Yes
451	Camden	Vorhees	Low	Yes
452	Camden	Cramer Hill (Camden)	High	Yes
453	Camden	Ferry Ave (PATCO)	Medium	Yes
457	Camden	Moorestown	High	Yes
460	Camden	Camden	Low	Yes
551	Philadelphia	Atlantic City	High	No

*Frequency: High = 0–30 minutes, Medium = 31–60 minutes, Low = > 60 minutes

**Yes = provides service other than to Walter Rand Transportation Center

Source: New Jersey Transit, 2017; DVRPC, 2017

Ferry

The Camden RiverLink is a seasonal cross-river ferry service operated by the Delaware River Waterfront Corporation (DRWC) that connects Penn's Landing in Philadelphia (near the Maritime Museum) with the Camden Waterfront (near the Adventure Aquarium). It operates every 30 minutes between 9:30 AM and 6:00 PM during the summer months. Extended service is available on weekends and during special events.

Shuttle Service

The Camden Rising Shuttle is operated via a partnership of Camden County, Camden County College, Rutgers Univeristy–Camden/Rowan University, South Jersey Transportation Authority, and the Cooper Medical School. Students, faculty, and employees of these colleges are eligible to use the service, as are employees of Camden County. The shuttle runs Monday through Friday on a circulatory loop throughout the Downtown area, generally from Broadway to Delaware Avenue.

The Rutgers/Rowan Internal Shuttle operates from 7:30 AM to 10:30 PM on weekdays, excluding holidays, during the fall and spring semesters of each academic year. During the summer semester the shuttle operates from Monday to Thursday from 7:00 AM to 7:00 PM.

Planned Transit Improvements

The central business district of Camden is currently experiencing a surge in development interest, particularly from Rutgers University–Camden/Rowan University and Cooper University Hospital. These developments, along with the transformation of the Camden riverfront, will continue to increase demand for public transportation.

Glassboro-Camden Rail Line

The proposed Glassboro-Camden Line (GCL) rail extension would travel along the 18-mile corridor that stretches from Glassboro to Camden along the existing railroad right-of-way. The new light rail line would traverse through 12 communities with 14 proposed stops. Connection in the study area would be via the Walter Rand Transportation Center and Cooper-Campbell. The Cooper-Campbell station is part of the planned transit center at Knights Crossing. The transit hub, planned for the area bounded by Mount Ephraim Avenue and Eighth Street, would link a new PATCO station with the GCL.

The planned alignment of the GCL enters the Camden Waterfront area on Cooper Street before turning left onto Delaware Avenue to serve the waterfront attractions. However, the recommended route for the GCL is to turn right onto Delaware Avenue, continuing north to Erie Street, looping back near N. Second Street. This route would serve the Liberty Property Trust Development, Campbell's Field, and the neighborhoods of Cooper Point. It would also reduce redundant service already provided by the River LINE.

Walter Rand Transportation Center Redevelopment

The Walter Rand Transportation Center is located in the heart of Camden's Downtown area. Going forward, there is potential for this transportation hub to provide an enhanced role in serving local and regional transportation needs. However, there are concerns with its current design. Operationally, the terminal and surrounding area does not provide for seamless transfers among the various transit services. Many riders must cross Broadway mid-block to access bus and light rail services. Additionally, some view the building itself as derelict or obsolete. Public safety is also an issue due to loitering in the area. The Walter Rand Transportation Center does not fulfill its potential as a transit center or a catalyst for urban redevelopment.

Discussions are currently taking place to formulate a plan for the future of the Walter Rand Transportation Center. Camden County was awarded a Transportation and Community Development Initiative (TCDI) grant for a marketing feasibility study and redesign of the Walter Rand Transportation Center. Preliminary tasks include a circulation assessment to look at enhancing safe and efficient access to and from the terminal. Plans also include station design concepts to address architecture, aesthetics, and commercial development, and to ensure safety of the site and the surrounding area. The redesign of the Walter Rand Transportation Center will provide better connections for parking, buses, taxis, public transit, and retail space, and make it easier for pedestrians to navigate the transit center.

Ferry Service

The Delaware River Waterfront Corporation (DRWC), which currently operates the RiverLink Ferry, is considering additional service to foster economic development. Service is proposed in both Cramer Hill and North Camden to enhance neighborhood connections. The DRWC is also advocating for an additional ferry stop in the Central Waterfront at the end of Cooper Street, at the entrance to the new waterfront development currently under construction by Liberty Property Trust. It is envisioned that this will support the build-out of the Central Waterfront and provide increased transportation opportunities for residents and employees in the city.

