



November 2012

City of Camden Access Study



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The outer ring symbolizes the region as a whole while the diagonal bar signifies the Delaware River. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

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Table of Contents

Executive Summary.....	1
C H A P T E R 1	
Purpose and Introduction	3
■ Purpose.....	3
■ Introduction	3
C H A P T E R 2	
Demographics	9
■ Introduction	9
■ Population	9
■ Employment	10
■ Environmental Justice.....	10
C H A P T E R 3	
Land Use and Development.....	13
■ Land Use.....	13
■ Development.....	18
C H A P T E R 4	
Traffic Circulation and Parking	23
■ Existing Condition	23
■ Vehicular Mobility and Access Analysis.....	27
C H A P T E R 5	
Pedestrian and Bicycle Mobility.....	37
■ Pedestrian Mobility.....	37
■ Bicycle Mobility	39
C H A P T E R 6	
Goods Movement	45
■ Background.....	45
■ Truck Routes.....	46
■ Recommendations	47
C H A P T E R 7	
Public Transportation Accessibility.....	49
■ Existing Condition	49
■ Recommendations	52
C H A P T E R 7	
Conclusion, Recommendations, and Implementation.....	53
■ Conclusion	53

- Summary of Recommendations..... 53
- Implementation..... 59

Figures and Tables

- Figure 1: Study Area 5
- Figure 2: Land Use (2010) 14
- Figure 3: Developable Land 17
- Figure 4: Conceptual Gateway Redevelopment..... 20
- Figure 5: Highway Network 24
- Figure 6: Conceptual Access Improvements..... 34
- Figure 7: Planned Bicycle Environment Improvements 40
- Figure 8: Transit Service 51
- Figure 9: Summary of Recommended Improvements..... 55

- Table 1: Current Study Area Population (2010) 10
- Table 2: Disadvantaged Population by Study Area Neighborhood 11
- Table 3: Potential Trip Generation Summary 22
- Table 4: Key Intersection Level of Service - Existing Condition 28
- Table 5: Key Intersection Level of Service - Build Out Condition 29
- Table 6: Study Area New Jersey Transit Bus Routes 50

Appendices

A P P E N D I X A

- Synchro Analysis DataA-1
 - Base ConditionA-1
 - Build Out ConditionA-2

A P P E N D I X B

- Potential Funding SourcesB-1
 - Local SourcesB-1
 - Regional ProgramsB-2
 - State ProgramsB-2

Executive Summary

The City of Camden has experienced several decades of declining population and industry. However, the recent past and the future show promise for the rebirth of the city. There are extensive amounts of developable land throughout the study area, which is bounded by the Delaware and Cooper rivers, Clinton Street, and the Ben Franklin Bridge. Plans and proposals exist for new developments on much of that land. If they are all realized, the city's transportation infrastructure may become taxed. The purpose of this study is to determine the extent that the study area's transportation infrastructure may become taxed and to identify potential mitigation strategies.

An estimate of potential trip generation associated with planned and proposed developments was conducted. The trips were distributed across the city's transportation network. A quantitative analysis of 11 key intersections was completed. Additional qualitative analyses were conducted for several other intersections and access points to the city. In general, the analyses found that the city's transportation infrastructure operates with sufficient levels of available capacity. However, several intersections may begin to perform substandardly as development occurs. Mitigation strategies have been identified to effectively accommodate new vehicular trips. Upgrading and coordinating traffic signals in the study area is a primary recommendation and may provide the biggest benefit.

Other modes of travel were also assessed for this study, including transit, bicycle, and pedestrian. The assessment noted existing conditions and planned improvements. Several recommendations were also presented, including the standardization of pedestrian crossings.

Finally, heavy vehicle traffic in the southern waterfront area was assessed. Recommendations to better separate heavy vehicle traffic from residential areas were explored. The city is moving forward with implementing the recommendations from the 2011 *Feasibility Assessment Report*, which is essentially this study's primary recommendation on this topic.

Purpose and Introduction

Purpose

The purpose of this study is to assess the overall impact on the transportation infrastructure in the study area for planned land developments.

Though the study provides additional information, the primary goal defined the outcome:

- ◆ Provide the City of Camden with a resource to understand and plan for the impacts to the transportation infrastructure caused by the new trips generated by combined land developments.

Mitigation strategies were developed to maintain vehicular mobility and improve the pedestrian and bicycle environments, all while keeping with the principles of smart growth and sustainable development.

Using the results of this study, city officials can direct transportation investments toward projects that can bring the most long-term benefit. In addition, city officials can use this document to look beyond the limits of individual traffic impact studies to gain a better understanding of comprehensive traffic impacts.

As transportation is multimodal, the bicycle and pedestrian environment, impacts from heavy vehicles, and transit accessibility were also analyzed and discussed.

Introduction

The City of Camden is poised for redevelopment. In recent years, several major developments have been constructed and plans exist for significant levels of new development. The planned developments are generally sited along the periphery of the central business district and have numerous people and organizations championing them. Each new development will affect the city's transportation infrastructure in a unique way. This study assesses the overall impact.

Seeing the potential for future transportation challenges, the Camden County Improvement Authority and Camden County Division of Planning, in conjunction with the City of Camden, requested that DVRPC conduct this study. This project was completed as part of DVRPC's fiscal year 2012 Work Program.

This study analyzes key intersections within the study area that will experience the compound effect of traffic generated by the new developments. 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 in the city have the potential to increase pedestrian and bicycle traffic and demand for transit in the city. This study also analyzes the impact of increased demand on each of these modes. Finally, heavy vehicles drive economic activity along Camden's southern waterfront. However, conflicts exist between residential neighborhoods and heavy vehicle traffic. This study analyzes potential mitigation strategies to minimize the impact.

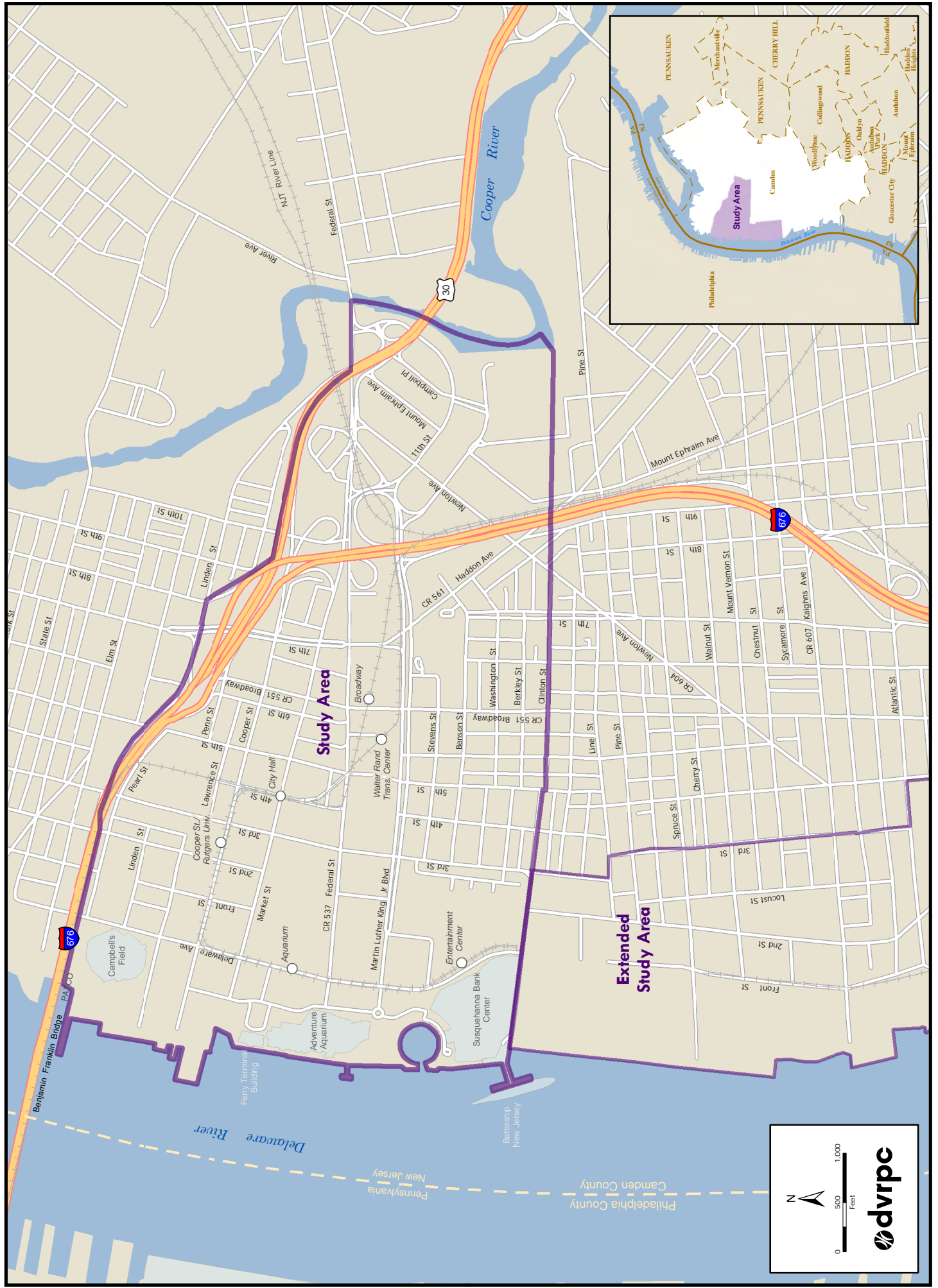
Study Area

This study focuses primarily on what could be considered the City of Camden's commercial core. It extends west to east between the Delaware and Cooper rivers, and north to south between the Ben Franklin Bridge and Clinton Street. Analyses of heavy vehicle traffic and transit service analyses and recommendations extend beyond the primary study area and include the entirety of the Central Waterfront neighborhood. This extended study area consists primarily of industrial land uses, with pockets of residential areas. **Figure 1** highlights both the primary and extended study areas.

The study area is vibrant, housing many of the city's major employers, including: Campbell's Soup Company, Cooper University Hospital, Camden City Hall, Rutgers University – Camden, L3 Communications, and the Camden County legal complex. Many attractions are also located in the study area, including: the Susquehanna Bank Center, Adventure Aquarium, and Campbell's Field. The neighborhoods of Cooper Grant and the Central Business District are included in their entirety. Pyne Point, Gateway, Central Waterfront, and Lanning Square are partially included. The Central Waterfront is included in its entirety in the expanded study area.

The study area also includes a diverse array of transportation options and facilities—I-676 and US 30 intersect in the study area, and the Walter Rand Transportation Center is located in the heart of the study area. Many New Jersey Transit bus routes serve the area and two rail lines provide service for residents and visitors. Travel to or from the study area is convenient from throughout the region.

Figure 1: Study Area



0 500 1,000 Feet

dvrpc

Relation to Previous Work

Many documents and studies were reviewed during the course of this study. Particular attention was focused on the city's neighborhood redevelopment plans and development plans. However, other plans were reviewed to assess their relation to this work. A list of reviewed works follows.

- ◆ Future Camden Master Plan, 2002;
- ◆ Camden Downtown Redevelopment Plan, 2004;
- ◆ Cooper Plaza Redevelopment Plan, 2005;
- ◆ Gateway Redevelopment Plan, 2005;
- ◆ City of Camden Downtown/Riverfront Traffic Circulation and Management Study, 2005;
- ◆ Cooper's Crossing Master Plan, 2008;
- ◆ Land Development Ordinance of the City of Camden, 2009;
- ◆ Camden Greenway Plan, 2010;
- ◆ Cooper Street Traffic Operations Study, and supplements, 2010;
- ◆ Finding Space: Balancing Parking Needs and Urban Vitality, 2011;
- ◆ Camden Waterfront Feasibility Assessment Report, 2011;
- ◆ Retail Study in Camden's University District, 2011; and
- ◆ Cooper Health System — Proposed Cancer Institute Traffic Impact & Parking Study, 2011.

Congestion Management

The Congestion Management Process (CMP) advances the goals of the DVRPC long-range plan and provides strategies to mitigate congestion throughout the region. Regularly updated, it provides information on transportation system performance and identifies strategies to enhance the mobility of people and goods. In keeping with federal regulations and DVRPC policy, it first seeks to address problems through strategies other than building new Single-Occupancy Vehicle (SOV) capacity. Where additions to SOV capacity are appropriate, the CMP includes supplemental strategies to attain the most long-term value from the investment. Projects that add SOV capacity must be consistent with the CMP to be eligible for federal transportation funding.

The CMP identifies a set of congested corridors for the region. Each is divided into subcorridors, where, at a regional planning scale, similar strategies are appropriate.

- ◆ Subcorridor 5A, US 30 in Camden: This subcorridor has strategies tailored to US 30 and the surrounding densely developed area.
 - ◆ Very appropriate strategies: signal improvements, parking operations, economic–development-oriented transportation policies, and modifications to existing transit routes or services.

- ◆ Subcorridor 2B, I-295, NJ Turnpike, I-76/676: This is part of the I-295/NJ Turnpike corridor, but focuses on I-76 and I-676. The strategies are tailored to the highways. This subcorridor includes the Walt Whitman and Benjamin Franklin bridges.
 - ◆ Very appropriate strategies: intelligent transportation systems, integrated corridor management, incident management, access management policies, and modifications to existing transit routes or services.

