APPENDIX 34

LOCAL IMPACT REPORT

Please see the local impact report enclosed in the separate, stand-alone binder labeled as such.

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November 7, 2012

By Hand Delivery

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City of Philadelphia
1515 Arch Street, 13th Floor
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Duane H. Bumb
Senior Deputy Director of Commerce
City of Philadelphia
1515 Arch Street, 13th Floor
Philadelphia, PA 19102

Re: Application of Tower Entertainment, LLC, for a Category 2 Slot Machine License and *The Provence* Mixed-Use Entertainment Facility Proposed for 400 North Broad Street

Gentlemen:

I am writing on behalf of my client Tower Entertainment, LLC ("Tower"). This letter and the attached confidential reports prepared by Econsult Corporation ("Econsult Report") (Tab "A"), and Traffic Planning and Design, Inc. ("TPD Report") (Tab "B") constitute the Local Impact Report required by the Pennsylvania Gaming Control Board to be served on local officials pursuant to 58 Pa. Code § 441a.3(d). Tower is pleased to provide these materials to you for your information and consideration and to demonstrate the positive economic impact and other benefits that *The Provence* (pronounced Prah-VONCE) -- a mixed-use entertainment facility to be located at 400 North Broad Street -- will bring to Philadelphia.

As you will see, this letter is divided into three sections. First, we briefly describe *The Provence*. Second, we detail the complex's positive impact on the local community. Finally, we explain the absence of adverse impact on the various municipal resources and services set forth at 58 Pa. Code § 441a.3 (d) and in Appendix 34 of Tower's application to the Pennsylvania Gaming Control Board.

Introduction to *The Provence* at 400 North Broad Street

With its application to the Pennsylvania Gaming Control Board, Tower proposes to develop a multi-faceted 1.25 million square foot urban resort complex at the northern edge of Center City that will

include amenities unlike any existing development in Philadelphia. *The Provence* will redevelop and feature the iconic Inquirer building as a 125-key hotel. The hotel alone would be an excellent complement to the Pennsylvania Convention Center, a mere two blocks south. Nevertheless, *The Provence* will also offer a remarkable array of non-gaming amenities, the highlight of which will be the creation of a European-style rooftop village that makes the development truly one of a kind. Specific non-gaming amenities will include a concert venue, a comedy club, a jazz club, a nightclub, a spa, a private swim club, a botanical garden, event and wedding facilities, and numerous retail shopping options. Patrons of *The Provence* will also enjoy a variety of dining choices with several full-service restaurants, a sports bar and multiple convenience food outlets. With this substantial offering of non-gaming entertainment, the 123,000 square foot casino will comprise less than 20% of *The Provence* (excluding the parking garages), notwithstanding that the casino will be the economic centerpiece and catalyst for the complex.

Located at 400 North Broad Street, one of the most significant advantages of the project is its proposed location. The resort complex will extend east-west along Callowhill Street from the Inquirer building on Broad Street all the way to 17th Street. With this area presently underdeveloped, the resort complex is ideally located to spur development along the northern edge of Center City. Importantly, the complex will connect North Broad Street south to the Convention Center, as well as to Center City hotels and attractions located across Vine Street.

Tower is pleased to have Seminole Hard Rock Entertainment, LLC ("Hard Rock"), one of the country's most respected gaming operators, manage the proposed casino and entertainment complex through its wholly-owned subsidiary, HR Philadelphia Manager, LLC. Hard Rock's extensive experience in gaming and non-gaming entertainment on six continents will maximize the guest experience and complement the array of amenities at *The Provence*. This complex will truly be well-positioned as a tourist and regional entertainment destination and a significant asset to the City of Philadelphia.

For additional information regarding *The Provence*, I am attaching hereto a recent review by architecture critic Inga Saffron in her Changing Skyline newspaper column. See Inga Saffron, *More Than a Casino*, Philadelphia Inquirer, Nov. 2, 2012 (Tab "C").

Positive Impact of *The Provence* at 400 North Broad Street

As documented in the Econsult Report, *The Provence* will deliver significant tax revenues for the City of Philadelphia and the Commonwealth of Pennsylvania.

- The gaming amenity alone will generate more than $900,000,000 in gaming tax revenue for the City and Commonwealth over the first five years of operations, as detailed below:

Slot Machine and Table Game Tax Revenue[1]

Year	State Gaming Fund & Property Tax Relief	City's Host Fees	State Racing Development Assessment	State Economic Development Assessment	State General Fund Revenue[2]
2015	$88,002,360	$12,678,942	$31,059,657	$12,941,524	$16,280,062
2016	$100,719,424	$14,388,489	$35,548,032	$14,811,680	$17,774,016
2017	$103,884,532	$14,840,647	$36,665,129	$15,277,137	$15,713,627
2018	$106,481,645	$15,211,664	$37,581,757	$15,659,065	$16,106,467
2019	$108,877,482	$15,553,926	$38,427,347	$16,011,394	$16,468,863
Total	*$507,965,444*	*$72,673,668*	*$179,281,921*	*$74,700,801*	*$82,343,034*

Source: Spectrum Gaming Group; Econsult Report, pp.13-14 (Table 5.1) and A-15 (Appendix G)

- The ongoing operations at *The Provence* will directly or indirectly generate almost $17,000,000 annually in non-gaming tax revenue for the City and the Commonwealth, as detailed below:

	City of Philadelphia		Commonwealth of Pennsylvania
Wage and Earnings	$4,200,000	Personal Income	$2,800,000
Sales, Use, and Hotel	$1,300,000	Sales, Use, and Hotel	$6,600,000
Business Privilege	$1,200,000	Corporate Net Income	$700,000
Total Per Year	*$6,700,000*	*Total Per Year*	*$10,100,000*

Source: Econsult Report, p. 16 (Table 5.3)

- *The Provence* will also generate additional ancillary spending within the City and Commonwealth that would not otherwise be spent. This ancillary spending will directly or indirectly generate approximately $11,500,000 in additional non-gaming tax revenue for the City and the Commonwealth, as detailed below:

	City of Philadelphia		Commonwealth of Pennsylvania
Wage and Earnings	$1,400,000	Personal Income	$2,600,000
Sales, Use, and Hotel	$700,000	Sales, Use, and Hotel	$4,200,000
Business Privilege	$700,000	Corporate Net Income	$2,000,000
Total Per Year	*$2,800,000*	*Total Per Year*	*$8,800,000*

Source: Econsult Report, p. 16 (Table 5.4)

- The upfront construction of *The Provence*, a 1.25 million square foot urban resort complex, will generate an additional one-time infusion of $19,500,000 in non-gaming tax revenue for the City and the Commonwealth, as detailed below:

---

1 Revenue projections were developed by Tower's gaming market expert, Spectrum Gaming Group.

2 The "General Fund Revenue" detailed above is paid to the Commonwealth's General Fund and is based on a 14% tax rate of the proposed casino's table game revenue for the first two years of operation and a 12% tax rate thereafter.

	City of Philadelphia		Commonwealth of Pennsylvania
Wage and Earnings	$3,400,000	Personal Income	$5,000,000
Sales, Use, and Hotel	$600,000	Sales, Use, and Hotel	$8,600,000
Business Privilege	$900,000	Corporate Net Income	$1,000,000
One-Time Total	*$4,900,000*	*One-Time Total*	*$14,600,000*

Source: Econsult Report, p. 15 (Table 5.2)

The Econsult Report also documents the substantial permanent job growth and temporary construction-related jobs generated by *The Provence* within the City and the Commonwealth.

- There will be an estimated 2,500 employment positions created to operate *The Provence* upon opening. Econsult Report, p.8.

- The ongoing operations at *The Provence* will generate in total approximately 3,000 permanent employment positions within the City (almost 3,700 permanent employment positions within the Commonwealth). Econsult Report, p.8-9 (Table 3.1).

- The ancillary spending generated by *The Provence* within the City and Commonwealth that would not otherwise be spent will spur additional job creation. The Econsult Report determines that this ancillary spending will generate approximately 2,300 permanent employment positions within the City (almost 4,100 permanent employment positions within the Commonwealth). Econsult Report, p. 11 (Table 4.1).

- The upfront construction of *The Provence* will further generate almost 2,000 temporary jobs within the City (more than 6,400 temporary jobs within the Commonwealth) during the construction phase of the new complex. Econsult Report, p. 6 (Table 2.1).

The Econsult Report further concludes that *The Provence* will serve as the catalyst for an additional 2-3 million square feet of new commercial and residential real estate development within a half (1/2) mile radius around *The Provence*, delivering even more benefits for the City and the Commonwealth, including:

- Real estate development investment of approximately $1 billion along North Broad Street and the northern edge of Center City (Econsult Report, p.19);

- An additional $9,400,000 annually in non-gaming tax revenue for the City and the Commonwealth, as detailed below:

	City of Philadelphia		Commonwealth of Pennsylvania
Wage and Earnings	$1,800,000	Personal Income	$2,200,000
Sales, Use, and Hotel	$900,000	Sales, Use, and Hotel	$3,200,000
Business Privilege	$600,000	Corporate Net Income	$700,000
Total Per Year	*$3,300,000*	*Total Per Year*	*$6,100,000*

Source: Econsult Report, p.22 (Table 6.5)

- An additional one-time infusion of $68 million in non-gaming tax revenue for the City and the Commonwealth from the upfront construction of the additional commercial and residential development, as detailed below:

	City of Philadelphia		Commonwealth of Pennsylvania
Wage and Earnings	$8,700,000	Personal Income	$24,700,000
Sales, Use, and Hotel	$2,000,000	Sales, Use, and Hotel	$22,300,000
Business Privilege	$4,300,000	Corporate Net Income	$6,000,000
One-Time Total	*$15,000,000*	*One-Time Total*	*$53,000,000*

Source: Econsult Report, p. 22 (Table 6.4)

- Additional permanent job creation of approximately 1,700 permanent employment positions within the City (more than 2,150 permanent employment positions within the Commonwealth) from the ongoing operations of the new commercial real estate development (Econsult Report, p. 21 (Table 6.3)); and

- Additional temporary job creation of more than 6,100 temporary jobs within the City (approximately 20,100 temporary jobs within the Commonwealth) from the upfront construction of the additional commercial and residential development (Econsult Report, p.20 (Table 6.1)).

The Provence will deliver significant additional benefits for the City, including:

- A goal to fill 1,000 temporary construction jobs and 1,000 permanent employment positions within the immediate neighborhood of *The Provence*;

- Enhancement of the City's tourism and conventioneer marketing efforts by adding a new and exciting mixed-use entertainment option and a 125-key hotel two blocks away from the Convention Center and Center City attractions; and

- A goal to utilize local suppliers and vendors in the construction, procurement of fixtures and operation of the development.

Absence of Adverse Impact on Municipal Resources and Services

Traffic: The TPD Report indicates that with a series of roadway improvements, "adequate accommodations for vehicles, pedestrians, mass transit, and bicycles can be provided for the site" (TPD Report, p.11). In the coming months, Tower and TPD will meet with the City's Department of Streets and PennDOT to further refine the traffic / transportation plan. We will keep you apprised and up-to-date as the plan continues to evolve. In addition to the TPD Report, I also attach for your review a Traffic Flow Analysis illustration (Tab "D").

Parking: The attached Parking Transportation Analysis illustration (Tab "E") shows that *The Provence* will maintain parking for 1,700 cars. In addition, existing and projected parking facilities in the immediate area maintain a capacity for an additional 2,955 cars, for a total capacity of 4,655 cars. Accordingly, there will be no adverse impact on the local community due to parking.

Transit Access: SEPTA's Broad Street subway line and numerous SEPTA bus routes, including Route 2, 4, 16, 43, as well as several New Jersey Transit routes, already serve the expanded Pennsylvania Convention Center Expansion District and will be able to serve *The Provence*. The subway line connects the complex to the 69th Street Terminal and Frankford Transportation Center via the Market-Frankford subway-elevated line as well as the Regional Rail and Trolley Lines via Suburban Station. Additional information regarding public transit facilities is included in the TPD report (TPD Report, p. 3).

Housing: *The Provence* is not anticipated to have a material adverse impact on housing as the complex will be constructed on non-residential property. In fact, the complex is projected to increase commercial and residential development within a half (1/2) mile radius around *The Provence* by 2-3 million square feet, including 1.5 million square feet of residential construction (Econsult Report, pp.18, 20). This substantial increase in the supply of housing will have a measurably positive impact on the local community. Any increase in demand for housing will be satisfied by the increased supply that will be spurred by *The Provence*.

Water and Sewer Systems: The City infrastructure already in place at the location for *The Provence* easily accommodated intensive water and sewer utilization when the site served as the editorial, production and distribution facility for the *Philadelphia Inquirer* and *Daily News*. The change of use to *The Provence* is not anticipated to cause adverse impacts on the existing water and sewer systems.

Local Police and Emergency Services: With the addition of Pennsylvania State Police troopers assigned to the proposed casino, and an enhanced level of service provided by internal security, existing police and emergency services resources in the City will be able to address any increased demand that arises from the development of the proposed complex.

Existing Tourism, including Historical and Cultural Resources: *The Provence* will have no adverse impact on Philadelphia's existing tourism and cultural resources. To the contrary, the complex will add an additional attraction that will complement existing tourism and cultural resources and draw substantial additional tourist visits to the City.

Thank you for your attention and courtesy with respect to these matters. We would be pleased to discuss this letter and its attachments with you, as well as any other aspect of Tower's application to the Pennsylvania Gaming Control Board, at your convenience.

Sincerely,

Adrian R. King, Jr.

Attachments

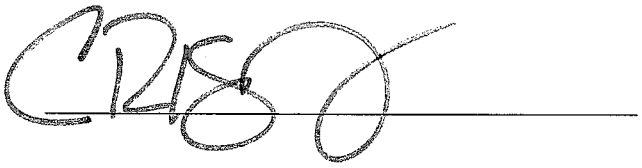
Proof of Service

I, Adrian R. King, Jr., certify that on November 7, 2012, I caused the original and one copy of Tower Entertainment, LLC's Local Impact Report to be served by hand delivery on the following officials listed below.

Alan Jay Greenberger, AIA
Deputy Mayor for Economic Development and Director of Commerce
Executive Director, Philadelphia City Planning Commission
City of Philadelphia
1515 Arch Street, 13th Floor
Philadelphia, PA 19102

Duane H. Bumb
Senior Deputy Director of Commerce
City of Philadelphia
1515 Arch Street, 13th Floor
Philadelphia, PA 19102

On behalf of the City of Philadelphia



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Section 707(b) Statement

The enclosed reports contain certain confidential proprietary information of Tower Entertainment, LLC, protected from disclosure under the Right-to-Know Law. In accordance with Section 707(b) of the Right-to-Know Law, I hereby request notice of any request for the enclosed records and the opportunity to provide input on the release of the record.

Adrian R. King, Jr.

THE POTENTIAL ECONOMIC AND FISCAL IMPACTS OF THE PROVENCE

Report Submitted To:
Tower Entertainment, LLC
1033 North 2nd Street Suite 2A
Philadelphia PA 19123

Report Submitted By:
Econsult Corporation
1435 Walnut Street Suite 300
Philadelphia, PA 19102

November 6, 2012

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EXECUTIVE SUMMARY

Tower Entertainment is proposing to develop The Provence, a resort complex containing a hotel, a casino, and a mix of non-gaming entertainment venues at the northern edge of Center City and immediately adjacent to the expanded Pennsylvania Convention Center Expansion District. The project will significantly stimulate the City of Philadelphia and the Commonwealth of Pennsylvania economies and generate new investment in surrounding areas.

No other casino-related development in Pennsylvania would better maximize total benefits to the City and Commonwealth, in terms of:

- Direct investment, annual spending, employment
- Corresponding net new state and local tax revenues
- Induced real estate investment by others, generating new development, construction and economic activity in nearby areas

Specific economic and fiscal impacts of The Provence and resulting real estate investments include:

1. For the City:
    - 2,000 jobs and $5 million in city tax revenues, related to construction activities
    - An additional 5,300 jobs and $25 million in city tax revenues annually after that, from gaming revenue, ongoing operations, and ancillary spending
    - Over 600 temporary jobs and 1,000 permanent jobs accessible to residents from the immediate neighborhood

2. For the Commonwealth:
    - 6,400 jobs and $89 million in tax revenues and license fees, related to construction activities
    - An additional 7,800 jobs and $204 million in state tax annually after that, from gaming revenue, ongoing operations, and ancillary spending

3. Serve as a catalyst for 2-3 million square feet of new commercial and residential development around The Provence over the next decade, representing about $1 billion in initial investment

1.0 INTRODUCTION

1.1 Tower Entertainment's Proposed The Provence: Project and Site Characteristics

Tower Entertainment is proposing to develop The Provence, an entertainment complex containing a hotel, a casino, and a mix of non-gaming entertainment venues along the north side of three blocks of Callowhill Street between North Broad Street and 17th Street, at the (current) northern edge of Center City and immediately adjacent to the expanded Pennsylvania Convention Center Expansion District. This area is severely underdeveloped at this time, and with strong development to the south and west, this project could be the keystone to spur one of the most important redevelopment opportunities for the city and state at the present time.

The Provence will generate significant economic impacts within the City of Philadelphia and the Commonwealth of Pennsylvania, and will generate significant fiscal (i.e. tax revenue) impacts for the City and Commonwealth. This report estimates that when fully operational, The Provence will generate hundreds of millions of dollars in economic impact within the City and Commonwealth, produce over $160 million in gaming tax revenues for the Commonwealth, and induce an additional 2 million to 3 million square feet in new real estate developments in a very important part of the city.

The Provence will be positioned as a tourist and regional entertainment destination with gaming facilities, rather than a locals-oriented, stand-alone casino. The nature of The Provence makes it substantially different than other existing or proposed casino developments within the Commonwealth in terms of its scope, its significantly positive impact and its ability to open for business within 24 months of a license issuance. The Provence will cater to a far wider market than any other current or proposed casinos in Pennsylvania, including higher income tourists, conventioneers, locals, and visitors not currently inclined to patronize existing metro area casinos. Furthermore, coordination with tourism and convention marketing efforts should serve to maximize out-of-state visitor impact (increased visitors, increased visitor days, and increased visitor spending per day).

The breadth of scope and design of The Provence is the primary strength of the proposal. Multiple entertainment components aggregate to approximately 1.25 million square feet of new construction, and the creation of a 120,000 square foot European-style, family-oriented rooftop village makes The Provence truly unique. The full service, high quality casino, featuring 3,300 electronic gaming devices (slots and automated table games)[1] and 150 table games, will be the centerpiece of The Provence, but will comprise less than 20 percent of The Provence (excluding the garages) (see Table 1.1).

[1] The Provence must open with no more than 3,000 slots but can subsequently expand to more upon regulatory approval

Table 1.1 – Proposed Preliminary Distribution of Uses within The Provence[2]

Use	SF
Casino	120,000
Garage (2 Garages)	649,000
Bridges (2)	12,000
Hotel (125 keys)	160,000
Concert Hall	75,000
Shops	60,000
Restaurants (8)	25,000
Event Facilities (3)	30,000
Meeting Rooms	20,000
Spa and Fitness Center	20,000
Sports Venue	30,000
Pool	40,000
Night Club	9,000
Total	1,250,000

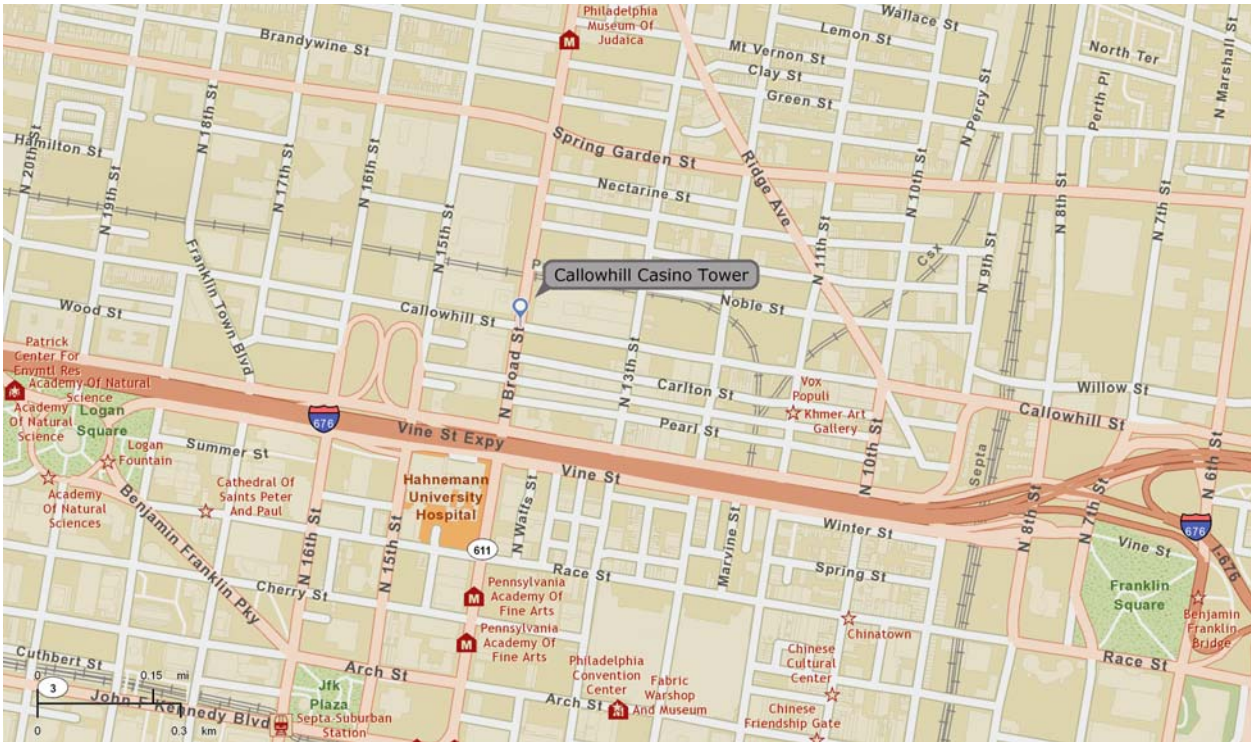
Source: Tower Entertainment (2012)

1.2 Project Strategy: Inducing Investment, Development and Economic Activity

The Provence has the potential not only to become a significant addition to the City and Commonwealth economy on its own, but also to serve as a spark to ignite and expand the nascent transformation of the northeast quadrant of Center City Philadelphia. This induced, or "spin-off" investment potential represents the primary public and economic benefit of the project to the city and the state. This report identifies and provides estimates of the potential economic and fiscal impacts generated by (1) the development and annual operations of The Provence itself, (2) ancillary spending by new visitors attracted by The Provence, and (3) development and annual operations of spin-off activity nearby.

In addition to the nature of The Provence project itself, clearly one of the strongest advantages is **the proposed location** at the crossroads of the last large area poised for redevelopment in Center City: the northeast quadrant.

[2] Throughout this report, totals may not sum exactly due to rounding



This project is consistent with existing city planning objectives for North Broad Street and its environs. It will connect *south* to the Convention Center and to Center City hotels and attractions, crossing Vine St. with investment in the currently underdeveloped area between Broad Street and the Benjamin Franklin Parkway. As such, it would provide a natural extension to broaden the Convention Center's impact with its new North Broad entrance.

It will also spur development *east* of Broad Street, from Vine Street to Spring Garden Street, North Broad Street to Old City, and to the Delaware River. It will further enhance redevelopment *north* along Broad Street, including boosting the nascent but popular Spring Garden/Fairmount neighborhoods up to Temple University.

Nearby transit junctions for employees and local customers, automobile ingress and egress without having to circulate through surrounding neighborhood streets, and ample existing and new parking will guarantee a very efficient access to The Provence while minimizing negative traffic impacts.[3]

Spectrum Gaming Group LLC has performed a market analysis for the casino component of this unique entertainment complex, and it forecasts $457 million in annual gross gaming revenue (GGR) by Year 5, which is significantly higher than estimates for stand-alone casinos in other

[3] There are or will be 1,500-2,000 parking spaces on-site and other existing parking garages and surface lots in the area supply an additional 2000 parking spaces.

parts of Philadelphia and the state. Likewise, it forecasts net new GGR to be approximately $196 million per year by Year 5, much higher than the amounts forecasted for other proposed Pennsylvania casinos.

Indeed, it would be hard to envision a casino related development in Pennsylvania that would better maximize total city and state benefits generated from multiple sources:

- Direct investment, annual spending, employment
- Corresponding net new state and local tax revenues
- Ancillary spending by patrons outside of The Provence
- State and local tax revenues generated by ancillary spending
- Induced real estate investment by others, generating new development, construction and economic activity in nearby areas
- Maximize the **net export nature of the gaming**, considering:
    - ✓ Use by out-of-state visitors (i.e. export)
    - ✓ Current visitor and additional visitors
    - ✓ Import substitution (i.e. keeping resident spending from going elsewhere)
    - ✓ Counter new opportunities in adjacent states
    - ✓ Latent demand (not other in-state consumption)
    - ✓ Spin-off investment, development and economic activity

2.0 ECONOMIC IMPACTS FROM UPFRONT CONSTRUCTION OF THE PROVENCE

2.1 Direct Expenditures from Upfront Construction of The Provence

It is estimated that The Provence will have a project cost of about $700 million. For purposes of properly modeling the economic and fiscal impact of upfront construction, the following adjustments were made:

1. Seventy percent of the estimated $65 million in furniture, fixtures, and equipment (FF&E) was excluded from the economic impact analysis, to account for the fact that a significant component of FF&E will be slots and tables, which are not manufactured within the Commonwealth.

2. One-time license fees of $50 million for slots and $24.75 million for tables were excluded from the economic impact analysis, and accounted for directly in fiscal impacts.

3. Financing costs ($104.2 million) and land contribution ($100 million) were excluded from the economic impact analysis, as they are typically not counted in input-output modeling because they do not represent the purchase of goods and services.

This yields about $320 million in hard costs and about $55 million in soft costs. These amounts will represent direct expenditures that will then have a multiplier effect throughout the City and Commonwealth economy, as vendors ramp up to meet new demand for goods and services, and as workers spend their earnings locally.[4]

2.2 Economic Impact from Upfront Construction of The Provence

The first set of economic impacts that results from these expenditures takes place **during the construction period** itself. It is estimated that these investments, and the indirect and induced expenditures that resulted from them, will generate a considerable impact within the City and Commonwealth (see Table 2.1). **Within the City**, upfront construction is estimated to generate about $560 million in total expenditures, supporting about **2,000 jobs** and about $90 million in earnings. **Within the Commonwealth**, upfront construction is estimated to generate about $880 million in total expenditures, supporting about **6,400 jobs** and about $270 million in

[4] See Appendix A for Econsult's economic and fiscal impact methodology.

earnings.[5] Because The Provence contains so many additional uses besides a casino, its impacts from upfront construction will be much larger than any other potential casino site.

Table 2.1 – Estimated One-Time Economic Impact of Upfront Construction of The Provence ($M)[6]

City of Philadelphia	Casino	Non-Casino	The Provence
Direct Expenditures	$75	$301	$376
Indirect and Induced Expenditures	$37	$146	$183
Total Expenditures	$112	$447	$559
Total Employment	398	1,592	1,990
Total Earnings	$17	$69	$86
Commonwealth of Pennsylvania	**Casino**	**Non-Casino**	**The Provence**
Direct Expenditures	$75	$301	$376
Indirect and Induced Expenditures	$100	$402	$502
Total Expenditures	$175	$703	$878
Total Employment	1,283	5,135	6,418
Total Earnings	$55	$218	$273

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

2.3 Industry Distribution of Economic Impact from Upfront Construction of The Provence

The construction industry will gain the most from upfront construction of The Provence, but many other industries will also be positively impacted. Within the City, it is preliminarily estimated that 42 percent of the expenditure impact and 44 percent of the employment impact will be in industries besides construction. Within the Commonwealth, it is preliminarily

[5] Commonwealth impacts are larger than City impacts, even though direct expenditures are the same, because spillover impacts continue to emanate beyond City boundaries to areas outside the City. Since the City is completely contained within the Commonwealth, the Commonwealth figures include the City figures, and the difference between the two represents the impact that is estimated to take place inside the Commonwealth but outside the City.

[6] Throughout the report, dollar figures are expressed in 2012 terms.

estimated that 63 percent of the expenditure impact and 60 percent of the employment impact will be in industries besides construction.[7]

[7] See Appendix B for additional detail on the industry composition of the estimated economic impact from upfront construction of The Provence.

3.0 ECONOMIC IMPACTS FROM ONGOING OPERATIONS OF THE PROVENCE

3.1 Direct Expenditures from Ongoing Operations of The Provence

The Provence will represent 1.25 million square feet of space and will include a 120,000 square foot casino, a 125-room hotel, a 75,000 square foot concert hall, 60,000 square feet of retail space, 50,000 square feet of event and meeting space, a 40,000 square foot pool area, a 30,000 square foot sports venue, a 20,000 square foot spa and fitness area, five restaurants, and a night club. Using data provided by Tower Entertainment, and based on conservative assumptions as to employment, salaries, and expenditures associated with various uses (proxied in part by the characteristics of other casinos and related operations throughout the Commonwealth), it is estimated that The Provence will represent about **$225 million in annual operations and directly employ about 2,500 people**.[8]

3.2 Economic Impact from Ongoing Operations of The Provence

The first set of economic impacts that results from The Provence takes place during the construction period itself, as discussed in Section 2. The second set of economic impacts that results from The Provence takes place each year thereafter, as it represents operating expenditures that in turn have a stimulative effect on the City and Commonwealth economy.

Based on Tower Entertainment' projections of the size and composition of The Provence and on the assumptions described above, it is estimated that these investments, and the indirect and induced expenditures that resulted from them, will generate a considerable impact within the City and Commonwealth (see Table 3.1). **Within the City**, ongoing operations are estimated to generate about $350 million in total expenditures, supporting about **3,000 jobs** and about $110 million in earnings per year. **Within the Commonwealth**, ongoing operations are estimated to generate about $460 million in total expenditures, supporting about **3,700 jobs** and about $150 million in earnings per year.

Because The Provence contains so many additional uses besides a casino, its impacts from ongoing operations will be much larger than any other potential casino location. In addition, its location characteristics (away from other casino locations up and down Interstate 95, proximate to the Pennsylvania Convention Center) suggest far less cannibalization of casino activity from other existing casinos than other possible casino sites, meaning that a much higher proportion of these impacts will be net new impacts for the Commonwealth.

[8] These and other operating estimates represent full occupancy figures. See Appendix C for additional detail on the assumptions used to estimate operating expenditures for The Provence.

Table 3.1 – Estimated Annual Economic Impact of Ongoing Operations of The Provence ($M)

City of Philadelphia	Casino	Non-Casino	The Provence
Direct Expenditures	$123	$102	$225
Indirect and Induced Expenditures	$64	$44	$128
Total Expenditures	$187	$166	$353
Total Employment	1,802	1,198	3,000
Total Earnings	$63	$44	$107
Commonwealth of Pennsylvania	**Casino**	**Non-Casino**	**The Provence**
Direct Expenditures	$123	$102	$225
Indirect and Induced Expenditures	$122	$114	$236
Total Expenditures	$245	$216	$461
Total Employment	2,119	1,565	3,684
Total Earnings	$88	$64	$152

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

3.3 Industry Distribution of Economic Impact from Ongoing Operations of The Provence

The arts, entertainment, and recreation industry will gain the most from ongoing operations of The Provence, but many other industries will also be positively impacted. Within the City, it is preliminarily estimated that 65 percent of the expenditure impact and 43 percent of the employment impact will be in industries besides arts, entertainment, and recreation. Within the Commonwealth, it is preliminarily estimated that 73 percent of the expenditure impact and 52 percent of the employment impact will be in industries besides arts, entertainment, and recreation.[9]

[9] See Appendix D for additional detail on the industry composition of the estimated economic impact from ongoing operations of The Provence.

4.0 ECONOMIC IMPACTS FROM ANCILLARY SPENDING ATTRACTED BY THE PROVENCE

4.1 Direct Expenditures from Ancillary Spending Attracted by The Provence

In addition to one-time expenditures associated with its upfront construction and annual expenditures associated with its ongoing operations, The Provence will generate new expenditures within the City and Commonwealth through the importation of spending by visitors to its hotel and casino components. These expenditures, in categories such as transportation, accommodations, food, and retail, are often referred to as *ancillary spending*, and they are an important component of The Provence's economic and fiscal impact within the City and Commonwealth.

For the purposes of this analysis, ancillary spending estimates are only for those amounts outside of The Provence, since any spending within The Provence is already accounted for in the previous section's figures regarding operating expenditures. For the sake of simplicity and to be conservative, only ancillary spending generated by The Provence's casino component is considered in this report. In reality, ancillary spending generated by The Provence's hotel component is likely to be significant, especially given the City's relative dearth of hotel rooms and the recent expansion of the Pennsylvania Convention Center.

Based on a market analysis conducted by Spectrum Gaming Group, the casino component of The Provence is estimated to attract about 5.3 million gaming patron visits per year, as well as an additional 361,000 visits per year from tourists who will patronize the casino. To be conservative, no ancillary spending is ascribed to the projected 361,000 tourist visits, since it is assumed that they are already coming to the City and Commonwealth and therefore do not represent any net new ancillary spending within the City and Commonwealth.[10] To be further conservative, low-end estimates of ancillary spending per gaming patron visit are used, and 50 percent of those ancillary spending amounts are assumed to take place within The Provence and are therefore excluded.[11] Based on these assumptions, it is estimated that the volume and distribution of visits estimated by the Spectrum Gaming Group will represent about $127 million per year in ancillary spending within the City and Commonwealth.

[10] I.e. it is assumed that they do not represent any net new spending in such categories as transportation, accommodations, food, and retail. They may represent net new spending within The Provence, but as noted above, that spending is already accounted for in the previous section's figures regarding operating expenditures. In reality, it is likely that The Provence will in fact result in net new tourist visits to the City and Commonwealth, thus generating additional visitor spending over and above what is estimated here.

[11] I.e. of the ancillary spending represented by gaming patron visits, half of those amounts are assumed to go towards expenditures within The Provence, which are therefore already accounted for in the previous section's figures regarding operating expenditures. See Appendix E for additional detail on ancillary spending generated by The Provence.

4.2 Economic Impact from Ancillary Spending Attracted by The Provence

This importation of spending, and the indirect and induced expenditures that resulted from them, will generate a considerable impact within the City and Commonwealth (see Table 4.1). **Within the City**, ancillary spending is estimated to generate about $200 million in total expenditures, supporting about **2,300 jobs** and about $37 million in earnings per year. **Within the Commonwealth**, ancillary spending is estimated to generate about $290 million in total expenditures, supporting about **4,100 jobs** and about $82 million in earnings per year.

Because The Provence contains so many additional uses besides a casino, its impacts from ancillary spending will be much larger than any other potential casino location. And, as noted before, its location characteristics suggest far less cannibalization of casino activity from other existing casinos than other possible casino sites, meaning that a much higher proportion of these impacts will be net new impacts for the Commonwealth.

Table 4.1 – Estimated Annual Economic Impact of Ancillary Spending Attracted by The Provence ($M)

	City	Commonwealth
Direct Expenditures	$127	$127
Indirect and Induced Expenditures	$76	$158
Total Expenditures	$203	$285
Total Employment	2,273	4,081
Total Earnings	$37	$82

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

4.3 Industry Distribution of Economic Impact from Ancillary Spending Attracted by The Provence

The accommodations and food services industry will gain the most from ancillary spending attracted by The Provence, but many other industries will also be positively impacted. Within the City, it is preliminarily estimated that 58 percent of the expenditure impact and 42 percent of the employment impact will be in industries besides arts, entertainment, and recreation. Within the Commonwealth, it is preliminarily estimated that 70 percent of the expenditure

impact and 54 percent of the employment impact will be in industries besides arts, entertainment, and recreation.[12]

[12] See Appendix F for additional detail on the industry composition of the estimated economic impact from ancillary spending attracted by The Provence.

5.0 FISCAL IMPACTS FROM THE PROVENCE

5.1 Fiscal Impact Overview

The Provence will generate significant fiscal revenue and expenditures for both the Commonwealth and City. New tax revenues will be generated from expansions in various local and state tax bases from the following sources:

- ***Gaming Tax Revenues***
- ***Construction, Operations and Ancillary Spending***
- ***Resulting Nearby Investments:***
  - ✓ Upfront construction of nearby real estate investment
  - ✓ Ongoing operations of commercial component of nearby real estate investment
  - ✓ New residents and wage earners from residential component of nearby real estate investment

The increased economic activity will also generate a demand for increased public sector services, primarily municipal services. In this section, we estimate and forecast, and note that both the net fiscal impacts for both the Commonwealth and the City are likely to be positive and significant.

5.2 One-Time License Fees

If awarded, The Provence will pay $50 million in one-time license fees to the Commonwealth for the right to have slot machines, and will also pay $24.8 million in one-time license fees to the Commonwealth for the right to have table games. This represents an upfront fiscal impact to the Commonwealth of $74.8 million.

5.3 Annual Gaming Tax Revenues

Gaming tax revenues will be the main state and local source of tax revenue generated by The Provence. Based on Spectrum Gaming Group's estimates, the casino component of The Provence will generate about $460 million in Gross Gaming Revenues (GGR) in Year 5.

Approximately 70 percent of this revenue should come from slot machines, and the remaining 30 percent from table gaming revenues.

According to the Pennsylvania Gaming Control Board, one dollar produced via slots machines represents 51 cents in revenue returned to all Pennsylvanians through taxation, and an additional four cents to the City.[13] Table gaming revenue is estimated to bring 14 cents to the dollar in tax revenue to Pennsylvanians and an additional two cents to the City. Based on these estimates, **tax revenues to the Commonwealth in Year 5 represent an estimated $185 million, and another $16 million to the City** (see Table 5.1).[14]

Table 5.1 – Estimated Annual Total Gaming Tax Revenues Generated by The Provence (in $M)

	Year 1	Year 2	Year 3	Year 4	Year 5
Total State Gaming Revenues	$152.9	$173.9	$176.8	$181.2	$185.2
Total Local Gaming Revenues	$12.7	$14.4	$14.8	$15.2	$15.6
Total Gaming Tax Revenues	$165.6	$188.3	$191.6	$196.4	$200.8

Source: Spectrum Gaming Group (2012), Gaming Control Board (2012)

5.4 Fiscal Impact from Upfront Construction, Ongoing Operations, and Ancillary Spending of The Provence

The Provence will expand various tax bases within the City and Commonwealth in three distinct ways. First, construction will generate new upfront economic activity. Second, operations will generate new ongoing economic activity. Third, ancillary spending will draw in new expenditures each year.

The expansion in economic activity represented by direct construction expenditures of The Provence and by the indirect and induced expenditures that result from them will result in a

[13] "Gaming Benefits for Pennsylvanians," Gaming Control Board.

[14] See Appendix G for additional detail on fiscal impact from Gross Gaming Revenue to the City of Philadelphia and the Commonwealth of Pennsylvania.

one-time expansion in various tax bases within the City and Commonwealth (see Table 5.2).[15] It is estimated that **the City will gain about $5 million in tax revenues and the Commonwealth will gain about $15 million in tax revenues** as a result of upfront construction of The Provence.

Table 5.2 – Estimated One-Time Fiscal Impact from Upfront Construction of The Provence ($M)

City of Philadelphia	Casino	Non-Casino	The Provence
Wage and Earnings	$0.7	$2.7	$3.4
Sales	$0.1	$0.5	$0.6
Business Privilege	$0.2	$0.7	$0.9
Total City Tax Revenues	$1.0	$3.9	$4.9
Commonwealth of Pennsylvania	**Casino**	**Non-Casino**	**The Provence**
Personal Income	$1.0	$4.0	$5.0
Sales and Use	$1.7	$6.9	$8.6
Corporate Net Income	$0.2	$0.8	$1.0
Total Commonwealth Tax Revenues	$2.9	$11.7	$14.6

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

The expansion in economic activity represented by ongoing operations of The Provence and by the indirect and induced expenditures that result from it will result in an ongoing expansion in various tax bases within the City and Commonwealth (see Table 5.3). It is estimated that **the City will gain about $7 million in tax revenues and the Commonwealth will gain about $10 million in tax revenues each year** as a result of ongoing operations of The Provence. These fiscal impacts include estimated hotel tax revenues from the hotel room revenues associated with The Provence.

Finally, the expansion in economic activity represented by ancillary spending drawn into the City and Commonwealth by The Provence, and by the indirect and induced expenditures that result from them, will result in an ongoing expansion in various tax bases within the City and Commonwealth (see Table 5.4). It is estimated that **the City will gain about $3 million in tax**

[15] Because the City and Commonwealth are distinct government jurisdictions, there is no overlap between City tax revenue estimates and Commonwealth tax revenue estimates: the City tax revenue figure is the amount estimated to go to the City, and the Commonwealth tax revenue figure is the amount estimated to go to the Commonwealth.

revenues and the Commonwealth will gain about $9 million in tax revenues each year as a result of ancillary spending drawn by The Provence.

Table 5.3 – Estimated Annual Fiscal Impact from Ongoing Operations of The Provence ($M)

City of Philadelphia	Casino	Non-Casino	The Provence
Wage and Earnings	$2.5	$1.7	$4.2
Sales (Including Hotel Taxes)	$0.4	$0.9	$1.3
Business Privilege	$0.7	$0.5	$1.2
Total City Tax Revenues	$3.6	$3.1	$6.7
Commonwealth of Pennsylvania	**Casino**	**Non-Casino**	**The Provence**
Personal Income	$1.6	$1.2	$2.8
Sales and Use (Including Hotel Taxes)	$3.4	$3.2	$6.6
Corporate Net Income	$0.4	$0.3	$0.7
Total Commonwealth Tax Revenues	$5.4	$4.7	$10.1

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

Table 5.4 – Estimated Annual Fiscal Impact from Ancillary Spending Attracted by The Provence ($M)

City of Philadelphia		Commonwealth of Pennsylvania	
Wage and Earnings	$1.4	Personal Income	$2.6
Sales	$0.7	Sales and Use	$4.2
Business Privilege	$0.7	Corporate Net Income	$2.0
Total City Tax Revenues	$2.8	Total Commonwealth Tax Revenues	$8.8

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

5.5 Total Fiscal Impacts of The Provence

All told, The Provence will generate significant fiscal impacts for the City and Commonwealth (see Table 5.5 and Table 5.6). The City will collect about $16 million annually from Gross

Gaming Revenue (GGR) (by Year 5 of operations), and gain approximately $5 million in tax revenues from upfront construction and $10 million per year in tax revenues from annual operations and ancillary spending. The Commonwealth will collect about $75 million from one-time licensing fees and about $185 million annually from GGR (by Year 5 of operations), and gain approximately $15 million in tax revenues from upfront construction and $19 million per year in tax revenues from annual operations and ancillary spending.

Table 5.5 – Estimated Fiscal Impacts to the City of Philadelphia from The Provence ($M)

One-Time Fiscal Impacts	Casino	Non-Casino	The Provence
From Upfront Construction	$1.0	$3.9	$4.9

GGR Impacts	Casino	Non-Casino	The Provence
Annual Gaming Revenues (by Year 5)	$15.6		$15.6

Annual Fiscal Impacts	Casino	Non-Casino	The Provence
From Ongoing Operations	$3.6	$3.1	$6.7
From Ancillary Spending		$2.8	$2.8
Annual Fiscal Impacts	$3.6	$5.9	$9.5

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

Table 5.6 – Estimated Fiscal Impacts to the Commonwealth of Pennsylvania from The Provence ($M)

License Fees	Casino	Non-Casino	The Provence
One-Time Fees for Slots and Tables	$74.8		$74.8

One-Time Fiscal Impacts	Casino	Non-Casino	The Provence
From Upfront Construction	$2.9	$11.7	$14.6

GGR Impacts	Casino	Non-Casino	The Provence
Annual Gaming Revenues (by Year 5)	$185.2		$185.2

Annual Fiscal Impacts	Casino	Non-Casino	The Provence
From Ongoing Operations	$5.4	$4.7	$10.1
From Ancillary Spending		$8.8	$8.8
Annual Fiscal Impacts	$5.4	$13.5	$18.9

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

6.0 ECONOMIC AND FISCAL IMPACT FROM ADDITIONAL NEARBY REAL ESTATE INVESTMENT

6.1 Direct Expenditures from Upfront Construction of Additional Nearby Real Estate Investment

The Provence is likely to induce significant additional nearby residential and commercial development, on the order of 2 million to 3 million square feet within a ½ mile radius of the site. It is assumed that the composition of this new investment will be 200,000 square feet of retail, 800,000 square feet of office, and 1.5 million of residential (1,000 units at 1,500 square feet per unit). Using industry estimates for construction cost per square foot, it is estimated that that will represent about $1 billion in aggregate upfront construction activity.

It is useful to consider the magnitude of additional economic and fiscal impact to the City and Commonwealth that is associated with this nearby real estate investment. These impacts will result from upfront construction as well as ongoing operations, expanding various City and Commonwealth tax bases and adding residents and wage earners to the City and Commonwealth.

6.2 Economic Impact from Upfront Construction of Additional Nearby Real Estate Investment

The first set of economic impacts that results from these investments will take place during the construction period itself. It is estimated that these investments, and the indirect and induced expenditures that resulted from them, will generate a considerable impact within the City and Commonwealth (see Table 6.1). **Within the City**, upfront construction is estimated to generate about $1.46 billion in total expenditures, supporting about **6,000 jobs** and about $240 million in earnings. **Within the Commonwealth**, upfront construction is estimated to generate about $2.35 billion in total expenditures, supporting about **20,000 jobs** and about $760 million in earnings.

Table 6.1 – Estimated One-Time Economic Impact of Upfront Construction of Additional Nearby Real Estate Investment Induced by The Provence ($M)

	City	Commonwealth
Direct Expenditures	$973	$973
Indirect and Induced Expenditures	$483	$1,373
Total Expenditures	$1,456	$2,346
Total Employment	6,167	20,133
Total Earnings	$240	$760

Source: US Department of Commerce (2009), City of Philadelphia Office of Property Assessment (2012), Marshall & Swift (2010), Buildingjournal.com (2012), Turner Construction (2012), Econsult Corporation (2012)

6.3 Economic Impact from Ongoing Operations of Additional Nearby Commercial Real Estate Investment

The second set of economic impacts that results from these investments takes place each year thereafter, as these developments represent operating expenditures that in turn have a stimulative effect on the City and Commonwealth economy. Based on conservative assumptions as to employment, salaries, and expenditures associated with the various commercial uses, it is estimated that the ongoing operations from this newly added commercial space will represent about $200 million in annual operating expenditures and employ 2,700 people (see Table 6.2).

Table 6.2 – Conservative Assumptions Made in Estimating Annual Operating Expenditures of Additional Nearby Commercial Real Estate Investment Induced by The Provence[16]

Use	Residential	Retail	Office	Total
SF	1,500,000	200,000	800,000	2,500,000
Estimated # Employees		300	2,400	2,700
Estimated Total Expenditures ($M)		$28	$184	$212

Source: Tower Entertainment (2012), US Bureau of Labor Statistics (2011), bizstats.com (2011), Econsult Corporation (2012)

[16] See Appendix H for additional detail on conservative assumptions utilized in estimating annual operating expenditures for The Provence.

Based on the assumptions described above, it is estimated that these investments, and the indirect and induced expenditures that resulted from them, will generate a considerable impact within the City and Commonwealth (see Table 6.3). **Within the City**, ongoing operations are estimated to generate about $330 million in total expenditures, supporting about **1,700 jobs** and about $50 million in earnings per year. **Within the Commonwealth**, ongoing operations are estimated to generate about $480 million in total expenditures, supporting about **2,200 jobs** and about $130 million in earnings per year.

Table 6.3 – Estimated Annual Economic and Fiscal Impact of Ongoing Operations of Additional Nearby Commercial Real Estate Investment Induced by The Provence ($M)

	City	Commonwealth
Direct Expenditures	$212	$212
Indirect and Induced Expenditures	$123	$264
Total Expenditures	$335	$476
Total Employment	1,665	2,158
Total Earnings	$49	$134

Source: US Department of Commerce (2009), City of Philadelphia Office of Property Assessment (2012), Marshall & Swift (2010), Buildingjournal.com (2012), Turner Construction (2012), Econsult Corporation (2012)

6.4 Fiscal Impact from Additional Nearby Commercial Real Estate Investment

The expansion in economic activity represented by direct construction expenditures of real estate investment near The Provence and by the indirect and induced expenditures that result from them will expand various tax bases within the City and Commonwealth (see Table 6.4). It is estimated that **the City will gain about $15 million in tax revenues and the Commonwealth will gain about $53 million in tax revenues** as a result.

Table 6.4 – Estimated Fiscal Impact of Economic Activity Resulting from Upfront Construction of Additional Nearby Commercial Real Estate Investment ($M)

City of Philadelphia		Commonwealth of Pennsylvania	
Wage and Earnings	$8.7	Personal Income	$24.7
Sales	$2.0	Sales and Use	$22.3
Business Privilege	$4.3	Corporate Net Income	$6.0
Total City Tax Revenues	$15.0	Total Commonwealth Tax Revenues	$53.0

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

The expansion in economic activity represented by ongoing operations of the commercial component of real estate investment near The Provence and by the indirect and induced expenditures that result from them will expand various tax bases within the City and Commonwealth (see Table 6.5). It is estimated that **the City will gain about $3 million in tax revenues and the Commonwealth will gain about $6 million in tax revenues each year** as a result.

Table 6.5 – Estimated Fiscal Impact of Economic Activity Resulting from Ongoing Operations of Additional Nearby Commercial Real Estate Investment ($M)

City of Philadelphia		Commonwealth of Pennsylvania	
Wage and Earnings	$1.8	Personal Income	$2.2
Sales	$0.9	Sales and Use	$3.2
Business Privilege	$0.6	Corporate Net Income	$.7
Total City Tax Revenues	$3.3	Total Commonwealth Tax Revenues	$6.1

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

6.5 Fiscal Impact from New Residents and Wage Earners from Additional Nearby Residential Real Estate Investment

The fiscal impact estimates above only include impacts which are generated from the operations of the commercial components of new developments near The Provence. To the extent that these new developments also include a significant residential component, which

will result in net new residents and wage earners within the City and Commonwealth, these developments also represent an expansion in the City's and Commonwealth's tax bases and an increase in the City's and Commonwealth's tax revenues.

Using conservative assumptions regarding the importation of new residents and wage earners, and the annual personal earnings and sales taxable spending they represent, it is estimated that **the residential component of all of these new developments directly results in an additional $600,000 in City tax revenues and an additional $300,000 in Commonwealth tax revenues per year**.[17]

[17] These figures do not include any indirect or induced expenditures generated by this importation of residents and wage earners. See Appendix I for additional detail used to estimate the fiscal impact of new residents.

7.0 CREATION OF JOBS FROM UPFRONT CONSTRUCTION AND ONGOING OPERATIONS OF THE PROVENCE THAT ARE ACCESSIBLE TO NEIGHBORHOOD RESIDENTS

7.1 Overview

The Provence will not only support a significant amount of new jobs within the City and Commonwealth, but will also represent a significant number of jobs that are accessible to residents of its immediate neighborhood (see Figure 7.1). By comparing the labor demanded by the upfront construction and ongoing operations of The Provence with the labor supplied by neighborhood residents, an estimate of the number and proportion of jobs that are accessible to neighborhood residents can be determined.

Figure 7.1 – Boundaries of The Provence's Immediate Neighborhood

Source: City of Philadelphia (2010, 2012), Econsult Corporation (2012)

7.2 Defining Job Accessibility

In addition to the broader economic and fiscal impacts described in previous sections, The Provence strengthens its immediate neighborhood by creating jobs that are accessible to neighborhood residents. This section compares the amount and distribution of *labor demanded by The Provence* (during upfront construction and ongoing operations) with the amount and distribution of labor that can potentially be *supplied by neighborhood residents*.

Accessibility of jobs created by The Provence (labor demanded) to residents of its immediate neighborhood (labor supplied) was proxied by conservatively assigning educational attainment levels needed for various jobs and comparing that with the educational attainment levels of neighborhood residents. Three educational attainment levels were used in estimating how much labor being demanded by The Provence could be supplied by neighborhood residents:

- "A" – Requiring high school diploma and some college
- "B" – Requiring a bachelor degree
- "C" – Requiring a master or doctoral degree[18]

7.3 Job Accessibility

Comparing the composition of jobs demanded by The Provence (by educational attainment level needed) with the composition of the residents of its immediate neighborhood (by their educational attainment level) gives some sense of the number of jobs demanded by The Provence that are accessible to neighborhood residents. For "A," "B," and "C" jobs, it appears there are many more qualified neighborhood residents than there are available jobs, suggesting that a very large proportion of the jobs demanded are accessible to neighborhood residents (see Table 7.1).

[18] These letters represent the intersection of employment demand (jobs required by The Provence), and employment supply (the labor pool represented by the immediate neighborhood). To be conservative, higher educational attainment levels than are actually necessary were used. This is not done to suggest that The Provence will be restrictive in its hiring of local residents; rather, it is done to make the labor supply estimates lower than they probably are, for purposes of being conservative. For example, if a set of jobs does not require even a high school diploma, and the methodology employed here only looks at residents who have a high school diploma and some college, that will have the effect of conservatively underestimating the number of residents for whom that set of jobs is accessible. Results arrived at through such a conservative approach should therefore be considered low-end estimates, with actual amounts likely to be higher.

Table 7.1 – Comparison of the Composition of Jobs Demanded by The Provence, by Educational Attainment, with the Educational Attainment of the Residents within The Provence's immediate Neighborhood

Job Level	# Jobs Demanded (Upfront Construction)	# Jobs Demanded (Ongoing Operations)	# Jobs Supplied by Qualified Neighborhood Residents
"A"	1,094	1,943	6,101
"B"	214	299	1,674
"C"	30	258	1,631
Total	1,338	2,500	9,406

Source: EMSI (2012), US Department of Labor Bureau of Labor Statistics (2010), US Census Bureau (2010), Econsult Corporation (2012)

Educational attainment is admittedly an imperfect proxy for the skills and experiences needed for a particular job. On the labor supply side, neighborhood residents may choose not to apply for these new jobs because they are already gainfully employed or because they are simply not interested in these kinds of jobs. On the labor demand side, the number of direct construction and operations jobs that are accessible to neighborhood residents that actually go to neighborhood residents can be influenced by the amount of outreach that is conducted to make neighborhood residents aware of such job opportunities.

Nevertheless, a rough estimate can be made of the number and type of jobs that are accessible to neighborhood residents. If it is conservatively assumed that 50 percent of "A" jobs, 30 percent of "B" jobs, and 10 percent of "C" jobs will be secured by residents of The Provence's immediate neighborhood (the labor supply and labor demand numbers suggest that these proportions are readily achievable), this would mean that **over 610 direct construction jobs** (about 46 percent of the direct construction jobs that will go to City residents) and **over 1,000 direct operations jobs** (about 43 percent of the direct operations jobs that will go to City residents) **may go to residents of The Provence's immediate neighborhood** (see Table 7.2 and Table 7.3).[19]

[19] See Appendix J for additional detail on labor demanded and educational attainment by industry.

Table 7.2 – Estimated Number of Temporary Jobs Generated by the Upfront Construction of The Provence That Are Accessible to Residents within The Provence's Immediate Neighborhood

Job Level	# Jobs Demanded by Upfront Construction	% Jobs That May Go to Neighborhood Residents	# Jobs That May Go to Neighborhood Residents
"A"	1,094	50%	547
"B"	214	30%	64
"C"	30	10%	3
Total	1,338		614
% of All Jobs			46%

Source: EMSI (2012), US Department of Labor Bureau of Labor Statistics (2010), US Census Bureau (2010), Econsult Corporation (2012)

Table 7.3 – Estimated Number of Permanent Jobs Generated by the Ongoing Operations of The Provence That Are Accessible to Residents within The Provence's Immediate Neighborhood

Job Level	# Jobs Demanded by Ongoing Operations	% Jobs That May Go to Neighborhood Residents	# Jobs That May Go to Neighborhood Residents
"A"	1,943	50%	971
"B"	299	30%	90
"C"	258	10%	26
Total	2,500		1,087
% of All Jobs			43%

Source: EMSI (2012), US Department of Labor Bureau of Labor Statistics (2010), US Census Bureau (2010), Econsult Corporation (2012)

8.0 CONCLUSION

In summary, The Provence represents the highest potential for impact among all possible casino sites within the City, in terms of its economic and fiscal impact to the City and Commonwealth (see Table 8.1 and Table 8.2).

1. Its many complementary uses will work together to generate a significant amount of economic and fiscal impact within the City and Commonwealth.

2. Its strategic location makes it the site that will cannibalize existing casino activity the least, making more of that economic and fiscal impact new to the Commonwealth and not just a reshuffling of existing impact.

3. Its catalytic effect on nearby residential and commercial development will result in even more economic and fiscal impact within the City and Commonwealth.

Furthermore, The Provence represents the fulfillment of many citywide objectives. Most notably, it builds off of existing positive momentum on North Broad Street, sits in close proximity to the expanded Pennsylvania Convention Center, and adds significant density at a transit-served hub near the heart of Center City. These characteristics represent additional compelling positives for The Provence.

Table 8.1 – Estimated Economic and Fiscal Impact of Upfront Construction, Ongoing Operations, and Ancillary Spending of The Provence in the City of Philadelphia (in 2012 $M)

From Upfront Construction	Casino	Non-Casino	The Provence
Total Expenditures	$112	$447	$559
Total Employment	398	1,592	1,990
Total Tax Revenues	$1.0	$3.9	$4.9
From Ongoing Operations and Ancillary Spending	**Casino**	**Non-Casino**	**The Provence**
Total Expenditures	$187	$369	$556
Total Employment	1,802	3,471	5,273
Total Tax Revenues (incl. GGR)	$19.2	$5.9	$25.1

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

Table 8.2 – Estimated Economic and Fiscal Impact of Upfront Construction, Ongoing Operations, and Ancillary Spending of The Provence in the Commonwealth of Pennsylvania (in 2012 $M)

From Upfront Construction	Casino	Non-Casino	The Provence
Total Expenditures	$175	$703	$878
Total Employment	1,283	5,135	6,148
Total Tax Revenues (incl. license fees)	$77.7	$11.7	$89.4
From Ongoing Operations and Ancillary Spending	**Casino**	**Non-Casino**	**The Provence**
Total Expenditures	$245	$501	$746
Total Employment	2,119	5,646	7,765
Total Tax Revenues (incl. GGR)	$190.6	$13.5	$204.1

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

APPENDIX A – ECONOMIC AND FISCAL IMPACT MODEL METHODOLOGY

A.1 Economic Impact Model

The methodology and input-output model used in this economic impact analysis are considered standard for estimating such expenditure impacts, and the results are typically recognized as reasonable and plausible effects based on the assumptions (including data) used to generate the impacts. In general, any economic activity can be described in terms of the total output generated from every dollar of direct expenditures. If an industry in a given region sells $1 million of its goods, there is a direct infusion of $1 million into the region. These are referred to as *direct expenditures*.

However, the economic impact on the region does not stop with that initial direct expenditure. Regional suppliers to that industry have also been called upon to increase their production to meet the needs of the industry to produce the $1 million in goods sold. Further, suppliers of these same suppliers must also increase production to meet their increased needs as well. These are referred to as *indirect expenditures*. In addition, these direct and indirect expenditures require workers, and these workers must be paid for their labor. These wages and salaries will, in turn, be spent in part on goods and services produced locally, engendering another round of impacts. These are referred to as *induced expenditures*.

Direct expenditures are fed into a model constructed by Econsult Corporation and based on data provided by the US Department of Commerce's Bureau of Economic Analysis through its Regional Input-Output Modeling System (RIMS II). The model then produces a calculation of the total expenditure effect on the regional economy. This total effect includes the initial direct expenditure effect, as well as the ripple effects described, the indirect and induced expenditure effects.

Part of the total expenditure effect is actually the increase in total wages and salaries (usually referred to as earnings), which the model can separate from the expenditure estimates. Direct payroll estimates are fed into the "household' industry of the input-output model. Impacts of this industry are estimated using the personal consumption expenditure breakdown of the national input-output table and are adjusted to account for regional consumption spending and leakages from personal taxes and savings. The direct, indirect, and induced earnings represent a component of the total economic impact attributable to wages and salaries. Finally, the model calculates the total expenditures affecting the various industries and translates this estimate into an estimate of the total labor (or jobs) required to produce this output.[20]

[20] In the input-output model, the estimate of increased employment will always be in terms of the employment required for a given level of production, usually referred to as *person-years* of employment. As such, these estimates cannot be interpreted as specifying *permanent jobs.*

In short, the input-output model estimates the total economic activity in a region that can be attributed to the direct demand for the goods or services of various industries. This type of approach is used to estimate the total economic activity attributable to the expenditures associated with various types of spending in the region.

A.2 Fiscal Impact Model

The RIMS II model provides estimates of the economic impact of a new project or program on the regional economy. It does not, however, estimate the fiscal impact of the increased economic activity on state and local governments. Econsult has constructed a model that takes the output from the RIMS II model and generates detailed estimates of the increases in state and local tax collections that arise from the new project. Those revenues are in fact a part of the total economic impact of a new project that is often ignored in conventional economic impact analyses.

The RIMS II model provides estimates of direct, indirect, and induced expenditures, earnings, and employment within the defined region. The Econsult fiscal impact model combines the RIMS II output with U. S. Census Bureau County Business Patterns data to produce estimates of the distribution of additional employment and earnings by county. In addition, the 2000 Census "Journey to Work" data on commuting flows are utilized to estimate income earned by residents of each county within the region, regardless of where they work. The fiscal model can then estimate the increase in earned income taxes by county and for the state as a whole resulting from the new project. For complex cases, like Philadelphia, the model can differentiate between residents and nonresidents and apply the proper wage tax rate. Pennsylvania state business and sales taxes, as well as business taxes in Philadelphia, are estimated based on the most recent data on average sales tax base per employee by major industry, as contained in publications from the Pennsylvania Department of Revenue.

Figure A.1 – Glossary of Terms for Input-Output Models

Multiplier Effect – the notion that initial outlays have a ripple effect on a local economy, to the extent that direct expenditures lead to indirect and induced expenditures.

Economic Impacts – total expenditures, employment, and earnings generated.

Fiscal Impacts – local and/or state tax revenues generated.

Direct Expenditures – initial outlays usually associated with the project or activity being modeled; examples: one-time upfront construction and related expenditures associated with a new or renovated facility, annual expenditures associated with ongoing facility maintenance and/or operating activity.

Direct Employment – the full time equivalent jobs associated with the direct expenditures.

Direct Earnings – the salaries and wages earned by employees and contractors as part of the direct expenditures.

Indirect Expenditures – indirect and induced outlays resulting from the direct expenditures; examples: vendors increasing production to meet new demand associated with the direct expenditures, workers spending direct earnings on various purchases within the local economy.

Indirect Employment – the full time equivalent jobs associated with the indirect expenditures.

Indirect Earnings – the salaries and wages earned by employees and contractors as part of the indirect expenditures.

Total Expenditures – the sum total of direct expenditures and indirect expenditures.

Total Employment – the sum total of direct employment and indirect employment.

Total Earnings – the sum total of direct earnings and indirect earnings.

Source: Econsult Corporation (2009)

APPENDIX B – ESTIMATED INDUSTRY DISTRIBUTION OF ECONOMIC IMPACT FROM UPFRONT CONSTRUCTION OF THE PROVENCE

Table B.1 – Estimated Expenditure Distribution of Economic Impact within the City from Upfront Construction of The Provence

Rank	Industry	Expenditures	%
1	Construction	$321	57.5%
2	Professional, scientific, and technical services	$83	14.9%
3	Real estate and rental and leasing	$42	7.5%
4	Manufacturing	$25	4.4%
5	Finance and insurance	$18	3.2%
	All other industries	$70	12.4%

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

Table B.2 – Estimated Employment Distribution of Economic Impact within the City from Upfront Construction of The Provence

Rank	Industry	Employment	%
1	Construction	1,114	56.0%
2	Professional, scientific, and technical services	271	13.6%
3	Retail trade	109	5.5%
4	Accommodation and food services	74	3.7%
5	Health care and social assistance	64	3.2%
	All other industries	358	18.0%

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

Table B.3 – Estimated Expenditure Distribution of Economic Impact within the Commonwealth from Upfront Construction of The Provence

Rank	Industry	Expenditures	%
1	Construction	$324	36.9%
2	Professional, scientific, and technical services	$124	14.2%
3	Manufacturing	$102	11.6%
4	Real estate and rental and leasing	$54	6.2%
5	Retail trade	$43	4.9%
	All other industries	$231	26.2%

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

Table B.4 – Estimated Employment Distribution of Economic Impact within the Commonwealth from Upfront Construction of The Provence

Rank	Industry	Employment	%
1	Construction	2,535	39.5%
2	Professional, scientific, and technical services	712	11.1%
3	Retail trade	603	9.4%
4	Health care and social assistance	443	6.9%
5	Manufacturing	404	6.3%
	All other industries	1,721	26.8%

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

APPENDIX C – CONSERVATIVE ASSUMPTIONS MADE IN ESTIMATING ANNUAL OPERATING EXPENDITURES BY THE PROVENCE

Table C.1 – Additional Detail on Existing Casino Sites within the Commonwealth of Pennsylvania

Casino Name	Casino Location	Casino SF	# Slot Machines	#Tables	# Employees	Payroll	Average Salary
Mohegan Sun	Wilkes-Barre	82,396	2,332	84	1832	$47M	$25,655
Parx	Bensalem	163,476	3,371	168	1,416		
Harrah's	Chester	106,102	2,800	121	1,883		
Presque Isle	Erie	58,938	2,031	53	960		
The Meadows	North Strabane Township	136,344	3,317	80	1,289		
Mount Airy	Mount Pocono	67,746	2,075	72	1,315	$36M	$27,376
Hollywood	Grantville	99,536	2,478	70	1,389		
Sands	Bethleham	143,244	3,024	152	1,910		
Rivers	Pittsburgh	136,594	2,933	116	1,810		
Sugar House	Fishtown, Philadelphia	53,536	1,602	59	1,098		
Valley Forge	King of Prussia	33,222	600	50	1,185		
Average of Existing Casino Sites		98,285	2,415	93	1,462	$42M	$26,500
The Provence (estimated)	Center City Philadelphia	120,000	3,300	150	1,582	$49M	$31,254

Source: Pennsylvania Gaming Control Board (2011), Tower Entertainment (2012), Spectrum Gaming (2012), Econsult Corporation (2012)

Table C.2 – Conservative Assumptions Made in Estimating Annual Operating Expenditures of The Provence

Use	Casino	Non-Casino	The Provence
Estimated # Employees	1,582	918	2,500
Average Annual Salary	$31,254	$33,000	
Estimated Total Salaries ($M)	$49	$30	$79
Salaries as % of Total Expenditures	40%	30%	
Estimated Total Expenditures	$123	$102	$225

Source: Tower Entertainment (2012), US Bureau of Labor Statistics (2011), bizstats.com (2011), Econsult Corporation (2012)

APPENDIX D – ESTIMATED INDUSTRY DISTRIBUTION OF ECONOMIC IMPACT FROM ONGOING OPERATIONS OF THE PROVENCE

Table D.1 – Estimated Expenditure Distribution of Economic Impact within the City from Ongoing Operations of The Provence

Rank	Industry	Expenditures	%
1	Arts, entertainment, and recreation	$121	35.3%
2	Accommodation	$83	23.6%
3	Real estate and rental and leasing	$25	7.0%
4	Retail trade	$19	5.4%
5	Finance and insurance	$16	4.5%
	All other industries	$85	24.2%

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

Table D.2 – Estimated Employment Distribution of Economic Impact within the City from Ongoing Operations of The Provence

Rank	Industry	Employment	%
1	Arts, entertainment, and recreation	1,721	57.4%
2	Accommodation	615	20.5%
3	Retail trade	173	5.8%
4	Food services and drinking places	127	4.2%
5	Real estate and rental and leasing	56	1.9%
	All other industries	308	10.3%

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

Table D.3 – Estimated Expenditure Distribution of Economic Impact within the Commonwealth from Ongoing Operations of The Provence

Rank	Industry	Expenditures	%
1	Arts, entertainment, and recreation	$125	27.2%
2	Accommodation	$83	18.0%
3	Real estate and rental and leasing	$32	7.0%
4	Manufacturing	$32	7.0%
5	Retail trade	$29	6.3%
	All other industries	$159	34.5%

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

Table D.4 – Estimated Employment Distribution of Economic Impact within the Commonwealth from Ongoing Operations of The Provence

Rank	Industry	Employment	%
1	Arts, entertainment, and recreation	1,758	47.7%
2	Accommodation	597	16.2%
3	Retail trade	296	8.0%
4	Food services and drinking places	163	4.4%
5	Health care and social assistance	133	3.6%
	All other industries	736	20.0%

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

APPENDIX E – ADDITIONAL DETAIL ON ANCILLARY SPENDING GENERATED BY THE PROVENCE

According to a market analysis conducted by Spectrum Gaming Group, The Provence will attract about 360,000 visits from tourists who will patronize the casino. Ancillary spending from tourist visits is conservatively excluded from this analysis under the assumption that they do not represent any net new spending within the City and Commonwealth.

The same analysis estimates that The Provence will attract about 5.3 million gaming patron visits per year, from a variety of markets within the broader region. Econsult classified these markets into "day trip" and "out of town," for purposes of assigning per-visit spending amounts. It was conservatively estimated that only half of out-of-town visits involved an overnight stay, that all overnight stays were for only one night, and that there were 2 people per hotel room (see Table E.1).[21]

It was also estimated that 50 percent of spending for both day trip visits and out-of-town visits was captured by The Provence, and therefore only the other 50 percent was considered ancillary spending not already accounted for in figures associated with The Provence's operating expenditures.