DVRPC's Fiscal Year 2016 Transportation Improvement Program has identified federal funding allocated for the Ferry Program under the New Jersey Statewide Program. The state has allocated approximately $2 million per year to construct ferry boats and ferry terminal facilities.

CHAPTER 10

Conclusion, Recommendations, and Implementation

Conclusion

Overall, the City of Camden's transportation system functions satisfactorily. The analyses conducted for this study found the need for several improvements to increase and/or maintain existing levels of mobility in the city as redevelopment occurs.

Recommendations

Recommendations for improvements are found throughout this report. Highlights of these improvements have been summarized and organized into the following tables. Location-specific recommendations, focused at several key intersections, are shown in **Table 10**.

Table 10: Location-Specific Recommendations

Location	Recommendations
Linden St & Seventh St	• Optimize signal and coordinate with Eighth St & Linden St • Allow for a second northbound left turn lane
Haddon Ave & Cooper St	• Redesignate SB Seventh St with right turn only lane • Formally designate the LEAP Academy drop-off zone • Remove parking on northbound side of Cooper St
Cooper St & Fifth St	• Coordinate signals for peak directional flow • Implement findings from the Cooper Street Pedestrian Access Project
MLK Blvd & Haddon Ave	• Implement a fully actuated traffic signal • Serve non-conflicting movements during transit preemption • Provide a mid-block pedestrian refuge area on MLK Boulevard
Federal St & Flanders Ave	• Signalize intersection with additional turn lanes

Source: DVRPC, 2017

More general improvement strategies were also summarized by category or theme. These recommendations are shown in **Table 11**.

Table 11: Area-Wide Recommendations

Theme	Recommendations
Traffic Signals	• Upgrade signals for coordination • Manage traffic via a Traffic Control Center • Investigate implementing an Adaptive Traffic Control system
Roadway Conditions	• Maintain a good state of repair of the roadway network • Develop an asset management program to prioritize maintenance
Pavement Markings	• Ensure pavement markings are present and clearly visible • Develop a maintenance program to prioritize markings that are faded or missing
Pedestrian Mobility	• Crosswalks should utilize the highly visible Continental style • Countdown timers at intersections should be standard • Retrofit existing crosswalks with ADA adherence • Implement and coordinate an ongoing pedestrian wayfinding signage program • Maintain safe, unobstructed, and level sidewalks
Parking	• Replace parking meters with electronic kiosks • Implement pricing strategies that discourage long-duration parking • Where applicable, on-street parking should be converted to angle parking
Bicycle Mobility	• Implement bicycle infrastructure improvements identified in the *Connecting Communities* report • Install bike racks and proper storage at key locations • Implement an enhanced, consistent bicycle signage program • Continue to pursue bike share opportunities
Wayfinding	• Implement a clear and consistent visual communication system • Ensure the wayfinding system is scaled to cater to anticipated users • Add or augment signage at key gateways or intersections
Gateways	• Implement gateway strategies at the Federal Street Bridge and at the intersections of Mount Ephraim Avenue, Haddon Avenue, and Pine Street
Urban Deliveries	• Provide the appropriate number of loading zones to support the commercial activity and character of the street • Provide a five foot buffer between loading zones and curbside bike lanes
Public Transit	• Implement and support the Glassboro-Camden Line rail extension • Redesign the Walter Rand Transportation Center to address surrounding area architecture, aesthetics, safety, connectivity, and commercial development • Advocate for an additional ferry stop in the Central Waterfront

Source: DVRPC. 2017

Implementation

This study assessed the impact to the city's transportation infrastructure, assuming all planned and proposed developments are realized. Keeping in mind that several of these plans are long term or conceptual, it will take time before all of the developments are completed. Continued development is assured. Implementing the recommendations from this study should occur in stages, as development progresses.

The assigned priority of each recommendation corresponds roughly with the implementation timeframe. However, since development may occur in varying degrees, at different locations, the city's planning and engineering offices will need to continuously update the priority of each recommendation. For example, heavy development along the Waterfront area would require different priorities than heavy development in the Gateway area. Time will ultimately dictate priority.

The question that begs to be answered–how will this study's recommendations be funded–can only be answered with time. A blend of Federal, State, local, and private funding through a P-3 (public-private partnership) is envisioned. Some projects may be funded by developers to mitigate specific traffic concerns, but others will require the city to seek funding for their implementation. Potential funding sources are cited in **Appendix B**.

