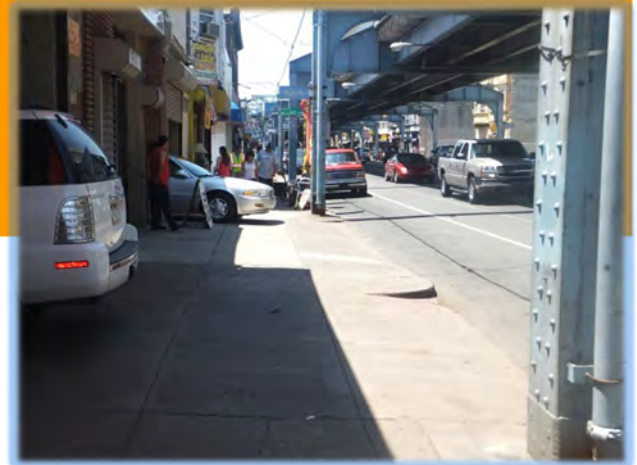


G STREET and KENSINGTON AVENUE ROAD SAFETY AUDITS

City of Philadelphia, Pennsylvania
December 2013





The Delaware Valley Regional Planning Commission is dedicated to uniting the region's elected officials, planning professionals, and the public with a common vision of making a great region even greater. Shaping the way we live, work, and play, DVRPC builds consensus on improving transportation,

promoting smart growth, protecting the environment, and enhancing the economy. We serve a diverse region of nine counties: Bucks, Chester, Delaware, Montgomery, and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester, and Mercer in New Jersey. DVRPC is the federally designated Metropolitan Planning Organization for the Greater Philadelphia Region — leading the way to a better future.



The symbol in our logo is adapted from the official DVRPC seal and is designed as a stylized image of the Delaware Valley. 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.

DVRPC is funded by a variety of funding sources including federal grants from the U.S. Department of Transportation's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), the Pennsylvania and New Jersey departments of transportation, as well as by DVRPC's state and local member governments. The authors, however, are solely responsible for the findings and conclusions herein, which may not represent the official views or policies of the funding agencies.

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Executive Summary

Although crash fatalities have declined in recent years, both nationally and, to a lesser extent, regionally, crash trends have remained constant at the corridor level in many locations. These areas require focused attention to understand problems and develop targeted improvements. The Delaware Valley Regional Planning Commission (DVRPC), in collaboration with local, state, and federal agencies, facilitated a road safety audit (RSA) to examine two such corridors in North Philadelphia in May 2012.

This document is the final report for the G Street and Kensington Avenue RSAs. An audit is an effective way of identifying crash safety issues, evaluating risks, and brainstorming appropriate countermeasures. The audit process employs a dynamic and intensive short-term approach that taps into the collective knowledge of local and subject-matter experts using crash data and a walking survey of a corridor. The result, detailed in this report, is a summary of the corridor's safety history, a listing of identified issues, and a set of improvement recommendations organized by location.

Although this was not officially a Pedestrian RSA, the urban nature of the two corridors combined with the significant percentage of pedestrians hit by drivers necessitated a pedestrian-safety focused effort. To help audit team members better understand pedestrian issues, the audit presentation provided an overview of Federal Highway Administration's (FHWA's) Pedestrian RSA Prompt Lists, and each team member was given a copy of the complete prompt lists for reference during the event. In addition, the audit also considered crashes involving bicyclists hit by drivers and the related circumstances, and the total history of bicyclist crashes in regard to the bicycling environment of these corridors.

Despite recent declines in total crash fatalities, pedestrian fatalities (and pedestrian injuries) have remained consistently high in some locations, including Philadelphia. In an effort to address this trend, the FHWA created the Pedestrian Safety Focus States and Cities program¹ to provide extra resources in places where pedestrian fatalities and/or fatality rates are highest nationally.

DVRPC worked with PennDOT's District 6-0 office and the City of Philadelphia's Streets Department to identify these two RSA corridors drawing from PennDOT's High Crash Locations (HCL) list. The HCL list results from a data-driven process that guides district-level and state-level safety efforts as part of the state's Highway Safety Improvement Program (HSIP). Both G Street and Kensington Avenue ranked high on the list, and G Street was included in the top five percent of crash priority locations in Pennsylvania statewide. This project represents a step toward the goals of PennDOT's Strategic Highway Safety Plan (SHSP) and DVRPC's Transportation Safety Action Plan.

The two road safety audits were conducted on consecutive days in 2012: G Street on Wednesday, May 30, and Kensington Avenue on Thursday, May 31. The preaudit and postaudit meetings were held at PennDOT's Traffic Sign and Signal Shop, 4501 G Street, Philadelphia, PA. Both corridors are non-state facilities that are owned and maintained by the City of Philadelphia. The audit team consisted of 19 participants from local, regional, and state government agencies, among others. See Appendix A for the full list of audit team members.

The Findings and Recommendations chapter details each identified issue and associated improvement recommendation, includes general ratings for ease of implementation, and identifies the responsible party. Items

¹Cities were identified as pedestrian focus cities if they had more than 20 average annual pedestrian fatalities or a pedestrian fatality rate greater than 2.33 per 100,000 population (the annual national average number of pedestrian fatalities is 20 and the average national rate of pedestrian fatalities is 2.33 per 100,000 population). http://safety.fhwa.dot.gov/ped_bike/ped_focus/

highlighted in yellow are high safety-benefit improvement strategies that are considered low in difficulty to implement. Things that fall into this category include signs and striping, among others, and can often be addressed during regular maintenance. Also, a listing of audit team priority items is included in the section preceding the graphics and tables.

The recommendations herein were developed collaboratively with roadway owners and local stakeholders from the audit team; DVRPC served as facilitator. The study partners expressed an interest in implementing many of the recommendations as time and funds allow. Several of the maintenance items can be addressed without additional engineering. The City of Philadelphia Streets Department indicated that most of the striping and pavement issues will be addressed during the next scheduled repaving of the corridors, though an implementation date was not yet set as of the time of this document's publication.

In general, a large number of the identified issues were related to the pedestrian environment. Most of the blocks on these two corridors were densely developed with either residential uses (G Street) or retail uses (Kensington Avenue), which makes walking and biking easier and much more common.

Another important characteristic of these corridors is the reported level of poverty and criminal activity, as described by the local law enforcement members of the audit team. Although crime data was not used in the audit, staff included an environmental justice evaluation of the two-corridor study area for the purpose of understanding the demographic characteristics that may be influencing the identified crash trends. In summary, out of seven possible degrees of disadvantage, these corridors contain five or more, including households in poverty and with limited English proficiency. Though these conditions are not responsible for crash problems, they are often found in places where total crashes, including pedestrian crashes, are high.

Introduction

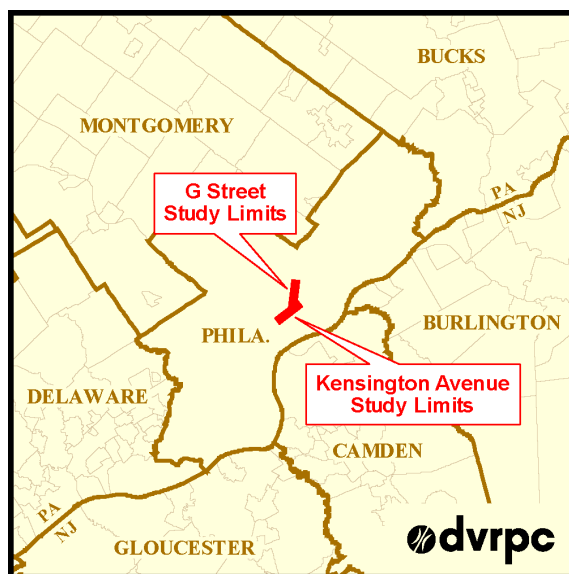
As the final report for the G Street and Kensington Avenue RSAs, this document represents a step toward implementation of PennDOT's HSIP and DVRPC's 2012 Transportation Safety Action Plan (#12030). The RSA process identifies safety issues through an intensive and collaborative forum and uses brainstorming and local knowledge to enhance analysis findings in developing a range of improvement recommendations. This audit was made possible through the assistance of the PennDOT District 6-0 Traffic Division and the City of Philadelphia Streets Department. In addition to staff support at the audit event, both agencies provided crash data analysis and help with logistics. DVRPC conducted additional analysis using GIS, Microsoft Access, and PennDOT's Crash Data Analysis and Retrieval Tool (CDART).

Corridor Selection

Representatives from DVRPC, PennDOT's District 6-0 office, and the City of Philadelphia's Streets Department collaborated on which corridors to select and the appropriate corridor limits, drawing from PennDOT's High Crash Locations (HCL) list. G Street was selected because it placed in the top five percent of worst corridors in the state. Kensington was not in the top five percent, but it was close behind. Since these two corridors intersect, the roadway owners suggested a two-corridor audit as a way of advancing two priority locations. Both the G Street and Kensington Avenue corridors are owned and maintained by the City of Philadelphia (see Figure 1).

DVRPC worked closely with representatives from District 6-0 to identify reportable crashes on each corridor, and the Streets Department provided data for non-reportable crashes (no injuries or fatalities, and no vehicle required towing from the scene). Together, these two data sets formed the foundation of crash analysis for the audit event.

Figure 1: Regional Setting



What is a Road Safety Audit?

An RSA is a formal safety performance examination of an existing or future road or intersection by a multidisciplinary team. Road safety audits can be conducted on projects that are in progress (planning, design, or construction phases), or on existing facilities with a history of crashes typically identified through a data-driven process. DVRPC has mostly used the tool on roadway sections of five miles in length or less, exhibiting a trend of high total crashes, or of a particular crash type.

Although this effort was not officially a Pedestrian RSA, the urban nature of the corridors combined with the number of pedestrian crashes necessitated a pedestrian safety focus. To help audit team members better understand pedestrian issues, the team used the *Pedestrian Road Safety Audit Guidelines and Prompt Lists*

(2007, #FHWA-SA-07-007) as a resource during the event. This guide illustrates the needs of pedestrians of all abilities and presents an overview of how pedestrians should be considered in the RSA process.

For each RSA, emphasis is placed on identifying low-cost, quick-turnaround safety improvements, although strategies that are more complex are sometimes included. Implementation of improvement strategies identified through this process in Pennsylvania may be eligible for federal safety funds through their HSIP. Because the RSA process is adaptable to local needs and conditions, recommendations can be implemented as time and resources permit.

The audit event has three basic components:

- ▶ Preaudit – the audit team is presented an overview of the study area and an examination of crash history;
- ▶ Field visit – the audit team walks the corridor to examine conditions; and
- ▶ Postaudit – the audit team members discuss findings and develop a list of problems and improvement strategies.

Prior to the audit, DVRPC collects and analyzes relevant data, including crash concentrations, pedestrian and bicyclist crash locations, corridor-wide crash summaries, daytime and nighttime roadway video, traffic volume data, and aerial photographs. DVRPC staff also conducts a preaudit field visit to examine existing conditions. The identified crash concentrations served as the focus areas during both audit events. All maps and data used during the audit are included in the preaudit PowerPoint presentations found in Appendices B and C.

Following the event, DVRPC staff compiled the identified problems and improvement strategies into a table. This document was sent back to the audit team for problem verification and for refinement of the recommended strategies by the implementing agencies.

The G Street and Kensington Avenue RSA Events

The two road safety audits were conducted on consecutive days in 2012 with G Street on Wednesday, May 30, and Kensington on Thursday, May 31. The preaudit and postaudit meetings were held at PennDOT's Traffic Sign and Signal Shop, 4501 G Street, Philadelphia, PA. Among the audit team of 19 participants were representatives from the Philadelphia Streets Department, the Philadelphia Mayor's Office of Transportation and Utilities, Philadelphia City Planning Commission, Philadelphia Police Truck Enforcement Unit, Bicycle Coalition of Greater Philadelphia, PennDOT District 6-0, SEPTA, New Kensington Community Development Corporation, and DVRPC. See Appendix A for the list of audit team members.

The preaudit meeting began at 8:00 AM. Next was the field visit, when the audit team walked the entire corridor to examine conditions and identify safety issues. After lunch, the team returned to the meeting room for the postaudit session, where identified safety issues were defined and countermeasures discussed.

Environmental Justice Technical Analysis

What is Environmental Justice?

Title VI of the Civil Rights Act of 1964 and the 1994 President's Executive Order on Environmental Justice (#12898) state 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, and in turn, Metropolitan Planning Organizations (MPOs) are charged with evaluating their plans and programs for environmental justice (EJ) sensitivity, including expanding their outreach efforts to low-income, minority, and other disadvantaged populations as part of the United States Department of Transportation's certification requirements.

Year 2010 Census Data for Degrees of Disadvantage

The quantitative methodology used to identify disadvantaged groups in the Delaware Valley is documented in the original report “...and Justice for All”: DVRPC’s *Strategy for Fair Treatment and Meaningful Involvement of All People* (September 2001, #01022). Subsequent updates rely primarily upon available U.S. Census data. The most recent update to this report includes seven degrees of disadvantage (DOD): minorities, Hispanics, the elderly (ages 75 and older), carless households, impoverished households, female head of household with child, and limited English proficiency households.

A total of all persons in each disadvantaged demographic group in the nine-county region is divided by the total nine-county population to obtain a regional threshold, or average. This average is used to determine if the DODs within a census tract meet or exceed the regional average. Each DOD within a census tract that meets or exceeds the regional average indicates the presence of a disadvantaged demographic population at the census tract level, making it an “environmental justice area.”

Characteristics of the Study Area Census Tracts

Table 1 below provides a DOD summary by census tract. The two-corridor study area consists of three planning districts and 11 census tracts representing 63,552 residents. Because the corridors intersect each other and share census tracts, this analysis considers the corridors as one EJ area. Qualifying census tracts have either Kensington Avenue or G Street as their border, or are intersected by either corridor. Census tracts sharing a border with or intersected by Kensington Avenue are predominately dense urban commercial areas with some residential uses. Census tracts sharing a border with or intersected by G Street are predominately dense urban residential, though for most of the blocks in the center section of this corridor, the residential concentration is replaced by commercial uses, e.g., distribution centers.

Table 1: Degrees of Disadvantage Identified in the Study Area Census Tracts

Number of Tracts	DODs	Combined Tract Population	Percent of Total Tract Population
0	0	0	0%
0	1 or 2	0	0%
0	3 or 4	0	0%
11	5 or 6	63,552	100%
0	7	0	0%

Source: DVRPC, 2013

All 11 of the study area tracts have either five or six degrees of disadvantage represented, and all 11 tracts exceeded the regional thresholds for the following demographics:

- ▶ Carless Households (highest tract = 53 percent, regional threshold = 14 percent)
- ▶ Households in Poverty (highest tract = 61 percent, regional threshold = 12 percent)
- ▶ Female Head of Household with Child (highest tract = 39 percent, regional threshold = 9 percent)
- ▶ Hispanic (highest tract = 82 percent, regional threshold = 8 percent)
- ▶ Limited English Proficiency (highest tract = 25 percent, regional threshold = 3 percent)

None of the census tracts in the study area exceed the regional threshold for elderly population.

Safety Implications of the EJ Evaluation

The purpose of an EJ evaluation in an RSA is to consider factors other than roadway design and condition that may influence the frequency and severity of crashes, and to identify especially vulnerable populations. DVRPC's EJ process identified that the census tracts comprising the study corridor exceeded the regional threshold for at least five of the seven degrees of disadvantage and, in most tracts, by three or four times the average. Also worth noting is that pedestrian crash frequency is typically higher in urban areas of the Delaware Valley, especially where demographics resemble the Kensington and G Street corridors of Philadelphia.

In North Philadelphia, poverty is a pervasive problem. Urban poverty typically correlates with lower education levels, high immigrant populations that often have limited English proficiency, single mother heads of households, and crime, all of which were found in the audit study area. A 2010 study by the National Center for Biotechnology Information (National Library of Medicine) on the relationship of pedestrian injuries to socioeconomic characteristics found that "...pedestrian crashes are four times more frequent in poor neighborhoods and that neither age of the population, education, English language fluency, nor population density explained the effect of poverty."² In summary, though these characteristics typically coincide with pedestrian crashes, poverty remains the constant.

Infrastructure

The roadway surface of both corridors was in serviceable condition at the time of the audit, though potholes and other deficiencies were identified. One noted problem was the state of roadway striping and signing, particularly the no-parking "boxes" and bus stops, and their accompanying signage. It was also noted that these spaces were often occupied by parked cars or delivery trucks. Striping can be addressed during a scheduled repaving, and signs can be addressed through regular maintenance. These improvements, combined with an increased and/or a targeted enforcement campaign will provide an increased benefit.

Sidewalks were in place along both corridors, though crossings needed attention, with some curb ramps found to be ADA non-compliant; this is further evidence that infrastructure is only one component of a safe pedestrian environment.

Improvements to the pedestrian infrastructure can serve as a catalyst for improved pedestrian safety by raising the profile of the pedestrian. The best designed facilities also modify driver behavior by helping to establish a pedestrian environment where drivers must slow down and be cognizant of the pedestrians sharing the facility. These benefits are typically shared with bicyclists, though providing a dedicated right-of-way is the best way to accommodate bicyclists of all skill levels. Though bike lanes were present on Kensington Avenue and the northern section of G Street, there were breaks in the continuity, and restriping was needed at select locations.

Data-Driven Approach to Crime and Traffic Safety (DDACTS)

An increased police presence consistently enforcing traffic laws for both drivers and pedestrians is an effective companion strategy to support improvements to the physical environment. The Kensington Avenue and G Street corridors may benefit from a hybrid crash and crime analysis approach called DDACTS. The National Highway Traffic Safety Administration (NHTSA) describes DDACTS as a model that "integrates location-based crime and traffic data to establish effective and efficient methods for deploying law enforcement and other resources, by using geo-mapping to identify areas that have high incidences of crime and crashes."³ DDACTS draws on the deterrent of highly visible traffic enforcement and the knowledge that crime often involves the use of motor vehicles.

²The relationship of pedestrian injuries to socioeconomic characteristics in a large Southern California County, 2010. www.ncbi.nlm.nih.gov/pubmed/20872307

³Data-Driven Approaches to Crime and Traffic Safety. <http://www.nhtsa.gov/ddacts>

G Street

Study Location

The study area consists of approximately 1.72 miles of G Street, from the intersection of Kensington Avenue north to Wyoming Avenue (see Figure 2). The study area is located within North Philadelphia in a predominately dense urban neighborhood with a standard street-grid pattern. The frontage along the corridor is primarily a mix of residential, light industrial and commercial uses. From Kensington Avenue to East Venango Street, land use is residential mixed intermittently with retail. From East Venango Street to East Annsbury Street, land use is predominately commercial and industrial. From East Annsbury Street to East Wyoming Street, land use is residential with one retail shop.

There are two elementary schools along the study corridor: Philip H. Sheridan Elementary School is located between East Thayer Street and East Ontario Street on G Street. Hunting Park Elementary School is located between East Hunting Park Avenue and East Bristol Street on G Street. Also, a baseball field is located between East Venango and East Atlantic Streets.

Roadway Characteristics

G Street is classified as a major collector and has a posted speed limit of 25 MPH. The roadway configuration is one lane, one-way northbound (NB) between Kensington Avenue and East Venango Street with shoulders on both sides for on-street parking. At East Venango Street, G Street transitions to a two-lane, two-way street also with shoulders, and on-street parking is intermittently available on both sides of the street.

The study area has eight signalized intersections and 20 unsignalized intersections where the side-street is stop-controlled, nine of which are four-leg, and 11 that are three-leg intersections. Sidewalks are consistently available, and bike lanes can be found from East Venango Street to West Wyoming Street.

Figure 2: G Street Study Area



Traffic Volumes

Existing Annual Average Daily Traffic (AADT) volumes were used for total vehicle movements, and turning movement counts were collected at two key intersections within the corridor. Pedestrian and bicyclist movements were also utilized for this RSA: three pedestrian count locations and three bicyclist count locations. All counts can be found on Figure 3: Traffic Volumes.

Traffic volumes in the southern portion (one-way section) of the corridor, south of East Erie Avenue, were approximately 7,000 vehicles per day on average. North of East Erie Avenue, volumes increase to approximately 10,000 vehicles per day on average. Total pedestrian volume north of Erie Avenue was between 124 and 184 pedestrians per day, while south of Erie Avenue, volume climbed to 599. On Allegheny Avenue near G Street, total pedestrian volume is over 1,000 per day. Bicyclist volume south of Erie Avenue was recorded at 27 NB, and north of Erie Avenue, it was 32 bicyclists per day. The total bicycle volume on Allegheny Avenue at G Street was 170 per day.

Peak hour turning movement volumes were collected at two signalized intersections: G Street at Allegheny and G Street at Erie Avenue. At Allegheny Avenue, G Street is one-way northbound, and Allegheny is two-way running east/west. The identified peak hour was 7:45–8:45 AM, with a total intersection volume of 1,656 vehicles. Allegheny Avenue carries the majority of the volume through the intersection with more than twice the total vehicles on G Street. The PM peak hour was 5:00–6:00, and the volume distribution was also in favor of Allegheny Avenue, and even greater than in the morning. In both periods, the east/west volumes on Allegheny were fairly evenly split.

At Erie Avenue, the volumes were markedly higher than at Allegheny (total volume approximately 2,400 in combined morning and evening peak hours), though the identified peak hours were nearly identical as at Allegheny Avenue (same in the evening, and 7:30–8:30 in the morning). Worth noting is the east/west exchange on Erie Avenue: volumes were highest westbound in the morning (853 vehicles per hour) and in the evening in the eastbound direction (947 vehicles per hour). Both AM and PM volumes on G Street southbound were higher than on G Street northbound.

Transit Service

The study corridor is fairly well served by bus transit with stops and connecting services easily accessible by foot and typically within less than a half mile from anywhere along the corridor (see Figure 4). There is one SEPTA bus that runs along a segment of the G Street study corridor and two SEPTA buses that run across the study corridor. SEPTA's 89 bus follows G Street between Erie Avenue and Hunting Park Avenue on its route from Front Street at Dauphin Street to the Arrott Transportation Center. SEPTA's 56 and 56 Nite Owl buses cross G Street at Erie Avenue, and the 60 and 60 Nite Owl buses cross G Street at Allegheny Avenue.

The Market-Frankford Elevated Line crosses G Street at the southernmost end of the study area at Allegheny Station, located one block north and east of the G Street and Kensington Avenue intersection. Pedestrian volume near Allegheny Avenue and G Street is higher presumably for this reason. SEPTA's Regional Rail Main Line crosses under G Street, though there are no local stops in the study area.

Study Limits:
Kensington Ave. to Wyoming Ave.

- Bicycle Count¹
- Pedestrian Count¹
- Vehicle Count²
- SEPTA Rail Stop

¹ "Bicycle Count" represents Annual Daily Bicycle (ADB) volume and "Pedestrian Count" represents Annual Daily Pedestrian (ADP) volume. These volumes are estimates of all such traffic during a 24 hour period at the location indicated for the year in which the data was collected.

² "Vehicle Count" represents Annual Average Daily Traffic (AADT) volume.