Demographics

Introduction

Demographic data is a key aspect of any transportation study. Where people live, where they work, and how they make the connection between the two contribute to 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, an assessment of population and employment within the study area was conducted. An assessment of environmental justice was also conducted to ensure that future planning efforts consider the needs of disadvantaged populations.

The primary study area includes all or portions of six Camden neighborhoods: Central Waterfront, Cooper Grant, Central Business District, Lanning Square, Gateway, and Pyne Point. Typical Census subdivisions do not align with the study area's boundaries. For population, an aggregation of block-level data was conducted to determine values. Employment data is simply considered on a citywide basis because smaller subdivisions of Census data are not useful for quantifying the level of employment within the study area's boundaries. The assessment of environmental justice was done at the neighborhood scale.

Only the portion of the Pyne Point neighborhood south of US 30 is relevant to this study. This area represents a tiny fraction of the neighborhood's total land area and none of its population.

Population

It is no secret that the City of Camden has suffered years of population loss due to suburbanization and the decline of the city's manufacturing sector. The city's population peaked in the 1950s, with roughly 125,000 residents. In 2010, the population was around 77,000 residents, a decline of nearly 40 percent from its peak. Left behind were many of the city's most vulnerable residents. The population loss drove down housing costs, which in turn attracted immigrants. The U.S. Census Bureau notes that 14 percent of the city's residents are foreign born, 40 percent speak a language other than English at home, and 47 percent are of Hispanic or Latino origin.

Population within the study area was determined by aggregating Census blocks and Census 2010 data. The results are shown in **Table 1**.

Table 1: Current Study Area Population (2010)

Neighborhood	2010 Population
Central Waterfront	1,509
<i>Primary Study Area</i>	<i>1,192</i>
<i>Extended Study Area</i>	<i>317</i>
Cooper Grant	819
Central Business District	2,275
Lanning Square	1,343
Gateway	819
Study Area	6,765

U.S. Census, 2010

DVRPC, 2012

To note, 1,742 of the central business district's 2,275 residents reside in the Census block housing the Camden County Jail. This equates to 76 percent of the central business district's, and 26 percent of the study area's total population.

Citywide, DVRPC's 2040 population forecast projects a 1.1 percent increase. However, if planned developments (discussed later) are realized, the population would surpass the forecast. Alternatively, portions of the city may experience continued population loss while the study area's population increases. In any event, the forecast calls for stabilization of the city's population.

Employment

There is no means of disaggregating Census data accurately to estimate the portion of the city's employment that falls within the boundaries of the study area. However, the study area includes many of the city's major employers (Campbell's Soup Company, L3 Communications, Cooper University Hospital, and Rutgers University). It is a safe assumption that the vast majority of the city's jobs are found in the study area. DVRPC's estimates and forecasts find citywide employment to be stable, at around 34,000 jobs. This value represents the current estimate and the 2035 forecast.

Environmental Justice

Federal law states that no person or group shall be excluded from participation in, or denied the benefits of, any program or activity utilizing federal funds. Each federal agency is required to identify any disproportionately high and adverse

health or environmental effects from its programs on minority and low-income populations. In turn, Metropolitan Planning Organizations (MPOs), as part of the United States Department of Transportation’s certification requirements, are charged with evaluating their plans and programs for environmental justice sensitivity, including expanding their outreach efforts to low-income, minority, or other disadvantaged population groups.

As the MPO for the Philadelphia metropolitan region, DVRPC’s “Degrees of Disadvantage” process was applied to the study area using data from the 2000 Census. The finding of the process is indicated by study area at the neighborhood scale on **Table 2**. Planning efforts that may result in projects requiring federal funding should reach out to these populations. Reaching out to these populations might involve advertising public participation events at locations such as nursing homes and churches, and with community groups that represent the potentially disadvantaged populations.

Table 2: Disadvantaged Population by Study Area Neighborhood

Neighborhood	Non-Hispanic Minority	Carless Household	Impoverished	Disabled	Female Head of Household	Hispanic	Elderly (>/= 75)	Limited English Proficiency
Central Waterfront	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cooper Grant	Yes	No	Yes	No	Yes	Yes	No	No
Central Business District	Yes	No	Yes	No	Yes	Yes	No	Yes
Lanning Square	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Gateway	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Pyne Point	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes

Yes indicates that the population of this area meets or exceeds the regional average

DVRPC,
2012

Land Use and Development

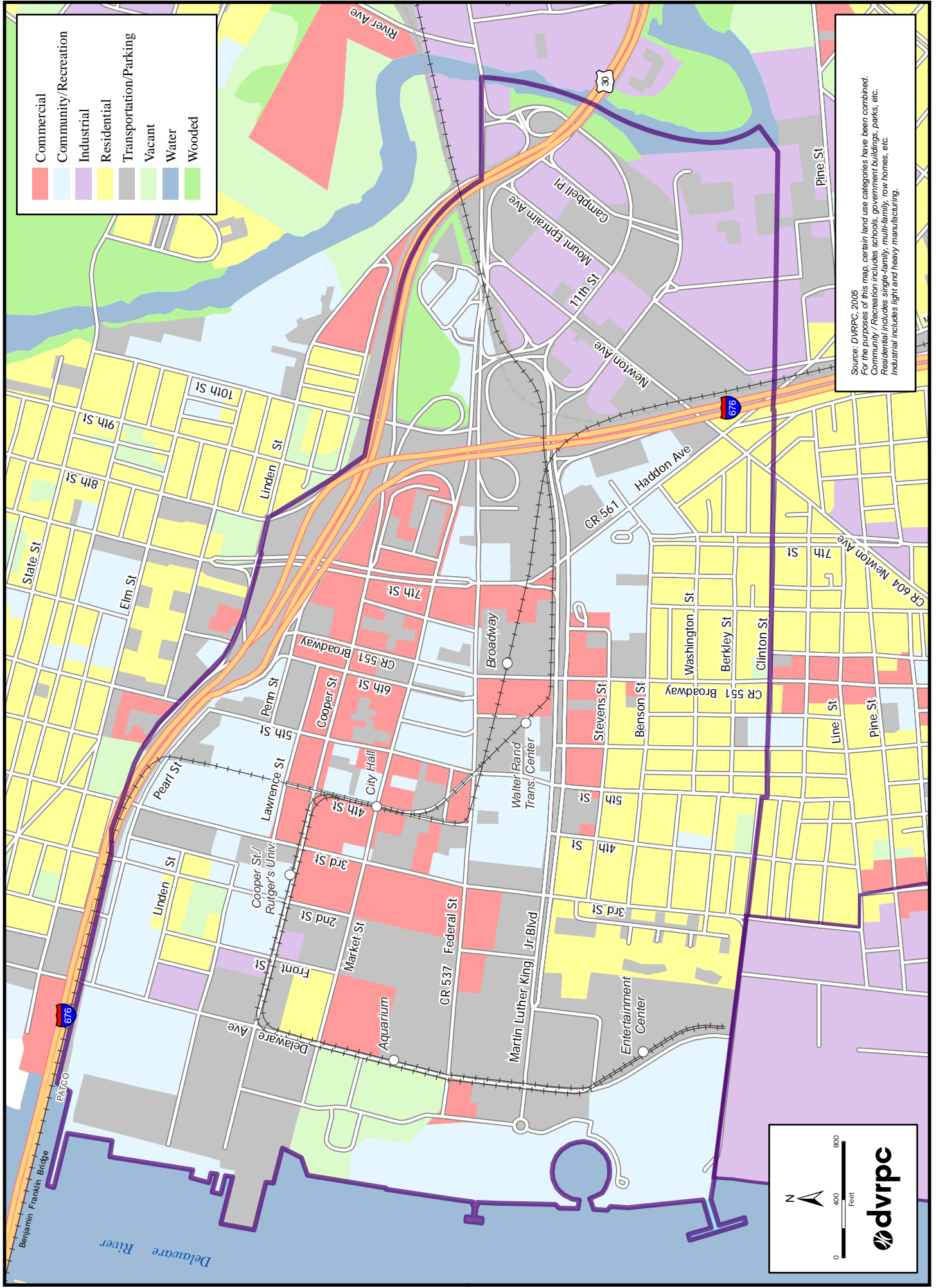
Land Use

Land Use Overview

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 density is responsible for trip generation and its magnitude. The aerial spread of the uses and the transportation facilities connecting or serving the uses is responsible for trip mode (e.g., by highway, transit, walking, etc.).

Existing land uses are shown on **Figure 2**. 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 all neighborhoods.

Figure 2: Land Use (2005)



Vacant and Developable Land

In order to estimate the development potential for the study area, an inventory of developable lands was conducted. Vacant land and land currently in use as surface-grade parking were considered to be developable. While this may not be entirely accurate, it provides a base for estimation. A sizable portion of the developable land may need to be converted into structured parking to satisfy the parking needs of existing and future development. This type of analysis also omits vacant structures and the redevelopment of actively used buildings; for example, the site of the Rowan University Medical School would not have been considered developable for that reason. In general, the largest developable parcels are in the Waterfront and Gateway portions of the study area. A total of 135 developable acres were identified in the study area. The following is a summary of identified developable lands. **Figure 3** highlights the majority of the developable land within the study area.

Waterfront (MW1 Zone)

This Mixed Waterfront zone (MW1) extends between the Ben Franklin Bridge and Clinton Street, and the Delaware River and Delaware Avenue, except south of Martin Luther King Jr. Boulevard, where it extends east to Third Street.

- ◆ 43.8 developable acres;
- ◆ Susquehanna Bank Center parking covers approximately 15 acres that are shared with Rutgers University, Campbell's Field, and the Adventure Aquarium;
- ◆ The stadium area, north of Market Street, contains approximately 20 developable acres; and
- ◆ Approximately 44 percent of the total land area is developable, and is currently under a redevelopment agreement with the Camden Redevelopment Authority (CRA) and the New Jersey Economic Redevelopment Authority (NJEDA).

University (US Zone)

This University and Support zone (US) is bounded by the Ben Franklin Bridge/I-676, Delaware Avenue, and Market Street.

- ◆ 18.8 developable acres;
- ◆ Adjacent to the Victor building are 4.9 developable acres;
- ◆ Small, developable parcels are scattered throughout the zone; and
- ◆ Approximately 27 percent of the total land area is developable.

Gateway (OLI Zone)

The Gateway Office and Light Industrial zone (OLI) is bound by Federal Street, US 30, I-676, and Line Street. Much of the area is occupied by the Campbell's Soup Company.

- ◆ 24.8 developable acres;
- ◆ The area bound by Newton Street, US 30, and 11th Street, and has 12.3 developable acres;
- ◆ Campbell's Soup Company has approximately 4.1 acres of surface-level parking on the north side of its complex; and
- ◆ Approximately 46 percent of the total land area is developable.

Downtown (CC Zone)

The Downtown Center City zone (CC) is bound by Delaware Avenue, I-676, Market Street, and Martin Luther King Jr. Boulevard. The zone also extends south down the Broadway corridor to Clinton Street.

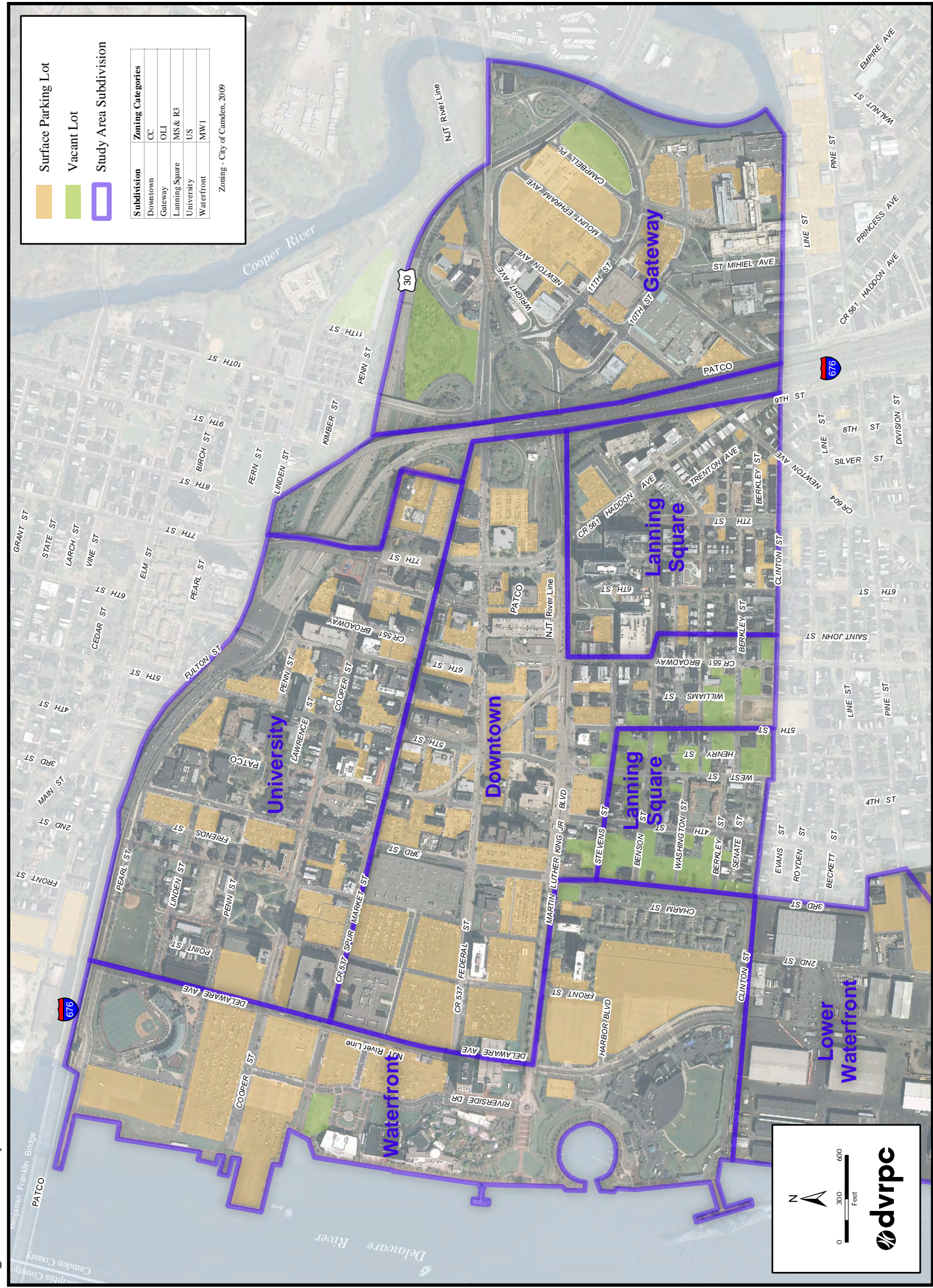
- ◆ Roughly 38.1 developable acres;
- ◆ L3 Communications has approximately 9.4 acres of surface-level parking; and
- ◆ Several large parcels along Federal Street.