APPENDIX A

Detailed Trip Distribution Information by Time Period

Table A-1: AM Peak Hour Inbound Summary

Direction	Facility	Measured at	Volume	Percent
From the East:	I-676	Linden Street	1,031	13.8%
	US 30	Flanders Avenue	992	13.3%
	Federal Street	Cooper River	762	10.2%
	Haddon Avenue	Pine Street	121	1.6%
			2,906	**39.0%**
From the West:	I-676/Ben Franklin Br	6th Street	116	1.6%
	I-676/Ben Franklin Br	Broadway	106	1.4%
	US 30	Wright Avenue	141	1.9%
	I-676	Market Street	87	1.2%
	I-676	Federal Street	278	3.7%
			728	**9.8%**
From the North:	State Street	Cooper River	373	5.0%
			373	**5.0%**
From the South:	I-676	Linden Avenue	878	11.8%
	I-676	MLK Boulevard	1,401	18.8%
	Haddon Avenue	Pine Street	242	3.2%
	Mount Ephraim	Pine Street	288	3.9%
	7th Street	Pine Street	199	2.7%
	Broadway	Pine Street	256	3.4%
	2nd Street	Clinton Street	180	2.4%
			3,444	**46.2%**
		Total:	**7,451**	**100%**

Source: DVRPC, 2017

Table A-2: AM Peak Hour Outbound Summary

Direction	Facility	Measured at	Volume	Percent
To the East:	US 30	Cooper Street	306	7.7%
	Federal Street	Cooper River	721	18.1%
	US 30	Wright Avenue	507	12.8%
	Pine Street	Haddon Avenue	131	3.3%
			1,665	**41.9%**
To the West:	I-676/Ben Franklin Br	Linden Street	297	7.5%
	US 30	Flanders Avenue	169	4.3%
			466	**11.7%**
To the North:	State Street	Cooper River	295	7.4%
			295	**7.4%**
To the South:	I-676	Penn Street	370	9.3%
	I-676	MLK Boulevard	557	14.0%
	Haddon Avenue	Pine Street	128	3.2%
	Mount Ephraim	Haddon Avenue	165	4.2%
	7th Street	Pine Street	107	2.7%
	Broadway	Pine Street	165	4.2%
	2nd Street	Clinton Street	55	1.4%
			1,547	**38.9%**
		Total:	**3,973**	**100.0%**

Source: DVRPC, 2017

Table A-3: PM Peak Hour Inbound Summary

Direction	Facility	Measured at	Volume	Percent
From the East:	I-676	Linden Street	704	14.1%
	US 30	Flanders Avenue	604	12.1%
	Federal Street	Cooper River	683	13.7%
	Haddon Avenue	Pine Street	86	1.7%
			2,077	**41.7%**
From the West:	I-676/Ben Franklin Br	6th Street	93	1.9%
	I-676/Ben Franklin Br	Broadway	64	1.3%
	US 30	Wright Avenue	125	2.5%
	I-676	Market Street	81	1.6%
	I-676	Federal Street	237	4.8%
			600	**12.1%**
From the North:	State Street	Cooper River	352	7.1%
			352	**7.1%**
From the South:	I-676	Linden Avenue	477	9.6%
	I-676	MLK Boulevard	628	12.6%
	Haddon Avenue	Pine Street	184	3.7%
	Mount Ephraim	Pine Street	242	4.9%
	7th Street	Pine Street	187	3.8%
	Broadway	Pine Street	175	3.5%
	2nd Street	Clinton Street	55	1.1%
			1,948	**39.1%**
		Total:	**4,977**	**100.0%**

Source: DVRPC, 2017

Table A-4: PM Peak Hour Outbound Summary

Direction	Facility	Measured at	Volume	Percent
To the East:	US 30	Cooper Street	720	10.7%
	Federal Street	Cooper River	942	14.0%
	US 30	Wright Avenue	980	14.6%
	Pine Street	Haddon Avenue	69	1.0%
			2,711	**40.4%**
To the West:	I-676/Ben Franklin Br	Linden Street	427	6.4%
	US 30	Flanders Avenue	176	2.6%
			603	**9.0%**
To the North:	State Street	Cooper River	428	6.4%
			428	**6.4%**
To the South:	I-676	Penn Street	517	7.7%
	I-676	MLK Boulevard	1,472	21.9%
	Haddon Avenue	Pine Street	222	3.3%
	Mount Ephraim	Haddon Avenue	214	3.2%
	7th Street	Pine Street	139	2.1%
	Broadway	Pine Street	232	3.5%
	2nd Street	Clinton Street	180	2.7%
			2,976	**44.3%**
		Total:	**6,718**	**100.0%**