Based on national data on spending patterns, it was conservatively assumed that day-trip visits represented $37 each, out-of-town visits not involving an overnight stay represented $67 each, and out-of-town visits represented $250 each. It was also conservatively assumed that half of these amounts were captured within The Provence, and therefore only the other 50 percent was considered ancillary spending not already accounted for in figures associated with The Provence's operating expenditure (see Table E.2). This yields aggregate ancillary spending of about $127 million per year (see Table E.3).

[21] Therefore, for every two out-of-town visits involving a hotel stay, one visit was treated as including the cost of a hotel, from the standpoint of average spending per visit, while the other visit was treated as the equivalent of an out-of-town visit not involving a hotel stay.

Table E.1 – Estimated Number of Visits to The Provence, by Visitor Type

Location	Day Trip	Out-of-Town	No Hotel	Hotel
Philadelphia	4,142,041			
Atlantic City	203,147			
Bethlehem	73,280			
Central NJ	182,428			
Newark NJ		310,354	155,177	155,177
New York City		35,321	17,661	17,661
Reading		216,213	108,107	108,107
York		18,579	9,290	9,290
DelMarVA		74,307	37,154	37,154
Maryland		18,330	9,165	9,165
Harrisburg		17,959	8,980	8,980
Poconos		13,161	6,581	6,581
Total Visits	4,600,896	704,224	352,112	352,112
Nights/Visit				1
Guests/Room				2
Total Rooms				176,056
Distribution by Type	4,600,896	704,224	528,168	176,056

Spectrum Gaming Group (2012), Econsult Corporation (2012)

Table E.2 – Estimated Ancillary Spending per Visit for The Provence, by Visitor Type

Expenditure Category	Day Trip	Out-of-Town, No Hotel Stay	Out-of-Town, Hotel Stay
Transportation	$8	$15	$23
Accommodations			$153
Food	$22	$44	$66
Other	$8	$8	$8
Total Ancillary Spending	$38	$67	$250
Total Ancillary Spending Excluding That Which is Captured by The Provence	$19	$34	$125

Spectrum Gaming Group (2012), US General Service Administration (2009), US Bureau of Labor Statistics (2009), Greater Philadelphia Cultural Alliance (2007), Econsult Corporation (2012)

Table E.3 – Estimated Aggregate Ancillary Spending per Year for The Provence

	Day Trip	Out-of-Town, No Hotel Stay	Out-of-Town, Hotel Stay	Total
# Visits	4,600,896	704,224	352,112	5,305,120
Ancillary Spending per Visit	$19	$34	$125	
Aggregate Ancillary Spending ($M)	$87	$18	$22	$127

Spectrum Gaming Group (2012), US General Service Administration (2009), US Bureau of Labor Statistics (2009), Greater Philadelphia Cultural Alliance (2007), Econsult Corporation (2012)

APPENDIX F – ESTIMATED INDUSTRY DISTRIBUTION OF ECONOMIC IMPACT FROM ANCILLARY SPENDING ATTRACTED BY THE PROVENCE

Table F.1 – Estimated Expenditure Distribution of Economic Impact within the City from Ancillary Spending Attracted by The Provence

Rank	Industry	Expenditures	%
1	Accommodation and food services	$85	41.6%
2	Transportation and warehousing	$28	13.6%
3	Arts, entertainment, and recreation	$22	10.8%
4	Real estate and rental and leasing	$14	6.8%
5	Manufacturing	$9	4.6%
	All other industries	$46	22.6%

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

Table F.2 – Estimated Employment Distribution of Economic Impact within the City from Ancillary Spending Attracted by The Provence

Rank	Industry	Employment	%
1	Accommodation and food services	1,327	58.4%
2	Transportation and warehousing	409	18.0%
3	Arts, entertainment, and recreation	288	12.7%
4	Health care and social assistance	37	1.6%
5	Retail trade	29	1.3%
	All other industries	184	8.1%

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

Table F.3 – Estimated Expenditure Distribution of Economic Impact within the Commonwealth from Ancillary Spending Attracted by The Provence

Rank	Industry	Expenditures	%
1	Accommodation and food services	$87	30.3%
2	Transportation and warehousing	$32	11.1%
3	Manufacturing	$31	11.0%
4	Arts, entertainment, and recreation	$23	7.9%
5	Real estate and rental and leasing	$20	6.8%
	All other industries	$94	32.8%

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

Table F.4 – Estimated Employment Distribution of Economic Impact within the Commonwealth from Ancillary Spending Attracted by The Provence

Rank	Industry	Employment	%
1	Accommodation and food services	1,881	46.1%
2	Transportation and warehousing	686	16.8%
3	Arts, entertainment, and recreation	476	11.7%
4	Retail trade	167	4.1%
5	Health care and social assistance	157	3.8%
	All other industries	713	17.5%

Source: US Department of Commerce (2009), Tower Entertainment (2012), Econsult Corporation (2012)

APPENDIX G – ADDITIONAL DETAIL ON THE FISCAL IMPACT FROM GROSS GAMING REVENUE TO THE CITY OF PHILADELPHIA AND THE COMMONWEALTH OF PENNSYLVANIA FROM THE PROVENCE

Table G.1 – Estimated Annual State Gaming Tax Revenues to the Commonwealth of Pennsylvania from The Provence (in $M)

	Year 1	Year 2	Year 3	Year 4	Year 5
Gross Slots Revenues	$258.8	$296.2	$305.5	$313.2	$320.2
State Tax (34%)	$88.0	$100.7	$103.9	$106.5	$108.9
Economic Development and Tourism Fund (5%)	$12.9	$14.8	$15.3	$15.7	$16.0
Race Horse Development Fund (12%)	$29.2	$33.5	$34.5	$35.4	$36.2
PA Gaming Control Board Tax (1.5%)	$3.9	$4.4	$4.6	$4.7	$4.8
Gross Table Gaming Revenues	$116.3	$127.0	$130.9	$134.2	$137.2
PA Budget General Fund (14% in Yrs. 1 and 2,12% after)	$16.3	$17.8	$15.7	$16.1	$16.5
PA Automated Table Games Tax[22]	$0.8	$0.8	$0.8	$0.8	$0.8
PA Gaming Control Board Tax (1.5%)	$1.7	$1.9	$2.0	$2.0	$2.1
Total State Gaming Revenues	$152.9	$173.9	$176.7	$181.1	$185.2

Source: Spectrum Gaming Group (2012), Gaming Control Board (2012)

[22] This tax is applied at 48 percent for the first two years and 46 percent thereafter to all unstaffed automated electronic table games.

Table G.2 – Estimated Annual Local Gaming Tax Revenues to the City of Philadelphia from The Provence (in $M)

	Year 1	Year 2	Year 3	Year 4	Year 5
Gross Slots Revenues	$258.8	$296.2	$305.5	$313.2	$320.2
Local Taxes (4%)	$10.4	$11.8	$12.2	$12.5	$12.8
Gross Table Gaming Revenues	$116.3	$127.0	$130.9	$134.2	$137.2
Local Taxes (2%)	$2.3	$2.5	$2.6	$2.7	$2.7
Total Local Gaming Revenues	$12.7	$14.3	$14.8	$15.2	$15.6

Source: Spectrum Gaming Group (2012), Gaming Control Board (2012)

APPENDIX H – CONSERVATIVE ASSUMPTIONS MADE IN ESTIMATING ANNUAL OPERATING EXPENDITURES BY NEARBY COMMERCIAL DEVELOPMENTS INDUCED BY THE PROVENCE

Table H.1 – Conservative Assumptions Made in Estimating Annual Operating Expenditures of Nearby Commercial Developments Induced by The Provence

Use	Residential	Retail	Office	Total
SF	1,500,000	200,000	800,000	2,500,000
Employee/1000SF		1.50	3.00	
(Range from Lit Review)		1.0-2.0	2.6-3.3	
Estimated # Employees		300	2,400	2,700
Average Annual Salary		$20,000	$50,000	
(From US BLS / CCD)		$25,166	$58,210	
Estimated Total Salaries ($M)		$6	$120	$126
Salaries as % of Total Expenditures		20%	60%	
(From bizstats.com)		10%	30%	
Estimated Total Expenditures		$28	$184	$212

Source: Tower Entertainment (2012), US Bureau of Labor Statistics (2011), bizstats.com (2011), Econsult Corporation (2012)

APPENDIX I – ADDITIONAL DETAIL ON THE FISCAL IMPACT FROM NEW RESIDENTS AND WAGE EARNERS RESULTING FROM NEARBY RESIDENTIAL DEVELOPMENTS INDUCED BY THE PROVENCE

Table I.1 – Estimated Distribution of Residential Units and Resulting Residents and Wage Earners Living in Nearby Residential Developments Induced by The Provence

Type	# Units	Residents/Unit	# Residents	Wage Earners/Unit	# Wage Earners
1-2BR	500	2	1,000	1	500
3-4BR	500	3	1,500	2	1,000
Total	1,000		2,500		1,500

Source: Tower Entertainment (2012), Econsult Corporation (2012)

Table I.2 – Estimated Residents and Wage Earners Living in Nearby Residential Developments Induced by The Provence That Are New to the City of Philadelphia and the Commonwealth of Pennsylvania[23]

	#/%	City	Commonwealth
# Residents	2,500		
% New to City/Commonwealth		40%	20%
# New to City/Commonwealth		1,000	500
	#/%	City	Commonwealth
# Wage Earners	1,500		
% New to City/Commonwealth		20%	10%
# New to City/Commonwealth		300	150

Source: Tower Entertainment (2012), Econsult Corporation (2012)

[23] It is assumed that the vast majority of residents and wage earners are not new to the City or the Commonwealth.

Table I.3 – Estimated Wage and Income Tax Revenues from Residents and Wage Earners Living in Nearby Residential Developments Induced by The Provence That Are New to the City of Philadelphia and the Commonwealth of Pennsylvania[24]

	#/%	City	Commonwealth
New Wage Earners		300	150
Average Salary	$50,000		
Aggregate Salary ($M)		$15	$7.5
Income Tax Rate		3.93%	3.07%
New Income Tax Revenue ($000)		$590	$230

Source: Tower Entertainment (2012), Econsult Corporation (2012)

Table I.4 – Estimated Sales Tax Revenues from Residents and Wage Earners Living in Nearby Residential Developments Induced by The Provence That Are New to the City of Philadelphia and the Commonwealth of Pennsylvania[25]

	#/%	City	Commonwealth
Aggregate Salary ($M)		$15	$7.5
% Spent on Sales Taxable Items	10%		
Sales Taxable Amount ($M)		$1.5	$0.75
Sales Tax Rate		2%	6%
New Sales Tax Revenue ($000)		$30	$45

Source: Tower Entertainment (2012), Econsult Corporation (2012)

[24] A relatively low average annual salary is conservatively assumed.

[25] A relatively low proportion of sales taxable purchases is conservatively assumed.

APPENDIX J – ADDITIONAL DETAIL ON THE LABOR DEMANDED BY THE PROVENCE AND SUPPLIED BY IMMEDIATE NEIGHBORHOOD RESIDENTS

J.1 Labor Demanded by Upfront Construction

It is estimated that upfront construction of The Provence will support a total of 3,700 jobs for City residents, and that about 2,500 of those jobs are directly associated with upfront construction of The Provence (the remainder representing jobs supported by the spillover activity generated by upfront construction of The Provence). These 2,300 direct construction jobs were apportioned into the educational attainment levels required to fulfill them by assuming that they were of the same proportion as that of NAICS Code 23 (Construction) and NAICS Code 54 (Professional, Scientific, and Technical Services). This yields an estimate of **1,962 "A" jobs, 419 "B" jobs, and 74 "C" jobs** (see Table J.1).

Table J.1 – Estimate of the Distribution by Educational Attainment Level of Jobs Represented by the Upfront Construction of The Provence

Job Level	Upfront Construction Jobs
"A"	1,962
"B"	419
"C"	74
Total Jobs Demanded	2,455

Source: EMSI (2012), US Department of Labor Bureau of Labor Statistics (2010), Econsult Corporation (2012)

J.2 Labor Demanded by Ongoing Operations

It is estimated that ongoing operations of The Provence will support a total of 3,300 jobs for City residents, and that about 2,500 of those jobs are directly associated with ongoing operations of The Provence (the remainder representing jobs supported by the spillover activity generated by ongoing operations of The Provence). These 2,500 direct operations jobs were apportioned into the educational attainment levels required to fulfill them by assuming that jobs associated with food services, accommodation, gambling, and retail were of the same proportion as that of NAICS Code 71 (Arts, Entertainment, and Recreation), NAICS Codes 44 and

45 (Retail Trade), and NAICS Code 72 (Accommodations and Food Services). This yields an estimate of **1,943 "A" jobs, 299 "B" jobs, and 258 "C" jobs** (see Table J.2).

Table J.2 – Estimate of the Distribution by Educational Attainment Level of Full-Time Equivalent Jobs Represented by the Ongoing Operations of The Provence

Job Level	Ongoing Operations Jobs
"A"	1,943
"B"	299
"C"	258
Total Jobs Demanded	2,500

Source: EMSI (2012), US Department of Labor Bureau of Labor Statistics (2010), Econsult Corporation (2012)

J.3 Labor Supplied by Ongoing Operations

Residents of The Provence's immediate neighborhood who are of working age were classified by their educational attainment levels, using 2010 Census data. This yields an estimate of about 6,100 residents of working age who can perform "A" jobs, about 1,700 residents of working age who can perform "B" jobs, and about 1,600 residents of working age who can perform "C" jobs (see Table J.3).

Table J.3 – Estimated Number of Residents within The Provence's Immediate Neighborhood who are Qualified for "A," "B," and "C" Jobs

Highest Educational Attainment Level	The Provence
1. Population 25 and over	9,406
2. Less than High School	2,271
3. High School or Associate's degree	3,830
4. Bachelor's degree	1,674
5. Graduate or professional degree	1,631
Job Level (Number of Persons)	**The Provence**
"A" (#2 plus #3)	6,101
"B" (#4)	1,674
"C" (#5)	1,631

Source: US Census Bureau (2010), Econsult Corporation (2012)

TRANSPORTATION IMPACT STUDY

For:

Tower Entertainment, LLC
City of Philadelphia
Philadelphia County, Pennsylvania

Prepared For:

Tower Entertainment, LLC

Prepared By:

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SECTION I – INTRODUCTION

Traffic Planning and Design, Inc. (TPD) has completed a Transportation Impact Study (TIS) for the proposed development at 400 North Broad in the City of Philadelphia, Philadelphia County, Pennsylvania. The project site, as depicted in **Figure 1**, is bound by Callowhill Street to the south, N. 17th Street to the west, Hamilton Street to the north, and N. Broad Street to the east. The following analysis for the 400 North Broad development is based on information provided by Tower Entertainment, LLC.

Existing Site

The site currently consists of existing structures on three separate blocks along Callowhill Street to include the Inquirer Building between Broad Street and 15th Street, the parking structure between 15th Street and 16th Street, and the parking structure between 16th Street and 17th Street.

Proposed Development

The proposed development will consist of the following amenities as shown in **Figure 2**:

- Casino with 3000 slot machines and 150 table games;
- Restaurants, Eateries, Coffee Shops, Bars, Clubs;
- Retail Shops;
- Meeting rooms and a Theater;
- 125-room Hotel;
- Three (3) parking garages: one 800-space self-park garage and two garages totaling 900 valet parking spaces.

The site is anticipated to be open in 2015 and TPD utilized a design year of 2020 for the project.

A. Site Access Locations

Access locations for the proposed development are as follows:

Broad Street:

- Egress access from hotel valet return;

Callowhill Street:

- Ingress access to the hotel valet between Broad Street and 15th Street;
- Ingress access to the self-park garage between Broad Street and 15th Street;
- Ingress and egress access to the porte-cochere area between 15th Street and 16th Street; and,
- Ingress and egress access to the self-park garage between 16th Street and 17th Street.

16th Street:

- Egress access from the porte-cochere area between Callowhill Street and Hamilton Street; and,
- Service access to loading dock area between Callowhill Street and Hamilton Street.

15th Street:

- Ingress and egress access to the self-park garage between Broad Street and 15th Street;
- Ingress and egress access to the porte-cochere area between 15th Street and 16th Street; and,
- Service access to loading dock area between Broad Street and 15th Street.

Hamilton Street:

- Service access to loading dock area between Callowhill Street and 15th Street.

SECTION II – EXISTING ROADWAY NETWORK

A field review of the existing roadway system in the study area was conducted. The existing roadway characteristics within the study area are summarized in **Table 1**.

TABLE 1
ROADWAY CHARACTERISTICS WITHIN STUDY AREA

Roadway	Ownership	PennDOT Functional Classification/ Roadway Type	Predominant Directional Orientation	Posted Speed Limit[1]
N. Broad Street	State (S.R. 0611)	Urban Principal Arterial	North-South	Not Posted
Spring Garden Street	State (S.R. 2006)	Urban Principal Arterial	East-West	25 mph
Vine Street	State (S.R. 2676)	Urban Minor Arterial	East-West	25 mph
Callowhill Street	City	Urban Collector	East-West	Not Posted
N. 15th Street	City/State (S.R. 3029)	Urban Minor Arterial	North-South	Not Posted
N. 16th Street	City/State (S.R. 3027)	Urban Minor Arterial	North-South	Not Posted
N. 17th Street	City	Urban Collector	North-South	Not Posted
Franklin Town Boulevard	City	Urban Collector	North-South	Not Posted

[1] TPD assumes 25 mph when not posted

A. Multi-Modal Facilities

Based on the observations during field visits, sidewalks exist on both sides of the street for all roadways considered for this study with the exception of the west side of 15th Street between

Callowhill Street and Vine Street, along the Vine Street Expressway frontage. Most of the sidewalks are in fair condition; however, curb ramps throughout the study area do not appear in compliance with current ADA standards. There are exclusive bicycle lanes along Spring Garden Street in the vicinity of the site.

Public transportation is available in the vicinity of the proposed site via bus and subway routes of the Southeastern Pennsylvania Transportation Authority (SEPTA). SEPTA Bus Routes 2, 4, 16, and 43 have scheduled stops in the vicinity of the proposed site. The Broad Street Subway Line has nearby stops along Broad Street at Race-Vine Street and Spring Garden Street. Lastly, the proposed site is located less than ½ mile from the following transportation amenities:

- SEPTA Regional Rail – Suburban Station;
- Market Frankford Line (subway-elevated line);
- Numerous other SEPTA bus routes;
- Philadelphia FLASH;
- Greyhound Bus Terminal Facility.

As indicated above, the proposed site is served by numerous multi-modal facilities and it is anticipated that a significant percentage of its visitors will utilize them, to include locally employed persons. The existing public transportation amenities surrounding the site are shown in **Figure 3**.

SECTION III – EXISTING TRAFFIC CONDITIONS

A. Manual Turning Movement Counts

Manual traffic counts were conducted on 15-minute intervals during the Friday evening (4:00 to 6:00 P.M.) peak period. Data pertaining to heavy vehicles, pedestrians, bicycles, and transit vehicles were observed during the manual counts. Peak hours and count dates for the study area intersections are identified in **Table 2**.

TABLE 2
MANUAL TRAFFIC COUNT INFORMATION

Intersection	Count Date	Observed Peak Hour (Vehs)	Peak Hour Volumes	
			Vehicular	Pedestrians/ Bicycles
Vine Street & 15th Street (2 intersections)	09/21/2012	4:00 P.M.	5,169	479 / 4
Vine Street & 16th Street	09/21/2012	4:00 P.M.	1,945	425 / 19
Vine Street & Broad Street (2 intersections)	09/21/2012	4:30 P.M.	6,141	1,175 / 128
Callowhill Street & Broad Street	09/21/2012	4:45 P.M.	2,046	311 / 1
Callowhill Street & 15th Street	09/14/2012	4:00 P.M.	1,045	156 / 0
Callowhill Street & 16th Street	09/21/2012	4:30 P.M.	1,126	375 / 26
Callowhill Street & 17th Street	09/14/2012	4:30 P.M.	869	255 / 28
Callowhill Street & Franklin Town Blvd	09/14/2012	4:00 P.M.	952	112 / 16
Spring Garden Street & Broad Street	10/26/2012	5:00 P.M.	3,595	521 / 121
Spring Garden Street & 15th Street	09/14/2012	4:15 P.M.	2,126	842 / 76
Spring Garden Street & 16th Street	09/14/2012	4:45 P.M.	2,424	633 / 97
Spring Garden Street & 18th Street	10/26/2012	4:30 P.M.	2,144	279 / 94

1. Peak Hour consists of the four consecutive 15-minute intervals where the highest traffic volumes occur.

Existing condition vehicular and pedestrian traffic volumes for the Friday P.M. peak hour are illustrated in **Figures 4A and 4B, respectively**. Manual traffic count data sheets are provided in **Appendix A**.

SECTION IV – BASE (NO-BUILD) CONDITIONS

TPD obtained the background growth factor for the roadways in the study area from the PennDOT Bureau of Planning and Research (BPR). Considering the PennDOT BPR suggests that there is a 0% background growth trend factor per year in Philadelphia County for urban non-interstate roadways, TPD did not include any background growth. However, base (no-build) traffic conditions were calculated to include traffic volumes from proposed developments, which, though not operating under existing conditions, may be operating by the opening year (2015) of the proposed development. Traffic associated with the following nearby planned developments was specifically included in this study:

The Granary is a proposed residential development consisting of 120 apartment dwelling units and is located on the northeast corner of the 20th Street and Callowhill Street intersection.

Broad and Spring Garden (former State building) is a proposed residential development consisting of 204 apartment unit and is located on the southwest corner of the Broad Street and Spring Garden Street intersection.

Mormon Latter Day Saints Temple is a proposed worship place with 53,000 square feet of total floor area. The site is located along the north side of Vine Street between 17th and 18th streets.

The additional traffic volumes due to nearby developments were added to the existing traffic data to produce 2020 base (no-build) condition traffic volumes. Base condition volumes for the weekday P.M. peak hour are illustrated in **Figures 5A and 5B, respectively** for the 2020 design year condition. Trip distributions for the background developments are provided in **Appendix B.**

SECTION V – TRIP GENERATION

TPD conducted a trip generation analysis to develop proposed traffic levels for the casino use and ancillary uses. The detailed trip generation data and analysis is included in **Appendix C**. The calculated trip generation for the proposed development is shown in **Table 3**.

TABLE 3
TRIP GENERATION SUMMARY – 400 NORTH BROAD

Land Use	Size / Units (X)	Total Trips	Int. Trips	External Trips					
				Mass Transit[2]	Ped-Bike	Pass-by	New Trips[3]		
							Total	Enter	Exit
Casino Use									
Casino	3,000 slots / 150 tables	2,333	---	1,161	300	---	859	475	384
			Shuttle Bus Trips				13	7	6
Ancillary Uses									
Hotel	125	88	66	7	2	0	13	6	7
Restaurant	56,210[1]	554	416	43	11	30	54	32	22
Drinking Place	30,287[1]	343	257	27	7	20	32	21	11
Theater / Clubs	49,148[1]	55	41	4	1	0	9	7	2
Retail	72,264	196	147	15	4	10	20	9	11
Subtotal – Ancillary Trips		1,236	927	96	25	60	128	75	53
Total Site Trips		***3,569***	***927***	***1,257***	***325***	***60***	***1,000***	***557***	***443***

Int. = Internal Capture Trips **X** = Independent Variable (Size in KSF, Gaming Positions, Units)
[1] Assumes 30% of space not utilized/open during weekday P.M. peak hour
[2] Includes visitors who are employed locally and use transit [3] New trips include passenger cars and taxis

SECTION VI – TRIP DISTRIBUTION

The distribution of trips generated by the proposed redevelopment was based on the local road network, the existing traffic patterns, the location of the proposed access points, and proprietary marketing information provided by the developer. The vehicular, pedestrian, and mass transit

trips for the proposed development were distributed to the local transportation network based on the percentages shown in **Table 4**.

TABLE 4
VEHICULAR TRIP DISTRIBUTION PERCENTAGES

Direction	Distribution Percentages
Vehicular Trips	
West via Spring Garden Street	4%
North via Broad Street	5%
East via Spring Garden Street	5%
via Callowhill Street	4%
Via Vine Street Local	5%
Via I-676 westbound	30%
South via Broad Street	5%
Via Vine Street Local eastbound	4%
Via I-676 eastbound	30%
Via 16th Street	4%
Via 15th Street	4%
Pedestrian Trips	
Northwest of site	13%
North of site	12%
Northeast of site	13%
East of site	13%
Southeast of site	13%
South of site	14%
West of site	22%
Mass Transit Trips	
Bus Routes in project area	25%
Broad Street Line (Spring Garden Station)	15%
Broad Street Line (Race-Vine Station)	15%
Regional Rail – Suburban Station	45%

The assignment of site-generated trips for the proposed development during the weekday P.M. peak hour is shown in **Figures 6A and 6B, respectively**. The detailed analysis of trip distribution and trip assignment are shown in **Appendix D.**

SECTION VII – PROJECTED (BUILD) CONDITION TRAFFIC VOLUMES

The site-generated trips for the proposed development were added to the 2020 base condition traffic volumes to develop 2020 projected condition traffic volumes. Projected condition traffic volumes for the opening year of 2020 for the weekday P.M. peak hour are shown in **Figures 7A and 7B, respectively.**

SECTION VIII – CAPACITY ANALYSIS

A. Levels of Service for an Intersection

For analysis of intersections, level of service is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. LOS criteria is stated in terms of control delay per vehicle for a one-hour analysis period. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The criteria are shown in **Table 5**. Delay, as it relates to level of service, is a complex measure and is dependent upon a number of variables. For signalized intersections, these variables include the quality of vehicle progression, the cycle length, the green time ratio, and the volume/capacity ratio for the lane group in question. For unsignalized intersections, delay is related to the availability of gaps in the flow of traffic on the major street and the driver's discretion in selecting an appropriate gap for a particular movement from the minor street (straight across, left or right turn).

TABLE 5
LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS [1]

Level of Service	Control Delay Per Vehicle (Seconds)	
	Signalized	**Unsignalized**
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

[1] Obtained from Exhibits 16-2 and 17-2 of the Transportation Research Board's *Highway Capacity Manual*, 2000 Edition

B. Capacity Analysis Methodology

Capacity analyses were conducted for the weekday P.M. peak hour at the study area intersections. These analyses were conducted according to the methodologies contained in the 2000 *Highway Capacity Manual* (HCM) using *Synchro 7* software, a Trafficware product. The following conditions were analyzed, as applicable:

- Existing conditions;
- 2020 Base conditions (Design year without development);
- 2020 Projected conditions (Design year with development);

The capacity analysis worksheets are included in **Appendix E**.

PennDOT's Transportation Impact Study Guidelines outlined in Strike-Off Letter 470-09-4, dated February 12, 2009 contain the following criteria regarding levels of service:

- Page 29 of the Guidelines state that if evaluation of the With Development Horizon Year Scenario to the Without Development Horizon Year Scenario indicates that the overall intersection level of service has dropped, the applicant will be required to mitigate the level of service if the increase in overall intersection delay is greater than 10-seconds. If the overall intersection delay increase is less than or equal to 10-seconds, mitigation of the intersection will not be required.
- Page 29 of the Guidelines state that for mitigation scenarios, applicants are expected to mitigate the overall intersection LOS to the original Without Development LOS; the 10-second delay variance is not applied to mitigation scenarios. Applicants may be required to address available storage and queue lengths at critical movements or approaches even if the overall LOS requirements are met.
- Page 31 of the Guidelines states new signalized or unsignalized intersection established to serve as access to the development shall be designed to operate at minimum LOS C for rural areas, and minimum LOS D for urban areas.
- Page 34 of the Guidelines states that the Department will consider the marginal LOS degradation based on municipal input and review of the Municipal Land Use and Transportation Plan to ensure that congestion and delay are managed in the Study Area. Marginal LOS degradation is defined as overall intersection LOS within the range of LOS B to LOS C for rural areas, and LOS B to LOS D for urban areas.

C. Levels of Service in the Study Area

The Level of service (LOS) summary matrix for the study area intersections are shown in **Table 6** for the weekday P.M. peak hour. The recommended roadway improvements associated with the project and utilized in the projected conditions analysis are shown in **Table 7**.

TABLE 6
LEVEL OF SERVICE SUMMARY

Intersection	2012 Existing	Future Conditions	
		Base	Projected[1]
Spring Garden Street and 16th Street	D(42.5)	D(43.2)	D(49.7)
Spring Garden Street and 15th Street	C(27.0)	C(28.3)	D(32.8)
Callowhill Street and Franklin Town Boulevard	C(19.4)	C(20.9)	D(28.6)
Callowhill Street and 17th Street	B(14.4)	B(14.5)	C(18.8)
Callowhill Street and 16th Street	B(16.6)	B(16.6)	C(24.5)
Callowhill Street and 15th Street	D(26.3)	D(26.3)	C(27.8)
Callowhill Street and Broad Street	B(16.5)	B(16.5)	B(19.7)
Vine Street Local (WB) and 16th Street	B(14.8)	B(14.9)	B(15.4)
Vine Street Local (WB) and 15th Street	C(31.3)	C(33.7)	D(51.4)
Vine Street Local (WB) and Broad Street	C(32.9)	C(33.2)	D(39.4)
Vine Street Local (EB) and 15th Street	C(31.3)	C(33.7)	D(51.4)
Vine Street Local (EB) and Broad Street	C(32.9)	C(33.2)	D(39.4)
Spring Garden Street and 18th Street	D(42.5)	D(43.4)	D(38.5)
Spring Garden Street and Broad Street	C(31.1)	C(30.1)	C(28.4)

1 = With Site Related Improvements (see Table 7)

As indicated in **Table 6**, with the recommended improvements in **Table 7**, all study area intersections will operate at acceptable LOS D operations or better, have a less than 10 second increase in delay, or has a marginal level of service degradation. Therefore, with the recommended improvements, it is our opinion the PennDOT criteria will be satisfied and adequate accommodations for vehicles, pedestrians, mass transit, and bicycles can be provided for the site.

TABLE 7
ANTICIPATED ROADWAY IMPROVEMENTS

Intersection	Description of Roadway Improvements
Intersections along Vine Street Local	Modify traffic signal timings to accommodate site traffic, including signal phasing, cycle lengths, and offset. Add southbound left turn phase to 15th Street and the southern local Vine Street intersection.
Vine Street Local (EB) and Broad Street	Restripe the northbound Broad Street approach in order to provide an exclusive right-turn lane.
Site Frontage along Callowhill Street	Restrict parking for a majority of the site frontage, including, but not limited to section between Broad Street and 15th Street, section between 15th Street and 16th Street, and portion of section between 16th Street and 17th Street.
	Review and upgrade pedestrian facilities to meet current ADA regulations.
Callowhill Street and Broad Street	Remove a portion of the existing concrete median and construct a separate left-turn lane on the northbound Broad Street. The removal of the existing median is anticipated to extend approximately 125'-150'.
	Restrict on-street parking along the southbound Broad Street approach in order to provide a separate right-turn lane. The restriction is anticipated to extend along the site frontage between Broad Street and Noble Street.
	Review and upgrade pedestrian facilities to meet current ADA regulations.
Callowhill Street and 15th Street	Install traffic signal and upgrade pedestrian facilities to meet current ADA regulations.
	Restripe the southbound 15th Street approach in order to provide a separate right-turn lane.
Callowhill Street and 16th Street	Modify traffic signal timings to accommodate site traffic, including but, not limited to signal phasing, cycle lengths, and offset.
Callowhill Street and 17th Street	Review and upgrade pedestrian facilities to meet current ADA regulations.
Callowhill Street and Franklin Town Boulevard	No improvements are anticipated at this time.
Intersections along Broad Street	Modify traffic signal timings to accommodate site traffic, including but, not limited to signal phasing, cycle lengths, and offset.
Intersections along Spring Garden Street	Modify traffic signal timings to accommodate site traffic, including but, not limited to signal phasing, cycle lengths, and offset.

It should be noted that TPD investigated the feasibility of converting Callowhill Street to two-way traffic between 16th Street and Broad Street in order to improve traffic circulation for the site. Based upon our analysis, no conclusions or recommendations of this report are changed. The most significant impact realized when modifying Callowhill Street to two-way traffic is the increased delay experienced at its intersection with Broad Street, where the ILOS degrades due to the reduction of capacity and the introduction of conflicting turning movements.

SECTION IX – SUMMARY AND CONCLUSIONS

Based on the results of the transportation impact study, TPD offers the following conclusions:

- Upon full build-out, the proposed development is expected to generate 1,000 (557 entering, 443 exiting) new vehicle-trips, 1,257 mass transit trips (which includes employees of the complex and local patrons who live and work in Center City and the surrounding neighborhoods), and 325 pedestrian trips, during the weekday P.M. peak hour.
- The proposed site is served by numerous multi-modal facilities to include regional rail, and it is anticipated that a significant percentage of its visitors will utilize them.
- With the recommended improvements, all study area intersections will operate at acceptable LOS D operations or better, have a less than 10 second increase in delay, or has a marginal level of service degradation. Therefore, it is our opinion the PennDOT criteria will be satisfied.
- Based upon TPD's analysis, with provision of the roadway improvements anticipated for the development of the proposed 400 North Broad Street site, it is our opinion adequate accommodations for vehicles, pedestrians, mass transit, and bicycles can be provided for the site.

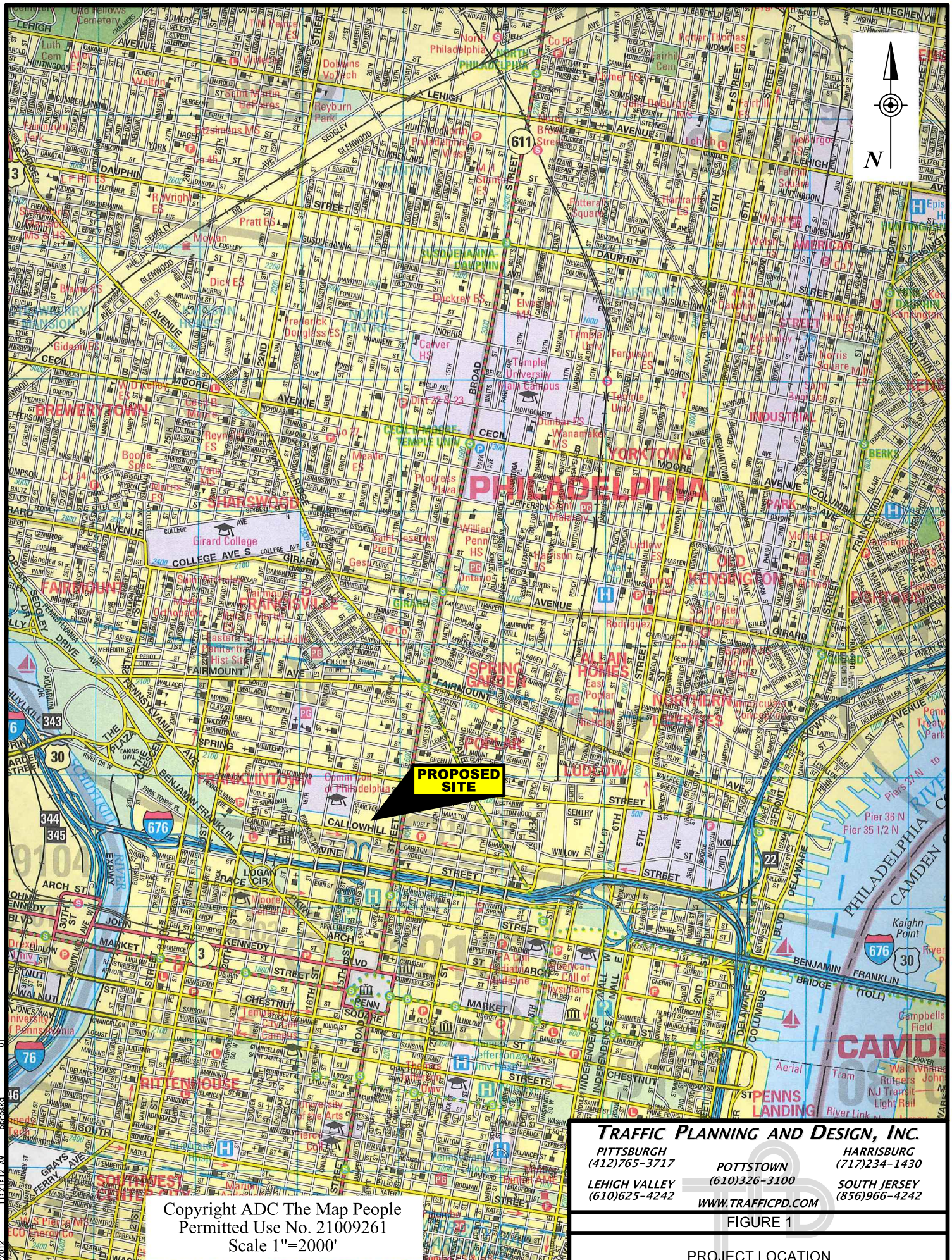

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FIGURE 1

PROJECT LOCATION

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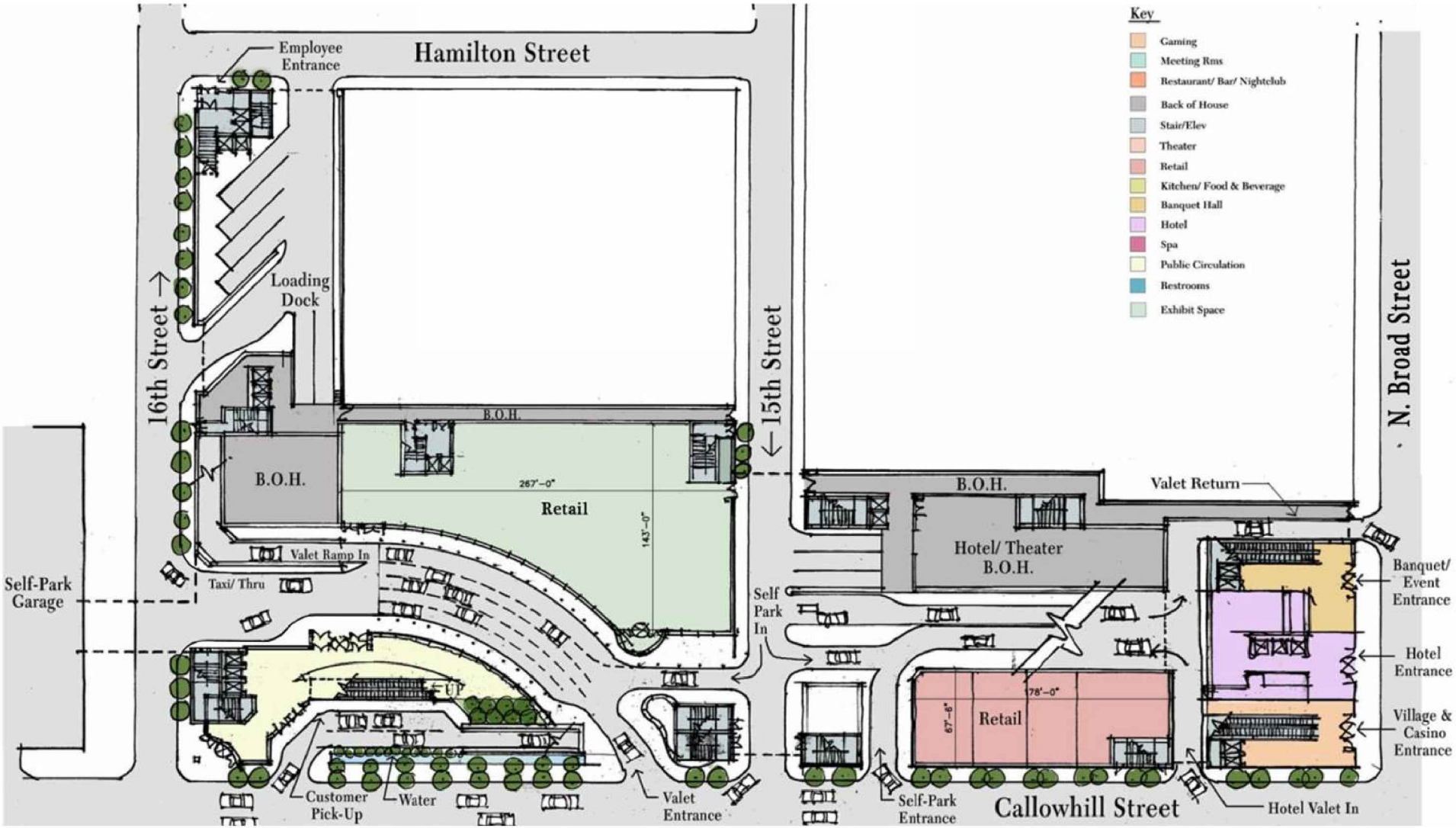

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FIGURE 2

SITE PLAN

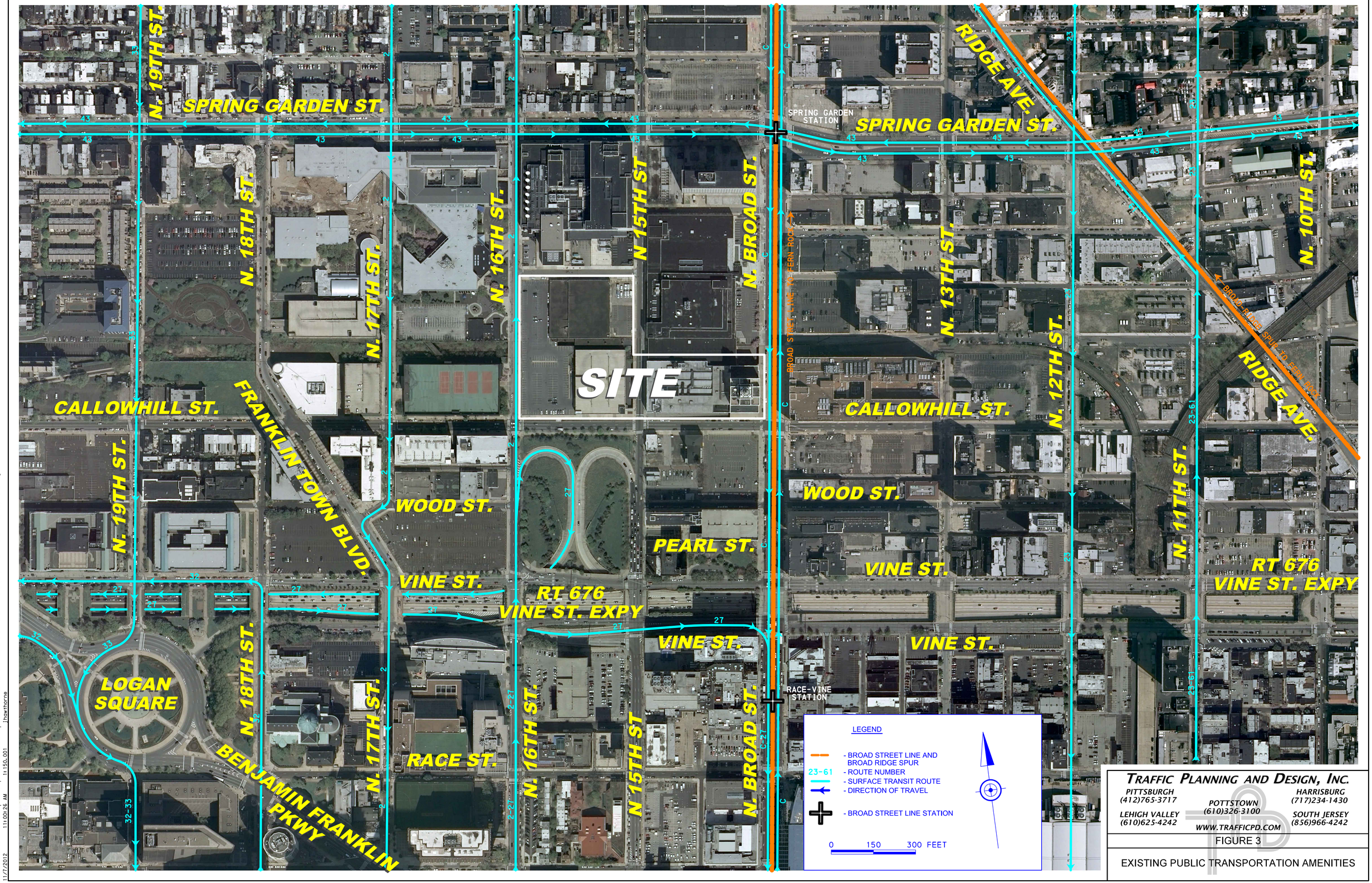

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FIGURE 3

EXISTING PUBLIC TRANSPORTATION AMENITIES

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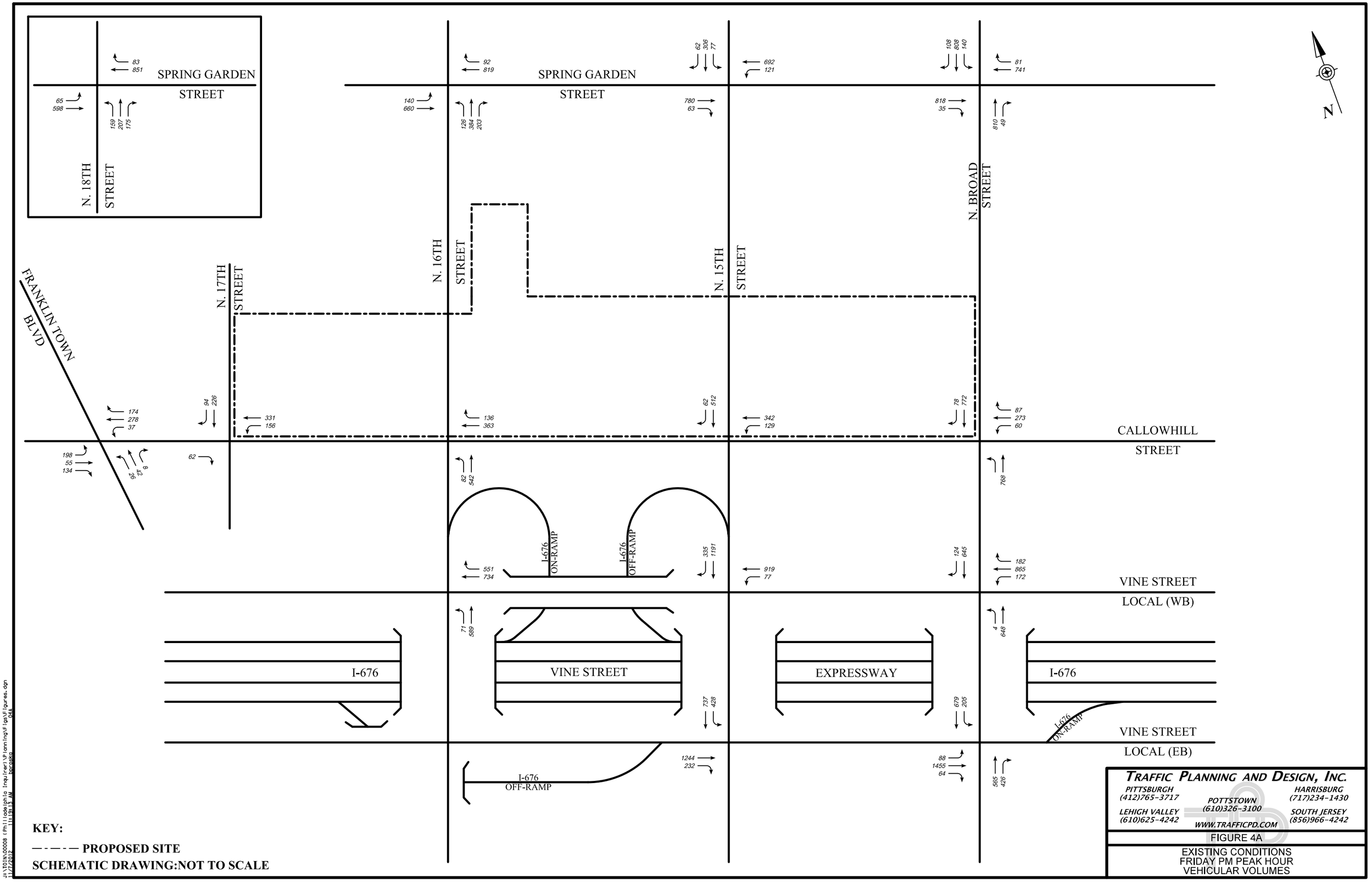

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FIGURE 4A

EXISTING CONDITIONS
FRIDAY PM PEAK HOUR
VEHICULAR VOLUMES

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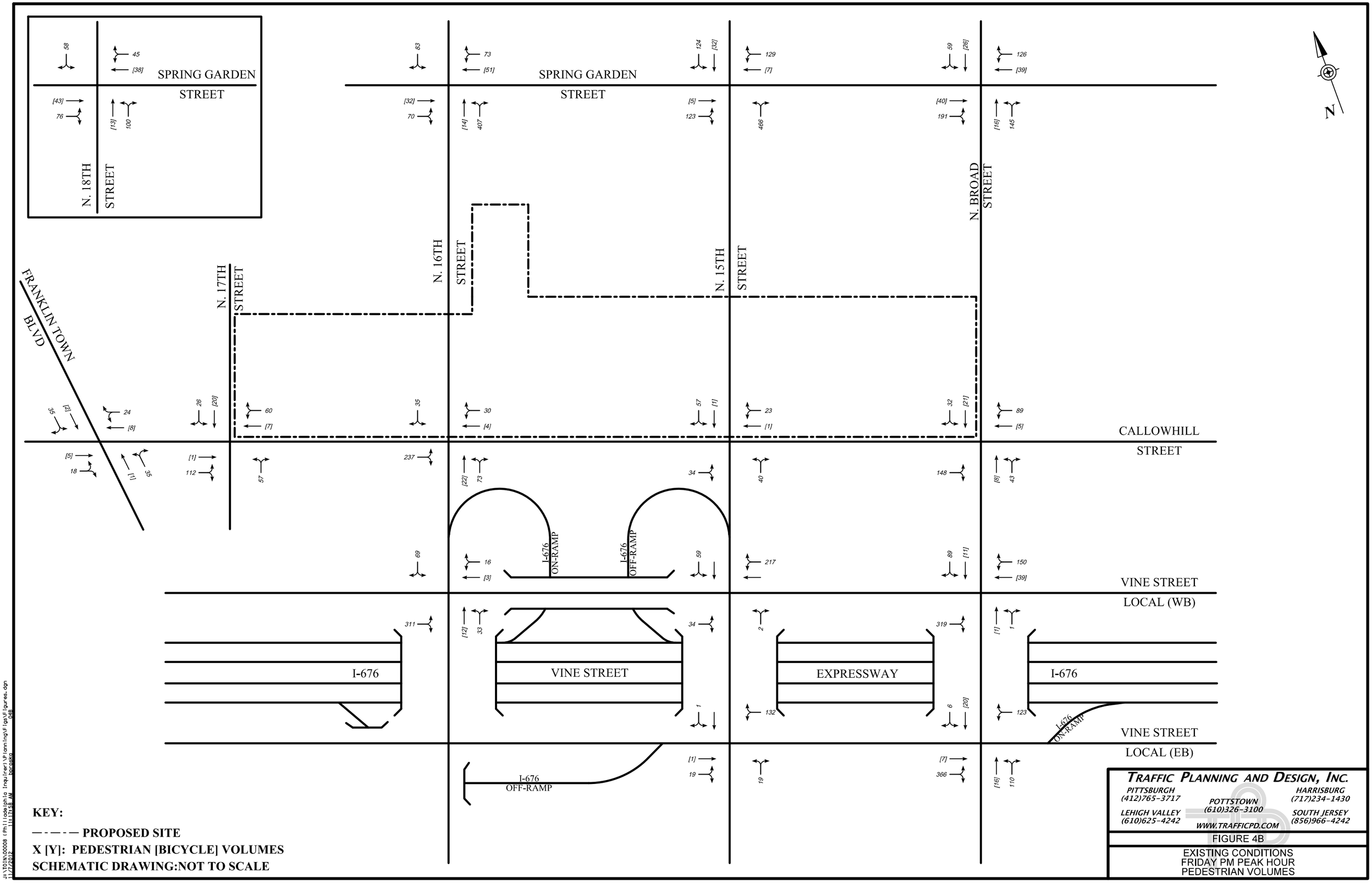
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FRANKLIN TOWN BLVD
CALLOWHILL STREET
VINE STREET
LOCAL (WB)
VINE STREET
LOCAL (EB)
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VINE STREET
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FIGURE 4B
EXISTING CONDITIONS
FRIDAY PM PEAK HOUR
PEDESTRIAN VOLUMES

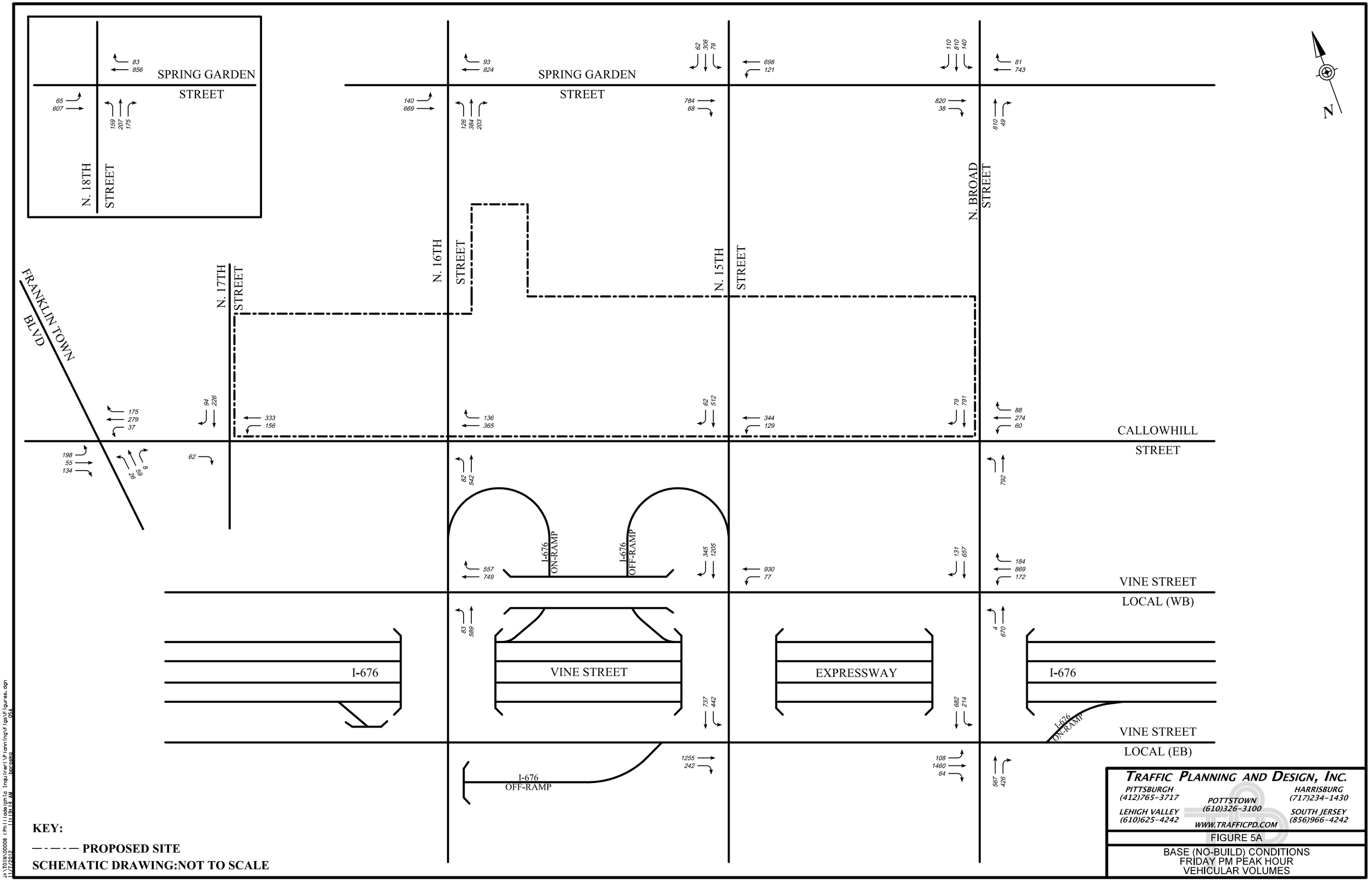

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FIGURE 5A

BASE (NO-BUILD) CONDITIONS
FRIDAY PM PEAK HOUR
VEHICULAR VOLUMES

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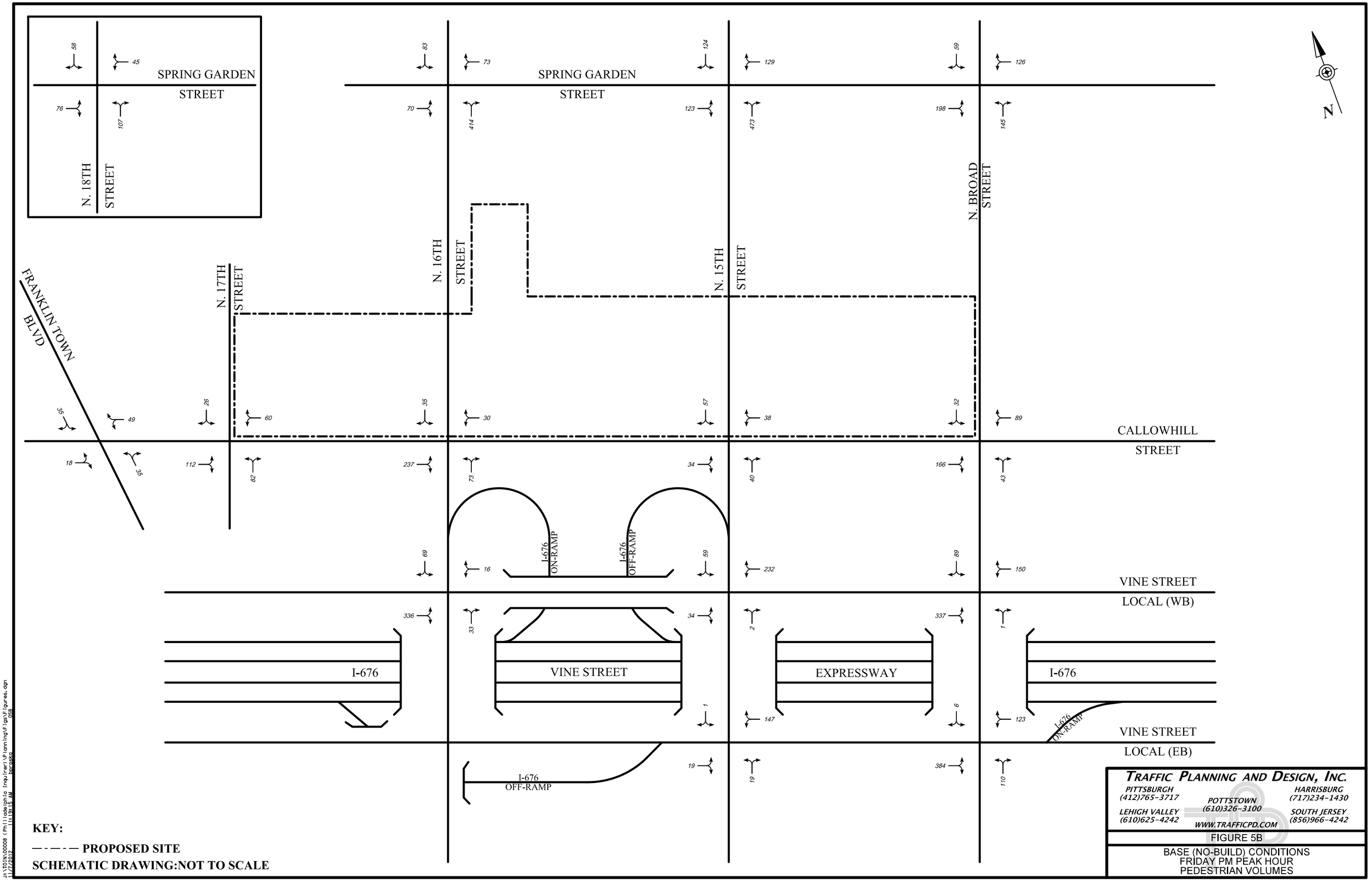
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CALLOWHILL STREET
VINE STREET
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VINE STREET
LOCAL (EB)
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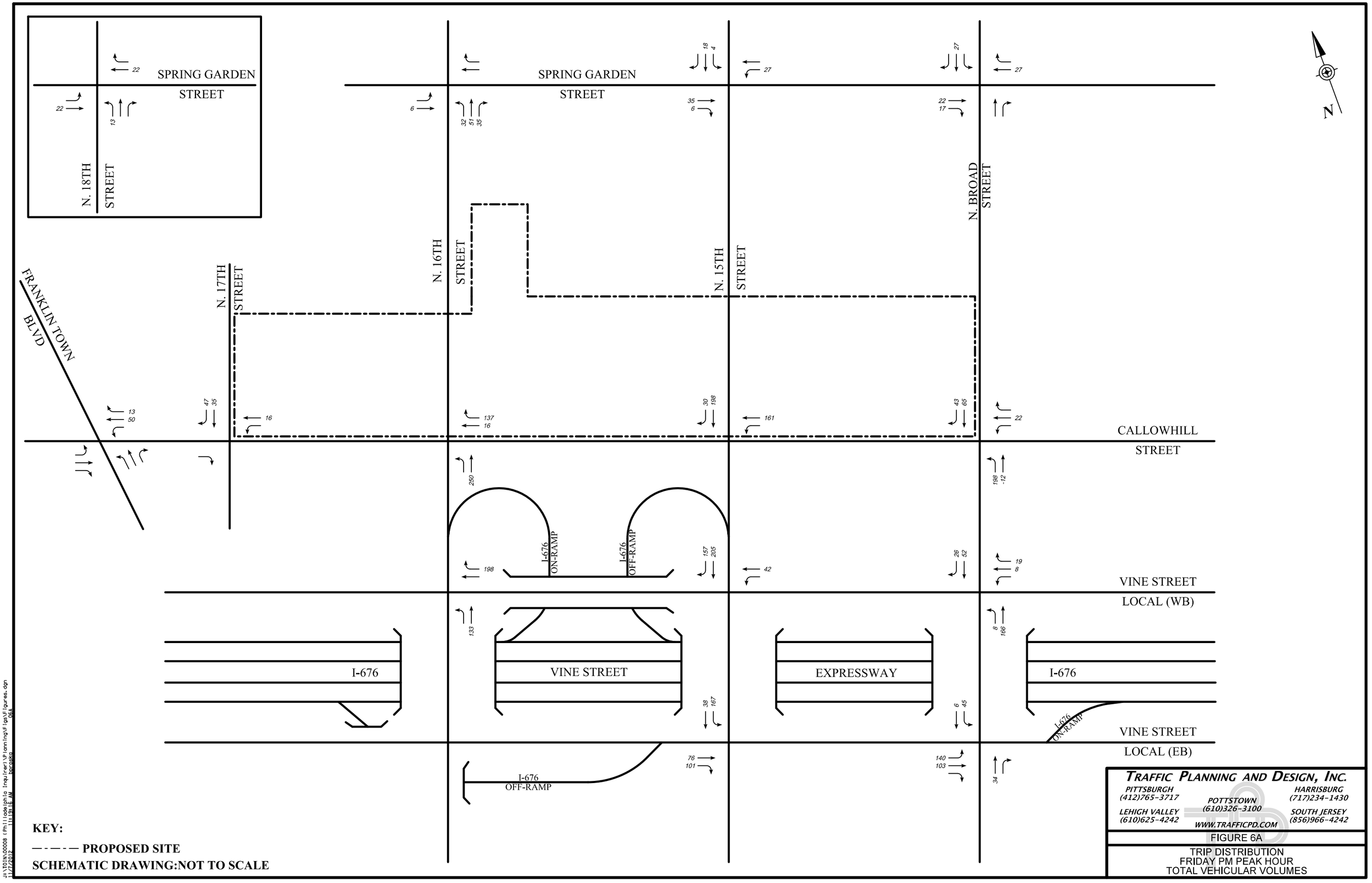
FIGURE 5B
BASE (NO-BUILD) CONDITIONS
FRIDAY PM PEAK HOUR
PEDESTRIAN VOLUMES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N. 17TH STREET
N. 16TH STREET
N. 15TH STREET
N. BROAD STREET
FRANKLIN TOWN BLVD
CALLOWHILL STREET
VINE STREET
LOCAL (WB)
VINE STREET
LOCAL (EB)
I-676
VINE STREET
EXPRESSWAY
I-676
I-676 ON-RAMP
I-676 OFF-RAMP
I-676 ON-RAMP
I-676 OFF-RAMP
N
KEY:
PROPOSED SITE
SCHEMATIC DRAWING:NOT TO SCALE
TRAFFIC PLANNING AND DESIGN, INC.
PITTSBURGH (412)765-3717
POTTSTOWN (610)326-3100
HARRISBURG (717)234-1430
LEHIGH VALLEY (610)625-4242
SOUTH JERSEY (856)966-4242
WWW.TRAFFICPD.COM
FIGURE 6A
TRIP DISTRIBUTION
FRIDAY PM PEAK HOUR
TOTAL VEHICULAR VOLUMES

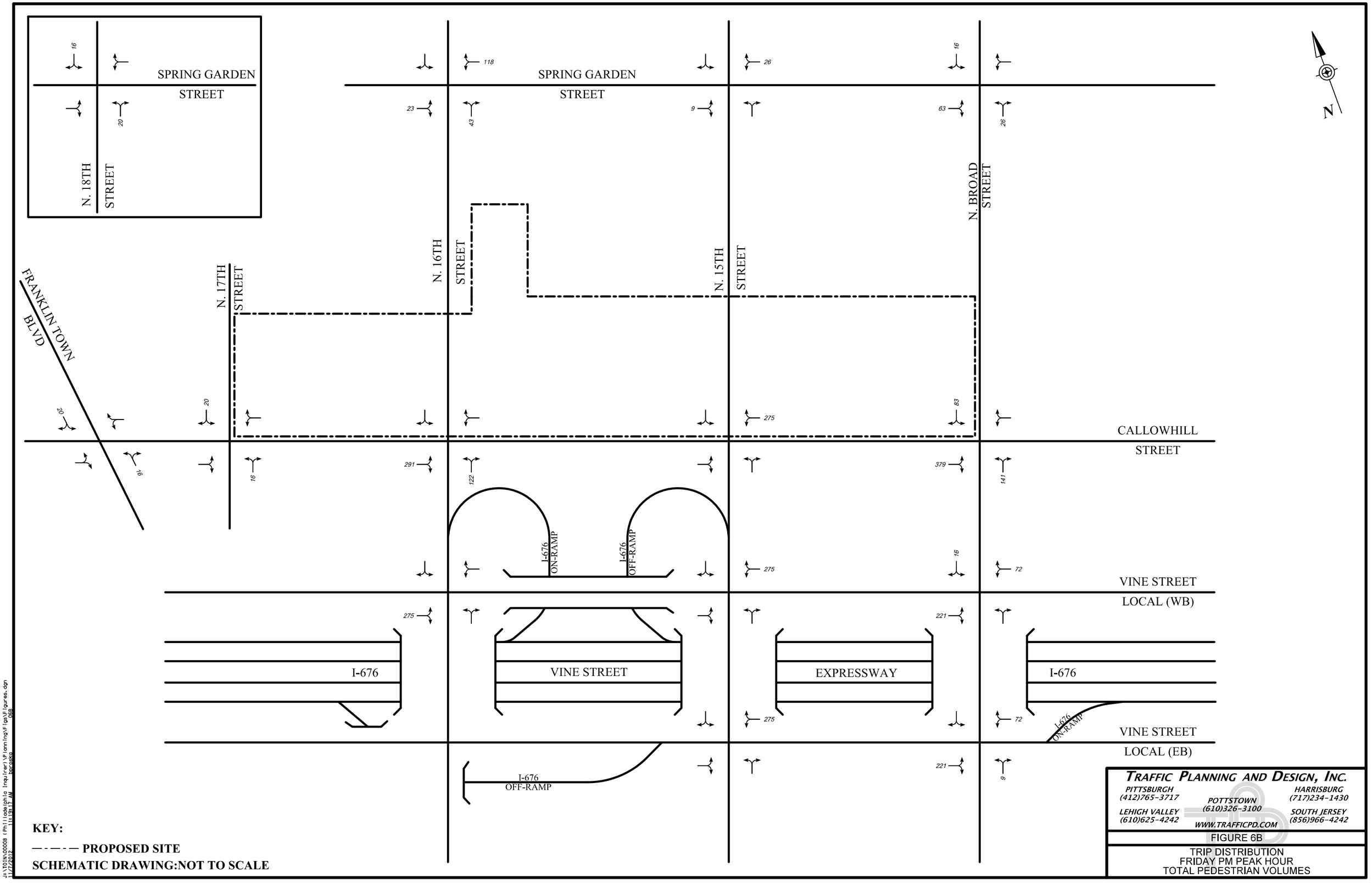
SPRING GARDEN STREET
N. 18TH STREET
16
20
118
23
43
9
26
16
63
26
N. 17TH STREET
N. 16TH STREET
N. 15TH STREET
N. BROAD STREET
FRANKLIN TOWN BLVD
20
20
16
16
275
83
CALLOWHILL STREET
291
122
379
141
I-676 ON-RAMP
I-676 OFF-RAMP
275
16
72
VINE STREET
LOCAL (WB)
275
221
I-676
VINE STREET
EXPRESSWAY
I-676
275
72
I-676 ON-RAMP
VINE STREET
LOCAL (EB)
I-676 OFF-RAMP
221
9
N
KEY:
PROPOSED SITE
SCHEMATIC DRAWING:NOT TO SCALE
TRAFFIC PLANNING AND DESIGN, INC.
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FIGURE 6B
TRIP DISTRIBUTION
FRIDAY PM PEAK HOUR
TOTAL PEDESTRIAN VOLUMES