Lanning Square (MS & R3 Zones)

This zone is a mix of Medical and Support (MS) and Residential (R3). The MS portion generally surrounds Cooper University Hospital. In general, the zone is bound by Martin Luther King Jr. Boulevard, I-676, Third Street, and Clinton Street. However, the Broadway corridor falls into the Downtown (CC) zone and divides Lanning Square into two areas.

- ◆ 9.5 developable acres;
- ◆ No surface-level parking identified;
- ◆ Developable land comprised of many small (less than 1.5 acre) parcels; and
- ◆ Approximately 41 percent of the total area is developable.

Figure 3: Developable Land



	Surface Parking Lot
	Vacant Lot
	Study Area Subdivision

Subdivision	Zoning Categories
Downtown	CC
Gateway	OLI
Lanning Square	MS & R3
University	US
Waterfront	MW1

Zoning - City of Camden, 2019

0 300 600 Feet

Development

Existing Development Plans

Gaining an understanding of the wide range of planned developments within the study area enables an effective analysis of an overall traffic impact. Planned developments were determined by reviewing neighborhood and development plans and having discussions with various stakeholders. Additionally, by assessing planned developments by neighborhood and zoning district, roadways and intersections potentially impacted could be identified.

Waterfront (MW1 Zone)

Cooper's Ferry Partnership (CFP) is charged with promoting and managing new development in the northern portion of the Central Waterfront neighborhood—north of Clinton Street. There are many recent developments in the area that resulted from the efforts of CFP.

Working with CFP, Steiner and Associates has created a development plan for much of the Waterfront area. Its plan is bound by the Ben Franklin Bridge, Delaware River, Delaware Avenue, and Dr. Martin Luther King Jr. Boulevard. The area currently houses the Adventure Aquarium, Campbell's Field, the Ferry Terminal building, and an abundance of surface-grade parking. The plan calls for the addition of: 28,250 square feet of retail; 312,000 square feet of office space; 1,638 residential units; a 140-room hotel; and 78,000 square feet of flex space. The Ferry Terminal building, which is already constructed, houses 105,000 square feet of office space. The balance of planned office space equals 207,000 square feet.

The planned developments in the Cooper's Crossing portion of the Waterfront may generate approximately 1,227 AM peak-hour and 1,193 PM peak-hour trips. This does not include the unquantifiable *flex* space.

CFP notes the proposal for Two Port Center, a twin to One Port Center, to also be constructed in the Central Waterfront neighborhood. At 175,000 square feet of office space, the building may generate an additional 271 AM peak-hour and 261 PM peak-hour auto trips.

Total potential trip generation for the Waterfront area is 1,498 AM peak-hour and 1,464 PM peak-hour trips.

University (US Zone)

The University zone generally follows the boundaries of the Cooper Grant neighborhood and is largely occupied by Rutgers University – Camden. Boundaries include I-676, Cooper Street, and Delaware Avenue. While there is potential for new residential development, any significant development will be

part of the university. The university's master plan has a horizon year of 2027 and plans for the addition of 900,000 gross square feet, 830 new dormitory beds, and 440 new parking spaces. The student population is planned to grow from an approximate 6,000 current students to 8,500. AM and PM peak-period trip generation for a gain of 2,500 students equals 525 new vehicle trips per peak hour.

Gateway (OLI Zone)

The Gateway area is home to the Campbell's Soup Company. There is potential for significant levels of new development. Much land has been cleared in anticipation of the new development. The primary area of concern is between US 30 and 11th Street, the area that includes the abandoned Sears department store. A conceptual build-out of this area was conducted to assess the impact to the transportation infrastructure. Using the zoning ordinance for guidance, the concept found a potential for 1,260 workers in 350,000 square feet of office space with 1,000 new parking spaces. This parking requirement is more progressive than required by the zoning ordinance. It provides one parking space per 350 square feet of office, or 0.8 spaces per worker. The existing zoning requirement is one space per 300 square feet of office. The Campbell's Soup Company offers roughly 1,200 parking spaces for approximately 1,500 employees and contractors, thus equivalent to 0.8 parking spaces per job. The conceptual design is shown as **Figure 4**. The progressive parking requirements are appropriate due to the abundance of transit and shuttle options in the area. A development of this magnitude has the potential to generate 543 AM peak-hour and 522 PM peak-hour new vehicle trips.

Downtown (CC Zone)

The Downtown area of Camden contains a mix of commercial, government, and institutional land uses. While the area contains little vacant land, there are many surface parking lots. An inventory found roughly 38.1 developable acres.

The primary source for determining planned developments was the *Camden Downtown Redevelopment Plan (2004)*. The plan includes Cooper Grant as part of the downtown, and individual proposals are difficult in determining their exact locations. Additionally, the plan does not distinguish between replacement or the addition of buildings. For those reasons, a best effort was made to determine the potential planned build-out of Downtown Camden. Identified were: 1,140,000 square feet of office, 450 apartment units, 100 hotel rooms, a 40,000 square foot conference center, 65,000 square feet of institutional use, and 60,000 square feet of retail. The addition of these uses may result in an increase of 2,345 AM peak-hour and 2,299 PM peak-hour new vehicle trips.

Figure 4: Conceptual Gateway Development



By virtue of zoning, the South Broadway corridor in Lanning Square is included in the Downtown area. Several developments are proposed or under construction in the area, including the Cooper Medical School of Rowan University, which is scheduled to open in September 2012. The medical school will not add a significant level of new trips due to its parking being located in the Lanning Square area. Another development is the proposed Lanning Square Elementary School. The elementary school students are currently schooled in two nearby facilities. A newly constructed school may generate 307 AM peak-period and 336 PM peak-period new vehicle trips. Finally, the *Lanning Square Redevelopment Plan* (2008) calls for significant (re)development in the area. In particular, 60,000 square feet of commercial space would be introduced in this zone and 10 vacant storefronts would be reoccupied. This has the potential to generate 230 AM peak-hour and 252 PM peak-hour new vehicle trips.

In summary, potential trip generation from planned land developments in the downtown area, including the South Broadway corridor, equals 2,882 AM peak-hour and 2,887 PM peak-hour new vehicle trips.

Lanning Square (MS & R3 Zones)

The portion of Lanning Square that falls into the study area is divided among several zones. The South Broadway corridor, discussed as part of the Downtown area, is in the CC zone. Cooper University Hospital and its surrounding area are in the MS zone. R3 zones are found on each side of the South Broadway corridor and account for the remaining land in the area.

The medical services zone within Lanning Square is stable following a major expansion of the Cooper University Hospital, with the exception of the Cooper Cancer Institute, which is under construction. In addition to the hospital, the zone also houses several associated surrounding businesses, primarily medical services. Several blocks of town/row homes also exist within the zone. Beyond the Cancer Institute, there are no other plans for new or additional development. New vehicle trips determined during the Cancer Institute's traffic impact analysis process have been applied to the traffic analysis for this area.

Two areas within the Lanning Square neighborhood are zoned R3. They are separated by the CC zone's southerly extension along the South Broadway corridor. Existing land use in the R3 zone is residential, with the exception of Cooper Plaza Commons Park and some recreational facilities along Fourth Street between Clinton Street and Washington Street, and limited instances of other land uses, including churches, convenience stores, charities, and others. Combined, these two R3 zones contain approximately 7.5 acres of developable land, or roughly 41 percent of the total land area. Nearly all developable land is found in the western R3 zone, bounded by Third, Fifth, Stevens, and Clinton streets. The *Lanning Square Redevelopment Plan* (2008) calls for a mix of residential and institutional land uses within the neighborhood. Specifically, 480

units of new and redeveloped single-family housing are proposed in the plan. Trip generation associated with the development would be approximately 211 new AM peak-hour trips and 220 new PM peak-hour trips.

Potential Build Out

The realization of all planned development projects within the study area will introduce many new vehicular trips to the city’s transportation network. **Table 3** below summarizes the potential trip generation by area. Potential trip generation was estimated using the *Trip Generation Manual, Seventh Edition* (2003). The *City of Camden Downtown/Riverfront Traffic Circulation and Management Study*, 2005, applied a factor of 0.60 to potential trip generation to account for urban density and the availability of transit in the study area. This factor is applied in this study for the same reasons.

As most development plans are several years old, caution was exercised to avoid double counting projects that may have already come to fruition.

Table 3: Potential Trip Generation Summary

Area/Neighborhood	Potential New Trips		60 Percent Factor	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Waterfront	1,498	1,464	899	878
University	525	525	315	315
Gateway	543	522	326	313
Downtown	2,882	2,887	1,729	1,732
Lanning Square	211	220	127	132
Total	5,659	5,618	3,396	3,371

DVRPC, 2012

Traffic Circulation and Parking

Existing Condition

Highway Network

Numerous limited-access and arterial highways provide connections throughout the city, and to and from regional destinations. A brief description of the study area's major highways follows. The major highways are also shown on **Figure 5**.

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 comprised of between six and eight travel lanes. The Ben Franklin Bridge portion of I-676 is dually designated with US 30. US 30 merges/diverges just east of the toll plaza.

US 30 (Admiral Wilson Boulevard)

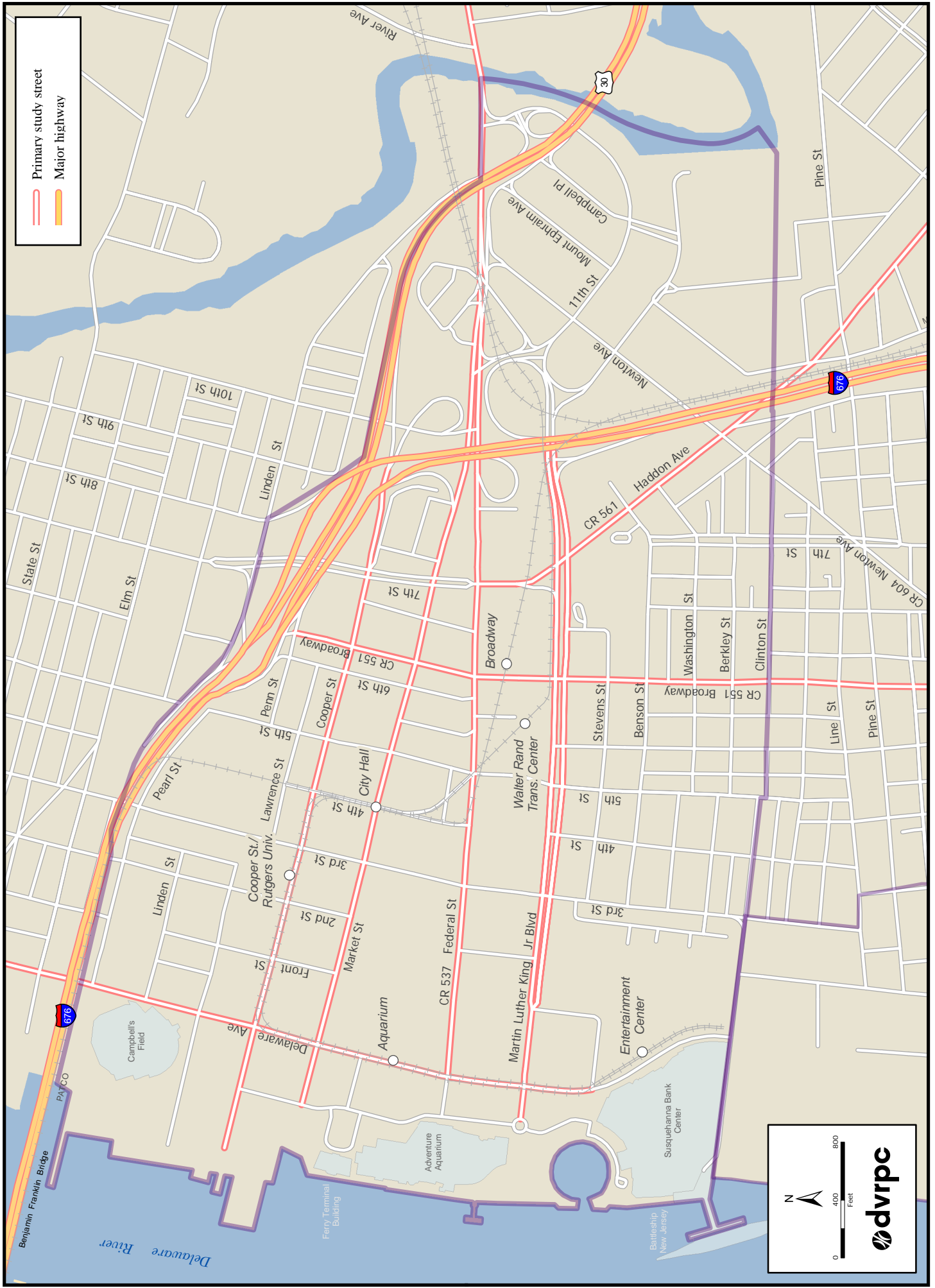
US 30 traverses the northern extent of the study area. On the Ben Franklin Bridge, US 30 is dually designated with I-676. Near the bridge toll plaza, US 30 merges/diverges along an east-west alignment north of Downtown Camden and the Gateway area. Throughout the study area, US 30 is a six- to eight-lane,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

Arterial Highways (East-West)

Cooper Street

Cooper Street is the northernmost of the four east-west downtown Camden thoroughfares. It extends between the Delaware River and the 10th Street/US 30 interchange area. Between Delaware Avenue and Eighth Street, two lanes for each direction are present. East of Eighth Street, only eastbound travel is offered. New Jersey Transit's River Line operates in both directions along Cooper Street between Delaware Avenue and Fourth Street. Signalized intersections include the following (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.