Source: DVRPC, 2017

APPENDIX B

Potential Funding Sources

Local Sources

Business Improvement Districts (BIDs) are public-private partnerships in which businesses in a defined area elect to pay an additional tax in order to fund future improvements within that specific geographic area. Funds are collected by the taxing authority and used to provide services, such as street and sidewalk maintenance, marketing, and capital improvements. BIDs are formed through the adoption of a municipal ordinance. State financial assistance is available for municipalities.

The Camden Special Services District serves as a BID for portions of the study area.

Community Impact Assessments are a process by which municipalities can evaluate the effects of a transportation (infrastructure) action on a community and the quality of life for its residents. This type of assessment should be done when large-scale development will be taking place within a community or as part of a large transportation improvement. This assessment can help the municipality integrate land use, economics, and transportation to achieve common goals, as well as bringing all federal and state agencies to agreement on the sustainable choice of improvement.

Capital Improvement Programs (CIP) set out a municipality's plans for future capital improvements, such as roads and other public facilities. The range and scope of these vary, but most cover an immediate five- to six-year period and can be scoped for up to 20 years. A successful CIP should include a schedule of implementation with a projected budget. If a municipality's CIP is consistent with the master plan and zoning ordinance, they can be useful tools, allowing the municipality to plan for future growth and improvements and lowering costs by anticipating the future demands of the municipal infrastructure system. The CIP can also provide developers and the public with more certainty concerning future public improvements, thereby improving opportunities for participation and increasing accountability. The adoption and updating of the CIP is no small task, but should be considered an immediate priority for municipalities.

Impact Fees are paid by developers to help finance a variety of needed services and facilities that result from growth. This type of revenue provides a better quality of life for residents by financing the infrastructure needed to support additional population, employment, and development. It ultimately reduces the need to impose higher taxes on existing residents to finance additional facilities. An impact fee ordinance requires modification of the master plan and subdivision and zoning codes.

Parkland Dedications/Fees-in-Lieu requires developers to provide open space within their development or to contribute fees-in-lieu to improve or preserve open space elsewhere. Fees-in-lieu should be outlined in the zoning and municipal subdivision code for the municipality. They are often based on the number of residential units that a particular development will introduce.

Regional Programs

Transportation and Community Development Initiative (TCDI)

Eligibility: Eligible municipalities
Purpose: Support local planning projects to improve transportation and encourage redevelopment
Terms: Grants up to $75,000 for single projects and $100,000 for multi-municipal projects; 20 percent local match required
Deadline: Approximately every two years
C: Delaware Valley Regional Planning Commission (DVRPC)
P: 215-592-1800
I: www.dvrpc.org

Transportation Enhancements Program –New Jersey

Eligibility: New Jersey local governments, counties, state or federal agencies, nonprofits
Purpose: Funds non-traditional projects designed to enhance the transportation experience, to mitigate the impacts of transportation facilities on communities and the environment, and to enhance community character.
Terms: 80 percent to 90 percent of costs can be funded
Deadline: Varies
C: Delaware Valley Regional Planning Commission
P: 215-592-1800
I: www.dvrpc.org

State Programs

Brownfields Development Area Initiative

Eligibility: New Jersey community groups and municipalities
Purpose: Project management assistance for communities impacted by multiple brownfield sites
Terms: Project manager is assigned from the Office of Brownfield Reuse
Deadline: Annual
C: New Jersey Department of Environmental Protection
P: 609-292-1251
I: www.nj.gov/dep/srp/brownfields/bda/

Brownfield Redevelopment Incentive Program

Eligibility: New Jersey business owners and developers
Purpose: To finance brownfield site remediation
Terms: Interim financing up to $750,000 at below-market interest rates
Deadline: Varies
C: New Jersey Economic Development Authority
P: 609-777-4898
I: www.njeda.com

Environmental Equity Program

Eligibility: New Jersey government entities and developers
Purpose: Provides loans for site acquisition, remediation, and demolition costs for brownfield redevelopment
Terms: Vary
Deadline: Varies
C: New Jersey Redevelopment Authority
P: 609-292-3739
I: www.njra.us