Map Data:

Location	Year	Bicycle Count	Pedestrian Count	Vehicle Count
Wyoming Ave	2011	85 WB	17 WB	14,607
Courtland St	2011	17 EB		
Ramona Ave	2009			1,539
Ramona Ave	2011	4 SB	2 NB	
Cayuga St	2011	70	9	
Bristol St	2011	11 SB	21 NB	
Hunting Park Ave	2009			26,263
Hunting Park Ave	2010			8,998 NB
Hunting Park Ave	2010			9,399 SB
Whitaker Ave	2010			17,684
Whitaker Ave	2009			6,475
Whitaker Ave	2011	124	184	
Whitaker Ave	2001			10,474
Whitaker Ave	2006			19,370
Whitaker Ave	2006			6,577
Whitaker Ave	2002			6,853
Whitaker Ave	2006			13,492
Whitaker Ave	2002			2,297
Whitaker Ave	2006			11,698
Whitaker Ave	2007			2,786 SB
Whitaker Ave	2007			1,779 NB
Whitaker Ave	2006			17,629
Whitaker Ave	2006			1,702 NB
Whitaker Ave	2006			1,503 SB
Whitaker Ave	2007			2,786 SB
Whitaker Ave	2007			1,779 NB
Whitaker Ave	2006			17,629
Whitaker Ave	2006			1,702 NB
Whitaker Ave	2006			1,503 SB
Whitaker Ave	2007			2,786 SB
Whitaker Ave	2007			1,779 NB
Whitaker Ave	2006			17,629
Whitaker Ave	2006			1,702 NB
Whitaker Ave	2006			1,503 SB
Whitaker Ave	2007			2,786 SB
Whitaker Ave	2007			1,779 NB
Whitaker Ave	2006			17,629
Whitaker Ave	2006			1,702 NB
Whitaker Ave	2006			1,503 SB
Whitaker Ave	2007			2,786 SB
Whitaker Ave	2007			1,779 NB
Whitaker Ave	2006			17,629
Whitaker Ave	2006			1,702 NB
Whitaker Ave	2006			1,503 SB
Whitaker Ave	2007			2,786 SB
Whitaker Ave	2007			1,779 NB
Whitaker Ave	2006			17,629
Whitaker Ave	2006			1,702 NB
Whitaker Ave	2006			1,503 SB
Whitaker Ave	2007			2,786 SB
Whitaker Ave	2007			1,779 NB
Whitaker Ave	2006			17,629
Whitaker Ave	2006			1,702 NB
Whitaker Ave	2006			1,503 SB
Whitaker Ave	2007			2,786 SB
Whitaker Ave	2007			1,779 NB
Whitaker Ave	2006			17,629
Whitaker Ave	2006			1,702 NB
Whitaker Ave	2006			1,503 SB
Whitaker Ave	2007			2,786 SB
Whitaker Ave	2007			1,779 NB
Whitaker Ave	2006			17,629
Whitaker Ave	2006			1,702 NB
Whitaker Ave	2006			1,503 SB
Whitaker Ave	2007			2,786 SB
Whitaker Ave	2007			1,779 NB
Whitaker Ave	2006			17,629
Whitaker Ave	2006			1,702 NB
Whitaker Ave	2006			1,503 SB
Whitaker Ave	2007			2,786 SB
Whitaker Ave	2007			1,779 NB
Whitaker Ave	2006			17,629
Whitaker Ave	2006			1,702 NB
Whitaker Ave	2006			1,503 SB
Whitaker Ave	2007			2,786 SB
Whitaker Ave	2007			1,779 NB
Whitaker Ave	2006			

Figure 4: G Street Transit Network



G Street Corridor-wide Crash Findings

The analysis used for the G Street RSA was based primarily on reportable crashes and, to a lesser extent, those classified as non-reportable. Reportable crashes result in a fatality or injury, or at minimum require that a vehicle be towed from the scene. This section covers reportable crashes; non-reportable crash data is covered in a subsequent section. Associated tables and data summaries are available in Appendix B.

Chronology

According to PennDOT's CDART crash database, there were 97 reportable crashes during the five-year analysis period of 2006–2010 (see Table 2). Crash totals fluctuated by year with a low of 11 in 2008 and a high of 30 in 2007, with no clear trend during the analysis period.

Table 2: G Street Crashes by Year

Year	Crashes	Percent of Total
2006	16	16%
2007	30	32%
2008	11	11%
2009	25	26%
2010	15	15%
Total	97	

Source: PennDOT, 2013

Examining concentrations by month over the five-year period, the total ranged between a low of four crashes in August and a high of 12 crashes in September, with an average of eight per month: no measureable trend was identified. By day of week, crash totals were also fairly evenly distributed. Mondays, Tuesdays, and Wednesdays each had 12 percent of the crash total. The low of eight percent was recorded on Saturdays. Fridays saw the most crashes with 22 percent, with Sundays and Thursdays in close second with 15 percent each. The remaining days of the week had between 11 and 14 percent each. Regarding hour of the day, 43 percent of the crashes occurred from 3 PM to 8 PM, with a peak of nine crashes recorded in the 5 PM hour. This trend coincides with the afternoon peak travel period. Please note that six percent of the crash records were missing time of day information.

Severity

Regarding severity, there were three fatal crashes that killed three people, 91 injury crashes injuring 159 people, and only three property-damage-only (PDO) crashes (see Table 3). One of the three people killed was a pedestrian, and all three fatal crashes occurred within the three-block span between Luzerne and Bristol Streets (approximately 2,000 feet). Forty-eight percent of those injured suffered minor injuries—the predominant injury level reported, followed by 37 percent categorized as “unknown severity.”

Table 3: G Street Crash Severity Level and Injury Severity Level for People Injured

Crash Severity Level	Number of Crashes	People Injured
Fatal	3	3
Major	5	7
Moderate	13	14
Minor	44	69
Unknown Injury	29	66
PDO	3	0
Total	97	159

Source: PennDOT, 2013

Collision Type

Table 4 summarizes crash distribution by collision type. The three highest collision type concentrations were right-angle (29 percent), pedestrian (23 percent), and rear-end (18 percent). Rear-end and right-angle crashes can be common in urban corridors having a high density of intersecting side-streets, which become points of conflict as drivers enter and exit the roadway. This influences crash location: fifty-three percent occurred at four-way intersections and 22 percent occurred at T-intersections, equaling 75 percent of the crash total. The density of on-street parking along most of the corridor may impede the line of sight for motorists making turns to and from G Street. Although pedestrian crashes are typically higher in urban neighborhoods, the sight-distance problems created by on-street parking may also complicate pedestrian crossings.

Table 4: G Street Collision Type

Collision Type	Count	Percentage
Angle	28	29%
Hit-Pedestrian	22	23%
Rear End	17	18%
Head On	8	8%
Sideswipe (Same Direction)	8	8%
Sideswipe (Opposite Direction)	6	6%
Hit-Fixed-Object	5	5%
Backing	2	2%
Non-Collision	1	1%

Source: PennDOT, 2013

Roadway Surface and Lighting Conditions

Seventy-nine percent of the corridor-wide crashes occurred on dry road surface conditions, 18 percent on wet surface, and the remainder on snowy or icy surface conditions (see Table 5). This distribution suggests that road surface was not a significant factor.

Light condition is less typical in that only 53 percent of the total occurred during daylight conditions, and 38 percent occurred at night with street lights on. This distribution suggested that lack of proper lighting may be a contributing factor as typically 75 percent or more of all crashes happen during daylight conditions.

Table 5: G Street Road Surface and Illumination

Category		Crashes	Percentage
Road Surface	Dry	77	79%
	Wet	17	18%
	Snowy	1	1%
	Ice	1	1%
	Unknown	1	1%
Illumination	Daylight	51	53%
	Street Lights	37	38%
	Dawn	3	3%
	Dusk	2	2%
	Other	2	2%
	Dark	1	1%
	Unknown Lighting	1	1%

Source: PennDOT, 2013

Corridor-wide Summary

Table 6 highlights useful data findings from the corridor-wide analysis. Over the five-year study period, crash totals did fluctuate, but they remained mostly steady, as did pedestrian crashes.

Table 6: G Street Corridor-wide Reportable Crash Statistics Summary

Issue	G Street
Crash Severity	Three fatal crashes/three people killed
Five-year crash trend ('06-'10)	Steady
Highest crash months	September, December
Highest crash day	Friday
Time of day concentration	PM rush hour
Collision type overrepresentations	Angle, Hit-Pedestrian, Rear-end
Surface condition and illumination	79% dry/39% nighttime
Noteworthy pre-crash actions	"Running red light"

Source: PennDOT, 2013

Non-Reportable Crashes

Non-reportable crashes result in no injuries—only property damage—with no vehicles requiring towing from the scene. The DVRPC received non-reportable crash data for years 2006–2010 from the City of Philadelphia Streets Department in spreadsheet format. Because this data lacked point location information and was instead aggregated to multiple-block subsets, only summary information could be gleaned (see Appendix B for the corresponding map). This data helped identify places of high activity, which correlated consistently with reportable crash concentration areas. The most useful finding was that non-reportable crashes were most common in the most densely populated corridor sections.

Other findings from the non-reportable crash data are listed next.

- ▶ When combined with reportable crashes, non-reportable crashes account for between 79 and 90 percent of the total;
- ▶ 596 non-reportable crashes were recorded averaging 119 per year;
- ▶ Highest concentration: Kensington Avenue to E. Westmoreland Avenue (approximately 1,100 feet) = 27 percent of all non-reportable crashes (area of higher development density);
- ▶ Lowest concentration: Ramona Avenue to E. Wyoming Avenue (approximately 1,500 feet) = 10 percent of all non-reportable crashes (area of lower development density).

Pedestrian and Bicyclist Crashes

Although the primary focus of this road safety audit was not pedestrian and bicyclist crashes, the neighborhoods of North Philadelphia experience a high level of walking and biking due to the urban context and the availability of several easily accessible mass transit options. Thus, the G Street RSA team considered safety from both the pedestrian and bicyclist perspectives in all three components of the audit process concentrating on the condition of the walking and bicycling environments, and the location and circumstances of each such crash. See Figure 5 for a map of pedestrian and bicyclist crash locations. For reference, this map also includes all fatal crashes, of which one was a pedestrian.

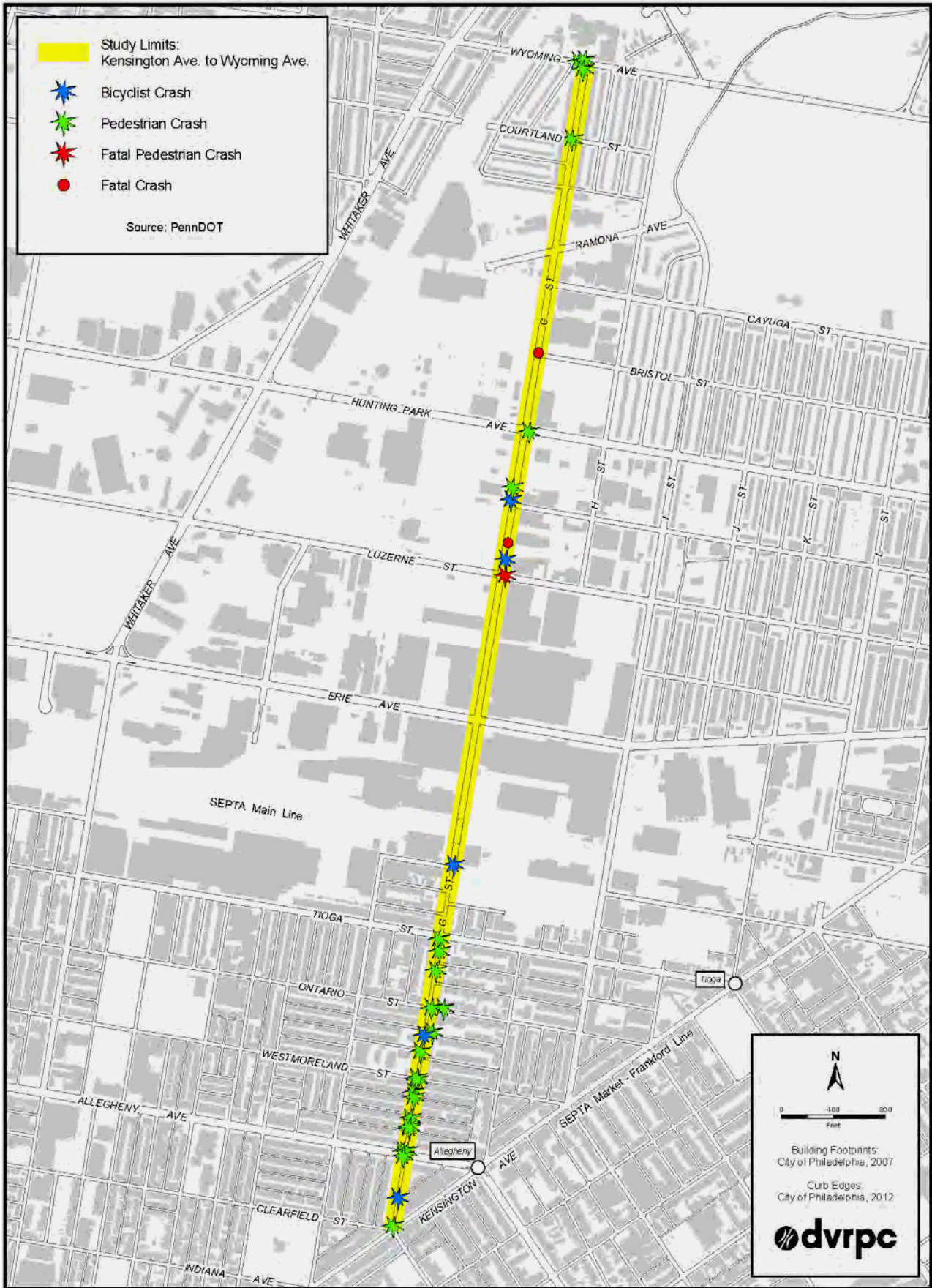
Pedestrian and Bicyclist Crash Statistics and Findings

There were 22 pedestrian crashes in the study corridor, representing 23 percent of the five-year total. These crashes, similar to the corridor-wide crash trend, have remained steady at about four per year, though a high of seven occurred in 2007, and a low of one was recorded in 2008. Of the total, one resulted in a fatality, one in a major injury, four moderate injuries, and 11 minor injuries (the remainders were in the “unknown” category). The following findings should be noted:

- ▶ 16 pedestrian crashes (73 percent) occurred within the 2,200-foot section between Kensington Avenue and Tioga Street—the most densely developed residential section on the corridor;
- ▶ 50 percent occurred under “dark-street lights” condition.

Regarding bicyclist crash statistics and findings, there were five crashes, representing five percent of the five-year total. This small data set makes it difficult to identify crash trends. Of the five bicyclist crashes, no fatalities, one moderate injury, and three minor injuries were recorded. The remainders were categorized as “unknown severity.” The walkable and bike-able context of the study corridor, combined with the pedestrian and bicyclist crash data, builds on the ped/bike volume data presented earlier. This is further evidence of the need for improvements that support walking, biking, and access to transit.

Figure 5: G Street Bicyclist, Pedestrian, and Fatal Crashes 2006–2010



Findings and Recommendations

The following section summarizes the findings, potential strategies, and priorities of the G Street RSA. The table for each section shows site-specific safety issues and corresponding potential strategies, general ratings for difficulty to implement, proposed safety benefits, and responsible agency. An aerial map indicating the relative location of each identified issue (where possible) follows each table.

DVRPC uses the following general descriptions to characterize each of the three ratings associated with the “difficulty to implement” category:

- Low—can be accomplished through maintenance;
- Medium—requires use of existing or new contract and some engineering, funding may be readily available; and
- High—longer-term project, may need full engineering, and may require right-of-way acquisition and new funding.

The following abbreviations are used in the tables: SB—southbound, NB—northbound, WS—west side, ES—east side, NS—north side, SS—south side, SW—southwest, SE—southeast, TBD—to be determined, ADA—Americans with Disabilities Act, RRFB—Rectangular Rapid Flashing Beacon, HAWK—High-intensity Activated cross-Walk beacon.

Yellow highlighting identifies those issues that have a low rating for difficulty to implement. These improvements can typically be addressed through maintenance, or without beginning a new planning or engineering effort. Note that potential strategies that call for further study do have a safety benefit in that they are the next step toward a more detailed and appropriate safety improvement. Given fiscal constraints, recommendations may be considered one at a time or in small groups.

Being both the roadway owner and a member of the audit team, the Philadelphia Streets Department can use the findings of the RSA as a guide for designing improvements to address the identified issues. Although the findings are numerous, their experience in safety engineering and priority-setting will determine which issues from the tables will yield the highest safety benefit given limited funds.

Audit Team Priorities

The audit process provides an opportunity for the audit team members to advocate for what they consider the single most important issue resulting from the audit. These items are important because they are endorsed by individuals who spent the day familiarizing themselves with the corridor’s statistics, listening to the perspectives of the local participants including local police, and experiencing the issues firsthand having walked the entire corridor during the field visit. The roadway owner is encouraged to consider these items both in follow-up maintenance work, and to give them a high priority when doing long-term planning for the corridor. Improvement specifics are detailed in the issues and strategies table:

- ▶ Repave the corridor;
- ▶ Replace and or upgrade all signs where needed, re-strip or add new striping for centerline, edge line, stop bars, shoulders, and crosswalks where needed and coordinate with repaving;
- ▶ Re-establish the no parking boxes and bus zones and coordinate with SEPTA and the police department to enforce the restrictions;

- ▶ Address all identified issues in the section from Kensington Avenue to Venango Street, including relevant corridor-wide issues;
- ▶ Address Lycoming Street shopping center access issues;
- ▶ Revisit Luzerne Street intersection;
- ▶ Revisit Wyoming Avenue intersection.

Priority Recommendations

As mentioned above, items on the following tables highlighted in yellow have a low rating for difficulty to implement and a high safety benefit, and they are often addressed through maintenance. It is these items that should be implemented first, and they are also the items identified as a priority by the audit team, including repaving the corridor and re-establishing all striping and roadway markings.

The Conclusion section of this report includes the Road Owner Response. This is the Philadelphia Streets Department's acknowledgment of the audit findings, and their proposed actions. They have indicated that they will add missing signs, address needed signal timing changes, and add new signal heads where needed.

Figure 6: Panel 1 (G Street: Kensington Avenue to Allegheny Avenue)

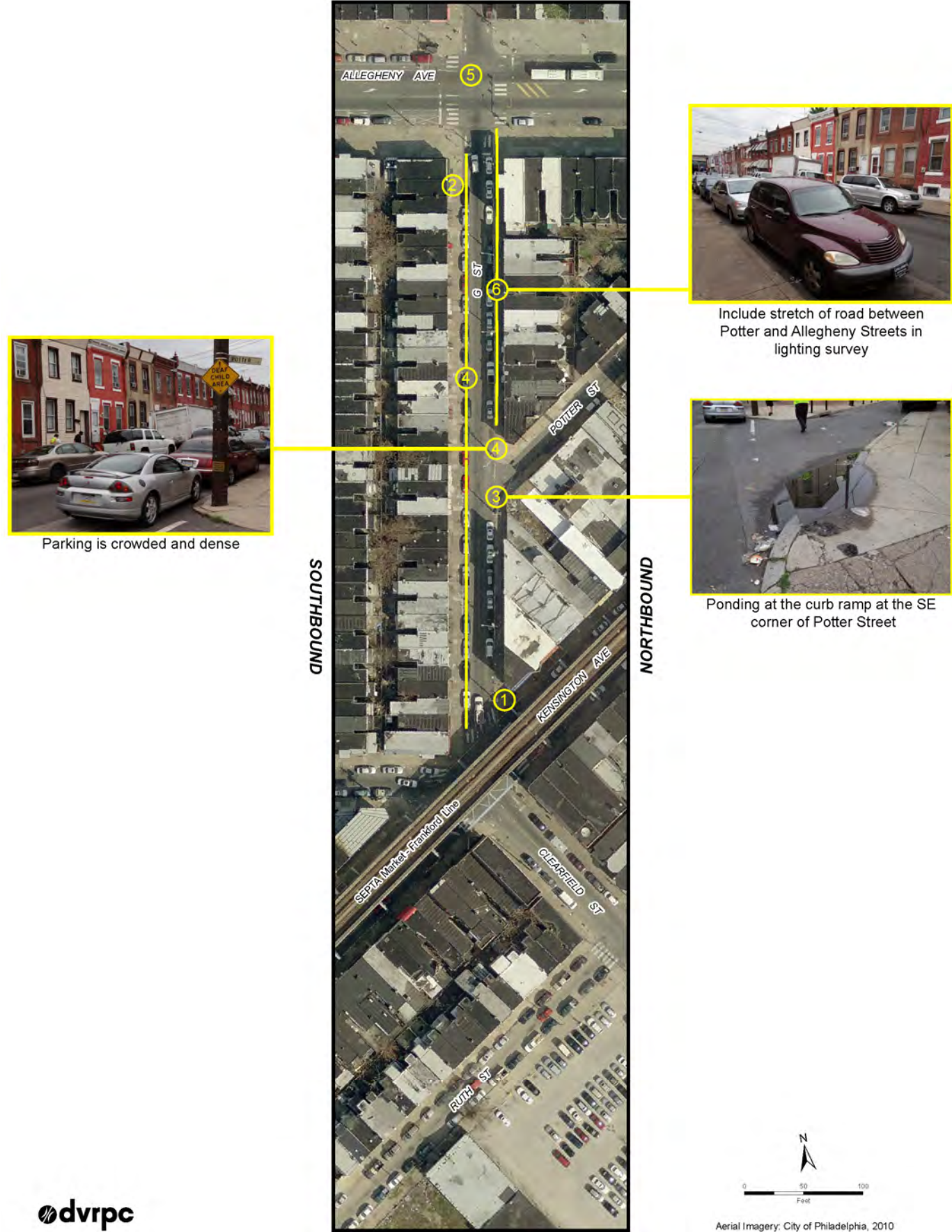


Table 7: Panel 1 (G Street: Kensington Avenue to Allegheny Avenue)

Site-specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 1 1. At Kensington, NE side of G St., pedestrian head is obstructed by MFL column;	1. Relocate pedestrian signal head;	Low	Medium	Streets Department
2. At 3164 G St. (WS of G St.) there is a sign post with missing sign;	2. Add missing sign;	Low	High	Streets Department
3. Ponding at the curb ramp at the SE corner of Potter St.;	3. Address during scheduled repaving;	Medium	Medium	Streets Department
4. Parking is crowded and dense;	4. Evaluate the need for parking restrictions;	High	TBD	Streets Department
5. The team expressed concerns about the safety of the permissive left-turn from EB Allegheny Ave. to NB G St.;	5. Review the Allegheny RSA for a consistent improvement recommendation, check the improvement slated for this intersection (currently in design phase);	Low	TBD	Streets Department
6. Include the stretch of road between Potter and Allegheny Streets in lighting survey.	6. Conduct lighting investigation.	Low	TBD	Streets Department

Source: DVRPC, 2013

Figure 7: Panel 2 (G Street: Hilton Street to Thayer Street)



Table 8: Panel 2 (G Street: Hilton Street to Thayer Street)

Site-specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 2 1. Crossing over G St. at Thayer St., there is a missing pedestrian crossing sign on WS of G St., and a missing "no parking box" on the WS approaching the crosswalk; 2. At Westmoreland Ave., the "No Turn on Red" signs (possibly other signs also) are too low; 3. Distance between controlled crossing opportunities is too long (from Allegheny Ave. to Westmoreland Ave.); 4. Post-mounted signals and school zone flashers are somewhat difficult for motorists to see.	1. Replace sign, re-stripe "no parking box"; 2. Check sign height, make code compliant; 3. Conduct study to identify an appropriate location midway between controlled crossings on G St. for a striped and ramped crossing; 4. Evaluate location of signals and signs to improve visibility.	Low Low Medium Medium	High Medium TBD TBD	Streets Department Streets Department Streets Department Streets Department

Source: DVRPC, 2013

Figure 8: Panel 3 (G Street: Ontario Street to Kingston Street)



Table 9: Panel 3 (G Street: Ontario Street to Kingston Street)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 3 1. A fence is encroaching the sidewalk on NW corner of G and Tioga Streets;	1. Enforce code violation;	Medium	High	Philadelphia Police
2. The bus zone at G and Tioga Streets has insufficient signing & markings (missing bus stop boxes);	2. Add proper signs and re-stripe the bus stop boxes;	Low	High	Streets Department
3. The pedestrian signal head on the SW corner of G and Tioga Streets is twisted, and signal head visor is missing;	3. Realign signal head and replace missing signal visor;	Low	Medium	Streets Department
4. On the SW corner of G and Tioga (EB) the "no through truck" sign is graffitied and now illegible;	4. Clean or replace defaced sign;	Low	High	Streets Department
5. The NE corner of G and Tioga Streets is missing a "no parking sign" to accommodate bus turns (same issue at Allegheny St);	5. Replace missing sign;	Low	High	Streets Department
6. Missing ADA ramps & crosswalks throughout panel;	6. Re-stripe crosswalks, consider replacing missing ramps during repaving;	Low /Medium	Medium	Streets Department
7. Missing no parking boxes throughout panel;	7. Re-stripe missing no parking boxes;	Low	High	Streets Department
8. The EB approach of Ontario St. has new pavement but new pavement markings not yet in place;	8. Install missing pavement markings;	Low	High	Streets Department
9. At Atlantic St. the approach to the playground on G St. is not marked (missing playground signage);	9. Install missing signs;	Low	High	Streets Department
10. At G and Ontario Streets the residents noted conflicts between students and drivers at around 3PM on school days;	10. Increase patrol coverage;	Medium	High	Philadelphia Police
11. There are no bike-safe inlet grates at Atlantic and G Streets (also clogged), or at G and Schiller Streets;	11. Replace drainage inlets during scheduled repaving;	Medium	High	Streets Department
12. There was no "end school zone" sign or markings for school zone that started at G and Thayer Streets.	12. Replace missing school zone sign.	Low	High	Streets Department

Source: DVRPC, 2013

Figure 9: Panel 4 (G Street: Kingston Street north over the train tracks)