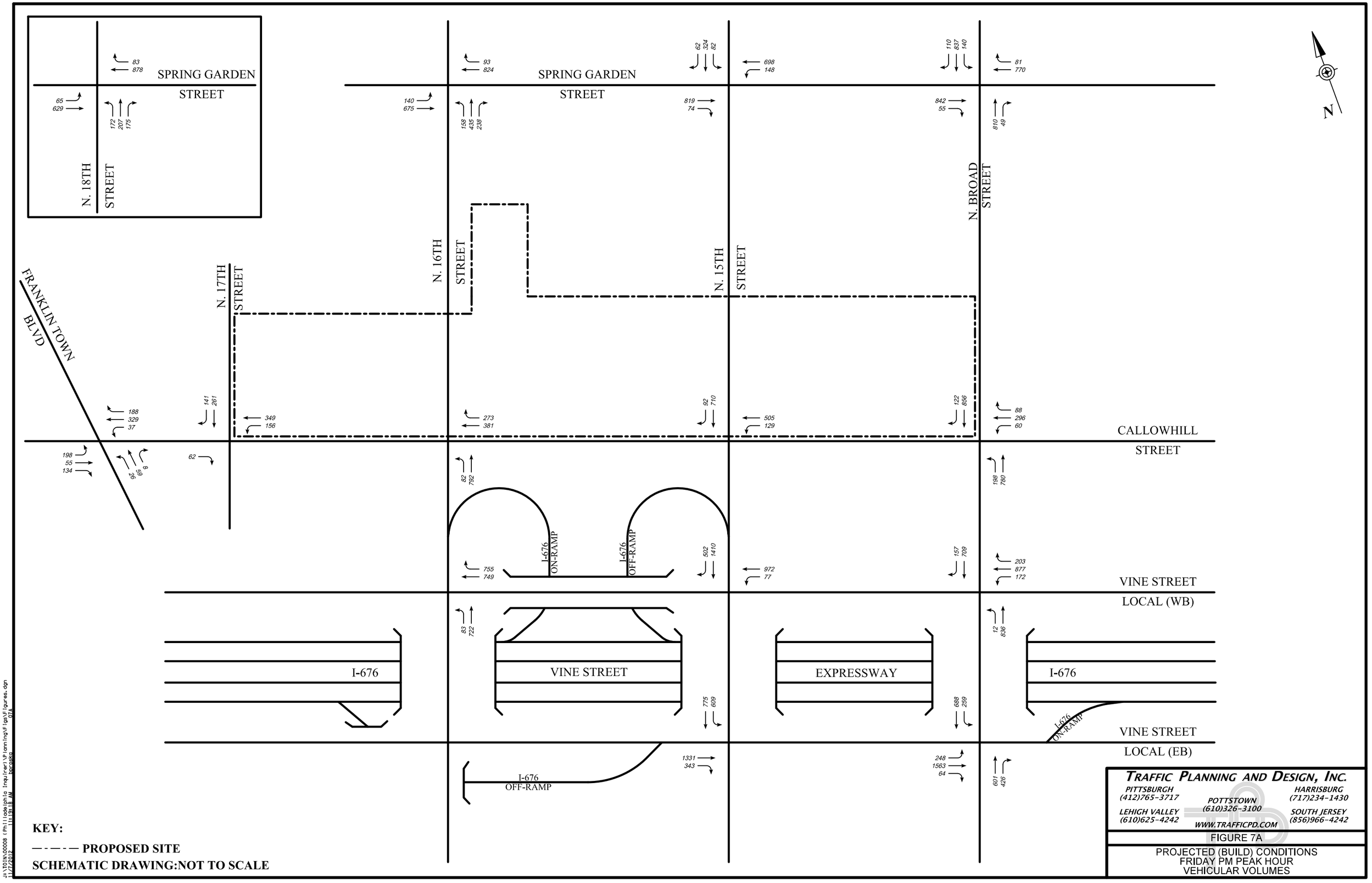

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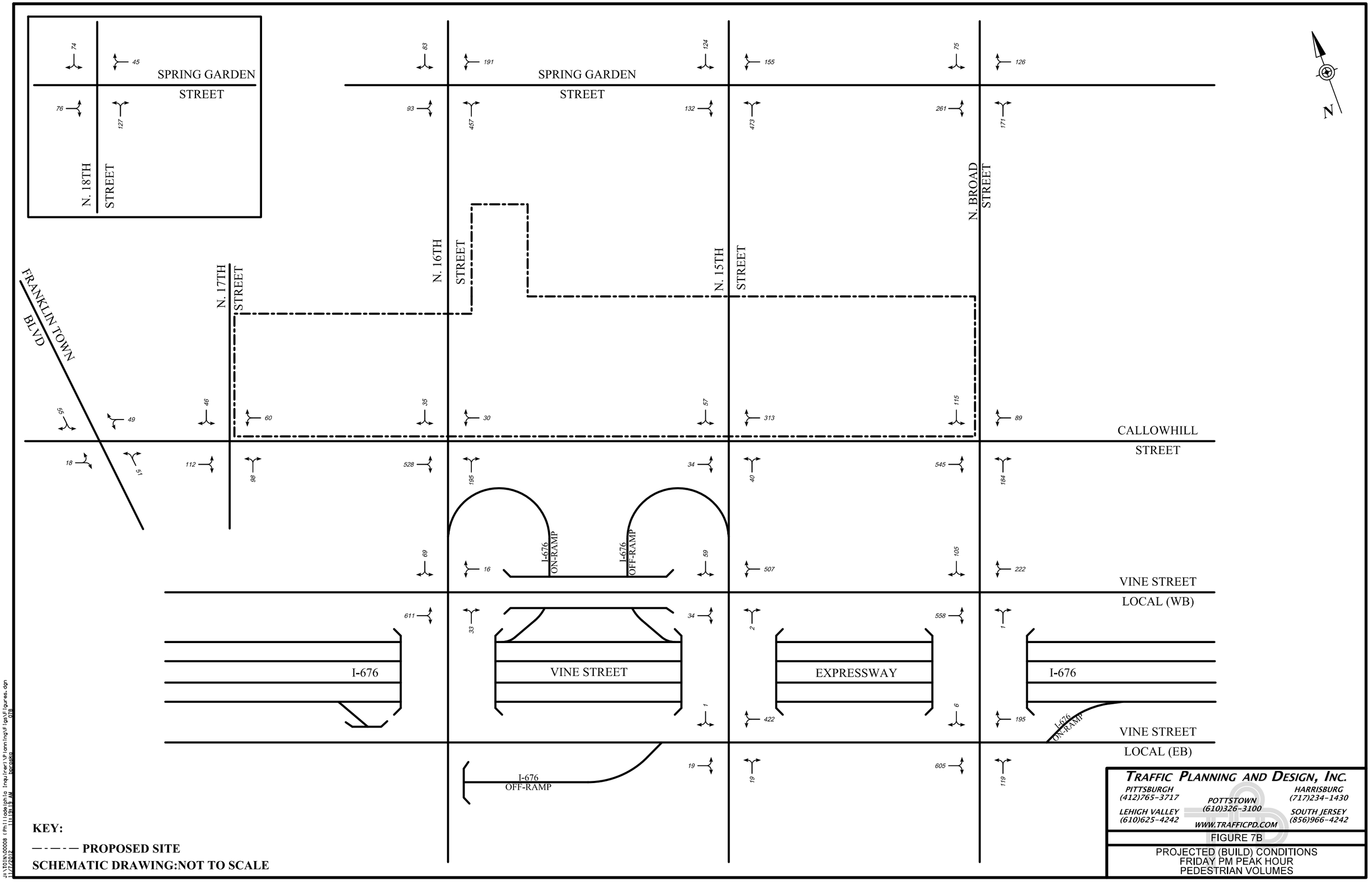
FIGURE 7A

PROJECTED (BUILD) CONDITIONS
FRIDAY PM PEAK HOUR
VEHICULAR VOLUMES

J:\TOIN\00008 (Philadelphia Inquirer)\Planning\Figs\Figures.dgn
11/27/2012 11:19:18 AM
bgcasko
07A


SPRING GARDEN STREET
N. 18TH STREET
N. 17TH STREET
N. 16TH STREET
N. 15TH STREET
N. BROAD STREET
FRANKLIN TOWN BLVD
CALLOWHILL STREET
VINE STREET
LOCAL (WB)
VINE STREET
LOCAL (EB)
I-676
VINE STREET
EXPRESSWAY
I-676
I-676 ON-RAMP
I-676 OFF-RAMP
I-676 ON-RAMP
I-676 OFF-RAMP
N
74
45
76
127
83
191
124
155
75
126
93
457
132
473
261
171
55
49
46
60
35
30
57
313
115
89
18
51
112
98
528
195
34
40
545
184
69
16
59
507
105
222
611
33
34
2
558
1
422
1
6
195
19
19
605
119
KEY:
PROPOSED SITE
SCHEMATIC DRAWING:NOT TO SCALE
TRAFFIC PLANNING AND DESIGN, INC.
PITTSBURGH (412)765-3717
POTTSTOWN (610)326-3100
HARRISBURG (717)234-1430
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WWW.TRAFFICPD.COM
FIGURE 7B
PROJECTED (BUILD) CONDITIONS
FRIDAY PM PEAK HOUR
PEDESTRIAN VOLUMES

APPENDIX A

DATA COLLECTION INFORMATION

Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

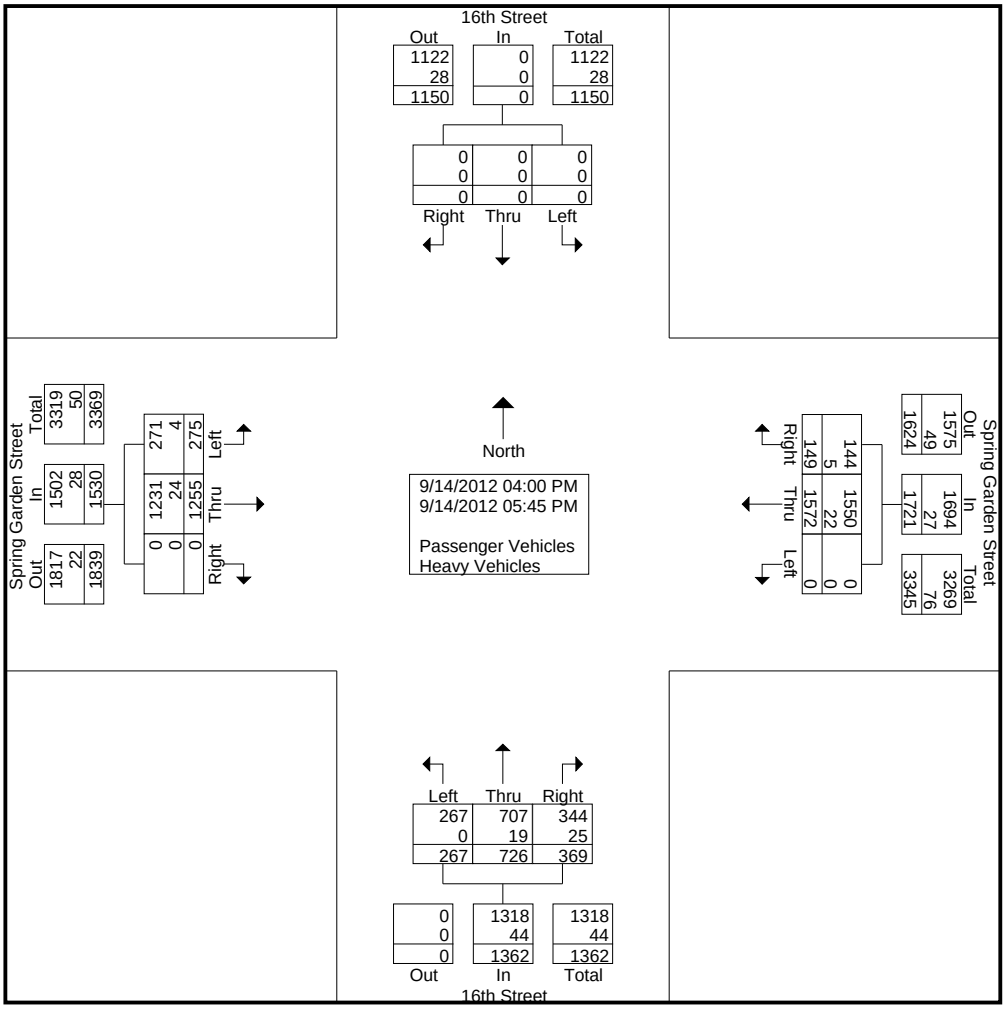
Spring Garden Street and 16th Street

Counter: PTO 18
Counted by: JH
Weather: Clear
Saved as: 2012-09-14 PMSG16

File Name : 2012-09-14 PMSG16
Site Code : 00000000
Start Date : 9/14/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	16th Street Northbound					16th Street Southbound					Spring Garden Street Eastbound					Spring Garden Street Westbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	42	81	35	0	158	0	0	0	0	0	35	165	0	0	200	0	183	24	1	207	1	565	566
04:15 PM	25	92	41	0	158	0	0	0	0	0	32	159	0	0	191	0	206	14	0	220	0	569	569
04:30 PM	32	90	43	0	165	0	0	0	0	0	36	121	0	0	157	0	196	9	0	205	0	527	527
04:45 PM	22	102	55	0	179	0	0	0	0	0	30	147	0	0	177	0	199	14	0	213	0	569	569
Total	121	365	174	0	660	0	0	0	0	0	133	592	0	0	725	0	784	61	1	845	1	2230	2231
05:00 PM	33	92	61	0	186	0	0	0	0	0	40	162	0	0	202	0	216	26	0	242	0	630	630
05:15 PM	35	101	48	0	184	0	0	0	0	0	38	164	0	0	202	0	205	28	0	233	0	619	619
05:30 PM	36	89	39	0	164	0	0	0	0	0	32	187	0	0	219	0	199	24	0	223	0	606	606
05:45 PM	42	79	47	0	168	0	0	0	0	0	32	150	0	0	182	0	168	10	0	178	0	528	528
Total	146	361	195	0	702	0	0	0	0	0	142	663	0	0	805	0	788	88	0	876	0	2383	2383
Grand Total	267	726	369	0	1362	0	0	0	0	0	275	1255	0	0	1530	0	1572	149	1	1721	1	4613	4614
Apprch %	19.6	53.3	27.1			0	0	0			18	82	0			0	91.3	8.7					
Total %	5.8	15.7	8		29.5	0	0	0		0	6	27.2	0		33.2	0	34.1	3.2		37.3	0	100	
Passenger Vehicles	267	707	344		1318	0	0	0		0	271	1231	0		1502	0	1550	144		1695	0	0	4515
% Passenger Vehicles	100	97.4	93.2	0	96.8	0	0	0	0	0	98.5	98.1	0	0	98.2	0	98.6	96.6	100	98.4	0	0	97.9
Heavy Vehicles	0	19	25		44	0	0	0		0	4	24	0		28	0	22	5		27	0	0	99
% Heavy Vehicles	0	2.6	6.8	0	3.2	0	0	0	0	0	1.5	1.9	0	0	1.8	0	1.4	3.4	0	1.6	0	0	2.1



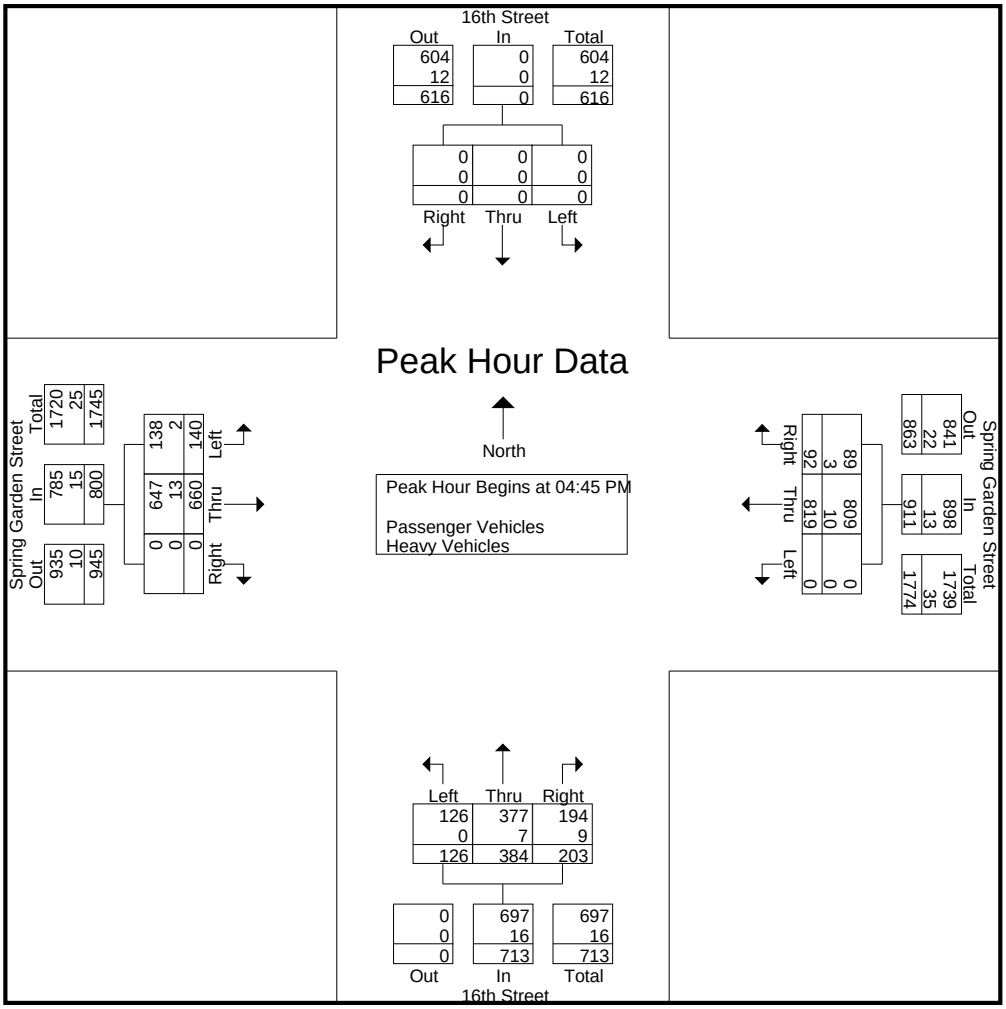
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

Spring Garden Street and 16th Street

Counter: PTO 18
Counted by: JH
Weather: Clear
Saved as: 2012-09-14 PMSG16

File Name : 2012-09-14 PMSG16
Site Code : 00000000
Start Date : 9/14/2012
Page No : 2

	16th Street Northbound				16th Street Southbound				Spring Garden Street Eastbound				Spring Garden Street Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	22	**102**	55	179	0	0	0	0	30	147	0	177	0	199	14	213	569
05:00 PM	33	92	**61**	**186**	0	0	0	0	**40**	162	0	202	0	**216**	26	**242**	**630**
05:15 PM	35	101	48	184	0	0	0	0	38	164	0	202	0	205	**28**	233	619
05:30 PM	**36**	89	39	164	0	0	0	0	32	**187**	0	**219**	0	199	24	223	606
Total Volume	126	384	203	713	0	0	0	0	140	660	0	800	0	819	92	911	2424
% App. Total	17.7	53.9	28.5		0	0	0		17.5	82.5	0		0	89.9	10.1		
PHF	.875	.941	.832	.958	.000	.000	.000	.000	.875	.882	.000	.913	.000	.948	.821	.941	.962
Passenger Vehicles	126	377	194	697	0	0	0	0	138	647	0	785	0	809	89	898	2380
% Passenger Vehicles	100	98.2	95.6	97.8	0	0	0	0	98.6	98.0	0	98.1	0	98.8	96.7	98.6	98.2
Heavy Vehicles	0	7	9	16	0	0	0	0	2	13	0	15	0	10	3	13	44
% Heavy Vehicles	0	1.8	4.4	2.2	0	0	0	0	1.4	2.0	0	1.9	0	1.2	3.3	1.4	1.8



Traffic Planning & Design, Inc.

2500 East High Street
Pottstown, PA 19464

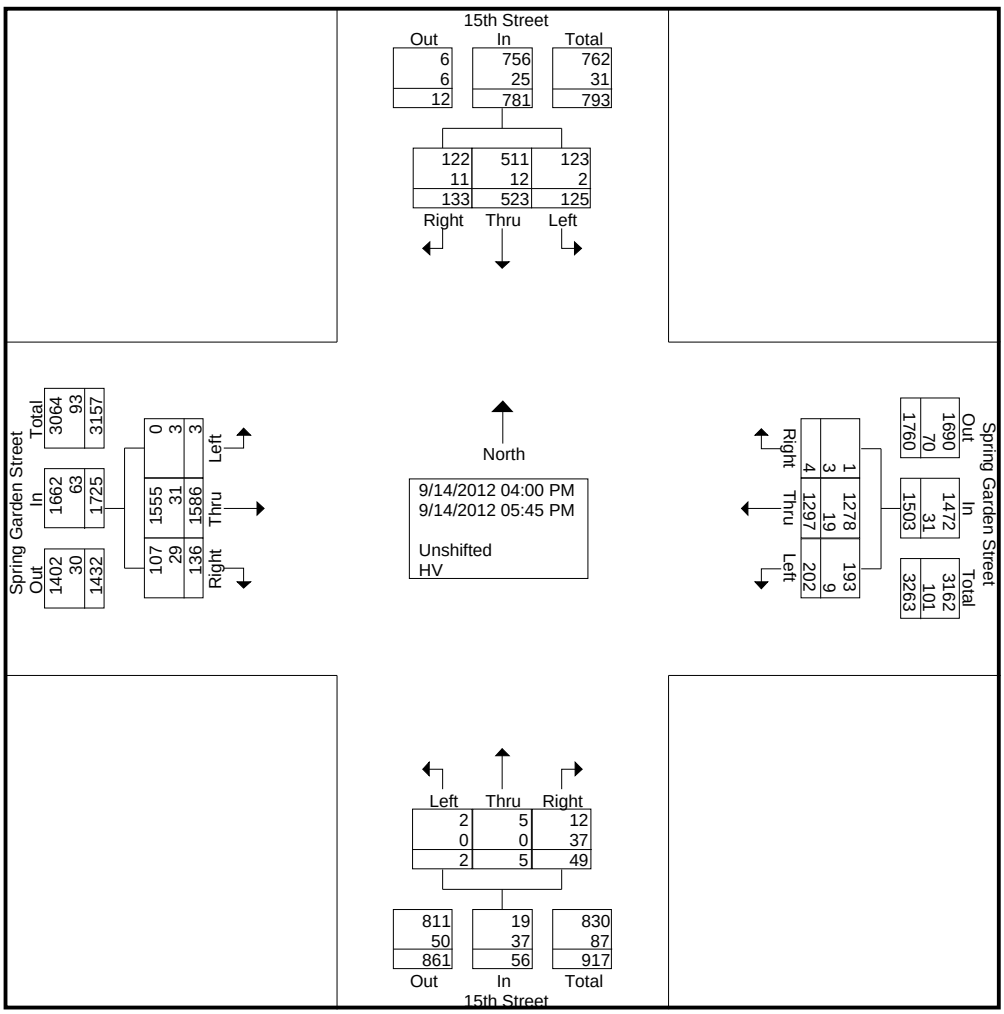
15th Street & Spring Garden Street

Counter: D4-5387
Counted by: J. Muthersbaugh
Weather: Sunny
Saved as: 2012-09-14 PM SG15

File Name : 2012-09-14 PM SG15
Site Code : 00000000
Start Date : 9/14/2012
Page No : 1

Groups Printed- Unshifted - HV

	Spring Garden Street Eastbound					Spring Garden Street Westbound					15th Street Northbound					15th Street Southbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	187	21	0	209	22	160	1	0	183	0	0	25	1	25	15	71	15	4	101	5	518	523
04:15 PM	0	188	18	0	206	33	161	0	0	194	0	3	3	0	6	20	79	16	0	115	0	521	521
04:30 PM	0	204	7	0	211	37	185	1	0	223	0	1	0	0	1	23	71	15	0	109	0	544	544
04:45 PM	0	187	18	0	205	29	150	1	0	180	0	1	1	0	2	18	80	16	5	114	5	501	506
Total	1	766	64	0	831	121	656	3	0	780	0	5	29	1	34	76	301	62	9	439	10	2084	2094
05:00 PM	0	201	20	0	221	22	196	0	0	218	0	0	14	0	14	16	76	15	1	107	1	560	561
05:15 PM	2	207	17	0	226	22	148	1	0	171	2	0	6	0	8	13	42	25	3	80	3	485	488
05:30 PM	0	210	16	0	226	19	167	0	0	186	0	0	0	0	0	11	64	21	1	96	1	508	509
05:45 PM	0	202	19	0	221	18	130	0	0	148	0	0	0	0	0	9	40	10	0	59	0	428	428
Total	2	820	72	0	894	81	641	1	0	723	2	0	20	0	22	49	222	71	5	342	5	1981	1986
Grand Total	3	1586	136	0	1725	202	1297	4	0	1503	2	5	49	1	56	125	523	133	14	781	15	4065	4080
Apprch %	0.2	91.9	7.9			13.4	86.3	0.3			3.6	8.9	87.5			16	67	17					
Total %	0.1	39	3.3		42.4	5	31.9	0.1		37	0	0.1	1.2		1.4	3.1	12.9	3.3		19.2	0.4	99.6	
Unshifted	0	1555	107		1662	193	1278	1		1472	2	5	12		19	123	511	122		765	0	0	3918
% Unshifted	0	98	78.7	0	96.3	95.5	98.5	25	0	97.9	100	100	24.5	0	33.3	98.4	97.7	91.7	64.3	96.2	0	0	96
HV	3	31	29		63	9	19	3		31	0	0	37		38	2	12	11		30	0	0	162
% HV	100	2	21.3	0	3.7	4.5	1.5	75	0	2.1	0	0	75.5	100	66.7	1.6	2.3	8.3	35.7	3.8	0	0	4



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2500 East High Street
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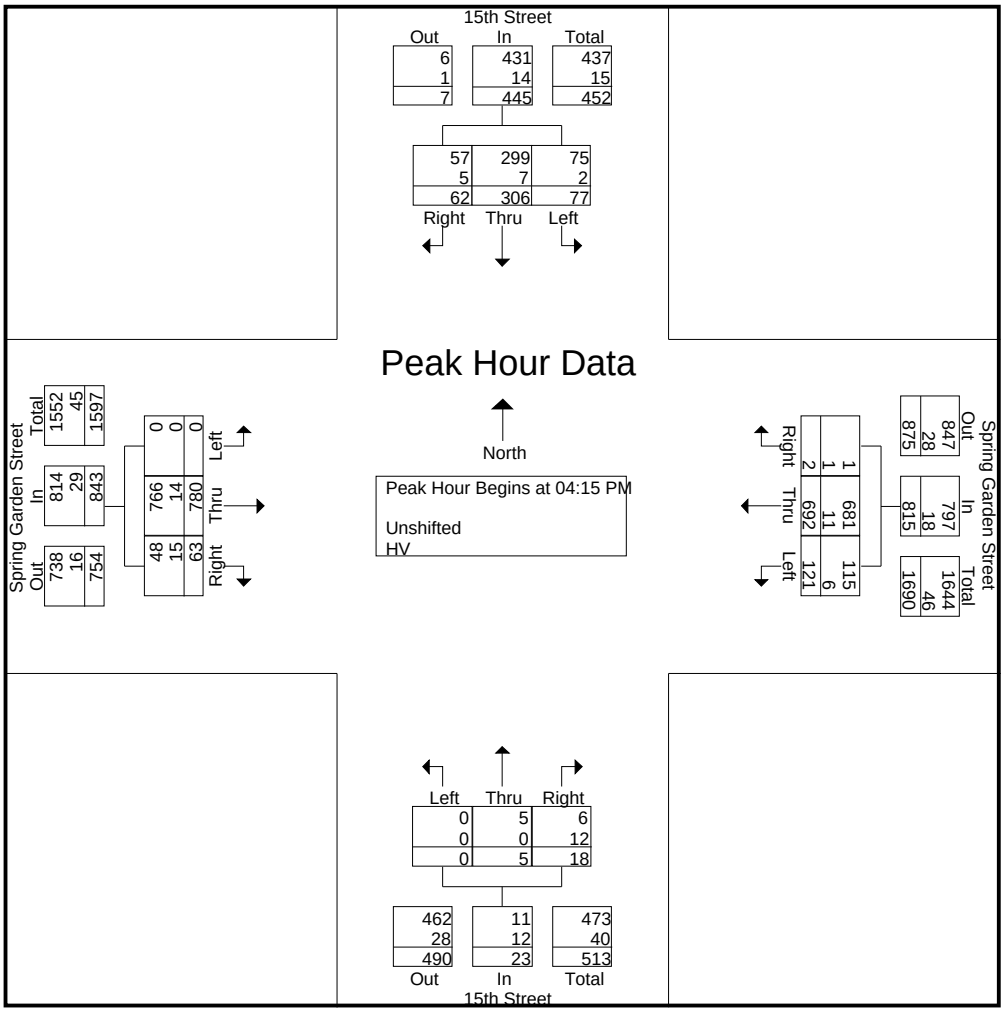
15th Street & Spring Garden Street

Counter: D4-5387
Counted by: J. Muthersbaugh
Weather: Sunny
Saved as: 2012-09-14 PM SG15

File Name : 2012-09-14 PM SG15
Site Code : 00000000
Start Date : 9/14/2012
Page No : 2

	Spring Garden Street Eastbound				Spring Garden Street Westbound				15th Street Northbound				15th Street Southbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	188	18	206	33	161	0	194	0	**3**	3	6	20	79	**16**	**115**	521
04:30 PM	0	**204**	7	211	**37**	185	**1**	**223**	0	1	0	1	**23**	71	15	109	544
04:45 PM	0	187	18	205	29	150	1	180	0	1	1	2	18	**80**	16	114	501
05:00 PM	0	201	**20**	**221**	22	**196**	0	218	0	0	**14**	**14**	16	76	15	107	**560**
Total Volume	0	780	63	843	121	692	2	815	0	5	18	23	77	306	62	445	2126
% App. Total	0	92.5	7.5		14.8	84.9	0.2		0	21.7	78.3		17.3	68.8	13.9		
PHF	.000	.956	.788	.954	.818	.883	.500	.914	.000	.417	.321	.411	.837	.956	.969	.967	.949
Unshifted	0	766	48	814	115	681	1	797	0	5	6	11	75	299	57	431	2053
% Unshifted	0	98.2	76.2	96.6	95.0	98.4	50.0	97.8	0	100	33.3	47.8	97.4	97.7	91.9	96.9	96.6
HV	0	14	15	29	6	11	1	18	0	0	12	12	2	7	5	14	73
% HV	0	1.8	23.8	3.4	5.0	1.6	50.0	2.2	0	0	66.7	52.2	2.6	2.3	8.1	3.1	3.4



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Camden, New Jersey 08103

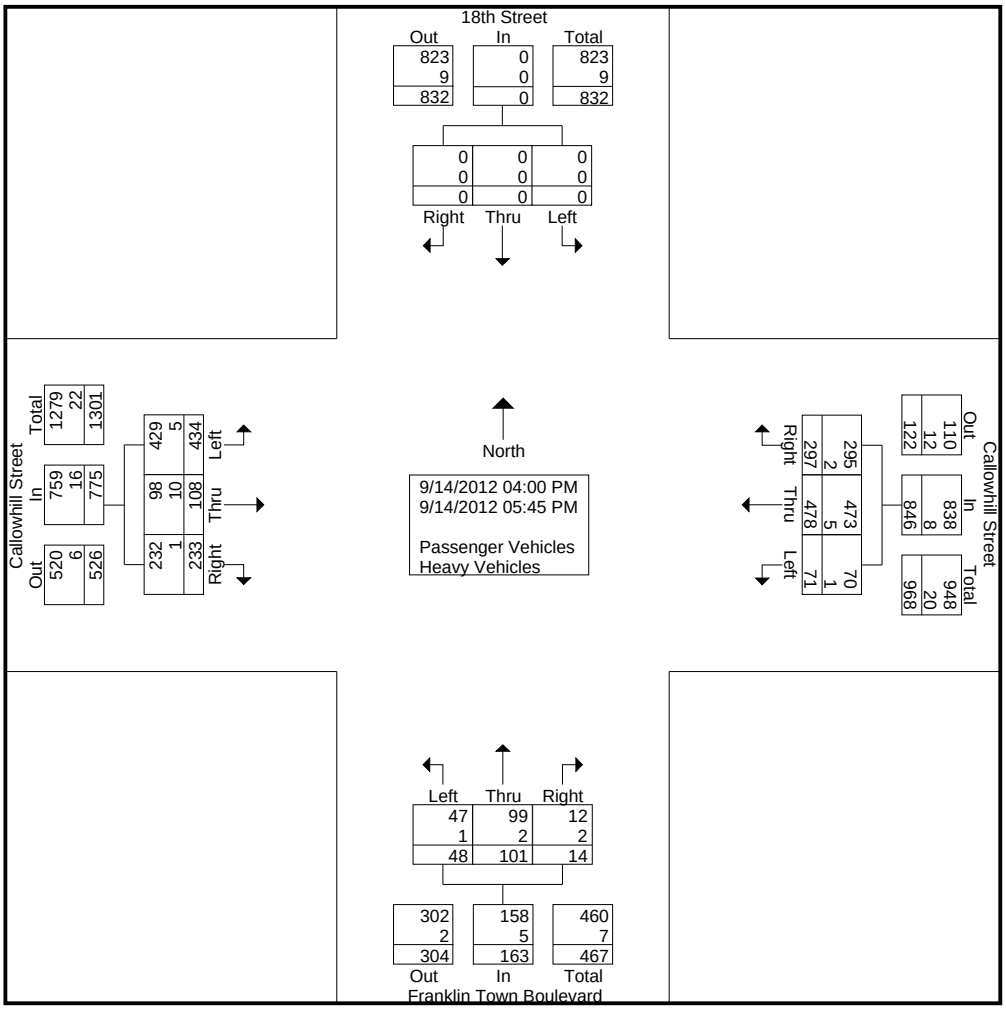
Callowhill Street and Franklin Town Boulevard

Counter: SJO 19
Counted by: JJ
Weather: Clear
Saved as: 2012-09-14 PMCSFTB

File Name : 2012-09-14 PMCSFTB
Site Code : 00000000
Start Date : 9/14/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Franklin Town Boulevard Northbound				18th Street Southbound				Callowhill Street Eastbound				Callowhill Street Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	7	4	2	13	0	0	0	0	55	14	42	111	15	61	54	130	254
04:15 PM	10	12	1	23	0	0	0	0	44	7	44	95	7	73	38	118	236
04:30 PM	5	16	3	24	0	0	0	0	47	18	20	85	9	79	59	147	256
04:45 PM	4	10	2	16	0	0	0	0	52	16	28	96	6	65	23	94	206
Total	26	42	8	76	0	0	0	0	198	55	134	387	37	278	174	489	952
05:00 PM	5	21	0	26	0	0	0	0	46	18	32	96	10	63	40	113	235
05:15 PM	4	17	3	24	0	0	0	0	66	10	18	94	11	57	30	98	216
05:30 PM	6	13	1	20	0	0	0	0	62	15	23	100	4	47	32	83	203
05:45 PM	7	8	2	17	0	0	0	0	62	10	26	98	9	33	21	63	178
Total	22	59	6	87	0	0	0	0	236	53	99	388	34	200	123	357	832
Grand Total	48	101	14	163	0	0	0	0	434	108	233	775	71	478	297	846	1784
Apprch %	29.4	62	8.6		0	0	0		56	13.9	30.1		8.4	56.5	35.1		
Total %	2.7	5.7	0.8	9.1	0	0	0	0	24.3	6.1	13.1	43.4	4	26.8	16.6	47.4	
Passenger Vehicles	47	99	12	158	0	0	0	0	429	98	232	759	70	473	295	838	1755
% Passenger Vehicles	97.9	98	85.7	96.9	0	0	0	0	98.8	90.7	99.6	97.9	98.6	99	99.3	99.1	98.4
Heavy Vehicles	1	2	2	5	0	0	0	0	5	10	1	16	1	5	2	8	29
% Heavy Vehicles	2.1	2	14.3	3.1	0	0	0	0	1.2	9.3	0.4	2.1	1.4	1	0.7	0.9	1.6



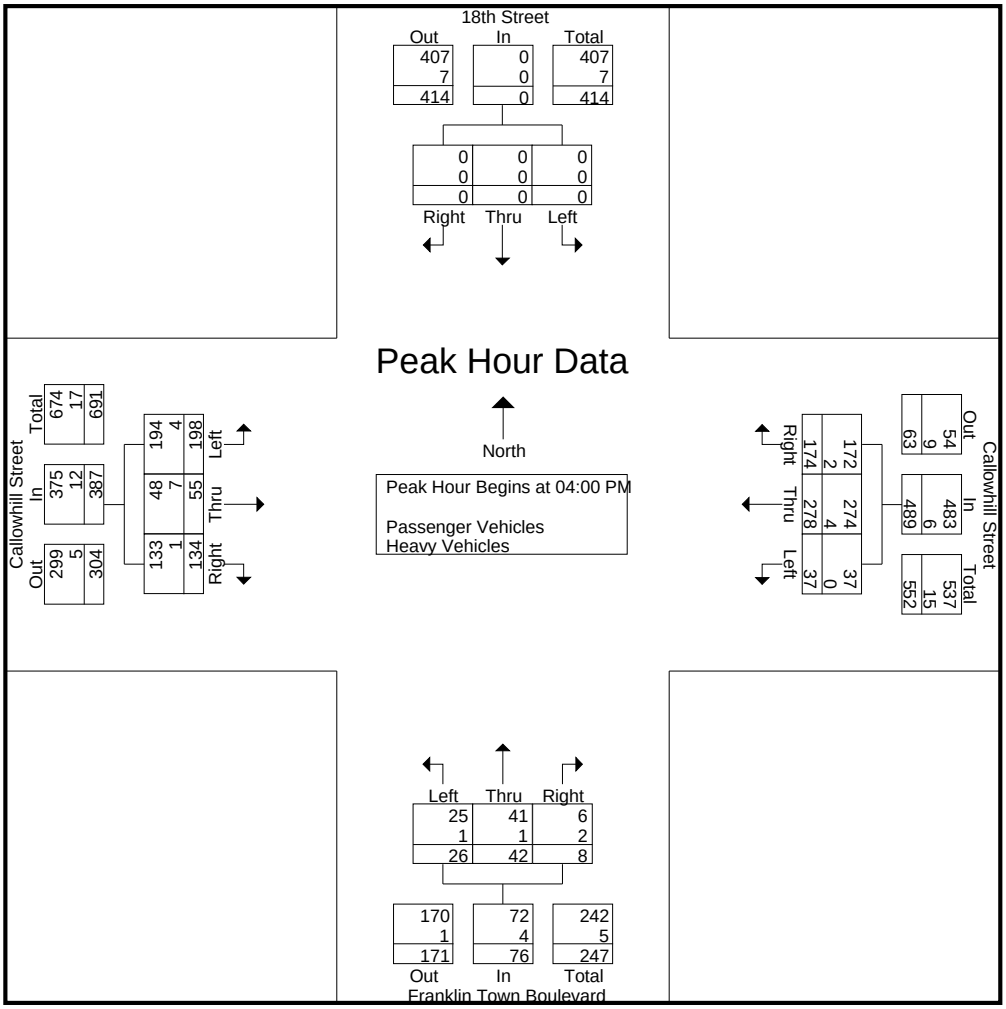
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

Callowhill Street and Franklin Town Boulevard

Counter: SJO 19
Counted by: JJ
Weather: Clear
Saved as: 2012-09-14 PMCSFTB

File Name : 2012-09-14 PMCSFTB
Site Code : 00000000
Start Date : 9/14/2012
Page No : 2

	Franklin Town Boulevard Northbound				18th Street Southbound				Callowhill Street Eastbound				Callowhill Street Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	7	4	2	13	0	0	0	0	**55**	14	42	**111**	**15**	61	54	130	254
04:15 PM	**10**	12	1	23	0	0	0	0	44	7	**44**	95	7	73	38	118	236
04:30 PM	5	**16**	**3**	**24**	0	0	0	0	47	**18**	20	85	9	**79**	**59**	**147**	**256**
04:45 PM	4	10	2	16	0	0	0	0	52	16	28	96	6	65	23	94	206
Total Volume	26	42	8	76	0	0	0	0	198	55	134	387	37	278	174	489	952
% App. Total	34.2	55.3	10.5		0	0	0		51.2	14.2	34.6		7.6	56.9	35.6		
PHF	.650	.656	.667	.792	.000	.000	.000	.000	.900	.764	.761	.872	.617	.880	.737	.832	.930
Passenger Vehicles	25	41	6	72	0	0	0	0	194	48	133	375	37	274	172	483	930
% Passenger Vehicles	96.2	97.6	75.0	94.7	0	0	0	0	98.0	87.3	99.3	96.9	100	98.6	98.9	98.8	97.7
Heavy Vehicles	1	1	2	4	0	0	0	0	4	7	1	12	0	4	2	6	22
% Heavy Vehicles	3.8	2.4	25.0	5.3	0	0	0	0	2.0	12.7	0.7	3.1	0	1.4	1.1	1.2	2.3



Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

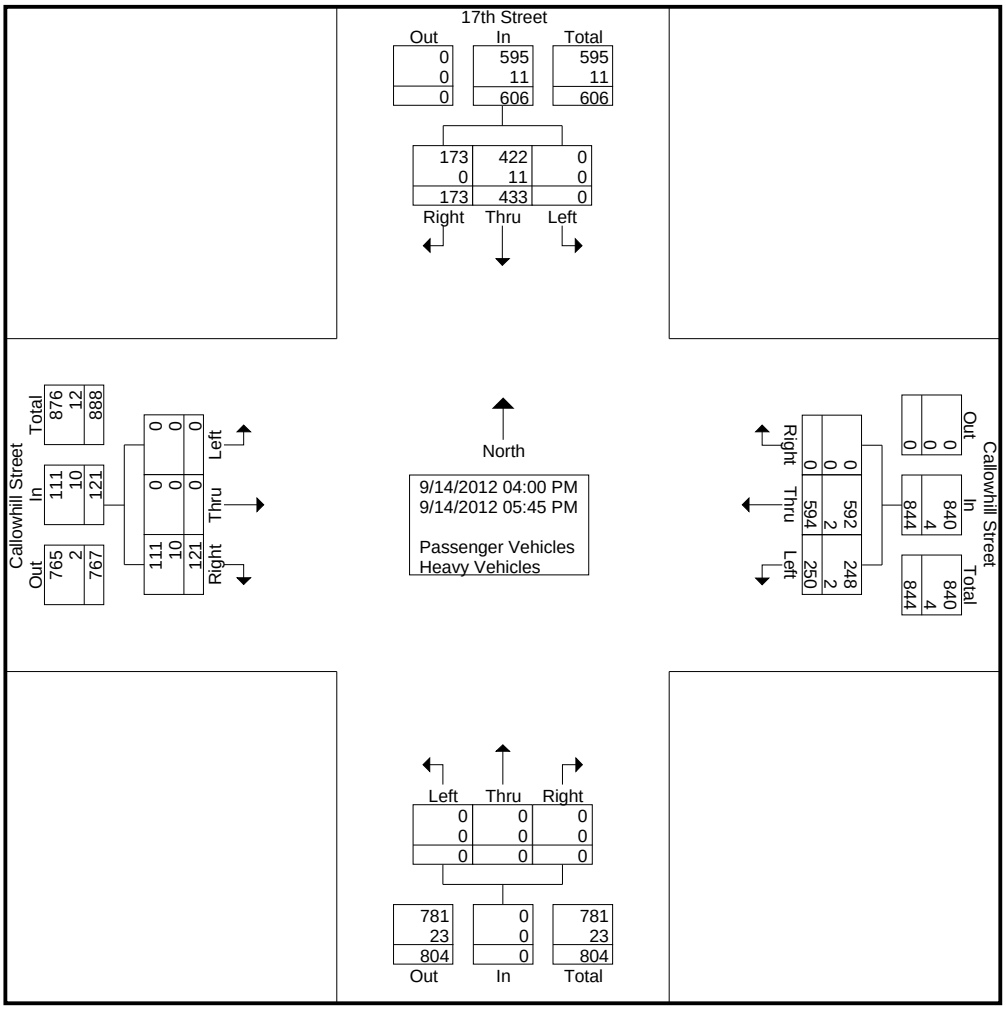
Callowhill Street and 17th Street

Counter: SJO 26
Counted by: BP
Weather: Clear
Saved as: 2012-09-14 PMCS17

File Name : 2012-09-14 PMCS17
Site Code : 00000000
Start Date : 9/14/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	Northbound				17th Street Southbound				Callowhill Street Eastbound				Callowhill Street Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	80	37	117	0	0	15	15	26	66	0	92	224
04:15 PM	0	0	0	0	0	56	23	79	0	0	13	13	20	80	0	100	192
04:30 PM	0	0	0	0	0	66	29	95	0	0	20	20	36	97	0	133	248
04:45 PM	0	0	0	0	0	41	16	57	0	0	17	17	47	81	0	128	202
Total	0	0	0	0	0	243	105	348	0	0	65	65	129	324	0	453	866
05:00 PM	0	0	0	0	0	66	31	97	0	0	15	15	36	71	0	107	219
05:15 PM	0	0	0	0	0	53	18	71	0	0	10	10	37	82	0	119	200
05:30 PM	0	0	0	0	0	33	9	42	0	0	19	19	29	60	0	89	150
05:45 PM	0	0	0	0	0	38	10	48	0	0	12	12	19	57	0	76	136
Total	0	0	0	0	0	190	68	258	0	0	56	56	121	270	0	391	705
Grand Total	0	0	0	0	0	433	173	606	0	0	121	121	250	594	0	844	1571
Apprch %	0	0	0		0	71.5	28.5		0	0	100		29.6	70.4	0		
Total %	0	0	0	0	0	27.6	11	38.6	0	0	7.7	7.7	15.9	37.8	0	53.7	
Passenger Vehicles	0	0	0	0	0	422	173	595	0	0	111	111	248	592	0	840	1546
% Passenger Vehicles	0	0	0	0	0	97.5	100	98.2	0	0	91.7	91.7	99.2	99.7	0	99.5	98.4
Heavy Vehicles	0	0	0	0	0	11	0	11	0	0	10	10	2	2	0	4	25
% Heavy Vehicles	0	0	0	0	0	2.5	0	1.8	0	0	8.3	8.3	0.8	0.3	0	0.5	1.6



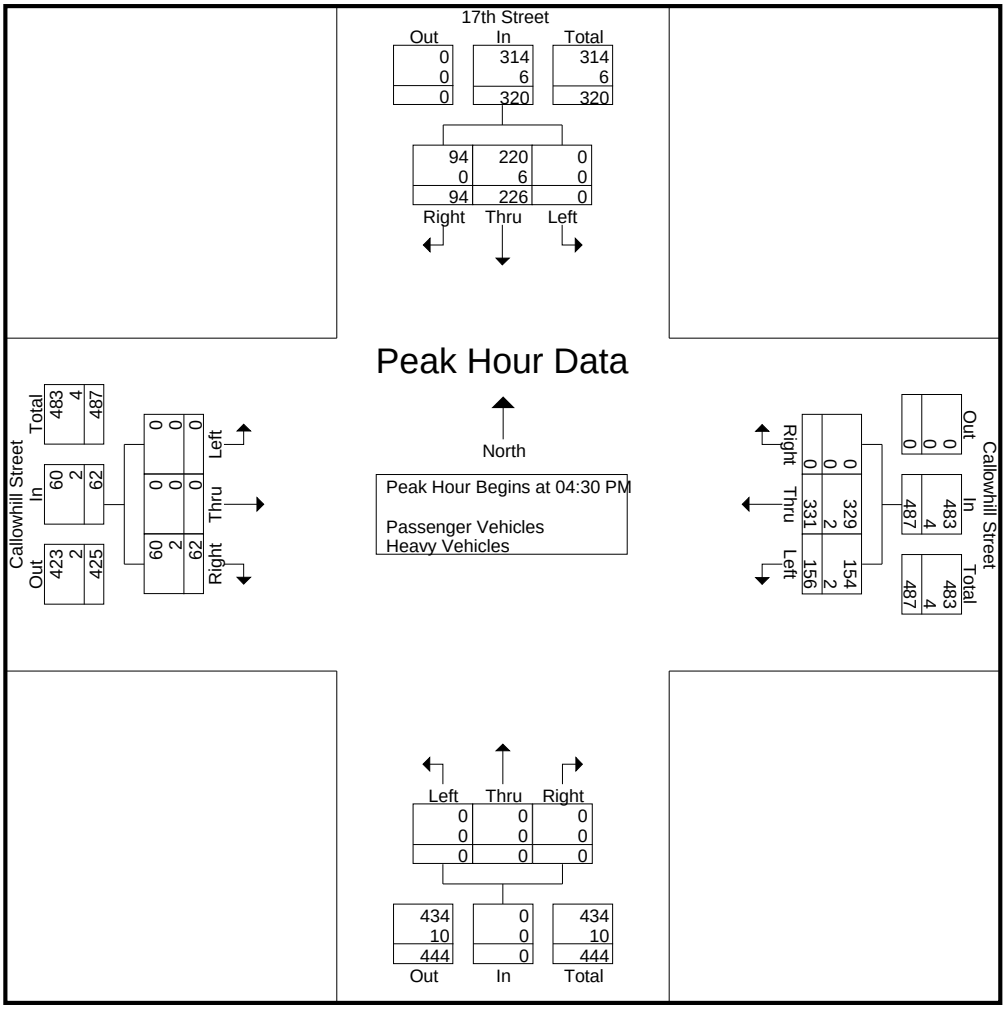
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

Callowhill Street and 17th Street

Counter: SJO 26
Counted by: BP
Weather: Clear
Saved as: 2012-09-14 PMCS17

File Name : 2012-09-14 PMCS17
Site Code : 00000000
Start Date : 9/14/2012
Page No : 2

	Northbound				17th Street Southbound				Callowhill Street Eastbound				Callowhill Street Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	**66**	29	95	0	0	**20**	**20**	36	**97**	0	**133**	**248**
04:45 PM	0	0	0	0	0	41	16	57	0	0	17	17	**47**	81	0	128	202
05:00 PM	0	0	0	0	0	66	**31**	**97**	0	0	15	15	36	71	0	107	219
05:15 PM	0	0	0	0	0	53	18	71	0	0	10	10	37	82	0	119	200
Total Volume	0	0	0	0	0	226	94	320	0	0	62	62	156	331	0	487	869
% App. Total	0	0	0		0	70.6	29.4		0	0	100		32	68	0		
PHF	.000	.000	.000	.000	.000	.856	.758	.825	.000	.000	.775	.775	.830	.853	.000	.915	.876
Passenger Vehicles	0	0	0	0	0	220	94	314	0	0	60	60	154	329	0	483	857
% Passenger Vehicles	0	0	0	0	0	97.3	100	98.1	0	0	96.8	96.8	98.7	99.4	0	99.2	98.6
Heavy Vehicles	0	0	0	0	0	6	0	6	0	0	2	2	2	2	0	4	12
% Heavy Vehicles	0	0	0	0	0	2.7	0	1.9	0	0	3.2	3.2	1.3	0.6	0	0.8	1.4



Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

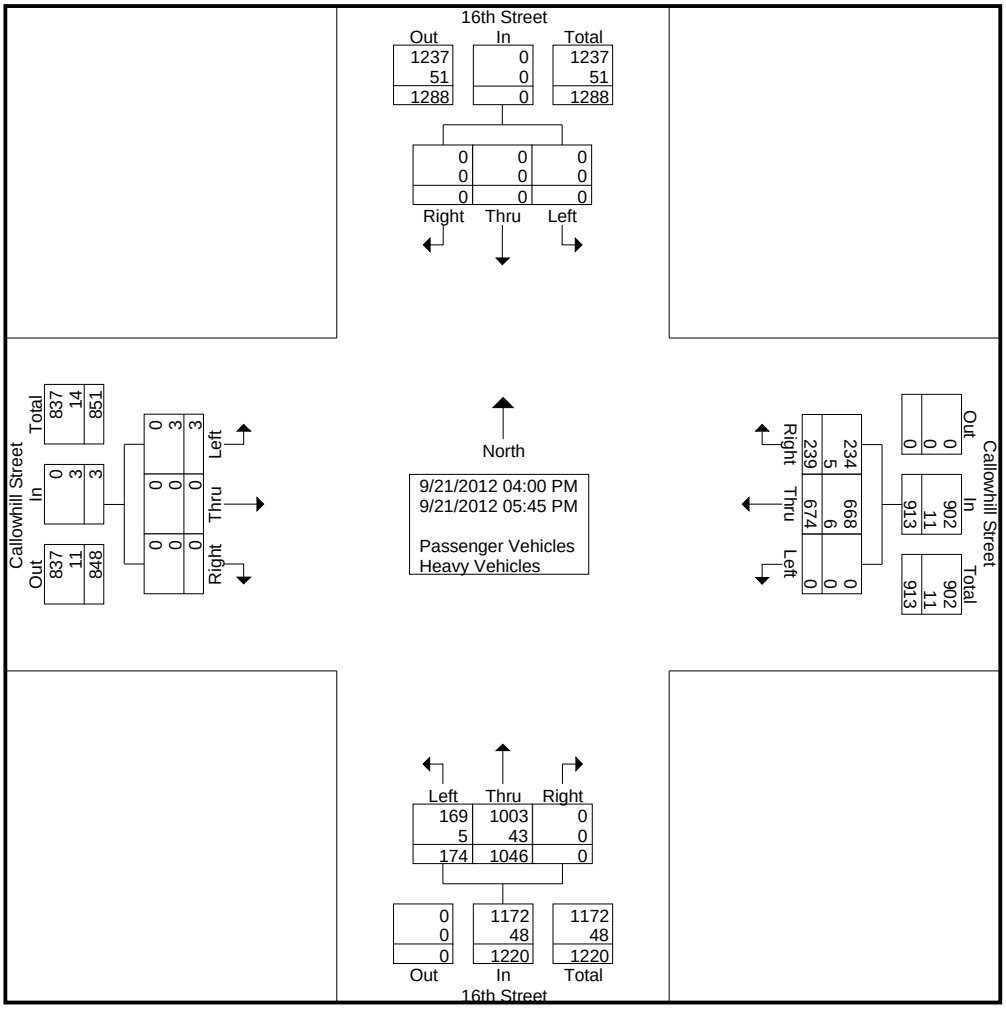
Callowhill Street and 16th Street

Counter: SJO 26
Counted by: JH
Weather: Clear
Saved as: 2012-09-24 PMCS16

File Name : 2012-09-21 PMCS16
Site Code : 00000000
Start Date : 9/21/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	16th Street Northbound					16th Street Southbound					Callowhill Street Eastbound					Callowhill Street Westbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	22	114	0	0	136	0	0	0	0	0	0	0	0	0	0	0	72	25	2	97	2	233	235
04:15 PM	31	128	0	0	159	0	0	0	0	0	0	0	0	0	0	0	86	26	0	112	0	271	271
04:30 PM	23	128	0	0	151	0	0	0	0	0	3	0	0	0	3	0	114	27	3	141	3	295	298
04:45 PM	16	121	0	0	137	0	0	0	0	0	0	0	0	0	0	0	86	27	2	113	2	250	252
Total	92	491	0	0	583	0	0	0	0	0	3	0	0	0	3	0	358	105	7	463	7	1049	1056
05:00 PM	20	132	0	0	152	0	0	0	0	0	0	0	0	0	0	0	83	44	6	127	6	279	285
05:15 PM	23	161	0	0	184	0	0	0	0	0	0	0	0	0	0	0	80	38	2	118	2	302	304
05:30 PM	19	144	0	0	163	0	0	0	0	0	0	0	0	0	0	0	77	20	2	97	2	260	262
05:45 PM	20	118	0	0	138	0	0	0	0	0	0	0	0	0	0	0	76	32	5	108	5	246	251
Total	82	555	0	0	637	0	0	0	0	0	0	0	0	0	0	0	316	134	15	450	15	1087	1102
Grand Total	174	1046	0	0	1220	0	0	0	0	0	3	0	0	0	3	0	674	239	22	913	22	2136	2158
Apprch %	14.3	85.7	0			0	0	0			100	0	0			0	73.8	26.2					
Total %	8.1	49	0		57.1	0	0	0		0	0.1	0	0		0.1	0	31.6	11.2		42.7	1	99	
Passenger Vehicles	169	1003	0		1172	0	0	0		0	0	0	0		0	0	668	234		924	0	0	2096
% Passenger Vehicles	97.1	95.9	0	0	96.1	0	0	0	0	0	0	0	0	0	0	0	99.1	97.9	100	98.8	0	0	97.1
Heavy Vehicles	5	43	0		48	0	0	0		0	3	0	0		3	0	6	5		11	0	0	62
% Heavy Vehicles	2.9	4.1	0	0	3.9	0	0	0	0	0	100	0	0	0	100	0	0.9	2.1	0	1.2	0	0	2.9



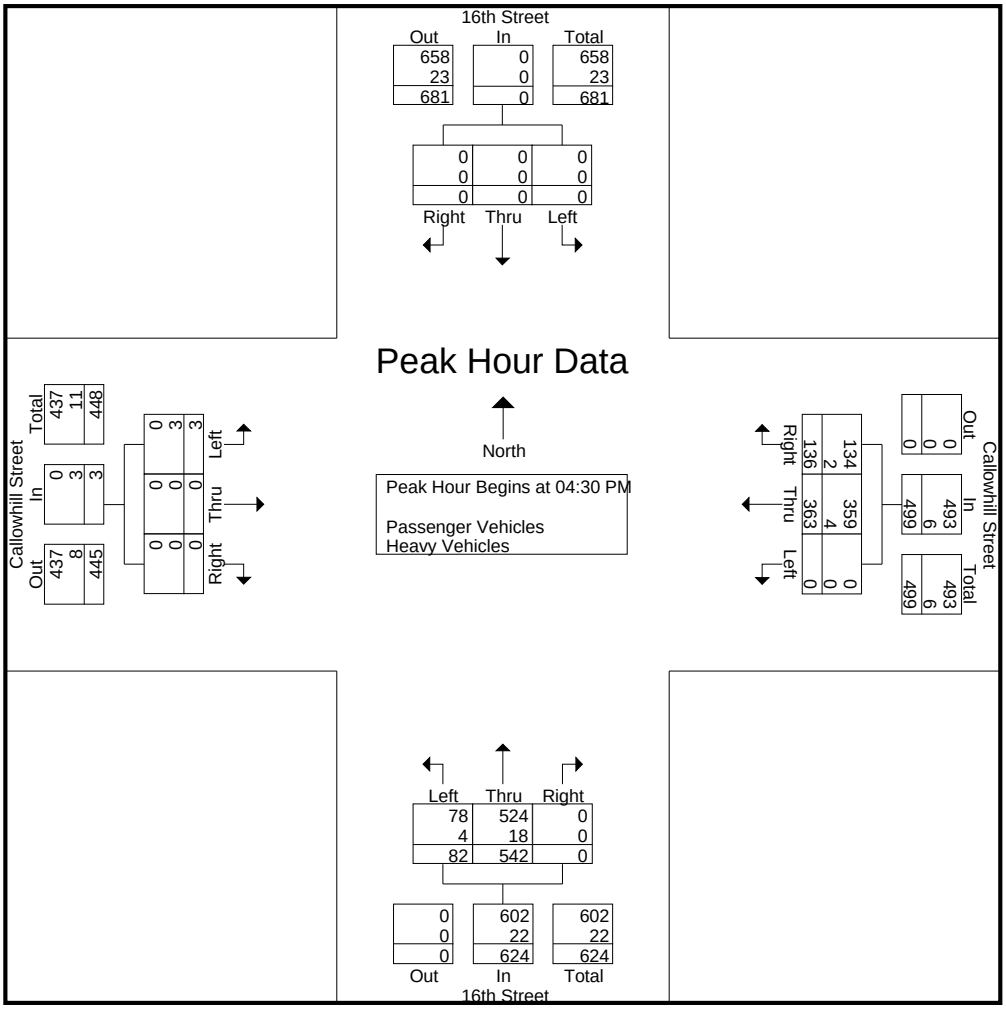
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

Callowhill Street and 16th Street

Counter: SJO 26
Counted by: JH
Weather: Clear
Saved as: 2012-09-24 PMCS16

File Name : 2012-09-21 PMCS16
Site Code : 00000000
Start Date : 9/21/2012
Page No : 2

	16th Street Northbound				16th Street Southbound				Callowhill Street Eastbound				Callowhill Street Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	**23**	128	0	151	0	0	0	0	**3**	0	0	**3**	0	**114**	27	**141**	295
04:45 PM	16	121	0	137	0	0	0	0	0	0	0	0	0	86	27	113	250
05:00 PM	20	132	0	152	0	0	0	0	0	0	0	0	0	83	**44**	127	279
05:15 PM	23	**161**	0	**184**	0	0	0	0	0	0	0	0	0	80	38	118	**302**
Total Volume	82	542	0	624	0	0	0	0	3	0	0	3	0	363	136	499	1126
% App. Total	13.1	86.9	0		0	0	0		100	0	0		0	72.7	27.3		
PHF	.891	.842	.000	.848	.000	.000	.000	.000	.250	.000	.000	.250	.000	.796	.773	.885	.932
Passenger Vehicles	78	524	0	602	0	0	0	0	0	0	0	0	0	359	134	493	1095
% Passenger Vehicles	95.1	96.7	0	96.5	0	0	0	0	0	0	0	0	0	98.9	98.5	98.8	97.2
Heavy Vehicles	4	18	0	22	0	0	0	0	3	0	0	3	0	4	2	6	31
% Heavy Vehicles	4.9	3.3	0	3.5	0	0	0	0	100	0	0	100	0	1.1	1.5	1.2	2.8



Traffic Planning & Design, Inc.

2500 East High Street
Pottstown, PA 19464

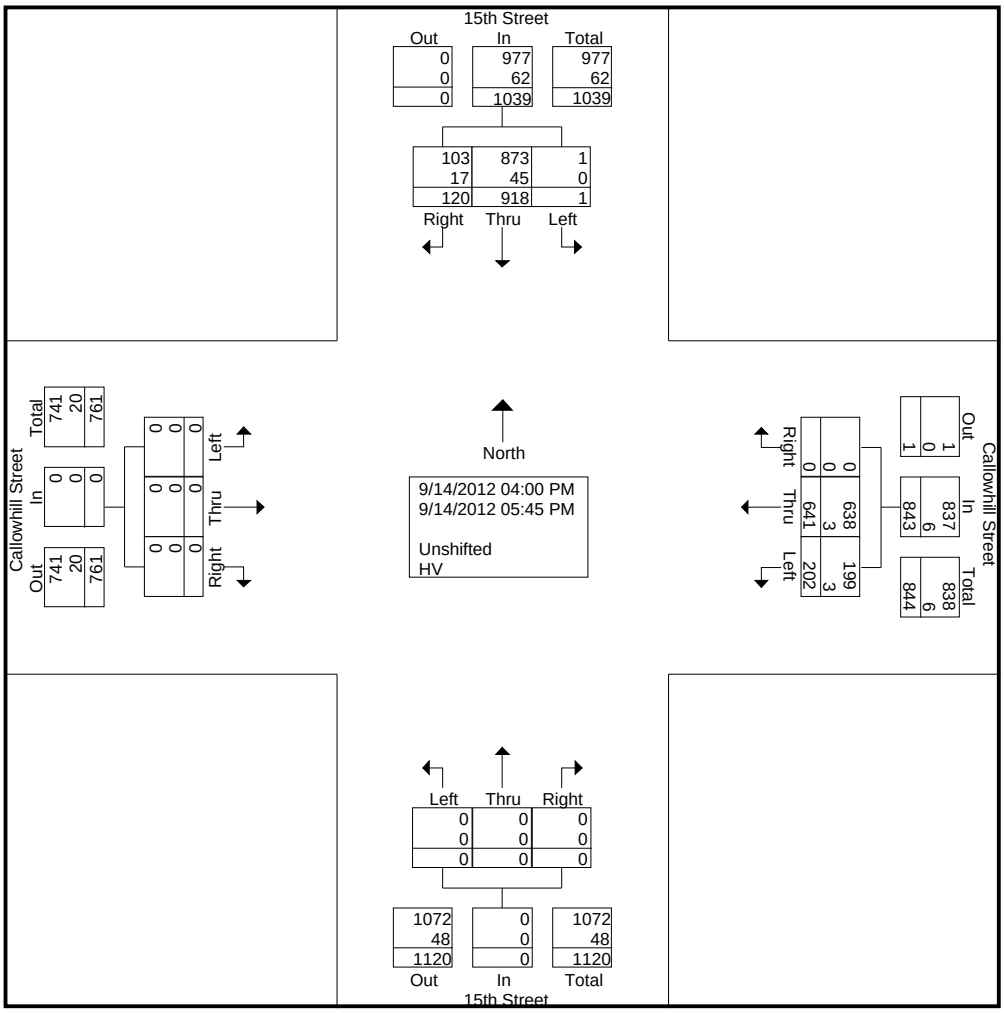
15th Street & Callowhill Street

Counter: 21
Counted by: N. Zipay
Weather: Sunny, Nice
Saved as: 2012-09-14 PM CH15

File Name : 2012-09-14 PM CS15
Site Code : 00000000
Start Date : 9/14/2012
Page No : 1

Groups Printed- Unshifted - HV

	Callowhill Street Eastbound				Callowhill Street Westbound				15th Street Northbound				15th Street Southbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	43	92	0	135	0	0	0	0	0	120	15	135	270
04:15 PM	0	0	0	0	34	89	0	123	0	0	0	0	0	134	13	147	270
04:30 PM	0	0	0	0	32	88	0	120	0	0	0	0	0	130	16	146	266
04:45 PM	0	0	0	0	20	73	0	93	0	0	0	0	0	128	18	146	239
Total	0	0	0	0	129	342	0	471	0	0	0	0	0	512	62	574	1045
05:00 PM	0	0	0	0	28	82	0	110	0	0	0	0	1	106	16	123	233
05:15 PM	0	0	0	0	20	81	0	101	0	0	0	0	0	106	19	125	226
05:30 PM	0	0	0	0	10	74	0	84	0	0	0	0	0	99	10	109	193
05:45 PM	0	0	0	0	15	62	0	77	0	0	0	0	0	95	13	108	185
Total	0	0	0	0	73	299	0	372	0	0	0	0	1	406	58	465	837
Grand Total	0	0	0	0	202	641	0	843	0	0	0	0	1	918	120	1039	1882
Apprch %	0	0	0		24	76	0		0	0	0		0.1	88.4	11.5		
Total %	0	0	0	0	10.7	34.1	0	44.8	0	0	0	0	0.1	48.8	6.4	55.2	
Unshifted	0	0	0	0	199	638	0	837	0	0	0	0	1	873	103	977	1814
% Unshifted	0	0	0	0	98.5	99.5	0	99.3	0	0	0	0	100	95.1	85.8	94	96.4
HV	0	0	0	0	3	3	0	6	0	0	0	0	0	45	17	62	68
% HV	0	0	0	0	1.5	0.5	0	0.7	0	0	0	0	0	4.9	14.2	6	3.6



Traffic Planning & Design, Inc.