Fund for Community Economic Development

Eligibility: New Jersey Community Development Organizations, developers
Purpose: To finance feasibility studies or other predevelopment activities
Terms: Vary
Deadline: Varies
C: New Jersey Economic Development Authority
P: 609-777-4898
I: www.njeda.com

Historic Site Management Grants

Eligibility: New Jersey municipalities, counties, non-profits
Purpose: Awards range from $5,000 to $50,000
Terms: Vary
Deadline: Varies
C: New Jersey Department of Community Affairs
P: 609-292-7156
I: www.state.nj.us/dca

Innocent Party Grants

Eligibility: New Jersey municipalities, counties, redevelopment entities, homeowners
Purpose: Applicant must not be responsible for contamination
Terms: Vary
Deadline: Open
C: New Jersey Economic Development Authority
P: 609-777-0990
I: www.njeda.com

Municipal Grants

Eligibility: New Jersey municipalities, counties, redevelopment entities, homeowners
Purpose: Returns contaminated and underutilized properties to productive reuse
Terms: Up to $3 million, per municipality, per year for 100 percent of costs of preliminary assessment, site investigation, remedial investigation, and remedial action
Deadline: Open
C: New Jersey Economic Development Authority
P: 609-777-0990
I: www.njeda.com

Redevelopment Investment Fund

Eligibility: New Jersey municipalities, counties, non-profits, corporations
Purpose: Flexible investment fund that provides debt and equity financing for business and real estate ventures
Terms: Vary
Deadline: Varies
C: New Jersey Redevelopment Authority
P: 609-292-3739
I: www.njra.us

Redevelopment Area Bond Financing

Eligibility: New Jersey municipalities with designated redevelopment areas
Purpose: Tax-exempt bonds to fund the infrastructure and remediation components of redevelopment projects
Terms: Vary
Deadline: Varies
C: New Jersey Economic Development Authority
P: 609-777-4898
I: www.njeda.com

Smart Futures Grant

Eligibility: New Jersey local governments, counties, non-profits
Purpose: Funds projects that balance development with the preservation of open space and environmental resources
Terms: Vary
Deadline: Annual
C: New Jersey Department of Community Affairs
P: 609-292-7156
I: www.state.nj.us/dca

Smart Growth Redevelopment Funding

Eligibility: New Jersey developers undertaking mixed-use development projects
Purpose: To finance site preparations costs such as demolition, removal of debris, or engineering
Terms: Low-interest loans and loan guarantees up to $1 million
Deadline: Varies
C: New Jersey Economic Development Authority
P: 609-777-4898
I: www.njeda.com

Special Improvement Districts: Loans and Grants

Eligibility: New Jersey municipalities
Purpose: To finance capital improvements within a designated business improvement zone
Terms: Loans up to $500,000 for capital improvements; grants up to $10,000 for technical support
Deadline: Open
C: New Jersey Department of Community Affairs
P: 609-633-9769
I: www.state.nj.us/dca

New Jersey Environmental Infrastructure Financing Program

Eligibility: New Jersey local government units
Purpose: To finance infrastructure projects to protect clean water and drinking water
Terms: Loans up to $10 million per borrower
Deadline: Annual
C: New Jersey Environmental Infrastructure Trust
P: 609-219-8600
I: www.njeit.org

Section 319(h) Nonpoint Source Grant Program

Eligibility: Municipal planning departments or boards, health departments or boards; county planning departments or boards, health departments or boards; designated water quality management planning agencies; state and regional entities entirely within New Jersey; state government agencies, universities, and colleges; interstate agencies of which New Jersey is a member; watershed and water resource associations and other local non-profit organizations.
Purpose: To finance the construction and implementation of projects that help to protect, maintain, and improve water quality

Terms: Vary
Deadline: Annual
C: New Jersey Department of Environmental Protection, Division of Watershed Management, Bureau of Watershed Planning
P: 609-984-0058
I: http://www.nj.gov/dep/wms/bears/nps.htm

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Key Words: Intersection Analysis, Redevelopment, Access Management, Level of Service, Planned Development, Pedestrian Mobility, Bicycle Mobility, Land Use, Traffic Circulation, Traffic Impact Analysis, Vistro, Parking, Goods Movement

Abstract: This study was undertaken by Delaware Valley Regional Planning Commission (DVRPC) at the request of the City of Camden and Camden County Redevelopment Authority to assess transportation needs associated with the realization of planned development. The study area serves as an update to the prior DVRPC report, *City of Camden Access Study*, published in July 2012. Twenty-one intersections were quantitatively assessed to determine capacity and identify mobility improvements. Other modes of travel were also assessed. The study found that the city's transportation infrastructure has available capacity and can handle a significant number of new trips, although several locations have isolated issues that will require remedy. More general suggestions and ideas were also presented on topics such as sidewalks, pedestrian infrastructure, wayfinding, parking, goods movement, and public transit.