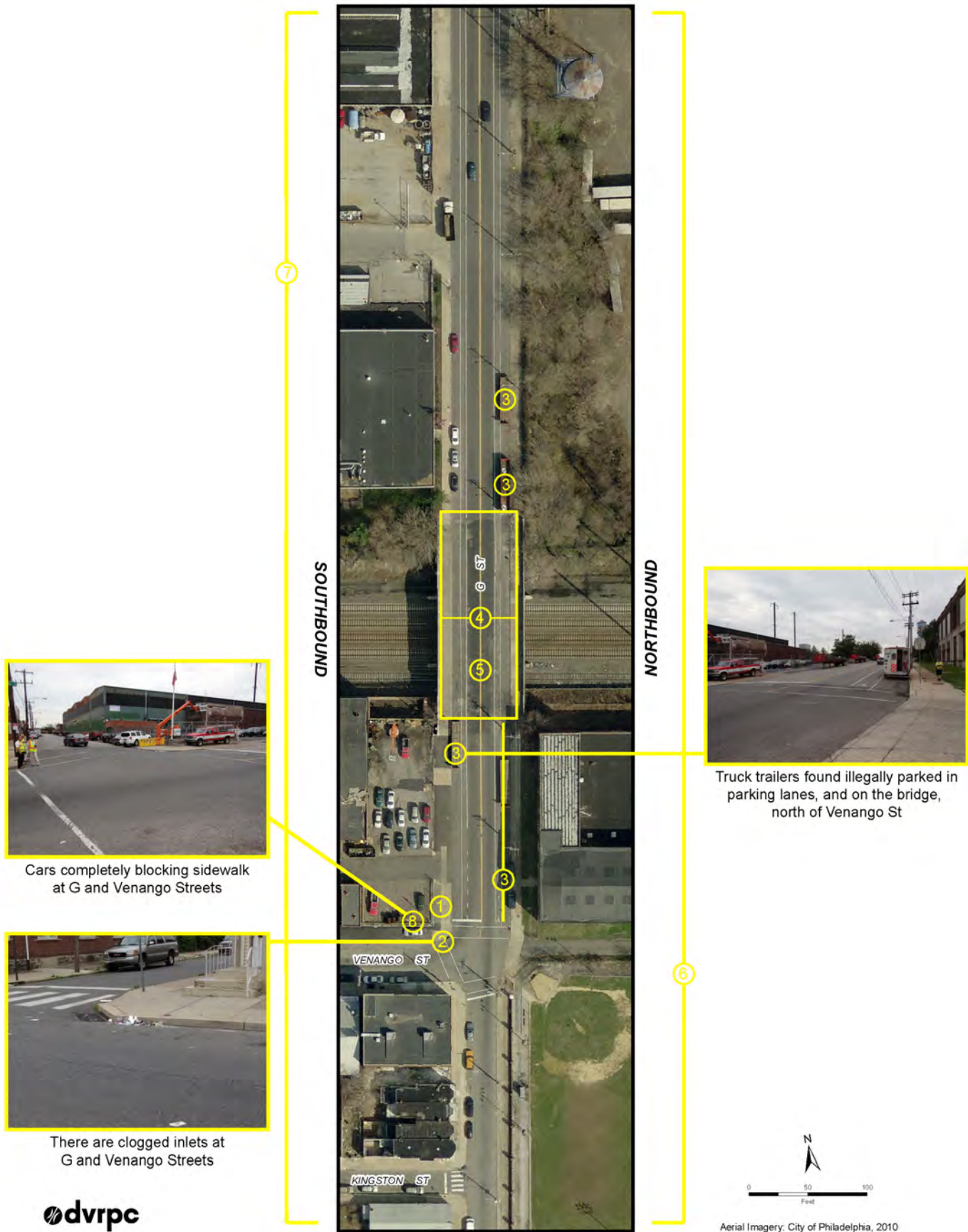


Table 10: Panel 4 (G Street: Kingston Street north over the train tracks)

Site-specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 4				
1. Missing playground sign in the SB direction of G St. in advance of playground;	1. Install missing playground sign;	Low	High	Streets Department
2. There are clogged inlets at G and Venango Streets;	2. Clean out inlets during regular maintenance;	Low	Medium	Streets Department
3. Truck trailers found illegally parked in parking lanes, and on the bridge, north of Venango St.;	3. Enforce parking restrictions;	Medium	High	Philadelphia Police
4. Pavement on the bridge deck is in very poor condition – rutted, holes, undulation;	4. Will be addressed during scheduled repaving;	Medium	High	Streets Department
5. The RSA team noted at least two (possibly overweight) trucks crossing a 25T weight restricted G St bridge (over Amtrak line) (reported that Coca Cola trucks violate this frequently);	5. Enforce truck restrictions;	Medium	High	Philadelphia Police
6. Trash and drainage issues prevalent intermittently throughout;	6. Work with private property owner to perform needed maintenance;	Medium	Medium	City of Philadelphia
7. Deteriorating sidewalk blocks and overgrown vegetation on the sidewalks;	7. Work with private property owner to perform needed maintenance;	Medium	Medium	City of Philadelphia
8. Cars completely blocking sidewalk at G and Venango Streets.	8. Enforce parking restrictions.	Medium	High	Philadelphia Police

Source: DVRPC, 2013

Figure 10: Panel 5 (G Street: Vicinity of Erie Avenue Intersection)

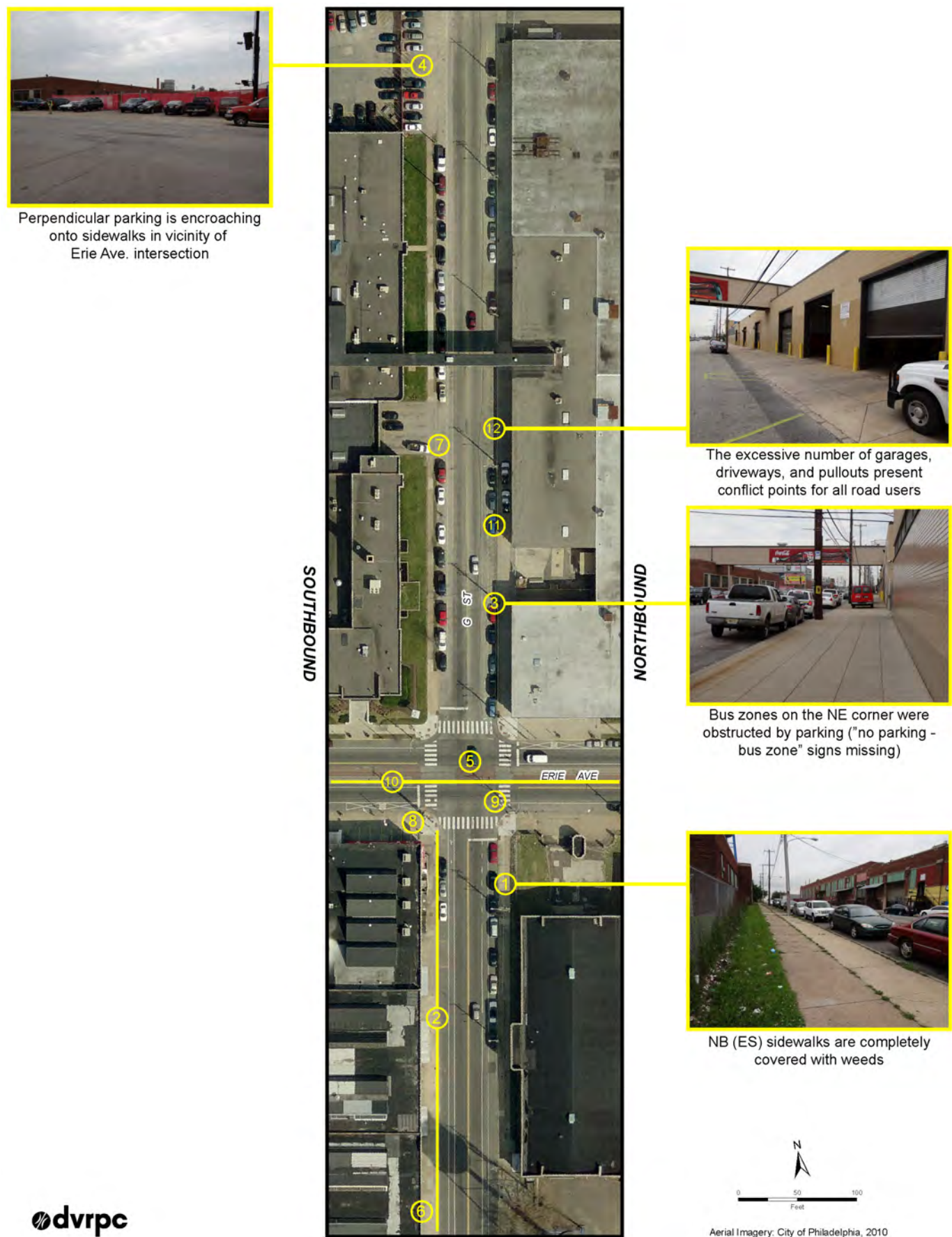


Table 11: Panel 5 (G Street: Vicinity of Erie Avenue Intersection)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 5				
1. NB (ES) sidewalks are completely covered with weeds;	1. Work with private property owner to perform needed maintenance;	Medium	Medium	City of Philadelphia
2. Bike legends were missing (except at intersections) between Venango St. and Erie Ave.;	2. Check MUTCD for guidance on required distance between legends; install as appropriate;	Low	High	Streets Department
3. Bus zones on the NE corner were obstructed by parking ("no parking – bus zone" signs missing);	3. Install missing signs;	Low	High	Streets Department
4. Perpendicular parking is encroaching onto sidewalks in vicinity of Erie Ave. intersection (and into Panel 6), parallel parked vehicles were on the sidewalk in this area as well;	4. Enforce parking laws and regulations;	Low	High	Philadelphia Police
5. The Erie intersection upgrade project is in design. This will include traffic signal mast arms, ped heads, striping, etc. - check with Streets Department;	5. Consult with City of Philadelphia on the details of the Erie Ave. project and ensure coordination;	Low	High	Streets Department
6. Missing 25T weight restriction signs for G St heading SB;	6. Install missing signs;	Low	High	Streets Department
7. The Coca Cola curb cut and apron are paved over creating a vertical obstruction for pedestrians;	7. Create appropriate access during scheduled repaving;	Medium	Medium	Streets Department
8. On Erie Ave. heading EB turning right onto G St., poles are obstructing view of the pedestrian crossing (SW corner);	8. Conduct follow-up field investigation to measure problem and identify improvement;	Low	TDB	Streets Department
9. Erie Ave. had questionable pedestrian crossing times, possibly insufficient for crossing Erie Ave. from G St.;	9. Investigate the signal timings and check the pedestrian phase length (compare to new MUTCD standard) and adjust as needed;	Low	TBD	Streets Department
10. The trolley tracks on Erie Ave. present a potential safety concern for bicyclists and people in wheelchairs;	10. Consult with City of Philadelphia and PennDOT on the long term plan for this currently unused infrastructure;	Low	TDB	Streets Department
11. 30 MPH speed sign is posted (as beginning) north of Erie Ave. but no other signs are present;	11. Install signs as appropriate (the maximum distance between speed signs for legal enforcement is one half mile as per PA Title 75);	Low	Medium	Streets Department
12. The excessive number of garages, driveways, and pullouts present conflict points for all road users.	12. Develop an access management plan and work with private property owners to implement.	High	High	Streets Department

Source: DVRPC, 2013

Figure 11: Panel 6 (G Street: Vicinity of Luzerne Avenue Intersection)

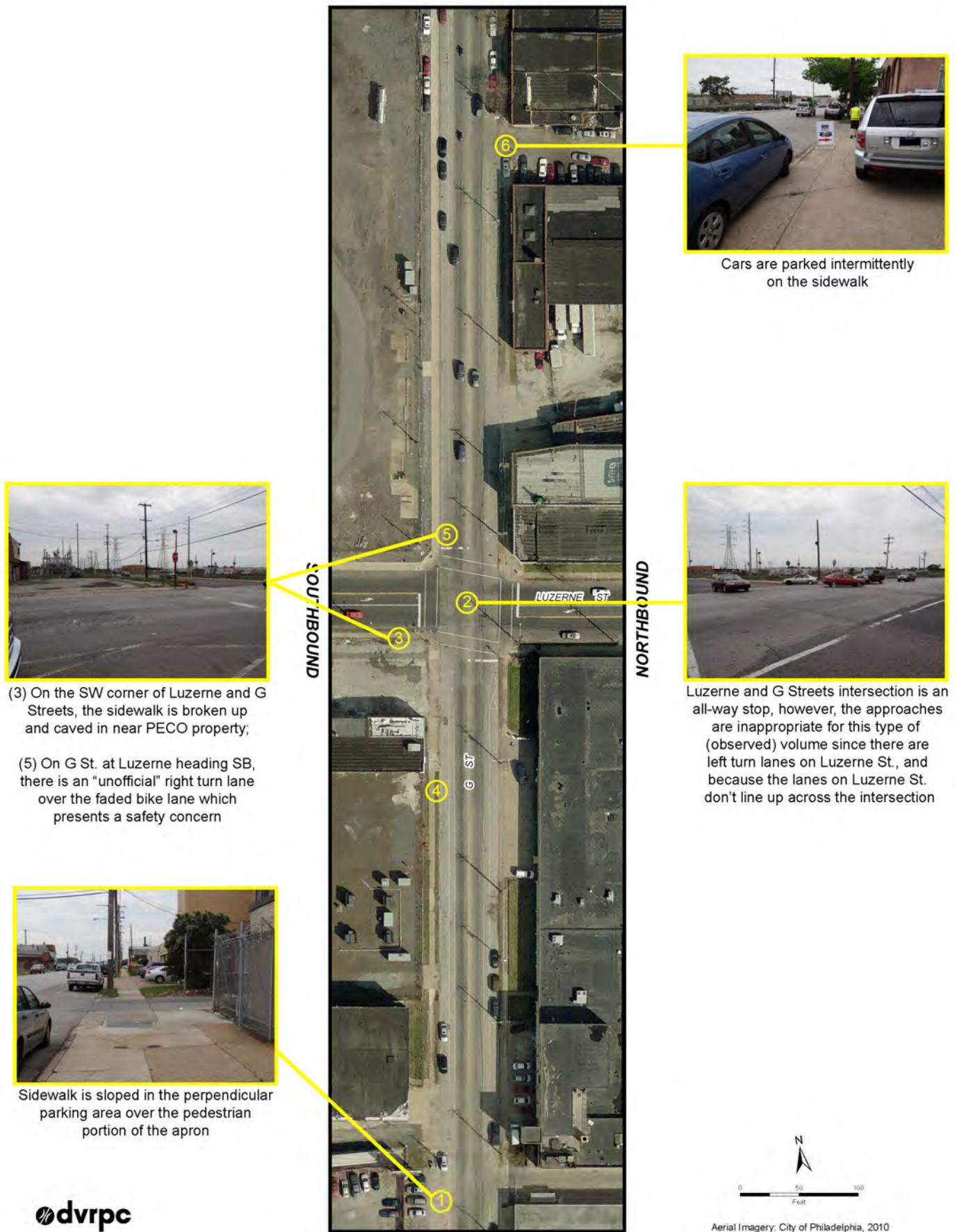


Table 12: Panel 6 (G Street: Vicinity of Luzerne Avenue Intersection)

Site-specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 6 1. Sidewalk is sloped in the perpendicular parking area over the pedestrian portion of the apron; 2. Luzerne and G Streets intersection is an all-way stop, however, the approaches are inappropriate for this type of (observed) volume since there are left turn lanes on Luzerne St., and because the lanes on Luzerne St. don't line up across the intersection; 3. On the SW corner of Luzerne and G Streets, the sidewalk is broken up and caved in near PECO property; 4. The sidewalk is severely heaved adjacent to PECO property on WS of G St.; 5. On G St. at Luzerne heading SB, there is an "unofficial" right turn lane over the faded bike lane which presents a safety concern; and the lanes do not line up across the intersection; 6. Cars are parked intermittently on the sidewalk.	1. Create appropriate access during scheduled repaving; 2. Short-term: realign lanes with new pavement markings and signage, Long term: Recommend signal warrant analysis and install bump outs at this location (consider a roundabout); 3. Work with private property owner to repair as needed; 4. Work with private property owner to repair as needed; 5. Conduct a full intersection evaluation (warrant analysis and turning movement evaluation); 6. Enforce parking restrictions.	Medium LT: Medium/ ST: Low Medium Medium Medium Medium	Medium LT: High/ ST: High High Medium Medium TBD High	Streets Department Streets Department City of Philadelphia City of Philadelphia Streets Department Philadelphia Police

Source: DVRPC, 2013

Figure 12: Panel 7 (G Street: Lycoming Street to Hunting Park Avenue)

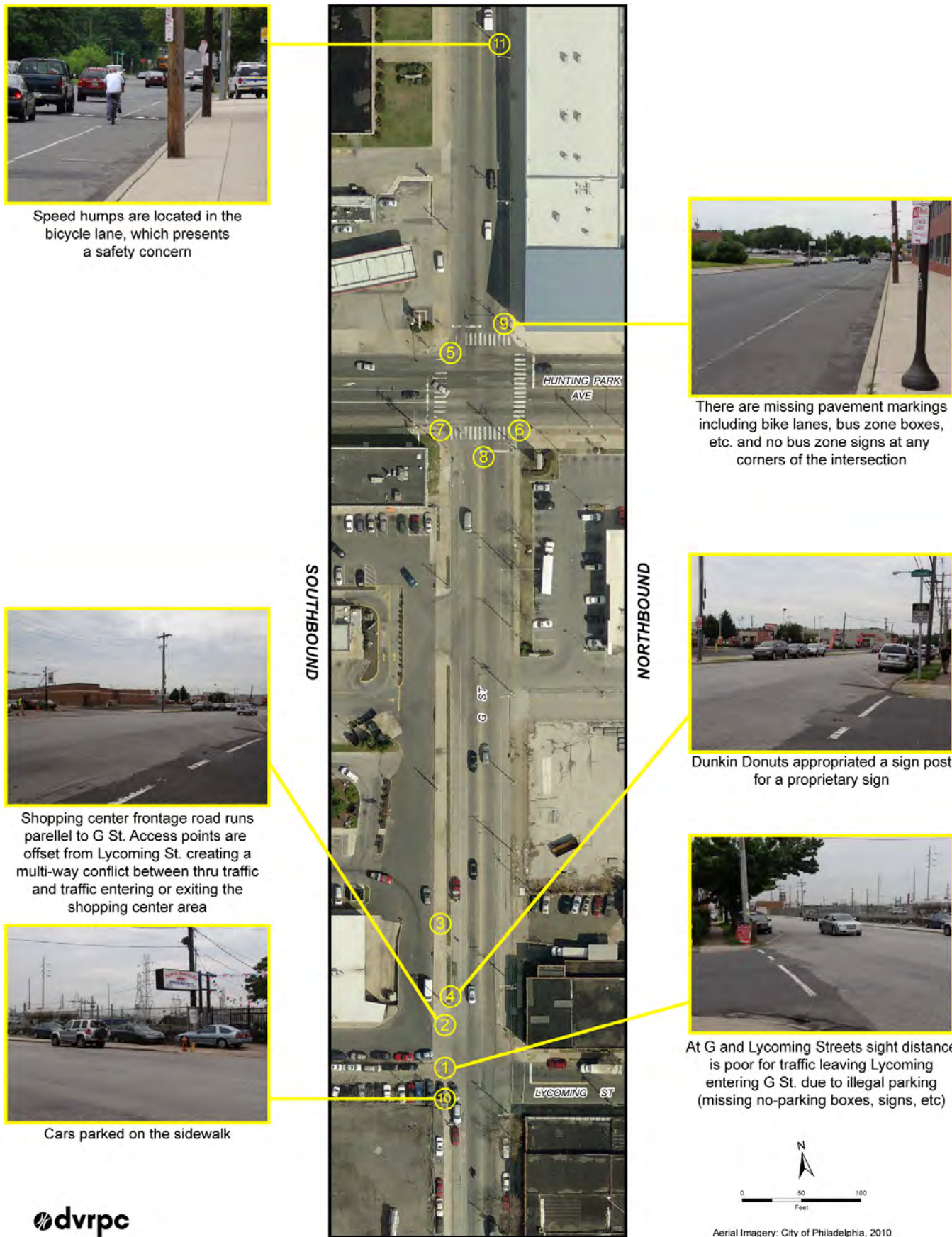


Table 13: Panel 7 (G Street: Lycoming Street to Hunting Park Avenue)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 7 1. At G and Lycoming Streets sight distance is poor for traffic leaving Lycoming entering G St. due to illegal parking (missing no-parking boxes, signs, etc.); 2. Shopping center frontage road runs parallel to G St. between Hunting Park Ave. and Lycoming St. on the WS of G St.; access points are offset from Lycoming St. creating a multi-way conflict between thru traffic and traffic entering or exiting the shopping center area; 3. There is a missing cover in the sidewalk for what seems to be a water meter just NW of Lycoming and G Streets (WS); 4. Dunkin Donuts appropriated a sign post for a proprietary sign, approximately 150 feet N of Lycoming St. on the WS G St.; 5. Hunting Park Ave. and G Streets does not have up-to-date ADA ramps; 6. Ponding on the SE corner Hunting Park Ave. intersection; 7. Pot holes and poor pavement condition on the SW corner of Hunting Park Ave.; 8. Irresponsible driving patterns were observed (passing on right) due to missing left turn lane storage at Hunting Park Ave., not enough time is given for queued traffic turning left at Hunting Park Ave.;	1. Re-stripe boxes, replace signs; 2. Consider access management changes to relocate the access points to better fit with existing side streets along NB G St. for improved traffic flow and sight distance – implement during scheduled repaving; 3. Replace missing cover; 4. Enforce sign code; 5. Replace ADA ramps with code compliant ramps during scheduled paving; 6. Address drainage issue during scheduled repaving; 7. Repair potholes during scheduled repaving; 8. Short Term: Increase enforcement, Long Term: evaluate need for dedicated left turn lane;	Low Medium Low Medium Low Low ST/LT: Medium	High High Medium Medium High Medium Medium ST/LT: High	Streets Department Streets Department Streets Department Philadelphia Police Streets Department Streets Department Streets Department Philadelphia Police/Streets Department
9. There are missing pavement markings including bike lanes, bus zone boxes, etc. and no bus zone signs at any corners of the intersection; 10. Cars parked on the sidewalk; 11. Speed humps are located in the bicycle lane, which presents a safety concern.	9. Re-stripe all missing pavement markings and add needed signs; 10. Enforce parking restrictions; 11. Evaluate speed hump placement.	Low Medium Low	High TBD Medium	Streets Department Philadelphia Police Streets Department

Source: DVRPC, 2013

Figure 13: Panel 8 (G Street: Bristol Street to Cayuga Street)

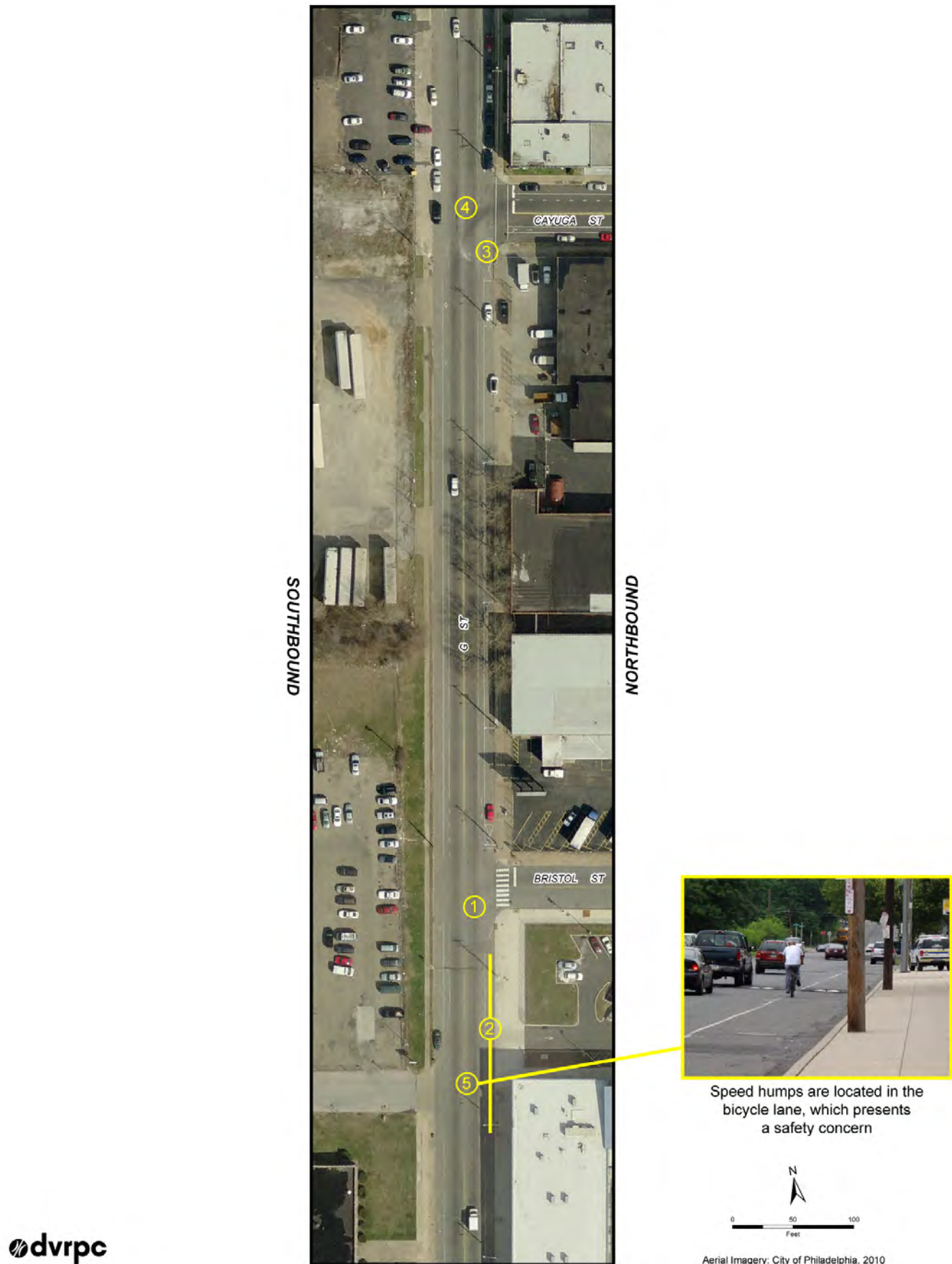


Table 14: Panel 8 (G Street: Bristol Street to Cayuga Street)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 8				
1. There are faded pavement markings at Bristol and G Streets;	1. Re-stripe pavement markings;	Low	High	Streets Department
2. There is a significant double parking problem with kids being dropped off and picked up at the school (just south of Bristol St. on the east side);	2. Conduct further analysis to determine extent of problem and workable solutions;	Medium	TBD	Streets Department
3. Similar to Lycoming St. intersection, sight distance is obstructed at the intersection for traffic entering G St.;	3. Restrict parking and use the dotted paint marking for the edge of travel and bike lane so motorists know where to position their vehicle before pulling out (consider this treatment as a systematic approach for all applicable intersections);	Medium	High	Streets Department
4. There are faded pavement markings at Cayuga and G Streets;	4. Re-stripe pavement markings;	Low	High	Streets Department
5. Speed humps are located in the bicycle lane, which presents a safety concern.	5. Evaluate speed hump placement.	Medium	High	Streets Department