Figure 5: Highway Network



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 portions, and on-street parking is available. New Jersey Transit's 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 that traverses Downtown Camden. The street extends between Riverside Drive and the Marlton neighborhood. East of I-676 Market Street joins with Federal Street and two-way travel is offered. Southbound I-676 has an exit onto Federal Street. Federal Street also indirectly connects with US 30. 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. New Jersey Transit's River Line crosses Federal Street at Delaware Avenue and Fifth Street.

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

Martin Luther King Jr. Boulevard is a two-way boulevard between Riverside Drive and I-676. There is a planted center median along much of its alignment. Martin Luther King Jr. Boulevard is the southernmost of the four east-west arterials serving Downtown Camden. I-676 connects with Martin Luther King Jr. 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 Martin Luther King Jr. Boulevard is a traffic circle at the intersection with Riverside Drive. Delaware Avenue is grade separated as it crosses Martin Luther King Jr. Boulevard.

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 Susquehanna Bank Center 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 New Jersey Transit River Line operates on Delaware Avenue between Hudson Boulevard and Cooper Street, with stations at the aquarium and the Susquehanna Bank Center, 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 Martin Luther King Jr. Boulevard, which is grade separated.

Broadway

Broadway (County Route 551) is a north-south arterial traversing the heart of Downtown Camden. The road extends from Brooklawn Borough, south of Camden, and 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): Clinton Street, Berkley Street, Washington Street, Benson Street, Stevens Street, Martin Luther King Jr. Boulevard, Federal Street, Market Street, and Cooper Street. A stop sign is present at the intersection with Penn Street. There is an at-grade crossing with New Jersey Transit's River Line just north of Martin Luther King Jr. 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 Martin Luther King Jr. Boulevard, and proceeds north to its northern terminus. South of Martin Luther King Jr. Boulevard, there is one travel lane for each direction. North of Martin Luther King Jr. 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 Martin Luther King Jr. Boulevard. Signalized intersections within the study area include (south to north): Newton Avenue, Benson Street, Martin Luther King Jr. Boulevard, Federal Street, Market Street, Cooper Street, and Linden Street.

Recent Roadway Improvements

In 2008, the New Jersey Department of Transportation completed major roadway improvements in the Gateway neighborhood, specifically in the area between the Campbell's Soup complex and US 30. The area is awaiting redevelopment. Major aspects of the improvements include the following:

- ◆ Saint Mihiel Avenue was closed to through traffic and now is only accessible from inside the Campbell's Soup complex.
- ◆ Tenth Street east of Mihiel Avenue has been closed and is only accessible from inside the Campbell's Soup complex.
- ◆ Eleventh Street between the US 30 overpass and I-676 underpass has been converted from one way westbound to two way. Traffic signals have been

installed at the 11th Street intersections with Campbell's Place, Mount Ephraim Avenue, and Newton Avenue.

- ◆ Channelization on Mount Ephraim Avenue at the 'T' intersection with 11th Street has been removed.
- ◆ Newton Avenue was converted from one way (south) to two way. A signal was installed at the intersection with 10th Street.
- ◆ Tenth Street between Mount Ephraim Avenue and Newton Avenue was converted from one way to two way.
- ◆ The north end of Newton Avenue was reconfigured from a 'T' intersection to a 'T' intersection with channelized lanes.
- ◆ Campbell's Place has been reconfigured, including the removal of connecting ramps and the addition of a four-way intersection at 11th Street. The southern leg to the intersection is a gated entry to the Campbell's Soup complex.

Vehicular Mobility and Access Analysis

Vehicular Mobility

Vehicular mobility was quantitatively assessed at 11 key intersections within the study area. The selected intersections are located in areas that may experience increased traffic caused by multiple developments, or where important connections to the regional highway system are present. To assess each intersection, a manual turning-movement count was conducted for both the AM and PM peak periods. Signal timing plans were obtained from a variety of sources, or when not available, they were manually quantified, except for the Seventh Street and Linden Street intersection, where manual quantification was not possible. Each intersection underwent an analysis using Synchro 7 traffic signal engineering software. Following the quantification of the existing condition, an exercise was conducted to estimate the distribution on new vehicle trips across the city's roadway network, thus assigning them to the selected intersections (see Chapter 3, Table 3 for potential new vehicular trips). The Synchro 7 analysis was repeated with the increased vehicular volumes. Where necessary, improvements needed to accommodate the increased traffic were developed.

See **Table 4** for the base year level of service for each intersection. **Appendix A** contains more detailed information.

Table 4: Key Intersection Level of Service - Existing Condition

INTERSECTION	AM		PM	
	Delay	LOS	Delay	LOS
Market Street and Broadway	16	B	15	B
Market Street and Haddon Avenue	36	D	23	C
Federal Street and Broadway	19	B	22	C
Federal Street and Haddon Avenue	16	B	22	C
MLK Boulevard and 3 rd Street	10	A	11	B
MLK Boulevard and 5 th Street	13	B	15	B
MLK Boulevard and Broadway	20	C	20	B
MLK Boulevard and Haddon Avenue	65	E	67	E
Haddon Avenue and Newton Street	32	C	26	C
7 th Street and Linden Street*	37	C	15	B
Market & Federal Streets and 10 th Street	38	D	17	B

*Signal timing unavailable - Synchro 7 optimized cycle length and phases used in the analysis

Delay = seconds

DVRPC, 2012

The *Camden Downtown/Riverfront Traffic Circulation and Management Study* (2005) conducted a similar analysis for eight of the same intersections using traffic data from 2003. When comparing 2011 to 2003, the Market Street and Haddon Avenue intersection degraded one level of service in both peak hours, and the Federal Street and Haddon Avenue intersection degraded one level of service for the PM peak hour.

Synchro 7 allows for an easy optimization of signal timing. All signals were optimized for cycle and split lengths, without concern for coordination. This was to determine essentially what is possible given the existing traffic volumes and geometric configurations of the intersections. Two intersections improved one level of service grade in the AM peak hour: Martin Luther King Jr. Boulevard and Haddon Avenue, and Market and Federal streets and 10th Street. The first is a complex heavily traveled intersection, with preemption for the River Line, so in practice improvement may be difficult.

In a summary of base-year conditions, there is remaining capacity at all intersections without serious negative consequences, save for the Martin Luther King Jr. Boulevard and Haddon Avenue intersection. Additionally, a review of the traffic counts conducted for this study finds fairly concentrated peak periods— heavy traffic volumes for a short amount of time. This would allow for traffic volumes to increase by widening the peak periods.

Future Vehicular Traffic

An exercise was conducted to distribute the estimated vehicular trips generated by planned development across the city’s transportation network. No other growth factors were applied, as this process replaced more generalized growth factors. Trip generation was estimated for five zones in the study area. The exercise distributed those trips based on various factors, including existing trip

patterns, magnitude and location of individual planned developments, and the type of development. For instance, residential developments will likely have opposite trip patterns than office developments. The purpose of this effort was to estimate the impact of combined development on the identified intersections. The resulting Synchro 7 analysis results are shown in **Table 5** (see **Appendix A** for more detailed information).

Table 5: Key Intersection Level of Service - Build Out Condition

INTERSECTION	AM		PM	
	Delay	LOS	Delay	LOS
Market Street and Broadway	17	B	15	B
Market Street and Haddon Avenue	35	C	25	C
Federal Street and Broadway	21	C	22	C
Federal Street and Haddon Avenue	16	B	19	B
MLK Boulevard and 3 rd Street	10	B	9	A
MLK Boulevard and 5 th Street	16	B	22	C
MLK Boulevard and Broadway	21	C	17	B
MLK Boulevard and Haddon Avenue	63	E	66	E
Haddon Avenue and Newton Street	28	C	26	C
7 th Street and Linden Street	69	E	28	C
Market & Federal Streets and 10 th Street	25	C	16	B

Delay = seconds DVRPC, 2012

Three intersections in the AM peak hour, and two in the PM peak hour, degraded one level of service in the build-out scenario. Several performed better, which may be attributable to a better balance of traffic on the intersections and optimized traffic signals.

Vehicular Mobility Recommendations

Eleven intersections were quantitatively analyzed for this study. In addition to the recommendations emanating from those analyses, several recommendations are based on qualitative analysis, and several have been brought forward from previous studies. For instance, Cooper Street was assessed in 2010 by Stantec Consulting for the City of Camden. The recommendations are still found to be relevant and new analyses were not conducted.

Study Area Vehicular Mobility Recommendations

Upgrade Traffic Signals

Foremost, the city should begin efforts to modernize and coordinate traffic signals throughout the study area. Few traffic signals have any type of vehicular actuation. Most operate on fixed times, without changes to accommodate differing travel patterns throughout the day or week. Several traffic signals have been upgraded—those associated with the River Line, Martin Luther King Jr. Boulevard and Haddon Avenue intersection, and Martin Luther King Jr. Boulevard and 10th Street intersection—but they lack coordination. Also troubling in regards to traffic signals is the lack of records. The study team attempted to

obtain signal timing plans for the listed intersections from the city, NJDOT, Camden County, Cooper University Hospital, and NJ Transit. Despite requests from these parties, not all signal plans could be obtained. The city should make efforts to file all current signal timing plans regardless of who is responsible for each. This will assist the efforts of traffic impact studies associated with new development, and is good practice.

Maintain a State of Good Repair

Roadway conditions in the City of Camden range from excellent to poor. Fortunately, within the study area, most roads are in a fair or better state of repair. Efforts should be made to maintain the public's investment and provide a safe driving environment. The public works hotline should be better brought to the public's attention or converted to a 311-type system. A means to report and track roadway problems on the city's website may also be appropriate.

This recommendation also includes periodic roadway restriping.

Recommendations From Previous Studies

Implement Recommendations from the City of Camden Downtown/Riverfront Traffic Circulation and Management Study

The study was completed in 2005 by McCormick Taylor. Many of the recommendations have yet to be implemented and are still relevant. In particular, one recommendation should be implemented when the opportunity arises:

- ◆ Remove the median barrier from Cooper Street at Sixth Street; this median barrier prevents left turns from all approaches at the intersection. While allowing left turns may have a negative localized congestion impact, it will remove vehicles from other intersections that are traveling circuitous routes to complete the movement.

Implement Recommendations from the Cooper Street Traffic Operations Study

The study assessed traffic needs along Cooper Street for 2012 and 2032. The study's limits were Fifth Street and Haddon Avenue/Seventh Street.

- ◆ Update traffic signals along Cooper Street (also a study-area-wide recommendation);
- ◆ Remove the median barrier from Cooper Street at 6th Street and signalize the new intersection (also a recommendation listed above); and
- ◆ Extend the Cooper Street center median between 7th Street and 7th Street/Haddon Avenue, and remove the unsignalized pedestrian crossing. Install the associated signage to redirect pedestrians to a signalized intersection.

Intersection-Specific Recommendations

Martin Luther King Jr. Boulevard and Haddon Avenue

This is the most congested intersection analyzed. Unfortunately for this intersection, major physical improvements are nearly impossible due to constraining factors, such as the River Line and abutting land uses. As congestion worsens at this intersection, traffic may find other routes more attractive, which could create a 'bottom' for future levels of congestion. To provide the most efficient intersection possible, periodic reassessments of signal timing should be conducted. This signal should be the master to which all other traffic signals are coordinated.

Haddon Avenue and Newton Street

This is another intersection for which major physical improvements are nearly impossible. However, the existing level of service and build-out condition level of service are satisfactory. Space within the right-of-way would allow for Haddon Avenue left-turn lanes, if warranted by future growth.