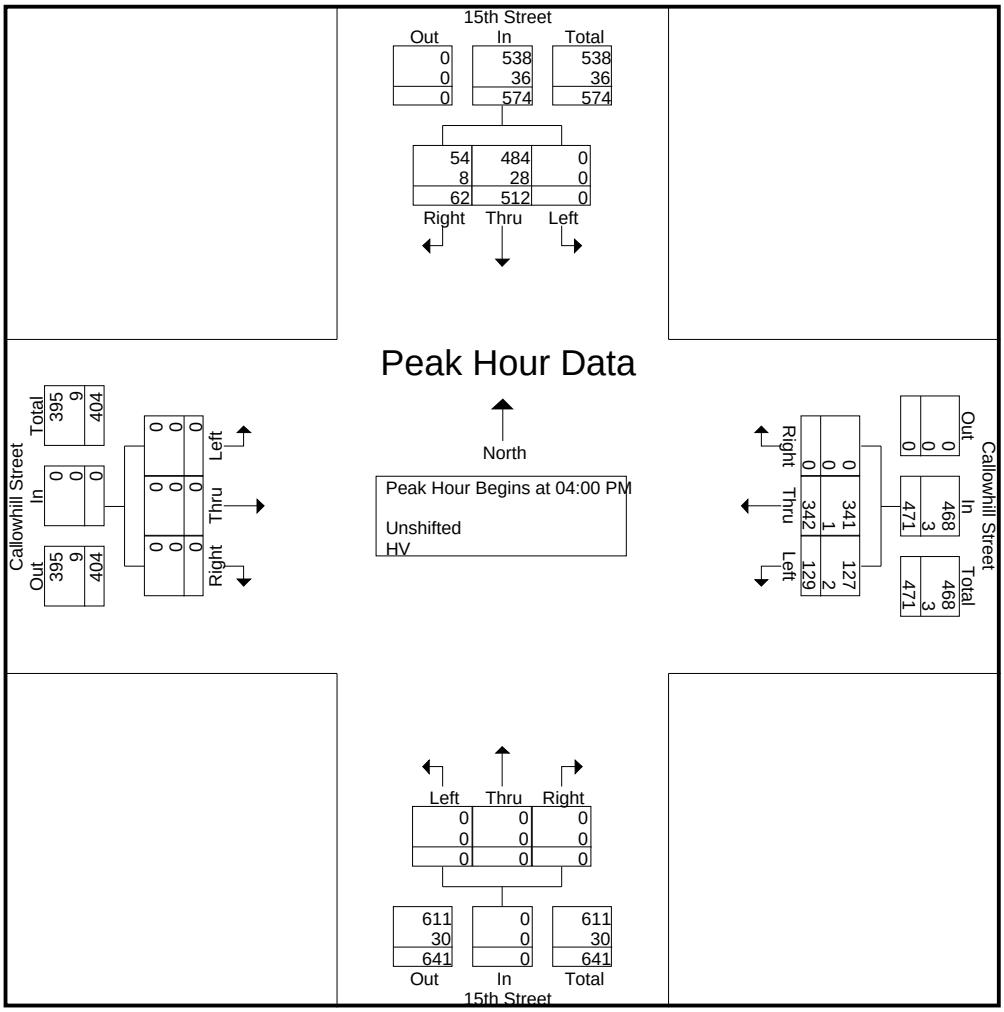
2500 East High Street
Pottstown, PA 19464

15th Street & Callowhill Street

Counter: 21
Counted by: N. Zipay
Weather: Sunny, Nice
Saved as: 2012-09-14 PM CH15

File Name : 2012-09-14 PM CS15
Site Code : 00000000
Start Date : 9/14/2012
Page No : 2

	Callowhill Street Eastbound				Callowhill Street Westbound				15th Street Northbound				15th Street Southbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	**43**	**92**	0	**135**	0	0	0	0	0	120	15	135	**270**
04:15 PM	0	0	0	0	34	89	0	123	0	0	0	0	0	**134**	13	**147**	270
04:30 PM	0	0	0	0	32	88	0	120	0	0	0	0	0	130	16	146	266
04:45 PM	0	0	0	0	20	73	0	93	0	0	0	0	0	128	**18**	146	239
Total Volume	0	0	0	0	129	342	0	471	0	0	0	0	0	512	62	574	1045
% App. Total	0	0	0		27.4	72.6	0		0	0	0		0	89.2	10.8		
PHF	.000	.000	.000	.000	.750	.929	.000	.872	.000	.000	.000	.000	.000	.955	.861	.976	.968
Unshifted	0	0	0	0	127	341	0	468	0	0	0	0	0	484	54	538	1006
% Unshifted	0	0	0	0	98.4	99.7	0	99.4	0	0	0	0	0	94.5	87.1	93.7	96.3
HV	0	0	0	0	2	1	0	3	0	0	0	0	0	28	8	36	39
% HV	0	0	0	0	1.6	0.3	0	0.6	0	0	0	0	0	5.5	12.9	6.3	3.7



Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

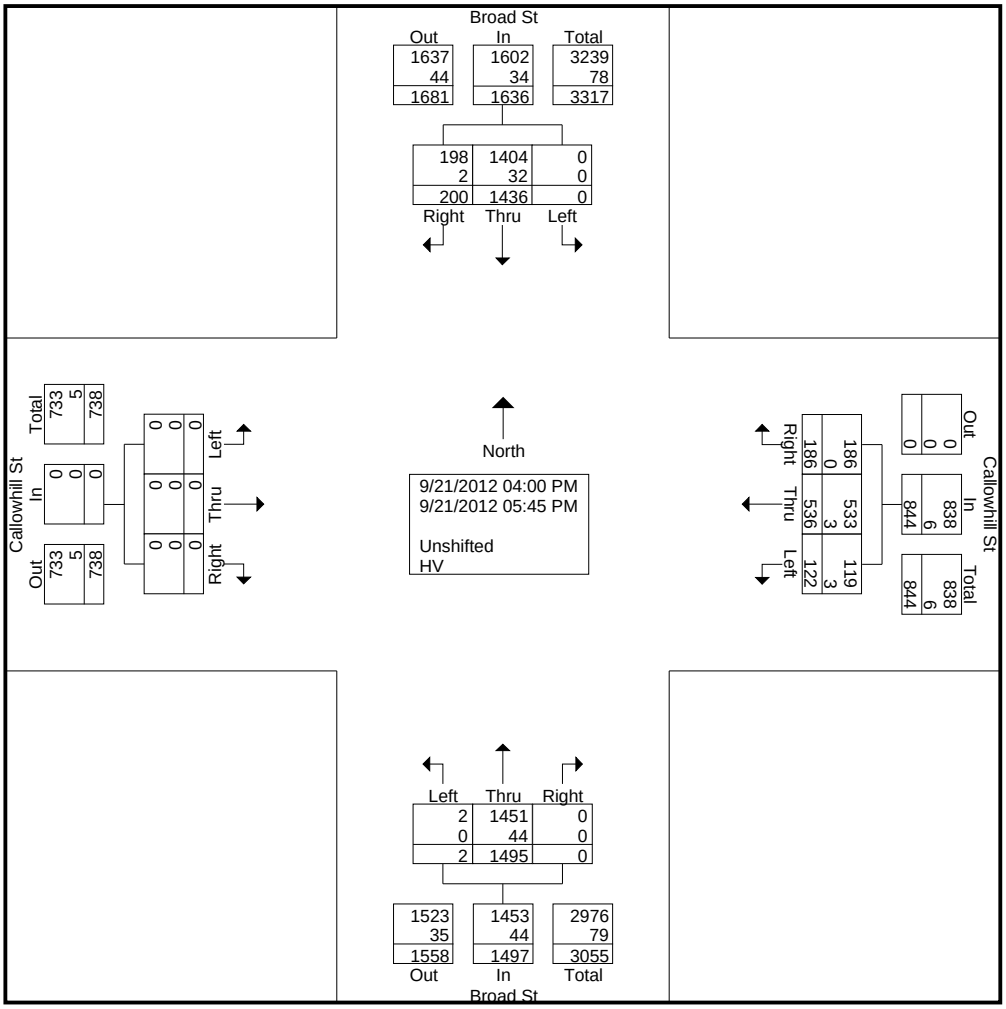
Broad Street and Callowhill Street

Counter: 13
Counted by: D. Little
Weather: Clear
Saved as: 2012-09-21 FRIBC

File Name : 2012-09-21 FRIBC
Site Code : 00000000
Start Date : 9/21/2012
Page No : 1

Groups Printed- Unshifted - HV

	Broad St Northbound					Broad St Southbound					Callowhill St Eastbound					Callowhill St Westbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	186	0	0	187	0	148	44	0	192	0	0	0	0	0	17	58	21	0	96	0	475	475
04:15 PM	0	199	0	0	199	0	172	32	0	204	0	0	0	0	0	13	74	27	2	114	2	517	519
04:30 PM	0	180	0	0	180	0	192	30	0	222	0	0	0	0	0	18	80	28	0	126	0	528	528
04:45 PM	0	179	0	0	179	0	172	25	0	197	0	0	0	0	0	15	69	14	1	98	1	474	475
Total	1	744	0	0	745	0	684	131	0	815	0	0	0	0	0	63	281	90	3	434	3	1994	1997
05:00 PM	0	162	0	0	162	0	194	18	1	212	0	0	0	0	0	14	74	16	0	104	1	478	479
05:15 PM	1	221	0	0	222	0	184	16	0	200	0	0	0	0	0	22	61	23	0	106	0	528	528
05:30 PM	0	206	0	0	206	0	222	19	0	241	0	0	0	0	0	9	69	34	1	112	1	559	560
05:45 PM	0	162	0	0	162	0	152	16	0	168	0	0	0	0	0	14	51	23	0	88	0	418	418
Total	1	751	0	0	752	0	752	69	1	821	0	0	0	0	0	59	255	96	1	410	2	1983	1985
Grand Total	2	1495	0	0	1497	0	1436	200	1	1636	0	0	0	0	0	122	536	186	4	844	5	3977	3982
Apprch %	0.1	99.9	0			0	87.8	12.2			0	0	0			14.5	63.5	22					
Total %	0.1	37.6	0		37.6	0	36.1	5		41.1	0	0	0		0	3.1	13.5	4.7		21.2	0.1	99.9	
Unshifted	2	1451	0		1453	0	1404	198		1603	0	0	0		0	119	533	186		842	0	0	3898
% Unshifted	100	97.1	0	0	97.1	0	97.8	99	100	97.9	0	0	0	0	0	97.5	99.4	100	100	99.3	0	0	97.9
HV	0	44	0		44	0	32	2		34	0	0	0		0	3	3	0		6	0	0	84
% HV	0	2.9	0	0	2.9	0	2.2	1	0	2.1	0	0	0	0	0	2.5	0.6	0	0	0.7	0	0	2.1



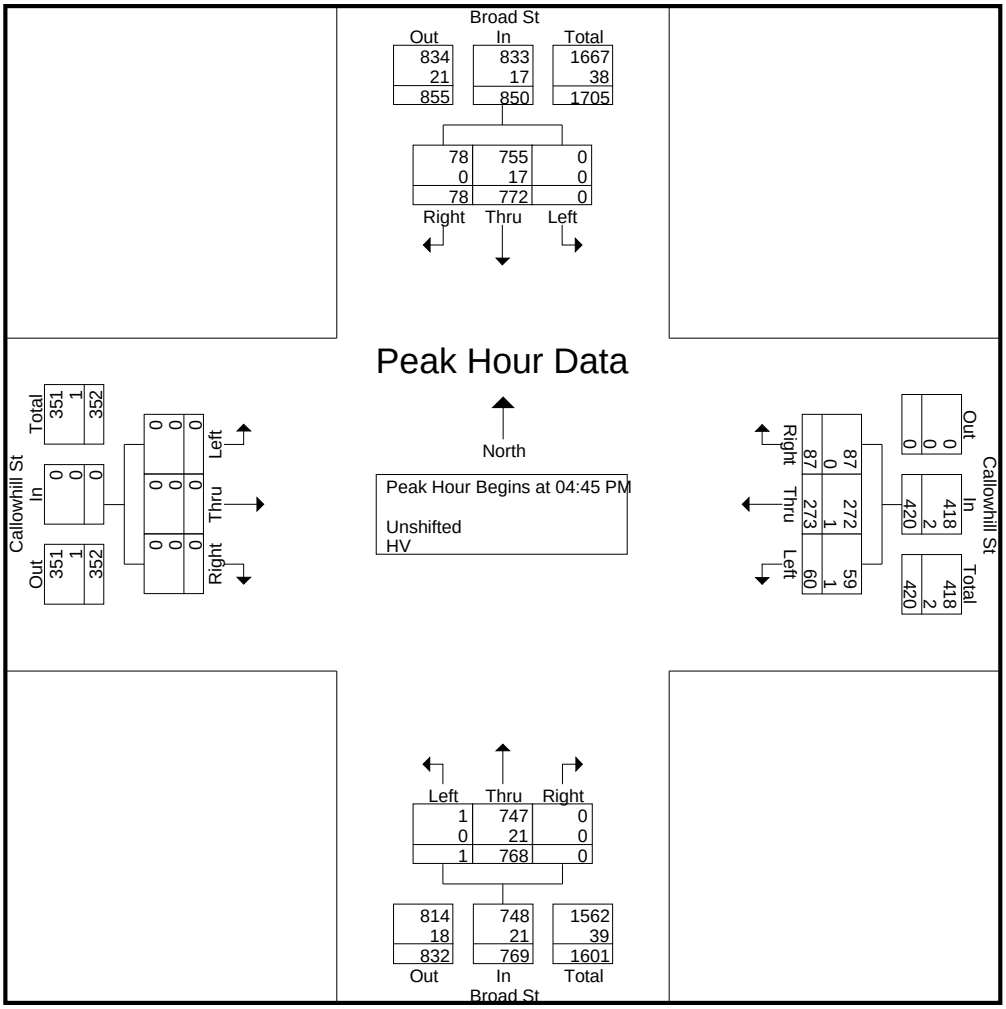
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

Broad Street and Callowhill Street

Counter: 13
Counted by: D. Little
Weather: Clear
Saved as: 2012-09-21 FRIBC

File Name : 2012-09-21 FRIBC
Site Code : 00000000
Start Date : 9/21/2012
Page No : 2

	Broad St Northbound				Broad St Southbound				Callowhill St Eastbound				Callowhill St Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	179	0	179	0	172	**25**	197	0	0	0	0	15	69	14	98	474
05:00 PM	0	162	0	162	0	194	18	212	0	0	0	0	14	**74**	16	104	478
05:15 PM	**1**	**221**	0	**222**	0	184	16	200	0	0	0	0	**22**	61	23	106	528
05:30 PM	0	206	0	206	0	**222**	19	**241**	0	0	0	0	9	69	**34**	**112**	**559**
Total Volume	1	768	0	769	0	772	78	850	0	0	0	0	60	273	87	420	2039
% App. Total	0.1	99.9	0		0	90.8	9.2		0	0	0		14.3	65	20.7		
PHF	.250	.869	.000	.866	.000	.869	.780	.882	.000	.000	.000	.000	.682	.922	.640	.938	.912
Unshifted	1	747	0	748	0	755	78	833	0	0	0	0	59	272	87	418	1999
% Unshifted	100	97.3	0	97.3	0	97.8	100	98.0	0	0	0	0	98.3	99.6	100	99.5	98.0
HV	0	21	0	21	0	17	0	17	0	0	0	0	1	1	0	2	40
% HV	0	2.7	0	2.7	0	2.2	0	2.0	0	0	0	0	1.7	0.4	0	0.5	2.0



Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

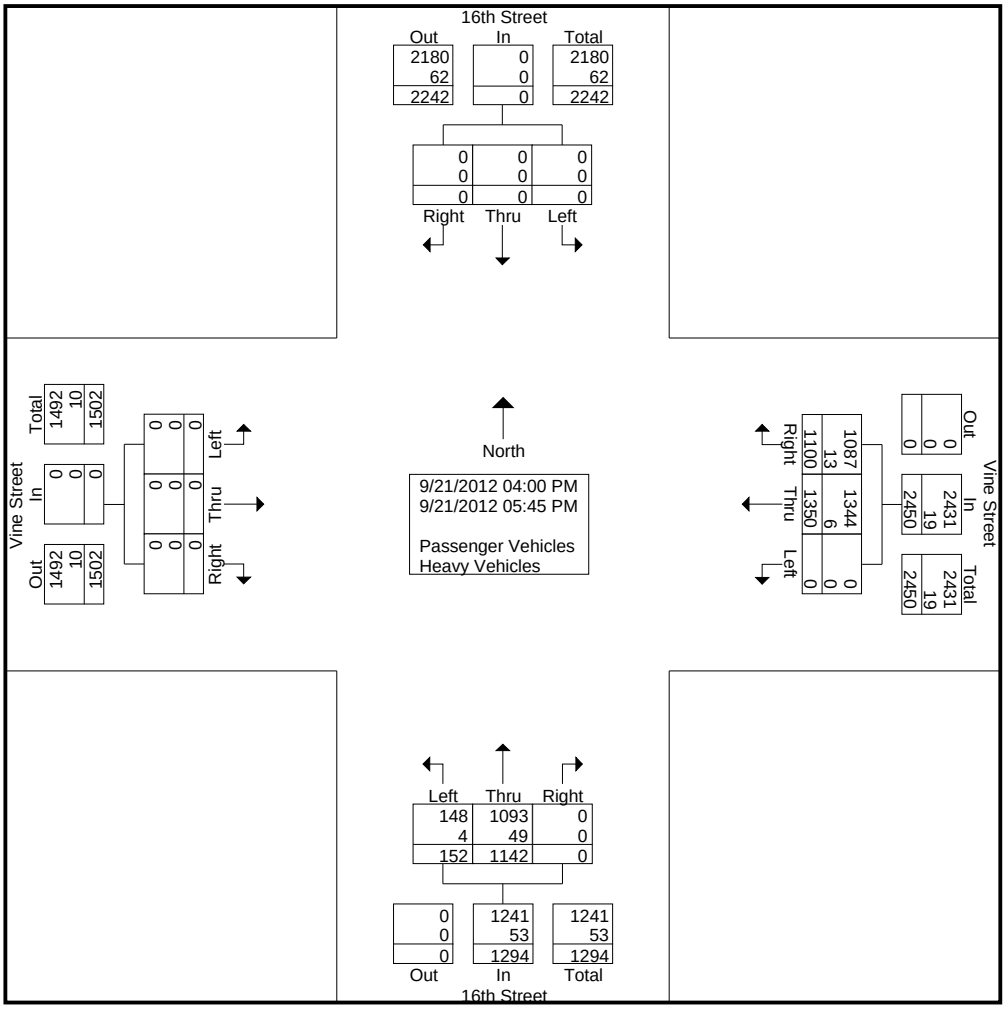
Vine Street and 16th Street (North)

Counter: PTO 18
Counted by: BP
Weather: Clear
Saved as: 2012-09-21 PMVS16

File Name : 2012-09-21 PMVS16
Site Code : 00000000
Start Date : 9/21/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	16th Street Northbound					16th Street Southbound					Vine Street Eastbound					Vine Street Westbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	21	153	0	0	174	0	0	0	0	0	0	0	0	0	0	0	187	149	1	336	1	510	511
04:15 PM	16	157	0	0	173	0	0	0	0	0	0	0	0	0	0	0	151	145	3	296	3	469	472
04:30 PM	12	135	0	0	147	0	0	0	0	0	0	0	0	0	0	0	191	132	1	323	1	470	471
04:45 PM	22	144	0	0	166	0	0	0	0	0	0	0	0	0	0	0	205	125	0	330	0	496	496
Total	71	589	0	0	660	0	0	0	0	0	0	0	0	0	0	0	734	551	5	1285	5	1945	1950
05:00 PM	24	129	0	0	153	0	0	0	0	0	0	0	0	0	0	0	157	128	0	285	0	438	438
05:15 PM	13	163	0	0	176	0	0	0	0	0	0	0	0	0	0	0	181	151	0	332	0	508	508
05:30 PM	24	140	0	0	164	0	0	0	0	0	0	0	0	0	0	0	144	144	4	288	4	452	456
05:45 PM	20	121	0	0	141	0	0	0	0	0	0	0	0	0	0	0	134	126	2	260	2	401	403
Total	81	553	0	0	634	0	0	0	0	0	0	0	0	0	0	0	616	549	6	1165	6	1799	1805
Grand Total	152	1142	0	0	1294	0	0	0	0	0	0	0	0	0	0	0	1350	1100	11	2450	11	3744	3755
Apprch %	11.7	88.3	0			0	0	0			0	0	0			0	55.1	44.9					
Total %	4.1	30.5	0		34.6	0	0	0		0	0	0	0		0	0	36.1	29.4		65.4	0.3	99.7	
Passenger Vehicles	148	1093	0		1241	0	0	0		0	0	0	0		0	0	1344	1087		2440	0	0	3681
% Passenger Vehicles	97.4	95.7	0	0	95.9	0	0	0	0	0	0	0	0	0	0	0	99.6	98.8	81.8	99.1	0	0	98
Heavy Vehicles	4	49	0		53	0	0	0		0	0	0	0		0	0	6	13		21	0	0	74
% Heavy Vehicles	2.6	4.3	0	0	4.1	0	0	0	0	0	0	0	0	0	0	0	0.4	1.2	18.2	0.9	0	0	2



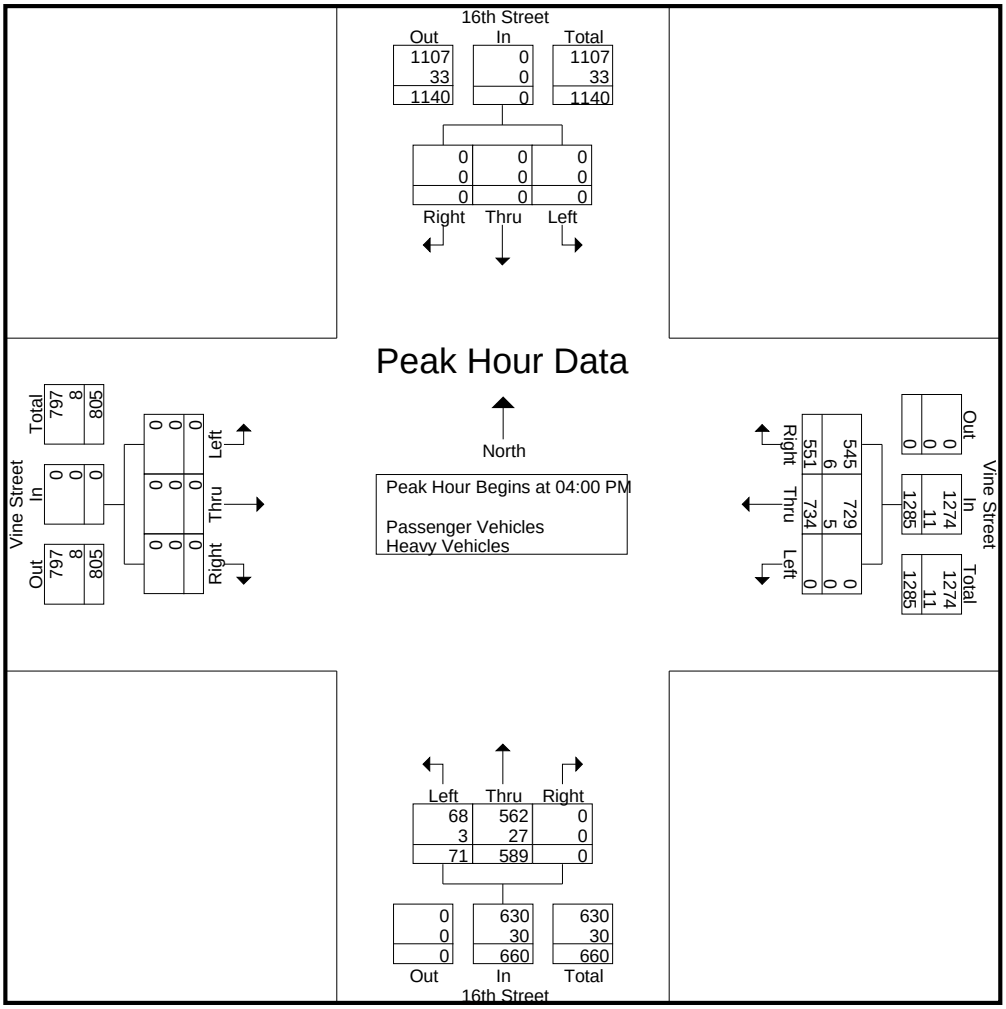
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

Vine Street and 16th Street (North)

Counter: PTO 18
Counted by: BP
Weather: Clear
Saved as: 2012-09-21 PMVS16

File Name : 2012-09-21 PMVS16
Site Code : 00000000
Start Date : 9/21/2012
Page No : 2

	16th Street Northbound				16th Street Southbound				Vine Street Eastbound				Vine Street Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	21	153	0	**174**	0	0	0	0	0	0	0	0	0	187	**149**	**336**	**510**
04:15 PM	16	**157**	0	173	0	0	0	0	0	0	0	0	0	151	145	296	469
04:30 PM	12	135	0	147	0	0	0	0	0	0	0	0	0	191	132	323	470
04:45 PM	**22**	144	0	166	0	0	0	0	0	0	0	0	0	**205**	125	330	496
Total Volume	71	589	0	660	0	0	0	0	0	0	0	0	0	734	551	1285	1945
% App. Total	10.8	89.2	0		0	0	0		0	0	0		0	57.1	42.9		
PHF	.807	.938	.000	.948	.000	.000	.000	.000	.000	.000	.000	.000	.000	.895	.924	.956	.953
Passenger Vehicles	68	562	0	630	0	0	0	0	0	0	0	0	0	729	545	1274	1904
% Passenger Vehicles	95.8	95.4	0	95.5	0	0	0	0	0	0	0	0	0	99.3	98.9	99.1	97.9
Heavy Vehicles	3	27	0	30	0	0	0	0	0	0	0	0	0	5	6	11	41
% Heavy Vehicles	4.2	4.6	0	4.5	0	0	0	0	0	0	0	0	0	0.7	1.1	0.9	2.1



Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

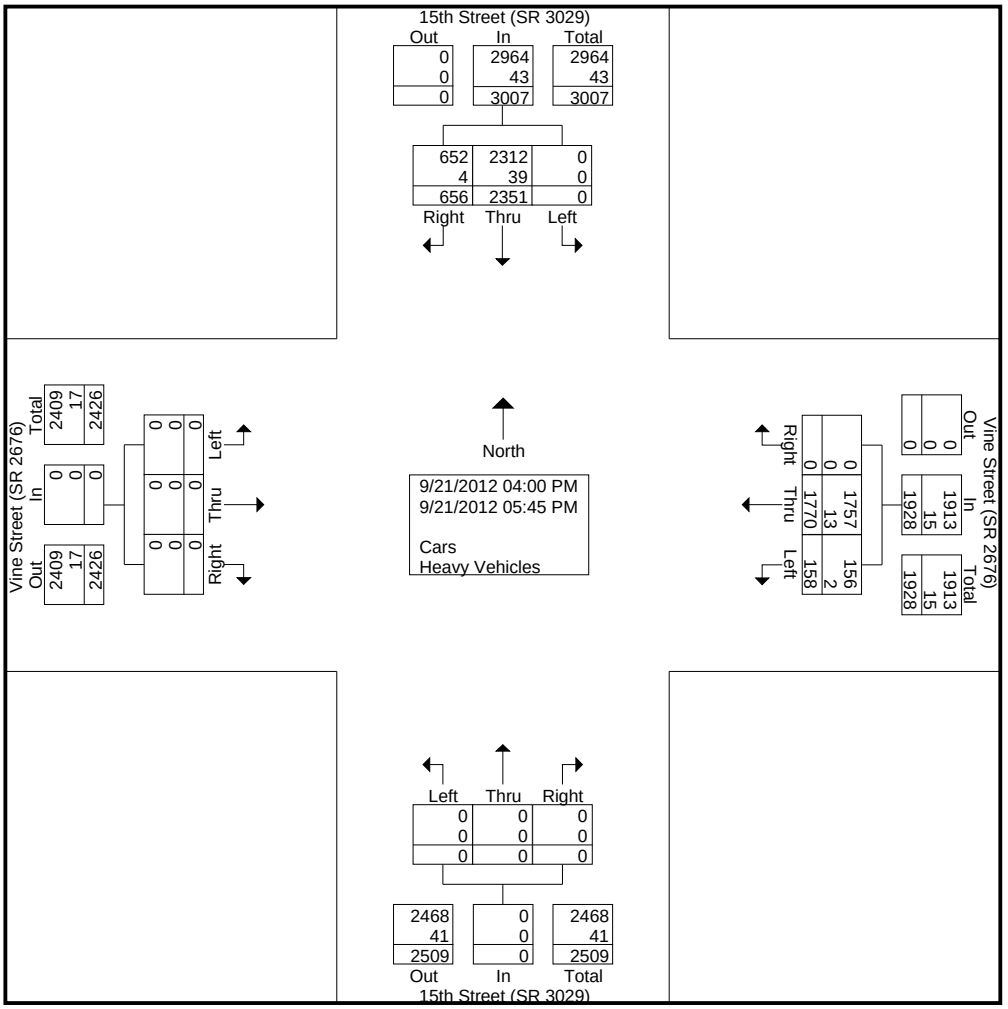
15th Street (SB) & Vine Street (WB)

Counter #: 14
Counted By: J. Wolfinger
Weather: Sunny
2012-09-21 FRI 15th VS-north

File Name : 2012-09-21 FRI 15th Vine-North
Site Code : 00000000
Start Date : 9/21/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Vine Street (SR 2676) Eastbound					Vine Street (SR 2676) Westbound					15th Street (SR 3029) Northbound					15th Street (SR 3029) Southbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	12	214	0	0	226	0	0	0	0	0	0	305	88	6	393	6	619	625
04:15 PM	0	0	0	0	0	25	223	0	0	248	0	0	0	0	0	0	330	77	1	407	1	655	656
04:30 PM	0	0	0	0	0	21	254	0	0	275	0	0	0	0	0	0	282	76	4	358	4	633	637
04:45 PM	0	0	0	0	0	19	228	0	0	247	0	0	0	0	0	0	274	94	3	368	3	615	618
Total	0	0	0	0	0	77	919	0	0	996	0	0	0	0	0	0	1191	335	14	1526	14	2522	2536
05:00 PM	0	0	0	0	0	16	213	0	0	229	0	0	0	0	0	0	295	88	10	383	10	612	622
05:15 PM	0	0	0	0	0	32	240	0	0	272	0	0	0	0	0	0	299	81	4	380	4	652	656
05:30 PM	0	0	0	0	0	17	219	0	0	236	0	0	0	0	0	0	297	73	3	370	3	606	609
05:45 PM	0	0	0	0	0	16	179	0	0	195	0	0	0	0	0	0	269	79	10	348	10	543	553
Total	0	0	0	0	0	81	851	0	0	932	0	0	0	0	0	0	1160	321	27	1481	27	2413	2440
Grand Total	0	0	0	0	0	158	1770	0	0	1928	0	0	0	0	0	0	2351	656	41	3007	41	4935	4976
Apprch %	0	0	0			8.2	91.8	0			0	0	0			0	78.2	21.8					
Total %	0	0	0		0	3.2	35.9	0		39.1	0	0	0		0	0	47.6	13.3		60.9	0.8	99.2	
Cars	0	0	0		0	156	1757	0		1913	0	0	0		0	0	2312	652		3005	0	0	4918
% Cars	0	0	0	0	0	98.7	99.3	0	0	99.2	0	0	0	0	0	0	98.3	99.4	100	98.6	0	0	98.8
Heavy Vehicles	0	0	0		0	2	13	0		15	0	0	0		0	0	39	4		43	0	0	58
% Heavy Vehicles	0	0	0	0	0	1.3	0.7	0	0	0.8	0	0	0	0	0	0	1.7	0.6	0	1.4	0	0	1.2



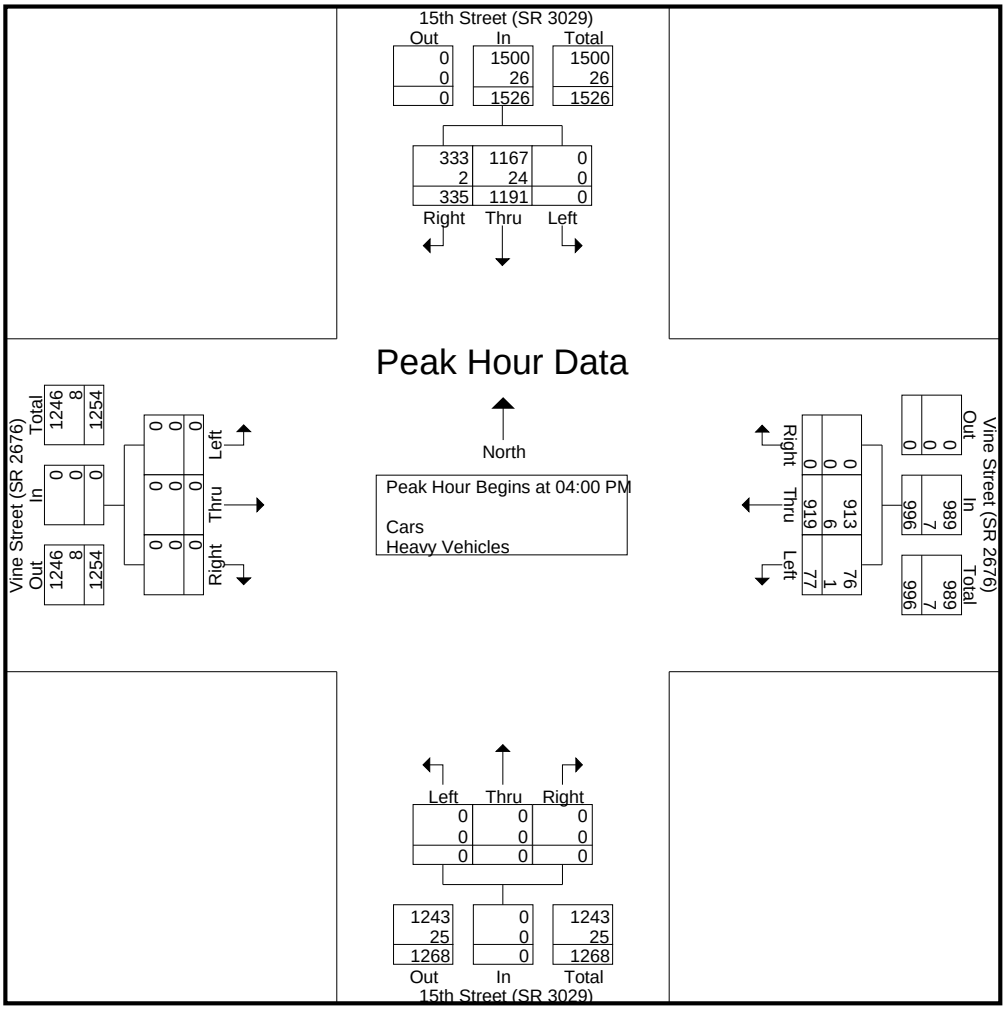
Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

15th Street (SB) & Vine Street (WB)

Counter #: 14
Counted By: J. Wolfinger
Weather: Sunny
2012-09-21 FRI 15th VS-north

File Name : 2012-09-21 FRI 15th Vine-North
Site Code : 00000000
Start Date : 9/21/2012
Page No : 2

	Vine Street (SR 2676) Eastbound				Vine Street (SR 2676) Westbound				15th Street (SR 3029) Northbound				15th Street (SR 3029) Southbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	12	214	0	226	0	0	0	0	0	305	88	393	619
04:15 PM	0	0	0	0	**25**	223	0	248	0	0	0	0	0	**330**	77	**407**	**655**
04:30 PM	0	0	0	0	21	**254**	0	**275**	0	0	0	0	0	282	76	358	633
04:45 PM	0	0	0	0	19	228	0	247	0	0	0	0	0	274	**94**	368	615
Total Volume	0	0	0	0	77	919	0	996	0	0	0	0	0	1191	335	1526	2522
% App. Total	0	0	0		7.7	92.3	0		0	0	0		0	78	22		
PHF	.000	.000	.000	.000	.770	.905	.000	.905	.000	.000	.000	.000	.000	.902	.891	.937	.963
Cars	0	0	0	0	76	913	0	989	0	0	0	0	0	1167	333	1500	2489
% Cars	0	0	0	0	98.7	99.3	0	99.3	0	0	0	0	0	98.0	99.4	98.3	98.7
Heavy Vehicles	0	0	0	0	1	6	0	7	0	0	0	0	0	24	2	26	33
% Heavy Vehicles	0	0	0	0	1.3	0.7	0	0.7	0	0	0	0	0	2.0	0.6	1.7	1.3



Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

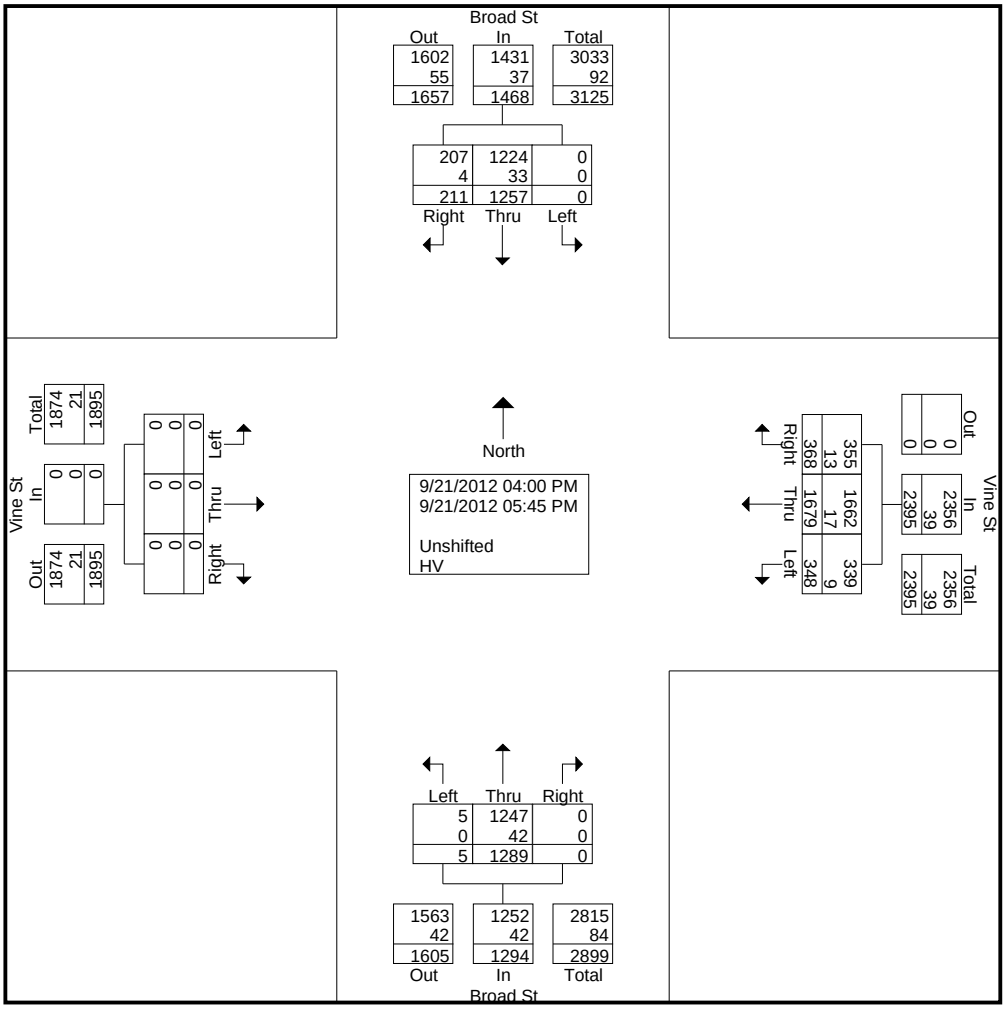
Broad Street and WB Vine Street

Counter: D4-5388
Counted by: J. Muthersbaugh
Weather: Sunny
Saved as: 2011-09-21 FRIBV

File Name : 2012-09-21 FRIBV
Site Code : 00000000
Start Date : 9/21/2012
Page No : 1

Groups Printed- Unshifted - HV

	Broad St Northbound					Broad St Southbound					Vine St Eastbound					Vine St Westbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	175	0	0	175	0	147	21	0	168	0	0	0	0	0	50	203	46	0	299	0	642	642
04:15 PM	1	161	0	0	162	0	139	18	0	157	0	0	0	0	0	51	238	43	0	332	0	651	651
04:30 PM	0	154	0	0	154	0	168	34	0	202	0	0	0	0	0	50	235	44	1	329	1	685	686
04:45 PM	1	158	0	0	159	0	176	28	0	204	0	0	0	0	0	31	205	49	2	285	2	648	650
Total	2	648	0	0	650	0	630	101	0	731	0	0	0	0	0	182	881	182	3	1245	3	2626	2629
05:00 PM	1	149	0	0	150	0	159	31	1	190	0	0	0	0	0	41	198	33	0	272	1	612	613
05:15 PM	2	187	0	0	189	0	142	31	0	173	0	0	0	0	0	50	227	56	0	333	0	695	695
05:30 PM	0	167	0	0	167	0	185	29	0	214	0	0	0	0	0	37	208	54	0	299	0	680	680
05:45 PM	0	138	0	0	138	0	141	19	2	160	0	0	0	0	0	38	165	43	1	246	3	544	547
Total	3	641	0	0	644	0	627	110	3	737	0	0	0	0	0	166	798	186	1	1150	4	2531	2535
Grand Total	5	1289	0	0	1294	0	1257	211	3	1468	0	0	0	0	0	348	1679	368	4	2395	7	5157	5164
Apprch %	0.4	99.6	0			0	85.6	14.4			0	0	0			14.5	70.1	15.4					
Total %	0.1	25	0		25.1	0	24.4	4.1		28.5	0	0	0		0	6.7	32.6	7.1		46.4	0.1	99.9	
Unshifted	5	1247	0		1252	0	1224	207		1432	0	0	0		0	339	1662	355		2357	0	0	5041
% Unshifted	100	96.7	0	0	96.8	0	97.4	98.1	33.3	97.3	0	0	0	0	0	97.4	99	96.5	25	98.2	0	0	97.6
HV	0	42	0		42	0	33	4		39	0	0	0		0	9	17	13		42	0	0	123
% HV	0	3.3	0	0	3.2	0	2.6	1.9	66.7	2.7	0	0	0	0	0	2.6	1	3.5	75	1.8	0	0	2.4



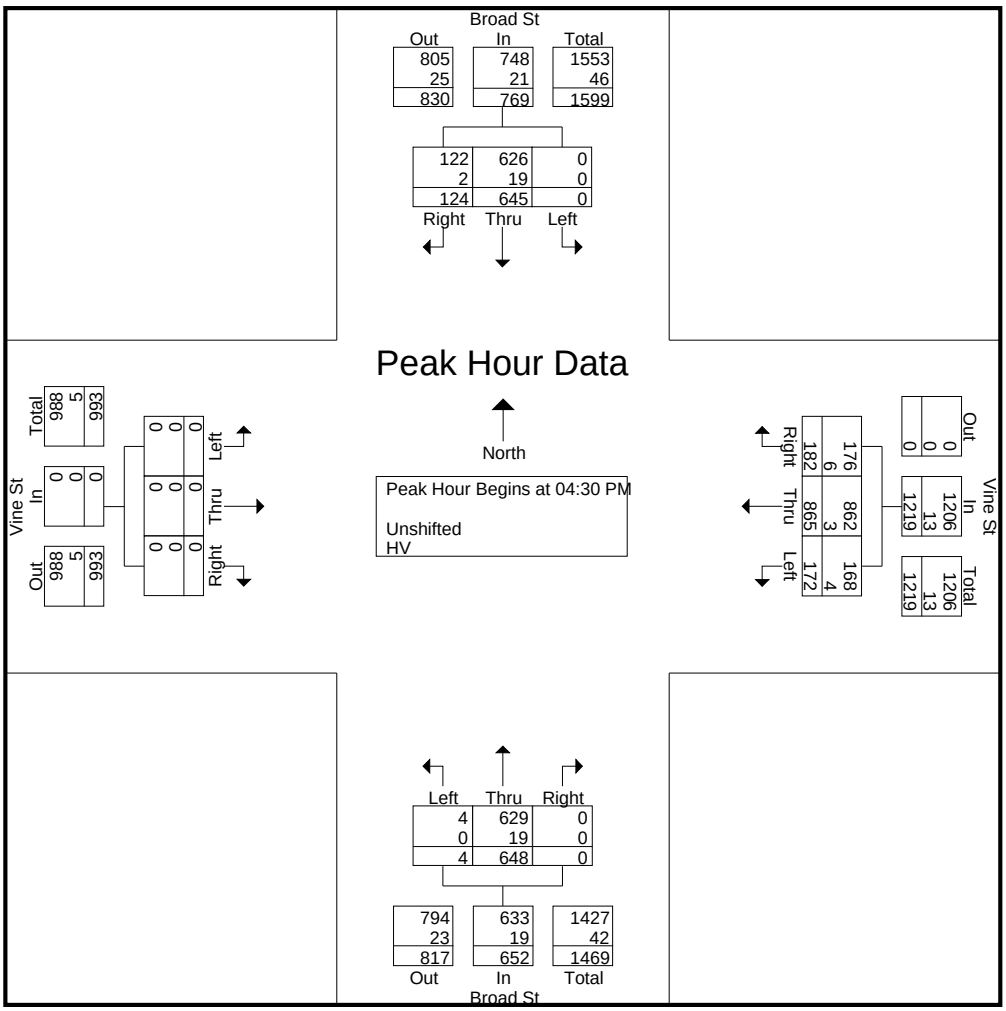
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

Broad Street and WB Vine Street

Counter: D4-5388
Counted by: J. Muthersbaugh
Weather: Sunny
Saved as: 2011-09-21 FRIBV

File Name : 2012-09-21 FRIBV
Site Code : 00000000
Start Date : 9/21/2012
Page No : 2

	Broad St Northbound				Broad St Southbound				Vine St Eastbound				Vine St Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	154	0	154	0	168	**34**	202	0	0	0	0	**50**	**235**	44	329	685
04:45 PM	1	158	0	159	0	**176**	28	**204**	0	0	0	0	31	205	49	285	648
05:00 PM	1	149	0	150	0	159	31	190	0	0	0	0	41	198	33	272	612
05:15 PM	**2**	**187**	0	**189**	0	142	31	173	0	0	0	0	50	227	**56**	**333**	**695**
Total Volume	4	648	0	652	0	645	124	769	0	0	0	0	172	865	182	1219	2640
% App. Total	0.6	99.4	0		0	83.9	16.1		0	0	0		14.1	71	14.9		
PHF	.500	.866	.000	.862	.000	.916	.912	.942	.000	.000	.000	.000	.860	.920	.813	.915	.950
Unshifted	4	629	0	633	0	626	122	748	0	0	0	0	168	862	176	1206	2587
% Unshifted	100	97.1	0	97.1	0	97.1	98.4	97.3	0	0	0	0	97.7	99.7	96.7	98.9	98.0
HV	0	19	0	19	0	19	2	21	0	0	0	0	4	3	6	13	53
% HV	0	2.9	0	2.9	0	2.9	1.6	2.7	0	0	0	0	2.3	0.3	3.3	1.1	2.0



Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

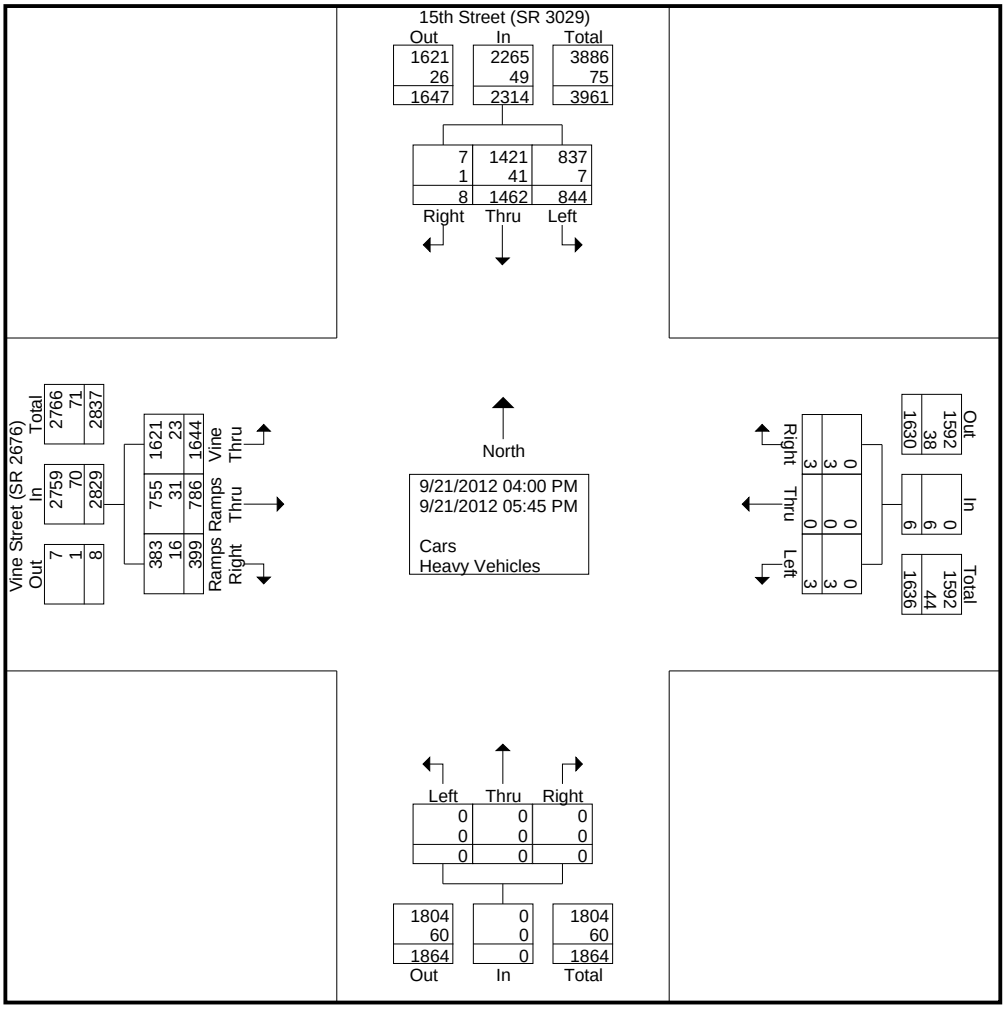
15th Street (SB) & Vine Street (EB) / Ramps

Counter #: 6
Counted By: J. Funk
Weather: Sunny
2012-09-21 FRI 15th VS South

File Name : 2012-09-21 FRI 15th Vine-South
Site Code : 00000000
Start Date : 9/21/2012
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Vine Street (SR 2676) Eastbound					Westbound					Northbound					15th Street (SR 3029) Southbound							
Start Time	Vine Thru	Ramps Thru	Ramps Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	210	121	51	0	382	0	0	0	0	0	0	0	0	0	0	111	209	0	0	320	0	702	702
04:15 PM	184	97	33	0	314	0	0	0	0	0	0	0	0	0	0	106	212	0	0	318	0	632	632
04:30 PM	206	83	42	0	331	0	0	0	0	0	0	0	0	0	0	105	157	4	0	266	0	597	597
04:45 PM	187	98	41	0	326	0	0	0	0	0	0	0	0	0	0	94	151	0	0	245	0	571	571
Total	787	399	167	0	1353	0	0	0	0	0	0	0	0	0	0	416	729	4	0	1149	0	2502	2502
05:00 PM	175	104	48	0	327	0	0	0	0	0	0	0	0	0	0	111	153	4	0	268	0	595	595
05:15 PM	234	76	41	0	351	0	0	0	0	0	0	0	0	0	0	119	218	0	0	337	0	688	688
05:30 PM	241	99	66	0	406	3	0	3	0	6	0	0	0	0	0	90	179	0	0	269	0	681	681
05:45 PM	207	108	77	0	392	0	0	0	0	0	0	0	0	0	0	108	183	0	0	291	0	683	683
Total	857	387	232	0	1476	3	0	3	0	6	0	0	0	0	0	428	733	4	0	1165	0	2647	2647
Grand Total	1644	786	399	0	2829	3	0	3	0	6	0	0	0	0	0	844	1462	8	0	2314	0	5149	5149
Apprch %	58.1	27.8	14.1			50	0	50			0	0	0			36.5	63.2	0.3					
Total %	31.9	15.3	7.7		54.9	0.1	0	0.1		0.1	0	0	0		0	16.4	28.4	0.2		44.9	0	100	
Cars	1621	755	383		2759	0	0	0		0	0	0	0		0	837	1421	7		2265	0	0	5024
% Cars	98.6	96.1	96	0	97.5	0	0	0	0	0	0	0	0	0	0	99.2	97.2	87.5	0	97.9	0	0	97.6
Heavy Vehicles	23	31	16		70	3	0	3		6	0	0	0		0	7	41	1		49	0	0	125
% Heavy Vehicles	1.4	3.9	4	0	2.5	100	0	100	0	100	0	0	0	0	0	0.8	2.8	12.5	0	2.1	0	0	2.4



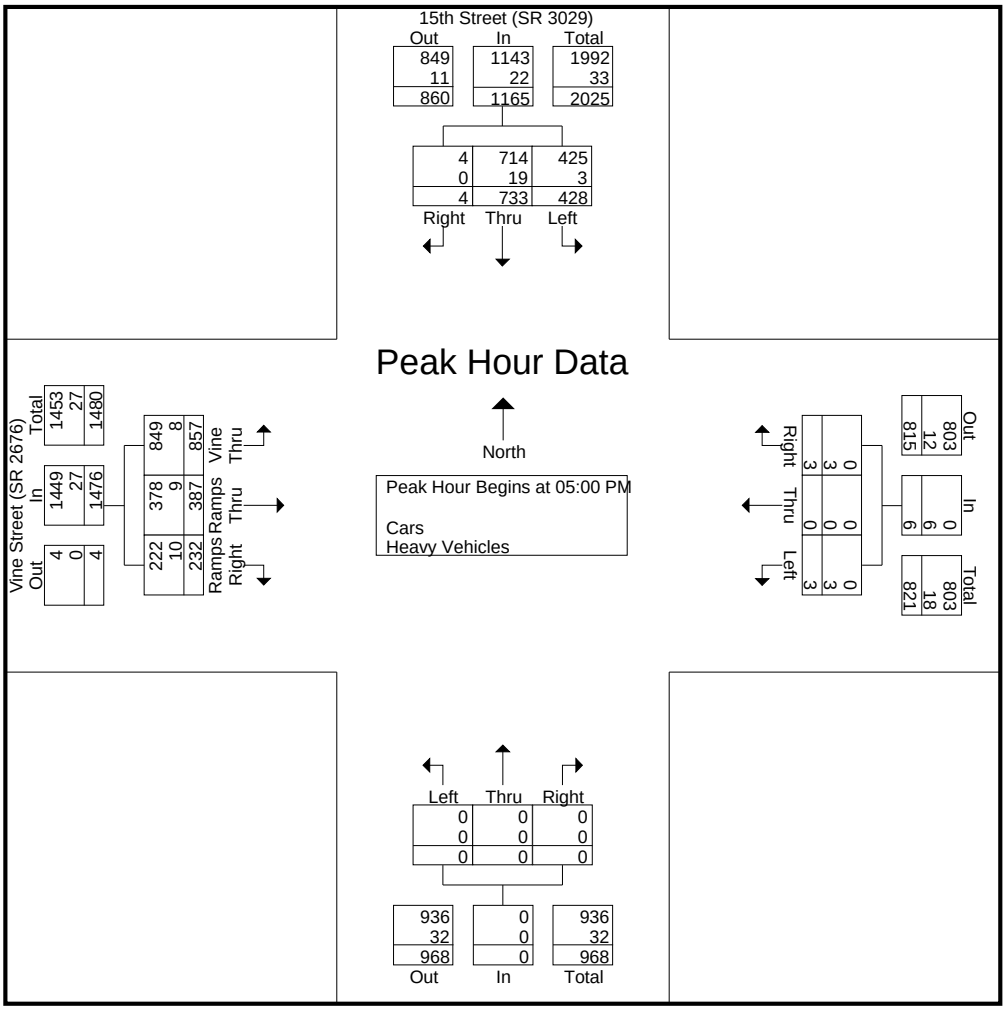
Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

15th Street (SB) & Vine Street (EB) / Ramps

Counter #: 6
Counted By: J. Funk
Weather: Sunny
2012-09-21 FRI 15th VS South

File Name : 2012-09-21 FRI 15th Vine-South
Site Code : 00000000
Start Date : 9/21/2012
Page No : 2

	Vine Street (SR 2676) Eastbound				Westbound				Northbound				15th Street (SR 3029) Southbound				
Start Time	Vine Thru	Ramps Thru	Ramps Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	175	104	48	327	0	0	0	0	0	0	0	0	111	153	**4**	268	595
05:15 PM	234	76	41	351	0	0	0	0	0	0	0	0	**119**	**218**	0	**337**	**688**
05:30 PM	**241**	99	66	**406**	**3**	0	**3**	**6**	0	0	0	0	90	179	0	269	681
05:45 PM	207	**108**	**77**	392	0	0	0	0	0	0	0	0	108	183	0	291	683
Total Volume	857	387	232	1476	3	0	3	6	0	0	0	0	428	733	4	1165	2647
% App. Total	58.1	26.2	15.7		50	0	50		0	0	0		36.7	62.9	0.3		
PHF	.889	.896	.753	.909	.250	.000	.250	.250	.000	.000	.000	.000	.899	.841	.250	.864	.962
Cars	849	378	222	1449	0	0	0	0	0	0	0	0	425	714	4	1143	2592
% Cars	99.1	97.7	95.7	98.2	0	0	0	0	0	0	0	0	99.3	97.4	100	98.1	97.9
Heavy Vehicles	8	9	10	27	3	0	3	6	0	0	0	0	3	19	0	22	55
% Heavy Vehicles	0.9	2.3	4.3	1.8	100	0	100	100	0	0	0	0	0.7	2.6	0	1.9	2.1



Traffic Planning & Design, Inc.

2500 East High Street
Pottstown, PA 19464

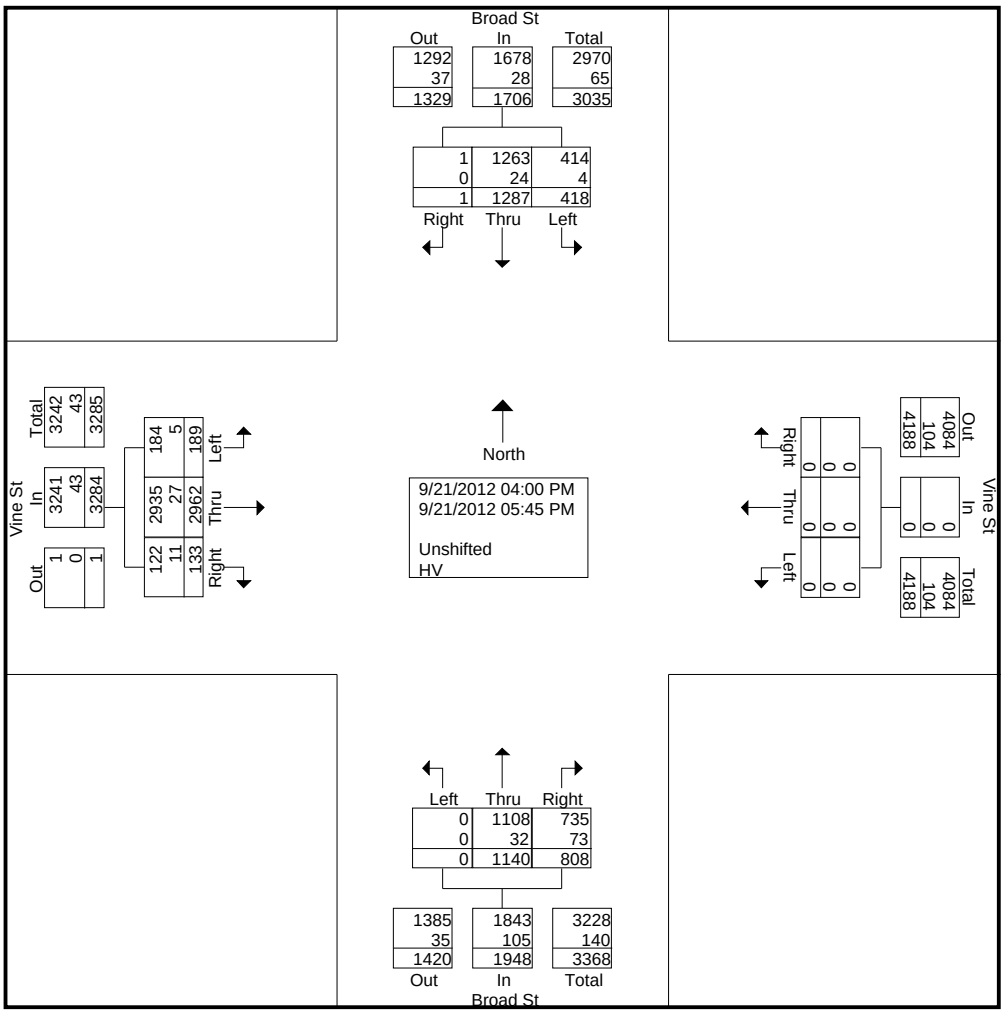
Broad Street & EB Vine Street

Counter: 19
Counted by: F. Montgomery
Weather: Sunny
Saved as: 2012-09-21 FRIBNV

File Name : 2012-09-21 FRIBNV
Site Code : 00000005
Start Date : 9/21/2012
Page No : 1

Groups Printed- Unshifted - HV

	Vine St Eastbound					Vine St Westbound					Broad St Northbound					Broad St Southbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	31	369	16	1	416	0	0	0	0	0	0	145	95	2	240	55	145	1	1	201	4	857	861
04:15 PM	24	392	12	0	428	0	0	0	0	0	0	174	101	0	275	52	155	0	0	207	0	910	910
04:30 PM	18	373	18	1	409	0	0	0	0	0	0	132	90	0	222	53	160	0	0	213	1	844	845
04:45 PM	24	366	13	0	403	0	0	0	0	0	0	132	102	0	234	56	152	0	0	208	0	845	845
Total	97	1500	59	2	1656	0	0	0	0	0	0	583	388	2	971	216	612	1	1	829	5	3456	3461
05:00 PM	24	345	18	0	387	0	0	0	0	0	0	115	114	0	229	52	174	0	0	226	0	842	842
05:15 PM	19	356	9	0	384	0	0	0	0	0	0	166	94	0	260	49	160	0	0	209	0	853	853
05:30 PM	21	388	24	0	433	0	0	0	0	0	0	152	116	0	268	48	193	0	0	241	0	942	942
05:45 PM	28	373	23	0	424	0	0	0	0	0	0	124	96	0	220	53	148	0	0	201	0	845	845
Total	92	1462	74	0	1628	0	0	0	0	0	0	557	420	0	977	202	675	0	0	877	0	3482	3482
Grand Total	189	2962	133	2	3284	0	0	0	0	0	0	1140	808	2	1948	418	1287	1	1	1706	5	6938	6943
Apprch %	5.8	90.2	4			0	0	0			0	58.5	41.5			24.5	75.4	0.1					
Total %	2.7	42.7	1.9		47.3	0	0	0		0	0	16.4	11.6		28.1	6	18.6	0		24.6	0.1	99.9	
Unshifted	184	2935	122		3241	0	0	0		0	0	1108	735		1843	414	1263	1		1679	0	0	6763
% Unshifted	97.4	99.1	91.7	0	98.6	0	0	0	0	0	0	97.2	91	0	94.5	99	98.1	100	100	98.4	0	0	97.4
HV	5	27	11		45	0	0	0		0	0	32	73		107	4	24	0		28	0	0	180
% HV	2.6	0.9	8.3	100	1.4	0	0	0	0	0	0	2.8	9	100	5.5	1	1.9	0	0	1.6	0	0	2.6



Traffic Planning & Design, Inc.