Source: DVRPC, 2013

Figure 14: Panel 9 (G Street: Ramona Avenue to Cortland Street)



Table 15: Panel 9 (G Street: Ramona Avenue to Cortland Street)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 9 1. Narrow sidewalks have intermittent deterioration and are obstructed by trees; 2. All striping is faded.	1. Work with private property owner to repair as needed; 2. Re-stripe pavement markings.	Medium Low	Medium High	City of Philadelphia Streets Department

Source: DVRPC, 2013

SOUTHBOUND

NORTHBOUND

WYOMING AVE

REACH ST

G ST

COURTLAND ST

1

2

3

4

5

6

Car parked on sidewalk at intersection on SW corner

All turns from G St. to Wyoming St. conflict with pedestrian crossings over Wyoming St.; missing pedestrian countdown signals and/or better pedestrian crossing accommodations; crosswalk striping faded; stop bars faded

Permitted right turns on red from and to G St. present a safety concern for crossing pedestrians, and for bicyclists (pedestrian crashes were recorded here)

0 50 100 Feet

Aerial Imagery: City of Philadelphia, 2010

Table 16: Panel 10 (G Street: Cortland Street to Wyoming Avenue)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 10 1. Permitted right turns on red from and to G St., present a safety concern for crossing pedestrians, and for bicyclists (pedestrian crashes were recorded here) ; 2. All turns from G St. to Wyoming St. conflict with pedestrian crossings over Wyoming St.; missing pedestrian countdown signals and/or better pedestrian crossing accommodations; crosswalk striping faded; stop bars faded; 3. There are heavy left turns from WB Wyoming St. and from NB G St. which present a safety concern for pedestrians; 4. Car parked on sidewalk at intersection on SW corner; 5. Old sign post stub (tripping hazard), just south of signal pole on southwest corner; 6. There are missing utility covers in the sidewalk, specifically on the east side, just south of Wyoming St.	1. Conduct warrant analysis to test for prohibition of right turns on red, and implement change if warranted; 2. Study pedestrian crossing problem; install pedestrian heads for all crossings and restripe stop bar and crosswalks; 3. Conduct warrant analysis for dedicated left turn lanes (combine with #1), consider complete signal upgrade; 4. Enforce parking restrictions; 5. Remove stub; 6. Replace missing covers.	Medium Medium Medium Medium Low Low	TBD High High Medium Medium Medium	Streets Department Streets Department Streets Department Philadelphia Police Streets Department Streets Department

Source: DVRPC, 2013

Table 17: G Street Corridor-wide Issues and Strategies

Corridor-wide Issues	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
<ol style="list-style-type: none"> 1. Crosswalks are misaligned at several intersections; 2. Curbs deteriorated, missing, damaged; 3. Bike lanes and legend (north of Atlantic St.) are worn, faded, missing, check signage consistency; 4. Trash strewn street and sidewalks, and weed growth on private and city property; 5. Ponding found intermittently at curb ramps; 6. Drainage inlets: many clogged with trash/debris, and many not bicycle safe by design (see AASHTO for current design); 7. Lighting serves traffic but excludes some areas of sidewalks (night-time review recommended); 8. Sidewalks: <ol style="list-style-type: none"> a. Obstructed by parked vehicles b. Littered with trash c. Perpendicular parking near Luzerne on both sides d. Uneven, broken blocks, unrepaired sections e. Vegetation overgrown 9. One-way section: <ol style="list-style-type: none"> a. Only one set of one-way signs (check each that applies for compliance) b. Missing bike connection from Allegheny Ave. to Venango St. creates a network gap 10. Intersections are not properly cleared due to parked vehicles at non-signalized minor street intersections - this compromises sight distance for drivers and pedestrians; 11. Crosswalks over G St. are missing ramps at uncontrolled G St. approaches to minor street intersections (i.e. no stop on G St.); 	<ol style="list-style-type: none"> 1. Re-stripe crosswalks with proper orientation; 2. Repair or replace damage; 3. Re-stripe bike lanes, replace missing signs; 4. Public education, property owner responsibility; 5. Can be addressed during scheduled paving; 6. Perform regular maintenance to keep inlets free of blockages; upgrade to AASHTO design (possibly during scheduled paving); 7. Conduct a nighttime evaluation to determine extent of problem; 8. Sidewalks: <ol style="list-style-type: none"> a. Enforce parking restrictions b. Property owner education c. Enforce parking restrictions d. Property owner responsibility e. Clean up city properties during regular maintenance 9. One-way section: <ol style="list-style-type: none"> a. Add missing signs where needed b. Roadway is too narrow for the bike lane, consider sharrows where needed to close network gap; 10. Enforce parking laws/regulations; 11. Conduct study to evaluate adding crosswalks midway between signalized intersections; 	<ol style="list-style-type: none"> Low Medium Low Medium Low Low Low High Low Medium Medium 	<ol style="list-style-type: none"> High Medium High Low/Medium High High TBD High High High TBD 	<ol style="list-style-type: none"> Streets Department Streets Department Streets Department City of Philadelphia Streets Department Streets Department Streets Department Streets Department/ Philadelphia Police /City of Philadelphia Streets Department Streets Department Streets Department

Source: DVRPC, 2013

Corridor-wide Issues	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
12. Intermittent sign clutter;	12. Conduct a sign inventory (possibly during regular maintenance) to reduce sign clutter, and instruct and inform the travelling public to help with navigation and allow better enforcement of speed limits and ordinances;	Medium	High	Streets Department
13. Faded or missing striping for: a. Double yellow b. Crosswalks c. Stop bars d. Bus stops e. No parking boxes	13. Faded or missing striping a. a– e. Restripe all pavement markings and legends;	Low	High	Streets Department
14. Stop bar placement is inconsistent;	14. Conduct inventory of stop bars and re-stripe where needed;	Low	High	Streets Department
15. "No turn on red" signs need updating;	15. Update signs to meet standard;	Medium	High	Streets Department
16. Pavement condition: buckling, undulating, rutting, deteriorating, mostly found at intersection approaches in the two-way section;	16. Will be addressed during scheduled repaving;	Medium	High	Streets Department
17. Speeding noted, an especially important issue in the one-way section of G St	17. Conduct evaluation to determine appropriateness of traffic calming and enforcement at select locations.	Medium	Medium	Streets Department

Source: DVRPC, 2013

Kensington Avenue

Study Location

The study area consists of approximately 1.66 miles of Kensington Avenue, from the intersection of Front Street northeast to East Tioga Avenue, cutting the standard street grid diagonally. The study area is located within North Philadelphia in a predominately dense urban neighborhood. The frontage along the corridor is primarily commercial, with some residential uses. Kensington Avenue runs beneath SEPTA's Market-Frankford Elevated Line which has four stops along the study corridor. This is a unique corridor with excellent transit options and a perpetually active street life. Neighborhood revitalization is moving toward Kensington Avenue despite challenges such as poverty, as mentioned in the Environmental Justice evaluation.

Roadway Characteristics

Kensington Avenue is classified as a major collector and has a posted speed limit of 25 mph. It is a two-way street with a two-lane cross-section. In both directions, there are sidewalks and bike lanes, and the shoulders are reserved for on-street metered parking spaces, intermittent loading zones, and striped bus-stop zones. Kensington Avenue has 35 intersections in the study area: 23 unsignalized and 12 signalized. Of the 12 signalized intersections, 11 have a 5-leg configuration due to the diagonal orientation of Kensington Avenue. This situation presents additional safety considerations for pedestrians and for drivers making turning movements.

Figure 16: Kensington Avenue Study Area



Traffic Volumes

Existing AADT volumes were used for total vehicle movements, and turning movement counts were collected at one key intersection on the corridor where crashes are concentrated. Pedestrian and bicyclist movements were also counted for this RSA: three pedestrian count locations and three bicyclist count locations. All counts can be found in Figure 17: Traffic Volumes.

Total traffic volumes north of East Lehigh Avenue were approximately 12,500 vehicles per day on average (combined directions). South of East Lehigh Avenue, volumes decreased to approximately 10,000 vehicles per day on average.

Pedestrian volume in the southernmost section of the study area near East Cumberland Street was measured at approximately 1,500 people per direction per day. Near East Indiana Street, approximately 1,700 people per direction per day were measured—this is the highest pedestrian traffic recorded on the corridor. It is hard to say exactly why pedestrian traffic is higher here, since this location is between Market-Frankford Elevated Line (MFL) stations, although McPherson Park is located on this corner, which may generate additional foot traffic. Near East Tioga Street, pedestrian volumes dropped considerably: 1,042 people on the eastbound side and 472 people on the westbound side. This drop is somewhat inconsistent with other volumes on the corridor, especially given the proximity of Tioga Station. Total bicyclist volume near Huntingdon Street was 160, near East Indiana Street it was 211, and near East Tioga Street it was approximately 70.

Peak hour turning movement volumes were collected at one signalized intersection: Kensington Avenue at Lehigh Avenue. The identified AM peak hour was 7:30–8:30, with a total intersection volume of 2,557 vehicles. Of the two streets, Lehigh Avenue carries the majority of the volume through the intersection with more than twice the total vehicles on Kensington Avenue. The PM peak hour was 4:15–5:15 with 2,438 vehicles, very similar to the AM peak hour. The volume distribution again favored Lehigh Avenue, which carried over 1,700 vehicles through the intersection.

Transit Service

Transit service is frequent and varied in the Kensington Avenue corridor. The SEPTA 3 bus runs the length of Kensington Avenue through the study area (see Figure 18). Three other SEPTA buses run along segments of the corridor (39, 54, and 89 buses), and another crosses the study corridor. The 39 bus runs on Huntingdon and Cumberland Streets, and briefly on Kensington Avenue. The 54 bus runs on Lehigh, Somerset, and Cambria Streets, and briefly on Kensington Avenue. Last, the 89 bus plies G and F Streets, runs partly on Kensington Avenue, and serves the Arrott Transportation Center. SEPTA's 60 bus and 60 Nite Owl service both cross Kensington Avenue at Allegheny Avenue.

The Market-Frankford Elevated Line runs the length of Kensington Avenue over the street and has four station stops along the study corridor (note: the York-Dauphin station is located outside the study limits, but it is shown on Figures 16, 17, and 18 for reference). These station stops are at Tioga, Allegheny, Somerset, and Huntingdon streets. The Market-Frankford Nite Owl Express Bus (labeled as “MFO” on Figure 18) follows the route of the train line twice per night on weekdays after the conclusion of train service.

Study Limits:
Front St. to Tioga St.

- Bicycle Count¹
- Pedestrian Count¹
- Vehicle Count²
- SEPTA Rail Stop

¹ "Bicycle Count" represents Annual Daily Bicycle (ADB) volume and "Pedestrian Count" represents Annual Daily Pedestrian (ADP) volume. These volumes are estimates of all such traffic during a 24 hour period at the location indicated for the year in which the data was collected.

² "Vehicle Count" represents Annual Average Daily Traffic (AADT) volume.

Map Data:

Location	Year	Bicycle Count	Pedestrian Count	Vehicle Count
Front St.	2012	1,300	1,692	-
Front St.	2009	7,613	-	9,802
Front St.	2004	-	-	9,802
Front St.	2012	83 WB	-	-
Front St.	2012	79 EB	-	-
Front St.	2009	-	-	11,854 EB
Front St.	2007	-	-	11,854 EB
Front St.	2007	-	-	9,779 WB
Front St.	2009	-	-	2,811
Front St.	2006	-	-	3,161
Front St.	2008	-	-	1,887 WB
Front St.	2009	-	-	9,302 WB
Front St.	2009	-	-	11,856 EB
Front St.	2007	-	-	9,871 EB
Front St.	2007	-	-	7,955
Front St.	2009	-	-	7,463
Front St.	2012	110 WB	-	-
Front St.	2012	101 EB	-	-
Front St.	2012	7,758	7,633	13,317
Front St.	2011	92 EB	-	-
Front St.	2011	78 WB	-	-
Front St.	2011	-	1,146	-
Front St.	2011	-	1,048	-
Front St.	2008	-	-	7,672
Front St.	2007	-	-	4,411 EB
Front St.	2007	-	-	5,048 WB
Front St.	2012	27 NB	-	-
Front St.	2012	599	189	-
Front St.	2011	30 SB	-	-
Front St.	2011	472	-	-
Front St.	2011	39 NB	-	-
Front St.	2011	-	1,047	-
Front St.	2007	-	-	12,342
Front St.	2009	-	-	1,034
Front St.	2008	-	-	7,279 WB
Front St.	2008	-	-	8,284 EB
Front St.	2010	-	-	5,089 WB
Front St.	2010	-	-	8,103 EB
Front St.	2006	-	-	11,351 SB
Front St.	2006	-	-	7,291 NB

Figure 18: Kensington Avenue Transit Network



Kensington Avenue Corridor-wide Crash Findings

The analysis used for the Kensington Avenue RSA was based primarily on reportable crashes and, to a lesser extent, those classified as non-reportable. Reportable crashes result in a fatality or an injury, or at minimum require that a vehicle be towed from the scene. This section covers reportable crashes; non-reportable crash data is covered in a subsequent section. Related crash charts and tables can be found in the audit-day presentation in Appendix C.

Chronology

According to the PennDOT crash database, there were 181 reportable crashes during the five-year analysis period of 2006 through 2010 (see Table 18). Crashes have increased by approximately 12 percent since 2006, rising gradually over the five-year period. The highest per year total of 39 crashes was recorded in 2009.

Table 18: Kensington Avenue Crashes by Year

Year	Crashes	Percent of Total
2006	33	18%
2007	35	19%
2008	37	20%
2009	39	23%
2010	37	20%
Total	181	

Source: PennDOT, 2013

Examining concentrations by month over the five-year period, the total ranged between a low of nine in January to a high of 19 in September, with an average of 15 per month. Crashes were steady in the spring to fall period of more favorable weather with between 16 and 19 each month from April to September.

By day of week, crash totals were also fairly evenly distributed with between 12 and 18 percent of the total each day for an average of 14 percent per day. Saturdays were the most frequent crash days with 18 percent, and the least number of crashes occurred on Sundays (12 percent).

Regarding hour of day, 70 percent of the crashes occurred from 8 AM to 8 PM, with a peak of 15 crashes recorded in the noon hour. This trend does not coincide with the peak travel periods, but it does correlate with the typical hours of retail activity. Please note that 10 percent of the crash records were missing time of day information.

Severity

Regarding severity, there were three fatal crashes that killed three people, 171 injury crashes that left 256 people injured, and seven property-damage-only (PDO) crashes (see Table 19). One of the three people killed was a pedestrian, and all three fatal crashes occurred within the three-block section from East Somerset Street to East Monmouth Street (approximately 1,000 feet). Fifty percent of those injured suffered minor injuries (most common), followed by 36 percent categorized as “unknown severity.”

Table 19: Kensington Avenue Crash Severity Level and Injury Severity Level for People Injured

Crash Severity Level	Number of Crashes	People Injured
Fatal	3	3
Major	16	17
Moderate	17	21
Minor	95	124
Unknown Injury	43	91
PDO	7	0
Total	181	256

Source: PennDOT, 2013

Collision Type

Table 20 shows crash distribution by collision type. The three highest collision type concentrations were hit-pedestrian (38 percent), right-angle (21 percent), and rear-end crashes (21 percent). Rear-end and right-angle crashes can be common in urban corridors having a high density of intersecting side-streets, which become points of conflict as drivers enter and exit the roadway. This is especially important along Kensington Avenue, which has 35 intersections over the 1.66-mile study corridor. Thirty-five percent of the 69 pedestrian crashes occurred at midblock locations. The high number of pedestrian crashes is a corridor-wide problem as these crashes were found consistently along Kensington Avenue. The retail nature of the corridor, combined with four MFL station stops on Kensington Avenue, generates significant foot traffic, which increases the rate of exposure to crashes for pedestrians. As stated earlier, pedestrian crashes are typically higher in urban areas, and as described in the Environmental Justice evaluation, they often correlate strongly with economically challenged urban areas. Thus, Kensington Avenue is highly suitable for pedestrian safety improvements, highlighting the need for infrastructure changes combined with education, policy, and enforcement initiatives.

Table 20: Kensington Avenue Collision Type

Collision Type	Count	Percentage
Hit-Pedestrian	69	38%
Right Angle	38	21%
Rear End	38	21%
Head On	11	6%
Sideswipe (Same Direction)	11	6%
Hit Fixed Object	8	4%
Sideswipe (Opposite Direction)	4	2%
Backing	2	1%
Total	181	

Source: PennDOT, 2013

Roadway Surface and Lighting Conditions

Eighty-one percent of the corridor-wide crashes occurred on dry road surface conditions, 17 percent on wet surface, and the remainder on icy surface conditions (see Table 21). This distribution suggests that road surface was not a significant factor contributing to crash frequency. Light condition is less typical in that only 65 percent of total crashes occurred in daylight, with 31 percent at night and three percent at dusk. Before the RSA event, the Philadelphia Streets Department replaced the existing overhead lighting on a portion of Kensington Avenue with LED lights as part of a demonstration project. According to audit team members, the LED installation was favorably received both for its better illumination of the roadway and sidewalk and its energy benefits. This was an important improvement that would be desirable for the entire Kensington Avenue study corridor. The audit data does not reflect the benefits of the lighting project because the installation did not occur within the analysis period.

Table 21: Kensington Avenue Road Surface and Illumination

Category		Crashes	Percentage
Road Surface	Dry	146	81%
	Wet	30	17%
	Ice	3	2%
	Other	2	1%
	Total	181	
Illumination	Daylight	117	65%
	Dusk	6	3%
	Night	56	31%
	Dawn	1	1%
	Unknown	1	1%
	Total	181	

Source: PennDOT, 2013

Corridor-wide Summary

Table 22 on the next page highlights significant data indicators considered in the corridor-wide analysis. Crashes increased about 12 percent between 2006 and 2010 during a time when regional and statewide numbers have decreased. Still, pedestrian and bicyclist crashes remain a problem, as well as nighttime crashes.

Table 22: Kensington Avenue Corridor-wide Statistics Summary

Issue	Kensington Avenue
Five-year crash trend ('06–'10)	Increased by 12%
Highest crash months	June, September
Highest crash day	Saturday
Hourly crash trends	8 AM to 8 PM, peak at 12 noon
Collision type overrepresentations	Hit-Pedestrian, Angle, Rear-End
Surface condition and illumination	81% dry/31% nighttime
Noteworthy pre-crash actions	"Improper action/carelessness," "Running red light," "Driving on wrong side of the road"

Source: PennDOT, 2013

Pedestrian and Bicyclist Crashes

Although the primary focus of this road safety audit was not pedestrian and bicyclist crashes, it became a significant consideration due to the observed level of walking and biking, the urban context, and the availability of several easily accessible mass transit options on the corridor. The RSA study team considered safety from the pedestrian's perspective in all three components of the audit process. Also important was the condition of the bicycling environment and the location and circumstances of bicyclist crashes. Although unique, walking and biking issues are often related in how these modes interact with vehicle traffic and how they navigate the system.

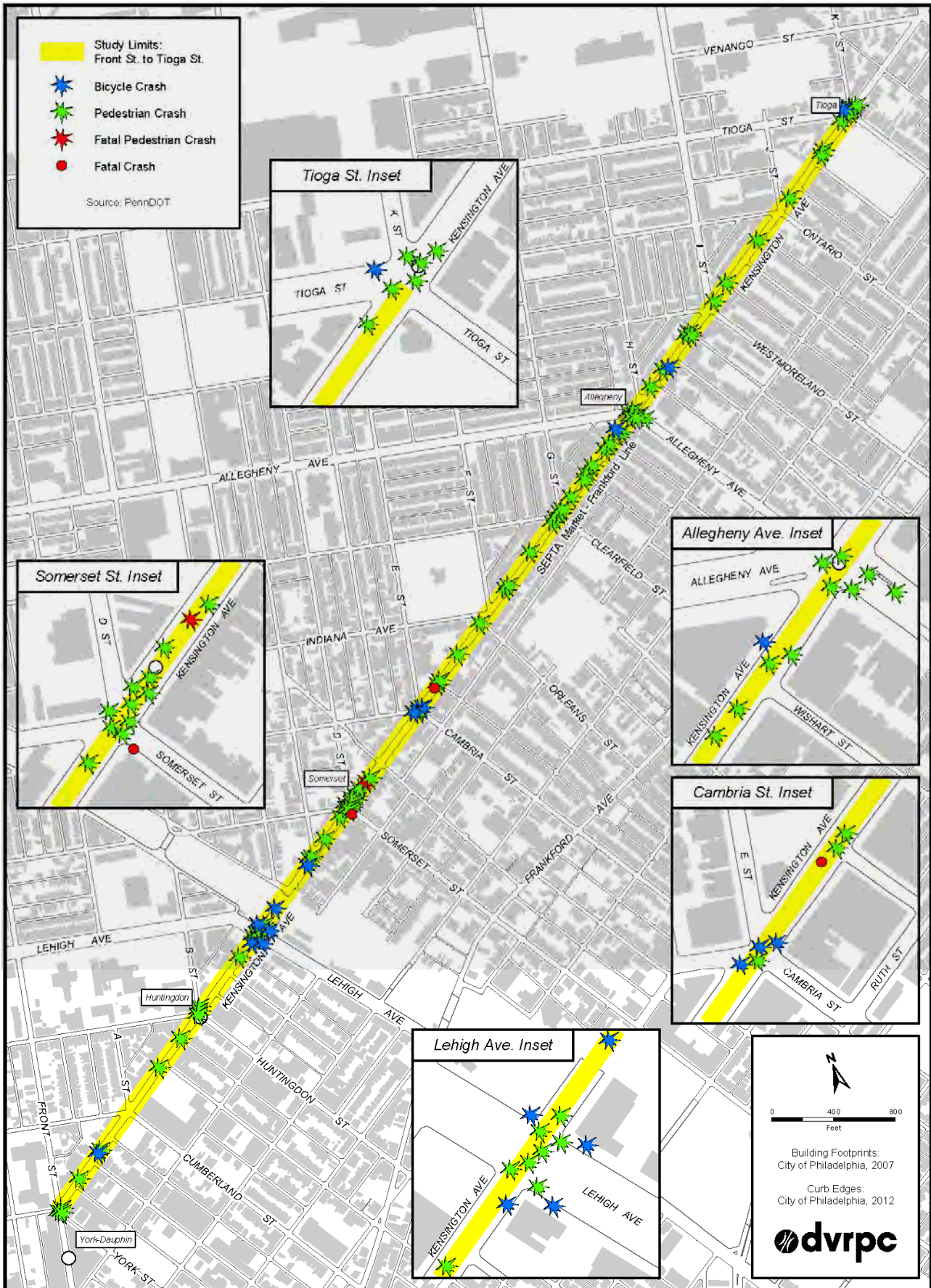
Pedestrian Crash Statistics and Findings

Figure 19 depicts pedestrian, bicyclist, and fatal crashes. There were 69 pedestrian crashes in the study corridor, representing 38 percent of the five-year total, the highest of any collision type recorded. These crashes, similar to the corridor-wide crash trend, have declined from 17 in 2006 to 12 in 2010, but they remain a concern. Of the 69 pedestrian crashes, one resulted in a fatality, nine people suffered major injuries, 10 suffered moderate injuries, and 34 suffered minor injuries (the remainders were in the "unknown" category). The following findings should be noted:

- ▶ Pedestrian crashes occurred throughout the study corridor, and concentrations were identified at the intersections of Lehigh, Somerset, Allegheny, and Tioga Streets;
- ▶ 37 percent occurred under dark conditions, and most on a dry road surface (11 crashes).