Seventh Street and Linden Street

This is a high priority intersection. It serves access to the city from northbound I-676 and westbound US 30 and provides access to the Ben Franklin Bridge. Northbound and westbound left turns greatly outnumber the other movements on the respective approaches. Several improvements may extend the serviceability of the intersection: restripe and sign the northbound approach to dual left-turn lanes and a single through lane; and restripe and sign the westbound approach as dual left-turn lanes and dual through lanes and add a short right-turn lane (about 100 feet). All will provide operational improvements if accompanied by signal optimization.

Market and Federal Streets and 10th Street

The primary issue with this intersection is the southbound left turn. The movement connects people coming from North Camden and beyond with the Gateway area and US 30 eastbound. There are several means to improve the southbound left turn. In the short term, striping and signage could be installed to allow left turns from both approach lanes. This would slightly degrade the southbound right turn, but provide an improvement for the approach. In the longer term, measures could be taken to improve the right turns, such as minor widening to allow for a short right-turn lane. Permitting southbound left turns from both lanes improves the approach level of service from D to C during both peak hours.

11th Street and Newton Avenue

This intersection was not quantitatively assessed. During talks with Campbell's Soup Company, this intersection, specifically the westbound 11th Street left turn,

was noted as having heavy volumes and insufficient queuing space. Adding additional left-turn queuing space for this movement is problematic. The eastbound 11th Street to Mount Ephraim Avenue left-turn lane could be shortened or the movement prohibited. When the Gateway area is redeveloped, an opportunity to improve this intersection may be present.

Access Analysis

Access into and out of the city by motor vehicle is important for the city's economic vitality. Workers, residents, and goods must all be able to efficiently access the city and connect to regional highways. With a limited number of river crossings, two limited-access highways and several arterials all converge in Camden, where the Ben Franklin Bridge provides connections to and from Philadelphia and the west. Within the city, there are eight access points providing one or more connections to or from US 30 and/or I-676. There are also four arterials that provide access to/from nearby areas.

◆ Highway Accesses

- ◆ Linden Street, via Seventh and 10th streets, access to the Ben Franklin Bridge;
- ◆ Linden Street from westbound US 30;
- ◆ Cooper Street access to eastbound US 30;
- ◆ Market and Federal Street access from both directions of I-676, and access to southbound I-676;
- ◆ Martin Luther King Jr. Boulevard to southbound and from northbound I-676;
- ◆ Eleventh Street to and from westbound US 30;
- ◆ Penn Street to southbound I-676; and
- ◆ Sixth Street and Broadway from southbound I-676 (Ben Franklin Bridge).

◆ Arterial Accesses

- ◆ Haddon Avenue to/from the southeast;
- ◆ Mount Ephraim Avenue to/from the southeast;
- ◆ Broadway to/from the south;
- ◆ Federal Street to/from the east; and
- ◆ River Avenue to/from the north (via Federal Street).

Access Recommendations

Improving access into and out of the city is appropriate at several locations. The following improvements are recommended (**Figure 6** highlights the first three recommendations):

- ◆ US 30 westbound off ramp to Linden Street – This ramp should be reconfigured to begin west of the overhead railroad bridge. The reconfiguration would separate the 11th Street to US 30 westbound on ramp from the Linden Street off ramp. Currently, the US 30 on ramp and

the Linden Street off ramp share a 160-foot acceleration/deceleration lane, thereby creating a safety concern.

- ◆ River Road and Federal Street intersection – While this may appear to be an intersection serving local traffic, it affects access due to the congestion and spill back that it causes. In the short term, updated signal timing is appropriate to add time to clear eastbound Federal Street traffic that is turning left onto River Road. Federal Street has a wide cross-section, except where it crosses the Cooper River. The bridge is constricted to one travel lane in each direction. The River Road intersection is immediately east of the bridge, and space to queue left-turning vehicles does not exist. Vehicles waiting for a gap to turn left onto River Road cause congestion that spills back along Federal Street and 11th Street, spilling all the way back to the Campbell's Soup Company during peak periods. The long-term mitigation strategy would require the realignment of River Road to intersect Federal Street 175 feet to the west—opposite 15th Street. This would make additional left-turning vehicle queuing space available.
- ◆ Memorial Drive/US 30 eastbound ramps – The redevelopment of the Gateway area provides an excellent opportunity to address a safety concern associated with Memorial Drive and the US 30 eastbound ramps, particularly the off ramp. Currently, exiting traffic approaches Memorial Drive on a parallel course. Memorial Drive is stop controlled, but the US 30 ramp is not. Consideration should be given to realign Memorial Drive to the south to allow the US 30 off ramp to intersect Memorial Drive at 90 degrees and align opposite Mount Ephraim Drive.
- ◆ Promote Elm Street (via Seventh Street) and Pearl Street as a means to travel to and from the Waterfront area and I-676; improvements may become necessary when the Waterfront area becomes heavily developed, such as wayfinding signage, resurfacing Elm Street, and signaling the Delaware Avenue and Third Street intersections with Pearl Street.

Figure 6: Conceptual Access Improvements



Parking

Parking in downtown Camden has often been characterized by a confusing array of options and a veritable sea of surface parking lots. Camden has plenty of existing parking; however, safety concerns have made pedestrians reluctant to walk more than a few blocks. As a result, much of the supply is underutilized, while some is at or above capacity.

In the 2011 DVRPC study, *Finding Space: Balancing Parking Needs and Urban Vitality in the City of Camden (11030)*, DVRPC conducted a thorough analysis of existing parking, including surface lots, on-street parking, and structured parking facilities.

DVRPC performed a spatial analysis to identify the location of parking demand generators relative to available parking supply to identify areas of parking surplus and deficiency. In addition, parking requirements and policies were examined, parking management practices studied, and the built environment reviewed. Preferred sites for future parking facilities were identified at locations where they will have the greatest positive impact on the existing environment, while supporting future development. The study also provides recommendations to alleviate some of the pressure to provide parking and to utilize the existing stock more efficiently.

Recommendations

- ◆ Future changes to Camden's parking policies or physical infrastructure should support activity generation. Progressive parking policy and mixed-use development that supports smart growth can serve this purpose in Camden.

Conclusion

The vehicular transportation network in the study area has available capacity. While certain improvements can be made to modernize the network or alleviate specific location problems, the network can generally handle a significant amount of increased volume. Should the city work with its partners to implement the recommendations of this study, satisfactory levels of vehicular mobility can be assured into the future.

Pedestrian and Bicycle Mobility

Pedestrian Mobility

As might be expected in an urban area, the downtown area of Camden and the study area have a complete pedestrian network. Sidewalks are present along all streets and crossing amenities are present at most intersections. Portions of the downtown area 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.

In the Gateway area, the recent roadway improvements described earlier included new sidewalks and pedestrian crossings. However, an absence of pedestrian destinations in the area currently limits pedestrian activity. Pedestrian connections between the Gateway area and Downtown Camden, along Martin Luther King Jr. Boulevard are possible, but undesirable due to the distance and the unattractiveness of the pedestrian corridor.

Major pedestrian generators in the study area include the following.

- ◆ Rutgers University – Camden;
- ◆ Cooper University Hospital;
- ◆ Walter Rand Transportation Center;
- ◆ Camden County College; and
- ◆ Susquehanna Bank Center (event driven).

New development in the study area has potential to increase the number of pedestrians using the existing amenities. This study assumes 40 percent of new trips will be by means other than private motor vehicle. Increased transit usage also places demand on the pedestrian amenities, as transit users must be pedestrians on one or both ends of their trips.

Pedestrian Safety

An assessment of crashes resulting in the injury of a pedestrian was conducted. The assessment considered the years 2007 through 2010. A total of 44 individual incidents were recorded, averaging 11 per year, or roughly one per month. That vast majority were coded to intersections and during daylight hours. Of the total, 10 occurred along Broadway, with the Broadway intersections with Martin Luther King Jr. Boulevard and Federal Street being the worst, with three crashes each. These two intersections are adjacent to the Walter Rand Transportation Center—a significant pedestrian generator.

During a field visit in February 2012, pedestrian activity at the intersection of Broadway and Martin Luther King Jr. Boulevard was observed. Crossing Martin Luther King Jr. Boulevard requires traversing six travel lanes and a center median. Several uniformed police officers were deployed to the intersection to assist the safe crossing by pedestrians. Pedestrian countdown signals are located at each corner to inform pedestrians of the time remaining in the crossing phase. Despite the presence of police officers and the pedestrian countdown signals, many pedestrians were observed crossing illegally. A planted center median inhibits the ability of both pedestrians and motor vehicle drivers to see each other. However, the planted center median does curtail midblock pedestrian crossing.

Pedestrian safety is certainly a concern in the study area and improvements should be safety oriented.

Improving the Pedestrian Environment

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. Following are several recommended improvements for the pedestrian environment:

Crosswalks

The city should adopt a uniform crosswalk style. The continental style provides the most visible crosswalk. The city should implement a periodic restriping work plan.

Pedestrian Signage

Pedestrian control signage should be available in both English and Spanish. Nearly 40 percent of Camden residents are of Hispanic origin.

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 Federal Highway Administration's 2009 *Manual on Uniform Traffic Control Devices* (MUTCD).

Pedestrian Corridor Improvements

Improve the pedestrian environment along the following corridors:

- ◆ Martin Luther King Jr. Boulevard between Broadway and the Gateway area – This corridor has the potential to provide an important connection between transit and employment. It currently has a sidewalk along the northern side. There is no buffer between vehicular traffic and the sidewalk. A long-term potential improvement would be to remove one eastbound travel lane from Martin Luther King Jr. Boulevard under the overpass. The added space would allow for improved pedestrian amenities, such as a wider sidewalk, bicycle lane, and buffer area. However, the distance between the Gateway area and the Walter Rand Transportation Center is on the edge of convenient walking distance. Major improvements are low priority.
- ◆ Martin Luther King Jr. Boulevard between Broadway and the waterfront – This corridor experiences heavy pedestrian and vehicular volumes before and after events at the Susquehanna Bank Center. Space exists along much of the corridor to widen the sidewalks.
- ◆ Improve the pedestrian environment along north-south Broadway and Sixth Street corridors connecting Cooper University Hospital with Rutgers University; this recommendation originated in the Urban Land Institute's *Retail Study in Camden's University District* report, 2011.

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. This may be accomplished through municipal code requirements, though enforcement would be necessary.

Pedestrian Environment Conclusion

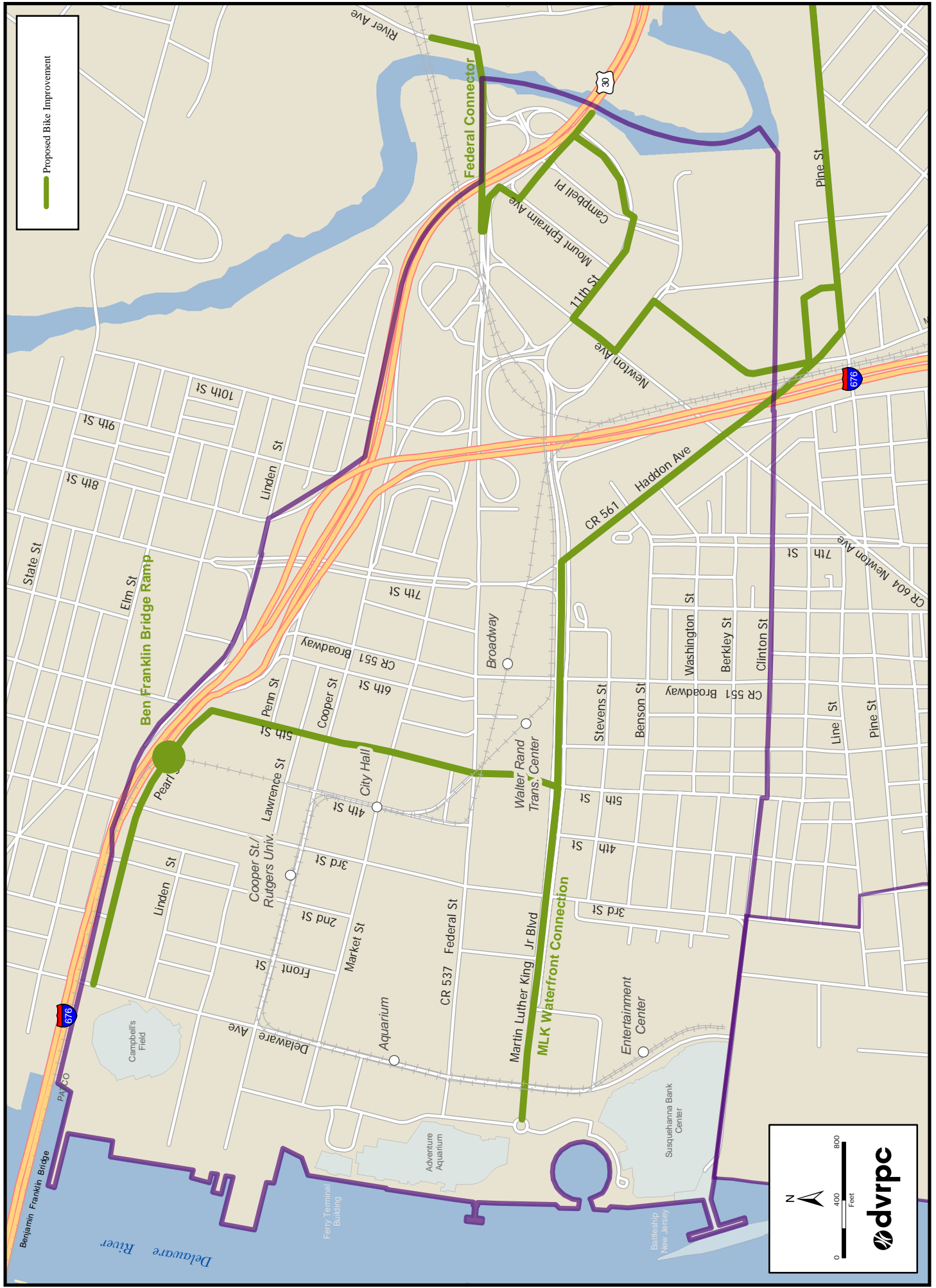
The city benefits from a comprehensive pedestrian network. Most recommended improvements are maintenance related. Widening sidewalks and upgrading pedestrian man hands (crossing signals) can be done over time, as new development is realized or the existing infrastructure reaches the end of its useful life.