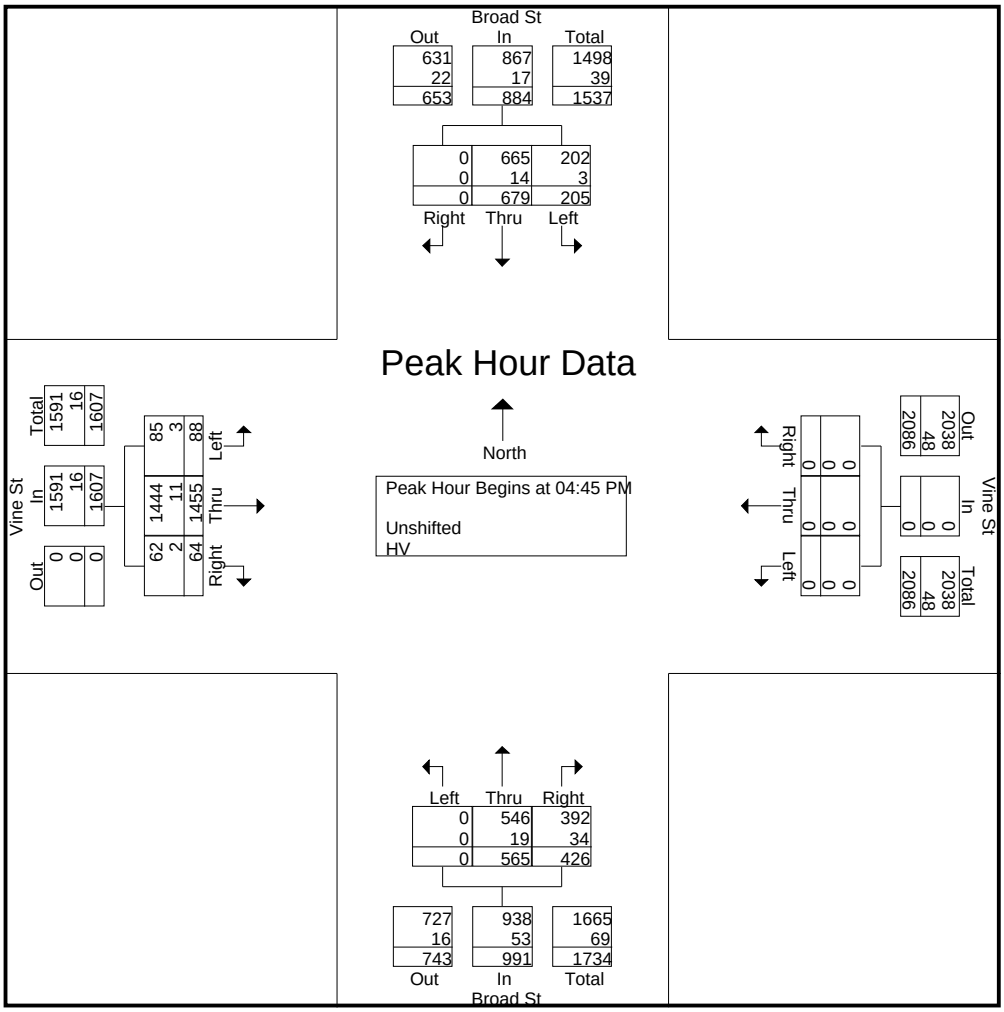
2500 East High Street
Pottstown, PA 19464

Broad Street & EB Vine Street

Counter: 19
Counted by: F. Montgomery
Weather: Sunny
Saved as: 2012-09-21 FRIBNV

File Name : 2012-09-21 FRIBNV
Site Code : 00000005
Start Date : 9/21/2012
Page No : 2

	Vine St Eastbound				Vine St Westbound				Broad St Northbound				Broad St Southbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**24**	366	13	403	0	0	0	0	0	132	102	234	**56**	152	0	208	845
05:00 PM	24	345	18	387	0	0	0	0	0	115	114	229	52	174	0	226	842
05:15 PM	19	356	9	384	0	0	0	0	0	**166**	94	260	49	160	0	209	853
05:30 PM	21	**388**	**24**	**433**	0	0	0	0	0	152	**116**	**268**	48	**193**	0	**241**	**942**
Total Volume	88	1455	64	1607	0	0	0	0	0	565	426	991	205	679	0	884	3482
% App. Total	5.5	90.5	4		0	0	0		0	57	43		23.2	76.8	0		
PHF	.917	.938	.667	.928	.000	.000	.000	.000	.000	.851	.918	.924	.915	.880	.000	.917	.924
Unshifted	85	1444	62	1591	0	0	0	0	0	546	392	938	202	665	0	867	3396
% Unshifted	96.6	99.2	96.9	99.0	0	0	0	0	0	96.6	92.0	94.7	98.5	97.9	0	98.1	97.5
HV	3	11	2	16	0	0	0	0	0	19	34	53	3	14	0	17	86
% HV	3.4	0.8	3.1	1.0	0	0	0	0	0	3.4	8.0	5.3	1.5	2.1	0	1.9	2.5



Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

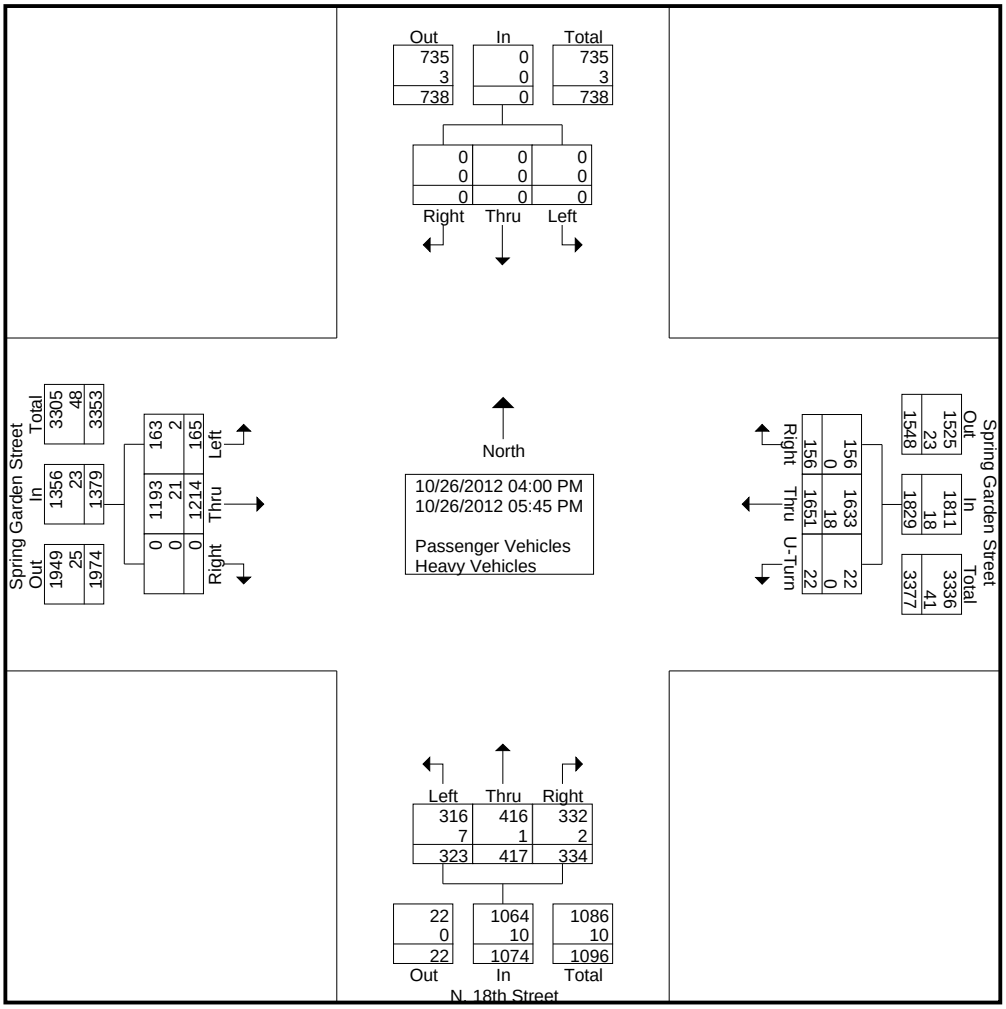
Spring Garden Street and N 18th Street

Counter: SJO 26
Counted by: JH
Weather: Clear
Saved as: 2012-10-26 PMSGS18

File Name : 2012-10-26 PMSGS18
Site Code : 00000000
Start Date : 10/26/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	N. 18th Street Northbound					Southbound					Spring Garden Street Eastbound					Spring Garden Street Westbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	40	52	45	9	137	0	0	0	0	0	35	131	0	0	166	0	209	21	2	230	11	533	544
04:15 PM	45	45	39	4	129	0	0	0	0	0	28	150	0	0	178	5	208	8	1	221	5	528	533
04:30 PM	40	56	51	1	147	0	0	0	0	0	19	158	0	0	177	0	223	19	1	242	2	566	568
04:45 PM	38	52	38	10	128	0	0	0	0	0	13	148	0	0	161	3	206	17	0	226	10	515	525
Total	163	205	173	24	541	0	0	0	0	0	95	587	0	0	682	8	846	65	4	919	28	2142	2170
05:00 PM	44	48	48	11	140	0	0	0	0	0	12	133	0	0	145	2	218	19	0	239	11	524	535
05:15 PM	37	51	38	8	126	0	0	0	0	0	21	159	0	0	180	1	204	28	1	233	9	539	548
05:30 PM	40	59	43	12	142	0	0	0	0	0	15	164	0	0	179	6	192	29	2	227	14	548	562
05:45 PM	39	54	32	6	125	0	0	0	0	0	22	171	0	0	193	5	191	15	0	211	6	529	535
Total	160	212	161	37	533	0	0	0	0	0	70	627	0	0	697	14	805	91	3	910	40	2140	2180
Grand Total	323	417	334	61	1074	0	0	0	0	0	165	1214	0	0	1379	22	1651	156	7	1829	68	4282	4350
Apprch %	30.1	38.8	31.1			0	0	0			12	88	0			1.2	90.3	8.5					
Total %	7.5	9.7	7.8		25.1	0	0	0		0	3.9	28.4	0		32.2	0.5	38.6	3.6		42.7	1.6	98.4	
Passenger Vehicles	316	416	332		1124	0	0	0		0	163	1193	0		1356	22	1633	156		1818	0	0	4298
% Passenger Vehicles	97.8	99.8	99.4	98.4	99	0	0	0	0	0	98.8	98.3	0	0	98.3	100	98.9	100	100	99	0	0	98.8
Heavy Vehicles	7	1	2		11	0	0	0		0	2	21	0		23	0	18	0		18	0	0	52
% Heavy Vehicles	2.2	0.2	0.6	1.6	1	0	0	0	0	0	1.2	1.7	0	0	1.7	0	1.1	0	0	1	0	0	1.2



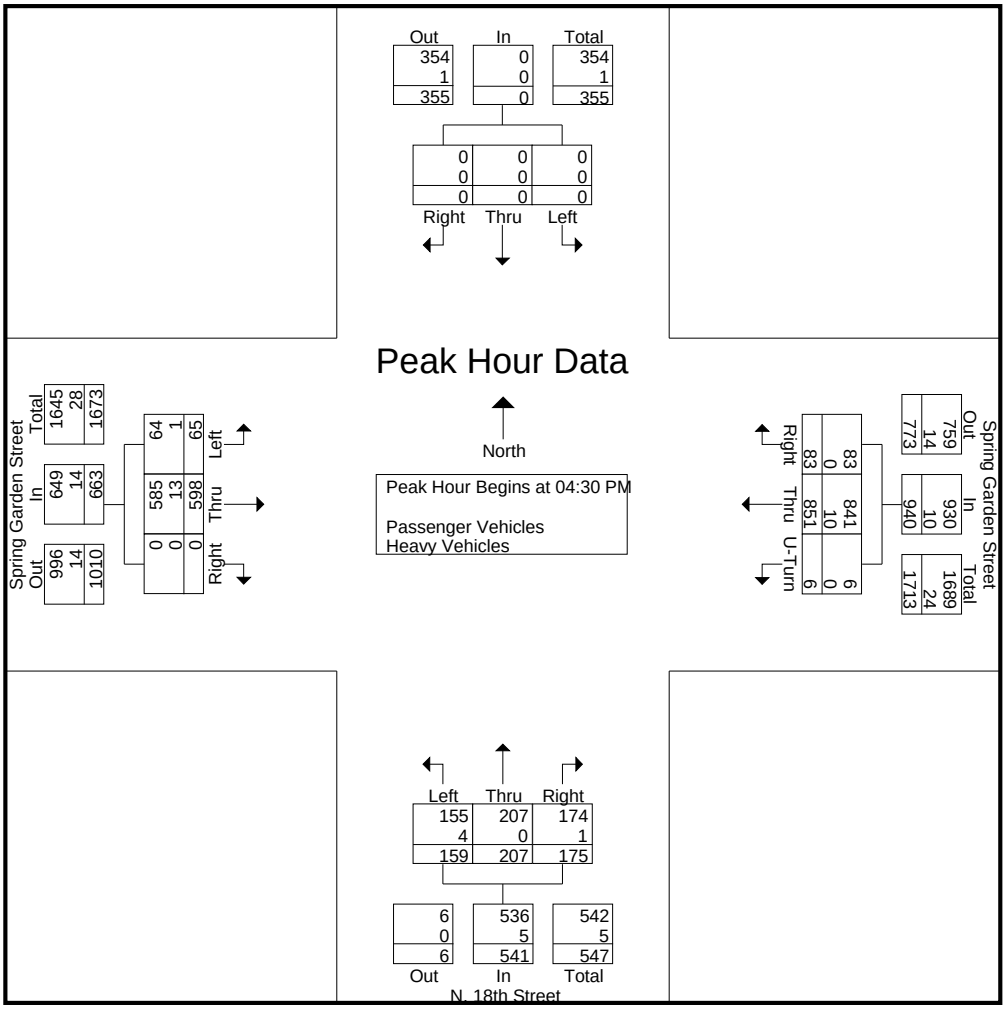
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

Spring Garden Street and N 18th Street

Counter: SJO 26
Counted by: JH
Weather: Clear
Saved as: 2012-10-26 PMSGS18

File Name : 2012-10-26 PMSGS18
Site Code : 00000000
Start Date : 10/26/2012
Page No : 2

	N. 18th Street Northbound				Southbound				Spring Garden Street Eastbound				Spring Garden Street Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	40	**56**	**51**	**147**	0	0	0	0	19	158	0	177	0	**223**	19	**242**	**566**
04:45 PM	38	52	38	128	0	0	0	0	13	148	0	161	**3**	206	17	226	515
05:00 PM	**44**	48	48	140	0	0	0	0	12	133	0	145	2	218	19	239	524
05:15 PM	37	51	38	126	0	0	0	0	**21**	**159**	0	**180**	1	204	**28**	233	539
Total Volume	159	207	175	541	0	0	0	0	65	598	0	663	6	851	83	940	2144
% App. Total	29.4	38.3	32.3		0	0	0		9.8	90.2	0		0.6	90.5	8.8		
PHF	.903	.924	.858	.920	.000	.000	.000	.000	.774	.940	.000	.921	.500	.954	.741	.971	.947
Passenger Vehicles	155	207	174	536	0	0	0	0	64	585	0	649	6	841	83	930	2115
% Passenger Vehicles	97.5	100	99.4	99.1	0	0	0	0	98.5	97.8	0	97.9	100	98.8	100	98.9	98.6
Heavy Vehicles	4	0	1	5	0	0	0	0	1	13	0	14	0	10	0	10	29
% Heavy Vehicles	2.5	0	0.6	0.9	0	0	0	0	1.5	2.2	0	2.1	0	1.2	0	1.1	1.4



Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

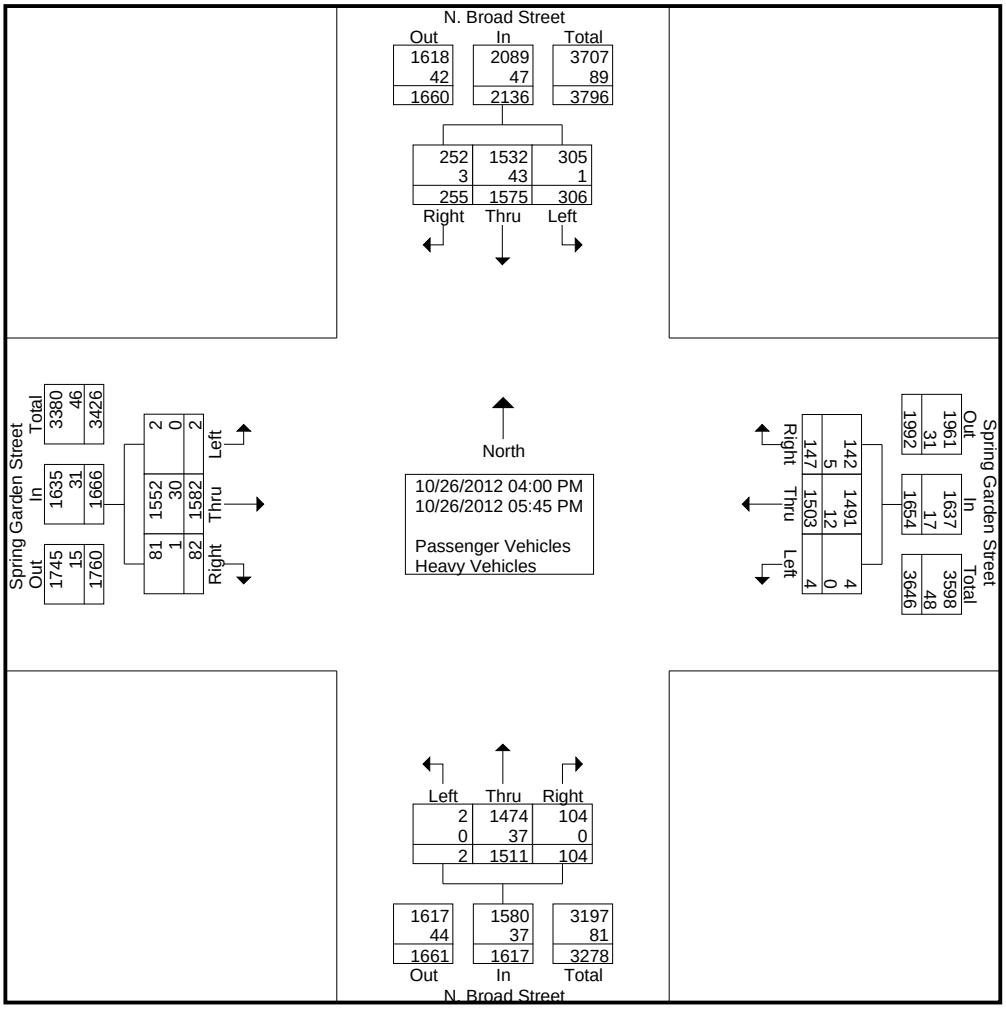
N. Broad Street and Spring Garden Street

Counter: LVO 18
Counted by: BP
Weather: Clear
Saved as: 2012-10-26 PMBSSGS

File Name : 2012-10-26 PMBSSGS
Site Code : 00000000
Start Date : 10/26/2012
Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles

	N. Broad Street Northbound					N. Broad Street Southbound					Spring Garden Street Eastbound					Spring Garden Street Westbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	185	21	0	206	48	203	41	1	292	0	189	14	0	203	1	183	10	0	194	1	895	896
04:15 PM	0	182	13	0	195	37	222	29	0	288	0	174	13	1	187	0	204	24	0	228	1	898	899
04:30 PM	1	170	12	0	183	45	182	44	0	271	0	197	12	3	209	0	205	19	0	224	3	887	890
04:45 PM	0	164	9	0	173	36	160	33	0	229	1	204	8	0	213	0	170	13	0	183	0	798	798
Total	1	701	55	0	757	166	767	147	1	1080	1	764	47	4	812	1	762	66	0	829	5	3478	3483
05:00 PM	1	176	9	0	186	29	229	30	0	288	1	215	11	0	227	0	201	16	0	217	0	918	918
05:15 PM	0	197	18	0	215	48	199	32	0	279	0	204	8	0	212	2	193	14	0	209	0	915	915
05:30 PM	0	216	9	0	225	30	198	17	0	245	0	211	5	0	216	0	194	29	0	223	0	909	909
05:45 PM	0	221	13	0	234	33	182	29	0	244	0	188	11	1	199	1	153	22	0	176	1	853	854
Total	1	810	49	0	860	140	808	108	0	1056	1	818	35	1	854	3	741	81	0	825	1	3595	3596
Grand Total	2	1511	104	0	1617	306	1575	255	1	2136	2	1582	82	5	1666	4	1503	147	0	1654	6	7073	7079
Apprch %	0.1	93.4	6.4			14.3	73.7	11.9			0.1	95	4.9			0.2	90.9	8.9					
Total %	0	21.4	1.5		22.9	4.3	22.3	3.6		30.2	0	22.4	1.2		23.6	0.1	21.2	2.1		23.4	0.1	99.9	
Passenger Vehicles	2	1474	104		1580	305	1532	252		2090	2	1552	81		1639	4	1491	142		1637	0	0	6946
% Passenger Vehicles	100	97.6	100	0	97.7	99.7	97.3	98.8	100	97.8	100	98.1	98.8	80	98.1	100	99.2	96.6	0	99	0	0	98.1
Heavy Vehicles	0	37	0		37	1	43	3		47	0	30	1		32	0	12	5		17	0	0	133
% Heavy Vehicles	0	2.4	0	0	2.3	0.3	2.7	1.2	0	2.2	0	1.9	1.2	20	1.9	0	0.8	3.4	0	1	0	0	1.9



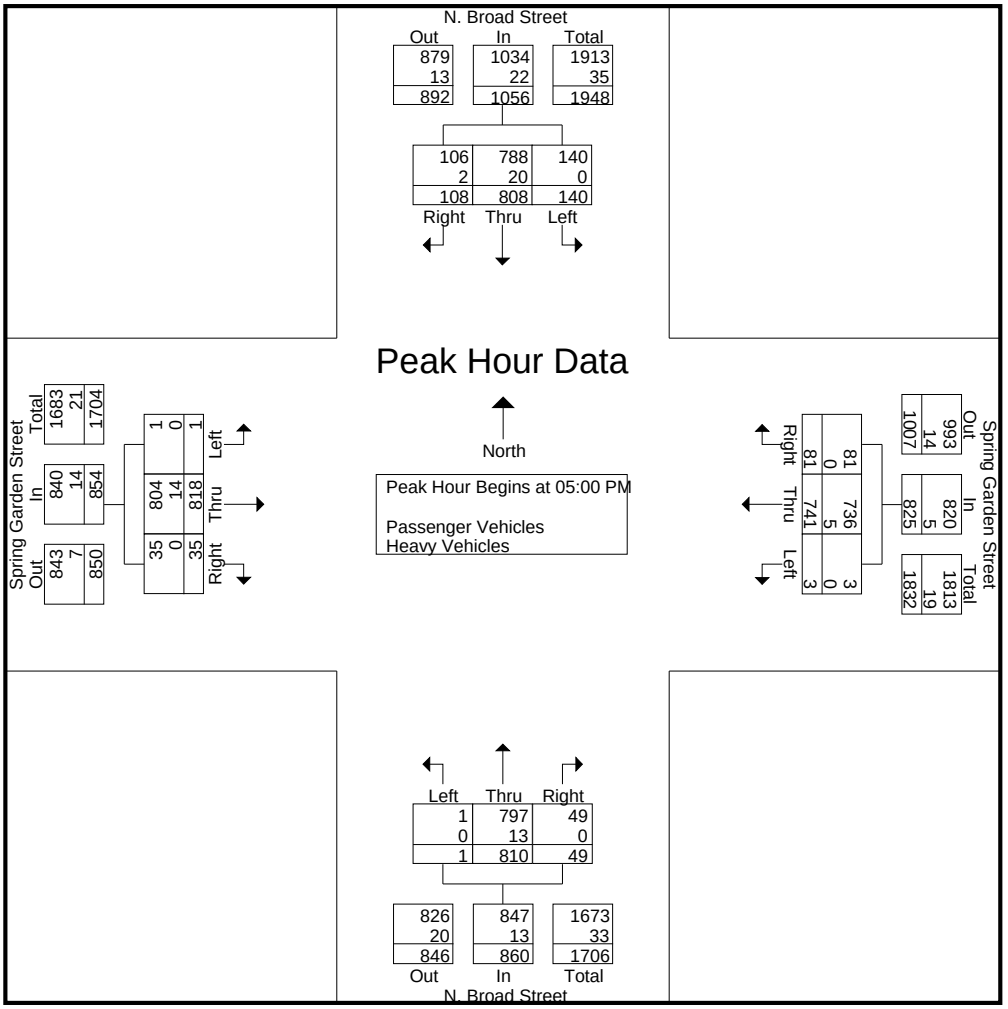
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

N. Broad Street and Spring Garden Street

Counter: LVO 18
Counted by: BP
Weather: Clear
Saved as: 2012-10-26 PMBSSGS

File Name : 2012-10-26 PMBSSGS
Site Code : 00000000
Start Date : 10/26/2012
Page No : 2

	N. Broad Street Northbound				N. Broad Street Southbound				Spring Garden Street Eastbound				Spring Garden Street Westbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**1**	176	9	186	29	**229**	30	**288**	**1**	**215**	**11**	**227**	0	**201**	16	217	**918**
05:15 PM	0	197	**18**	215	**48**	199	**32**	279	0	204	8	212	**2**	193	14	209	915
05:30 PM	0	216	9	225	30	198	17	245	0	211	5	216	0	194	**29**	**223**	909
05:45 PM	0	**221**	13	**234**	33	182	29	244	0	188	11	199	1	153	22	176	853
Total Volume	1	810	49	860	140	808	108	1056	1	818	35	854	3	741	81	825	3595
% App. Total	0.1	94.2	5.7		13.3	76.5	10.2		0.1	95.8	4.1		0.4	89.8	9.8		
PHF	.250	.916	.681	.919	.729	.882	.844	.917	.250	.951	.795	.941	.375	.922	.698	.925	.979
Passenger Vehicles	1	797	49	847	140	788	106	1034	1	804	35	840	3	736	81	820	3541
% Passenger Vehicles	100	98.4	100	98.5	100	97.5	98.1	97.9	100	98.3	100	98.4	100	99.3	100	99.4	98.5
Heavy Vehicles	0	13	0	13	0	20	2	22	0	14	0	14	0	5	0	5	54
% Heavy Vehicles	0	1.6	0	1.5	0	2.5	1.9	2.1	0	1.7	0	1.6	0	0.7	0	0.6	1.5



Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

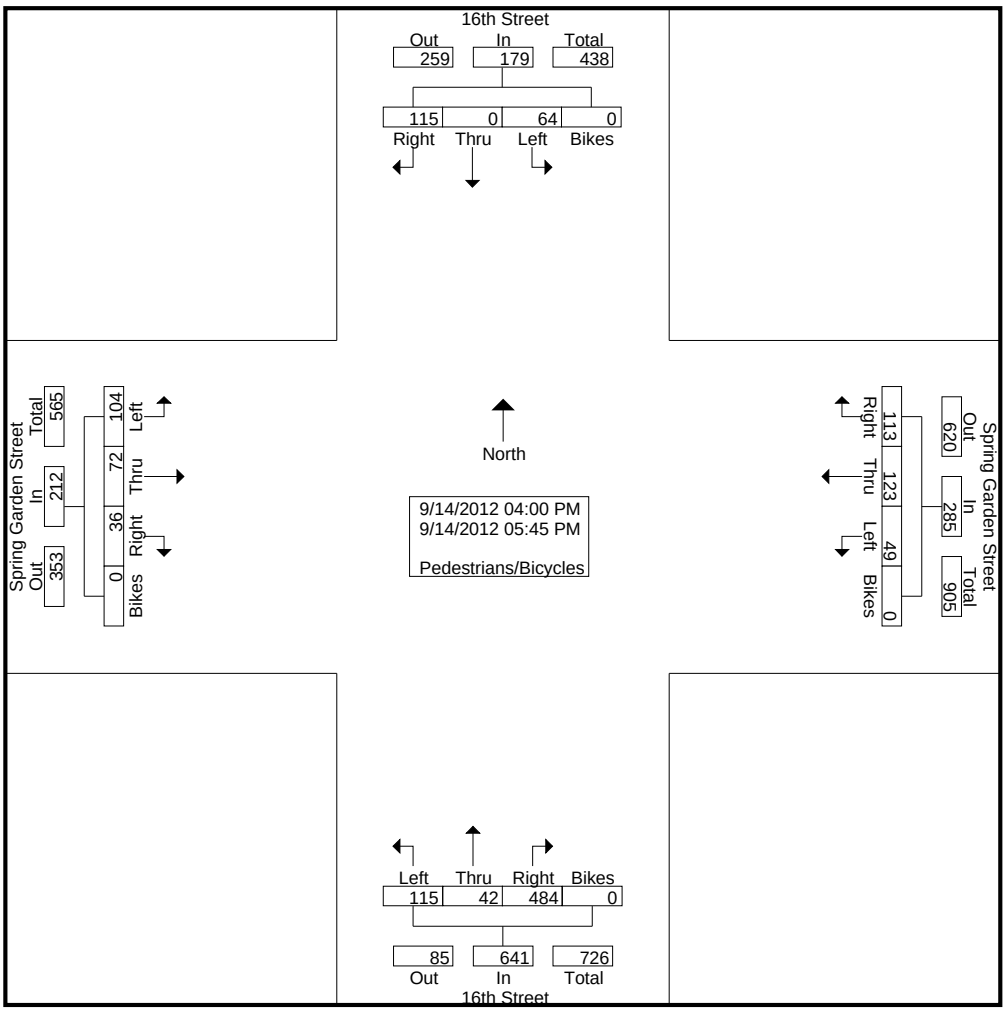
Spring Garden Street and 16th Street

Counter: PTO 18
Counted by: JH
Weather: Clear
Saved as: 2012-09-14 PMSG16

File Name : 2012-09-14 PMSG16
Site Code : 00000000
Start Date : 9/14/2012
Page No : 1

Groups Printed- Pedestrians/Bicycles

	16th Street Northbound					16th Street Southbound					Spring Garden Street Eastbound					Spring Garden Street Westbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
04:00 PM	22	3	145	0	170	7	0	16	0	23	19	9	5	0	33	7	14	15	0	36	262
04:15 PM	20	5	69	0	94	9	0	14	0	23	7	3	10	0	20	3	11	7	0	21	158
04:30 PM	21	2	57	0	80	3	0	10	0	13	10	7	4	0	21	6	12	25	0	43	157
04:45 PM	13	4	60	0	77	9	0	15	0	24	14	13	1	0	28	1	14	9	0	24	153
Total	76	14	331	0	421	28	0	55	0	83	50	32	20	0	102	17	51	56	0	124	730
05:00 PM	19	8	91	0	118	12	0	13	0	25	14	16	4	0	34	6	13	21	0	40	217
05:15 PM	5	7	19	0	31	11	0	14	0	25	16	6	3	0	25	8	25	21	0	54	135
05:30 PM	11	8	25	0	44	6	0	15	0	21	12	11	5	0	28	8	21	4	0	33	126
05:45 PM	4	5	18	0	27	7	0	18	0	25	12	7	4	0	23	10	13	11	0	34	109
Total	39	28	153	0	220	36	0	60	0	96	54	40	16	0	110	32	72	57	0	161	587
Grand Total	115	42	484	0	641	64	0	115	0	179	104	72	36	0	212	49	123	113	0	285	1317
Apprch %	17.9	6.6	75.5	0		35.8	0	64.2	0		49.1	34	17	0		17.2	43.2	39.6	0		
Total %	8.7	3.2	36.8	0	48.7	4.9	0	8.7	0	13.6	7.9	5.5	2.7	0	16.1	3.7	9.3	8.6	0	21.6	



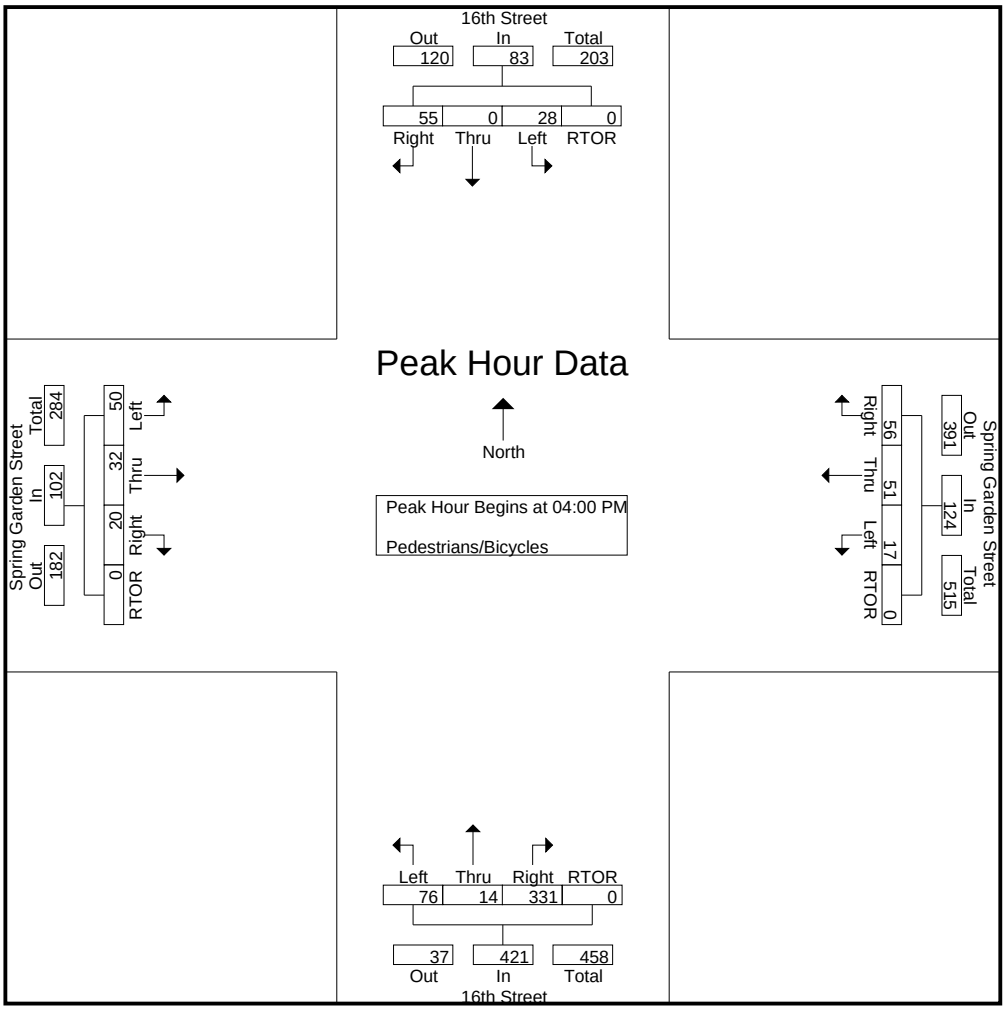
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

Spring Garden Street and 16th Street

Counter: PTO 18
Counted by: JH
Weather: Clear
Saved as: 2012-09-14 PMSG16

File Name : 2012-09-14 PMSG16
Site Code : 00000000
Start Date : 9/14/2012
Page No : 2

	16th Street Northbound					16th Street Southbound					Spring Garden Street Eastbound					Spring Garden Street Westbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**22**	3	**145**	0	**170**	7	0	**16**	0	23	**19**	9	5	0	**33**	**7**	**14**	15	0	36	**262**
04:15 PM	20	**5**	69	0	94	**9**	0	14	0	23	7	3	**10**	0	20	3	11	7	0	21	158
04:30 PM	21	2	57	0	80	3	0	10	0	13	10	7	4	0	21	6	12	**25**	0	**43**	157
04:45 PM	13	4	60	0	77	9	0	15	0	**24**	14	**13**	1	0	28	1	14	9	0	24	153
Total Volume	76	14	331	0	421	28	0	55	0	83	50	32	20	0	102	17	51	56	0	124	730
% App. Total	18.1	3.3	78.6	0		33.7	0	66.3	0		49	31.4	19.6	0		13.7	41.1	45.2	0		
PHF	.864	.700	.571	.000	.619	.778	.000	.859	.000	.865	.658	.615	.500	.000	.773	.607	.911	.560	.000	.721	.697



Traffic Planning & Design, Inc.

2500 East High Street
Pottstown, PA 19464

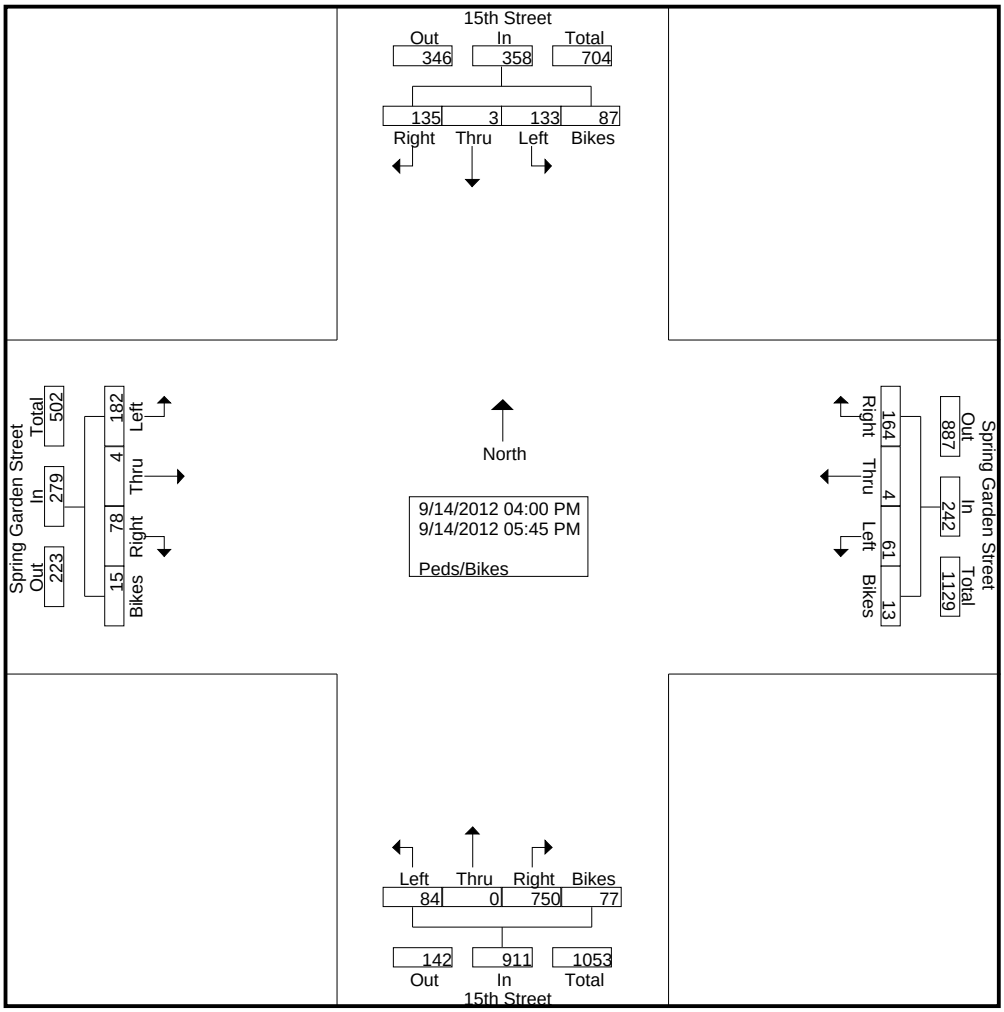
15th Street & Spring Garden Street

Counter: D4-5387
Counted by: J. Muthersbaugh
Weather: Sunny
Saved as: 2012-09-14 PM SG15

File Name : 2012-09-14 PM SG15
Site Code : 00000000
Start Date : 9/14/2012
Page No : 1

Groups Printed- Peds/Bikes

	Spring Garden Street Eastbound					Spring Garden Street Westbound					15th Street Northbound					15th Street Southbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
04:00 PM	23	2	8	2	35	12	0	20	3	35	38	0	177	5	220	18	0	11	8	37	327
04:15 PM	26	1	7	1	35	6	0	15	2	23	8	0	114	7	129	21	0	26	10	57	244
04:30 PM	20	0	11	1	32	10	3	34	2	49	1	0	52	7	60	22	0	9	7	38	179
04:45 PM	17	0	8	1	26	11	0	18	0	29	7	0	69	13	89	11	0	6	7	24	168
Total	86	3	34	5	128	39	3	87	7	136	54	0	412	32	498	72	0	52	32	156	918
05:00 PM	52	0	5	0	57	2	1	27	0	30	6	0	131	11	148	27	2	22	8	59	294
05:15 PM	6	1	15	5	27	5	0	13	0	18	11	0	81	17	109	21	1	24	19	65	219
05:30 PM	28	0	16	3	47	11	0	21	4	36	7	0	74	6	87	9	0	21	22	52	222
05:45 PM	10	0	8	2	20	4	0	16	2	22	6	0	52	11	69	4	0	16	6	26	137
Total	96	1	44	10	151	22	1	77	6	106	30	0	338	45	413	61	3	83	55	202	872
Grand Total	182	4	78	15	279	61	4	164	13	242	84	0	750	77	911	133	3	135	87	358	1790
Apprch %	65.2	1.4	28	5.4		25.2	1.7	67.8	5.4		9.2	0	82.3	8.5		37.2	0.8	37.7	24.3		
Total %	10.2	0.2	4.4	0.8	15.6	3.4	0.2	9.2	0.7	13.5	4.7	0	41.9	4.3	50.9	7.4	0.2	7.5	4.9	20	



Traffic Planning & Design, Inc.

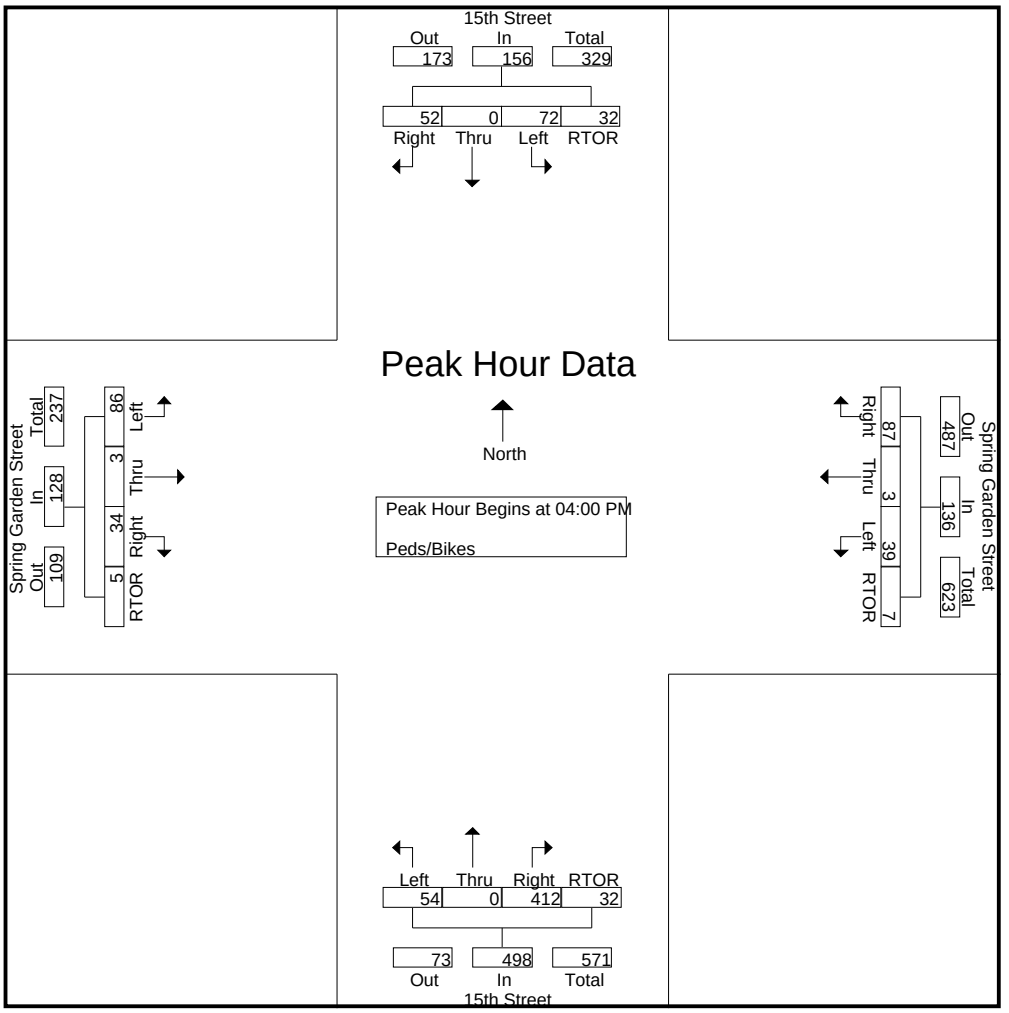
2500 East High Street
Pottstown, PA 19464

15th Street & Spring Garden Street

Counter: D4-5387
Counted by: J. Muthersbaugh
Weather: Sunny
Saved as: 2012-09-14 PM SG15

File Name : 2012-09-14 PM SG15
Site Code : 00000000
Start Date : 9/14/2012
Page No : 2

	Spring Garden Street Eastbound					Spring Garden Street Westbound					15th Street Northbound					15th Street Southbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	23	**2**	8	**2**	**35**	**12**	0	20	**3**	35	**38**	0	**177**	5	**220**	18	0	11	8	37	**327**
04:15 PM	**26**	1	7	1	35	6	0	15	2	23	8	0	114	7	129	21	0	**26**	**10**	**57**	244
04:30 PM	20	0	**11**	1	32	10	**3**	**34**	2	**49**	1	0	52	7	60	**22**	0	9	7	38	179
04:45 PM	17	0	8	1	26	11	0	18	0	29	7	0	69	**13**	89	11	0	6	7	24	168
Total Volume	86	3	34	5	128	39	3	87	7	136	54	0	412	32	498	72	0	52	32	156	918
% App. Total	67.2	2.3	26.6	3.9		28.7	2.2	64	5.1		10.8	0	82.7	6.4		46.2	0	33.3	20.5		
PHF	.827	.375	.773	.625	.914	.813	.250	.640	.583	.694	.355	.000	.582	.615	.566	.818	.000	.500	.800	.684	.702



Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

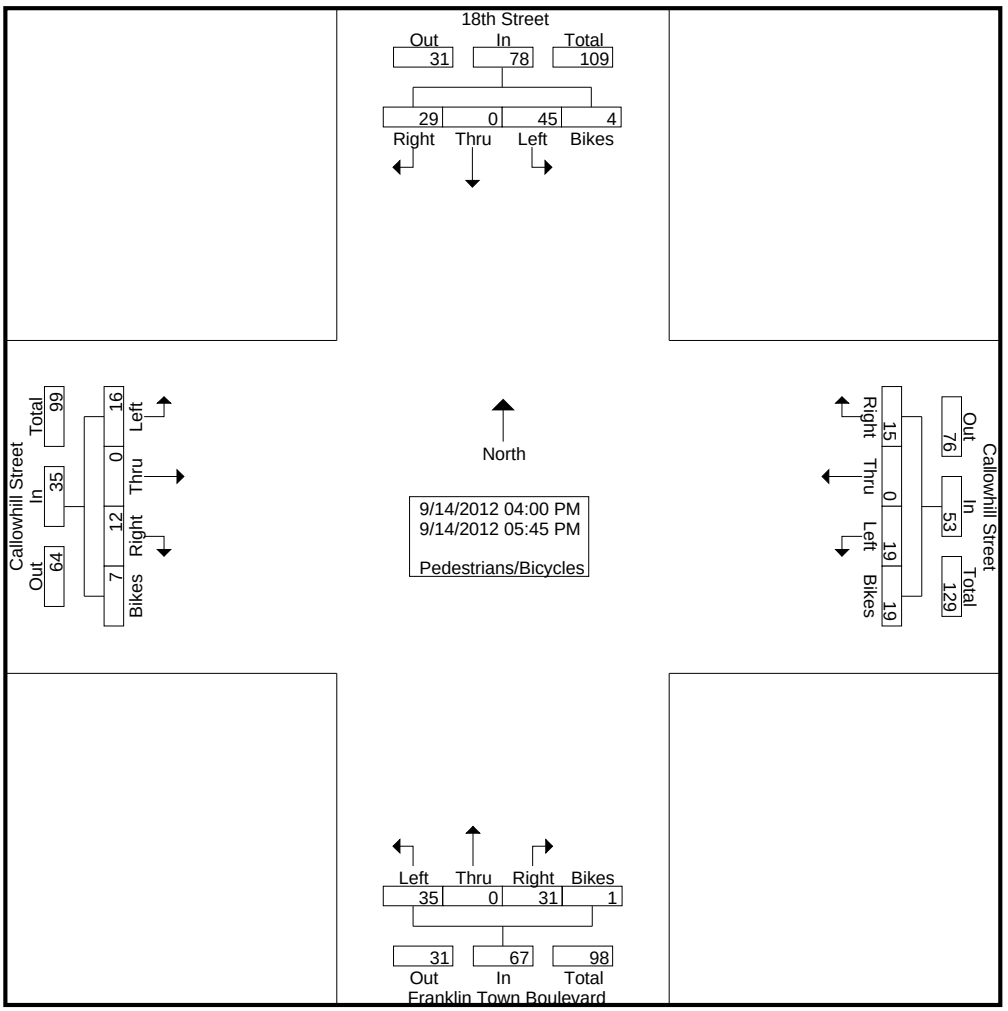
Callowhill Street and Franklin Town Boulevard

Counter: SJO 19
Counted by: JJ
Weather: Clear
Saved as: 2012-09-14 PMCSFTB

File Name : 2012-09-14 PMCSFTB
Site Code : 00000000
Start Date : 9/14/2012
Page No : 1

Groups Printed- Pedestrians/Bicycles

	Franklin Town Boulevard Northbound					18th Street Southbound					Callowhill Street Eastbound					Callowhill Street Westbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
04:00 PM	3	0	2	0	5	9	0	2	1	12	0	0	0	1	1	2	0	0	9	11	29
04:15 PM	6	0	5	0	11	6	0	4	0	10	3	0	1	0	4	0	0	0	2	2	27
04:30 PM	5	0	1	0	6	10	0	1	1	12	2	0	2	1	5	3	0	0	0	3	26
04:45 PM	4	0	4	1	9	6	0	2	2	10	1	0	2	0	3	3	0	1	2	6	28
Total	18	0	12	1	31	31	0	9	4	44	6	0	5	2	13	8	0	1	13	22	110
05:00 PM	5	0	7	0	12	2	0	2	0	4	6	0	1	3	10	3	0	3	2	8	34
05:15 PM	3	0	3	0	6	4	0	13	0	17	2	0	1	1	4	1	0	2	2	5	32
05:30 PM	3	0	6	0	9	4	0	2	0	6	1	0	4	1	6	5	0	6	2	13	34
05:45 PM	6	0	3	0	9	4	0	3	0	7	1	0	1	0	2	2	0	3	0	5	23
Total	17	0	19	0	36	14	0	20	0	34	10	0	7	5	22	11	0	14	6	31	123
Grand Total	35	0	31	1	67	45	0	29	4	78	16	0	12	7	35	19	0	15	19	53	233
Apprch %	52.2	0	46.3	1.5		57.7	0	37.2	5.1		45.7	0	34.3	20		35.8	0	28.3	35.8		
Total %	15	0	13.3	0.4	28.8	19.3	0	12.4	1.7	33.5	6.9	0	5.2	3	15	8.2	0	6.4	8.2	22.7	



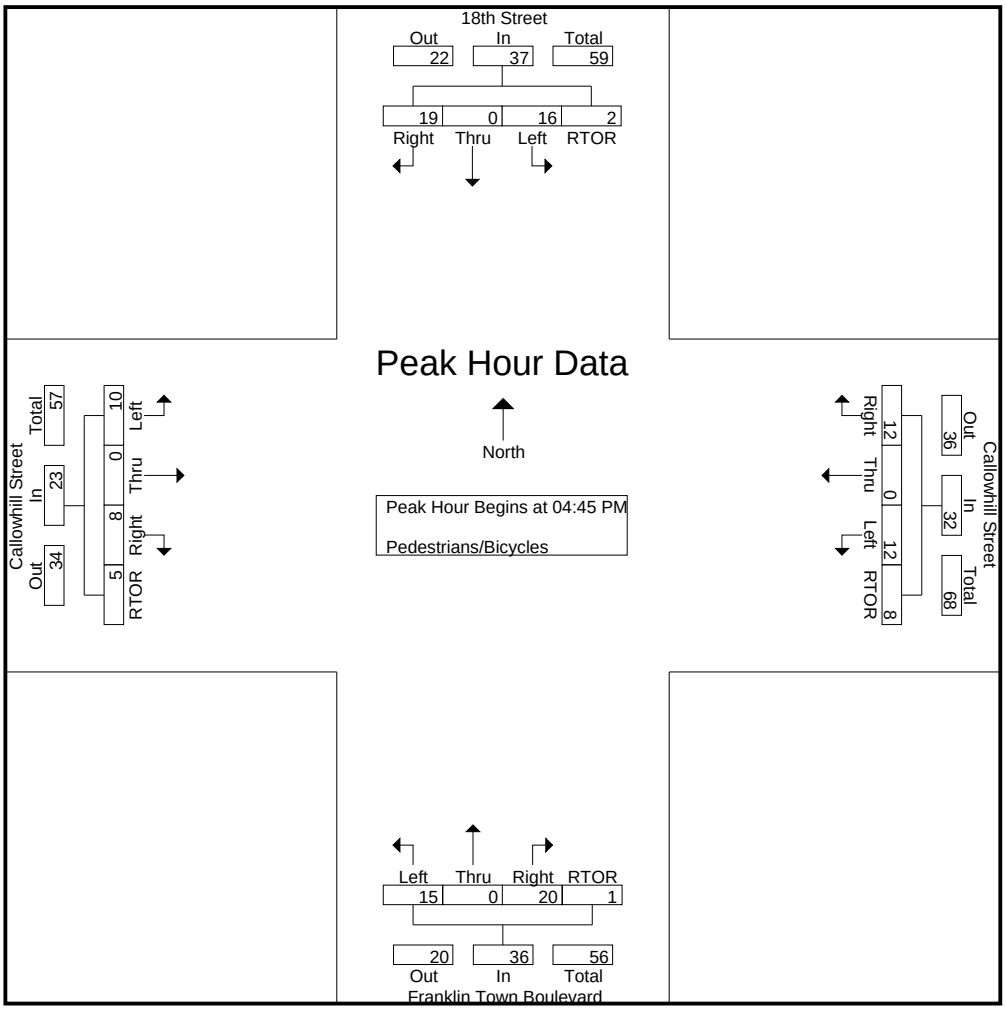
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

Callowhill Street and Franklin Town Boulevard

Counter: SJO 19
Counted by: JJ
Weather: Clear
Saved as: 2012-09-14 PMCSFTB

File Name : 2012-09-14 PMCSFTB
Site Code : 00000000
Start Date : 9/14/2012
Page No : 2

	Franklin Town Boulevard Northbound					18th Street Southbound					Callowhill Street Eastbound					Callowhill Street Westbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	4	0	4	**1**	9	**6**	0	2	**2**	10	1	0	2	0	3	3	0	1	**2**	6	28
05:00 PM	**5**	0	**7**	0	**12**	2	0	2	0	4	**6**	0	1	**3**	**10**	3	0	3	2	8	**34**
05:15 PM	3	0	3	0	6	4	0	**13**	0	**17**	2	0	1	1	4	1	0	2	2	5	32
05:30 PM	3	0	6	0	9	4	0	2	0	6	1	0	**4**	1	6	**5**	0	**6**	2	**13**	34
Total Volume	15	0	20	1	36	16	0	19	2	37	10	0	8	5	23	12	0	12	8	32	128
% App. Total	41.7	0	55.6	2.8		43.2	0	51.4	5.4		43.5	0	34.8	21.7		37.5	0	37.5	25		
PHF	.750	.000	.714	.250	.750	.667	.000	.365	.250	.544	.417	.000	.500	.417	.575	.600	.000	.500	1.00	.615	.941



Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

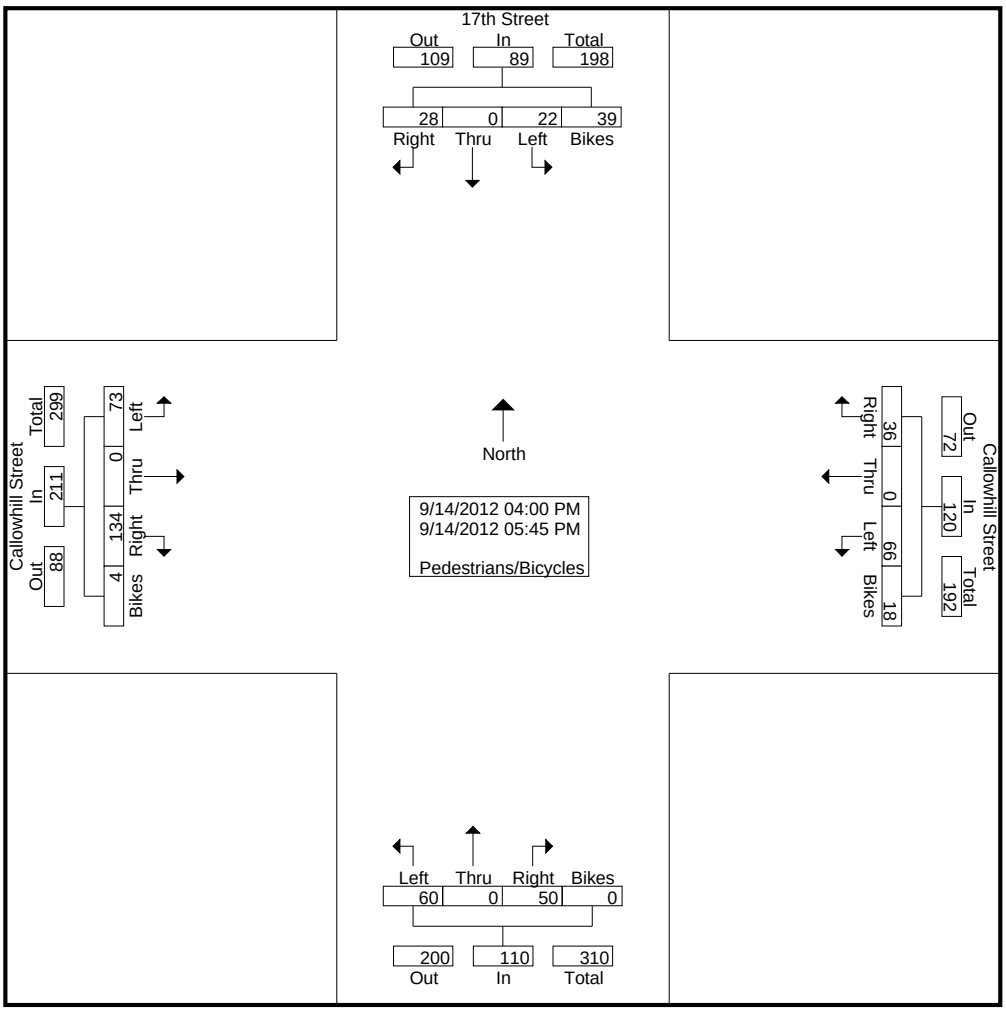
Callowhill Street and 17th Street

Counter: SJO 26
Counted by: BP
Weather: Clear
Saved as: 2012-09-14 PMCS17

File Name : 2012-09-14 PMCS17
Site Code : 00000000
Start Date : 9/14/2012
Page No : 1

Groups Printed- Pedestrians/Bicycles

	Northbound					17th Street Southbound					Callowhill Street Eastbound					Callowhill Street Westbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
04:00 PM	6	0	3	0	9	1	0	5	8	14	6	0	32	0	38	12	0	6	5	23	84
04:15 PM	8	0	8	0	16	1	0	1	7	9	19	0	18	0	37	6	0	3	2	11	73
04:30 PM	7	0	2	0	9	3	0	0	5	8	9	0	22	0	31	8	0	5	2	15	63
04:45 PM	8	0	5	0	13	3	0	5	3	11	7	0	14	0	21	6	0	4	0	10	55
Total	29	0	18	0	47	8	0	11	23	42	41	0	86	0	127	32	0	18	9	59	275
05:00 PM	7	0	12	0	19	7	0	6	5	18	11	0	12	1	24	20	0	8	3	31	92
05:15 PM	8	0	10	0	18	4	0	3	2	9	9	0	11	0	20	9	0	3	3	15	62
05:30 PM	7	0	5	0	12	2	0	3	5	10	8	0	12	1	21	1	0	3	1	5	48
05:45 PM	9	0	5	0	14	1	0	5	4	10	4	0	13	2	19	4	0	4	2	10	53
Total	31	0	32	0	63	14	0	17	16	47	32	0	48	4	84	34	0	18	9	61	255
Grand Total	60	0	50	0	110	22	0	28	39	89	73	0	134	4	211	66	0	36	18	120	530
Apprch %	54.5	0	45.5	0		24.7	0	31.5	43.8		34.6	0	63.5	1.9		55	0	30	15		
Total %	11.3	0	9.4	0	20.8	4.2	0	5.3	7.4	16.8	13.8	0	25.3	0.8	39.8	12.5	0	6.8	3.4	22.6	



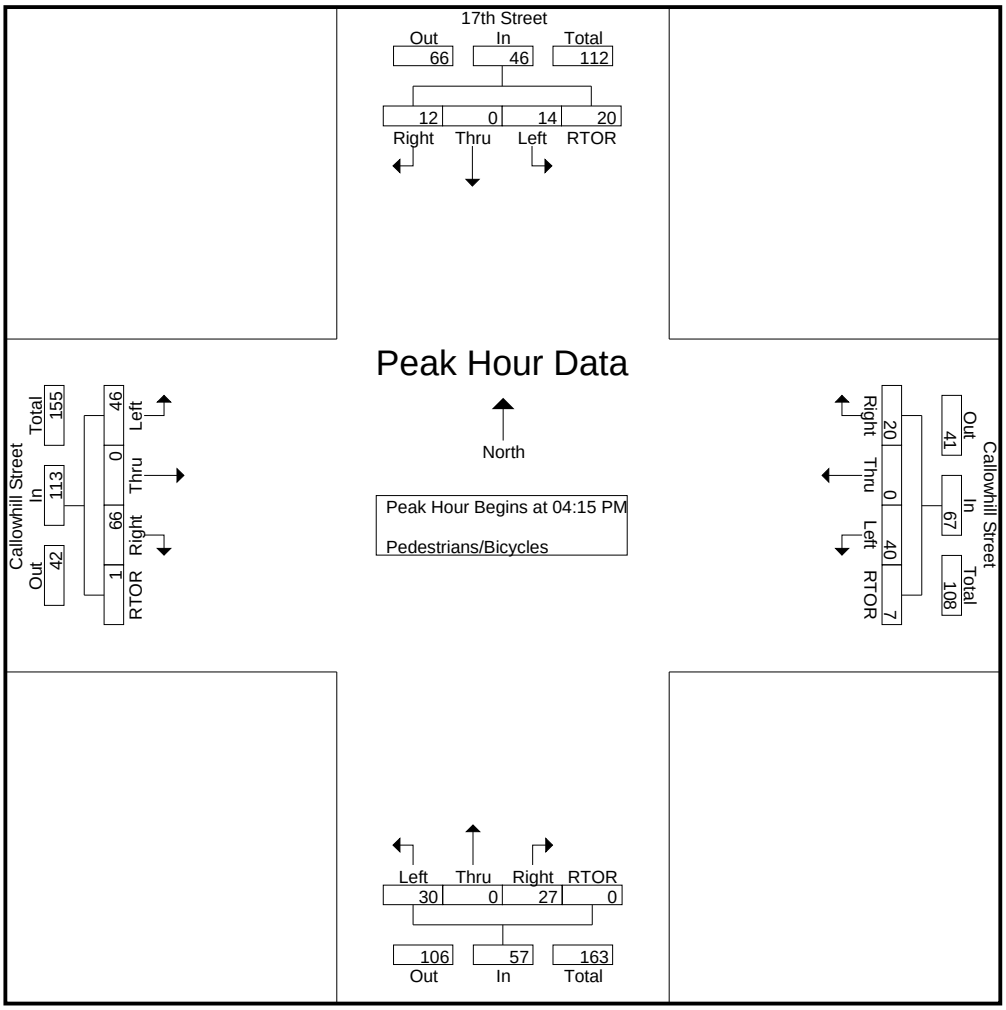
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

Callowhill Street and 17th Street

Counter: SJO 26
Counted by: BP
Weather: Clear
Saved as: 2012-09-14 PMCS17

File Name : 2012-09-14 PMCS17
Site Code : 00000000
Start Date : 9/14/2012
Page No : 2

	Northbound					17th Street Southbound					Callowhill Street Eastbound					Callowhill Street Westbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	**8**	0	8	0	16	1	0	1	**7**	9	**19**	0	18	0	**37**	6	0	3	2	11	73
04:30 PM	7	0	2	0	9	3	0	0	5	8	9	0	**22**	0	31	8	0	5	2	15	63
04:45 PM	8	0	5	0	13	3	0	5	3	11	7	0	14	0	21	6	0	4	0	10	55
05:00 PM	7	0	**12**	0	**19**	**7**	0	**6**	5	**18**	11	0	12	**1**	24	**20**	0	**8**	**3**	**31**	**92**
Total Volume	30	0	27	0	57	14	0	12	20	46	46	0	66	1	113	40	0	20	7	67	283
% App. Total	52.6	0	47.4	0		30.4	0	26.1	43.5		40.7	0	58.4	0.9		59.7	0	29.9	10.4		
PHF	.938	.000	.563	.000	.750	.500	.000	.500	.714	.639	.605	.000	.750	.250	.764	.500	.000	.625	.583	.540	.769



Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

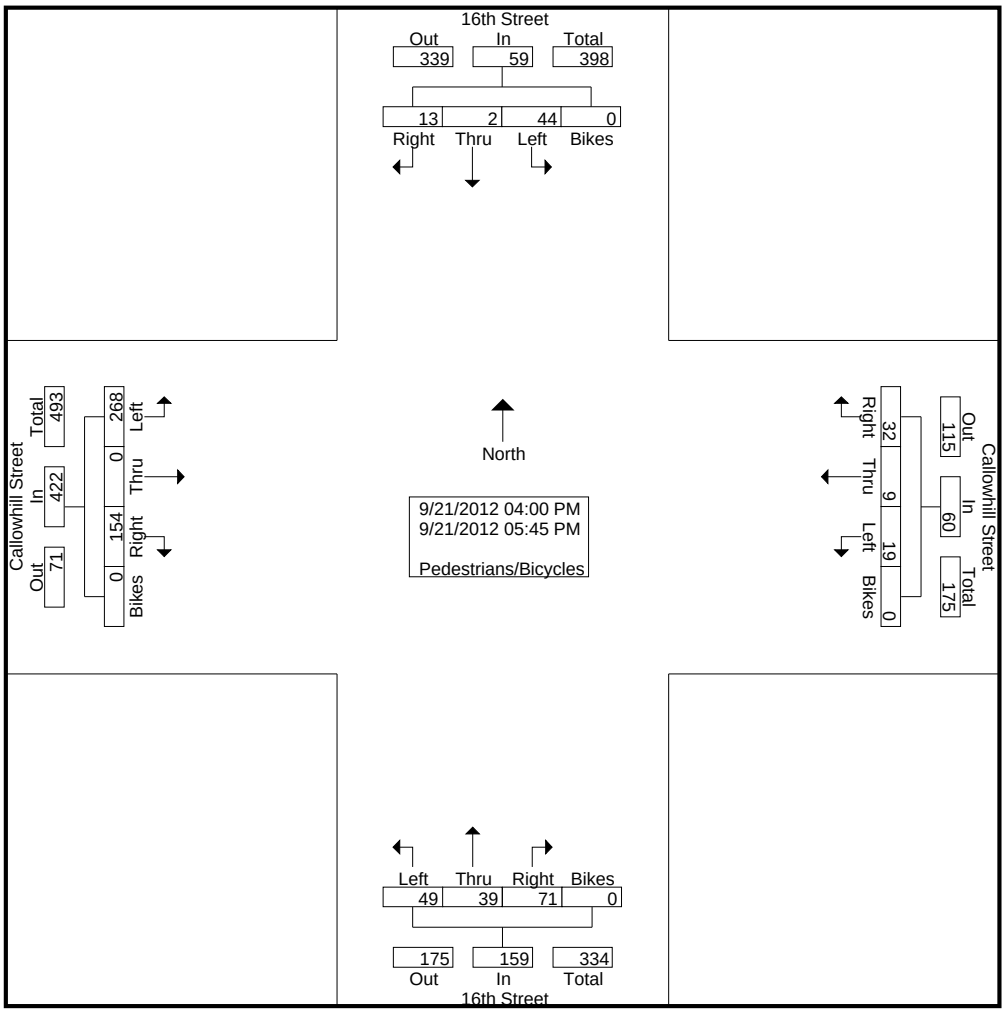
16th Street & Callowhill Street

Counter: SJO 26
Counted by: JH
Weather: Clear
Saved as: 2012-09-24 PMCS16

File Name : #8 - 2012-09-21 PMCS16
Site Code : 00000000
Start Date : 9/21/2012
Page No : 1

Groups Printed- Pedestrians/Bicycles

	Callowhill Street Eastbound					Callowhill Street Westbound					16th Street Northbound					16th Street Southbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
04:00 PM	37	0	26	0	63	1	0	1	0	2	10	2	3	0	15	5	0	0	0	5	85
04:15 PM	38	0	5	0	43	1	2	6	0	9	3	5	8	0	16	3	0	1	0	4	72
04:30 PM	35	0	35	0	70	4	1	9	0	14	10	5	13	0	28	7	0	4	0	11	123
04:45 PM	39	0	20	0	59	0	0	2	0	2	2	3	5	0	10	3	0	0	0	3	74
Total	149	0	86	0	235	6	3	18	0	27	25	15	29	0	69	18	0	5	0	23	354
05:00 PM	42	0	25	0	67	4	0	3	0	7	5	6	9	0	20	12	0	1	0	13	107
05:15 PM	21	0	20	0	41	2	3	6	0	11	10	8	19	0	37	7	0	1	0	8	97
05:30 PM	33	0	16	0	49	7	3	4	0	14	4	4	10	0	18	3	1	2	0	6	87
05:45 PM	23	0	7	0	30	0	0	1	0	1	5	6	4	0	15	4	1	4	0	9	55
Total	119	0	68	0	187	13	6	14	0	33	24	24	42	0	90	26	2	8	0	36	346
Grand Total	268	0	154	0	422	19	9	32	0	60	49	39	71	0	159	44	2	13	0	59	700
Apprch %	63.5	0	36.5	0		31.7	15	53.3	0		30.8	24.5	44.7	0		74.6	3.4	22	0		
Total %	38.3	0	22	0	60.3	2.7	1.3	4.6	0	8.6	7	5.6	10.1	0	22.7	6.3	0.3	1.9	0	8.4	



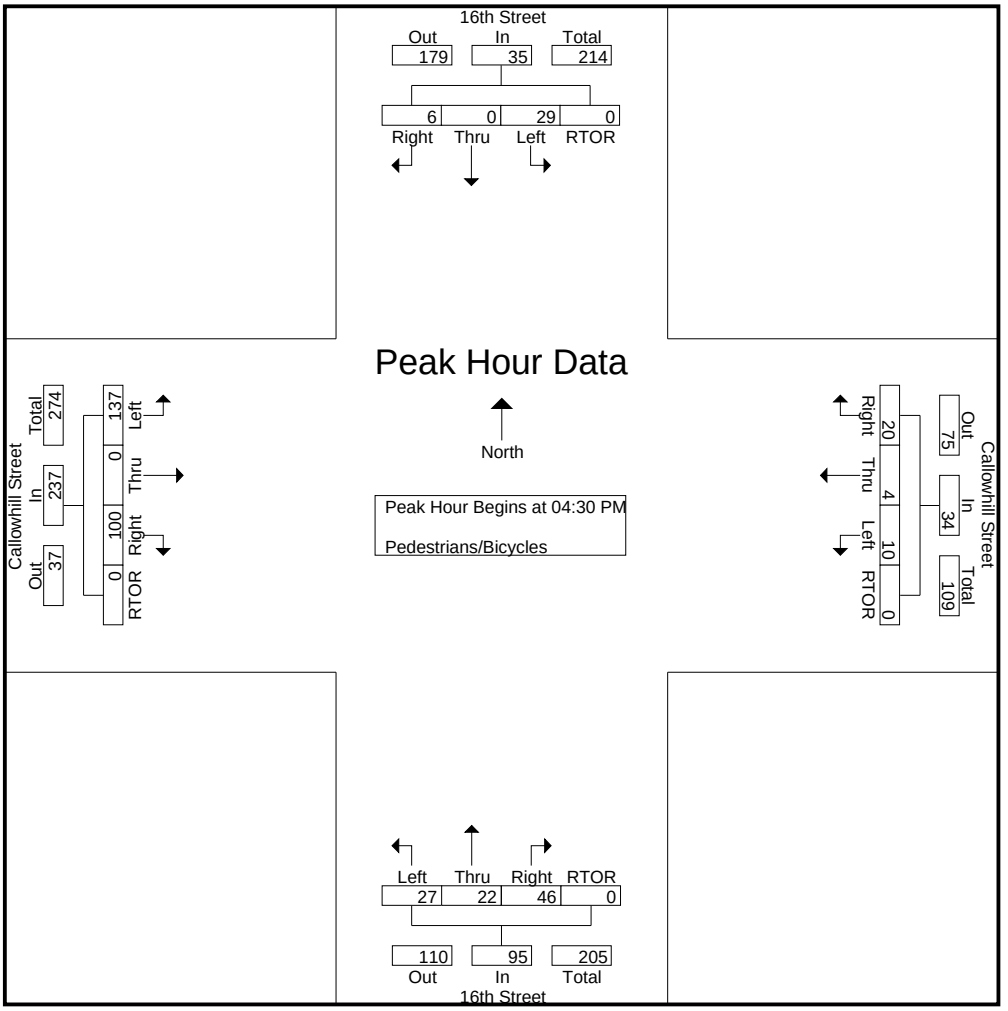
Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

16th Street & Callowhill Street

Counter: SJO 26
Counted by: JH
Weather: Clear
Saved as: 2012-09-24 PMCS16

File Name : #8 - 2012-09-21 PMCS16
Site Code : 00000000
Start Date : 9/21/2012
Page No : 2

	Callowhill Street Eastbound					Callowhill Street Westbound					16th Street Northbound					16th Street Southbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	35	0	**35**	0	**70**	**4**	1	**9**	0	**14**	**10**	5	13	0	28	7	0	**4**	0	11	**123**
04:45 PM	39	0	20	0	59	0	0	2	0	2	2	3	5	0	10	3	0	0	0	3	74
05:00 PM	**42**	0	25	0	67	4	0	3	0	7	5	6	9	0	20	**12**	0	1	0	**13**	107
05:15 PM	21	0	20	0	41	2	**3**	6	0	11	10	**8**	**19**	0	**37**	7	0	1	0	8	97
Total Volume	137	0	100	0	237	10	4	20	0	34	27	22	46	0	95	29	0	6	0	35	401
% App. Total	57.8	0	42.2	0		29.4	11.8	58.8	0		28.4	23.2	48.4	0		82.9	0	17.1	0		
PHF	.815	.000	.714	.000	.846	.625	.333	.556	.000	.607	.675	.688	.605	.000	.642	.604	.000	.375	.000	.673	.815



Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

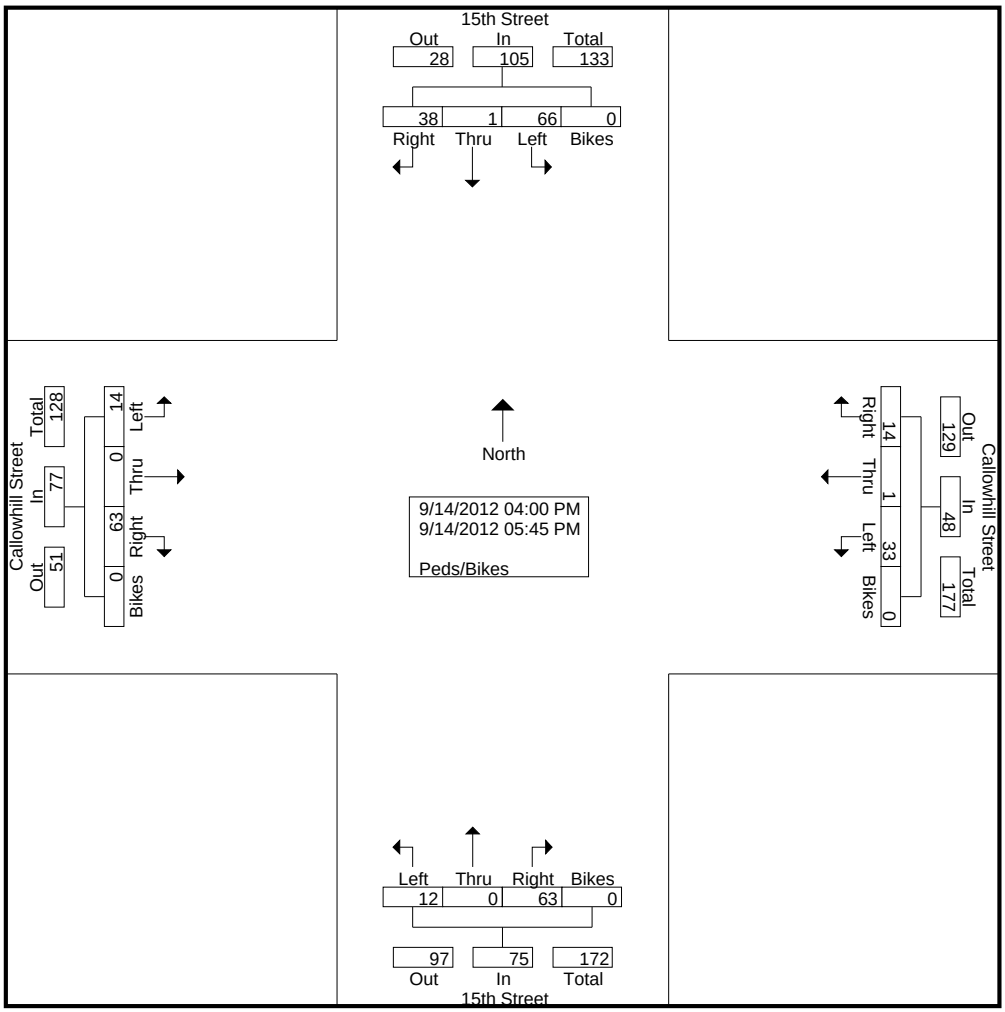
15th Street & Callowhill Street

Counter: 21
Counted by: N. Zipay
Weather: Sunny, Nice
Saved as: 2012-09-14 PM CH15