Bicyclist crashes were 6.6 percent of the five-year total, equaling 12 crashes. The total peaked in 2009, when five were recorded, but dipped to two in 2010. This small data set makes it difficult to identify crash trends. Of the 12 bicyclist crashes, no fatalities were recorded, and eight of the 12 resulted in minor injuries. Regarding collision type, nine of the 12 crashes were coded as angle-type crashes, which involve a driver making a turn. This is worth noting since angle-crashes typically occur at intersections—a common trouble spot for bicyclists and a magnet for bicyclist crashes.

Figure 19: Kensington Avenue Bicyclist, Pedestrian, and Fatal Crashes, 2006-2010



Findings and Recommendations

The following section summarizes the findings, potential strategies, and priorities of the Kensington Avenue RSA in Philadelphia, Pennsylvania. The table for each section shows site-specific safety issues and corresponding potential strategies, general ratings for difficulty to implement, proposed safety benefits, and responsible agency. An aerial map indicating the relative location of each identified issue (where possible) follows each table.

DVRPC uses the following general descriptions to characterize each of the three ratings associated with the “difficulty to implement” category:

- Low—can be accomplished through maintenance;
- Medium—requires use of existing or new contract and some engineering, funding may be readily available; and
- High—longer-term project, may need full engineering, and may require right-of-way acquisition and new funding.

The following abbreviations are used in the tables: SB—southbound, NB—northbound, WS—west side, ES—east side, NS—north side, SS—south side, SW—southwest, SE—southeast, TBD—to be determined, ADA—Americans with Disabilities Act, RRFB—Rectangular Rapid Flashing Beacon, HAWK—High-intensity Activated cross-Walk beacon.

Yellow highlighting identifies those issues that have a low rating for difficulty to implement and a high safety benefit. These improvements can typically be addressed through maintenance without beginning a new planning or engineering effort. It is expected that implementing these recommendations will improve the safety and operations along the study corridor. Note that potential strategies that call for further study do have a safety benefit in that they are the next step toward a more detailed and appropriate safety improvement. Given fiscal constraints, recommendations may be considered one at a time or in small groups.

Being the roadway owner, the Philadelphia Streets Department should use the findings of the RSA as a guide for designing improvements to address the identified issues. Whereas the findings are numerous, they should use their experience in safety engineering and priority-setting to determine which issues from the table will yield the highest safety benefit given limited funds.

Audit Team Priorities

The audit process provides an opportunity for the audit team members to advocate for what they consider the single most important issue resulting from the audit. These items are important because they are endorsed by individuals who spent the day familiarizing themselves with the corridor’s statistics, listening to the perspectives of the local participants including local police, and experiencing the issues firsthand having walked the entire corridor during the field visit. The roadway owner—the Philadelphia Streets Department—is encouraged to consider these items both in follow-up maintenance work, and to give them a high priority when doing long-term planning for the corridor. Improvement specifics are detailed in the issues and strategies table:

- ▶ Signal retiming (which will update pedestrian crossing speed as per recent MUTCD changes);
- ▶ Lighting at specified target locations;
- ▶ Signs: add where missing, reposition for better view, and consider adding overhead signs where needed;

- ▶ Pavement markings: replace missing or faded bike lanes and add skip lines through intersections for continuity, repaint bus zone boxes and “no parking” boxes, and remove parking spaces at intersections);
- ▶ Implement and enforce “no turn on red” at each 5-leg intersection corridor-wide;
- ▶ Install pedestrian countdown signal heads where missing.

Priority Recommendations

As mentioned above, items in the following tables highlighted in yellow have a low rating for difficulty to implement and a high safety benefit, and they are often addressed through maintenance. It is these items that should be implemented first, and they are also the items identified as a priority by the audit team, including repaving the corridor and re-establishing all striping and roadway markings.

The conclusion section of this report includes the Road Owner Response. This is the City of Philadelphia Streets Department’s acknowledgment of the audit findings, and their proposed actions. They have indicated that they will add missing signs, address needed signal timing changes, and add new signal heads where needed.

Figure 20: Panel 1 (Kensington Ave.: Front Street to A Street)



At Cumberland St., a retail driveway on the ES is a potentially illegal access to the street creating an additional conflict

Not Shown: #4



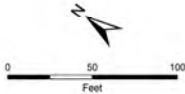
At Cumberland St., the street name sign located on the WS is blocked by a building and obstructs sight lines for drivers approaching the intersection



At Letterly St., a column/pole obstructs a street sign



Furniture, etc. is blocking the bike lane and sidewalk



Aerial Imagery: City of Philadelphia,

Table 23: Panel 1 (Kensington Ave.: Front Street to A Street)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 1				
1. Bike lane drops transitioning from Front St. to Kensington Ave.;	1. Re-stripe bike lane;	Low	High	Streets Department
2. There are missing pedestrian countdown timers;	2. Survey panel area and replace missing units;	Medium	Medium	Streets Department
3. Furniture, etc. is blocking the bike lane and sidewalk;	3. Enforce parking/obstruction restrictions;	Medium	High	Philadelphia Police
4. Three pedestrian crashes of unknown circumstances occurred between Boston and Cumberland;	4. ST: Investigate crash reports, and reconsider signal sequencing (this will be a corridor-wide recommendation for all signals), LT: install pedestrian countdown timers;	Medium	High	Streets Department
5. There is a missing inner bike lane stripe going SB;	5. Re-stripe missing bike lane;	Low	High	Streets Department
6. At Cumberland St. going NB, street sign is obstructed by MFL structure, also one-way signs are hard to see from Kensington;	6. Relocate signs as needed;	Low	High	Streets Department
7. At Letterly St., a column/pole obstructs a street sign;	7. Relocate sign as needed;	Low	High	Streets Department
8. The sign for A St. is missing;	8. Replace missing sign;	Low	High	Streets Department
9. On the NE corner of Cumberland St. there is a yellow signal bulb out, also, green for NB Kensington Ave. is missing a visor;	9. Repair signal equipment;	Low	High	Streets Department
10. At Cumberland St., a retail driveway on the ES is a potentially illegal access to the street creating an additional conflict point;	10. Investigate access code restrictions;	Low	TBD	Philadelphia Police
11. Bus stop at Front St. and Kensington Ave. is missing bus zone "no parking" box and sign;	11. Replace bus zone sign and restripe;	Low	High	Streets Department
12. There is a missing "no parking" box on corner of Haggart St.;	12. Re-stripe "no parking" box;	Low	High	Streets Department
13. At Haggart St. a car was parked in the crosswalk;	13. Enforce parking restrictions;	Medium	High	Philadelphia Police
14. At Cumberland St., street name sign located on the WS is blocked by a building and obstructs sight lines for drivers approaching intersection.	14. Investigate sign issue.	Low	TBD	Streets Department

Source: DVRPC, 2013

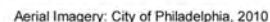


Table 24: Panel 2 (Kensington Ave.: Sergeant Street to Albert Street)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 2				
1. At Huntington St. there is a big pothole in NB lane;	1. Repair pothole;	Low	Medium	Streets Department
2. At Harold St. the crosswalk is faded and missing (corridor-wide issue);	2. Re-stripe crosswalk;	Low	High	Streets Department
3. At Huntington Station, pedestrian traffic from the train cuts through the intersection (disregarding crosswalk) following a desire line to B St. from the SE corner;	3. Consider pedestrian-only crossing phase to accommodate this high volume of pedestrians;	Low	TBD	Streets Department
4. The location of Huntington Station had 63% dark crashes;	4. Conduct nighttime investigation into street lighting, recommend improvements as deemed appropriate;	Low	TBD	Streets Department
5. Ponding at the ramp on the NW corner of B St.;	5. Address during scheduled repaving;	Medium	Medium	Streets Department
6. No signal visible to pedestrians walking EB on SS of Huntington Ave. crossing Kensington Ave. (obstructed by column);	6. Relocate signal, or add second signal head at a location visible to pedestrians;	Medium	Medium	Streets Department
7. At the southern end of the station, near the corner of Huntington and Kensington Avenues, power lines are not properly connected to the MFL structure presenting a safety hazard for pedestrians;	7. Repair power lines as needed;	Low	Low	Streets Department
8. Loading zones are not being enforced along SB Kensington Ave.;	8. Enforce loading zone restrictions. Corridor-wide Suggestion: consider extending bike skip lines through intersection for continuity;	Medium	High	Philadelphia Police
9. At Huntington St. no parking sign is damaged;	9. Replace damaged sign;	Low	High	Streets Department
10. At Huntington St. (ES) MFL pole and traffic signal pole blocks the pedestrian ramp.	10. Investigate pedestrian obstruction, may require moving the pole.	Low	Medium	Streets Department

Source: DVRPC, 2013

Figure 22: Panel 3 (Kensington Ave.: Oakdale Street to Boudinot Street)

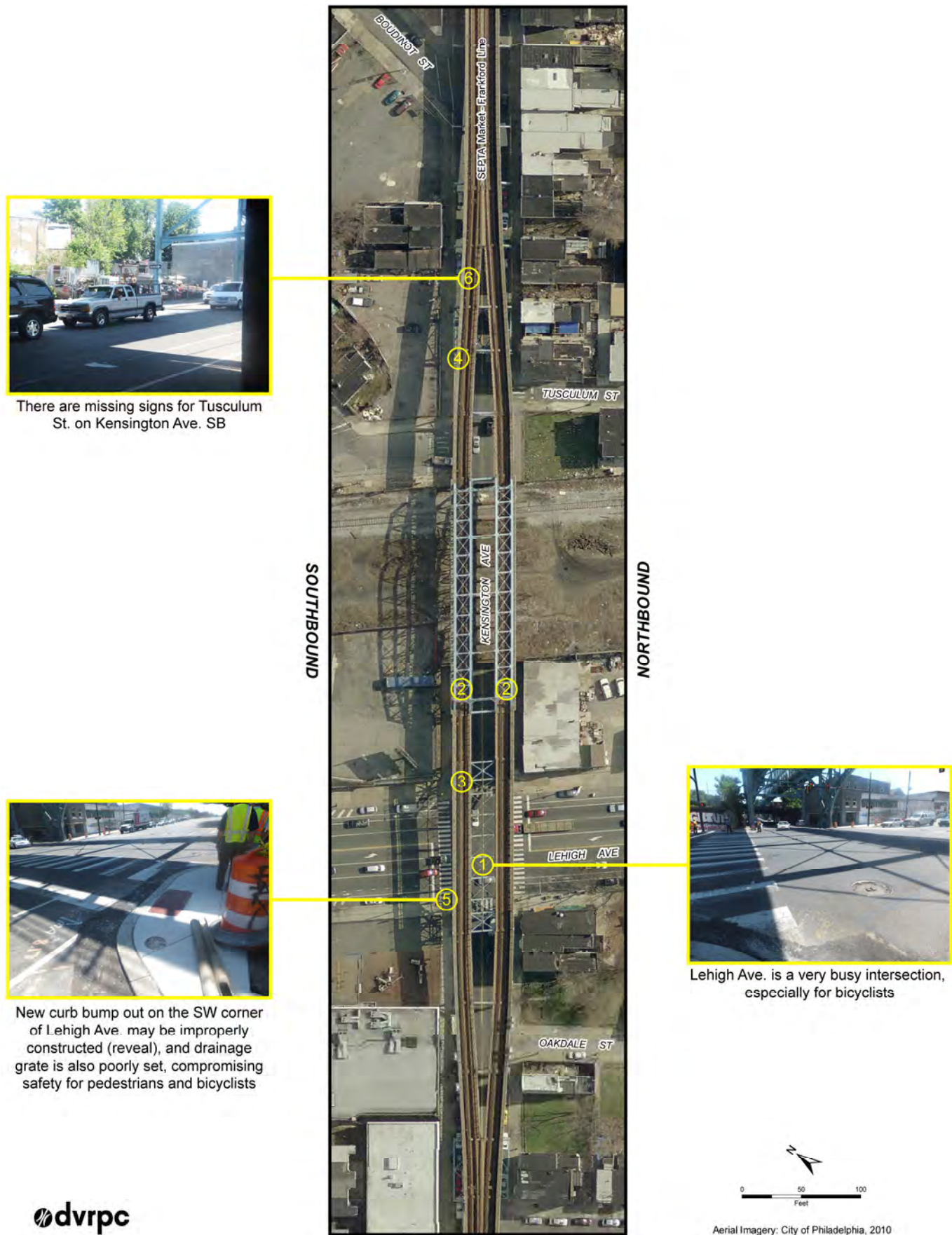


Table 25: Panel 3 (Kensington Ave.: Oakdale Street to Boudinot Street)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 3				
1. Lehigh Ave. is a very busy intersection, especially for bicyclists;	1. At Lehigh Ave., add bike lane skips through the intersection;	Low	High	Streets Department
2. Lighting under the rail overpass was dim on the roadway (more than on the sidewalk);	2. Recommend LED demonstration project continue through bridge overpass, if not possible, consider other options to improve lighting;	Medium	Medium	Streets Department
3. There is a big hole under the overpass on the sidewalk on the SB side;	3. Work with private property owner to repair damaged sidewalk;	Medium	Medium	City of Philadelphia
4. North of Tusculum St. there are objects blocking the sidewalk and bike lane on the SB side, and retail access is questionable and poses a potential safety issue for pedestrians;	4. Enforce bike lane and sidewalk restrictions, investigate access code;	Medium	High	Philadelphia Police
5. New curb bump out on the SW corner of Lehigh Ave. may be improperly constructed (reveal), and drainage grate is also poorly set, compromising safety for pedestrians and bicyclists;	5. Recommend addressing this now while construction is underway - consult with Charlie Denny;	Medium	High	Streets Department
6. There are missing signs for Tusculum St. on Kensington Ave. SB.	6. Replace missing signs.	Low	High	Streets Department

Source: DVRPC, 2013

Figure 23: Panel 4 (Kensington Ave.: Boudinot Street to Hart Lane)

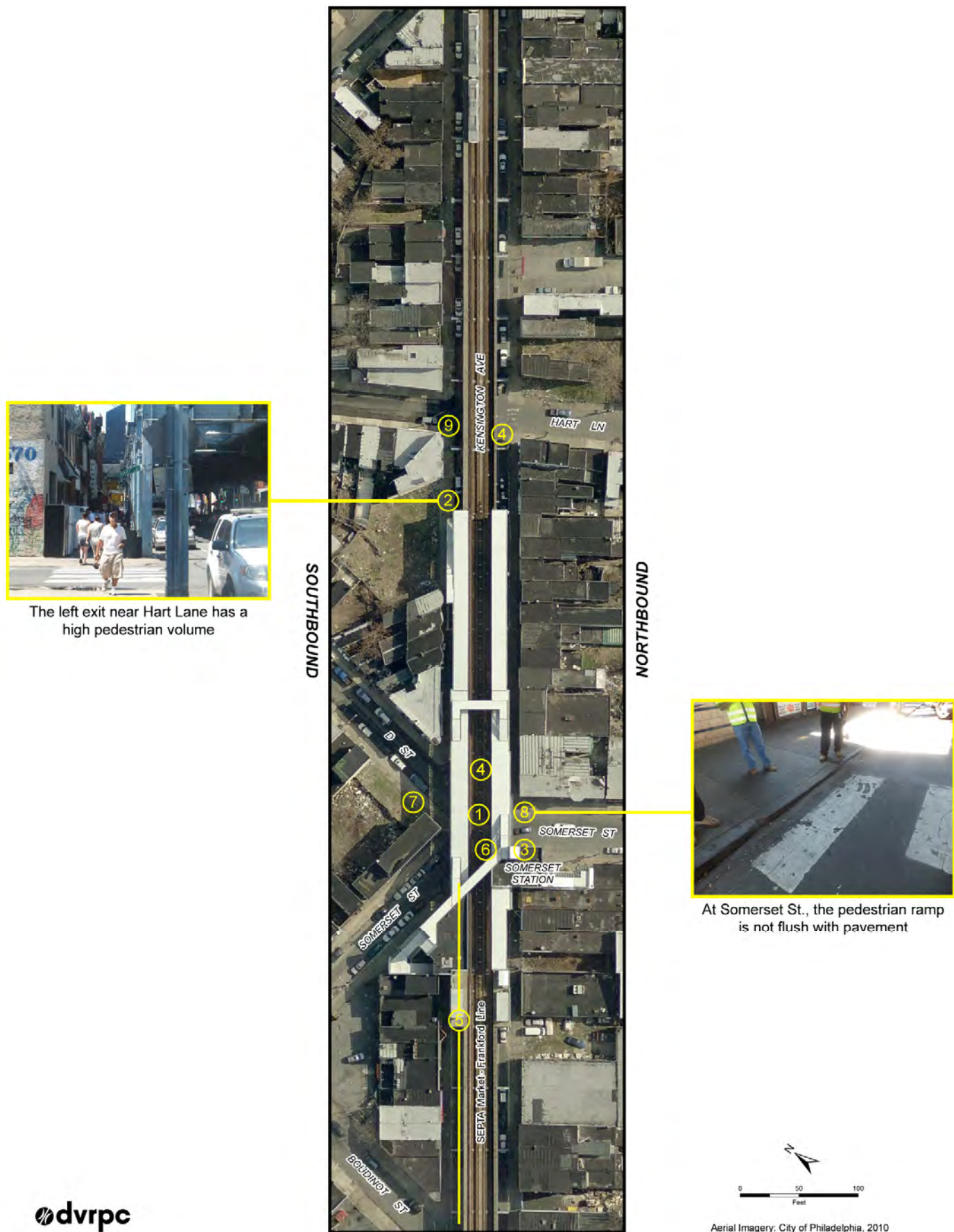


Table 26: Panel 4 (Kensington Ave.: Boudinot Street to Hart Lane)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 4				
1. At the Somerset St. cluster, 75% crashes are pedestrian crashes;	1. Evaluate pedestrian benefits of a change from a 2 to 3 phase signal, implement if provides safety benefit;	Medium	High	Streets Department
2. The left station exit near Hart Lane has a high pedestrian volume;	2. Consider this location for a pedestrian crossing over Kensington at Hart Ln. (midblock between signals);	Medium	Medium	Streets Department
3. At Somerset St. the SS crosswalk going EB has an 8-inch pedestrian traffic signal obscured by MFL pier and a confusing signal head;	3. Evaluate this crossing and make appropriate upgrades and changes to better accommodate pedestrian crossings;	Medium	Medium	Streets Department
4. Missing crosswalk on D St. and Hart Ln. over Kensington Ave.;	4. Install missing crosswalk;	Low	High	Streets Department
5. The bike lane is completely faded (missing) between Somerset and Boudinot Streets along Kensington Ave. SB;	5. Re-stripe bike lane (corridor-wide);	Low	High	Streets Department
6. The station area is poorly lit during the daytime;	6. Conduct investigation into need for improved lighting at the Somerset MFL station;	Medium	TBD	Streets Department
7. There are overgrown lots along the sidewalk, and is cluttered with trash;	7. Work with private property owner to perform needed maintenance;	Medium	Medium	City of Philadelphia
8. At Somerset St., the pedestrian ramp is not flush with pavement;	8. Address during next repaving, or if deemed significant, apply a spot fix;	Medium	Medium	Streets Department
9. Hart Ln. street name sign is bent	9. Replace damaged sign.	Low	High	Streets Department

Source: DVRPC, 2013

Figure 24: Panel 5 (Kensington Ave.: Cambria Street to F Street)



Table 27: Panel 5 (Kensington Ave.: Cambria Street to F Street)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 5				
1. There are excessive curb cuts, especially along the SB side;	1. Evaluate need for an access management plan;	Low	Medium	Streets Department
2. Car-oriented uses are blocking the sidewalk on both sides;	2. Enforce parking restrictions;	Medium	High	Philadelphia Police
3. Pedestrian crossings are longer than typical at Cambria St.;	3. If 2-phase signal at Cambria St., consider 3-phase during signal re-timing corridor-wide;	Medium	Medium	Streets Department
4. A signal pole obstructs the curb ramp on the NE corner of Cambria St.;	4. Consider relocation of either curb ramp or signal pole;	Medium	High	Streets Department
5. Business awning on the SE corner obstructs the sight line of the Cambria St. sign;	5. Approach business owner to discuss options;	Medium	Medium	City of Philadelphia
6. Missing signal visor on the SW corner of Cambria St.;	6. Replace missing signal visor;	Low	Medium	Streets Department
7. At 2900 Kensington Ave. there are missing vent caps and water valve box covers;	7. Replace missing hardware;	Low	Medium	Streets Department
8. The NE corner of Orleans St. has uncovered water valves (across from F);	8. Replace missing covers;	Low	Medium	Streets Department
9. The bike legend is paved over along the NB side of Kensington Ave.;	9. Re-install bike lane legend;	Low	High	Streets Department
10. There are missing green and yellow visors on the signal on the NE corner of Orleans St. (signal is also misaligned);	10. Replace missing signal visor and realign signal head;	Low	Medium	Streets Department
11. At Indiana Ave. delivery truck blocked the crosswalk.	11. Enforce no parking restrictions.	Medium	High	Philadelphia Police

Source: DVRPC, 2013

Figure 25: Panel 6 (Kensington Ave.: F Street to Clementine Street)



Table 28: Panel 6 (Kensington Ave.: F Street to Clementine Street)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 6 1. At Clearfield and G Streets, pedestrian clearance time is only 4 seconds on pedestrian head, and only one signal head for crossing two intersection legs; 2. Signal visors are missing on the NW corner of G St.; 3. Schools located on Clearfield St. south of Kensington Ave. produce heavy pedestrian volumes at and around the intersection during school begin and end times; 4. The pedestrian head is obstructed on the NE corner for crossing; 5. Left turn restriction from Kensington Ave. at Clearfield St. is being ignored	1. Re-time signal to increase the walk time (may be part of corridor-wide signal re-timing), evaluate need for additional signal head; 2. Replace missing signal visor; 3. Conduct follow-up study to quantify problem and recommend improvements; 4. Evaluate situation and relocate signal or add second head; 5. Supplement signs with more/better placed signs and pavement markings to reinforce the restriction (verify with video at K&A and at Clearfield St.)	Medium Low Medium Medium Low	High Medium TBD High Medium	Streets Department Streets Department Streets Department Streets Department Streets Department

Source: DVRPC, 2013

Figure 26: Panel 7 (Kensington Ave.: Clementine Street to Madison Street)