Bicycle Mobility

The first signed and striped bike lane in the city was installed along Martin Luther King Jr. Boulevard during the course of this study. A trail extending east of the study area along the Cooper River begins just east of the Gateway area.

There are several planned improvements to the bicycle environment in the study area (See **Figure 7**):

Figure 7: Planned Bicycle Environment Improvements



- ◆ The Delaware River Port Authority has plans to construct new, bike-friendly ramps to the Ben Franklin Bridge in 2012, though the project was recently deferred and its current status is unknown.
- ◆ The Martin Luther King Waterfront Connection, a TIGER-funded project, will improve pedestrian and bicycle facilities on Martin Luther King Jr. Boulevard between Wiggins Park and Fifth Street. On-street bike lanes will be installed. This project was partially implemented during the course of this study.
- ◆ Pearl Street, south of and parallel to the Ben Franklin Bridge, will have bicycle and pedestrian improvements completed between the bridge's pedestrian walkway termination and the river. This is also a TIGER-funded project. Bicycle lanes will be installed on Pearl Street.
- ◆ The Greenway Trail Plan proposes numerous trail links in and around the study area. The Martin Luther King Jr. Boulevard and Pearl Street improvements are parts of this larger plan. The plan includes a mix of dedicated trail segments with street connections.
- ◆ In 2012 the City of Camden is implementing a pedestrian- and cyclist-oriented wayfinding signage system in downtown Camden. These signs will direct pedestrians and cyclists from key transportation hubs to important destinations in Downtown Camden.
- ◆ Construction is expected to begin in 2012 to extend Cooper Street westward to the Delaware River. The extension will include the installation of bicycle lanes.

Improving the Bicycle Environment

Improvements to the bicycle environment are currently planned. These projects will vastly improve upon the existing environment. Several other improvements could assist in promoting bicycle commuting, such as:

- ◆ Bicycle storage – Storage by means of bike racks or lockers would be beneficial to the city. Bicycle storage lockers would be appropriate at locations where long-term storage is necessary, such as the Walter Rand Transportation Center. Bicycle racks, or other means of securing a bicycle, should be located in areas where long-term storage is not necessary, such as along the south Broadway corridor or other commercial centers. Developers should be encouraged to include bicycle storage amenities at new developments.
- ◆ Dedicated bicycle routes – At least one east-west and one north-south road should have striped bicycle lanes. Bicycle lanes along Martin Luther King Jr. Boulevard are currently being implemented. Third Street is a good candidate for north-south bike lanes due to the road continuing under the Ben Franklin Bridge and its wide cross-section. Should portions of a road be too narrow to accommodate both vehicle and bicycle lanes, shared lane markings

(sharrows) are an appropriate treatment. A sharrow lets drivers know that they are traveling in a shared lane.

- ◆ Signage – Share-the-road signs are an effective method of reinforcing a bicyclist's right to travel on roads and should be placed throughout the study area.

With minimal bicycle amenities existing in the study area, any improvement would be beneficial. Several planned projects will improve the study area's bicycle environment.

The Camden Greenway

The Camden Greenway is a planned 12-mile multiuse trail system in the City of Camden, New Jersey. It mainly runs along the Cooper River and the Delaware River back channel. There are currently about 3.5 miles of trails completed and 1.5 miles of trails underway. Ultimately, the trail will connect neighborhoods, municipalities, and even states (via the Ben Franklin Bridge). Many Camden residents use the existing trails as a primary form of transportation, and a number of anchor institutions have begun to use adjacent greenspace as primary recreation spaces. The proven benefits of greenspace and multiuse trails, such as affordable transportation, clean air, water filtration, and more economic activity, will collectively help to improve the quality of life for Camden residents.

There is a great deal of momentum around the Camden Greenway today. From a regional perspective, it is an integral part of the urban core of the Circuit, the Greater Philadelphia regional trail network, which consists of 250 completed miles and 750 planned miles of trails. On the Camden Greenway, numerous constituents are playing diverse roles, including everything from acquisition to programming. The New Jersey Conservation Foundation is working diligently to close gaps in the trails from the Pub to North Camden. Cooper's Ferry Partnership is redeveloping Pyne Point Park to incorporate the Greenway. The Kroc Center and Petty's Island Park are two other developing regional destinations. Meanwhile, Camden County and Rails to Trails Conservancy has been creating meaningful programming with the new bike-share program, and Urban Trekkers has been making great use of the water trails along the Greenway.

The area around Campbell's Soup is a particularly important node in the Camden Greenway. At this junction, someone traveling the trail will likely choose one of three primary destinations: across Downtown toward the Ben Franklin Bridge, south toward Cooper River Park, or north toward the Cramer Hill and North Camden waterfronts. For this reason, it is particularly important that the area near Campbell's is designed to minimize barriers and obstacles so that travelers may safely choose their destination of choice.

Source: New Jersey Conservation Foundation, 2012

Complete Streets

New Jersey Department of Transportation (NJDOT) Policy No. 703, Complete Streets Policy, now guides the inclusion of pedestrian and bicycle elements in NJDOT projects. The policy defines a complete street as a “means to provide safe access for all users by designing and operating a comprehensive, integrated, connected multi-modal network of transportation options.” Complete Streets elements, such as pedestrian and bicycle amenities, as appropriate, will be included in NJDOT projects, with limited exceptions.

The NJDOT policy applies to state-owned roads. In order to encourage Complete Streets at the municipal level, NJDOT awards Local Aid Program application bonus points to municipalities that have adopted their own Complete Streets policy. Many New Jersey municipalities have already adopted their own policies, and it would be beneficial for the City of Camden to do the same.

Pedestrian and Bicycle Mobility Conclusion

Often overlooked, pedestrians and bicyclists contribute to urban vitality and reduced vehicular congestion. The study area benefits from a complete pedestrian network, though maintenance and safety issues exist. New development in the city will allow for improvements to be made and for greater usage. Planned bicycle environment improvements will benefit users and the city. Pedestrian and bicycle environment improvements may also contribute to increased transit usage and a more vibrant city.

The State of New Jersey recently adopted a Complete Streets Policy. Applying to state roads, all future NJDOT projects will incorporate amenities for all users. A city Complete Streets Policy would assist in improving the pedestrian and bicycle environments across the entire study area and beyond.

Goods Movement

Background

Many industrial and port-related land uses are present along Camden's waterfront, many of which are generators of truck trips. These businesses are vital to the economy of the city. Residential neighborhoods are present between these facilities and I-676. The conflict between heavy vehicle traffic is often of concern to residents regarding safety, noise, and vibration.

The Joseph A Balzano Marine Terminal is part of a Major Freight Center, which contains historic industrial areas along the waterfronts of Camden. It attracts ships carrying products from all over the world. The eastern edge of the center is directly adjacent to urban residential areas, while the western edge is the Delaware River. The center also has two heavy manufacturing sites, both of which receive ships carrying bulk materials: Blueknight Energy Partners, which imports a byproduct of the process of refining crude petroleum in order to make liquid asphalt, and Georgia Pacific, which manufactures an array of gypsum products, such as drywall and industrial plaster. In the surrounding light manufacturing areas, there are a series of facilities that manufacture, store, and distribute an array of goods and products, including foodstuffs and scrap metal. Camden Iron and Metal purchases, processes, and sells more than a million tons of scrap iron and nonferrous materials to consumers worldwide each year. With the consolidation of its operation through relocation of the Philadelphia plant to the Camden site, 175 jobs will be moving to Camden. This is therefore an important economic activity in the City of Camden.

Interchanges #3, #4, and #5A of I-676 provide highway access to the study area via connector roadways. Officially designated National Highway System (NHS) Connector roadways exist for connecting Joseph A Balzano Marine Terminal to the NHS system. These roadways include: Martin Luther King Boulevard, Third Street, Clinton Street, Second Street, Ferry Avenue, and Atlantic Avenue.

The Bulson Street Running Track and a network of terminal lead tracks provide direct rail access to the freight center. The Vineland Secondary leads into the River Line, which then feeds into the Delair Bridge, which connects into the North American rail network.

Truck Routes

The primary points of entry for trucks entering the City of Camden are from US 30 and I-676. While there is a significant amount of trucks making local delivery, the major destinations are at the gateway area in the east and the southern waterfront area to the west.

I-676 and US 30 are both NHS routes that provide the most direct ingress to, and egress from, the study area for most motorists. However, the interchanges for both highways are atypical due to their lack of ramps serving all potential movements, thus contributing to motorist confusion and excessive vehicle circulation. An example of this occurs at I-676 East exits 5A and 5B, which provide access to westbound Federal Street and eastbound Market Street, respectively. Access to I-676 East is only available from Martin Luther King Jr. Boulevard, albeit from both directions of travel. Direct access to I-676 West is not possible from this area. Similarly, access to US 30 East is provided at Cooper Street and Campbell Place, while access to US 30 West is only available at 11th Street.

Despite being situated at incomplete interchanges, the ramps for I-676 and US 30 carry the most volume of any of the facilities that provide access to the study area. I-676 serves vehicles traveling from points west and south of the study area, including Philadelphia and southern New Jersey, respectively.

The designated truck routes to the study area include Morgan Boulevard, I-676, Atlantic Avenue, and Broadway. Trucks sometimes use neighborhood streets, whether intentionally or inadvertently, leading to conflict with the residents. In response to neighborhood complaints, a Feasibility Assessment Report was conducted by McCormick Taylor for NJDOT in 2011 to analyze the extent of the truck problem and develop a truck management plan to divert heavy truck traffic away from the residential areas of the Waterfront South area, particularly in the vicinity of Ferry Avenue south of Atlantic Avenue. This was documented in the 2011 report, *Camden Waterfront South Truck Traffic Management, Streetscape & Safety Enhancement Project*. Several truck rerouting alternatives were developed. Most include the use of traffic calming and restrictive measures for trucks along the road network and the posting of better truck route signage, installing traffic-calming measures, better lighting, and streetscaping, as well as an extensive education program for motorists and residents. While the area of concern is outside the limits of the DVRPC study, recommendations to regulate truck traffic will impact truck movement throughout a greater part of the city.

Recommendations

- ◆ Modify truck routes to avoid land use conflicts;
- ◆ Revise signage plans to better identify truck routes from interstate to destination; and
- ◆ Implement the measures identified in the 2011 report, *Camden Waterfront South Truck Traffic Management, Streetscape & Safety Enhancement Project*.

Public Transportation Accessibility

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

Scheduled public transit service to, from, and within the City of Camden is primarily provided by New Jersey Transit and the Port Authority Transit Corporation (PATCO). There are several modes of public transportation within the city, including: light rail, urban heavy rail, bus, and ferry. **Figure 8** illustrates the spatial distribution of regularly scheduled transit services serving the study area.

Existing Condition

Light Rail

Light rail service is offered by the New Jersey 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 20-station alignment, four 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 am and 10 pm, with 15-minute peak and 30-minute off-peak headways. Within the study area, the River Line operates parallel to Martin Luther King Jr. 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 New Jersey 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, the Walter Rand Transportation Center (Broadway Station) 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 five 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.

Bus

Bus service in the City of Camden is primarily provided by New Jersey Transit (NJT). Most NJT bus routes serving the study area terminate at the Walter Rand Transportation Center. The table below provides an overview of the NJT bus routes and schedules within the study area.