File Name : #7 - 2012-09-14 PM CS15
Site Code : 00000000
Start Date : 9/14/2012
Page No : 1

Groups Printed- Peds/Bikes

	Callowhill Street Eastbound					Callowhill Street Westbound					15th Street Northbound					15th Street Southbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
04:00 PM	3	0	1	0	4	2	0	8	0	10	0	0	11	0	11	9	1	6	0	16	41
04:15 PM	1	0	10	0	11	3	0	0	0	3	3	0	6	0	9	12	0	6	0	18	41
04:30 PM	2	0	7	0	9	4	1	0	0	5	5	0	3	0	8	11	0	6	0	17	39
04:45 PM	0	0	10	0	10	6	0	0	0	6	4	0	8	0	12	3	0	4	0	7	35
Total	6	0	28	0	34	15	1	8	0	24	12	0	28	0	40	35	1	22	0	58	156
05:00 PM	3	0	12	0	15	3	0	1	0	4	0	0	6	0	6	9	0	1	0	10	35
05:15 PM	1	0	14	0	15	5	0	2	0	7	0	0	9	0	9	9	0	5	0	14	45
05:30 PM	4	0	4	0	8	4	0	1	0	5	0	0	11	0	11	11	0	2	0	13	37
05:45 PM	0	0	5	0	5	6	0	2	0	8	0	0	9	0	9	2	0	8	0	10	32
Total	8	0	35	0	43	18	0	6	0	24	0	0	35	0	35	31	0	16	0	47	149
Grand Total	14	0	63	0	77	33	1	14	0	48	12	0	63	0	75	66	1	38	0	105	305
Apprch %	18.2	0	81.8	0		68.8	2.1	29.2	0		16	0	84	0		62.9	1	36.2	0		
Total %	4.6	0	20.7	0	25.2	10.8	0.3	4.6	0	15.7	3.9	0	20.7	0	24.6	21.6	0.3	12.5	0	34.4	



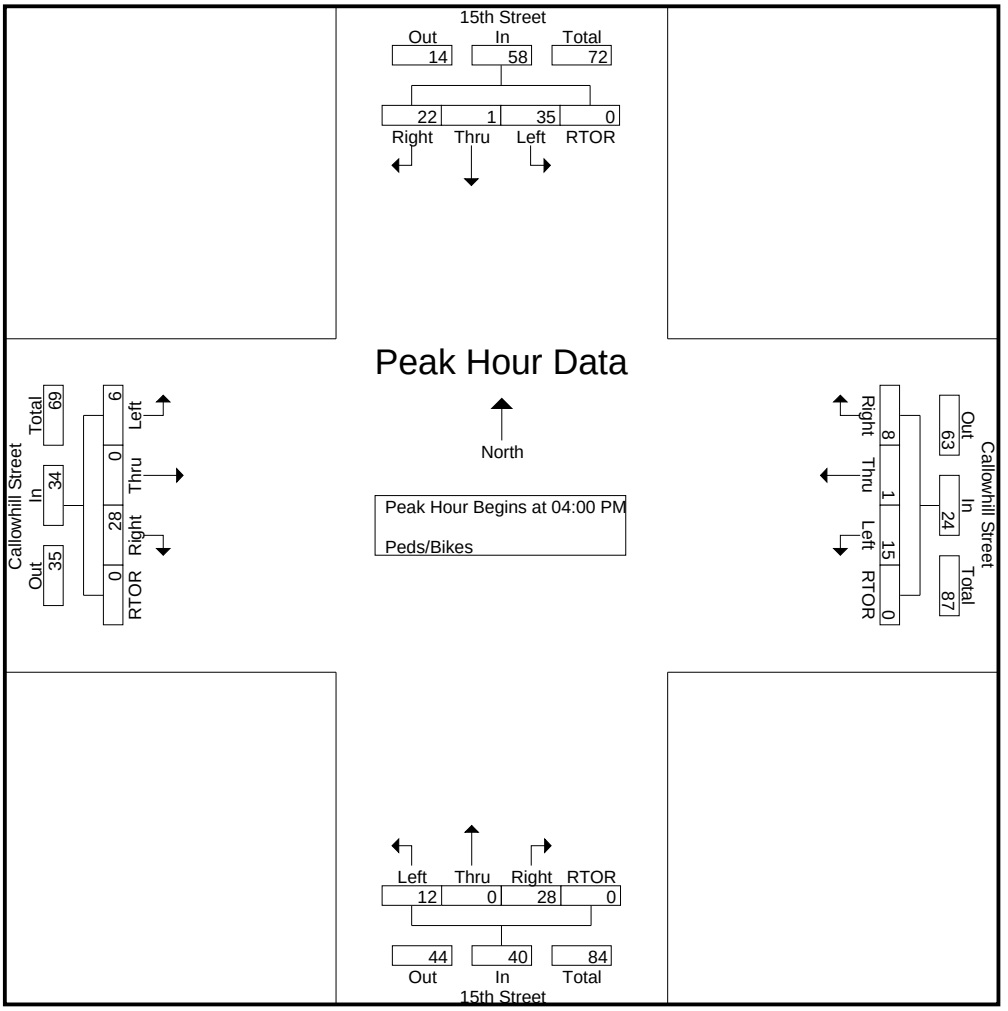
Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

15th Street & Callowhill Street

Counter: 21
Counted by: N. Zipay
Weather: Sunny, Nice
Saved as: 2012-09-14 PM CH15

File Name : #7 - 2012-09-14 PM CS15
Site Code : 00000000
Start Date : 9/14/2012
Page No : 2

	Callowhill Street Eastbound					Callowhill Street Westbound					15th Street Northbound					15th Street Southbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**3**	0	1	0	4	2	0	**8**	0	**10**	0	0	**11**	0	11	9	**1**	**6**	0	16	**41**
04:15 PM	1	0	**10**	0	**11**	3	0	0	0	3	3	0	6	0	9	**12**	0	6	0	**18**	41
04:30 PM	2	0	7	0	9	4	**1**	0	0	5	**5**	0	3	0	8	11	0	6	0	17	39
04:45 PM	0	0	10	0	10	**6**	0	0	0	6	4	0	8	0	**12**	3	0	4	0	7	35
Total Volume	6	0	28	0	34	15	1	8	0	24	12	0	28	0	40	35	1	22	0	58	156
% App. Total	17.6	0	82.4	0		62.5	4.2	33.3	0		30	0	70	0		60.3	1.7	37.9	0		
PHF	.500	.000	.700	.000	.773	.625	.250	.250	.000	.600	.600	.000	.636	.000	.833	.729	.250	.917	.000	.806	.951



Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

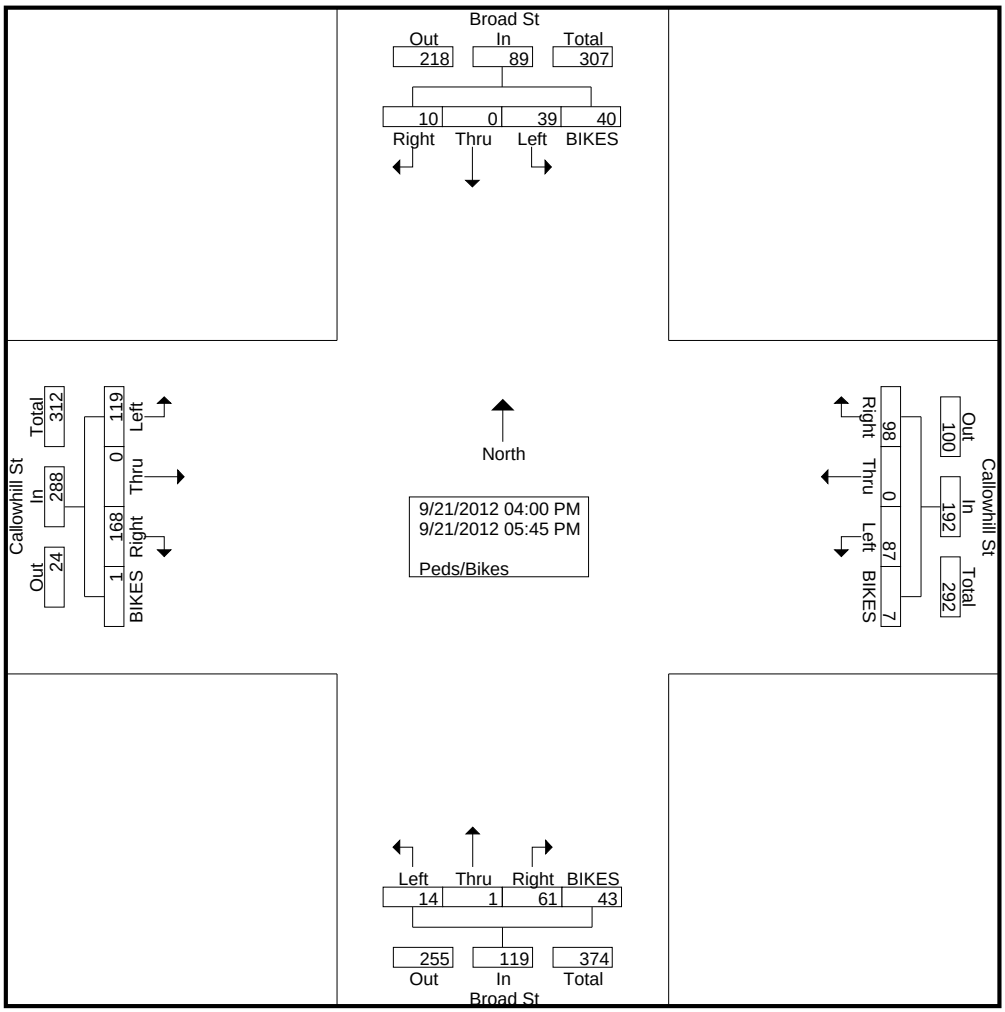
Broad Street & Callowhill Street

Counter: 13
Counted by: D. Little
Weather: Clear
Saved as: 2012-09-21 FRIBC

File Name : 2012-09-21 FRIBC
Site Code : 00000000
Start Date : 9/21/2012
Page No : 1

Groups Printed- Peds/Bikes

	Callowhill St Eastbound					Callowhill St Westbound					Broad St Northbound					Broad St Southbound					
Start Time	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Int. Total
04:00 PM	14	0	27	0	41	14	0	10	0	24	1	0	3	2	6	4	0	2	8	14	85
04:15 PM	18	0	18	1	37	16	0	9	1	26	1	0	9	2	12	1	0	2	2	5	80
04:30 PM	15	0	17	0	32	11	0	17	1	29	0	0	8	3	11	18	0	1	4	23	95
04:45 PM	13	0	23	0	36	9	0	9	1	19	2	0	8	7	17	3	0	0	4	7	79
Total	60	0	85	1	146	50	0	45	3	98	4	0	28	14	46	26	0	5	18	49	339
05:00 PM	17	0	23	0	40	9	0	12	0	21	5	0	8	10	23	3	0	2	5	10	94
05:15 PM	13	0	27	0	40	13	0	9	3	25	1	0	11	6	18	3	0	2	8	13	96
05:30 PM	16	0	14	0	30	9	0	19	0	28	1	1	10	4	16	5	0	1	4	10	84
05:45 PM	13	0	19	0	32	6	0	13	1	20	3	0	4	9	16	2	0	0	5	7	75
Total	59	0	83	0	142	37	0	53	4	94	10	1	33	29	73	13	0	5	22	40	349
Grand Total	119	0	168	1	288	87	0	98	7	192	14	1	61	43	119	39	0	10	40	89	688
Apprch %	41.3	0	58.3	0.3		45.3	0	51	3.6		11.8	0.8	51.3	36.1		43.8	0	11.2	44.9		
Total %	17.3	0	24.4	0.1	41.9	12.6	0	14.2	1	27.9	2	0.1	8.9	6.2	17.3	5.7	0	1.5	5.8	12.9	



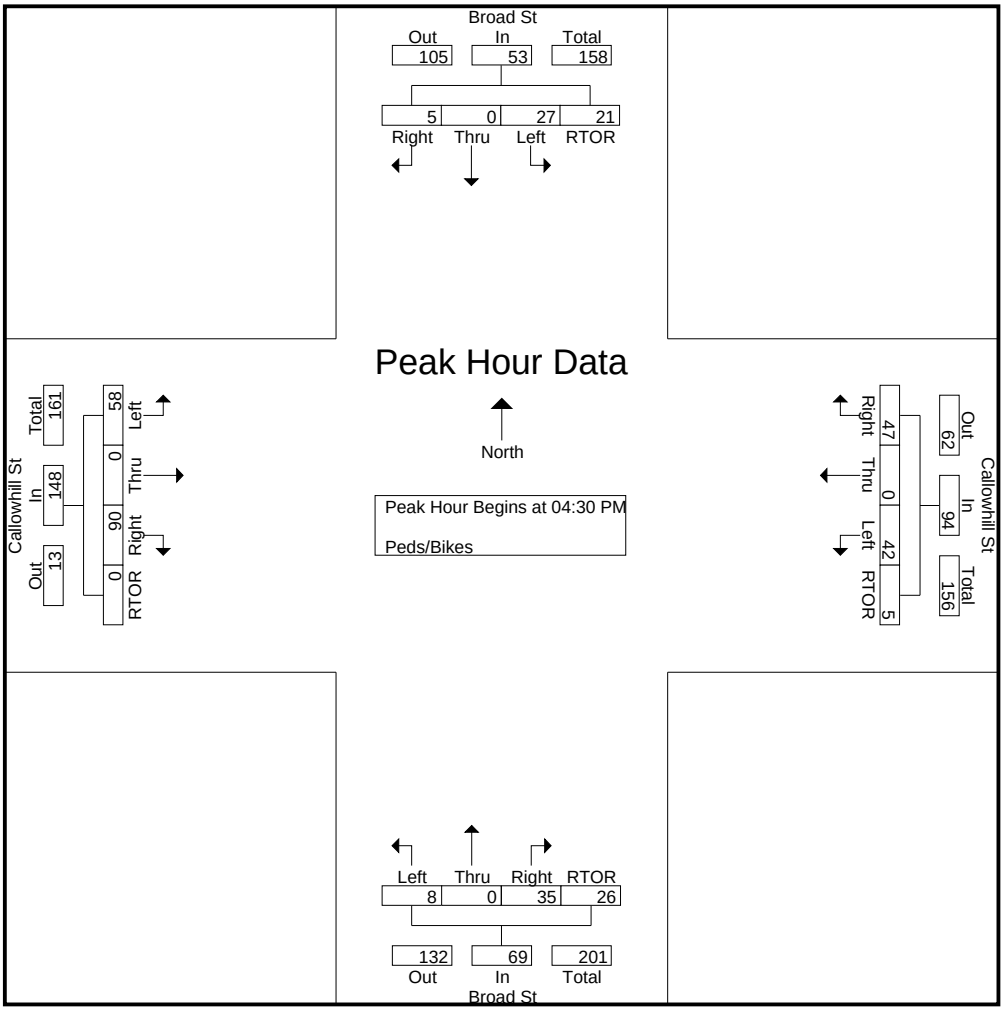
Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

Broad Street & Callowhill Street

Counter: 13
Counted by: D. Little
Weather: Clear
Saved as: 2012-09-21 FRIBC

File Name : 2012-09-21 FRIBC
Site Code : 00000000
Start Date : 9/21/2012
Page No : 2

	Callowhill St Eastbound					Callowhill St Westbound					Broad St Northbound					Broad St Southbound					
Start Time	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	15	0	17	0	32	11	0	**17**	1	**29**	0	0	8	3	11	**18**	0	1	4	**23**	95
04:45 PM	13	0	23	0	36	9	0	9	1	19	2	0	8	7	17	3	0	0	4	7	79
05:00 PM	**17**	0	23	0	**40**	9	0	12	0	21	**5**	0	8	**10**	**23**	3	0	**2**	5	10	94
05:15 PM	13	0	**27**	0	40	**13**	0	9	**3**	25	1	0	**11**	6	18	3	0	2	**8**	13	**96**
Total Volume	58	0	90	0	148	42	0	47	5	94	8	0	35	26	69	27	0	5	21	53	364
% App. Total	39.2	0	60.8	0		44.7	0	50	5.3		11.6	0	50.7	37.7		50.9	0	9.4	39.6		
PHF	.853	.000	.833	.000	.925	.808	.000	.691	.417	.810	.400	.000	.795	.650	.750	.375	.000	.625	.656	.576	.948



Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

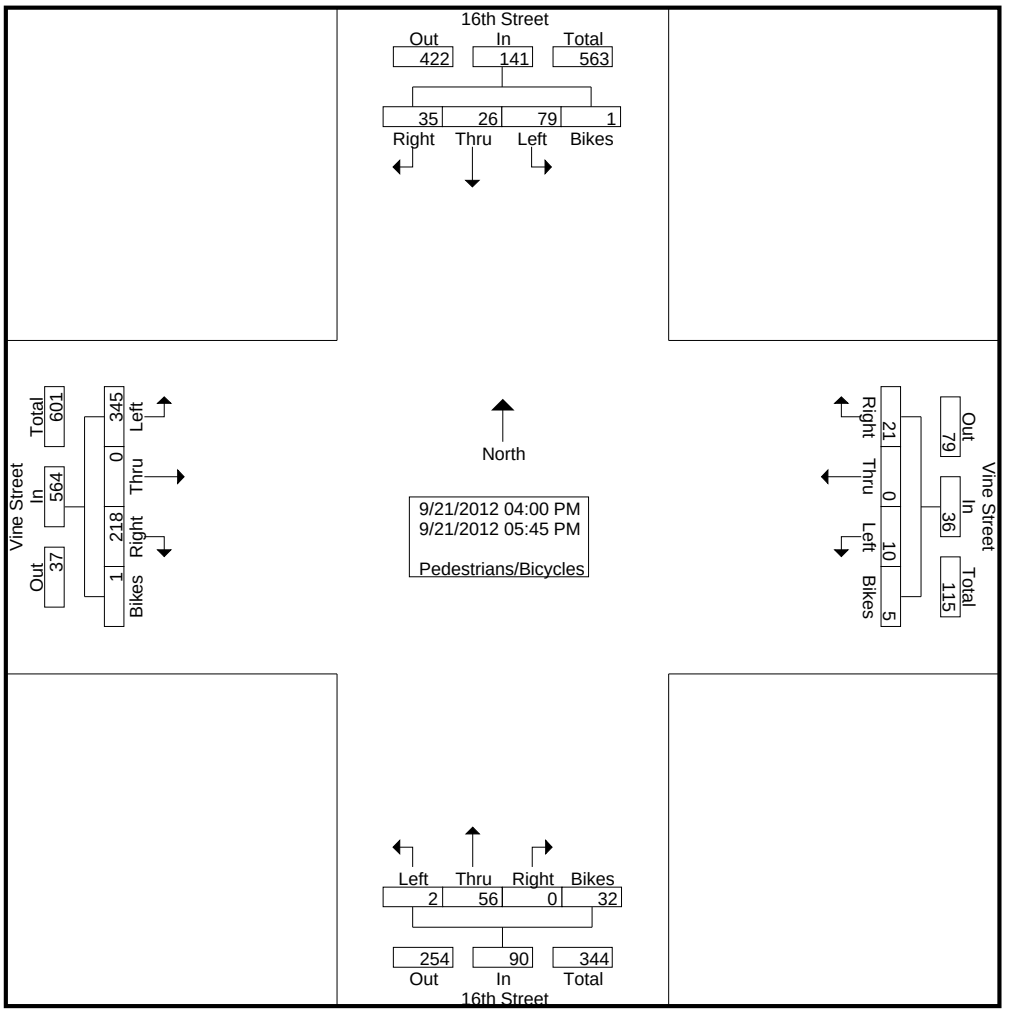
16th Street & Vine Street

Counter: PTO 18
Counted by: BP
Weather: Clear
Saved as: 2012-09-21 PMVS16

File Name : #5 - 2012-09-21 PMVS16
Site Code : 00000000
Start Date : 9/21/2012
Page No : 1

Groups Printed- Pedestrians/Bicycles

	Vine Street Eastbound					Vine Street Westbound					16th Street Northbound					16th Street Southbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
04:00 PM	51	0	30	0	81	3	0	2	2	7	0	9	0	3	12	11	6	8	0	25	125
04:15 PM	47	0	24	0	71	1	0	2	0	3	2	15	0	3	20	15	2	3	0	20	114
04:30 PM	41	0	49	0	90	0	0	5	0	5	0	4	0	4	8	5	2	3	0	10	113
04:45 PM	49	0	20	0	69	1	0	2	1	4	0	3	0	2	5	8	2	4	0	14	92
Total	188	0	123	0	311	5	0	11	3	19	2	31	0	12	45	39	12	18	0	69	444
05:00 PM	54	0	29	0	83	0	0	5	1	6	0	8	0	5	13	10	2	5	0	17	119
05:15 PM	42	0	23	0	65	3	0	3	0	6	0	7	0	5	12	5	6	3	0	14	97
05:30 PM	38	0	30	0	68	1	0	2	1	4	0	8	0	7	15	12	5	8	1	26	113
05:45 PM	23	0	13	1	37	1	0	0	0	1	0	2	0	3	5	13	1	1	0	15	58
Total	157	0	95	1	253	5	0	10	2	17	0	25	0	20	45	40	14	17	1	72	387
Grand Total	345	0	218	1	564	10	0	21	5	36	2	56	0	32	90	79	26	35	1	141	831
Apprch %	61.2	0	38.7	0.2		27.8	0	58.3	13.9		2.2	62.2	0	35.6		56	18.4	24.8	0.7		
Total %	41.5	0	26.2	0.1	67.9	1.2	0	2.5	0.6	4.3	0.2	6.7	0	3.9	10.8	9.5	3.1	4.2	0.1	17	



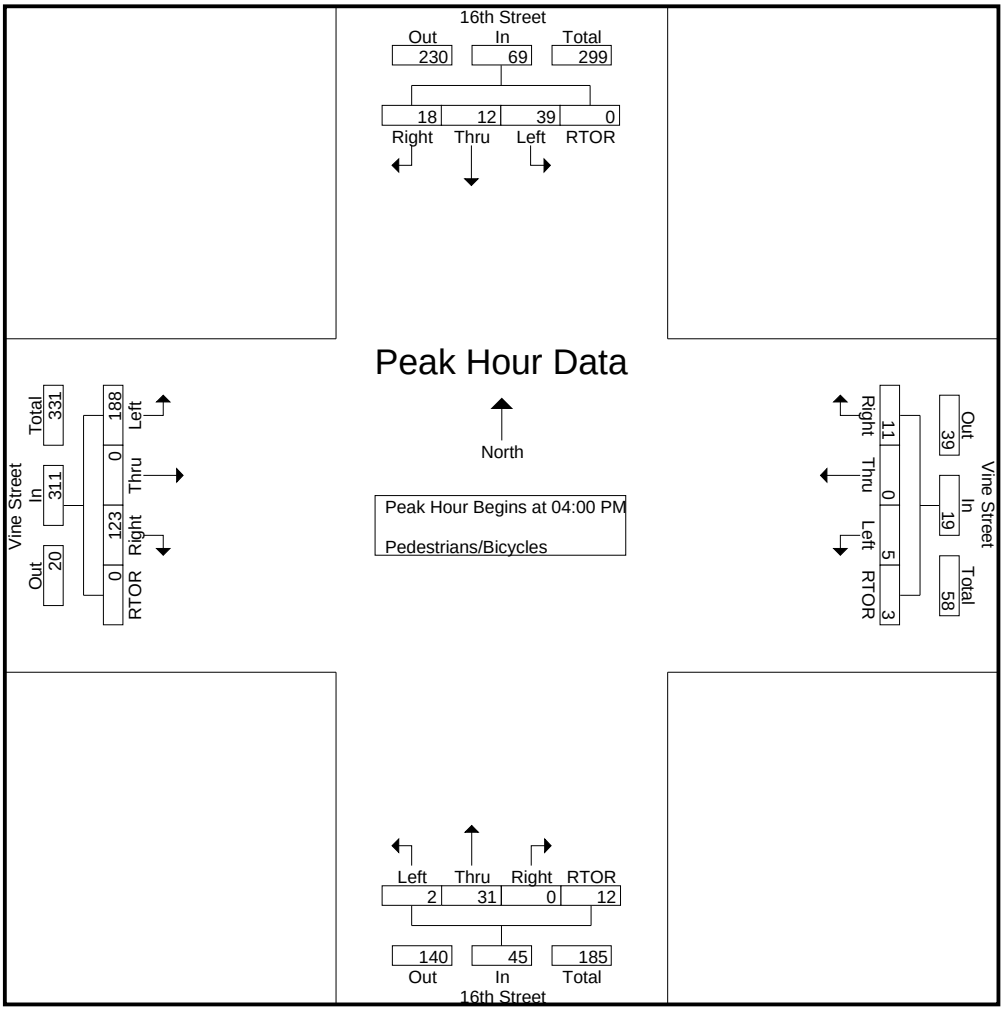
Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

16th Street & Vine Street

Counter: PTO 18
Counted by: BP
Weather: Clear
Saved as: 2012-09-21 PMVS16

File Name : #5 - 2012-09-21 PMVS16
Site Code : 00000000
Start Date : 9/21/2012
Page No : 2

	Vine Street Eastbound					Vine Street Westbound					16th Street Northbound					16th Street Southbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**51**	0	30	0	81	**3**	0	2	**2**	**7**	0	9	0	3	12	11	**6**	**8**	0	**25**	**125**
04:15 PM	47	0	24	0	71	1	0	2	0	3	**2**	**15**	0	3	**20**	**15**	2	3	0	20	114
04:30 PM	41	0	**49**	0	**90**	0	0	**5**	0	5	0	4	0	**4**	8	5	2	3	0	10	113
04:45 PM	49	0	20	0	69	1	0	2	1	4	0	3	0	2	5	8	2	4	0	14	92
Total Volume	188	0	123	0	311	5	0	11	3	19	2	31	0	12	45	39	12	18	0	69	444
% App. Total	60.5	0	39.5	0		26.3	0	57.9	15.8		4.4	68.9	0	26.7		56.5	17.4	26.1	0		
PHF	.922	.000	.628	.000	.864	.417	.000	.550	.375	.679	.250	.517	.000	.750	.563	.650	.500	.563	.000	.690	.888



Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

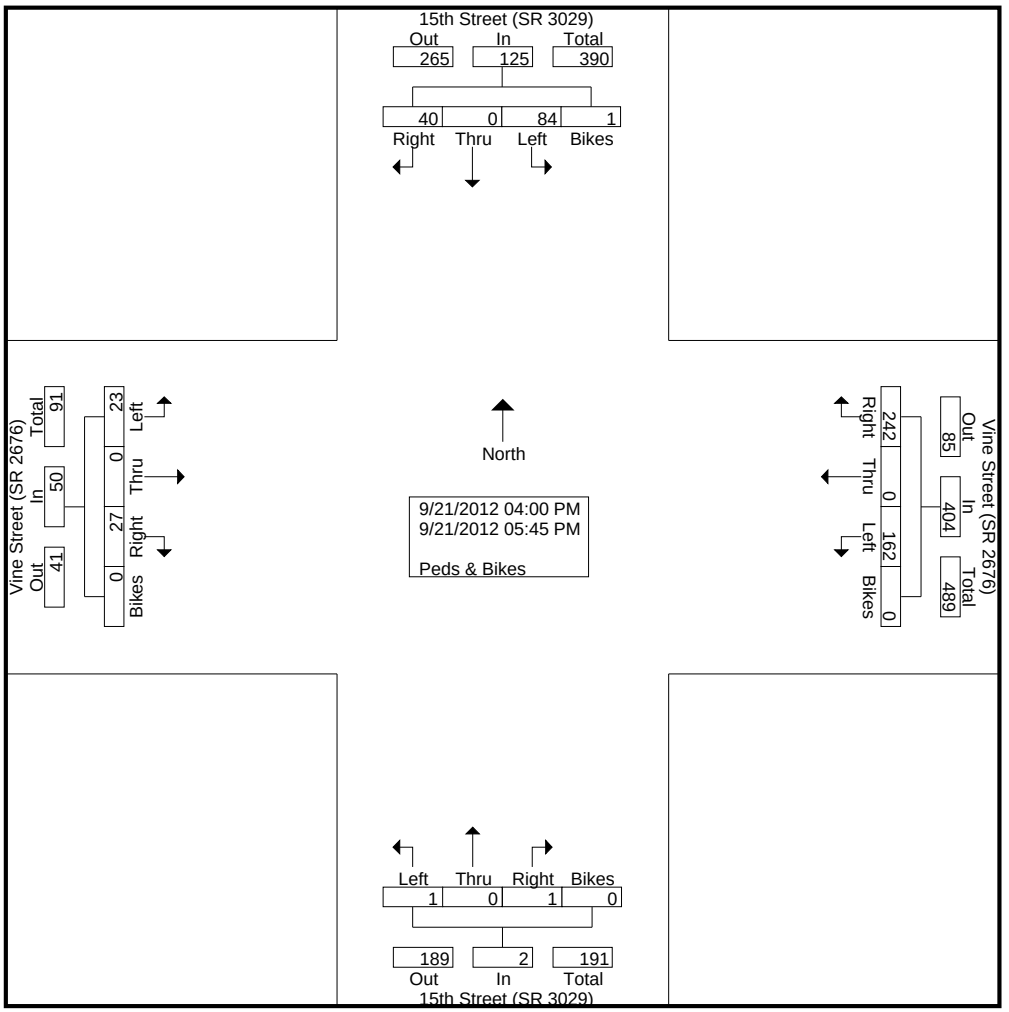
15th Street (SB) & Vine Street (WB)

Counter #: 14
Counted By: J. Wolfinger
Weather: Sunny
2012-09-21 FRI 15th VS-north

File Name : 2012-09-21 FRI 15th Vine-North
Site Code : 00000000
Start Date : 9/21/2012
Page No : 1

Groups Printed- Peds & Bikes

	Vine Street (SR 2676) Eastbound					Vine Street (SR 2676) Westbound					15th Street (SR 3029) Northbound					15th Street (SR 3029) Southbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
04:00 PM	1	0	1	0	2	22	0	29	0	51	0	0	0	0	0	12	0	8	0	20	73
04:15 PM	2	0	2	0	4	27	0	31	0	58	0	0	0	0	0	19	0	3	1	23	85
04:30 PM	4	0	2	0	6	16	0	27	0	43	0	0	0	0	0	8	0	1	0	9	58
04:45 PM	2	0	9	0	11	20	0	34	0	54	0	0	0	0	0	4	0	7	0	11	76
Total	9	0	14	0	23	85	0	121	0	206	0	0	0	0	0	43	0	19	1	63	292
05:00 PM	5	0	4	0	9	22	0	34	0	56	0	0	0	0	0	10	0	1	0	11	76
05:15 PM	2	0	5	0	7	26	0	40	0	66	0	0	1	0	1	11	0	11	0	22	96
05:30 PM	5	0	2	0	7	16	0	25	0	41	1	0	0	0	1	10	0	5	0	15	64
05:45 PM	2	0	2	0	4	13	0	22	0	35	0	0	0	0	0	10	0	4	0	14	53
Total	14	0	13	0	27	77	0	121	0	198	1	0	1	0	2	41	0	21	0	62	289
Grand Total	23	0	27	0	50	162	0	242	0	404	1	0	1	0	2	84	0	40	1	125	581
Apprch %	46	0	54	0		40.1	0	59.9	0		50	0	50	0		67.2	0	32	0.8		
Total %	4	0	4.6	0	8.6	27.9	0	41.7	0	69.5	0.2	0	0.2	0	0.3	14.5	0	6.9	0.2	21.5	



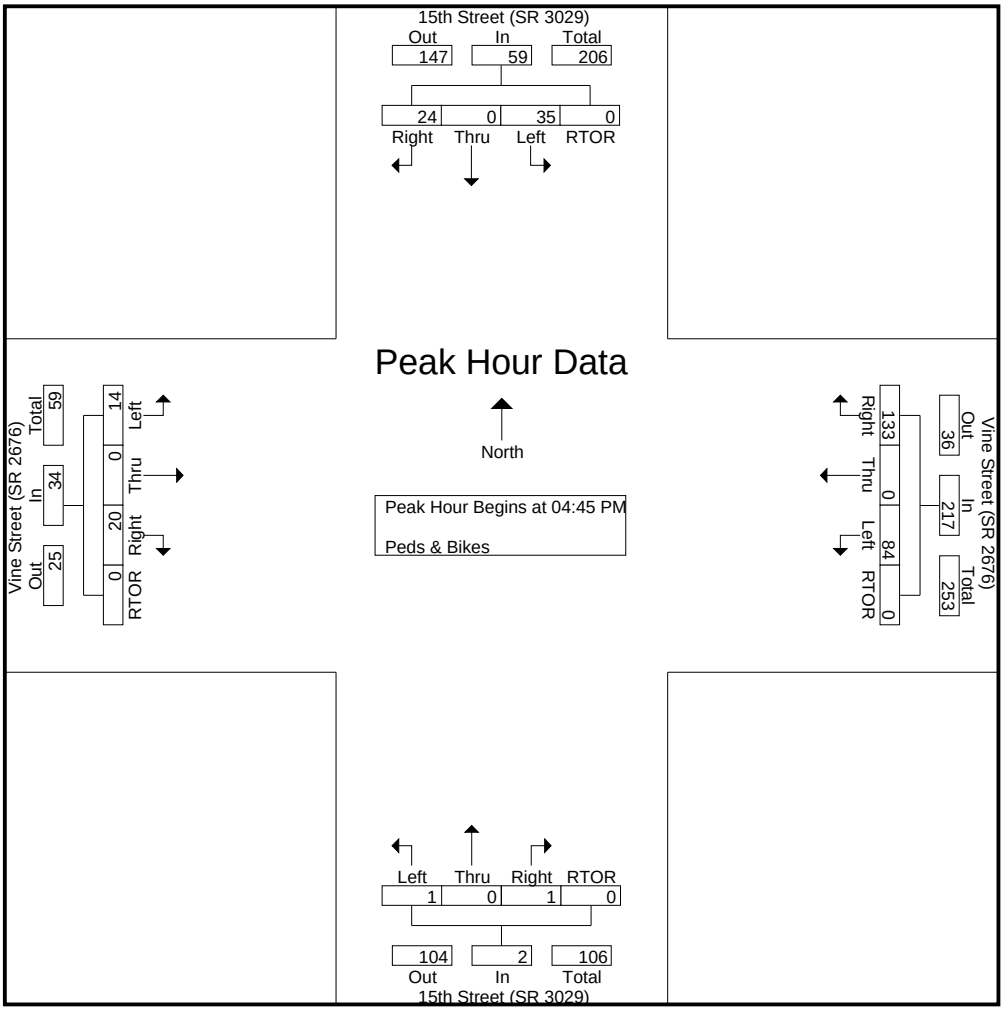
Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

15th Street (SB) & Vine Street (WB)

Counter #: 14
Counted By: J. Wolfinger
Weather: Sunny
2012-09-21 FRI 15th VS-north

File Name : 2012-09-21 FRI 15th Vine-North
Site Code : 00000000
Start Date : 9/21/2012
Page No : 2

	Vine Street (SR 2676) Eastbound					Vine Street (SR 2676) Westbound					15th Street (SR 3029) Northbound					15th Street (SR 3029) Southbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	2	0	**9**	0	**11**	20	0	34	0	54	0	0	0	0	0	4	0	7	0	11	76
05:00 PM	**5**	0	4	0	9	22	0	34	0	56	0	0	0	0	0	10	0	1	0	11	76
05:15 PM	2	0	5	0	7	**26**	0	**40**	0	**66**	0	0	**1**	0	**1**	**11**	0	**11**	0	**22**	**96**
05:30 PM	5	0	2	0	7	16	0	25	0	41	**1**	0	0	0	1	10	0	5	0	15	64
Total Volume	14	0	20	0	34	84	0	133	0	217	1	0	1	0	2	35	0	24	0	59	312
% App. Total	41.2	0	58.8	0		38.7	0	61.3	0		50	0	50	0		59.3	0	40.7	0		
PHF	.700	.000	.556	.000	.773	.808	.000	.831	.000	.822	.250	.000	.250	.000	.500	.795	.000	.545	.000	.670	.813



Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

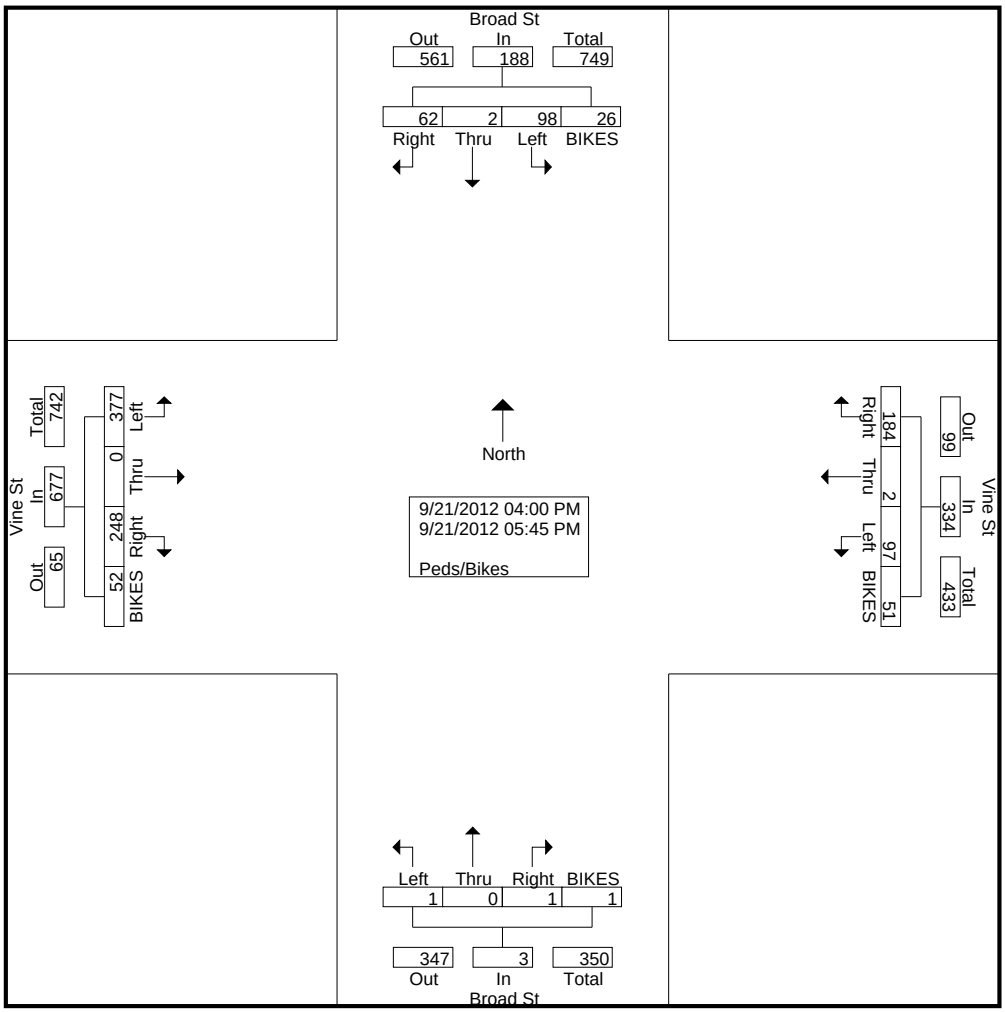
Broad Street & WB Vine Street

Counter: D4-5388
Counted by: J. Muthersbaugh
Weather: Sunny
Saved as: 2011-09-21 FRIBV

File Name : 2012-09-21 FRIBV
Site Code : 00000000
Start Date : 9/21/2012
Page No : 1

Groups Printed- Peds/Bikes

	Vine St Eastbound					Vine St Westbound					Broad St Northbound					Broad St Southbound					
Start Time	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Int. Total
04:00 PM	66	0	38	8	112	9	1	21	2	33	0	0	0	0	0	11	0	9	4	24	169
04:15 PM	35	0	33	2	70	24	0	24	4	52	0	0	0	0	0	13	0	9	3	25	147
04:30 PM	39	0	24	4	67	5	0	21	3	29	0	0	1	0	1	5	1	7	3	16	113
04:45 PM	44	0	27	4	75	9	0	19	3	31	0	0	0	0	0	9	0	9	5	23	129
Total	184	0	122	18	324	47	1	85	12	145	0	0	1	0	1	38	1	34	15	88	558
05:00 PM	56	0	34	4	94	16	1	22	13	52	1	0	0	1	2	18	0	2	1	21	169
05:15 PM	50	0	30	14	94	14	0	22	11	47	0	0	0	0	0	17	1	7	6	31	172
05:30 PM	52	0	26	8	86	10	0	23	8	41	0	0	0	0	0	15	0	9	4	28	155
05:45 PM	35	0	36	8	79	10	0	32	7	49	0	0	0	0	0	10	0	10	0	20	148
Total	193	0	126	34	353	50	1	99	39	189	1	0	0	1	2	60	1	28	11	100	644
Grand Total	377	0	248	52	677	97	2	184	51	334	1	0	1	1	3	98	2	62	26	188	1202
Apprch %	55.7	0	36.6	7.7		29	0.6	55.1	15.3		33.3	0	33.3	33.3		52.1	1.1	33	13.8		
Total %	31.4	0	20.6	4.3	56.3	8.1	0.2	15.3	4.2	27.8	0.1	0	0.1	0.1	0.2	8.2	0.2	5.2	2.2	15.6	



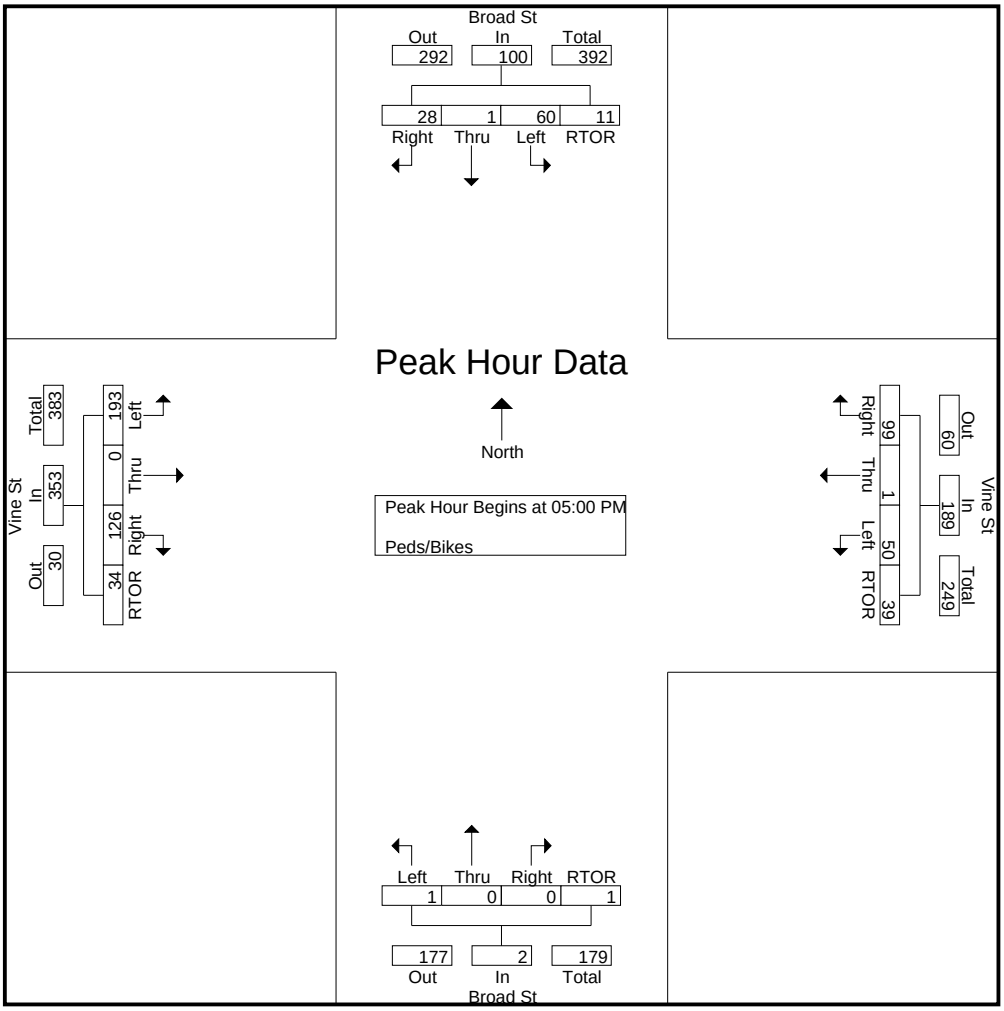
Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

Broad Street & WB Vine Street

Counter: D4-5388
Counted by: J. Muthersbaugh
Weather: Sunny
Saved as: 2011-09-21 FRIBV

File Name : 2012-09-21 FRIBV
Site Code : 00000000
Start Date : 9/21/2012
Page No : 2

	Vine St Eastbound					Vine St Westbound					Broad St Northbound					Broad St Southbound					
Start Time	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	**56**	0	34	4	**94**	**16**	**1**	22	**13**	**52**	**1**	0	0	**1**	**2**	**18**	0	2	1	21	169
05:15 PM	50	0	30	**14**	94	14	0	22	11	47	0	0	0	0	0	17	**1**	7	**6**	**31**	**172**
05:30 PM	52	0	26	8	86	10	0	23	8	41	0	0	0	0	0	15	0	9	4	28	155
05:45 PM	35	0	**36**	8	79	10	0	**32**	7	49	0	0	0	0	0	10	0	**10**	0	20	148
Total Volume	193	0	126	34	353	50	1	99	39	189	1	0	0	1	2	60	1	28	11	100	644
% App. Total	54.7	0	35.7	9.6		26.5	0.5	52.4	20.6		50	0	0	50		60	1	28	11		
PHF	.862	.000	.875	.607	.939	.781	.250	.773	.750	.909	.250	.000	.000	.250	.250	.833	.250	.700	.458	.806	.936



Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

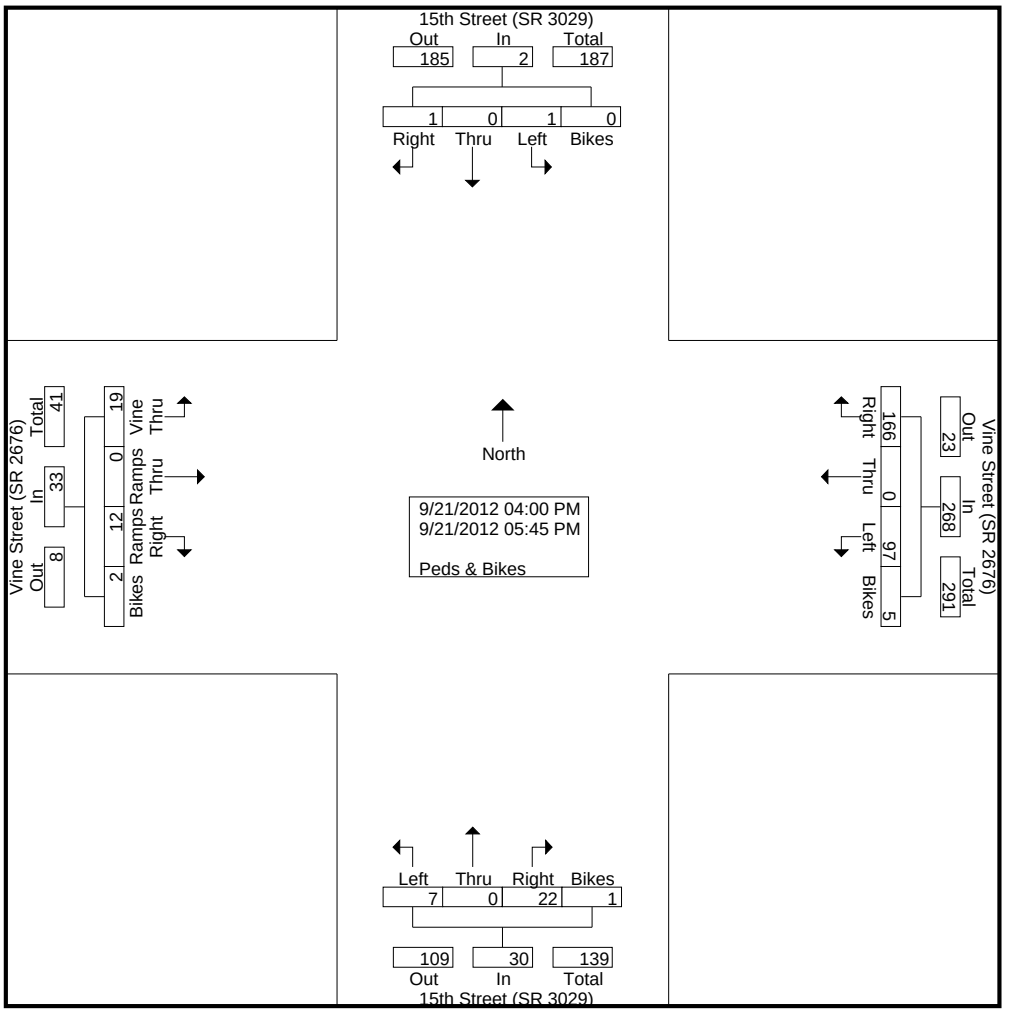
15th Street (SB) & Vine Street (EB) / Ramps

Counter #: 6
Counted By: J. Funk
Weather: Sunny
2012-09-21 FRI 15th VS South

File Name : 2012-09-21 FRI 15th Vine-South
Site Code : 00000000
Start Date : 9/21/2012
Page No : 1

Groups Printed- Peds & Bikes

	Vine Street (SR 2676) Eastbound					Vine Street (SR 2676) Westbound					15th Street (SR 3029) Northbound					15th Street (SR 3029) Southbound					
Start Time	Vine Thru	Ramps Thru	Ramps Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
04:00 PM	0	0	0	1	1	23	0	23	0	46	1	0	0	0	1	0	0	0	0	0	48
04:15 PM	2	0	1	0	3	17	0	19	2	38	0	0	1	1	2	0	0	0	0	0	43
04:30 PM	0	0	3	0	3	8	0	19	0	27	1	0	1	0	2	0	0	1	0	1	33
04:45 PM	3	0	4	1	8	10	0	23	0	33	0	0	3	0	3	0	0	0	0	0	44
Total	5	0	8	2	15	58	0	84	2	144	2	0	5	1	8	0	0	1	0	1	168
05:00 PM	5	0	2	0	7	13	0	23	0	36	1	0	10	0	11	0	0	0	0	0	54
05:15 PM	1	0	0	0	1	11	0	24	2	37	0	0	3	0	3	1	0	0	0	1	42
05:30 PM	4	0	0	0	4	11	0	17	0	28	0	0	2	0	2	0	0	0	0	0	34
05:45 PM	4	0	2	0	6	4	0	18	1	23	4	0	2	0	6	0	0	0	0	0	35
Total	14	0	4	0	18	39	0	82	3	124	5	0	17	0	22	1	0	0	0	1	165
Grand Total	19	0	12	2	33	97	0	166	5	268	7	0	22	1	30	1	0	1	0	2	333
Apprch %	57.6	0	36.4	6.1		36.2	0	61.9	1.9		23.3	0	73.3	3.3		50	0	50	0		
Total %	5.7	0	3.6	0.6	9.9	29.1	0	49.8	1.5	80.5	2.1	0	6.6	0.3	9	0.3	0	0.3	0	0.6	



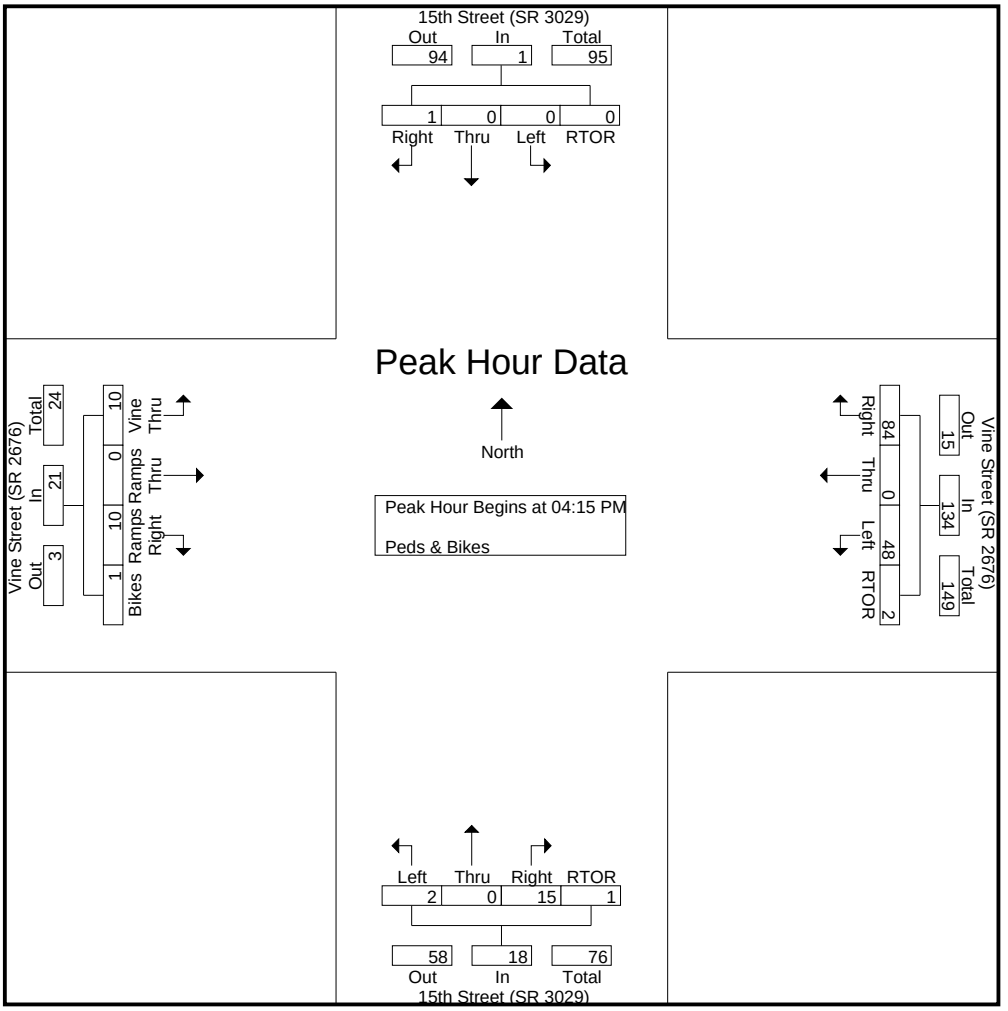
Traffic Planning & Design, Inc.
812 W. Hamilton Street, Suite 402
Allentown, PA 18101

15th Street (SB) & Vine Street (EB) / Ramps

Counter #: 6
Counted By: J. Funk
Weather: Sunny
2012-09-21 FRI 15th VS South

File Name : 2012-09-21 FRI 15th Vine-South
Site Code : 00000000
Start Date : 9/21/2012
Page No : 2

	Vine Street (SR 2676) Eastbound					Vine Street (SR 2676) Westbound					15th Street (SR 3029) Northbound					15th Street (SR 3029) Southbound					
Start Time	Vine Thru	Ramps Thru	Ramps Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	2	0	1	0	3	**17**	0	19	**2**	**38**	0	0	1	**1**	2	0	0	0	0	0	43
04:30 PM	0	0	3	0	3	8	0	19	0	27	**1**	0	1	0	2	0	0	**1**	0	**1**	33
04:45 PM	3	0	**4**	**1**	**8**	10	0	**23**	0	33	0	0	3	0	3	0	0	0	0	0	44
05:00 PM	**5**	0	2	0	7	13	0	23	0	36	1	0	**10**	0	**11**	0	0	0	0	0	**54**
Total Volume	10	0	10	1	21	48	0	84	2	134	2	0	15	1	18	0	0	1	0	1	174
% App. Total	47.6	0	47.6	4.8		35.8	0	62.7	1.5		11.1	0	83.3	5.6		0	0	100	0		
PHF	.500	.000	.625	.250	.656	.706	.000	.913	.250	.882	.500	.000	.375	.250	.409	.000	.000	.250	.000	.250	.806



Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

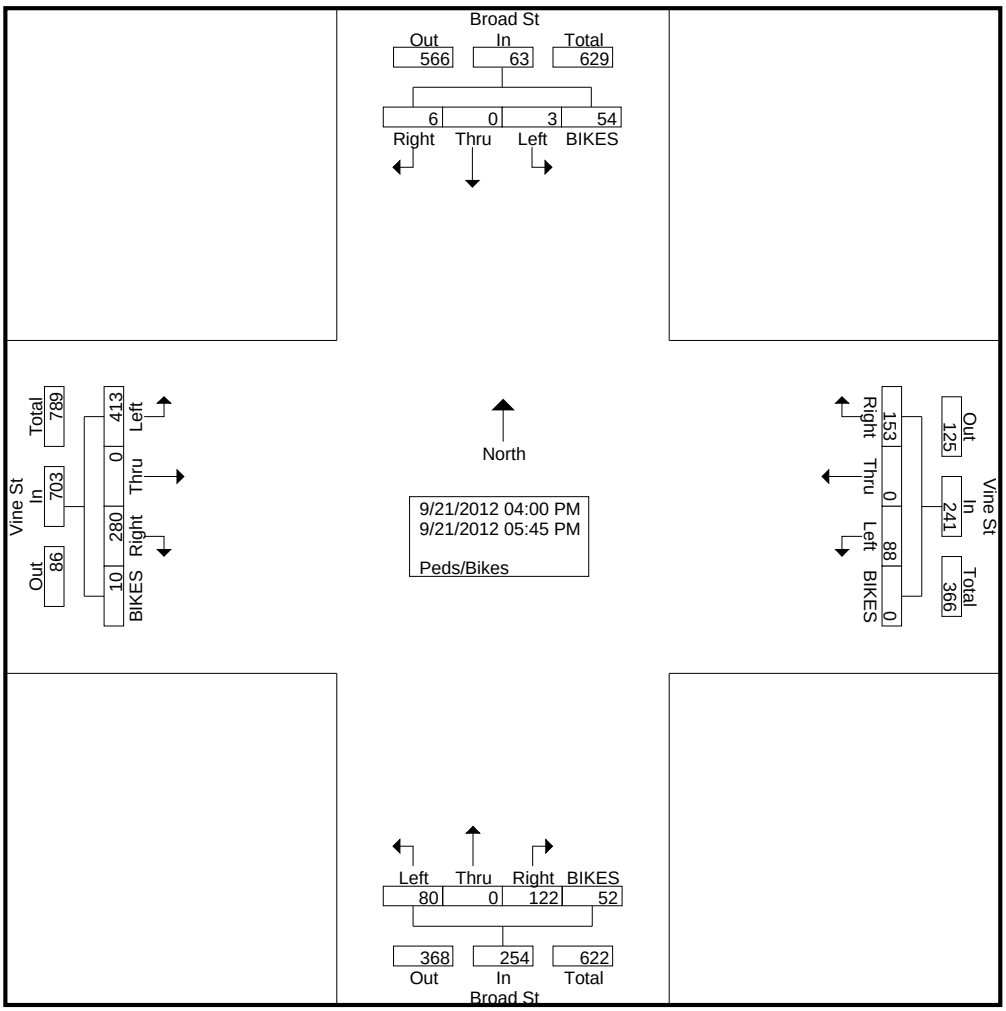
Broad Street and EB Vine Street

Counter: 19
Counted by: F. Montgomery
Weather: Sunny
Saved as: 2012-09-21 FRIBNV

File Name : 2012-09-21 FRIBNV
Site Code : 00000005
Start Date : 9/21/2012
Page No : 1

Groups Printed- Peds/Bikes

	Broad St Northbound					Broad St Southbound					Vine St Eastbound					Vine St Westbound					
Start Time	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Int. Total
04:00 PM	13	0	14	1	28	1	0	0	7	8	87	0	56	2	145	7	0	12	0	19	200
04:15 PM	8	0	16	6	30	0	0	2	3	5	39	0	32	0	71	24	0	30	0	54	160
04:30 PM	16	0	21	5	42	1	0	1	4	6	42	0	29	0	71	4	0	19	0	23	142
04:45 PM	11	0	11	4	26	0	0	1	6	7	48	0	33	5	86	10	0	17	0	27	146
Total	48	0	62	16	126	2	0	4	20	26	216	0	150	7	373	45	0	78	0	123	648
05:00 PM	17	0	22	13	52	0	0	0	7	7	52	0	33	1	86	11	0	21	0	32	177
05:15 PM	5	0	12	8	25	0	0	0	7	7	52	0	37	1	90	14	0	17	0	31	153
05:30 PM	5	0	17	7	29	1	0	2	11	14	62	0	26	0	88	11	0	21	0	32	163
05:45 PM	5	0	9	8	22	0	0	0	9	9	31	0	34	1	66	7	0	16	0	23	120
Total	32	0	60	36	128	1	0	2	34	37	197	0	130	3	330	43	0	75	0	118	613
Grand Total	80	0	122	52	254	3	0	6	54	63	413	0	280	10	703	88	0	153	0	241	1261
Apprch %	31.5	0	48	20.5		4.8	0	9.5	85.7		58.7	0	39.8	1.4		36.5	0	63.5	0		
Total %	6.3	0	9.7	4.1	20.1	0.2	0	0.5	4.3	5	32.8	0	22.2	0.8	55.7	7	0	12.1	0	19.1	



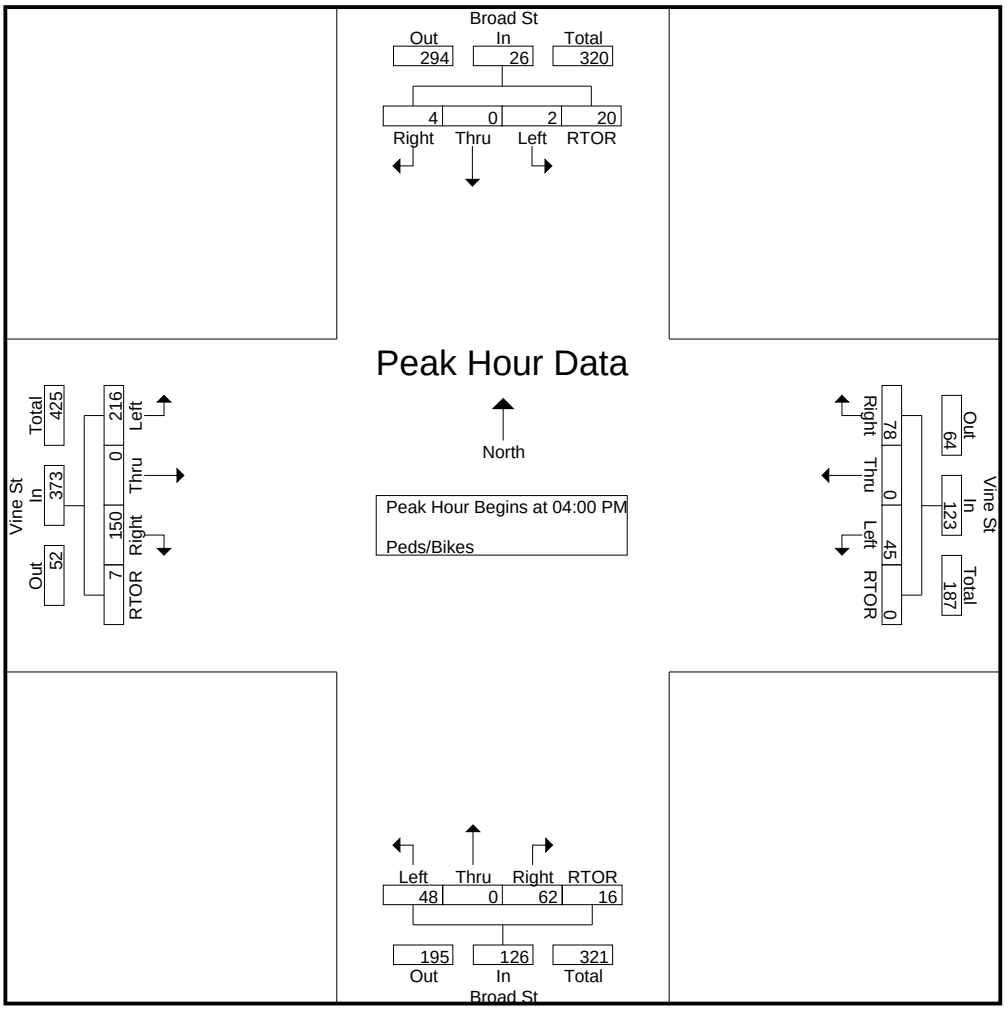
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

Broad Street and EB Vine Street

Counter: 19
Counted by: F. Montgomery
Weather: Sunny
Saved as: 2012-09-21 FRIBNV

File Name : 2012-09-21 FRIBNV
Site Code : 00000005
Start Date : 9/21/2012
Page No : 2

	Broad St Northbound					Broad St Southbound					Vine St Eastbound					Vine St Westbound					
Start Time	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Left	Thru	Right	BIKES	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	13	0	14	1	28	**1**	0	0	**7**	**8**	**87**	0	**56**	2	**145**	7	0	12	0	19	**200**
04:15 PM	8	0	16	**6**	30	0	0	**2**	3	5	39	0	32	0	71	**24**	0	**30**	0	**54**	160
04:30 PM	**16**	0	**21**	5	**42**	1	0	1	4	6	42	0	29	0	71	4	0	19	0	23	142
04:45 PM	11	0	11	4	26	0	0	1	6	7	48	0	33	**5**	86	10	0	17	0	27	146
Total Volume	48	0	62	16	126	2	0	4	20	26	216	0	150	7	373	45	0	78	0	123	648
% App. Total	38.1	0	49.2	12.7		7.7	0	15.4	76.9		57.9	0	40.2	1.9		36.6	0	63.4	0		
PHF	.750	.000	.738	.667	.750	.500	.000	.500	.714	.813	.621	.000	.670	.350	.643	.469	.000	.650	.000	.569	.810



Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

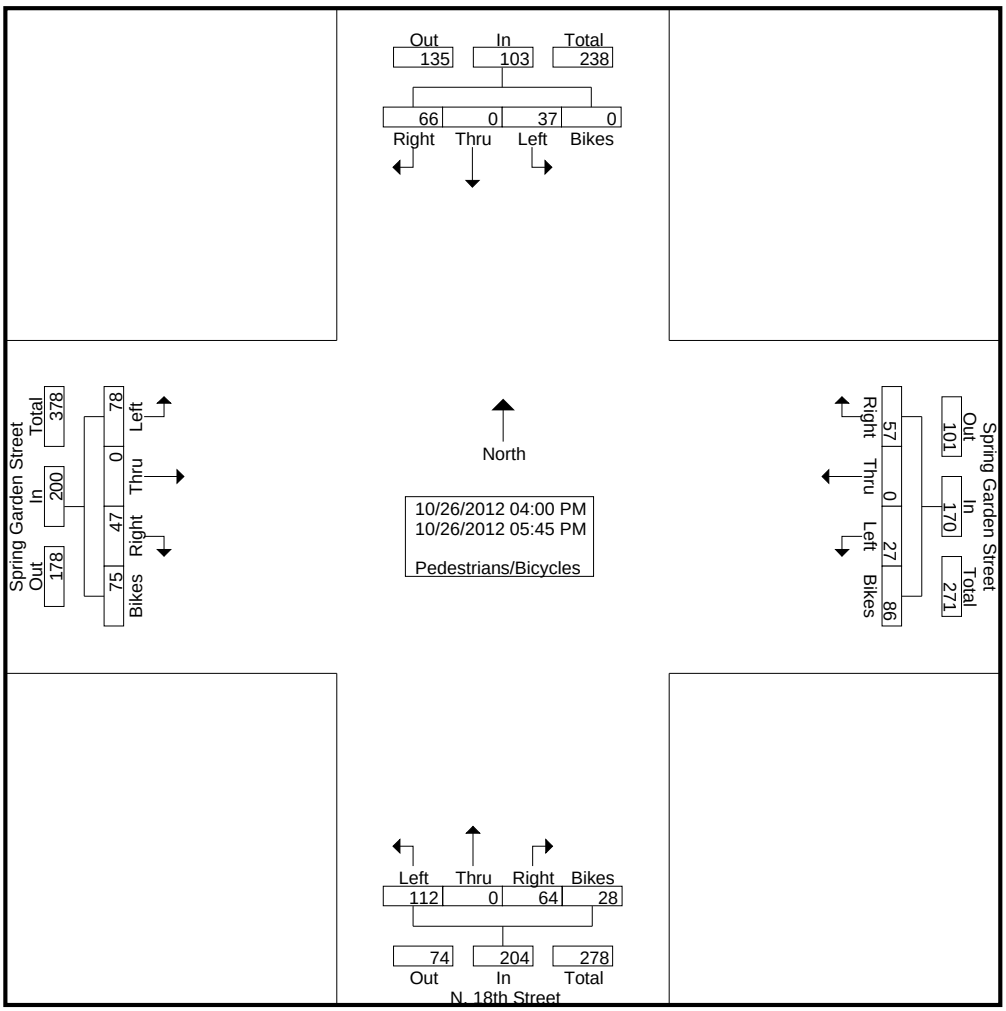
Spring Garden Street and N 18th Street

Counter: SJO 26
Counted by: JH
Weather: Clear
Saved as: 2012-10-26 PMSGS18

File Name : 2012-10-26 PMSGS18
Site Code : 00000000
Start Date : 10/26/2012
Page No : 1