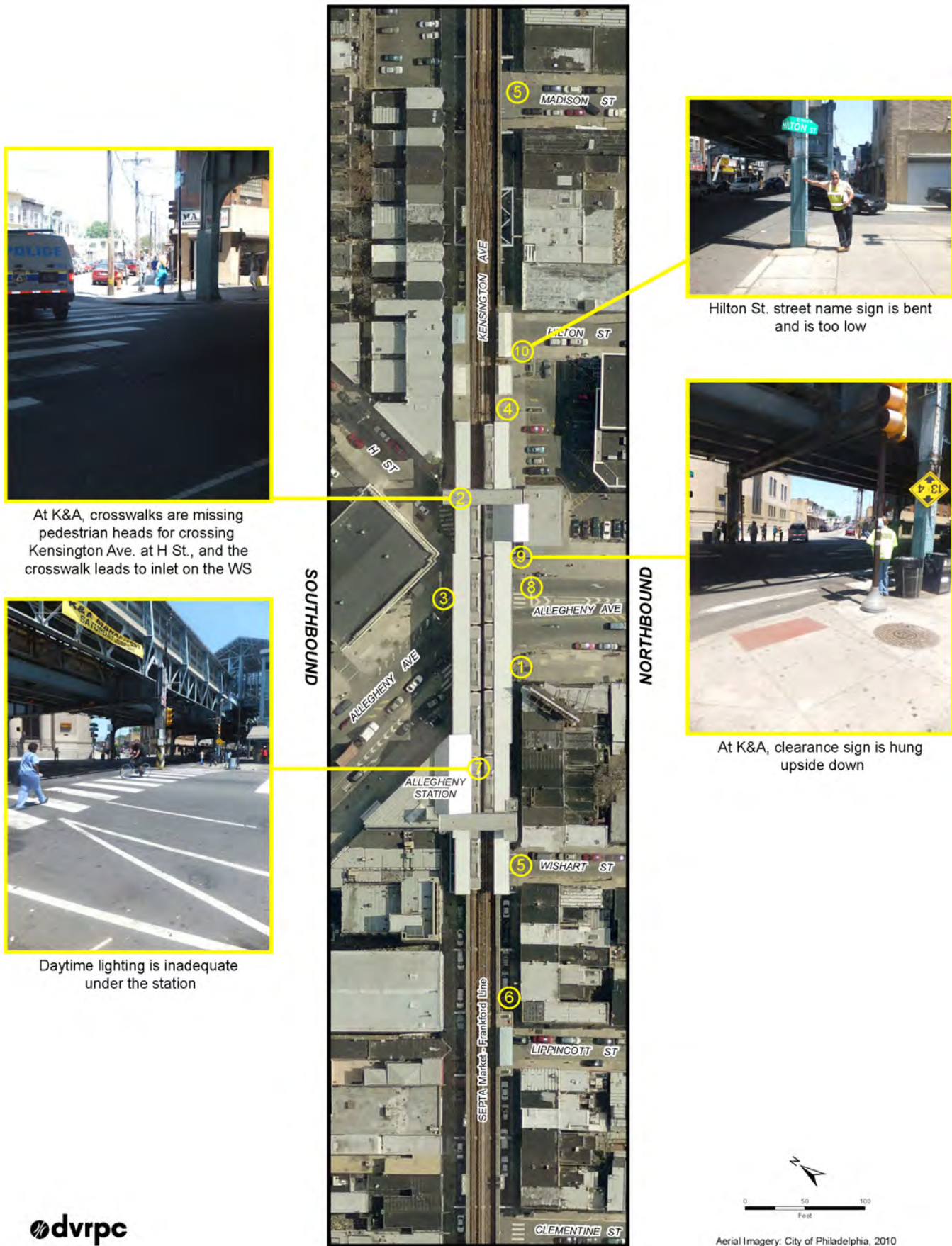


Table 29: Panel 7 (Kensington Ave.: Clementine Street to Madison Street)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 7				
1. Newsstand on SE corner is defunct at K&A and obstructs sight distance;	1. Recommend investigation by Philadelphia Licensing and Inspections;	Low	High	Streets Department
2. At K&A, crosswalks are missing pedestrian heads for crossing Kensington Ave. at H St., and the crosswalk leads to inlet on the WS;	2. Install missing pedestrian signal heads, consider realigning crosswalk;	Medium	Medium	City of Philadelphia
3. The pedestrian signs for crossing Kensington Ave. at Allegheny Ave. are too low, and are graffitied and therefore ineffective;	3. Replace defaced signs with new ones and mount at proper height;	Medium	High	Streets Department
4. Along NB Kensington Ave., street signs were hit (by parking drivers), and signs too low;	4. Replace damaged signs with new ones and mount at proper height;	Low	High	Streets Department
5. Crosswalk over Wishart St. and over Madison St. is missing;	5. Re-stripe missing crosswalks;	Low	High	Streets Department
6. There is a knocked down hydrant at 3153 Kensington Ave.;	6. Consult with Philadelphia Fire Department;	Low	High	Streets Department
7. Daytime lighting is inadequate under the station;	7. Conduct investigation into need for improved lighting at the Allegheny MFL station;	Medium	Medium	Streets Department
8. On Allegheny Ave. WB approaching intersection, the bike lane is poorly marked;	8. Re-stripe the bike lane through the intersection along Allegheny Ave;	Medium	TBD	Streets Department
9. At K&A, clearance sign is hung upside down;	9. Fix sign;	Low	High	Streets Department
10. Hilton St. street name sign is bent and is too low.	10. Replace damaged sign and mount at proper height.	Low	High	Streets Department

Source: DVRPC, 2013

Figure 27: Panel 8 (Kensington Ave.: Willard Street to Thayer Street)

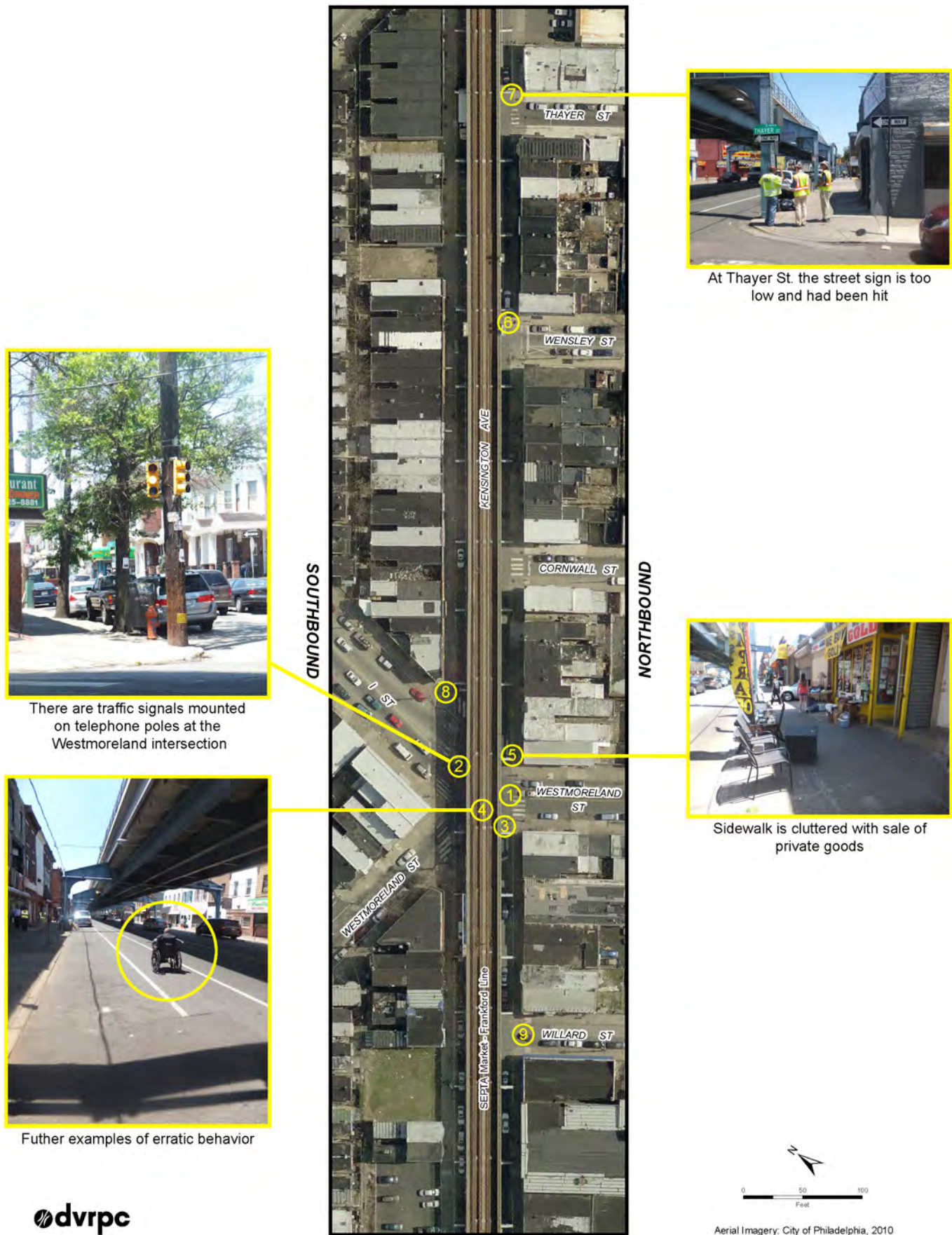


Table 30: Panel 8 (Kensington Ave.: Willard Street to Thayer Street)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 8				
1. At Westmoreland St. and Kensington Ave. the pedestrian signs are too low and unclear, also missing pedestrian heads and/or pedestrian 8 inch heads for pedestrian crossings;	1. Replace missing pedestrian signal heads and mount at proper height;	Medium	High	Streets Department
2. There are traffic signals mounted on telephone poles at the Westmoreland intersection;	2. Not necessarily a safety issue, but an improper installation that may cause a safety problem— address during corridor-wide signal re-timing;	Medium	Low	Streets Department
3. There is confusing truck restriction signing at Westmoreland St. on Kensington Ave. NB;	3. Investigate and make clear and consistent;	Low	Medium	Streets Department
4. Examples of erratic and unsafe behavior were observed;	4. Increase enforcement;	Medium	Medium	Philadelphia Police
5. Sidewalk is cluttered with sale of private goods;	5. Increase enforcement;	Medium	Medium	Philadelphia Police
6. At Wensly St. the street sign is too low and had been hit and is damaged;	6. Replace damaged signs with new ones and mount at proper height;	Low	High	Streets Department
7. At Thayer St. the street sign is too low and had been hit;	7. Replace damaged signs with new ones and mount at proper height;	Low	High	Streets Department
8. There was a missing signal-head visor on the corner of the I and Westmoreland Streets intersection;	8. Replace missing signal visor;	Low	Medium	Streets Department
9. There is no pedestrian crossing marked for Willard St.	9. Install pedestrian crosswalk.	Low	High	Streets Department

Source: DVRPC, 2013

Figure 28: Panel 9 (Kensington Ave.: Ontario Street to Tioga Street)

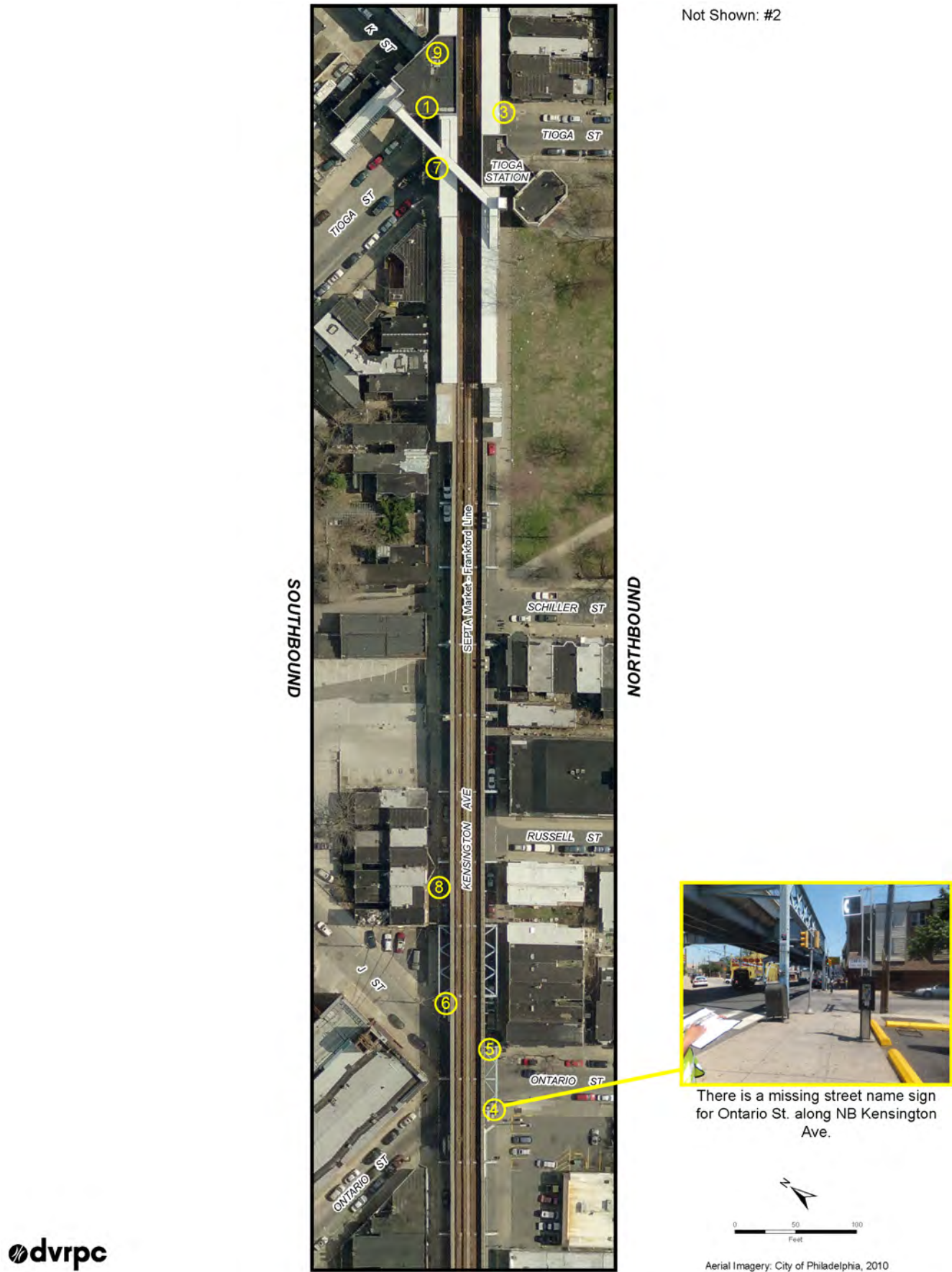


Table 31 Panel 9 (Kensington Ave.: Ontario Street to Tioga Street)

Site-Specific Issue	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
Panel 9				
1. There are no crosswalk over Tioga St., and the pedestrian heads are missing;	1. Install missing crosswalks and pedestrian signal heads;	Medium	High	Streets Department
2. Missing bus box along Kensington NB;	2. Restripe missing box;	Low	High	Streets Department
3. On NE corner of Tioga there is a missing green visor for EB Tioga;	3. Replace missing signal visor;	Low	Medium	Streets Department
4. There is a missing street name sign for Ontario St. along NB Kensington Ave.;	4. Replace missing signs, investigate pedestrian signal head alignment;	Low/Medium	High	Streets Department
5. Crossing from J St. over Kensington Ave. to Ontario St. there is no visible pedestrian head;	5. Investigate pedestrian signal head situation, install new if needed;	Low/Medium	High	Streets Department
6. There is a missing yellow visor for NB Kensington Ave. at the corner of J St. and Kensington Ave.;	6. Replace missing signal visor;	Low	Medium	Streets Department
7. There is a pot hole in the bike lane at Kensington Ave. and Tioga St. on Kensington Ave. SB;	7. Repair pot hole;	Low	Medium	Streets Department
8. There is a confusing truck restriction sign on SB Kensington Ave. just before J St.;	8. Investigate and make clear and consistent;	Low	Medium	Streets Department
9. At K St. and Kensington Ave., the street sign is visible but the name is obscured by the traffic signal.	9. Investigate obstruction and move sign to a more visible location.	Low	Medium	Streets Department

Source: DVRPC, 2013

Table 32: Kensington Ave. Corridor-wide Issues and Strategies

Corridor-wide Issues	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
<ol style="list-style-type: none"> Side streets are one-way away and not signed; Speed limit signs are missing from NB side; SB side did have two; Sight distance is poor entering Kensington Ave. from unsignalized intersections; 	<ol style="list-style-type: none"> Add missing signs where needed; Add missing signs where needed; ST: Reestablish and enforce no parking boxes; LT: curb extensions and remove parking spaces and meters from spaces at intersection approaches and add no parking anytime signs; 	<ol style="list-style-type: none"> Low Low Medium 	<ol style="list-style-type: none"> High Low High 	<ol style="list-style-type: none"> Streets Department Streets Department Streets Department/Philadelphia Police
<ol style="list-style-type: none"> Pavement markings are faded, worn, missing, and inconsistent, including crosswalks, bike lanes, edge line stripes; There is jaywalking, midblock crossings, and erratic behavior; Bus zones are missing signs and striped boxes, intermittently through the corridor; Inconsistent application and types of ADA ramps; ped crashes were identified at T intersections where curb ramps and crosswalks are not provided to cross Kensington Ave. (City policy: no ramps or striping at these locations); 	<ol style="list-style-type: none"> Re-stripe as needed; Consult with police to determine best locations for increased enforcement; Add missing signs where needed; Consider appropriate locations for midblock crossings; 	<ol style="list-style-type: none"> Low Medium Low Medium 	<ol style="list-style-type: none"> High TBD High TBD 	<ol style="list-style-type: none"> Streets Department Philadelphia Police Streets Department Streets Department
<ol style="list-style-type: none"> Turn restriction signs (No Left Turn, No Turn on Red), and School Crossing signs, were defaced – many of which were not at proper heights (too low); many of the SB approaches to Kensington Ave. (ex: letter streets) were not posted with "No Turn on Red" signs, nor were the right turn locations from Kensington; MFL piers were not consistently marked or painted (both in road and in sidewalk); On NB Kensington Ave., one-way signage for side streets is set far back out of view; Bicyclists: missing legends in bike lanes, missing signs ("Right Lane Bike Only," way-finding signs), parked vehicles encroaching the bike lane, and delivery trucks blocking bike lane; 	<ol style="list-style-type: none"> Each 3-phase intersection should be posted as no turn on red for every approach, as well as all MFL stations; add missing sign where needed; Upgrade markings for piers in the roadway/at intersections to retro reflective; Relocate signs; Re-stripe bike lane and legends throughout, enforce parking restrictions to keep lane free; 	<ol style="list-style-type: none"> Low Low Low Low/Medium 	<ol style="list-style-type: none"> High High High High 	<ol style="list-style-type: none"> Streets Department Streets Department Streets Department Streets Department/Philadelphia Police

Source: DVRPC, 2013

Corridor-wide Issues	Potential Strategy	Difficulty to Implement	Estimated Safety Benefit	Responsible Agency
12. Five-way intersection areas seem confusing for drivers and bicyclists;	12. Add skip lines through intersections, and broken green lines in conflict zones, recommend pedestrian crossing study to understand patterns;	Low/Medium	High	Streets Department
13. Lighting was poor at several transit stations (see Panels for locations), and under the rail bridge north of Lehigh Ave. intersection;	13. Conduct lighting survey to identify problem locations; coordinate findings with lighting demonstration project;	Medium	Medium	Streets Department
14. Parking signs were confusing and inconsistent; sanctioned parking was not corridor-wide;	14. Better establish parking areas with new signs and appropriate striping;	Low	High	Streets Department
15. Loading zones were missing where they are needed in some locations, others posted were not being enforced;	15. Re-stripe and sign loading zones, increase enforcement (team discussed benefits/tradeoffs of posting the corridor (or part of it) as "No Stopping" enforcement issue);	Low/Medium	High	Streets Department
16. Sidewalks are deteriorated and occupied by stuff and parked vehicles, from Huntington St. to Tioga St. there are some poor condition sections, bilco door/basement access doors are tripping hazards, also trash strewn;	16. Sidewalk maintenance is a private property issue; increase enforcement of parking restrictions;	Medium	Medium	Streets Department/Philadelphia Police
17. At 5-leg intersections pedestrians crossing at various locations (typically shortest distance) other than on the crosswalks as prescribed;	17. Conduct pedestrian crossing study to better understand problems and trends;	Medium	TBD	Streets Department
18. Signals have not been retimed in a very long time, and a safety benefit may be gained from updating the timing.	18. Move Kensington's 5-leg intersections up on the City's signal retiming priorities list for sooner implementation.	Medium	High	Streets Department

Source: DVRPC, 2013

Conclusion

The RSA was conducted to identify issues that compromise the driving, walking, and bicycling environment of the G Street and Kensington Avenue corridors. During this audit, the team identified a long list of issues from the field visit, and many practical short- and long-term improvements during the postaudit.

The recommendations documented in this report are designed to improve the safety of the study area. Some of the strategies identified can be implemented through routine maintenance, and all will be constrained by available time and budgetary priorities. The audit process and the resulting final document highlight the safety issues posed to all users of the corridors. Needed improvements are identified by location and organized for systematic implementation by the roadway owner.

When it comes to improving safety, engineering strategies alone only go so far. This is especially true when trying to address pedestrian safety in an economically challenged neighborhood, as demonstrated in the Environmental Justice analysis. Education, with support from a targeted enforcement campaign, is an effective approach for addressing the driver behaviors that lead to crashes. In addition, policy changes can provide the legal weight needed to motivate people to be safer and more conscientious drivers, pedestrians, and bicyclists. Employing a multipronged approach that includes engaging the appropriate stakeholders—Philadelphia Streets Department, who are the roadway owners, the City of Philadelphia Police Department, and the Mayor’s Office of Transportation and Utilities (MOTU)—is an effective course of action to advance the goal of improved safety on the corridor. It is also recommended that the program called Data-Driven Approach to Crime and Traffic Safety (DDACTS) be considered as an integral part of any safety strategy. DDACTS, which uses mapping to target locations demonstrating trends in crime and crashes, is supported by both state and federal partners.

Issues highlighted in yellow in both the G Street and Kensington Avenue issues and strategies tables should be implemented first because they typically require a lower level of effort to implement, and some are projected to have a medium or high safety benefit. Many of these items are low-cost safety improvements, such as signs and pavement markings, and can be implemented as part of the existing maintenance schedule.

Road Owner Response

An important part of the audit process is the road owner’s response: an acknowledgment of the audit’s findings and recommendations, and their planned follow-up. City of Philadelphia Streets Department delivered their response following the finalization of the findings and recommendations table.

In responding to the RSA’s findings, the road owner must bear in mind all the competing objectives involved when implementing the recommendations, and foremost among them is available resources. Because the audit process generated a long and wide-ranging list of improvements, the road owner is expected to implement as time and funds allow in coordination with other projects and priorities. The safety issues table should feed development of long-term improvement projects and serve as a punch list of maintenance tasks. As mentioned, items highlighted in yellow are considered low difficulty to implement and will produce a high safety benefit. These should be priority items.

DRVPC was lucky to have worked closely with City of Philadelphia Streets Department on the selection of the audit corridor, and as an audit team member, and will continue to collaborate with them on securing federal safety funds to implement audit recommendations.

As of October 2012, the Streets Department had met to discuss the two RSA corridors and had begun preparing work orders to implement the following improvements:

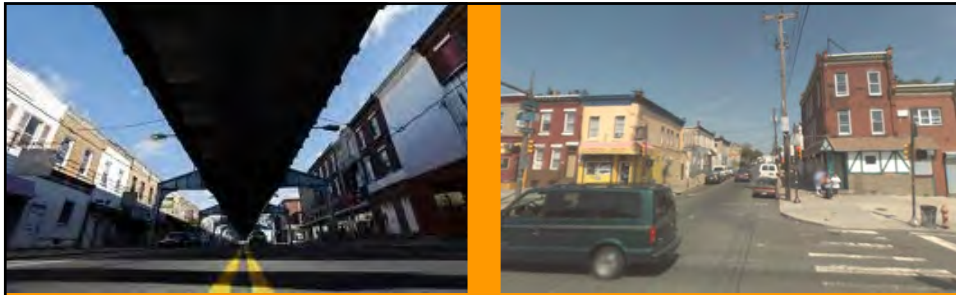
- ▶ Add missing signs;
- ▶ Replace engineering grade with new material;
- ▶ Address needed signal timing changes;
- ▶ Add missing signal heads.



Audit Team

Name	Agency
Jeannette Brugger	Philadelphia City Planning Commission
Dave Fecteau	Philadelphia City Planning Commission
Debbie Schaaf	Philadelphia City Planning Commission
Charles Denny	Philadelphia Streets Department
Regina Moore	DVRPC
Kevin Murphy	DVRPC
Donald Powers	DVRPC
Larry Bucci	PennDOT District 6-0
Sunil Gill	Philadelphia Streets Department
Jabulani Moyo	Philadelphia Streets Department
Charles Carmalt	Philadelphia Mayor's Office of Transportation and Utilities
Gus Scheerbaum	Philadelphia Mayor's Office of Transportation and Utilities
Sgt. Doreen Dean	City of Philadelphia Police – Truck Enforcement
Officer James Diamond	City of Philadelphia Police – Truck Enforcement
Officer Chester Hampton	City of Philadelphia Police – Truck Enforcement
Officer Mariano Santiago	City of Philadelphia Police – Truck Enforcement
John Boyle	Bicycle Coalition of Greater Philadelphia
Megan Rosenbach	Bicycle Coalition of Greater Philadelphia
John Reynolds	SEPTA – Surface Operations
Kevin Musselman	New Kensington CDC





G Street, Kensington Avenue Road Safety Audits

City of Philadelphia, PA



Wednesday, May 30, and
Thursday May 31, 2012

DVRPC – Delaware Valley Regional Planning Commission

- Metropolitan Planning Organization of the Delaware Valley serving 9 counties:
 - PA: Bucks, Chester, Delaware, Montgomery, and Philadelphia
 - NJ: Burlington, Camden, Gloucester, and Mercer
- Transportation Improvement Program (TIP)
 - DVRPC facilitates a regional body to oversee allocation of federal transportation funds



Audit Team Introductions

- Name
- Affiliation



G Street, Kensington Avenue

- **Why this these routes?**
 - Ranked highly on PennDOT's High Crash Locations list
 - # 16 – G Street (in top 5%)
 - # 22 – Kensington Avenue
- **Collaboration among:**
 - PennDOT District 6-0
 - Federal Highway Administration - PA
 - City of Philadelphia Streets Department
 - City Planning Commission, Mayor's Office of Transportation and Utilities
 - DVRPC's Office of Transportation Safety and Congestion Management



RSA Schedule

1. Pre-Audit Meeting - 8:00 AM
 - What are Road Safety Audits? – FHWA video
 - Analyze and discuss study area crash data and related safety issues
2. Field Visit
 - Foot survey of the corridor to identify safety issues and examine conditions
 - Lunch
3. Post Audit Meeting
 - Define problems
 - Brainstorm improvement ideas
 - Wrap up by 4:30 PM



What is a Road Safety Audit?