Table 6: 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	Medium	No
318	Philadelphia	Great Adventure	Low	No
400	Philadelphia	Sicklerville	High	Yes
401	Philadelphia	Salem	High	Yes
402	Philadelphia	Pennsville	Medium	Yes
403	Camden	Turnersville	High	Yes
404	Philadelphia	Cherry Hill	High	Yes
405	Camden	Cherry Hill	Medium	No
406	Philadelphia	Berlin Township	High	No
407	Camden	Moorestown	Medium	No
408	Philadelphia	Millville	Medium	No
409	Philadelphia	Trenton	High	No
410	Philadelphia	Bridgeton	High	Yes
412	Philadelphia	Sewell	High	Yes
413	Burlington City	Camden	High	No
417	Philadelphia	Mt. Holly	High	No
418	Camden	Trenton	Low	No
419	Camden	Burlington	Medium	No
450	Camden	Cherry Hill	High	Yes
451	Camden	Lindenwold	Medium	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

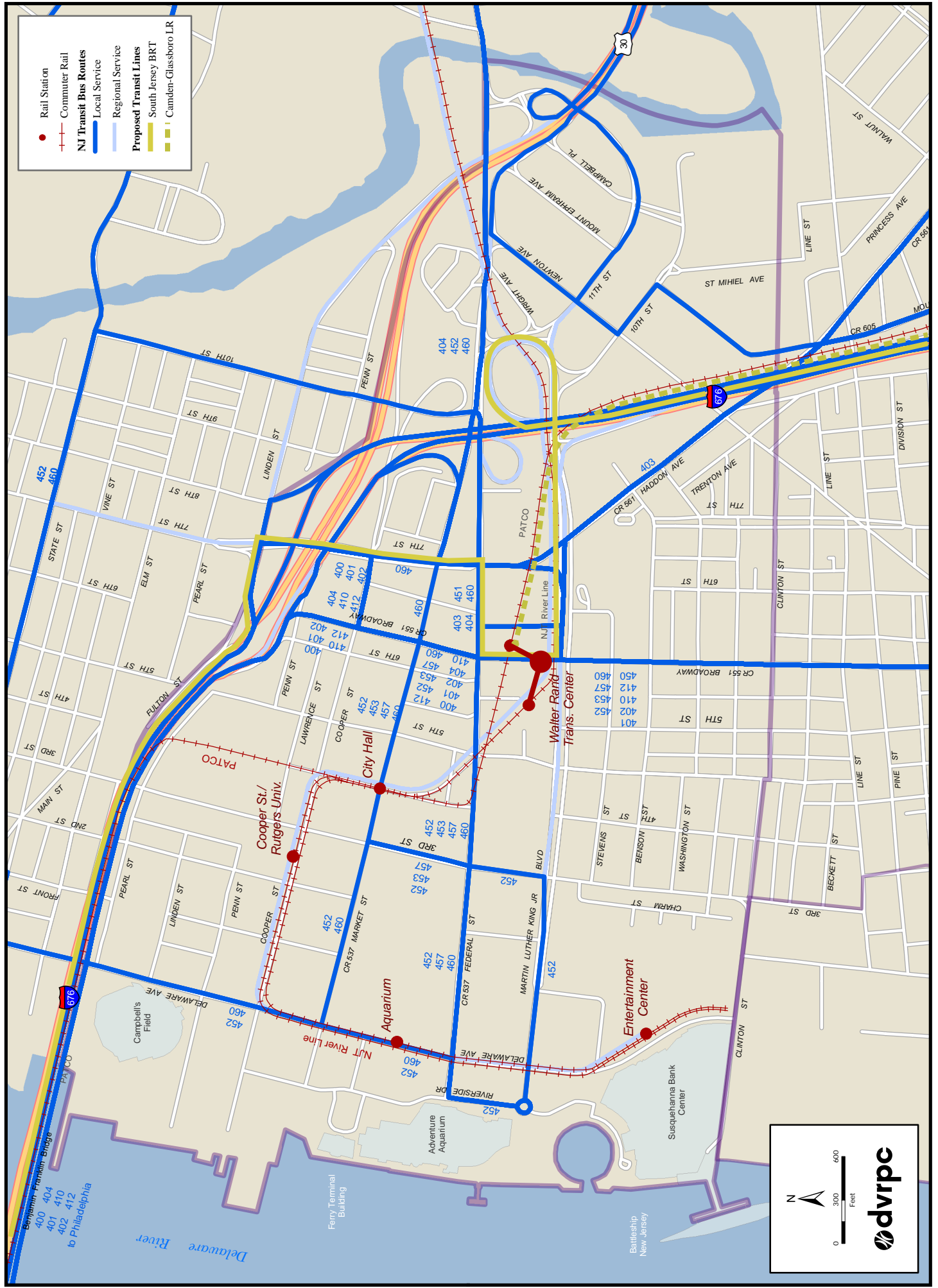
*Frequency: High = 0 - 30 minutes, Medium = 31 - 60 minutes, Low = > 60 minutes

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

New Jersey Transit, 2011
DVRPC, 2011

In addition to scheduled NJT service, there are several shuttle buses that serve the city. A first shuttle connects employees of the Campbell's Soup Company headquarters with the Walter Rand Transportation Center. A second shuttle, also operated by Campbell's Soup Company, transports its employees from 30th Street Station in Philadelphia to the Camden headquarters. This service is offered free of charge and during peak commuting times only. The South Jersey Transportation Authority operates a shuttle that connects employees with job sites at the Pureland Industrial Park in Gloucester County. This service, which is free to users, operates three times per day and is coordinated with shift changes.

Figure 8: Transit Service



0 300 600 Feet

dvrpc

Ferry

A final mode of public transportation worth mentioning is the Camden River Link cross-river ferry service. The ferry connects Penn's Landing in Philadelphia (near the Maritime Museum) with the Camden Waterfront (near the Adventure Aquarium). It operates hourly between 9 am and 7 pm during the summer months. During May and September, the service is available only on weekends.

Planned Transit Improvements

In 2009, the DRPA study, *Southern New Jersey to Philadelphia Mass Transit Expansion Alternatives Analysis Study*, identified the need for improved transit service along the Route 55/42/676 travel corridor to/from Camden and Philadelphia. New Jersey Transit is conducting an Alternatives Analysis (AA) that includes part of the City of Camden within the study area. Among the tasks of this AA is an evaluation of an enhanced Bus Rapid Transit system (BRT). This BRT would extend from the Route 42 corridor in Gloucester County, north to the I-676 right-of-way to the study area. Connections would be made to the Walter Rand Transportation Center in Downtown Camden, where riders could access the River Line, Speedline, and regional buses. The northwestern extent of the proposed route would connect to Center City Philadelphia.

The proposed Camden-Glassboro rail extension would travel along the 18-mile corridor that stretches from Glassboro to Camden along the existing railroad right-of-way currently used by Conrail for freight service would provide light rail along this corridor. This was the Recommended Alternative selected at the end of the Southern New Jersey to Philadelphia Mass Transit Expansion Alternatives Analysis study in 2009. The new line would traverse the communities from Glassboro to Camden City. Connection to the study area would be via the Walter Rand Transportation Center.

Recommendations

- ◆ Campbell's Soup Company and Cooper University Hospital are both supportive of rail stations in the Gateway area that would provide access to the River Line, Speedline, and Camden-Glassboro Line.
- ◆ Residents of Centreville are interested in more bus service, in particular, service that serves outbound/reverse commute.

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 maintain and improve existing levels of mobility in the city as redevelopment occurs.

Summary of Recommendations

Recommendations emanating from this study vary from needed improvements to desired improvements, and are indicated as such by their assigned priorities. They are prioritized per their assigned subgroup. **Figure 9** highlights the location of many.

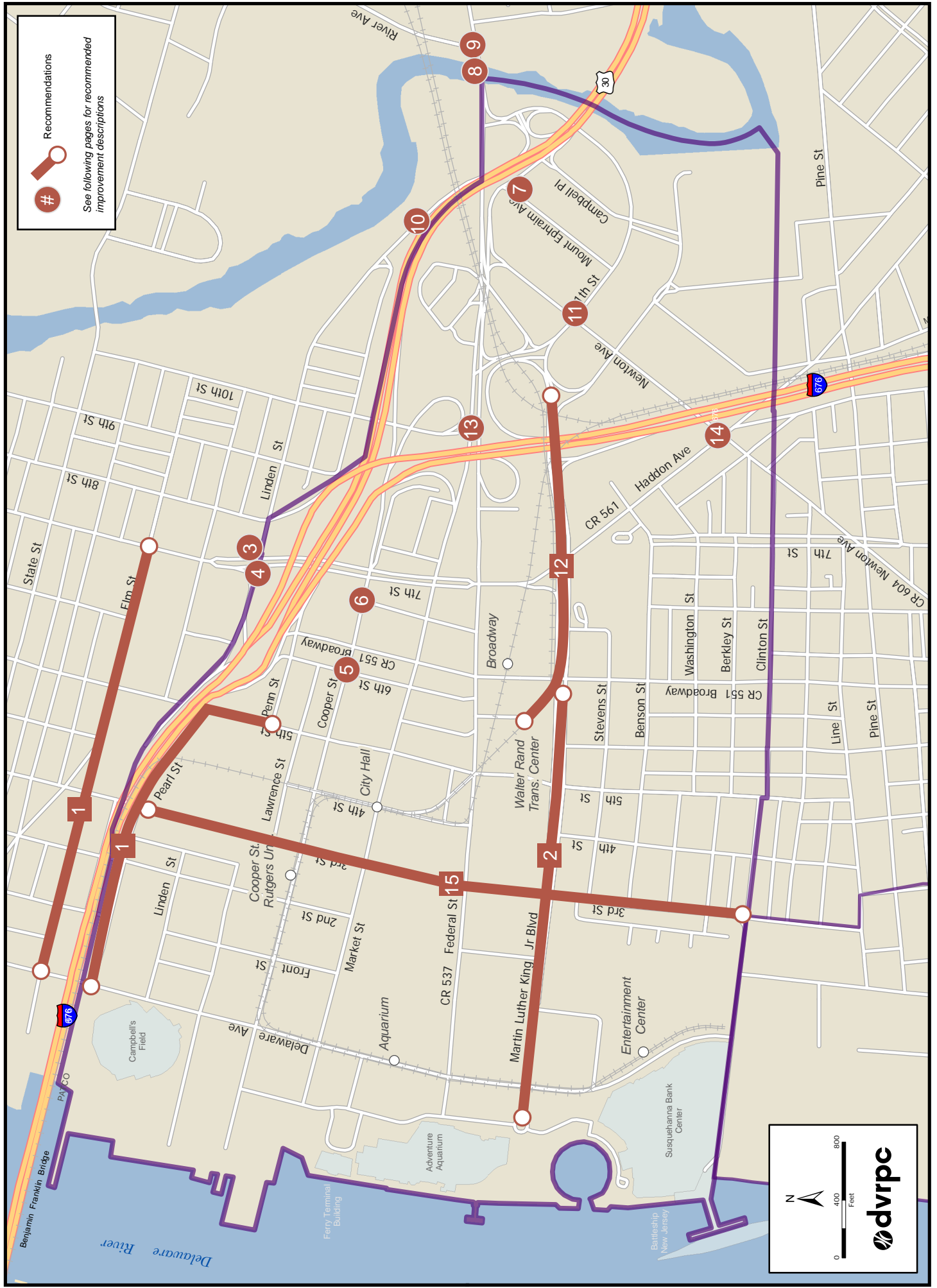
Several of the recommendations are already being implemented by the city or other study area stakeholders.

Recommendations (City Wide):

1. Upgrade and coordinate traffic signals throughout the study area
Issue: Traffic signals in Camden are generally uncoordinated and span differing eras and technological capabilities.
Next Step: Conduct a traffic signal needs plan.
Benefit: Optimizing signals will allow for more efficient traffic flow through the city.
Responsible Party: City leads, in coordination with county and NJDOT.
2. Create a central storage location for all traffic signal data
Issue: There is not a central storage location for all of the city's traffic signal plans.
Next Step: The city engineer's office begins an electronic and/or hard copy storage program.
Benefit: Will assist developers and engineers when assessing traffic impacts and needs.
Responsible Party: City engineer.

3. Implement measures identified in Camden Waterfront South Truck Traffic Management study
Issue: Conflict between heavy vehicles and local residents.
Next Step: Continue city's ongoing efforts.
Benefit: More livable communities.
Responsible Party: City.
4. Maintain a good state of repair of the city's transportation infrastructure
Issue: This is to prevent future problems.
Next Step: City's public works creates a periodic inspection program.
Benefit: Will assist in maintaining the infrastructure to attract new development.
Responsible Party: City public works.
5. Adopt a Complete Streets policy
Issue: Not all modes of travel are considered in the planning of future development.
Next Step: City adopts best practices from New Jersey municipalities
Benefit: Improved mobility for nonmotorized travel.
Responsible Party: City.
6. Maintain pedestrian clear passage through vegetation control
Issue: Encroaching vegetation inhibits pedestrian mobility and degrades sidewalks.
Next Step: Active code enforcement.
Benefit: Improved pedestrian mobility.
Responsible Party: City.
7. Ensure bicycle-related signage is in place
Issue: Lack of bicycle related signage in the city.
Next Step: Identify appropriate locations.
Benefit: Improved bicycle mobility.
Responsible Party: City, working with nonprofit organizations.
8. Provide bicycle storage amenities at key locations
Issue: There are insufficient places to store bicycles in the study area.
Next Step: Work with developers to increase bicycle storage amenities.
Benefit: Improved bicycle mobility options.
Responsible Party: City.
9. Adopt a parking policy that minimizes the need for additional parking lots and structures
Issue: Parking geographic distribution does not complement demand.
Next Step: Work with potential developers to find the right fit.
Benefit: More effective use of the city's parking resources.
Responsible Party: City in conjunction with nonprofits.

Figure 9: Summary of Recommended Improvements



Recommendations (Waterfront Area):

1. Promote Elm Street and Pearl Street as Waterfront area access and egress routes, Map #1
Issue: Too much reliance on the four Downtown east-west routes leads to congestion on these routes.
Next Step: Improve Elm Street pavement.
Benefit: More travel options, reduced congestion.
Responsible Party: City, working with Waterfront developers.
2. Increase pedestrian capacity along MLK between Broadway and the Waterfront area, Map #2
Issue: Narrow sidewalks line the main pedestrian Waterfront access.
Next Step: Work with Waterfront stakeholders to identify potential improvements.
Benefit: Increased pedestrian mobility between Walter Rand Transportation Center and the Waterfront area.
Responsible Party: City and Waterfront area stakeholders.