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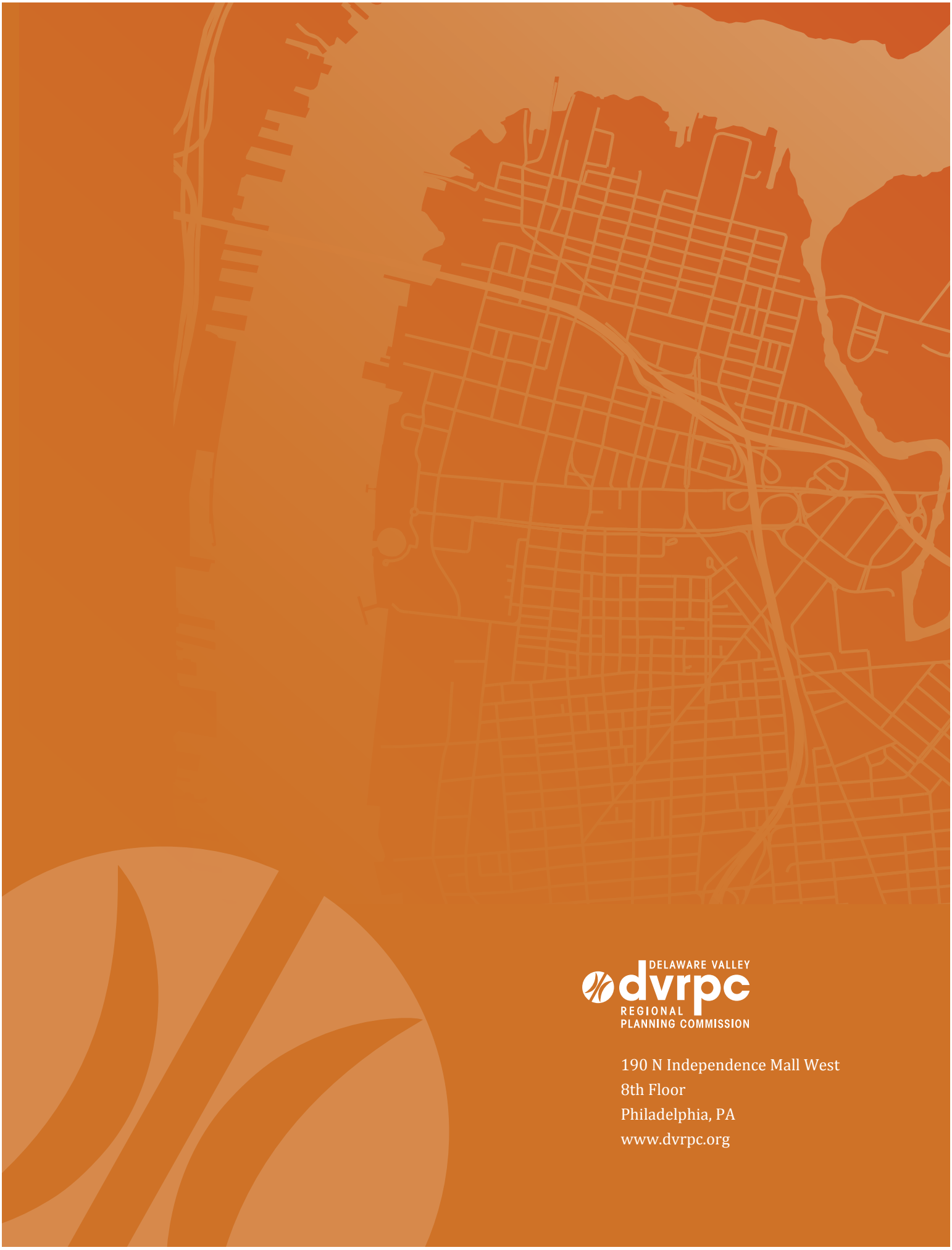

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