- Federal Highway Administration Road Safety Audit Video



What is a RSA?

- A safety performance examination of an existing or future road or intersection by an independent, multidisciplinary audit team
- Pedestrian RSA



History of RSAs

- First used in the United Kingdom in 1980s
- Australia and New Zealand have used RSAs since the 1990s
- Formal practice in the United States began in 1997 when the Federal Highway Administration sponsored a pilot program in 13 states



Benefits

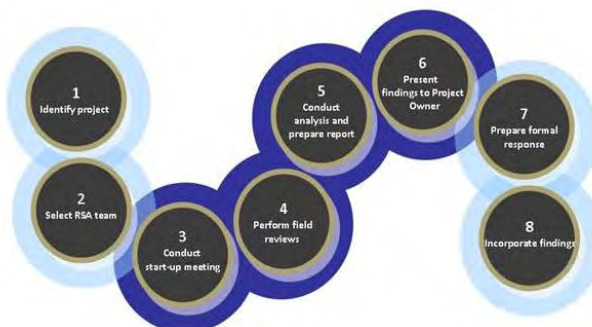
- Adaptable to local needs and conditions
- Short term
- Recommendations can be implemented in small stages as time and resources permit
- An audit can be performed during any stage of a project



How are RSAs conducted?

Responsibilities

- RSA Team
- Design Team / Project Owner



Source: VHB

Audit Team

- Federal Highway Administration - PA
- PennDOT District 6-0, Traffic
- City of Philadelphia
 - Streets, Planning, MOTU
- SEPTA
 - Service Planning, Surface Operations
- Bicycle Coalition of Greater Philadelphia
- Kensington Area Neighborhood Advisory Committee
- City of Philadelphia Police Department
- DVRPC
 - Office of Safety & Cng Mngmt, and Office of Transit, Bike and Ped Plng



Audit Materials

- Location Maps/Aerials
- Crash Data
 - Data Summaries
 - Analysis
- Traffic Counts
 - AADTs
 - Turning Movement Counts
- Field Note Sheets



Study Area: G Street

Land Use

- Kensington to E Venango
 - Dense urban neighborhood with standard street-grid pattern
 - Residential, intermittent retail
- E Venango to E Annsbury
 - Predominantly commercial and industrial, few residences
- E Annsbury to E Wyoming
 - Dense urban neighborhood with standard street-grid pattern
 - Residential, one retail shop



Transit

Buses - along the corridor

- Bus 89 follows G Street in segments of the study area

Buses - across the corridor

- Buses 56 and 56 Nite Owl cross G Street at Erie Avenue
- Buses 60 and 60 Nite Owl cross G Street at Allegheny Avenue

Rail

- Market-Frankford Elevated Line crosses G Street at the southern end of the study area, Allegheny Station one block north
- SEPTA's Regional Rail Main Line crosses under G Street, though there are no local stops in the study area



Operational Characteristics

Roadway

- 1.72 Miles
- North-south orientation
- One-way NB between Kensington and E. Venango
- Two-way between E Venango and E Wyoming
- Speed limit: 25 mph
- 28 Intersections:
 - 8 signalized (one 5-way at Kensington)
 - 4-way (9)
 - 3-way (11)
- On street parking throughout
- Bike Lanes: E Venango to W Wyoming



Intersections on G Street

Cross Street (minor cross st)	Signalized	Stop Controlled
Kensington Ave / E Clearfield St	5-leg	
Potter St		3-leg
E Allegheny St	4-leg	
E Hilton St		4-leg
E Madison St		4-leg
E Willard St		4-leg
E Westmoreland	4-leg	
E Cornwall St		4-leg
E Wensley St		4-leg
E Thayer St		4-leg
E Ontario St	4-leg	
E Russell St		3-leg
E Schiller St		3-leg
E Tioga St	4-leg	
E Atlantic St		3-leg
Kingston St		3-leg
E Venango St		3-leg
E Erie St	4-leg	
E Luzerne St		4-leg
E Lycoming St		3-leg
E Hunting Park Ave	4-leg	
E Bristol St		3-leg
E Cayuga St		3-leg
Ramona Ave		4-leg
E Annsbury St		3-leg
E Raymond St		3-leg
E Courtland St		4-leg
E Wyoming St	4-leg	3-leg

Operational Characteristics

Improvements

Countdown pedestrian signal heads installed at:

- G St & Hunting Park Avenue
- Clearfield St. & Kensington Avenue



Traffic Volumes

AADTs

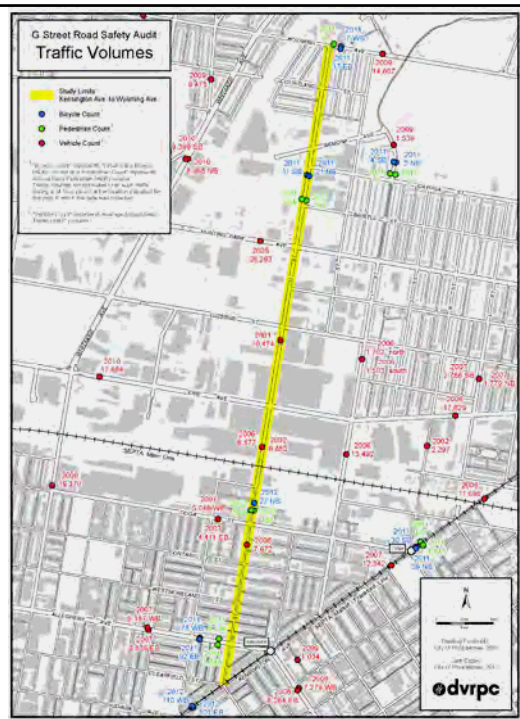
- South of E Erie Ave: aprx. 7,000 vehicles per day
- North of E Erie Ave: aprx. 10,000 vehicles per day

Pedestrian Volumes

- N of Erie – btwn 124 and 184
- S of Erie – as high as 599
- On Allegheny near G St – over 1,000

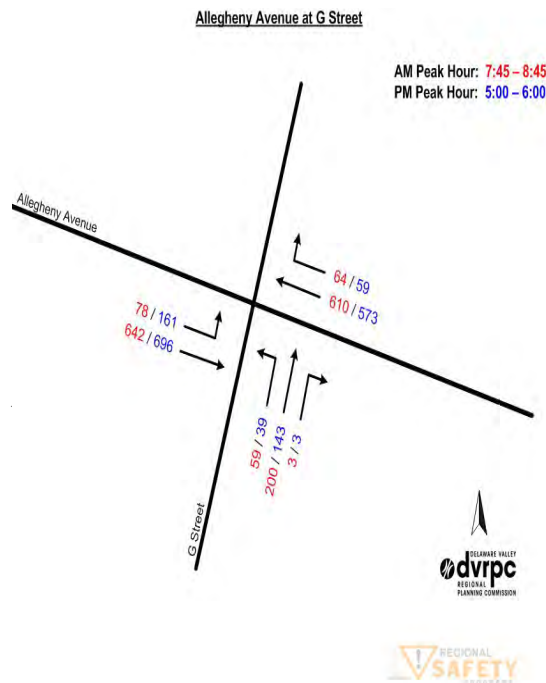
Bicyclist Volumes

- S of Erie – 27 NB (SB tube cut)
- N of Erie – 32 total volume
- On Allegheny – 170 total volume



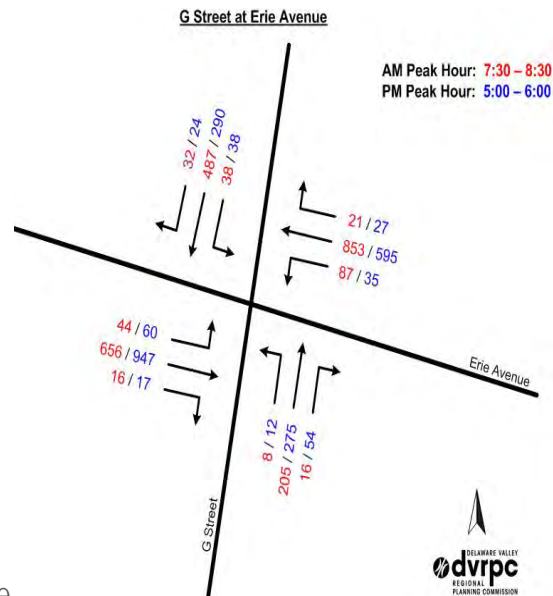
Peak Hour Turning Movement Counts

- **Intersection volumes**
 - AM = 1,656 vehicles
 - PM = 1,674 vehicles
- **Higher volumes** – Allegheny Avenue and G Street through movements
 - Allegheny Avenue had 76% of volume in AM and PM
- **Lower volumes** – G Street right-turns onto Allegheny Avenue



Peak Hour Turning Movement Counts

- **Intersection volumes**
 - AM = 2,463 vehicles
 - PM = 2,374 vehicles
- **Higher volumes – G Street and Erie Avenue through movements**
 - EB Erie Avenue afternoon through movement is 40% of PM traffic volume
- **Lower volumes – NB G Street left and right-turning movements; WB Erie Avenue right-turn movement**



Crash Data

Reportable and non-reportable crashes

- Reportable criteria: personal injury, or vehicle needs towing from scene Data years 2006 – 2010

PennDOT District 6-0

- Reportable crash summaries, resumes, report narratives and corridor stationing

Philadelphia Streets Department

- Reportable and non-reportable records with block and section information
- DVRPC GIS analysis and mapping

Data Issues

- Crashes on non-state facilities lack route/seg/offset information
 - Manual placement of crashes
- City data set is large, but lacks details

Corridor-wide Crash Findings

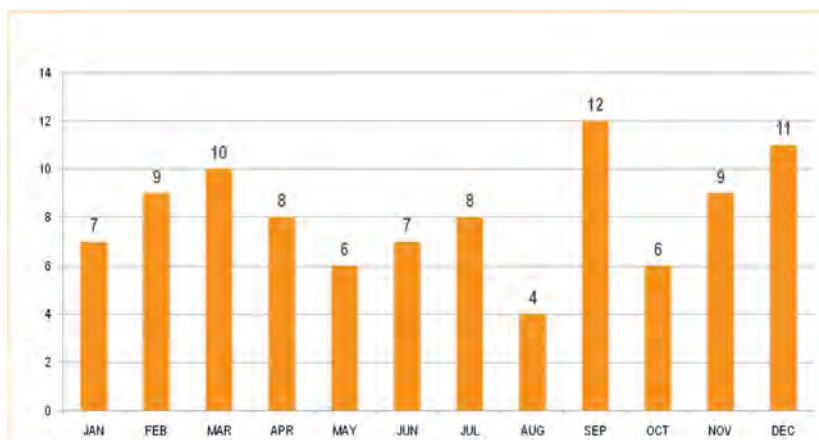
YEAR

	Reportable	
YEAR	TOTAL	PERCENTAGE
2006	16	16.5%
2007	30	30.9%
2008	11	11.3%
2009	25	25.8%
2010	15	15.5%
Total	97	



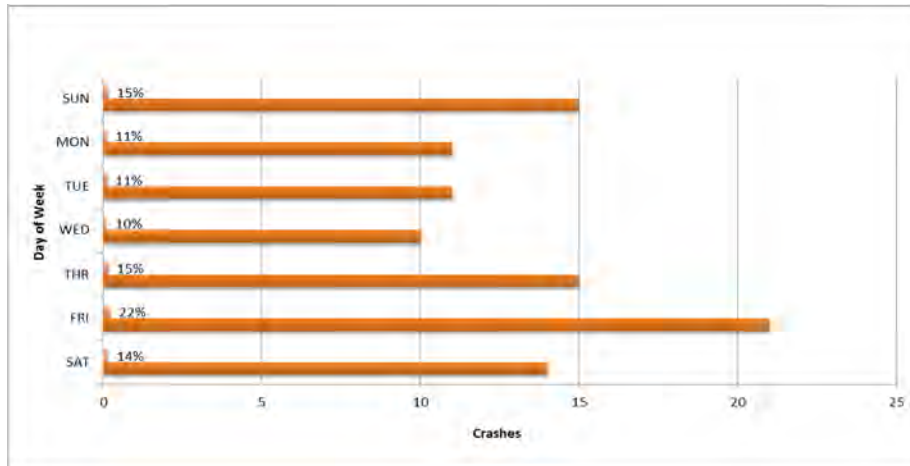
Corridor-wide Crash Findings

MONTH OF YEAR



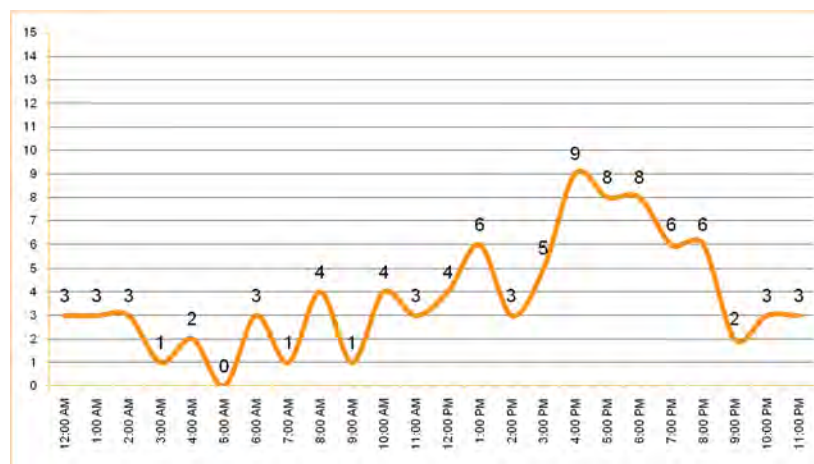
Corridor-wide Crash Findings

DAY OF WEEK



Corridor-wide Crash Findings

DAY OF WEEK



Corridor-wide Crash Findings

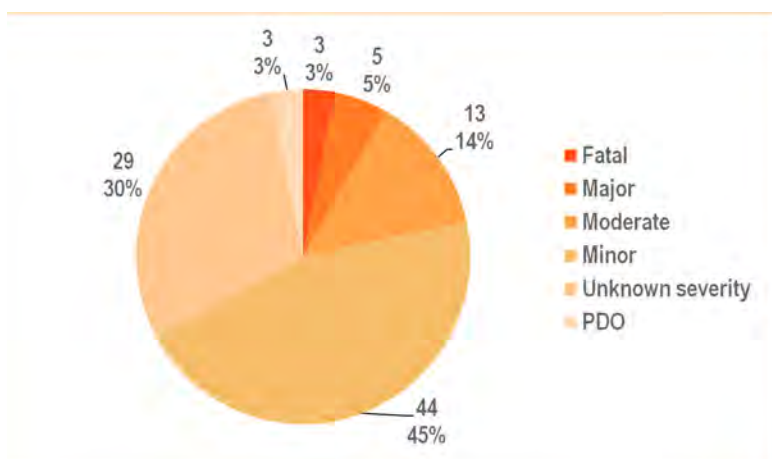
COLLISION TYPE

	Total Crashes	Percentage
Angle	28	29%
Pedestrian	22	23%
Rear End	17	18%
Head On	8	8%
Sideswipe (Same Direction)	8	8%
Sideswipe (Opposite Direction)	6	6%
Hit Fixed Object	5	5%
Backing	2	2%
Non Collision	1	1%



Corridor-wide Crash Findings

CRASH SEVERITY



Corridor-wide Crash Findings

WEATHER

	Total Crashes	Percentage
Clear	81	84%
Rain	13	13%
Sleet	1	1%
Snow	1	1%
Unknown	1	1%



Corridor-wide Crash Findings

ENVIRONMENTAL CONDITIONS

		Total Crashes	Percentage
Road Surface	Dry	77	79%
	Wet	17	18%
	Ice	1	1%
	Ice Patch	1	1%
	Other	1	1%
Illumination	Daylight	51	53%
	Street Lights	37	38%
	Dawn	3	3%
	Dusk	2	2%
	Other	2	2%
	Dark	1	1%
	Unknown Lighting	1	1%



Corridor-wide Crash Findings

DRIVER ACTIONS

	Total Crashes	Percentage
No Contributing Factor	79	39%
Unknown	60	30%
Running Red Light	10	5%
Affected Physical Condition	7	3%
Other Improper Driving	6	3%
Careless Passing/Lane Change	5	2%
Running Stop Sign	5	2%
Tailgating	5	2%
Careless/Illegal Backing	3	1%
Improper/Careless Turning	3	1%
Proceeding without Clearance	3	1%
Speeding	3	1%
Others	14	7%



Corridor-wide Summary

Where:

- Midblock = 24 (25%)
- At intersection
 - 4 way = 52 (53%)
 - T = 22 (22%)

Mode:

- Pedestrian crashes = 23%
- Bicyclists crashes = 5%
- Vehicle/vehicle = 72%

Predominant collision types (after ped):

- Angle = 28 (29%)
- Rear end = 17 (18%)

People involved: 159

- 3 fatal crashes, 3 people killed

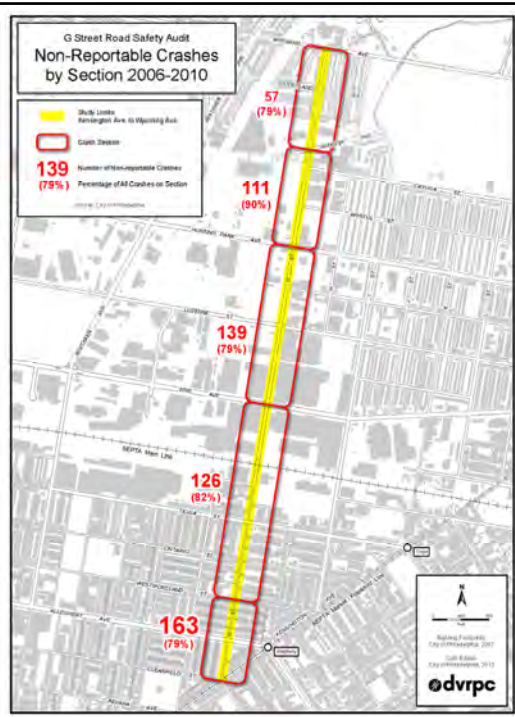


Non-Reportable Crashes by Section

Summary:

- 596 non-reportable crashes, 119/year
- Btwn 79% and 90% of all City data
- Highest concentration: Kensington to E Westmoreland Ave (6 blocks, 2 city blocks) = 27% of total
- Lowest concentration: Ramona Ave to E Wyoming Ave (aprx 20% longer than "most" section) = 10 %

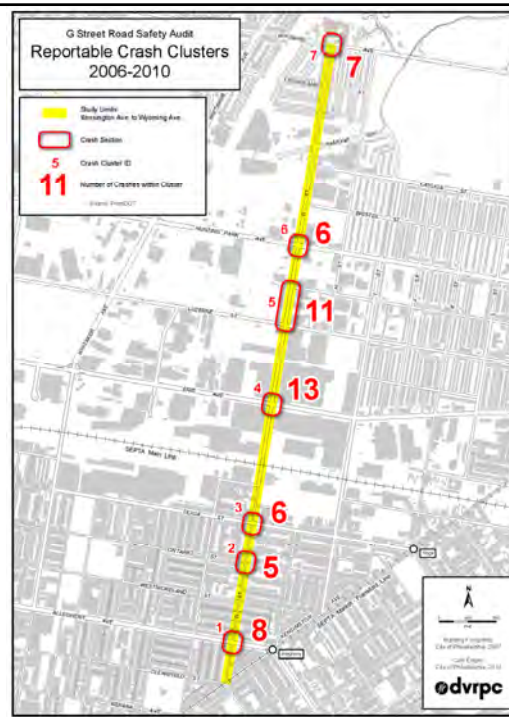
Very active environment!



Reportable Crash Clusters by Total Crashes

Summary:

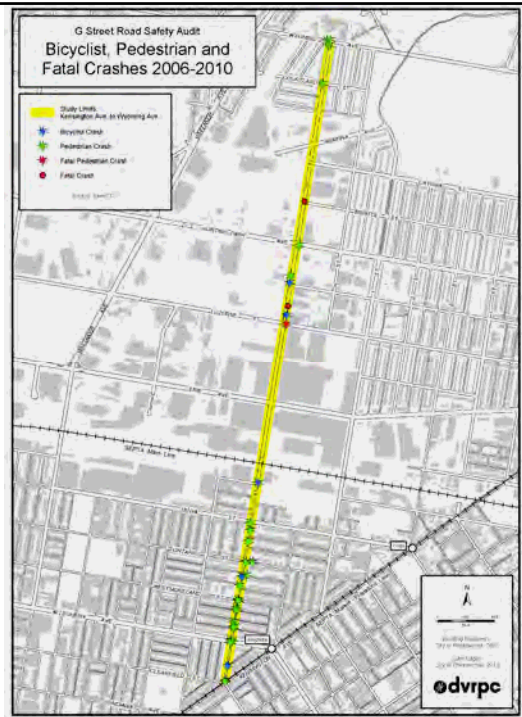
- 7 clusters
- Clusters represent 58% of all crashes
- Each includes a signalized intersection
- All coded as 4 way or T intersections
- Includes 8 ped crashes - less than 1/3 of total ped crashes
- Includes 2 of the 5 bike crashes
- Highest concentration: #4 at E Erie Avenue = 13 crashes
- Lowest concentration: #2 E Ontario St = 5 crashes



Bicyclist, Pedestrian, and Fatal Crashes

Observations:

- Pedestrian crashes more concentrated btwn Kensington and Tioga intersections
- Bicyclist crashes spread more widely
- All 3 fatal crashes occurred btwn E Luzerne and E Bristol
- One fatal was a pedestrian



Risk: Location of Pedestrian Crashes

- Midblock (27%)
- Intersections (33%)



- Nearly 60%

Midblock-related
Intersection-related

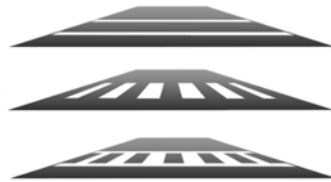
Crash Type	Percent
Midblock dart/dash	13.3
Other midblock	13.2
Other intersection	10.1
Vehicle turning at intersection	9.8
Not in road	8.6
Walking along roadway	7.9
Miscellaneous	7.8
Intersection dash	7.2
Backing vehicle	6.9
Driver violation at intersection	5.1
Working/playing in roadway	3.0
Disabled vehicle related	2.4
Driverless vehicle	2.1
Other vehicle-specific	1.9
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Source: VHB

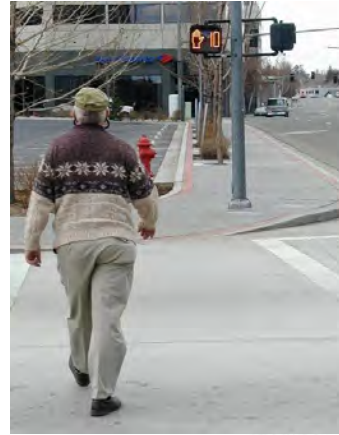
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Well designed and properly located crosswalks and signals:

- Inform motorists of the location of a pedestrian crossing
- Inform pedestrians where to cross
- Consider needs of users with disabilities
- Made with high-visibility markings
- Easily understood
- Use countdown timers
- Provide adequate crossing time



Source: VHB



Signal Timing and Phasing

- Walk Signal and Clearance Interval
 - Revisions to the MUTCD
 - Average walking speed reduced- 4 ft/s to 3.5 ft/s
- Longer Cycle Lengths
 - Increase delay
 - Reduce likelihood that pedestrians will wait
- Signal Phasing
 - Left-turn conflicts with permissive phasing
 - Potential for long delay or confusion with split phasing

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Features that Affect Bicyclists

- Uneven surfaces, pavement deterioration
 - Impact bicyclists more than motorist
 - Can throw rider off balance
- Raised utility covers and drainage grates, openings perpendicular to direction of travel
- Traffic speed
- Traffic volume
- Parking
- Bus activity
- Pedestrians



Source: VHB



Pedestrian RSA Guidelines

The *Pedestrian RSA Prompt Lists* are a useful tool for RSA teams to:

- Review prior to field visits
- Take along in the field
- Write RSA report

(FHWA Master Prompt List in binder)



Source: VHB



Daytime Video



Field Visit Itinerary

- Start: at southern end, Kensington and G Street intersection
- Stop: at northern end, E. Wyoming Avenue



Field View Checklist

- Drainage
- Public utilities
- Access management
 - Driveway spacing, redundancy
- Lighting
- Driver expectation
 - Sight distance adequate
 - Street signs visible
- Transit considerations
- Pedestrian crossings
- Pavement markings and lane delineation



Field View

- Material
 - Notes sheet
 - Aerial maps
- Vests



Post Audit Analysis

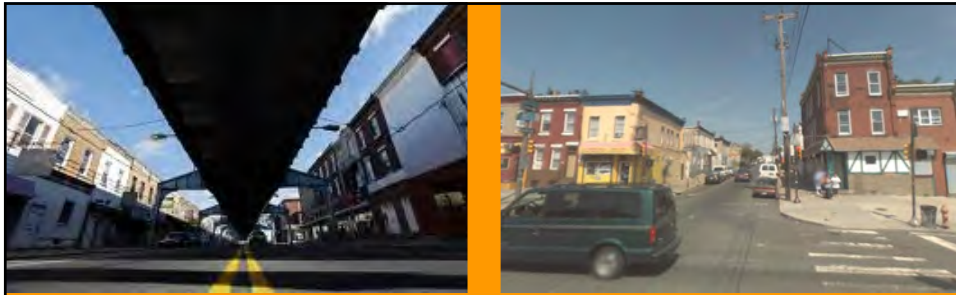
- Debriefing from field visit
- Define the problems
- Next steps
- Expected end by 4:30 PM



QUESTIONS ?