Recommendations (University Area):

1. Reconfigure westbound approach at the 7th Street/Linden Street intersection to dual left-turn lanes, dual through lanes, and construct a short right-turn lane, Map #3
Issue: Heavy volume of vehicles turning left toward the city.
Next Step: Prioritize location for preliminary engineering.
Benefit: Improved mobility and reduced congestion at a key intersection.
Responsible Party: City,
2. Reconfigure northbound approach at the 7th Street/Linden Street intersection to dual left-turn lanes and a single through lane, Map #4
Issue: Heavy volume of vehicles turning left toward the Ben Franklin Bridge.
Next Step: Prioritize location for preliminary engineering.
Benefit: Improved mobility and reduced congestion at a key intersection.
Responsible Party: City.
3. Remove the median barrier from Cooper Street at 6th Street, Map #5
Issue: The median barrier causes circuitous travel patterns.
Next Step: Conduct a traffic signal needs plan.
Benefit: More direct travel patterns to and from US 30 and less congestion.
Responsible Party: City.

4. Extend the Cooper Street center median between 7th Street and Haddon Avenue, and remove midblock pedestrian crossing, Map #6
Issue: Pedestrian safety and traffic congestion concerns.
Next Step: Conduct feasibility assessment.
Benefit: Improves safety and congestion around the Leap Academy.
Responsible Party: City.

Recommendations (Gateway Area):

1. Realign Memorial Drive in the Gateway area, Map #7
Issue: Poor roadway alignment creates safety concerns.
Next Step: Design and engineering in anticipation of development.
Benefit: Improved safety by providing a more predictable driving environment.
Responsible Party: City and NJDOT.
2. Retime Federal Street/River Road intersection to allow for more eastbound left turns, Map #8
Issue: Eastbound left turns create significant congestion at the intersection.
Next Step: Update signal timing plans.
Benefit: Improved mobility.
Responsible Party: County.
3. Realign River Road to intersect Federal Street opposite 15th Street, Map #9
Issue: Eastbound left turns create significant congestion at the intersection.
Next Step: Acquire land, conduct preliminary engineering.
Benefit: Improved mobility.
Responsible Party: City and county.
4. Reconfigure westbound US 30 off ramp to Linden Street to begin west of the railroad bridge, Map #10
Issue: A short, overlapping acceleration/deceleration lane creates safety concerns.
Next Step: Incorporate the project into a long-term US 30 reconstruction project.
Benefit: Improved safety.
Responsible Party: NJDOT.
5. Add left-turn storage capacity on the westbound approach at the 11th Street and Newton Avenue intersection, Map #11
Issue: Insufficient left-turn queuing storage.
Next Step: Improve signal throughput.
Benefit: Improved localized mobility.
Responsible Party: City.

6. Improve bicycle/pedestrian connection between Walter Rand Transportation Center and Gateway area, Map #12

Issue: Long, pedestrian unfriendly corridor between the two locations.

Next Step: Continue current pedestrian lighting and wayfinding initiatives.

Benefit: Improved commuting options for employees of the Gateway area.

Responsible Party: City and county.

Recommendations (Downtown Area):

1. Reconfigure southbound approaches of 10th Street at Market and Federal streets to allow for left turns from both travel lanes, and a short right-turn lane, Map #13

Issue: Heavy volume of vehicles turning left toward the Gateway area.

Next Step: Conduct engineering analysis, construction.

Benefit: Improved intersection operation.

Responsible Party: City.

2. Stripe bicycle lanes where sufficient roadway width exists, particularly along 3rd Street, Map #14

Issue: Lack of bicycle routes in the city.

Next Step: Identify appropriate locations.

Benefit: Improved bicycle mobility.

Responsible Party: City, working with nonprofit organizations.

Recommendations (Lanning Square Area):

1. Add left-turn lanes to Haddon Avenue at Newton Avenue when warranted, Map #15

Issue: Future traffic volumes may create localized congestion.

Next Step: Regularly assess congestion at the intersection.

Benefit: Will provide better mobility along Haddon Avenue.

Responsible Party: City and county.

Implementation

This study assessed the impact to the city's transportation infrastructure assuming all planned and proposed developments are realized. They will not be built overnight. In fact, it is quite possible that, at least as currently planned, all of the developments will never materialize. However, continued development is assured. Implementing the recommendations from this study should occur in stages, as developments occur.

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 these projects be funded—can only be answered with time. Many may be funded by developers to mitigate specific traffic concerns, but others will require the city to seek funding for their implementation. Many potential funding sources are contained in **Appendix B**.

APPENDIX A



Synchro Analysis Data

Base Condition

Table A-1: Synchro Analysis Data - Base Condition

Intersection	Northbound												Southbound												Eastbound												Westbound											
	Left			Thru			Right			Approach			Left			Thru			Right			Approach			Left			Thru			Right			Approach														
	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.																
Market Street and Broadway	C	103	C	107	C	210	C	210	C	210	C	210	C	210	C	210	C	210	C	210	C	210	C	210	C	210	C	210	C	210	C	210																
Market Street and Haddon Avenue	F	296	C	257	B	123	B	73	B	196	E	533	C	243	C	295	C	538	B	136	A	43	B	179	B	271	C	69	C	316	A	42	C	427														
Federal Street and Broadway																																																
Federal Street and Haddon Avenue	A	8	C	268	A	92	B	360	C	44	A	261	B	200	B	305	B	271	B	200	B	200	B	200	B	200	B	200	B	200	B	200	B	200														
MLK Boulevard and 3 rd Street	A	8	A	109	A	25	A	142	A	40	A	60	A	15	A	115	B	4	B	22	B	1	B	27	B	52	B	201	B	220	B	473	A															
MLK Boulevard and 5 th Street	A	34	A	63	A	86	A	183	B	110	B	76	A	48	B	234	B	35	B	161	B	15	B	211	B	155	B	567	B	146	B	866	B															
MLK Boulevard and Broadway	C	11	C	263	C	24	C	298	B	46	B	234	B	19	D	299	D	23	D	529	D	95	D	647	E	156	F	1317	B	243	F	1716	E															
MLK Boulevard and Haddon Avenue	E	144	D	293	D	81	D	518	D	77	D	379	B	91	D	547	D	23	D	529	D	95	D	647	D	99	D	384	D	208	D	551	C															
Haddon Avenue and Newton Street	C	5	C	330	C	25	C	360	B	16	B	189	B	9	B	218	B	27	B	207	B	26	B	262	C	1181	B	148	B	346	B	1675	C															
7 th Street and Linden Street*	C	133	B	131																																												
Market & Federal Streets and 10 th Street																																																

Intersection	Northbound												Southbound												Eastbound												Westbound											
	Left			Thru			Right			Approach			Left			Thru			Right			Approach			Left			Thru			Right			Approach														
	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.																
Market Street and Broadway	C	41	C	164	C	492	C	205	C	512	B	204	A	36	B	240	C	85	C	540	A	48	C	673	B	130	B	343	B	89	B	562																
Market Street and Haddon Avenue	C	110	C	86	B	99	B	185	B	162	A	79	B	241	B	212	C	133	C	455	C	187	C	775	B	175	B	360	B	102	B	637																
Federal Street and Broadway																																																
Federal Street and Haddon Avenue	A	7	A	93	A	25	A	125	B	197	A	30	A	5	B	292	B	15	B	53	B	8	B	76	B	33	A	50	A	41	A	124	B															
MLK Boulevard and 3 rd Street	A	13	A	53	A	131	A	197	C	195	B	77	A	17	B	289	B	23	B	414	B	7	B	444	C	171	A	120	A	51	B	342	B															
MLK Boulevard and Broadway	C	7	C	264	C	28	C	299	B	37	B	295	B	13	B	345	B	343	B	23	B	23	B	366	D	88	F	824	A	60	E	972	E															
MLK Boulevard and Haddon Avenue	D	80	D	297	D	413	D	790	D	287	D	385	B	75	D	747	E	147	F	1031	F	83	F	1261	D	97	C	342	C	51	C	390	C															
Haddon Avenue and Newton Street	C	16	C	287	C	31	C	394	C	47	C	435	C	14	C	496	B	21	B	186	B	16	B	232	B	761	A	150	A	414	B	1325	B															
7 th Street and Linden Street*	E	342	B	123																																												
Market & Federal Streets and 10 th Street																																																

*Signal timing unavailable - Synchro 7 optimized cycle length and phases used in the analysis

Build Out Condition

Table A-2: Synchro Analysis Data – Build Out Condition

Intersection	Northbound						Southbound						Eastbound						Westbound														
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right				
	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.			
Market Street and Broadway	C	108	C	142	C	475	D	786	C	250	C	310	A	45	B	188	C	72	C	482	A	44	C	598	B	124	B	895	B	132	B	1151	C
Federal Street and Haddon Avenue	E	311	C	475	B	159	B	77	B	433	C	75	B	210	B	285	C	221	B	294	B	80	B	595	C	253	C	1030	C	149	C	1432	C
Federal Street and Haddon Avenue	A	9	A	120	A	43	A	172	A	44	A	66	A	17	A	127	B	5	B	313	B	2	B	320	B	57	A	321	A	242	A	620	B
MLK Boulevard and 3 rd Street	A	37	A	69	A	125	A	231	C	437	B	51	B	84	A	53	B	39	B	481	B	17	B	537	C	171	B	724	B	161	B	1056	B
MLK Boulevard and Broadway	C	12	C	319	C	106	C	437	B	51	B	257	B	21	B	329	B	82	C	930	C	137	D	1149	F	267	E	1554	A	267	E	2088	E
MLK Boulevard and Haddon Avenue	F	161	F	338	F	96	F	585	E	85	F	447	C	104	F	636	E	82	C	930	C	137	D	1149	F	267	E	1554	A	267	E	2088	E
Haddon Avenue and Newton Street	C	5	C	377	C	42	C	434	C	42	C	434	B	25	B	259	B	43	B	217	B	44	B	304	D	62	D	314	D	255	F	631	C
7 th Street and Linden Street	F	438	C	142	E	580	F	393	C	370	D	763	C	78	A	568	A	646	A	568	A	568	A	646	F	1644	D	163	D	381	F	2188	E
Market & Federal Streets and 10 th Street																																	

Intersection	Northbound						Southbound						Eastbound						Westbound														
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right				
	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.	LOS	Vol.			
Market Street and Broadway	B	43	B	172	C	638	B	215	C	333	C	76	C	303	C	89	C	667	A	50	C	805	B	137	B	435	B	93	B	865	B	821	C
Federal Street and Broadway	A	90	A	104	A	194	C	638	B	215	C	76	C	303	C	240	C	978	C	196	C	914	B	184	B	453	B	184	B	821	C	821	C
Federal Street and Haddon Avenue	A	4	A	93	A	25	A	122	B	237	A	99	A	7	A	323	B	15	B	53	B	8	B	76	B	46	A	55	A	45	B	146	A
MLK Boulevard and 3 rd Street	B	14	B	58	B	144	B	216	D	215	C	85	A	19	C	319	A	25	B	675	B	8	B	708	D	288	A	142	A	56	C	486	C
MLK Boulevard and Broadway	C	8	C	290	C	31	C	329	B	41	B	255	B	14	B	310	B	6	B	597	B	25	B	622	B	328	A	37	B	365	B	365	B
MLK Boulevard and Haddon Avenue	D	103	F	374	F	530	F	1007	E	316	F	438	B	139	E	893	D	171	E	1358	E	106	E	1635	D	119	E	985	A	66	E	1170	E
Haddon Avenue and Newton Street	C	16	C	324	C	33	C	373	C	71	C	489	C	15	C	575	B	38	B	211	B	17	B	266	C	63	C	269	C	102	C	434	C
7 th Street and Linden Street	E	547	A	142	C	689	D	295	D	295	B	454	B	62	B	516	A	81	A	888	A	969	D	883	C	153	C	256	C	1292	C	1292	C
Market & Federal Streets and 10 th Street																																	

--Signal timing unavailable - Synchro 7 optimized cycle length and phases used in the analysis
 DVRPC, 2012

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 Program (CIP) sets 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, it can be a useful tool, 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 require 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 (TE) – New Jersey

Eligibility: New Jersey local governments, counties, state or federal agencies, and nonprofits

Purpose: Funds nontraditional 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 (DVRPC)

P: 215.592-1800

I: www.dvrpc.org

State Programs

Brownfields Development Area (BDA) 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.state.nj.us/dep/rsp/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 and 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, and nonprofits
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, and 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, and 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 (NJRIF)

Eligibility: New Jersey municipalities, counties, nonprofits, and 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, and nonprofits

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 (NPS) 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; and watershed and water resource associations and other local nonprofit 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/watershedmgt/319grant.htm>

Publication Title: City of Camden Access Study
Publication Number: 12008
Date Published: November 2012
Geographic Area Covered: City of Camden, Camden County, New Jersey

Key Words: Intersection analysis, redevelopment, access management, level of service, planned development, pedestrian mobility, bicycle mobility, land use

Abstract: This study was undertaken by 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 included the city's commercial core. Eleven key intersections were quantitatively assessed to determine capacity, and qualitative assessments were undertaken for several other intersections. 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, though several locations have isolated issues that will require remedy. The primary recommendation emanating from this study is the modernization of the city's traffic signals.

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