G Street, Kensington Avenue Road Safety Audits

City of Philadelphia, PA



Wednesday, May 30, and
Thursday May 31, 2012

DVRPC – Delaware Valley Regional Planning Commission

- Metropolitan Planning Organization of the Delaware Valley serving 9 counties:
 - PA: Bucks, Chester, Delaware, Montgomery, and Philadelphia
 - NJ: Burlington, Camden, Gloucester, and Mercer
- Transportation Improvement Program (TIP)
 - DVRPC facilitates a regional body to oversee allocation of federal transportation funds



Study Area: Kensington Avenue

Land Use

- Front Street to East Tioga Avenue
- Dense urban environment
- Predominantly commercial, with some residential
- Very active street life
- Runs beneath the transit line, four stops in study area
- Urban ills
- Active revitalization effort



Operational Characteristics

Roadway

- 1.66 Miles
- Cuts the grid diagonally
- Two-way street
- Orientation: North-east, south-west
- Bike lanes throughout
- Speed limit: 25 mph
- 35 Intersections:
 - 12 signalized (11 five-way intersections)
 - 4-way (1, E Lehigh Ave)
 - 3-way (22)
- On street parking throughout



Cross Street (minor cross st)	Signalized	Stop Controlled
Front St / E & W York St	5-leg	
E Boston St		3-leg
E Hager St		3-leg
E Letterly St		3-leg
E Cumberland / A St	5-leg	
E Sergeant St		3-leg
E Hazzard St		3-leg
E Huntington St / B St	5-leg	
E Harold St		3-leg
E Albert St		3-leg
E Oakdale		3-leg
E Lehigh St	4-leg	
E Tusculum St		3-leg offset
E Budinot St		
E Somerset / D St	5-leg	
Hart Ln		3-leg
E Cambria / E St	5-leg	
E Monmouth St		3-leg
E Orleans / E Indiana / F St	5-leg / offset	
E Clearfield / G St	5-leg	
E Clementine St		3-leg
E Lippencott St		3-leg
E Wishart St		3-leg
E Allegheny St / H St	5-leg	
E Hilton St		3-leg
E Madison St		3-leg
E Willard St		3-leg
E Westmoreland / I St	5-leg	
E Cornwall St		3-leg
E Wensley St		3-leg
E Thayer St		3-leg
E Ontario St / J St	5-leg	
E Russell St		3-leg
E Schiller St		3-leg
E Tioga St / K St	5-leg	

Intersections on Kensington Avenue

Improvements

Countdown pedestrian signal heads installed at:

- Allegheny & Kensington Avenues
- Clearfield St. & Kensington Avenues
- Lehigh and Kensington Avenues and being upgraded by the Lehigh Avenue East Project



Traffic Volumes

AADTs

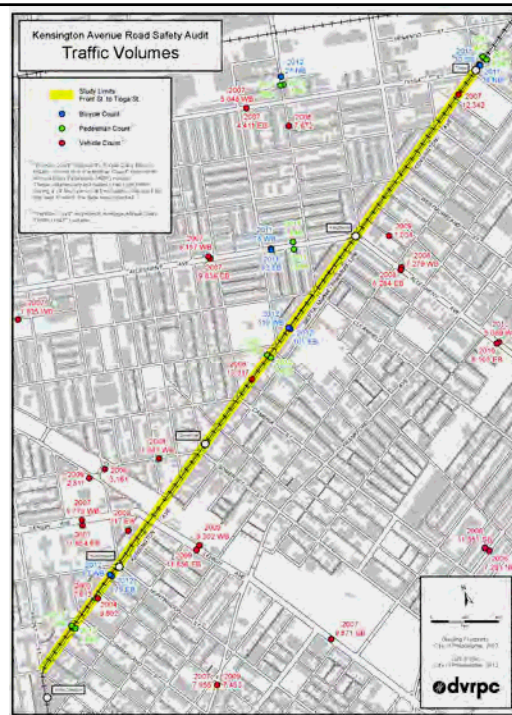
- North of E Lehigh Ave: aprx 12,500 vehicles per day (VPD)
- South of E Lehigh Ave:
- Under 10,000 VPD

Pedestrian Volumes

- Near E Cumberland St – aprx 1500 people per direction
- Near E Indiana St – aprx 1700 people per direction
- Near E Tioga St – 1042 people (EB side), 472 (WB side)

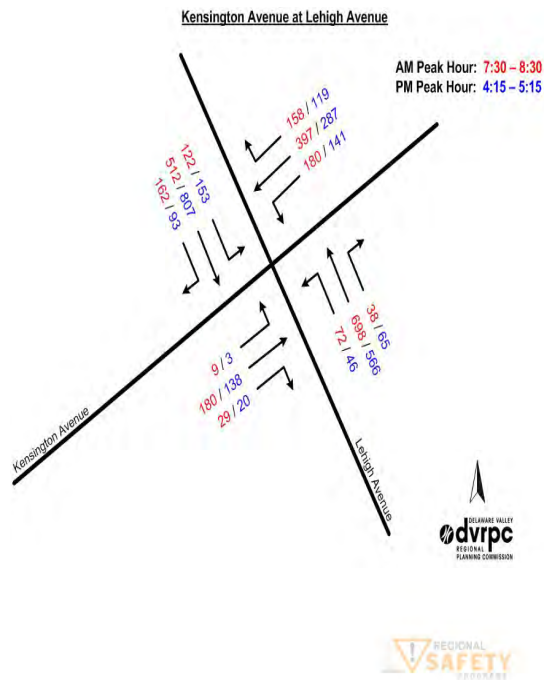
Bicyclist Volumes

- Near Huntington – aprx 160 total volume
- Near E Indiana St – aprx 211 total volume
- Near E Tioga St – aprx 70 total volume



Peak Hour Turning Movement Counts

- **Intersection volumes**
 - AM = 2,557 vehicles
 - PM = 2,438 vehicles
- **Higher volumes**
 - Lehigh Avenue and Kensington Avenue through movements
 - SE Lehigh Avenue PM through movement is 33% of total PM traffic volume
- **Lower volumes**
 - Kensington Avenue EB left and right-turns



Transit

Buses - along the corridor

- Bus 3 runs the length of Kensington Avenue in the study area
- Bus 39 runs on Huntingdon and Cumberland Streets, and briefly on Kensington Avenue
- Bus 54 runs on Lehigh, Somerset, and Cambria Streets, and briefly on Kensington Avenue

Buses - across the corridor

- Buses 60 and 60 Nite Owl cross Kensington Avenue at Allegheny Avenue

Rail

- Market-Frankford Elevated Line runs the length of Kensington Avenue over the street; four station stops
- The Market-Frankford Nite Owl Express Bus follows the route of the train line twice per night on weekdays



Crash Data

Reportable and non-reportable crashes

- Reportable criteria: personal injury, or vehicle needs towing from scene Data years 2006 – 2010

PennDOT District 6-0

- Reportable crash summaries, resumes, report narratives and corridor stationing

Philadelphia Streets Department

- Reportable and non-reportable records with block and section information
- DVRPC GIS analysis and mapping

Data Issues

- Crashes on non-state facilities lack route/seg/offset information
 - Manual placement of crashes
- City data set is large, but lacks details



Corridor-wide Crash Findings

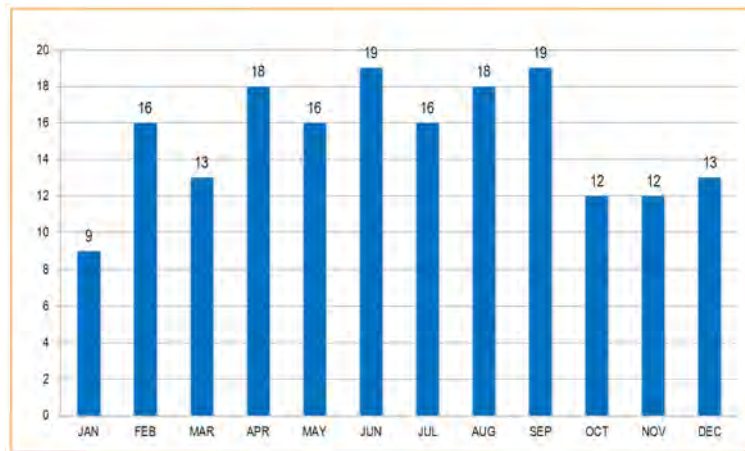
YEAR

	Reportable	
YEAR	TOTAL	PERCENTAGE
2006	33	18%
2007	35	19%
2008	37	20%
2009	39	22%
2010	37	20%
Total	181	



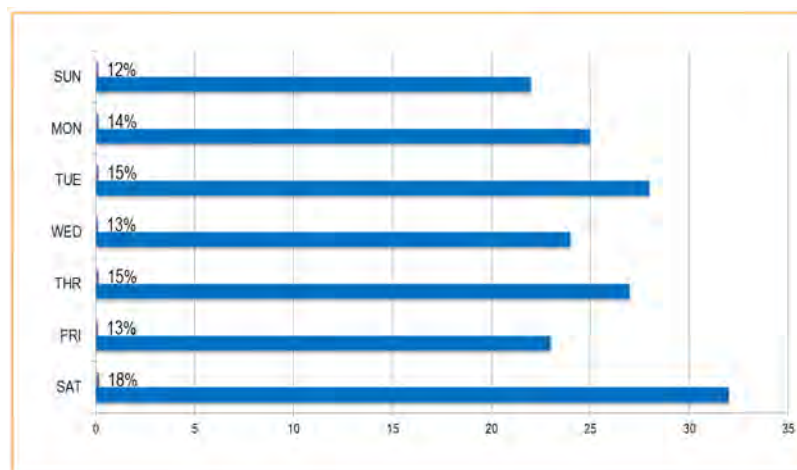
Corridor-wide Crash Findings

MONTH OF YEAR

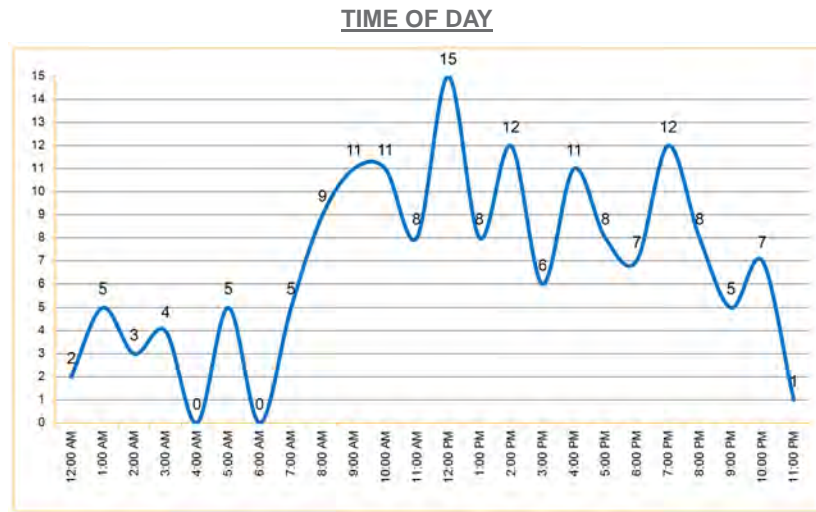


Corridor-wide Crash Findings

DAY OF WEEK



Corridor-wide Crash Findings



Corridor-wide Crash Findings

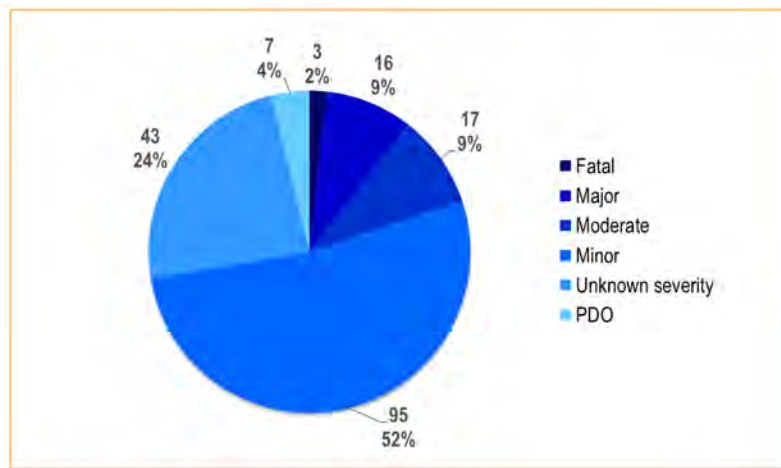
COLLISION TYPE

	Total Crashes	Percentage
Hit Pedestrian	69	38%
Angle	38	21%
Rear End	38	21%
Head On	11	6%
Sideswipe (Same Direction)	11	6%
Hit Fixed Object	8	4%
Sideswipe (Opposite Direction)	4	2%
Backing	2	1%



Corridor-wide Crash Findings

CRASH SEVERITY



Corridor-wide Crash Findings

WEATHER

	Total Crashes	Percentage
Clear	153	85%
Rain	24	13%
Snow	2	1%
Other	1	0.5%
Unknown	1	0.5%



Corridor-wide Crash Findings

ENVIRONMENTAL CONDITIONS

		Total Crashes	Percentage
Road Surface	Dry	146	81%
	Wet	30	17%
	Ice	2	1%
	Other	2	1%
	Ice Patches	1	1%
Illumination	Daylight	117	65%
	Dark – Street Lights	55	30%
	Dusk	6	3%
	Dark – No Street Lights	1	1%
	Dawn	1	1%
	Dark – Unknown	1	1%



Corridor-wide Crash Findings

DRIVER ACTIONS

	Total Crashes	Percentage
No contributing factor	225	47%
Unknown	139	29%
Other improper driving actions	18	4%
Making improper or careless turn	17	4%
Running red light	11	2%
Driving on the wrong side of the road	9	2%
Affected by a physical condition	9	2%
Tailgating	7	1%
Driver was distracted	6	1%
Driving too fast for conditions	5	1%
Proceeding without clearance after stop	4	1%
Driving the wrong way on 1-way street	4	1%
Others	25	5%



Corridor-wide Summary

Where:

- Midblock = 30.4%
- At intersection
 - 4 way = 42%
 - T = 11%
 - Y = 2.2%
 - Multi = 14.4%

Mode:

- Pedestrian crashes = 38%
- Bicyclists crashes = 6.6%
- Vehicle/vehicle = 55.4%

Predominant collision types (after ped):

- Rear end, angle = 21% each

People involved:

- 3 people killed, 256 people involved

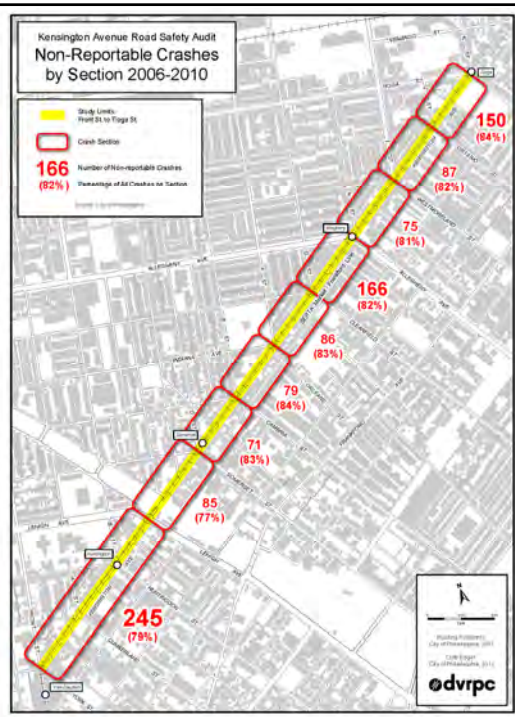


Non-Reportable Crashes by Section

Summary:

- 1044 non-reportable crashes, 208/year
- Btwn 77% and 84% of all City data
- Highest concentration: E Clearfield St to E Allegheny Ave (aprx. 1 city block) = 16% of total
- Lowest concentration: E Somerset St to E Cambia St (average section length) = 6.8%

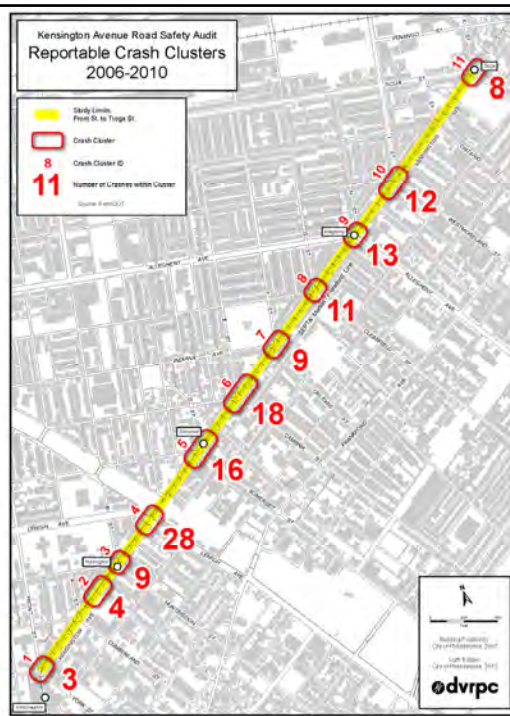
Intensely active environment!!



Reportable Crash Clusters by Total Crashes

Summary:

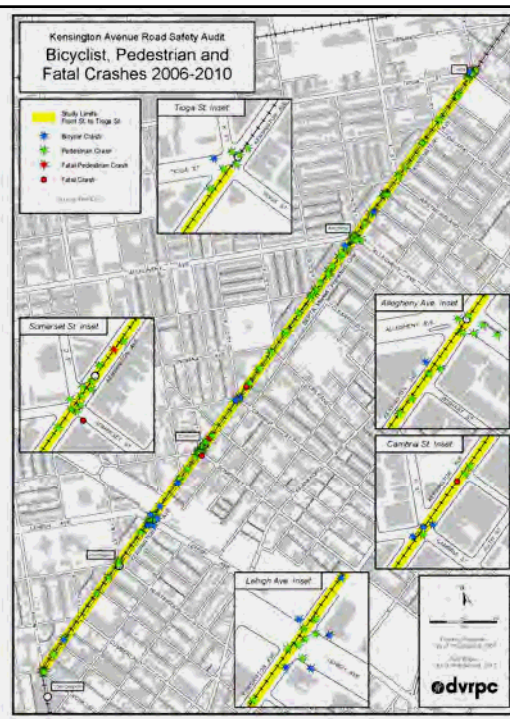
- 11 clusters
- Clusters represent 72% of all crashes (131)
- Midblock = 19%, remainder at 4 way, 5 way, T and Y intersections
- Cluster 5 – 2 fatal crashes, Cluster 6 – 1 fatal crash
- Includes 77% of ped crashes, and 10 (of the 12) bike crashes
- Highest concentration: E Lehigh Ave int. = 21.4% of total
- Lowest concentration: Front St int. = 2.3 %
- Includes all 4 MFL stops



Bicyclist, Pedestrian, and Fatal Crashes

Observations:

- Pedestrian and bicyclist crashes are a corridor wide problem
- Several concentration areas, though not isolated to single intersections
- Bicyclist crashes spread more widely
- All 3 fatal crashes occurred from E Somerset St to E Monmouth St
- On fatal was a pedestrian



Risk: Location of Pedestrian Crashes

- Midblock (27%)
- Intersections (33%)



- Nearly 60%
- Along roadway
- Off-road facilities

Midblock-related
Intersection-related

Crash Type	Percent
Midblock dart/dash	13.3
Other midblock	13.2
Other intersection	10.1
Vehicle turning at intersection	9.8
Not in road	8.6
Walking along roadway	7.9
Miscellaneous	7.8
Intersection dash	7.2
Backing vehicle	6.9
Driver violation at intersection	5.1
Working/playing in roadway	3.0
Disabled vehicle related	2.4
Driverless vehicle	2.1
Other vehicle-specific	1.9
Bus-related	0.9

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- Inform motorists of the location of a pedestrian crossing
- Inform pedestrians where to cross
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- Made with high-visibility markings
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- Provide adequate crossing time



Source: VHB

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- Walk Signal and Clearance Interval
 - Revisions to the MUTCD
 - Average walking speed reduced- 4 ft/s to 3.5 ft/s
- Longer Cycle Lengths
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- Signal Phasing
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Features that Affect Bicyclists

- Uneven surfaces, pavement deterioration
 - Impact bicyclists more than motorist
 - Can throw rider off balance
- Raised utility covers and drainage grates, openings perpendicular to direction of travel
- Traffic speed
- Traffic volume
- Parking
- Bus activity
- Pedestrians



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The *Pedestrian RSA Prompt Lists* are a useful tool for RSA teams to:

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(FHWA Master Prompt List in binder)



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Related Elements from City of Philadelphia Bicycle and Pedestrian Plan

Kensington and Allegheny

Current conditions listed:

- Existing medians on Allegheny may be confusing to pedestrians because they don't separate opposing traffic lanes
- Lighting under the tracks appears to be limited
- Wide turning radii encourages/enables drivers to turn at a high rate of speed
- Existing curb ramps need improvement
- Busy transit station with many passengers transferring to intersecting bus routes
- Long pedestrian crossing distances

Recommended improvements:

- Consider leading pedestrian intervals
- Reduce crossing distances
- Consider signs to warn pedestrians to look both ways as they cross the medians on Allegheny Avenue
- Improve lighting under the tracks
- Provide a tree or landscape buffer on Allegheny Avenue south of Kensington to improve the pedestrian environment while contributing to "green streets" goals
- Add bus shelter or benches on Allegheny Avenue



Field Visit Itinerary

- Start: at southwestern end, Kensington and Front Street intersection
- Stop: at northeastern end, E. Tioga Street intersection



Field View Checklist

- Drainage
- Public utilities
- Access management
 - Driveway spacing, redundancy
- Lighting
- Driver expectation
 - Sight distance adequate
 - Street signs visible
- Transit considerations
- Pedestrian crossings
- Pavement markings and lane delineation

Field View

- Material
 - Notes sheet
 - Aerial maps
- Clipboards
- Vests



Nighttime Video



Post Audit Analysis

- Debriefing from field visit
- Define the problems
- Next steps
- Target finish: 4:30 PM



QUESTIONS ?



Publication Title: G Street and Kensington Avenue Road Safety Audits

Publication Number: 12032

Date Published: October 2013

Geographic Area Covered: Philadelphia, PA

Key Words: Road safety audit, RSA, pedestrian, bicyclist, walking, biking, crashes, injuries, fatalities, issues, strategies, traffic signal, crossing, intersection, engineering, enforcement, education, stakeholders, prioritize, behavior, speed limit, traffic volumes, stakeholders, audit team, geometry, pavement markings, signs, crosswalk, sidewalk, G Street, Kensington Avenue, Philadelphia.

Abstract: This report documents the process and findings of the G Street and Kensington Avenue Road Safety Audits undertaken by the Delaware Valley Regional Planning Commission (DVRPC). The report details safety issues identified by the audit team over two days at the study corridors, as well as remedial strategies to address them. The goal of this audit was to identify safety issues and generate improvement recommendations for the study area in an effort to reduce crashes and improve conditions. Emphasis is placed on identifying low-cost, quick-turnaround safety projects to address the identified issues, where possible. This project represents a step toward implementation of DVRPC's Safety Action Plan. Implementation of improvement strategies may be eligible for Federal Highway Safety Improvement Program Funds.

Staff Contact:

Kevin S. Murphy
Principal Planner, Transportation Safety and Congestion Management
☎ (215) 238-2864
✉ kmurphy@dvrpc.org

Delaware Valley Regional Planning Commission
190 N. Independence Mall West, 8th Floor
Philadelphia PA 19106
Phone: (215) 592-1800
Fax: (215) 592-9125
Internet: www.dvrpc.org