Groups Printed- Pedestrians/Bicycles

	N. 18th Street Northbound					Southbound					Spring Garden Street Eastbound					Spring Garden Street Westbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
04:00 PM	20	0	11	2	33	3	0	9	0	12	7	0	4	7	18	1	0	9	19	29	92
04:15 PM	8	0	8	6	22	4	0	9	0	13	8	0	5	6	19	0	0	13	6	19	73
04:30 PM	14	0	4	6	24	0	0	5	0	5	7	0	6	8	21	5	0	4	12	21	71
04:45 PM	17	0	7	5	29	5	0	10	0	15	9	0	8	6	23	8	0	5	8	21	88
Total	59	0	30	19	108	12	0	33	0	45	31	0	23	27	81	14	0	31	45	90	324
05:00 PM	21	0	9	2	32	3	0	6	0	9	13	0	4	10	27	7	0	8	8	23	91
05:15 PM	17	0	12	5	34	6	0	5	0	11	19	0	8	14	41	3	0	4	6	13	99
05:30 PM	10	0	7	1	18	10	0	13	0	23	7	0	8	13	28	1	0	9	16	26	95
05:45 PM	5	0	6	1	12	6	0	9	0	15	8	0	4	11	23	2	0	5	11	18	68
Total	53	0	34	9	96	25	0	33	0	58	47	0	24	48	119	13	0	26	41	80	353
Grand Total	112	0	64	28	204	37	0	66	0	103	78	0	47	75	200	27	0	57	86	170	677
Apprch %	54.9	0	31.4	13.7		35.9	0	64.1	0		39	0	23.5	37.5		15.9	0	33.5	50.6		
Total %	16.5	0	9.5	4.1	30.1	5.5	0	9.7	0	15.2	11.5	0	6.9	11.1	29.5	4	0	8.4	12.7	25.1	



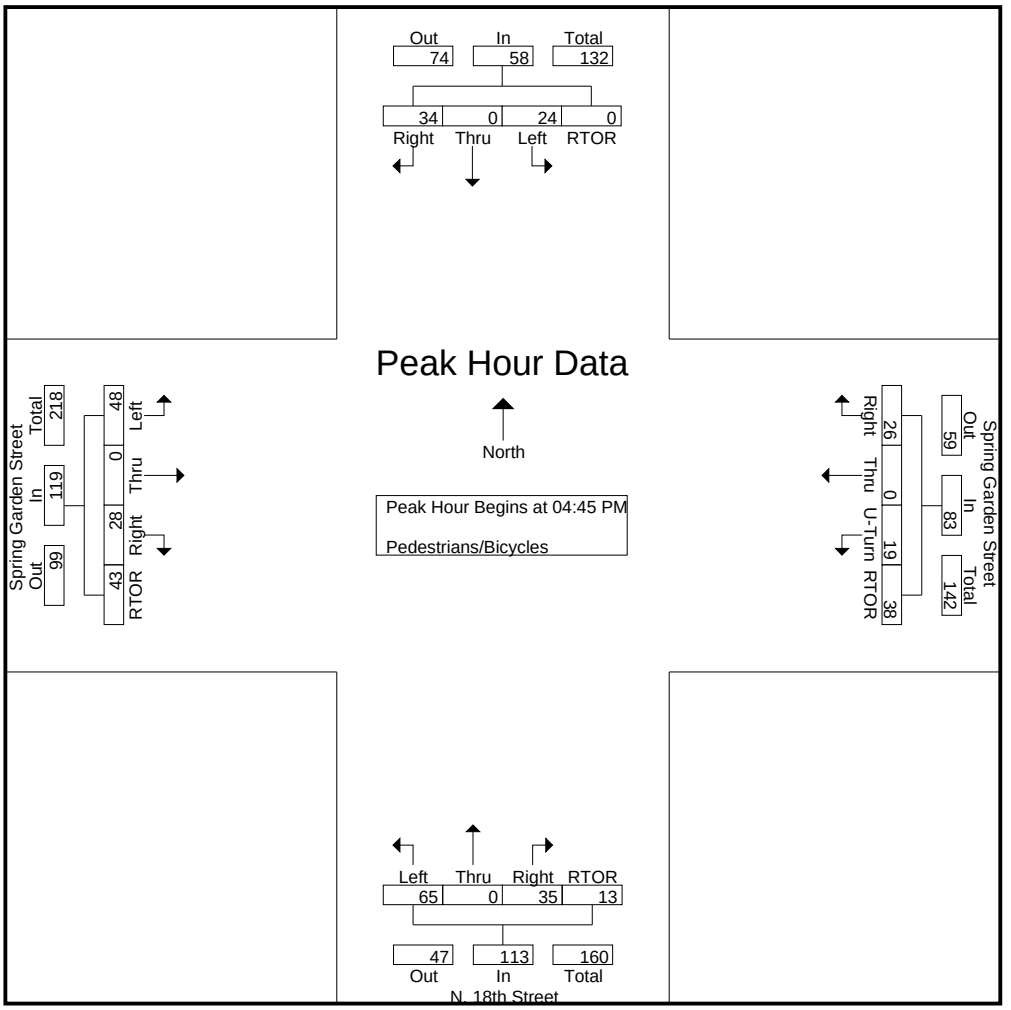
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

Spring Garden Street and N 18th Street

Counter: SJO 26
Counted by: JH
Weather: Clear
Saved as: 2012-10-26 PMSGS18

File Name : 2012-10-26 PMSGS18
Site Code : 00000000
Start Date : 10/26/2012
Page No : 2

	N. 18th Street Northbound					Southbound					Spring Garden Street Eastbound					Spring Garden Street Westbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	17	0	7	**5**	29	5	0	10	0	15	9	0	**8**	6	23	**8**	0	5	8	21	88
05:00 PM	**21**	0	9	2	32	3	0	6	0	9	13	0	4	10	27	7	0	8	8	23	91
05:15 PM	17	0	**12**	5	**34**	6	0	5	0	11	**19**	0	8	**14**	**41**	3	0	4	6	13	**99**
05:30 PM	10	0	7	1	18	**10**	0	**13**	0	**23**	7	0	8	13	28	1	0	**9**	**16**	**26**	95
Total Volume	65	0	35	13	113	24	0	34	0	58	48	0	28	43	119	19	0	26	38	83	373
% App. Total	57.5	0	31	11.5		41.4	0	58.6	0		40.3	0	23.5	36.1		22.9	0	31.3	45.8		
PHF	.774	.000	.729	.650	.831	.600	.000	.654	.000	.630	.632	.000	.875	.768	.726	.594	.000	.722	.594	.798	.942



Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

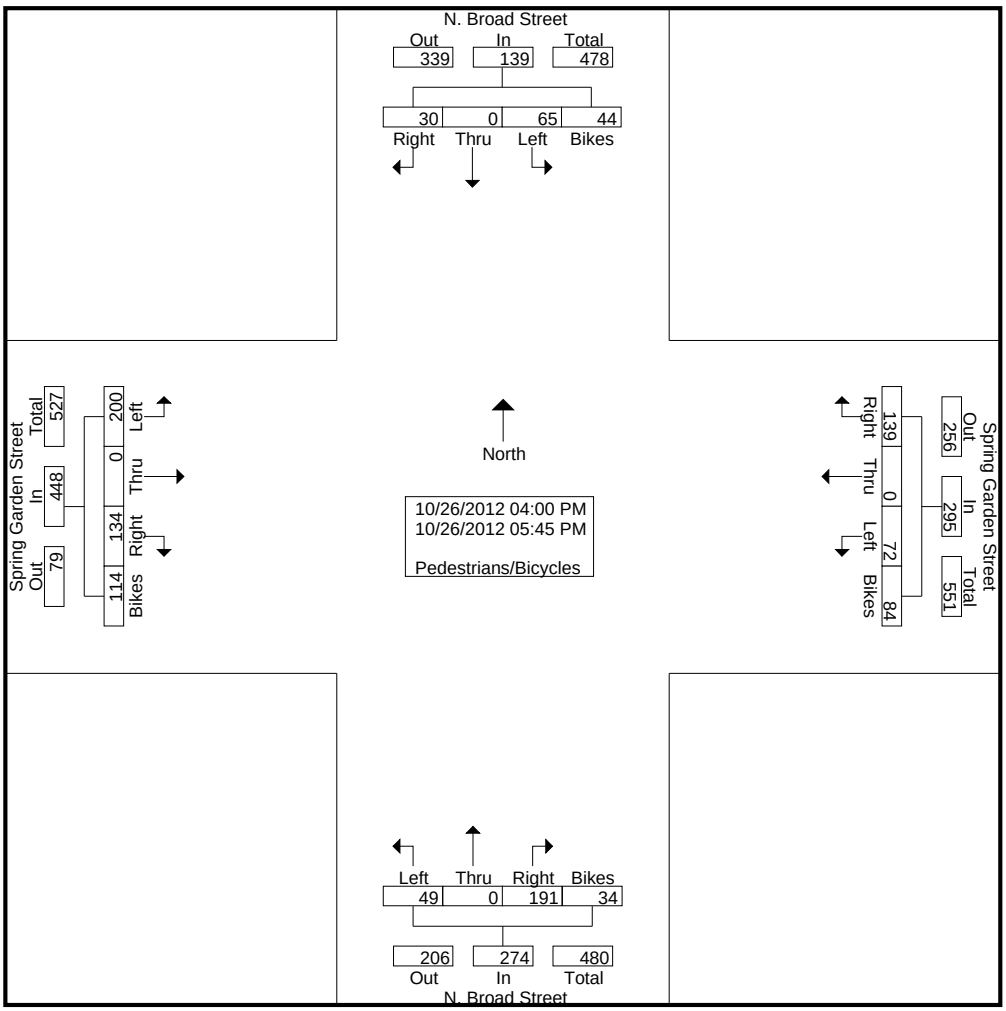
N. Broad Street and Spring Garden Street

Counter: LVO 18
Counted by: BP
Weather: Clear
Saved as: 2012-10-26 PMBSSGS

File Name : 2012-10-26 PMBSSGS
Site Code : 00000000
Start Date : 10/26/2012
Page No : 1

Groups Printed- Pedestrians/Bicycles

	N. Broad Street Northbound					N. Broad Street Southbound					Spring Garden Street Eastbound					Spring Garden Street Westbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
04:00 PM	11	0	38	4	53	11	0	0	12	23	25	0	18	11	54	15	0	28	8	51	181
04:15 PM	6	0	21	3	30	12	0	1	6	19	25	0	22	14	61	14	0	17	11	42	152
04:30 PM	6	0	28	4	38	16	0	10	3	29	34	0	23	9	66	6	0	11	10	27	160
04:45 PM	12	0	23	5	40	6	0	3	5	14	29	0	15	6	50	9	0	26	10	45	149
Total	35	0	110	16	161	45	0	14	26	85	113	0	78	40	231	44	0	82	39	165	642
05:00 PM	2	0	36	3	41	8	0	3	5	16	11	0	13	17	41	5	0	18	9	32	130
05:15 PM	7	0	29	3	39	9	0	5	3	17	24	0	11	14	49	9	0	18	8	35	140
05:30 PM	3	0	9	7	19	2	0	4	7	13	18	0	14	24	56	8	0	11	20	39	127
05:45 PM	2	0	7	5	14	1	0	4	3	8	34	0	18	19	71	6	0	10	8	24	117
Total	14	0	81	18	113	20	0	16	18	54	87	0	56	74	217	28	0	57	45	130	514
Grand Total	49	0	191	34	274	65	0	30	44	139	200	0	134	114	448	72	0	139	84	295	1156
Apprch %	17.9	0	69.7	12.4		46.8	0	21.6	31.7		44.6	0	29.9	25.4		24.4	0	47.1	28.5		
Total %	4.2	0	16.5	2.9	23.7	5.6	0	2.6	3.8	12	17.3	0	11.6	9.9	38.8	6.2	0	12	7.3	25.5	



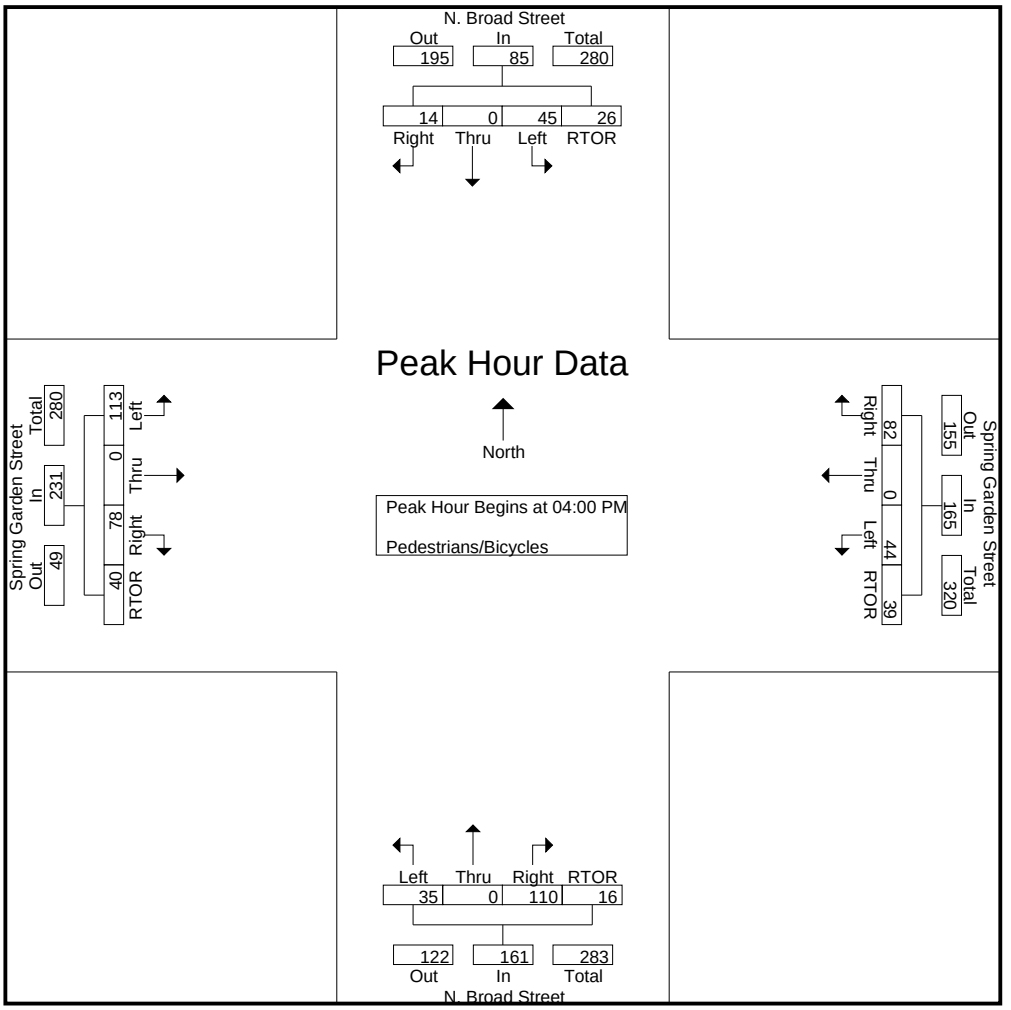
Traffic Planning and Design, Inc.
2 Riverside Drive, Suite 506
Camden, New Jersey 08103

N. Broad Street and Spring Garden Street

Counter: LVO 18
Counted by: BP
Weather: Clear
Saved as: 2012-10-26 PMBSSGS

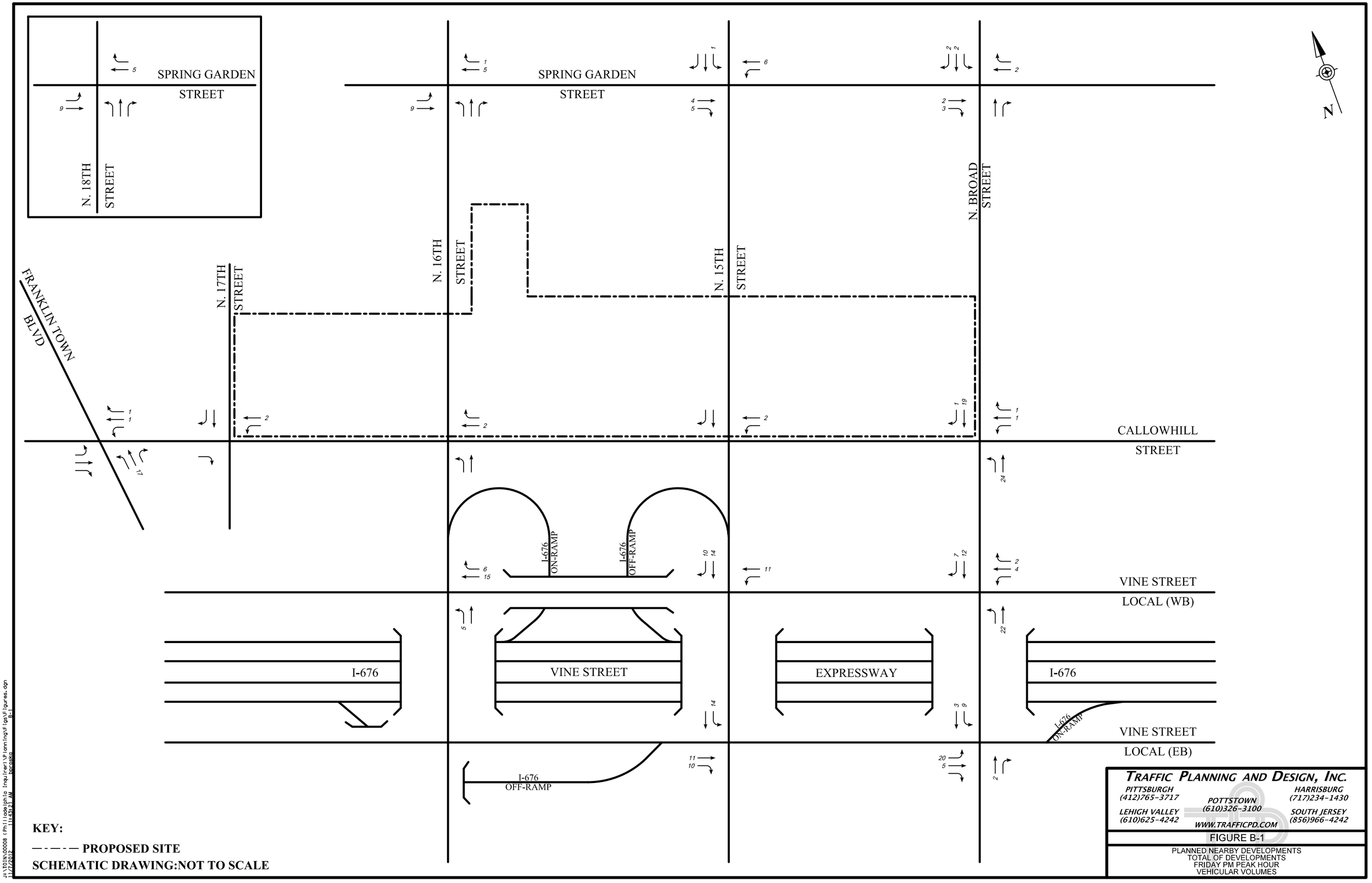
File Name : 2012-10-26 PMBSSGS
Site Code : 00000000
Start Date : 10/26/2012
Page No : 2

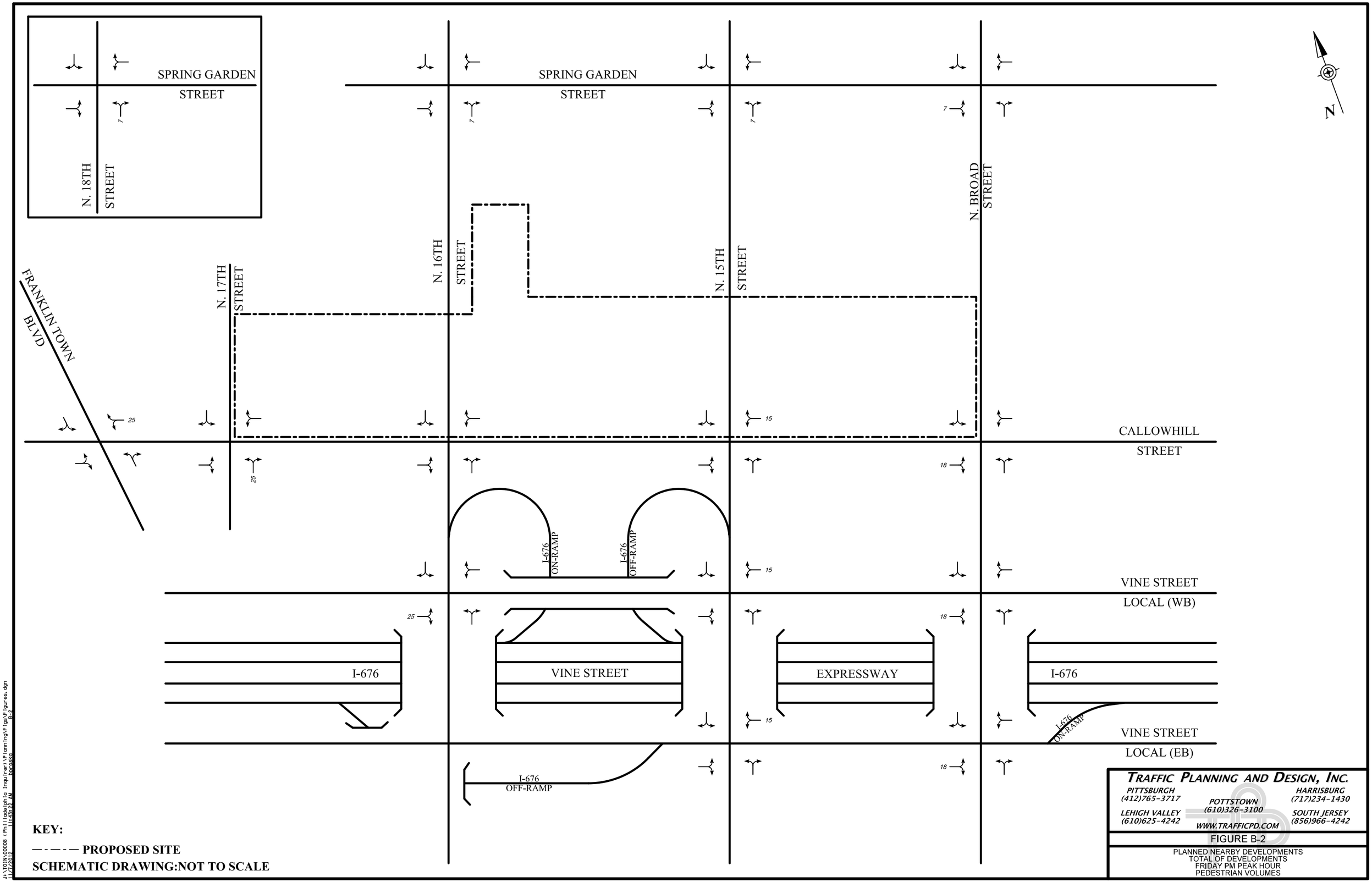
	N. Broad Street Northbound					N. Broad Street Southbound					Spring Garden Street Eastbound					Spring Garden Street Westbound					
Start Time	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Left	Thru	Right	Bikes	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	11	0	**38**	4	**53**	11	0	0	**12**	23	25	0	18	11	54	**15**	0	**28**	8	**51**	**181**
04:15 PM	6	0	21	3	30	12	0	1	6	19	25	0	22	**14**	61	14	0	17	**11**	42	152
04:30 PM	6	0	28	4	38	**16**	0	**10**	3	**29**	**34**	0	**23**	9	**66**	6	0	11	10	27	160
04:45 PM	**12**	0	23	**5**	40	6	0	3	5	14	29	0	15	6	50	9	0	26	10	45	149
Total Volume	35	0	110	16	161	45	0	14	26	85	113	0	78	40	231	44	0	82	39	165	642
% App. Total	21.7	0	68.3	9.9		52.9	0	16.5	30.6		48.9	0	33.8	17.3		26.7	0	49.7	23.6		
PHF	.729	.000	.724	.800	.759	.703	.000	.350	.542	.733	.831	.000	.848	.714	.875	.733	.000	.732	.886	.809	.887



APPENDIX B

PLANNED NEARBY DEVELOPMENTS


SPRING GARDEN STREET
N. 18TH STREET
N. 17TH STREET
N. 16TH STREET
N. 15TH STREET
N. BROAD STREET
FRANKLIN TOWN BLVD
CALLOWHILL STREET
VINE STREET
LOCAL (WB)
VINE STREET
LOCAL (EB)
I-676
VINE STREET
EXPRESSWAY
I-676
I-676 ON-RAMP
I-676 OFF-RAMP
I-676 ON-RAMP
I-676 OFF-RAMP
N
KEY:
PROPOSED SITE
SCHEMATIC DRAWING:NOT TO SCALE
TRAFFIC PLANNING AND DESIGN, INC.
PITTSBURGH (412)765-3717
POTTSTOWN (610)326-3100
HARRISBURG (717)234-1430
LEHIGH VALLEY (610)625-4242
WWW.TRAFFICPD.COM
SOUTH JERSEY (856)966-4242
FIGURE B-1
PLANNED NEARBY DEVELOPMENTS
TOTAL OF DEVELOPMENTS
FRIDAY PM PEAK HOUR
VEHICULAR VOLUMES


SPRING GARDEN
STREET
N. 18TH
STREET
N. 17TH
STREET
N. 16TH
STREET
N. 15TH
STREET
N. BROAD
STREET
FRANKLIN TOWN
BLVD
CALLOWHILL
STREET
VINE STREET
LOCAL (WB)
VINE STREET
LOCAL (EB)
I-676
ON-RAMP
I-676
OFF-RAMP
I-676
VINE STREET
EXPRESSWAY
I-676
I-676
ON-RAMP
I-676
OFF-RAMP
N
7
7
7
7
25
25
15
15
15
18
18
18
KEY:
PROPOSED SITE
SCHEMATIC DRAWING:NOT TO SCALE
TRAFFIC PLANNING AND DESIGN, INC.
PITTSBURGH
(412)765-3717
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POTTSTOWN
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FIGURE B-2
PLANNED NEARBY DEVELOPMENTS
TOTAL OF DEVELOPMENTS
FRIDAY PM PEAK HOUR
PEDESTRIAN VOLUMES

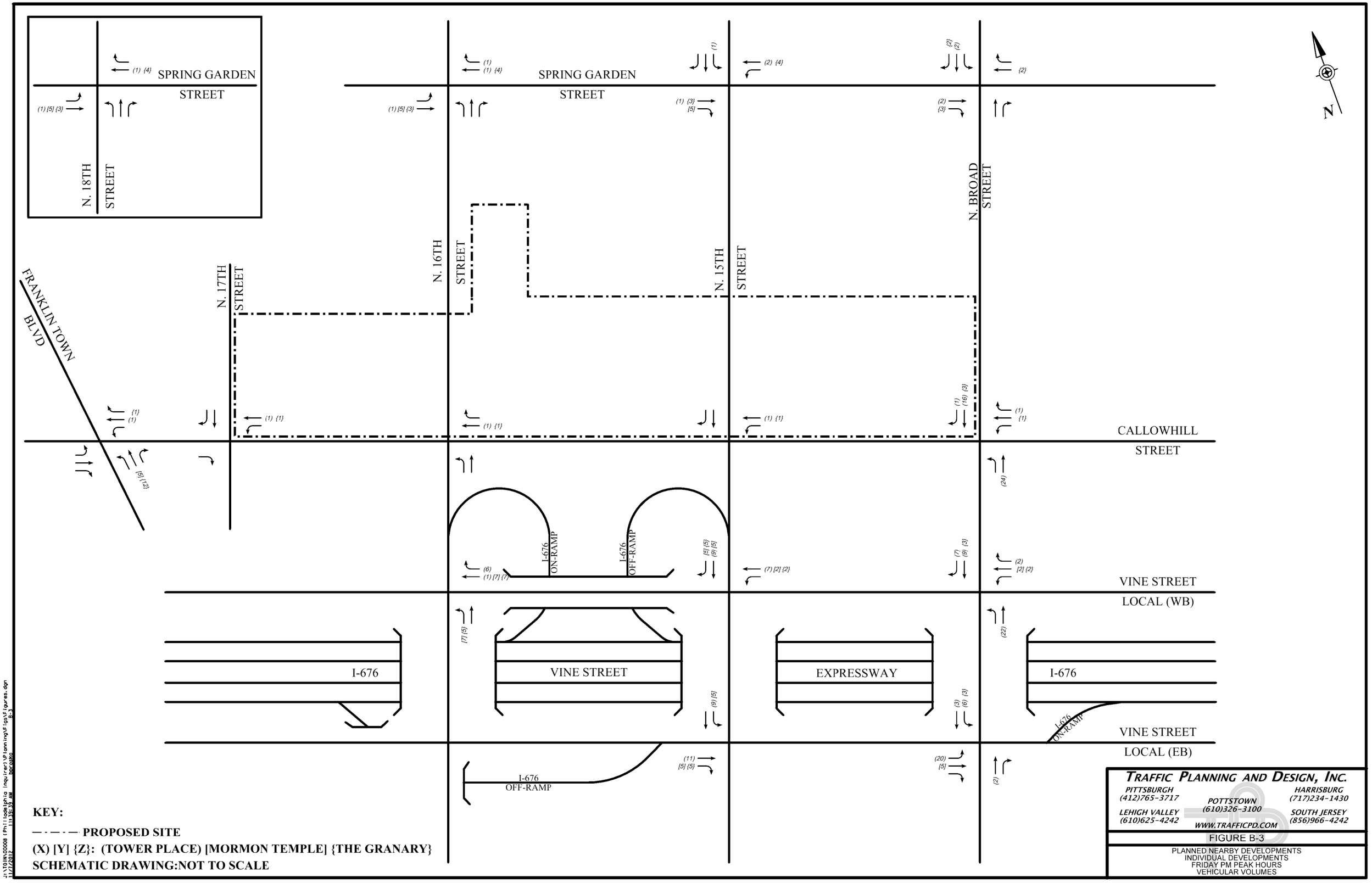
SPRING GARDEN STREET
N. 18TH STREET
N. 17TH STREET
N. 16TH STREET
N. 15TH STREET
N. BROAD STREET
FRANKLIN TOWN BLVD
CALLOWHILL STREET
VINE STREET
LOCAL (WB)
VINE STREET
LOCAL (EB)
I-676 ON-RAMP
I-676 OFF-RAMP
I-676
VINE STREET
EXPRESSWAY
I-676
I-676 ON-RAMP
I-676 OFF-RAMP
N
KEY:
PROPOSED SITE
(X) [Y] {Z}: (TOWER PLACE) [MORMON TEMPLE] {THE GRANARY}
SCHEMATIC DRAWING:NOT TO SCALE
TRAFFIC PLANNING AND DESIGN, INC.
PITTSBURGH (412)765-3717
POTTSTOWN (610)326-3100
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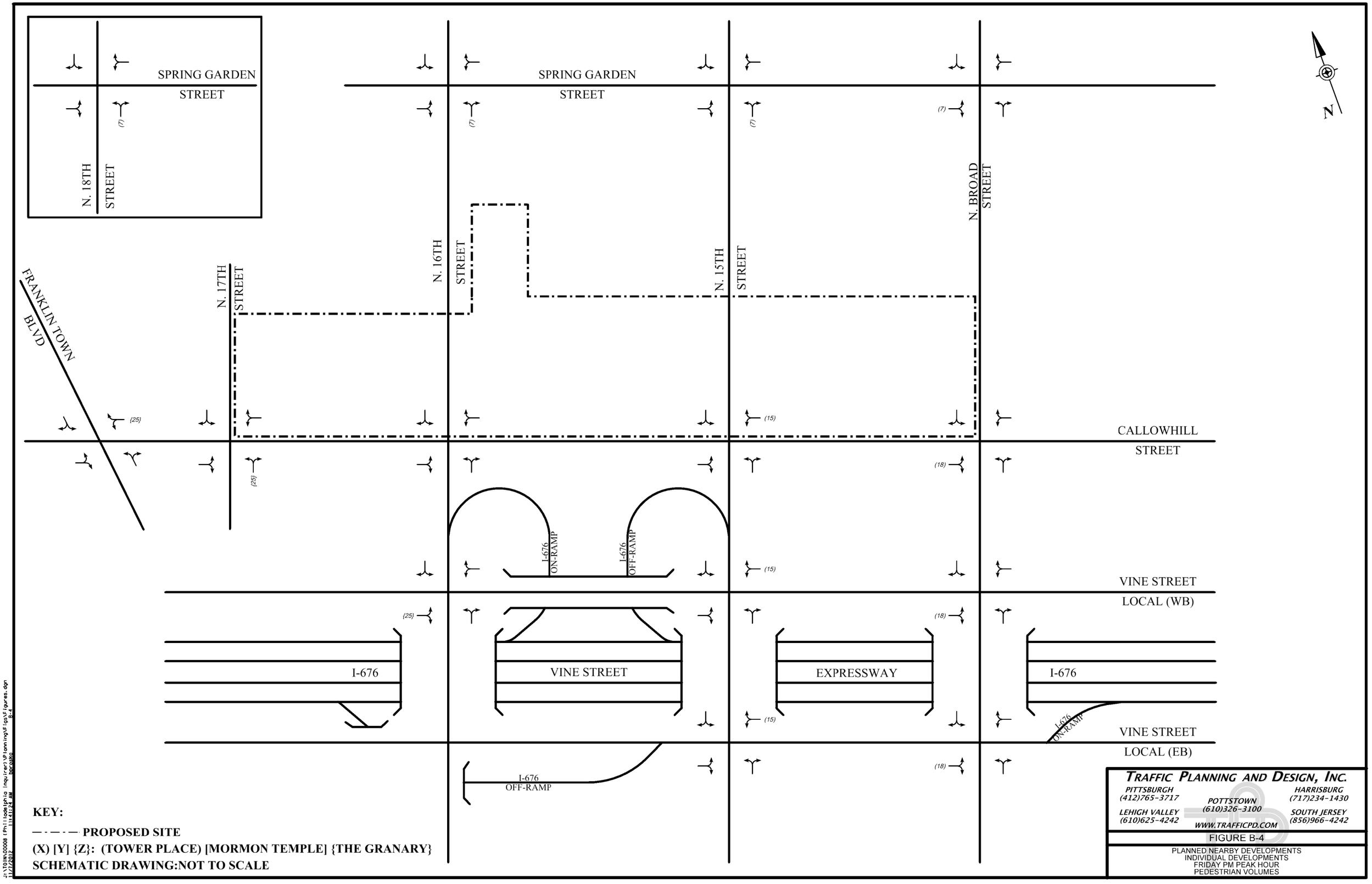
FIGURE B-3
PLANNED NEARBY DEVELOPMENTS
INDIVIDUAL DEVELOPMENTS
FRIDAY PM PEAK HOURS
VEHICULAR VOLUMES


SPRING GARDEN
STREET
N. 18TH
STREET
(7)
SPRING GARDEN
STREET
(7)
(7)
(7)
N. BROAD
STREET
N. 17TH
STREET
N. 16TH
STREET
N. 15TH
STREET
FRANKLIN TOWN
BLVD
(25)
(25)
(15)
(15)
(18)
(18)
(18)
CALLOWHILL
STREET
I-676
ON-RAMP
I-676
OFF-RAMP
VINE STREET
LOCAL (WB)
I-676
VINE STREET
EXPRESSWAY
I-676
I-676
ON-RAMP
VINE STREET
LOCAL (EB)
I-676
OFF-RAMP
N
KEY:
PROPOSED SITE
(X) [Y] {Z}: (TOWER PLACE) [MORMON TEMPLE] {THE GRANARY}
SCHEMATIC DRAWING:NOT TO SCALE
TRAFFIC PLANNING AND DESIGN, INC.
PITTSBURGH (412)765-3717
POTTSTOWN (610)326-3100
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LEHIGH VALLEY (610)625-4242
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FIGURE B-4
PLANNED NEARBY DEVELOPMENTS
INDIVIDUAL DEVELOPMENTS
FRIDAY PM PEAK HOUR
PEDESTRIAN VOLUMES

APPENDIX C

TRIP GENERATION INFORMATION

TRAFFIC PLANNING AND DESIGN, INC.
2 RIVERSIDE DRIVE, STE 506
CAMDEN, NJ 08103
PHONE: 856.966.4242
FAX: 856.966.4250
TPD@TRAFFICPD.COM
WWW.TRAFFICPD.COM

MEMORANDUM

To: Tower Entertainment, LLC

From: Traffic Planning & Design, Inc.

Date: October 12, 2012

Re: Trip Generation Analysis – 400 North Broad Development
City of Philadelphia, PA

The following memorandum includes a trip generation analysis for the proposed 400 North Broad development in the City of Philadelphia, PA. The purpose of this analysis is to develop proposed traffic levels for the casino use and ancillary uses.

TRIP GENERATION

Casino Use

TPD performed traffic counts at a local Philadelphia casino, located on Delaware Avenue opposite Frankford Avenue. **Table 1** below shows the locally obtained trip/visitor generation rates during the Friday evening peak hour.

TABLE 1
CASINO USE TRIP/VISITOR GENERATION RATE – LOCALLY OBTAINED

Description	Independent Variable	Rate per Gaming Position	Directional Split	
			Entering	Exiting
Friday Evening Peak Hour				
Trips	2,007	**T** = 0.623*(**X**)	55%	45%
Visitors		**T** = 0.925*(**X**)		

T = Total trips generated **X** = Gaming Positions (includes slot machines and table games)

Ancillary Uses

There are several ancillary uses associated with the proposed site that will likely serve as destination for external visitors as well as casino visitors. Although the locally collected data accounts for some entertainment and dining uses in the casino trip generation calculation, the ancillary uses of the proposed site were determined to be in addition to the casino visitors. Therefore, trips were generated for the proposed ancillary uses based on information contained in the manual *Trip Generation*, Ninth Edition, 2012, an Institute of Transportation Engineers (ITE) Informational Report. Pass-by Rates for the uses in the proposed development were taken from the ITE *Trip*

Generation Handbook, 9th Edition, 2012. **Table 2** shows the trip generation rates and directional splits utilized for the ancillary uses during the weekday P.M. peak hour.

TABLE 2
ANCILLARY USES TRIP GENERATION RATES – ITE DATA

Land Use	Independent Variable	Size / # of Units	Trip Generation Rate	Pass-By Rate	Directional Split	
					Entering	Exiting
Weekday P.M. Peak Hour						
Restaurant – ITE Land Use #932	Square Footage	80,300 s.f.	**T** = 9.85*(**X**)	43%	60%	40%
Drinking Place – ITE Land Use #925	Square Footage	43,267 s.f.	**T** = 11.34*(**X**)	43%	66%	34%
Hotel – ITE Land Use #310	Occupied Rooms	126 Rooms	**T** = 0.70*(**X**)	0%	49%	51%
Specialty Retail – ITE Land Use #826	Square Footage	72,264 s.f.	**T** = 2.71*(**X**)	34%	44%	56%
Theater – ITE Land Use #441	Square Footage	70,197 s.f.	**T** = 1.11*(**X**)[1]	0%	50%	50%

T = Total Trips
X = Independent Variable

[1] Based on correlation between seats to square footage

Based on the location and the surrounding amenities (transit) available to the proposed site, TPD assumed the following trip generation credits:

- Internal Capture – Visitors to the proposed casino use using the other on-site ancillary uses. This credit will be applied to ancillary uses of the proposed site only.
- Mass Transit Ridership – Proximity to available transit. Additionally, it is anticipated that a shuttle bus will be provided to transport patrons to/from the site to destinations such as hotels.
- Pedestrian / Bicycle Reduction – Site accessed by pedestrians / bicycles rather than vehicles.
- Pass-By Trips – Motorists already traveling on study area roadways.

The *Executive Summary of the Interim Report of Findings* by the Philadelphia Gaming Advisory Task Force contains information regarding the modal split of visitors to potential casino uses based on the different locales of potential sites throughout the Philadelphia region. Based on the information contained in the *Summary*, the expected typical distribution of transportation modes for a casino located in the North Delaware area of the City was similar to the modal splits observed during our collection of the locally obtained data. However, the observed choice of auto was slightly lower than the expected, while the public transit/pedestrian choice was slightly higher. As such, TPD utilized the expected typical distribution of transportation modes for a casino located in the Center City area of the City with minor modifications to reflect local observations. **Table 3** summarizes the expected and observed typical distribution of transportation modes.

TABLE 3
TYPICAL DISTRIBUTION OF TRANSPORTATION MODES

Description	North Delaware Area			Center City Sites		
	Task Force[1]	Locally Obtained	Difference	Task Force[1]	*Modifications*	Utilized
Auto	78%	71%	***-7%***	57%	*-20%*	37%
Public Transit	6%	17%	+11%	20%	*+11%*	31%
Casino Bus	9%	7%	-2%	8%	*+5%*	13%
Taxi	7%	5%	-2%	11%	*0%*	11%
Pedestrian	0%	0%	0%	4%	*+4%*	8%
Total	***100%***	***100%***	***0%***	***100%***	***0%***	***100%***

[1] *Executive Summary of the Interim Report of Findings* by the Philadelphia Gaming Advisory Task Force

The utilized modal splits/reductions are summarized as follows:

Internal Capture Credit

The *Trip Generation Handbook* recommends that when studying multi-use developments (i.e. the proposed site), that an interaction factor be applied to the trip generation to determine the quantity of "external trips" (trips from external roadways) and "internal trips" (trips between uses on site that do not utilize the external roadways). For example, many of the on-site amenities are marketed for use by patrons of the Casino. For purposes of the study, it was calculated that a ***75% trip credit*** during the Friday evening peak hour could be applied to the trip generation of the proposed site.

Mass Transit Trip Generation Credit

The proposed development is adjacent or within reasonable walking distance of numerous mass transit assets as identified earlier in the report. TPD assumed a ***31% trip credit*** during the Friday evening peak hour. It is anticipated that a significant amount of visitors to the proposed site will utilized mass transit, to include people who are locally employed in the City and utilize mass transit to get to/from work. Additionally, TPD assumes an additional ***13% trip credit*** for patrons that will utilize a shuttle bus to/from the site. It's estimated that shuttles will generate approximately 12-15 new trips to the study area during the peak hour.

Pedestrian / Bicycle Trip Generation Credit

Since the proposed site is in an urban area with high amounts of pedestrian traffic, a trip generation credit was assumed for access of the site by pedestrians / bicycles rather than vehicles or mass transit. TPD assumed an ***8% trip credit*** during the Friday evening peak hour.

Pass-By Trips

According to the *Trip Generation Handbook*, not all of the trips generated by the proposed development will be new to the surrounding area. A distinction was made between "new" trips, which are trips made to/from the study area for the express purpose of visiting the site, "pass-by" trips, which are trips made to the site by traffic passing the retail center on the adjacent roadways en

route to another destination. The pass-by trips do not add any additional traffic to the study area intersections but will result in shifts in turning movement at the site driveway intersections.

The calculated trip generation for the proposed development is shown in **Table 4**.

TABLE 4
TRIP GENERATION SUMMARY – 400 NORTH BROAD

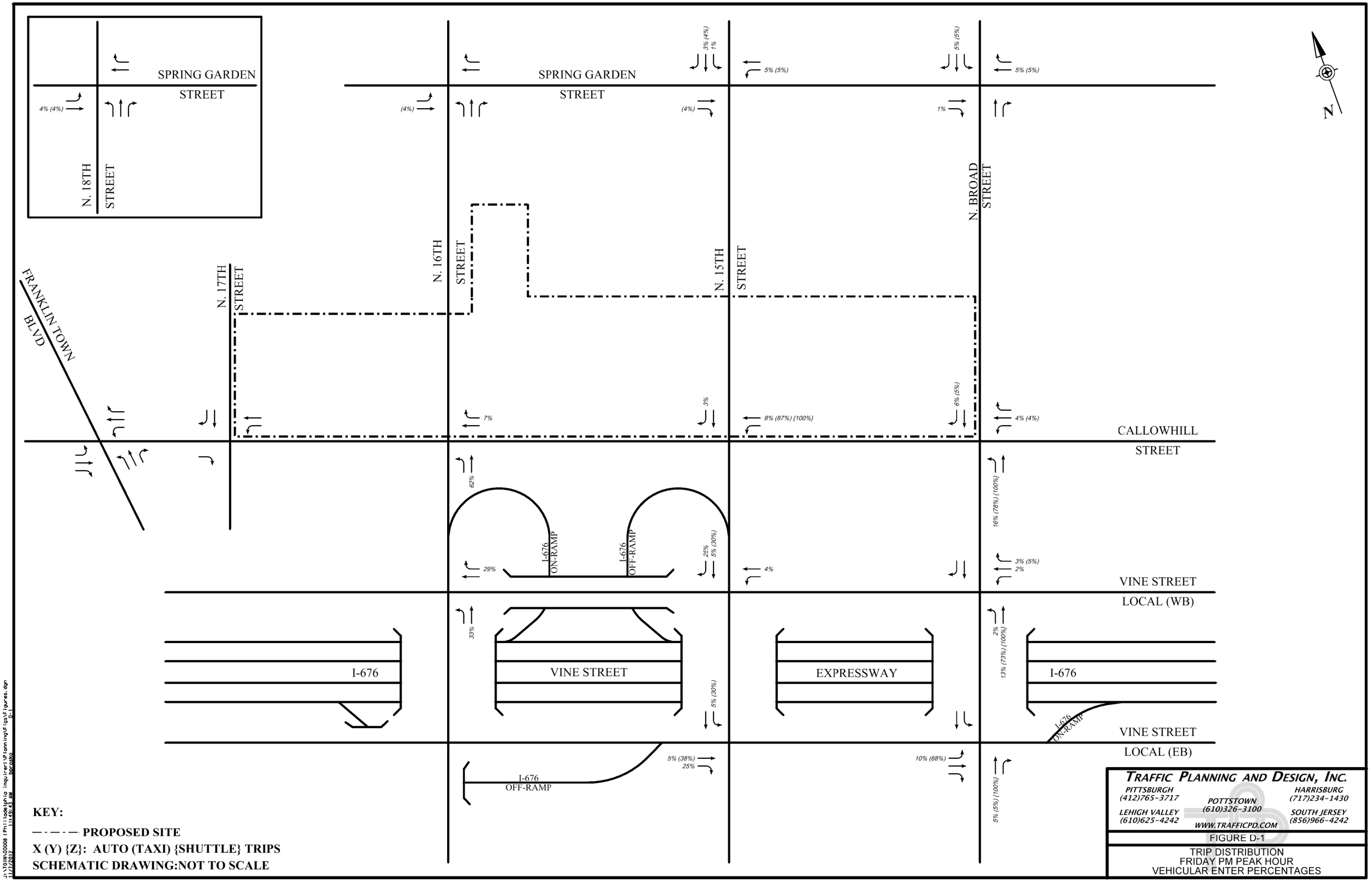
Land Use	Size / Units (X)	Total Trips	Int. Trips	External Trips					
				Mass Transit[2]	Ped-Bike	Pass-by	New Trips[3]		
							Total	Enter	Exit
Casino Use									
Casino	3,000 slots / 150 tables	2,333	---	1,161	300	---	859	475	384
			Shuttle Bus Trips				13	7	6
Ancillary Uses									
Hotel	125	88	66	7	2	0	13	6	7
Restaurant	56,210[1]	554	416	43	11	30	54	32	22
Drinking Place	30,287[1]	343	257	27	7	20	32	21	11
Theater / Clubs	49,148[1]	55	41	4	1	0	9	7	2
Retail	72,264	196	147	15	4	10	20	9	11
Subtotal – Ancillary Trips		1,236	927	96	25	60	128	75	53
Total Site Trips		***3,569***	***927***	***1,257***	***325***	***60***	***1,000***	***557***	***443***

Int. = Internal Capture Trips **X** = Independent Variable (Size in KSF, Gaming Positions, Units)
[1] Assumes 30% of space not utilized/open during weekday P.M. peak hour
[2] Includes visitors who are employed locally and use transit [3] New trips include passenger cars and taxis

If any of you have any questions or concerns, please do not hesitate to contact us.

APPENDIX D

TRIP DISTRIBUTION INFORMATION


SPRING GARDEN STREET
N. 18TH STREET
4% (4%)
SPRING GARDEN STREET
(4%)
(4%)
3% (4%)
1%
5% (5%)
5% (5%)
5% (5%)
1%
N. BROAD STREET
N. 16TH STREET
N. 15TH STREET
N. 17TH STREET
FRANKLIN TOWN BLVD
7%
3%
8% (87%) {100%}
6% (5%)
4% (4%)
CALLOWHILL STREET
62%
I-676 ON-RAMP
I-676 OFF-RAMP
29%
25%
5% (30%)
4%
16% (78%) {100%}
3% (5%)
2%
VINE STREET
LOCAL (WB)
33%
I-676
VINE STREET
5% (30%)
EXPRESSWAY
2%
13% (73%) {100%}
I-676
I-676 ON-RAMP
VINE STREET
LOCAL (EB)
5% (38%)
25%
I-676 OFF-RAMP
10% (68%)
5% (5%) {100%}
N
KEY:
PROPOSED SITE
X (Y) {Z}: AUTO (TAXI) {SHUTTLE} TRIPS
SCHEMATIC DRAWING:NOT TO SCALE
TRAFFIC PLANNING AND DESIGN, INC.
PITTSBURGH (412)765-3717
POTTSTOWN (610)326-3100
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LEHIGH VALLEY (610)625-4242
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FIGURE D-1
TRIP DISTRIBUTION
FRIDAY PM PEAK HOUR
VEHICULAR ENTER PERCENTAGES

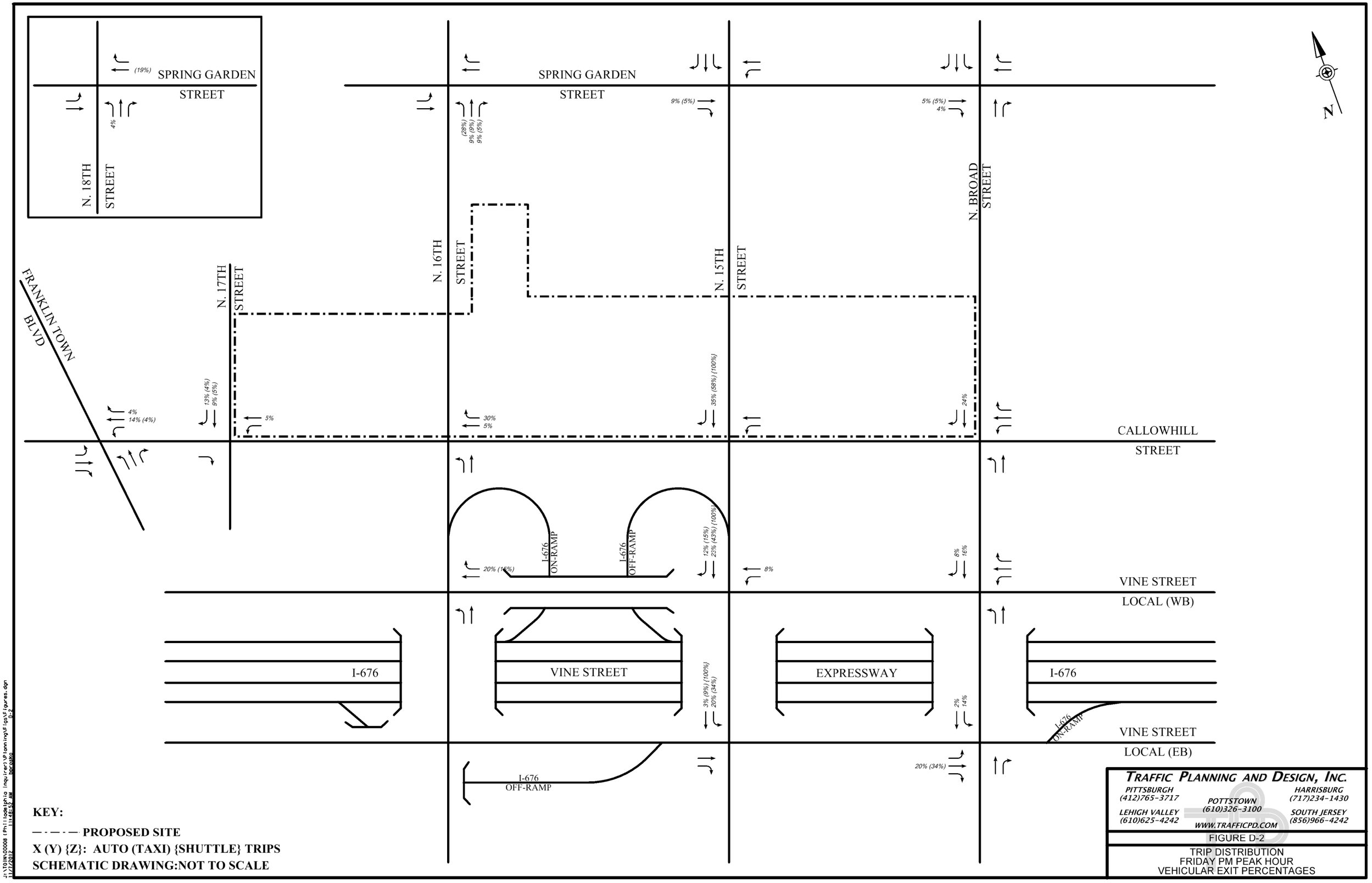
SPRING GARDEN STREET
N. 18TH STREET
(19%)
4%
N. 17TH STREET
N. 16TH STREET
N. 15TH STREET
N. BROAD STREET
FRANKLIN TOWN BLVD
4%
14% (4%)
13% (4%)
9% (5%)
5%
(28%)
9% (9%)
9% (5%)
30%
5%
9% (5%)
35% (58%) (100%)
5% (5%)
4%
24%
CALLOWHILL STREET
I-676 ON-RAMP
I-676 OFF-RAMP
20% (16%)
12% (15%)
23% (43%) (100%)
8%
8%
16%
VINE STREET LOCAL (WB)
I-676
VINE STREET
EXPRESSWAY
I-676
3% (9%) (100%)
20% (34%)
2%
14%
I-676 ON-RAMP
VINE STREET LOCAL (EB)
I-676 OFF-RAMP
20% (34%)
N
KEY:
PROPOSED SITE
X (Y) {Z}: AUTO (TAXI) {SHUTTLE} TRIPS
SCHEMATIC DRAWING:NOT TO SCALE
TRAFFIC PLANNING AND DESIGN, INC.
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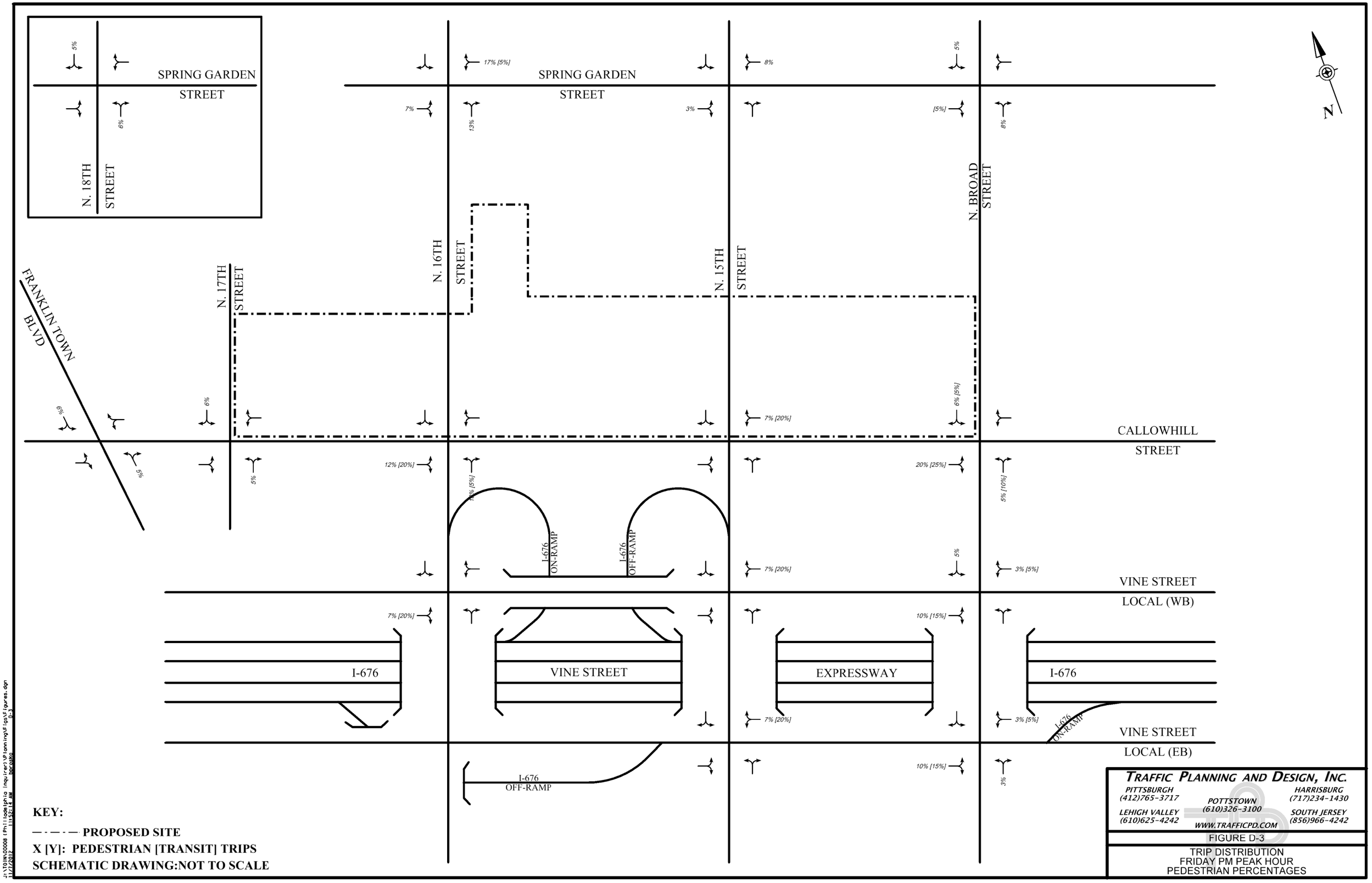
FIGURE D-2
TRIP DISTRIBUTION
FRIDAY PM PEAK HOUR
VEHICULAR EXIT PERCENTAGES



KEY:

— · — · — PROPOSED SITE

X [Y]: PEDESTRIAN [TRANSIT] TRIPS

SCHEMATIC DRAWING:NOT TO SCALE

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FIGURE D-3

TRIP DISTRIBUTION
FRIDAY PM PEAK HOUR
PEDESTRIAN PERCENTAGES

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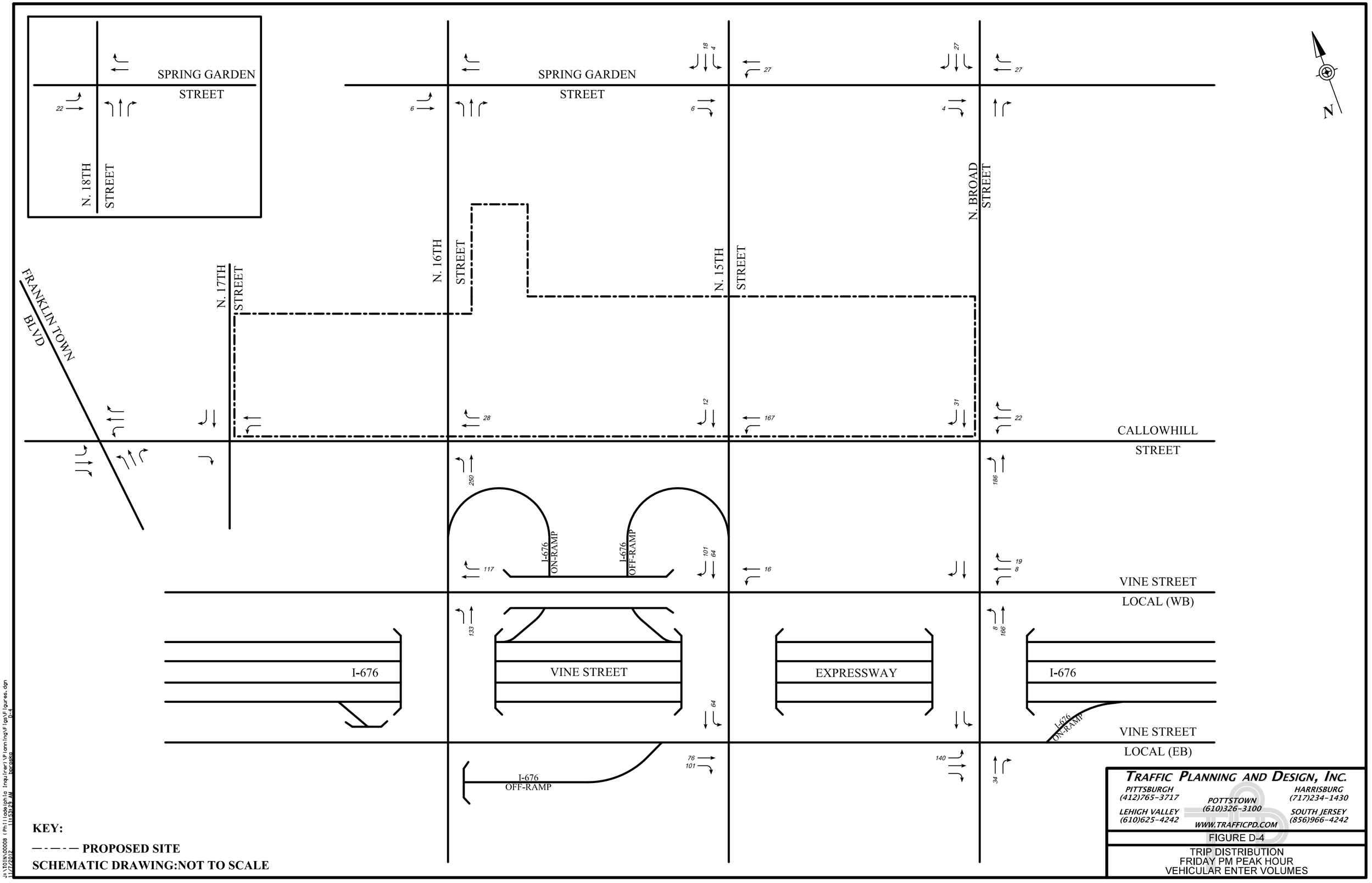
SPRING GARDEN STREET
N. 18TH STREET
22
SPRING GARDEN STREET
6
18
4
6
27
27
4
N. BROAD STREET
N. 16TH STREET
N. 15TH STREET
N. 17TH STREET
FRANKLIN TOWN BLVD
28
12
167
31
22
CALLOWHILL STREET
250
186
I-676 ON-RAMP
I-676 OFF-RAMP
117
101
64
16
19
8
VINE STREET
LOCAL (WB)
133
8
166
I-676
VINE STREET
EXPRESSWAY
I-676
64
I-676 ON-RAMP
VINE STREET
LOCAL (EB)
76
101
I-676 OFF-RAMP
140
34
N
KEY:
PROPOSED SITE
SCHEMATIC DRAWING:NOT TO SCALE
TRAFFIC PLANNING AND DESIGN, INC.
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POTTSTOWN (610)326-3100
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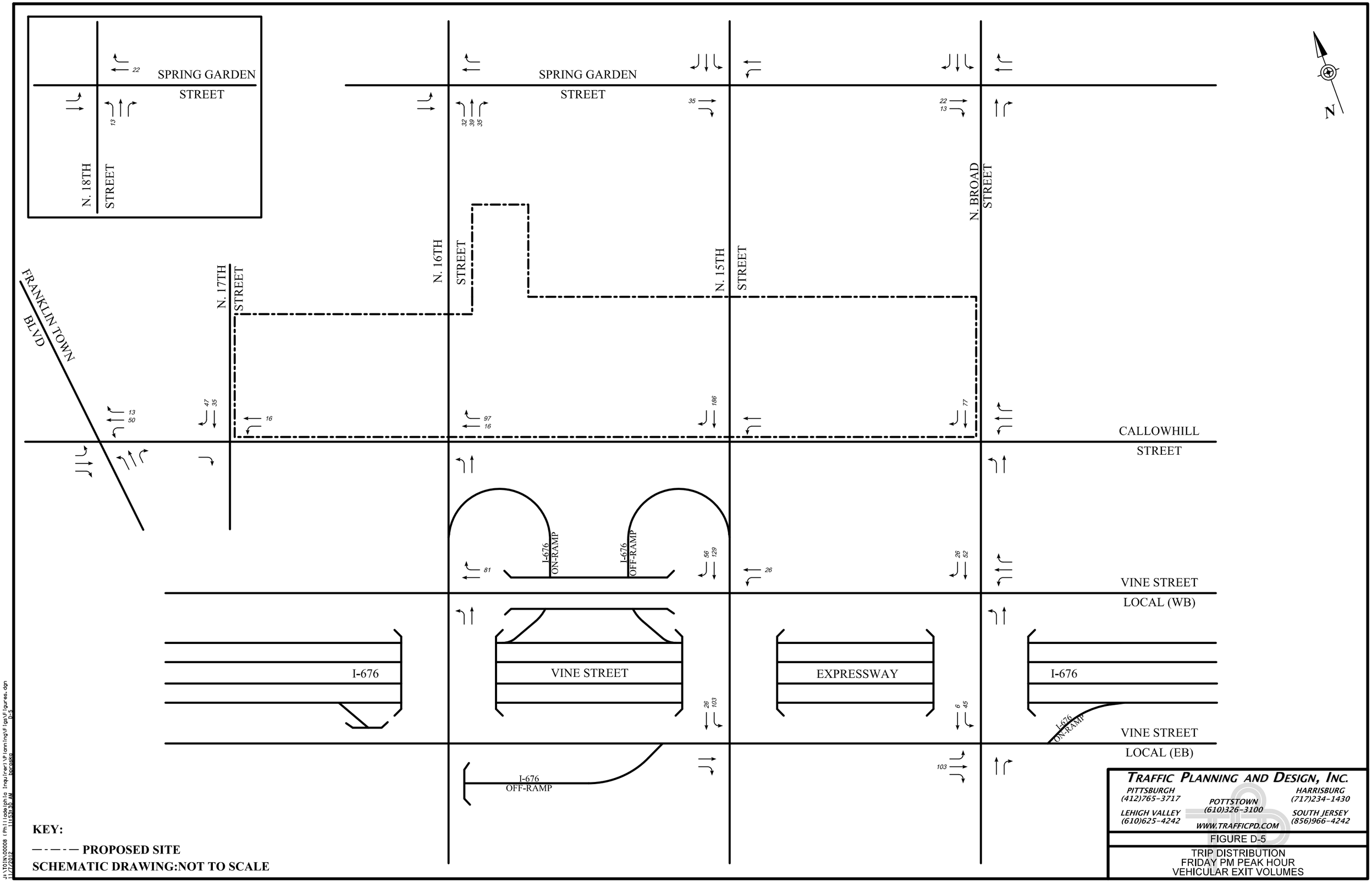
FIGURE D-4
TRIP DISTRIBUTION
FRIDAY PM PEAK HOUR
VEHICULAR ENTER VOLUMES



KEY:

— - — - — PROPOSED SITE

SCHEMATIC DRAWING:NOT TO SCALE

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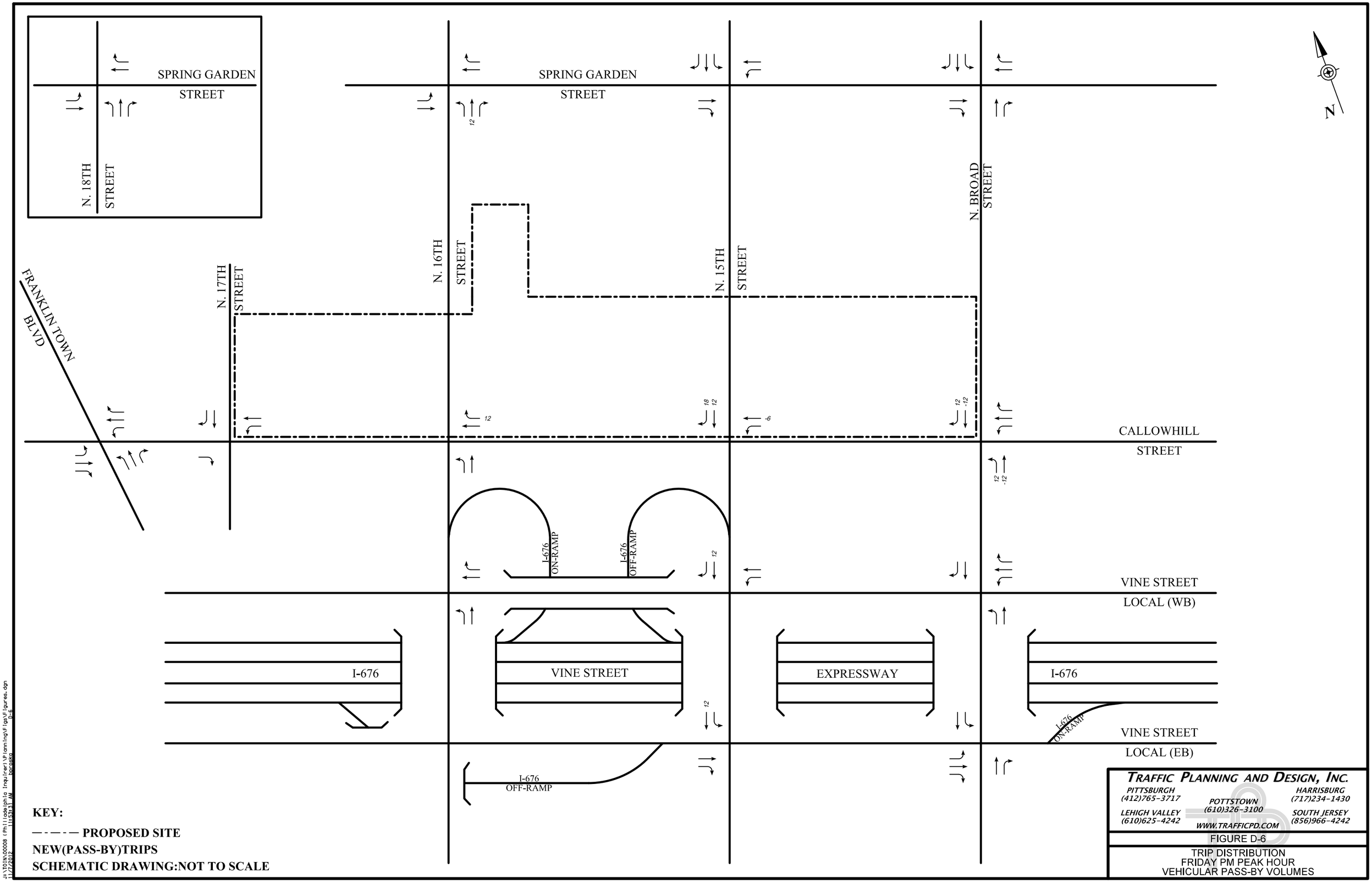
FIGURE D-5

TRIP DISTRIBUTION
FRIDAY PM PEAK HOUR
VEHICULAR EXIT VOLUMES


SPRING GARDEN STREET
N. 18TH STREET
SPRING GARDEN STREET
N. 16TH STREET
N. 15TH STREET
N. BROAD STREET
N. 17TH STREET
FRANKLIN TOWN BLVD
CALLOWHILL STREET
I-676 ON-RAMP
I-676 OFF-RAMP
VINE STREET
LOCAL (WB)
I-676
VINE STREET
EXPRESSWAY
I-676
I-676 ON-RAMP
VINE STREET
LOCAL (EB)
I-676 OFF-RAMP
N
12
18
12
-6
12
-12
12
-12
12
12
KEY:
PROPOSED SITE
NEW(PASS-BY)TRIPS
SCHEMATIC DRAWING:NOT TO SCALE
TRAFFIC PLANNING AND DESIGN, INC.
PITTSBURGH (412)765-3717
POTTSTOWN (610)326-3100
HARRISBURG (717)234-1430
LEHIGH VALLEY (610)625-4242
SOUTH JERSEY (856)966-4242
WWW.TRAFFICPD.COM
FIGURE D-6
TRIP DISTRIBUTION
FRIDAY PM PEAK HOUR
VEHICULAR PASS-BY VOLUMES

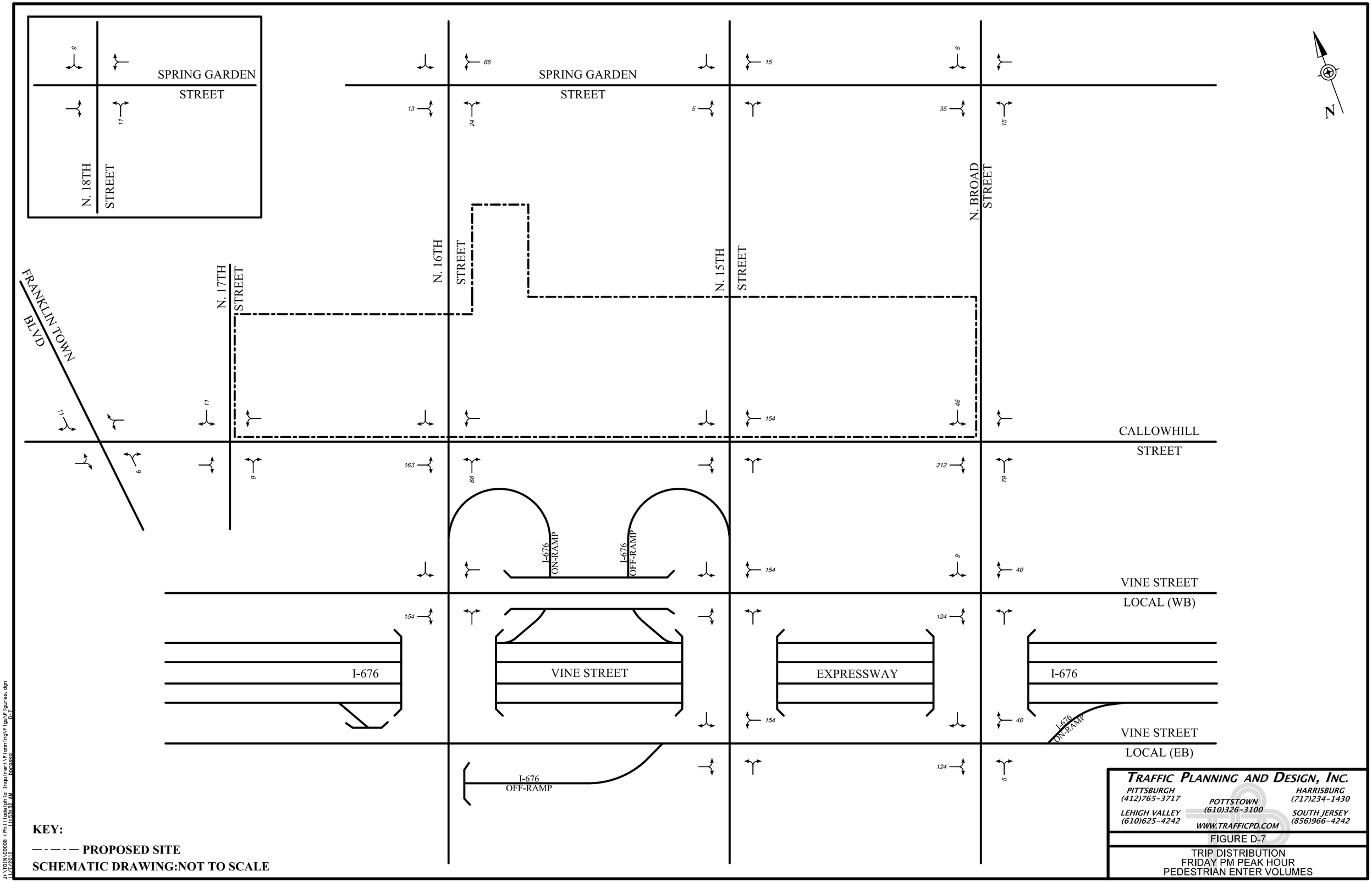

SPRING GARDEN STREET
N. 18TH STREET
N. 17TH STREET
N. 16TH STREET
N. 15TH STREET
N. BROAD STREET
FRANKLIN TOWN BLVD
CALLOWHILL STREET
VINE STREET
LOCAL (WB)
VINE STREET
LOCAL (EB)
I-676
VINE STREET
EXPRESSWAY
I-676
I-676 ON-RAMP
I-676 OFF-RAMP
I-676 ON-RAMP
I-676 OFF-RAMP
N
KEY:
PROPOSED SITE
SCHEMATIC DRAWING:NOT TO SCALE
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FIGURE D-7
TRIP DISTRIBUTION
FRIDAY PM PEAK HOUR
PEDESTRIAN ENTER VOLUMES

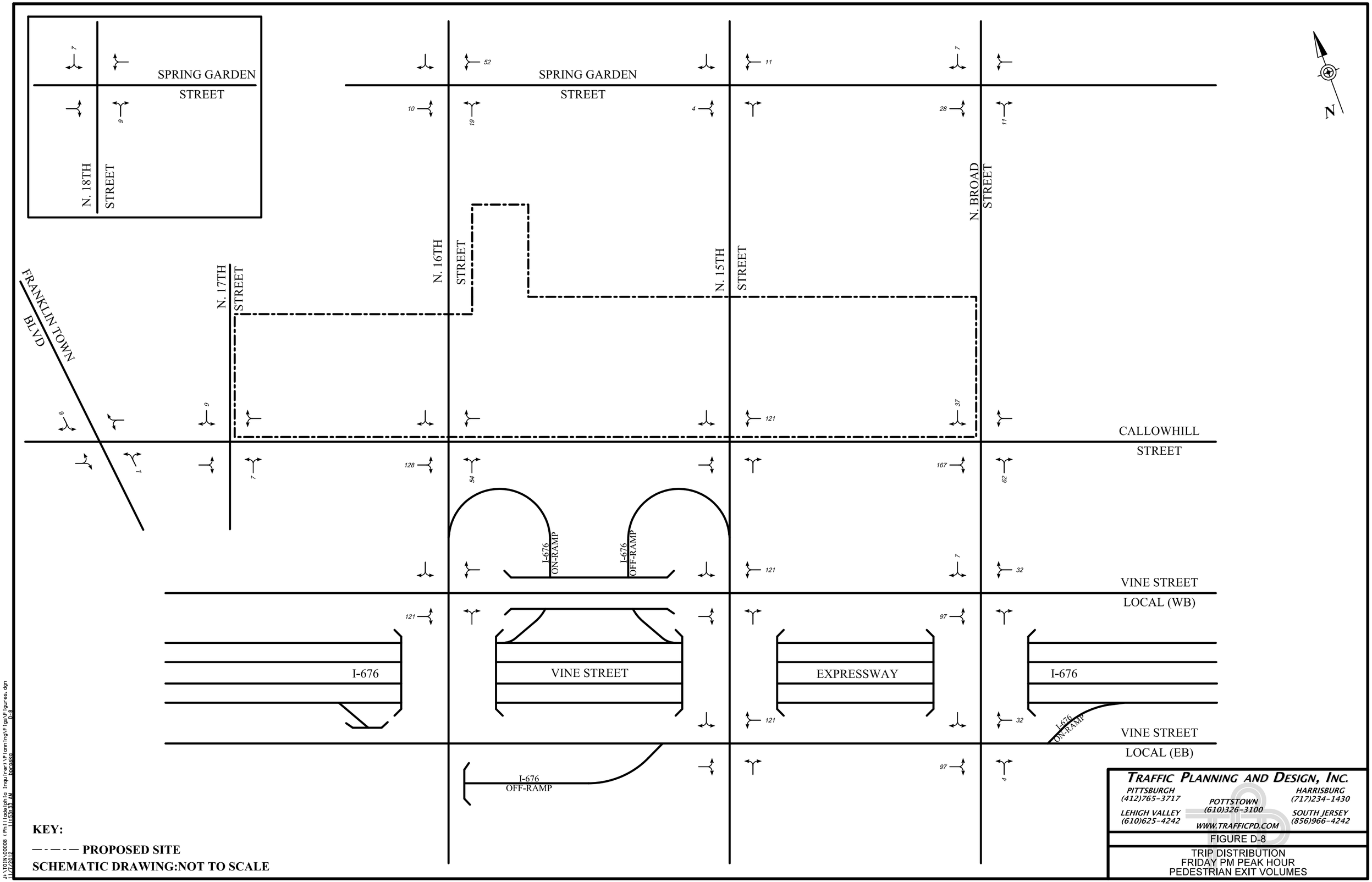
SPRING GARDEN STREET
N. 18TH STREET
N. 17TH STREET
N. 16TH STREET
N. 15TH STREET
N. BROAD STREET
FRANKLIN TOWN BLVD
CALLOWHILL STREET
VINE STREET
LOCAL (WB)
VINE STREET
LOCAL (EB)
I-676
VINE STREET
EXPRESSWAY
I-676
I-676 ON-RAMP
I-676 OFF-RAMP
I-676 ON-RAMP
I-676 OFF-RAMP
N
KEY:
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FIGURE D-8
TRIP DISTRIBUTION
FRIDAY PM PEAK HOUR
PEDESTRIAN EXIT VOLUMES

APPENDIX E

CAPACITY ANALYSIS INFORMATION

EXISTING CONDITIONS

HCM Signalized Intersection Capacity Analysis
1: Spring Garden Street & N. 16th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	660	0	0	819	92	126	384	203	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	11	12	12	12	12	12	12	12
Grade (%)		0%			2%			3%			0%	
Total Lost time (s)	3.0	6.0			6.0			6.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frpb, ped/bikes	1.00	1.00			0.98			0.97				
Flpb, ped/bikes	1.00	1.00			1.00			0.99				
Frt	1.00	1.00			0.98			0.95				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1349	2902			2801			2798				
Flt Permitted	0.17	1.00			1.00			0.99				
Satd. Flow (perm)	247	2902			2801			2798				
Peak-hour factor, PHF	0.88	0.88	0.91	0.92	0.95	0.82	0.88	0.94	0.83	0.92	0.92	0.92
Adj. Flow (vph)	159	750	0	0	862	112	143	409	245	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	159	750	0	0	974	0	0	797	0	0	0	0
Confl. Peds. (#/hr)	83		407	407		83	70		73	73		70
Confl. Bikes (#/hr)						51			14			
Heavy Vehicles (%)	1%	2%	2%	2%	1%	3%	0%	2%	4%	2%	2%	2%
Bus Blockages (#/hr)	0	4	0	0	4	0	0	5	0	0	0	0
Parking (#/hr)	0	0			0	0						
Turn Type	pm+pt						Perm					
Protected Phases	7	4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	29.0	29.0			20.0			19.0				
Effective Green, g (s)	29.0	29.0			20.0			19.0				
Actuated g/C Ratio	0.48	0.48			0.33			0.32				
Clearance Time (s)	3.0	6.0			6.0			6.0				
Lane Grp Cap (vph)	230	1403			934			886				
v/s Ratio Prot	c0.07	0.26			c0.35							
v/s Ratio Perm	0.27							0.28				
v/c Ratio	0.69	0.53			1.04			0.90				
Uniform Delay, d1	11.0	10.8			20.0			19.6				
Progression Factor	2.21	1.25			1.62			1.07				
Incremental Delay, d2	14.7	1.4			39.3			12.5				
Delay (s)	39.1	14.9			71.7			33.4				
Level of Service	D	B			E			C				
Approach Delay (s)		19.1			71.7			33.4			0.0	
Approach LOS		B			E			C			A	

Intersection Summary			
HCM Average Control Delay	42.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

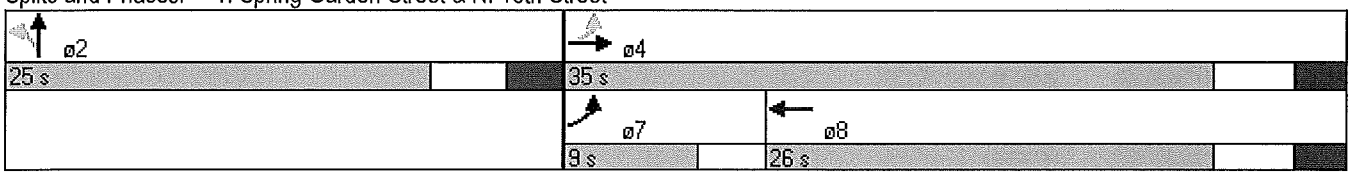
Timings
1: Spring Garden Street & N. 16th Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	140	660	819	384
Lane Group Flow (vph)	159	750	974	797
Turn Type	pm+pt			
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.66	0.53	1.04	0.90
Control Delay	31.7	15.2	72.6	35.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.7	15.2	72.6	35.4
Queue Length 50th (ft)	39	97	~204	161
Queue Length 95th (ft)	#84	147	m#315	#261
Internal Link Dist (ft)		780	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	241	1403	934	886
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.53	1.04	0.90

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 70
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Spring Garden Street & N. 16th Street



HCM Signalized Intersection Capacity Analysis
2: Spring Garden Street & N. 15th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	780	63	121	692	0	0	0	0	77	306	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	10	11	12	12	12	12	9	10	12
Grade (%)		0%			2%			0%			0%	
Total Lost time (s)		6.0		3.0	6.0					6.0	6.0	
Lane Util. Factor		0.95		1.00	0.95					1.00	1.00	
Frpb, ped/bikes		0.95		1.00	1.00					1.00	0.98	
Flpb, ped/bikes		1.00		0.99	1.00					0.85	1.00	
Frt		0.99		1.00	1.00					1.00	0.97	
Flt Protected		1.00		0.95	1.00					0.95	1.00	
Satd. Flow (prot)		2801		1268	2873					1157	1337	
Flt Permitted		1.00		0.17	1.00					0.95	1.00	
Satd. Flow (perm)		2801		232	2873					1157	1337	
Peak-hour factor, PHF	0.92	0.96	0.79	0.82	0.88	0.92	0.92	0.92	0.92	0.84	0.96	0.97
Adj. Flow (vph)	0	812	80	148	786	0	0	0	0	92	319	64
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	892	0	148	786	0	0	0	0	92	383	0
Confl. Peds. (#/hr)	124		466	466		124	123		129	129		123
Confl. Bikes (#/hr)			5									
Heavy Vehicles (%)	2%	2%	24%	5%	2%	2%	2%	2%	2%	8%	2%	3%
Bus Blockages (#/hr)	0	4	0	0	4	0	0	0	0	0	0	0
Parking (#/hr)	0		0	0	0						0	
Turn Type				pm+pt						Perm		
Protected Phases		2		1	6						4	
Permitted Phases				6						4		
Actuated Green, G (s)		20.0		29.0	29.0					19.0	19.0	
Effective Green, g (s)		20.0		29.0	29.0					19.0	19.0	
Actuated g/C Ratio		0.33		0.48	0.48					0.32	0.32	
Clearance Time (s)		6.0		3.0	6.0					6.0	6.0	
Lane Grp Cap (vph)		934		216	1389					366	423	
v/s Ratio Prot		c0.32		c0.07	0.27						c0.29	
v/s Ratio Perm				0.26						0.08		
v/c Ratio		0.96		0.69	0.57					0.25	0.91	
Uniform Delay, d1		19.6		10.6	11.0					15.2	19.6	
Progression Factor		0.80		1.00	1.00					1.00	1.00	
Incremental Delay, d2		17.2		16.3	1.7					1.6	25.5	
Delay (s)		32.9		26.9	12.7					16.9	45.1	
Level of Service		C		C	B					B	D	
Approach Delay (s)		32.9			14.9			0.0			39.6	
Approach LOS		C			B			A			D	

Intersection Summary			
HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

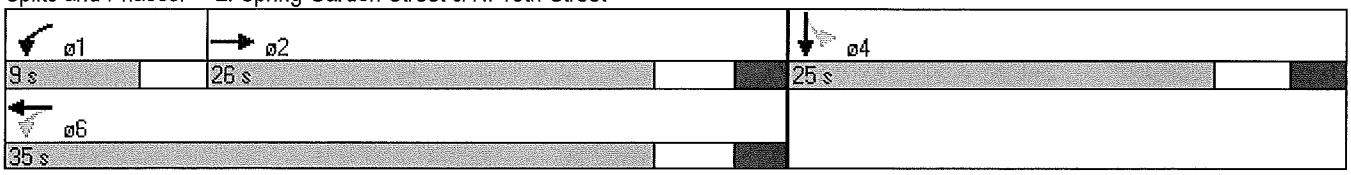
Timings
2: Spring Garden Street & N. 15th Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	780	121	692	77	306
Lane Group Flow (vph)	892	148	786	92	383
Turn Type		pm+pt		Perm	
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.96	0.67	0.57	0.25	0.91
Control Delay	35.9	26.5	13.0	17.6	49.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	35.9	26.5	13.0	17.6	49.0
Queue Length 50th (ft)	147	26	98	24	131
Queue Length 95th (ft)	m#270	#70	141	52	#278
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	934	220	1389	366	423
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.96	0.67	0.57	0.25	0.91

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Spring Garden Street & N. 15th Street



HCM Unsignalized Intersection Capacity Analysis
3: Callowhill Street & Franklin Town Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	198	55	134	37	278	174	26	42	8	0	0	0
Peak Hour Factor	0.90	0.76	0.76	0.62	0.88	0.74	0.67	0.66	0.65	0.92	0.92	0.92
Hourly flow rate (vph)	220	72	176	60	316	235	39	64	12	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	469	611	115
Volume Left (vph)	220	60	39
Volume Right (vph)	176	235	12
Hadj (s)	-0.08	-0.20	0.09
Departure Headway (s)	4.9	4.7	6.4
Degree Utilization, x	0.64	0.80	0.20
Capacity (veh/h)	705	757	514
Control Delay (s)	16.5	23.3	11.1
Approach Delay (s)	16.5	23.3	11.1
Approach LOS	C	C	B

Intersection Summary			
Delay	19.4		
HCM Level of Service	C		
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
3: Callowhill Street & Franklin Town Boulevard

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	198	55	134	37	278	174	26	42	8	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.949			0.948			0.986				
Flt Protected		0.977			0.995			0.983				
Satd. Flow (prot)	0	1491	0	0	1424	0	0	1585	0	0	0	0
Flt Permitted		0.977			0.995			0.983				
Satd. Flow (perm)	0	1491	0	0	1424	0	0	1585	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			329			412			215	
Travel Time (s)		17.6			9.0			11.2			5.9	
Confl. Peds. (#/hr)	35		35	35		35	18		24	24		18
Confl. Bikes (#/hr)			5			8			1			2
Peak Hour Factor	0.90	0.76	0.76	0.62	0.88	0.74	0.67	0.66	0.65	0.92	0.92	0.92
Heavy Vehicles (%)	2%	13%	1%	0%	1%	1%	4%	2%	25%	2%	2%	2%
Parking (#/hr)					0			0				
Adj. Flow (vph)	220	72	176	60	316	235	39	64	12	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	468	0	0	611	0	0	115	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.14	1.19	1.14	1.16	1.32	1.16	1.17	1.14	1.17	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: CBD
Control Type: Unsignalized
Intersection Capacity Utilization 79.5% ICU Level of Service D
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
4: Callowhill Street & N. 17th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	0	62	156	331	0	0	0	0	0	226	94
Peak Hour Factor	0.92	0.92	0.78	0.83	0.85	0.92	0.92	0.92	0.92	0.92	0.86	0.76
Hourly flow rate (vph)	0	0	79	188	389	0	0	0	0	0	263	124

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total (vph)	79	188	389	386
Volume Left (vph)	0	188	0	0
Volume Right (vph)	79	0	0	124
Hadj (s)	-0.55	0.52	0.02	-0.16
Departure Headway (s)	5.4	6.3	5.7	5.3
Degree Utilization, x	0.12	0.33	0.62	0.57
Capacity (veh/h)	611	557	603	648
Control Delay (s)	9.1	11.1	16.5	15.1
Approach Delay (s)	9.1	14.7		15.1
Approach LOS	A	B		C

Intersection Summary			
Delay	14.4		
HCM Level of Service	B		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Callowhill Street & N. 17th Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	62	156	331	0	0	0	0	0	226	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.957	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1292	1547	1516	0	0	0	0	0	1395	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1292	1547	1516	0	0	0	0	0	1395	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		329			440			230			610	
Travel Time (s)		9.0			12.0			6.3			16.6	
Confl. Peds. (#/hr)	26		57	57		26	112		60	60		112
Confl. Bikes (#/hr)			1									20
Peak Hour Factor	0.92	0.92	0.78	0.83	0.85	0.92	0.92	0.92	0.92	0.92	0.86	0.76
Heavy Vehicles (%)	2%	2%	3%	1%	1%	2%	2%	2%	2%	2%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	79	188	389	0	0	0	0	0	263	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	79	188	389	0	0	0	0	0	387	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.30	1.20	1.31	1.15	1.14	1.14	1.14	1.12	1.36	1.12
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: CBD
Control Type: Unsignalized
Intersection Capacity Utilization 53.7% ICU Level of Service A
Analysis Period (min) 15

HCM Signalized Intersection Capacity Analysis
5: Callowhill Street & N. 16th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	363	136	82	542	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)					5.0			5.0				
Lane Util. Factor					0.95			0.95				
Frpb, ped/bikes					0.98			1.00				
Flpb, ped/bikes					1.00			0.98				
Frt					0.96			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					2863			2995				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					2863			2995				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.80	0.77	0.84	0.85	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	454	177	98	638	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	68	0	0	20	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	563	0	0	716	0	0	0	0
Confl. Peds. (#/hr)	35		73	73		35	237		30	30		237
Confl. Bikes (#/hr)						4						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	1%	3%	4%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	5	0	0	0	0
Parking (#/hr)					0							
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					16.0			34.0				
Effective Green, g (s)					16.0			34.0				
Actuated g/C Ratio					0.27			0.57				
Clearance Time (s)					5.0			5.0				
Lane Grp Cap (vph)					763			1697				
v/s Ratio Prot					c0.20							
v/s Ratio Perm								0.24				
v/c Ratio					0.74			0.42				
Uniform Delay, d1					20.1			7.4				
Progression Factor					1.00			1.00				
Incremental Delay, d2					6.3			0.8				
Delay (s)					26.4			8.2				
Level of Service					C			A				
Approach Delay (s)		0.0			26.4			8.2			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

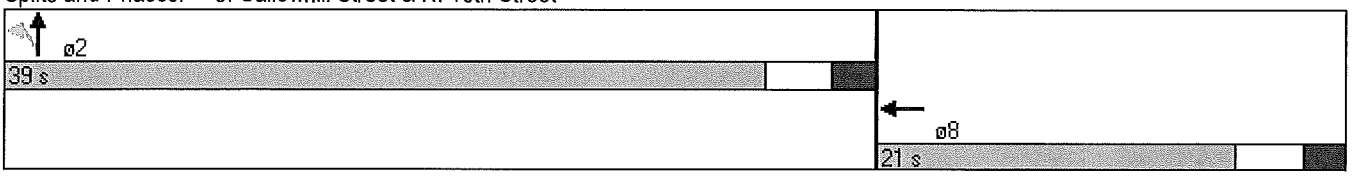
Timings
5: Callowhill Street & N. 16th Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	363	542
Lane Group Flow (vph)	631	736
Turn Type		
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	21.0	39.0
Total Split (s)	21.0	39.0
Total Split (%)	35.0%	65.0%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.76	0.43
Control Delay	24.4	7.9
Queue Delay	0.0	0.0
Total Delay	24.4	7.9
Queue Length 50th (ft)	93	65
Queue Length 95th (ft)	123	91
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	832	1716
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.76	0.43

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 5: Callowhill Street & N. 16th Street



HCM Unsignalized Intersection Capacity Analysis
6: Callowhill Street & N. 15th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	0	0	129	342	0	0	0	0	0	512	62
Peak Hour Factor	0.92	0.92	0.92	0.75	0.93	0.92	0.92	0.92	0.92	0.92	0.96	0.86
Hourly flow rate (vph)	0	0	0	172	368	0	0	0	0	0	533	72

Direction, Lane #	WB 1	WB 2	SB 1
Volume Total (vph)	295	245	605
Volume Left (vph)	172	0	0
Volume Right (vph)	0	0	72
Hadj (s)	0.31	0.03	0.04
Departure Headway (s)	6.6	6.3	5.3
Degree Utilization, x	0.54	0.43	0.90
Capacity (veh/h)	533	555	669
Control Delay (s)	15.7	12.7	36.9
Approach Delay (s)	14.3		36.9
Approach LOS	B		E

Intersection Summary			
Delay	26.3		
HCM Level of Service	D		
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Callowhill Street & N. 15th Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	129	342	0	0	0	0	0	512	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			0%			0%			-3%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt											0.984	
Flt Protected					0.984							
Satd. Flow (prot)	0	0	0	0	2996	0	0	0	0	0	1391	0
Flt Permitted					0.984							
Satd. Flow (perm)	0	0	0	0	2996	0	0	0	0	0	1391	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			146			1070	
Travel Time (s)		12.5			13.1			4.0			29.2	
Confl. Peds. (#/hr)	57		40	40		57	34		23	23		34
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.92	0.92	0.92	0.75	0.93	0.92	0.92	0.92	0.92	0.92	0.96	0.86
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	2%	2%	2%	2%	6%	13%
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	172	368	0	0	0	0	0	533	72
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	540	0	0	0	0	0	605	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.22	1.14	1.14	1.14	1.14	1.12	1.34	1.12
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: CBD
Control Type: Unsignalized
Intersection Capacity Utilization 59.1% ICU Level of Service B
Analysis Period (min) 15

HCM Signalized Intersection Capacity Analysis
7: Callowhill Street & N. Broad Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	60	273	87	1	768	0	0	772	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	11	12	12	10	12	12	10	12
Grade (%)		0%			3%			4%			-1%	
Total Lost time (s)				6.0	6.0			5.0			5.0	
Lane Util. Factor				1.00	0.95			0.91			0.95	
Frpb, ped/bikes				1.00	0.99			1.00			0.99	
Flpb, ped/bikes				0.96	1.00			1.00			1.00	
Frt				1.00	0.95			1.00			0.98	
Flt Protected				0.95	1.00			1.00			1.00	
Satd. Flow (prot)				1401	2908			4134			2893	
Flt Permitted				0.95	1.00			0.94			1.00	
Satd. Flow (perm)				1401	2908			3873			2893	
Peak-hour factor, PHF	0.92	0.92	0.92	0.68	0.92	0.64	0.25	0.87	0.92	0.92	0.87	0.78
Adj. Flow (vph)	0	0	0	88	297	136	4	883	0	0	887	100
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	88	433	0	0	887	0	0	987	0
Confl. Peds. (#/hr)	32		43	43		32	148		89	89		148
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	0%	3%	2%	2%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Turn Type				Perm			Perm					
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)				27.0	27.0			52.0			52.0	
Effective Green, g (s)				27.0	27.0			52.0			52.0	
Actuated g/C Ratio				0.30	0.30			0.58			0.58	
Clearance Time (s)				6.0	6.0			5.0			5.0	
Lane Grp Cap (vph)				420	872			2238			1672	
v/s Ratio Prot					c0.15						c0.34	
v/s Ratio Perm				0.06				0.23				
v/c Ratio				0.21	0.50			0.40			0.59	
Uniform Delay, d1				23.5	25.9			10.4			12.2	
Progression Factor				1.00	1.00			1.85			0.54	
Incremental Delay, d2				1.1	2.0			0.4			1.2	
Delay (s)				24.7	27.9			19.7			7.8	
Level of Service				C	C			B			A	
Approach Delay (s)		0.0			27.4			19.7			7.8	
Approach LOS		A			C			B			A	

Intersection Summary			
HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

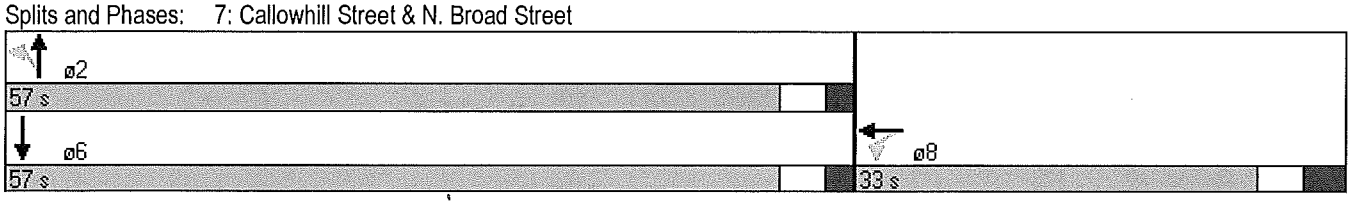
Timings
7: Callowhill Street & N. Broad Street

Lane Group	WBL	WBT	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	60	273	1	768	772
Lane Group Flow (vph)	88	433	0	887	987
Turn Type	Perm		Perm		
Protected Phases		8		2	6
Permitted Phases	8		2		
Minimum Split (s)	33.0	33.0	57.0	57.0	57.0
Total Split (s)	33.0	33.0	57.0	57.0	57.0
Total Split (%)	36.7%	36.7%	63.3%	63.3%	63.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
v/c Ratio	0.21	0.50		0.40	0.59
Control Delay	25.2	28.3		19.9	8.0
Queue Delay	0.0	0.0		0.0	0.0
Total Delay	25.2	28.3		19.9	8.0
Queue Length 50th (ft)	37	106		179	62
Queue Length 95th (ft)	55	152		207	m72
Internal Link Dist (ft)		550		480	990
Turn Bay Length (ft)	530				
Base Capacity (vph)	420	872		2238	1672
Starvation Cap Reductn	0	0		0	0
Spillback Cap Reductn	0	0		0	0
Storage Cap Reductn	0	0		0	0
Reduced v/c Ratio	0.21	0.50		0.40	0.59

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 49 (54%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Callowhill Street & N. Broad Street



HCM Signalized Intersection Capacity Analysis
8: WB Vine Street & N. 16th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	734	551	71	589	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Total Lost time (s)					5.3	5.3		6.0				
Lane Util. Factor					0.95	0.88		0.91				
Frpb, ped/bikes					1.00	0.94		1.00				
Flpb, ped/bikes					1.00	1.00		0.96				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3217	2310		4135				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3217	2310		4135				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.90	0.92	0.81	0.94	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	816	599	88	627	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	20	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	816	599	0	695	0	0	0	0
Confl. Peds. (#/hr)	69		33	33		69	311		16	16		311
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%	4%	5%	2%	2%	2%	2%
Turn Type						Perm	Perm					
Protected Phases					1			2				
Permitted Phases						1	2					
Actuated Green, G (s)					45.7	45.7		33.0				
Effective Green, g (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
Clearance Time (s)					5.3	5.3		6.0				
Lane Grp Cap (vph)					1634	1173		1516				
v/s Ratio Prot					0.25							
v/s Ratio Perm						c0.26		0.17				
v/c Ratio					0.50	0.51		0.46				
Uniform Delay, d1					14.6	14.7		21.7				
Progression Factor					0.59	0.58		1.12				
Incremental Delay, d2					0.8	1.2		0.9				
Delay (s)					9.4	9.8		25.3				
Level of Service					A	A		C				
Approach Delay (s)		0.0			9.5			25.3			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM Average Control Delay	14.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.3
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

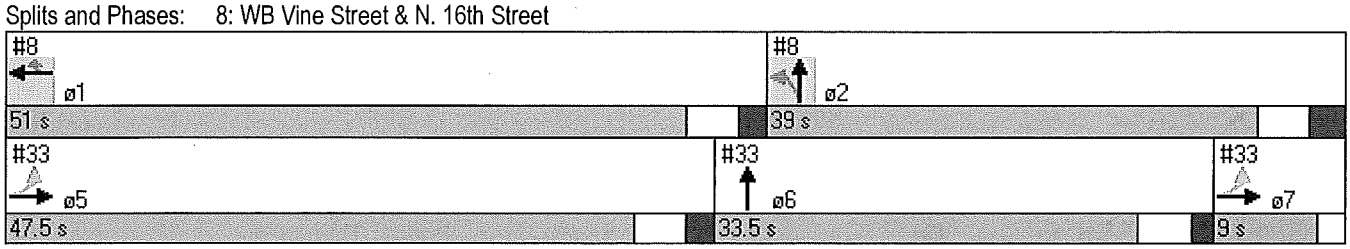
Timings
8: WB Vine Street & N. 16th Street

Lane Group	WBT	WBR	NBT	ø5	ø6	ø7
Lane Configurations						
Volume (vph)	734	551	589			
Lane Group Flow (vph)	816	599	715			
Turn Type		Perm				
Protected Phases	1		2	5	6	7
Permitted Phases		1				
Minimum Split (s)	51.0	51.0	39.0	47.5	33.5	9.0
Total Split (s)	51.0	51.0	39.0	47.5	33.5	9.0
Total Split (%)	56.7%	56.7%	43.3%	53%	37%	10%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	1.8	2.5	1.8	1.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0			
Total Lost Time (s)	5.3	5.3	6.0			
Lead/Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?						
v/c Ratio	0.50	0.51	0.47			
Control Delay	9.5	10.0	24.4			
Queue Delay	0.0	0.0	3.0			
Total Delay	9.5	10.0	27.5			
Queue Length 50th (ft)	93	73	108			
Queue Length 95th (ft)	m107	m88	145			
Internal Link Dist (ft)	380		90			
Turn Bay Length (ft)						
Base Capacity (vph)	1634	1173	1537			
Starvation Cap Reductn	0	0	692			
Spillback Cap Reductn	0	0	0			
Storage Cap Reductn	0	0	0			
Reduced v/c Ratio	0.50	0.51	0.85			

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: WB Vine Street & N. 16th Street



HCM Signalized Intersection Capacity Analysis
9: WB Vine Street & N. 15th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	77	919	0	0	0	0	0	1191	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Total Lost time (s)					5.0						15.0	
Lane Util. Factor					0.91						0.86	
Frpb, ped/bikes					1.00						0.99	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.97	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					4425						5292	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					4425						5292	
Peak-hour factor, PHF	0.92	0.92	0.92	0.77	0.91	0.92	0.92	0.92	0.92	0.92	0.90	0.89
Adj. Flow (vph)	0	0	0	100	1010	0	0	0	0	0	1323	376
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	35	0
Lane Group Flow (vph)	0	0	0	0	1110	0	0	0	0	0	1664	0
Confl. Peds. (#/hr)	59		2	2		59	34		217	217		34
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	2%	2%	1%
Parking (#/hr)					0							
Turn Type				Perm								
Protected Phases					1						2	
Permitted Phases				1								
Actuated Green, G (s)					44.0						26.0	
Effective Green, g (s)					44.0						26.0	
Actuated g/C Ratio					0.49						0.29	
Clearance Time (s)					5.0						15.0	
Lane Grp Cap (vph)					2163						1529	
v/s Ratio Prot											c0.31	
v/s Ratio Perm					0.25							
v/c Ratio					0.51						1.09	
Uniform Delay, d1					15.7						32.0	
Progression Factor					0.34						1.00	
Incremental Delay, d2					0.7						51.1	
Delay (s)					6.0						83.1	
Level of Service					A						F	
Approach Delay (s)		0.0			6.0			0.0			83.1	
Approach LOS		A			A			A			F	

Intersection Summary			
HCM Average Control Delay	52.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

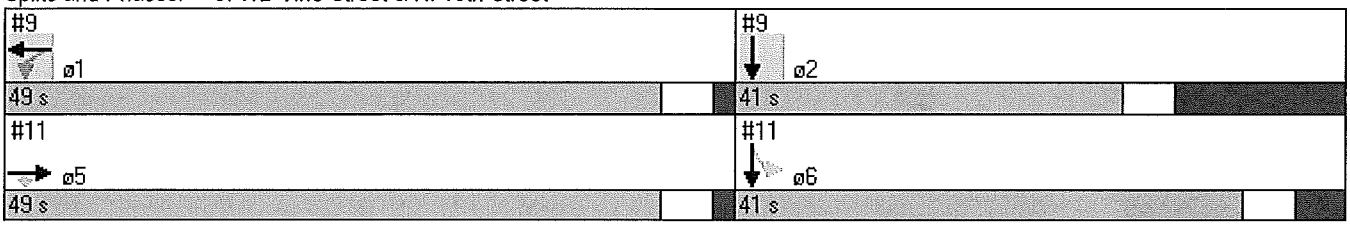
c Critical Lane Group

Lane Group	WBT	SBT	ø5	ø6
Lane Configurations				
Volume (vph)	919	1191		
Lane Group Flow (vph)	1110	1699		
Turn Type				
Protected Phases	1	2	5	6
Permitted Phases				
Minimum Split (s)	49.0	41.0	49.0	41.0
Total Split (s)	49.0	41.0	49.0	41.0
Total Split (%)	54.4%	45.6%	54%	46%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	11.5	1.5	3.5
Lost Time Adjust (s)	0.0	0.0		
Total Lost Time (s)	5.0	15.0		
Lead/Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?				
v/c Ratio	0.51	1.09		
Control Delay	6.1	81.1		
Queue Delay	0.0	7.5		
Total Delay	6.1	88.6		
Queue Length 50th (ft)	37	~313		
Queue Length 95th (ft)	44	#390		
Internal Link Dist (ft)	400	334		
Turn Bay Length (ft)				
Base Capacity (vph)	2164	1564		
Starvation Cap Reductn	0	0		
Spillback Cap Reductn	86	25		
Storage Cap Reductn	0	0		
Reduced v/c Ratio	0.53	1.10		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: WB Vine Street & N. 15th Street



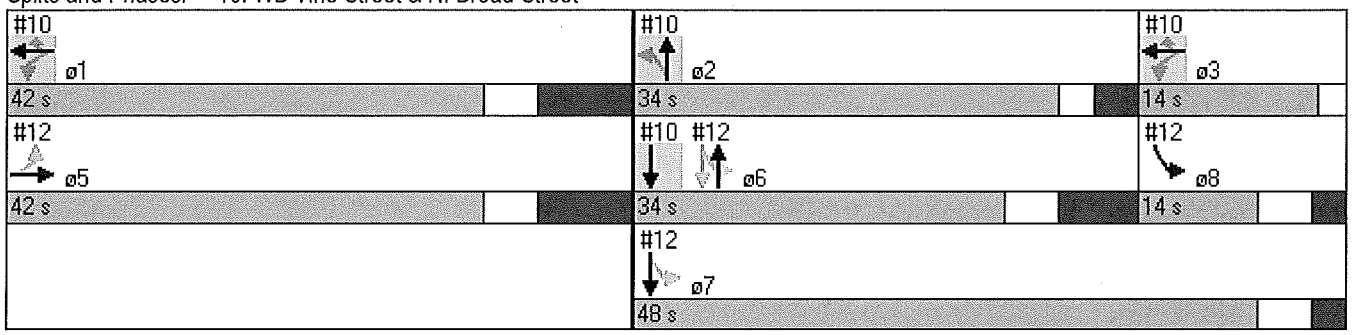
HCM Signalized Intersection Capacity Analysis
10: WB Vine Street & N. Broad Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	172	865	182	4	648	0	0	645	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Total Lost time (s)				10.0	10.0	10.0		5.4			9.0	
Lane Util. Factor				1.00	0.95	1.00		0.91			0.86	
Frpb, ped/bikes				1.00	1.00	0.92		1.00			0.95	
Flpb, ped/bikes				1.00	1.00	1.00		1.00			1.00	
Frt				1.00	1.00	0.85		1.00			0.98	
Flt Protected				0.95	1.00	1.00		1.00			1.00	
Satd. Flow (prot)				1584	3125	1289		4235			4889	
Flt Permitted				0.95	1.00	1.00		0.93			1.00	
Satd. Flow (perm)				1584	3125	1289		3930			4889	
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.92	0.81	0.50	0.87	0.92	0.92	0.92	0.91
Adj. Flow (vph)	0	0	0	200	940	225	8	745	0	0	701	136
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	200	940	225	0	753	0	0	837	0
Confl. Peds. (#/hr)	89		1	1		89	319		150	150		319
Confl. Bikes (#/hr)						39						11
Heavy Vehicles (%)	2%	2%	2%	2%	0%	3%	0%	3%	2%	2%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Turn Type				Perm		Perm	Perm					
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3	2					
Actuated Green, G (s)				46.0	46.0	46.0		28.6			25.0	
Effective Green, g (s)				44.0	44.0	44.0		28.6			25.0	
Actuated g/C Ratio				0.49	0.49	0.49		0.32			0.28	
Clearance Time (s)								5.4			9.0	
Lane Grp Cap (vph)				774	1528	630		1249			1358	
v/s Ratio Prot					c0.30						0.17	
v/s Ratio Perm				0.13		0.17		c0.19				
v/c Ratio				0.26	0.62	0.36		0.60			0.62	
Uniform Delay, d1				13.5	16.8	14.2		25.9			28.3	
Progression Factor				1.00	1.00	1.00		0.19			0.51	
Incremental Delay, d2				0.8	1.9	1.6		0.2			1.8	
Delay (s)				14.3	18.7	15.8		5.0			16.2	
Level of Service				B	B	B		A			B	
Approach Delay (s)		0.0			17.6			5.0			16.2	
Approach LOS		A			B			A			B	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	25.4
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Splits and Phases: 10: WB Vine Street & N. Broad Street



Timings
10: WB Vine Street & N. Broad Street

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	ø1	ø3	ø5	ø7	ø8
Lane Configurations											
Volume (vph)	172	865	182	4	648	645					
Lane Group Flow (vph)	200	940	225	0	753	837					
Turn Type	Perm		Perm	Perm							
Protected Phases		1 3!			2	6!	1	3	5	7	8
Permitted Phases	1 3!		1 3	2							
Minimum Split (s)				34.0	34.0	34.0	42.0	14.0	42.0	48.0	14.0
Total Split (s)	56.0	56.0	56.0	34.0	34.0	34.0	42.0	14.0	42.0	48.0	14.0
Total Split (%)	62.2%	62.2%	62.2%	37.8%	37.8%	37.8%	47%	16%	47%	53%	16%
Yellow Time (s)				2.4	2.4	3.6	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)				3.0	3.0	5.4	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0					
Total Lost Time (s)	10.0	10.0	10.0	5.4	5.4	9.0					
Lead/Lag				Lead	Lead	Lead		Lag			Lag
Lead-Lag Optimize?								Yes			
v/c Ratio	0.25	0.59	0.34		0.60	0.62					
Control Delay	13.3	17.3	14.9		5.0	16.3					
Queue Delay	0.0	0.0	0.0		5.3	0.2					
Total Delay	13.3	17.3	14.9		10.3	16.6					
Queue Length 50th (ft)	60	186	72		27	85					
Queue Length 95th (ft)	97	246	107		m24	111					
Internal Link Dist (ft)		550			90	480					
Turn Bay Length (ft)											
Base Capacity (vph)	810	1597	659		1250	1359					
Starvation Cap Reductn	0	0	0		425	0					
Spillback Cap Reductn	0	0	0		0	114					
Storage Cap Reductn	0	0	0		0	0					
Reduced v/c Ratio	0.25	0.59	0.34		0.91	0.67					

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

HCM Signalized Intersection Capacity Analysis
11: EB Vine Street & N. 15th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1244	232	0	0	0	0	0	0	428	737	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Total Lost time (s)		5.0	5.0							7.0	7.0	
Lane Util. Factor		0.86	0.88							1.00	0.91	
Frpb, ped/bikes		1.00	0.98							1.00	1.00	
Flpb, ped/bikes		1.00	1.00							0.90	1.00	
Frt		1.00	0.85							1.00	1.00	
Flt Protected		1.00	1.00							0.95	1.00	
Satd. Flow (prot)		5766	2377							1411	4294	
Flt Permitted		1.00	1.00							0.95	1.00	
Satd. Flow (perm)		5766	2377							1411	4294	
Peak-hour factor, PHF	0.92	0.92	0.75	0.92	0.92	0.92	0.92	0.92	0.92	0.90	0.84	0.92
Adj. Flow (vph)	0	1352	309	0	0	0	0	0	0	476	877	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	16	0	0
Lane Group Flow (vph)	0	1352	309	0	0	0	0	0	0	460	877	0
Confl. Peds. (#/hr)	1		19	19		1	19		132	132		19
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	1%	4%	2%	2%	2%	2%	2%	2%	1%	3%	2%
Turn Type			Perm							Perm		
Protected Phases		5									6	
Permitted Phases			5							6		
Actuated Green, G (s)		44.0	44.0							34.0	34.0	
Effective Green, g (s)		44.0	44.0							34.0	34.0	
Actuated g/C Ratio		0.49	0.49							0.38	0.38	
Clearance Time (s)		5.0	5.0							7.0	7.0	
Lane Grp Cap (vph)		2819	1162							533	1622	
v/s Ratio Prot		c0.23									0.20	
v/s Ratio Perm			0.13							c0.33		
v/c Ratio		0.48	0.27							0.86	0.54	
Uniform Delay, d1		15.4	13.5							25.8	21.9	
Progression Factor		1.03	0.99							0.21	0.12	
Incremental Delay, d2		0.6	0.6							1.9	0.1	
Delay (s)		16.4	13.9							7.3	2.8	
Level of Service		B	B							A	A	
Approach Delay (s)		15.9			0.0			0.0			4.4	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

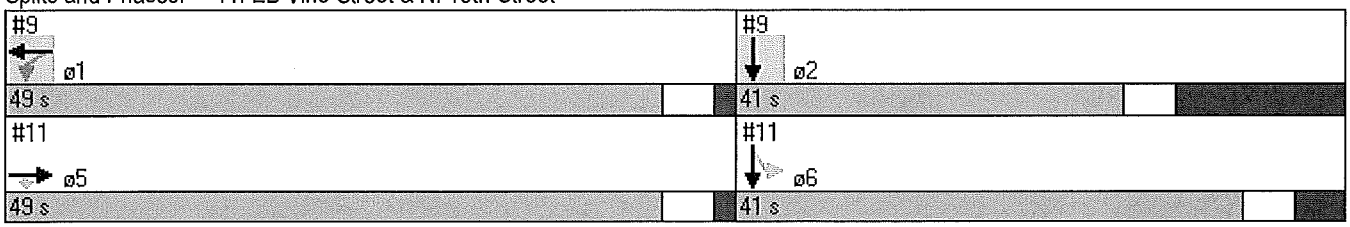
c Critical Lane Group

Lane Group	EBT	EBR	SBL	SBT	ø1	ø2
Lane Configurations						
Volume (vph)	1244	232	428	737		
Lane Group Flow (vph)	1352	309	476	877		
Turn Type		Perm	Perm			
Protected Phases	5			6	1	2
Permitted Phases		5	6			
Minimum Split (s)	49.0	49.0	41.0	41.0	49.0	41.0
Total Split (s)	49.0	49.0	41.0	41.0	49.0	41.0
Total Split (%)	54.4%	54.4%	45.6%	45.6%	54%	46%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	3.5	3.5	1.5	11.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.0	5.0	7.0	7.0		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						
v/c Ratio	0.48	0.27	0.87	0.54		
Control Delay	16.5	14.1	9.4	2.8		
Queue Delay	0.0	0.0	11.0	2.6		
Total Delay	16.5	14.1	20.4	5.4		
Queue Length 50th (ft)	138	51	17	16		
Queue Length 95th (ft)	165	57	m15	m15		
Internal Link Dist (ft)	2			90		
Turn Bay Length (ft)						
Base Capacity (vph)	2819	1162	549	1622		
Starvation Cap Reductn	0	0	60	597		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.48	0.27	0.97	0.86		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: EB Vine Street & N. 15th Street



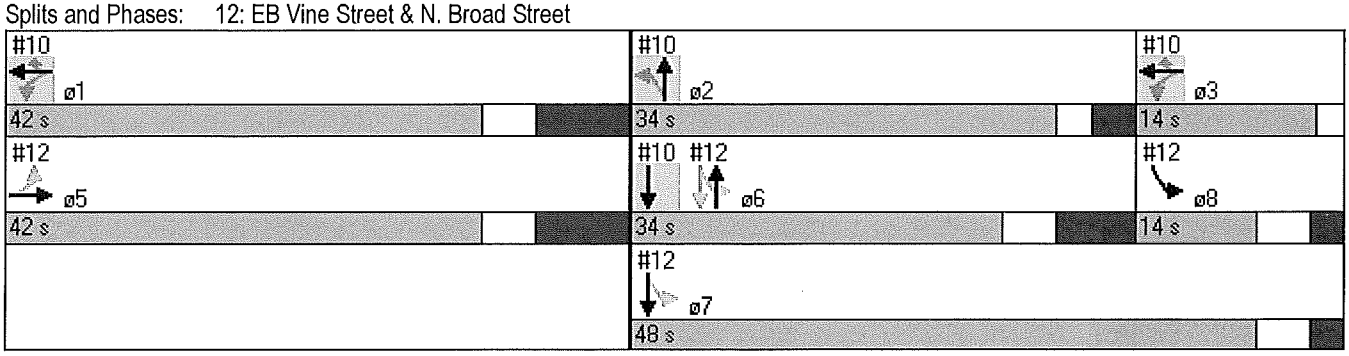
HCM Signalized Intersection Capacity Analysis
12: EB Vine Street & N. Broad Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	88	1455	64	0	0	0	0	565	426	205	679	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Total Lost time (s)		10.0						9.0		6.0	6.0	
Lane Util. Factor		0.86						0.91		1.00	0.91	
Frpb, ped/bikes		0.99						0.94		1.00	1.00	
Flpb, ped/bikes		1.00						1.00		1.00	1.00	
Frt		0.99						0.94		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		5655						3468		1574	4229	
Flt Permitted		1.00						1.00		0.17	1.00	
Satd. Flow (perm)		5655						3468		276	4229	
Peak-hour factor, PHF	0.92	0.94	0.67	0.92	0.92	0.92	0.92	0.85	0.92	0.92	0.88	0.92
Adj. Flow (vph)	96	1548	96	0	0	0	0	665	463	223	772	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1740	0	0	0	0	0	1128	0	223	772	0
Confl. Peds. (#/hr)	6		110	110		6	366		123	123		366
Confl. Bikes (#/hr)			7						16			
Heavy Vehicles (%)	3%	1%	3%	2%	2%	2%	2%	3%	8%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Turn Type	Perm									custom		
Protected Phases		5						6		8	7	
Permitted Phases	5									6 7	6 7	
Actuated Green, G (s)		32.0						25.0		42.0	42.0	
Effective Green, g (s)		32.0						25.0		42.0	42.0	
Actuated g/C Ratio		0.36						0.28		0.47	0.47	
Clearance Time (s)		10.0						9.0		6.0	6.0	
Lane Grp Cap (vph)		2011						963		244	1974	
v/s Ratio Prot								c0.33		c0.08	0.18	
v/s Ratio Perm		0.31								0.34		
v/c Ratio		0.87						1.60dr		0.91	0.39	
Uniform Delay, d1		27.0						32.5		28.2	15.7	
Progression Factor		0.50						1.00		0.68	0.38	
Incremental Delay, d2		4.4						88.3		36.1	0.5	
Delay (s)		18.0						120.8		55.2	6.5	
Level of Service		B						F		E	A	
Approach Delay (s)		18.0			0.0			120.8			17.5	
Approach LOS		B			A			F			B	

Intersection Summary			
HCM Average Control Delay	47.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Splits and Phases: 12: EB Vine Street & N. Broad Street



Lane Group	EBT	NBT	SBL	SBT	ø1	ø2	ø3
Lane Configurations							
Volume (vph)	1455	565	205	679			
Lane Group Flow (vph)	1740	1128	223	772			
Turn Type			custom				
Protected Phases	5	6	8	7	1	2	3
Permitted Phases			6 7	6 7			
Minimum Split (s)	42.0	34.0	14.0	48.0	42.0	34.0	14.0
Total Split (s)	42.0	34.0	14.0	48.0	42.0	34.0	14.0
Total Split (%)	46.7%	37.8%	15.6%	53.3%	47%	38%	16%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	2.4	2.0
All-Red Time (s)	6.4	5.4	2.4	2.4	6.4	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0			
Total Lost Time (s)	10.0	9.0	6.0	6.0			
Lead/Lag		Lead	Lag			Lead	Lag
Lead-Lag Optimize?							Yes
v/c Ratio	0.87	1.60dr	0.92	0.39			
Control Delay	18.4	119.7	61.8	6.6			
Queue Delay	0.0	0.0	41.9	0.7			
Total Delay	18.4	119.7	103.6	7.3			
Queue Length 50th (ft)	134	~283	85	33			
Queue Length 95th (ft)	156	#338	#213	45			
Internal Link Dist (ft)	400	350		90			
Turn Bay Length (ft)			45				
Base Capacity (vph)	2011	963	243	1974			
Starvation Cap Reductn	0	0	37	784			
Spillback Cap Reductn	0	0	0	0			
Storage Cap Reductn	0	0	0	0			
Reduced v/c Ratio	0.87	1.17	1.08	0.65			

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	598	0	0	851	83	159	207	175	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	11	12	12	9	9	12	12	12
Total Lost time (s)	3.0	6.0			6.0			6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00			
Frpb, ped/bikes	1.00	1.00			0.98			1.00	0.93			
Flpb, ped/bikes	1.00	1.00			1.00			0.96	1.00			
Frt	1.00	1.00			0.98			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.98	1.00			
Satd. Flow (prot)	1483	2925			2828			1273	1193			
Flt Permitted	0.17	1.00			1.00			0.98	1.00			
Satd. Flow (perm)	272	2925			2828			1273	1193			
Peak-hour factor, PHF	0.77	0.94	0.92	0.92	0.95	0.74	0.90	0.92	0.86	0.92	0.92	0.92
Adj. Flow (vph)	84	636	0	0	896	112	177	225	203	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	0	76	0	0	0
Lane Group Flow (vph)	84	636	0	0	992	0	0	402	127	0	0	0
Confl. Peds. (#/hr)	58		100	100		58	76		45	45		76
Confl. Bikes (#/hr)			43			26			13			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%
Parking (#/hr)		0			0			0				
Turn Type	pm+pt						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	29.0	29.0			20.0			19.0	19.0			
Effective Green, g (s)	29.0	29.0			20.0			19.0	19.0			
Actuated g/C Ratio	0.48	0.48			0.33			0.32	0.32			
Clearance Time (s)	3.0	6.0			6.0			6.0	6.0			
Lane Grp Cap (vph)	253	1414			943			403	378			
v/s Ratio Prot	0.03	c0.22			c0.35							
v/s Ratio Perm	0.13							0.32	0.11			
v/c Ratio	0.33	0.45			1.05			1.00	0.34			
Uniform Delay, d1	10.3	10.2			20.0			20.5	15.7			
Progression Factor	1.00	1.00			1.71			1.00	1.00			
Incremental Delay, d2	3.5	1.0			26.5			44.2	2.4			
Delay (s)	13.8	11.3			60.7			64.7	18.1			
Level of Service	B	B			E			E	B			
Approach Delay (s)		11.6			60.7			49.1			0.0	
Approach LOS		B			E			D			A	

Intersection Summary			
HCM Average Control Delay	42.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Timings
13: Spring Garden Street & N. 18th Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	65	598	851	207	175
Lane Group Flow (vph)	84	636	1008	402	203
Turn Type	pm+pt				Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.32	0.45	1.05	1.00	0.45
Control Delay	10.3	11.5	60.4	69.5	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	11.5	60.4	69.5	11.5
Queue Length 50th (ft)	14	74	~214	143	24
Queue Length 95th (ft)	26	111	m#203	#303	68
Internal Link Dist (ft)		476	780	380	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	265	1414	958	403	454
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.45	1.05	1.00	0.45

Intersection Summary

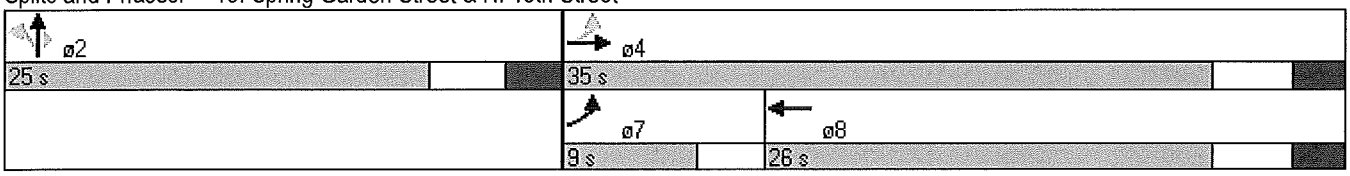
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 80
Control Type: Pretimed

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Spring Garden Street & N. 18th Street



HCM Signalized Intersection Capacity Analysis
14: Spring Garden Street & N. Broad Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	818	35	3	741	81	1	810	49	140	808	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	11	12	10	11	12
Grade (%)		0%			0%			0%			-1%	
Total Lost time (s)		6.0			6.0			6.0		3.0	6.0	6.0
Lane Util. Factor		0.95			0.95			0.91		1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.99			0.99		1.00	1.00	0.81
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	1.00
Frt		0.99			0.98			0.99		1.00	1.00	0.85
Flt Protected		1.00			1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)		2879			2836			4328		1487	3064	1153
Flt Permitted		0.95			0.95			0.94		0.21	1.00	1.00
Satd. Flow (perm)		2738			2682			4053		328	3064	1153
Peak-hour factor, PHF	0.25	0.95	0.80	0.38	0.92	0.70	0.25	0.92	0.68	0.73	0.88	0.84
Adj. Flow (vph)	4	861	44	8	805	116	4	880	72	192	918	129
RTOR Reduction (vph)	0	0	0	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	909	0	0	929	0	0	946	0	192	918	129
Confl. Peds. (#/hr)	59		145	145		59	191		126	126		191
Confl. Bikes (#/hr)			40			39			16			26
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Parking (#/hr)		0			0							
Turn Type	Perm			Perm			Perm			pm+pt		Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		34.0			34.0			35.0		44.0	44.0	44.0
Effective Green, g (s)		34.0			34.0			35.0		44.0	44.0	44.0
Actuated g/C Ratio		0.38			0.38			0.39		0.49	0.49	0.49
Clearance Time (s)		6.0			6.0			6.0		3.0	6.0	6.0
Lane Grp Cap (vph)		1034			1013			1576		238	1498	564
v/s Ratio Prot										c0.05	0.30	
v/s Ratio Perm		0.33			c0.35			0.23		c0.34		0.11
v/c Ratio		0.88			0.92			0.60		0.81	0.61	0.23
Uniform Delay, d1		26.1			26.7			21.9		15.7	16.8	13.2
Progression Factor		1.00			1.00			1.24		1.00	1.00	1.00
Incremental Delay, d2		10.6			14.2			1.6		24.6	1.9	0.9
Delay (s)		36.7			40.9			28.7		40.3	18.7	14.2
Level of Service		D			D			C		D	B	B
Approach Delay (s)		36.7			40.9			28.7			21.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	31.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Timings
14: Spring Garden Street & N. Broad Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	1	818	3	741	1	810	140	808	108
Lane Group Flow (vph)	0	909	0	929	0	956	192	918	129
Turn Type	Perm		Perm		Perm		pm+pt		Perm
Protected Phases		4		8		2	1	6	
Permitted Phases	4		8		2		6		6
Minimum Split (s)	33.0	33.0	33.0	33.0	35.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	40.0	40.0	41.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	44.4%	45.6%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.4	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.4	2.4	2.6	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag					Lag	Lag	Lead		
Lead-Lag Optimize?									
v/c Ratio		0.88		0.92		0.60	0.78	0.61	0.23
Control Delay		37.6		42.1		28.5	37.8	19.0	14.6
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		37.6		42.1		28.5	37.8	19.0	14.6
Queue Length 50th (ft)		248		260		131	57	191	40
Queue Length 95th (ft)		#367		#386		153	75	245	70
Internal Link Dist (ft)		400		550		990		290	
Turn Bay Length (ft)							170		
Base Capacity (vph)		1035		1012		1587	245	1498	564
Starvation Cap Reductn		0		0		0	0	0	0
Spillback Cap Reductn		0		0		0	0	0	0
Storage Cap Reductn		0		0		0	0	0	0
Reduced v/c Ratio		0.88		0.92		0.60	0.78	0.61	0.23

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Spring Garden Street & N. Broad Street

ø1	ø2	ø4
9 s	41 s	40 s

ø6	ø8
50 s	40 s

BASE (NO-BUILD) CONDITIONS

HCM Signalized Intersection Capacity Analysis
1: Spring Garden Street & N. 16th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	669	0	0	824	93	126	384	203	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	11	12	12	12	12	12	12	12
Grade (%)		0%			2%			3%			0%	
Total Lost time (s)	3.0	6.0			6.0			6.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frpb, ped/bikes	1.00	1.00			0.98			0.97				
Flpb, ped/bikes	1.00	1.00			1.00			0.99				
Frt	1.00	1.00			0.98			0.95				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1349	2902			2801			2798				
Flt Permitted	0.17	1.00			1.00			0.99				
Satd. Flow (perm)	247	2902			2801			2798				
Peak-hour factor, PHF	0.88	0.88	0.91	0.92	0.95	0.82	0.88	0.94	0.83	0.92	0.92	0.92
Adj. Flow (vph)	159	760	0	0	867	113	143	409	245	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	159	760	0	0	980	0	0	797	0	0	0	0
Confl. Peds. (#/hr)	83		414	414		83	70		73	73		70
Confl. Bikes (#/hr)						51			14			
Heavy Vehicles (%)	1%	2%	2%	2%	1%	3%	0%	2%	4%	2%	2%	2%
Bus Blockages (#/hr)	0	4	0	0	4	0	0	5	0	0	0	0
Parking (#/hr)	0	0			0	0						
Turn Type	pm+pt						Perm					
Protected Phases	7	4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	29.0	29.0			20.0			19.0				
Effective Green, g (s)	29.0	29.0			20.0			19.0				
Actuated g/C Ratio	0.48	0.48			0.33			0.32				
Clearance Time (s)	3.0	6.0			6.0			6.0				
Lane Grp Cap (vph)	230	1403			934			886				
v/s Ratio Prot	c0.07	0.26			c0.35							
v/s Ratio Perm	0.27							0.28				
v/c Ratio	0.69	0.54			1.05			0.90				
Uniform Delay, d1	11.0	10.8			20.0			19.6				
Progression Factor	2.20	1.26			1.63			1.07				
Incremental Delay, d2	14.6	1.4			41.2			12.5				
Delay (s)	39.0	15.0			73.8			33.4				
Level of Service	D	B			E			C				
Approach Delay (s)		19.2			73.8			33.4			0.0	
Approach LOS		B			E			C			A	

Intersection Summary			
HCM Average Control Delay	43.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

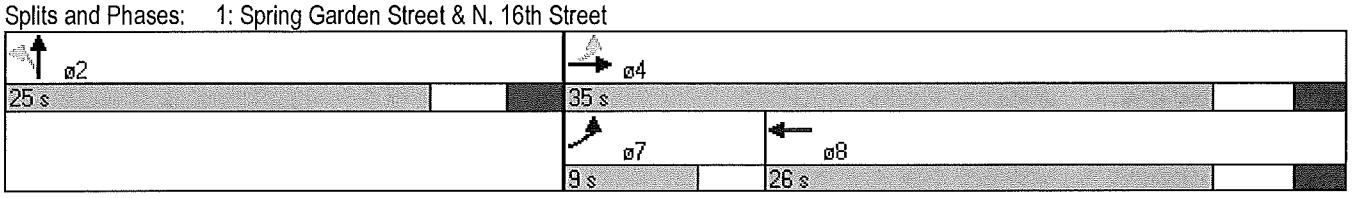
Timings
1: Spring Garden Street & N. 16th Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	140	669	824	384
Lane Group Flow (vph)	159	760	980	797
Turn Type	pm+pt			
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.66	0.54	1.05	0.90
Control Delay	31.5	15.4	74.5	35.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	31.5	15.4	74.5	35.4
Queue Length 50th (ft)	39	100	~207	161
Queue Length 95th (ft)	#105	150	m#317	#261
Internal Link Dist (ft)		780	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	241	1403	934	886
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.54	1.05	0.90

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 70
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Spring Garden Street & N. 16th Street



HCM Signalized Intersection Capacity Analysis
2: Spring Garden Street & N. 15th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	784	68	121	698	0	0	0	0	78	306	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	10	11	12	12	12	12	9	10	12
Grade (%)		0%			2%			0%			0%	
Total Lost time (s)		6.0		3.0	6.0					6.0	6.0	
Lane Util. Factor		0.95		1.00	0.95					1.00	1.00	
Frpb, ped/bikes		0.94		1.00	1.00					1.00	0.98	
Flpb, ped/bikes		1.00		0.99	1.00					0.85	1.00	
Frt		0.99		1.00	1.00					1.00	0.97	
Flt Protected		1.00		0.95	1.00					0.95	1.00	
Satd. Flow (prot)		2785		1269	2873					1157	1337	
Flt Permitted		1.00		0.17	1.00					0.95	1.00	
Satd. Flow (perm)		2785		232	2873					1157	1337	
Peak-hour factor, PHF	0.92	0.96	0.79	0.82	0.88	0.92	0.92	0.92	0.92	0.84	0.96	0.97
Adj. Flow (vph)	0	817	86	148	793	0	0	0	0	93	319	64
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	903	0	148	793	0	0	0	0	93	383	0
Confl. Peds. (#/hr)	124		473	473		124	123		129	129		123
Confl. Bikes (#/hr)			5									
Heavy Vehicles (%)	2%	2%	24%	5%	2%	2%	2%	2%	2%	8%	2%	3%
Bus Blockages (#/hr)	0	4	0	0	4	0	0	0	0	0	0	0
Parking (#/hr)	0		0	0	0						0	
Turn Type				pm+pt						Perm		
Protected Phases		2		1	6						4	
Permitted Phases				6						4		
Actuated Green, G (s)		20.0		29.0	29.0					19.0	19.0	
Effective Green, g (s)		20.0		29.0	29.0					19.0	19.0	
Actuated g/C Ratio		0.33		0.48	0.48					0.32	0.32	
Clearance Time (s)		6.0		3.0	6.0					6.0	6.0	
Lane Grp Cap (vph)		928		216	1389					366	423	
v/s Ratio Prot		c0.32		c0.07	0.28						c0.29	
v/s Ratio Perm				0.26						0.08		
v/c Ratio		0.97		0.69	0.57					0.25	0.91	
Uniform Delay, d1		19.7		10.7	11.1					15.2	19.6	
Progression Factor		0.80		1.00	1.00					1.00	1.00	
Incremental Delay, d2		20.3		16.3	1.7					1.7	25.5	
Delay (s)		36.1		26.9	12.8					16.9	45.1	
Level of Service		D		C	B					B	D	
Approach Delay (s)		36.1			15.0			0.0			39.6	
Approach LOS		D			B			A			D	

Intersection Summary			
HCM Average Control Delay	28.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

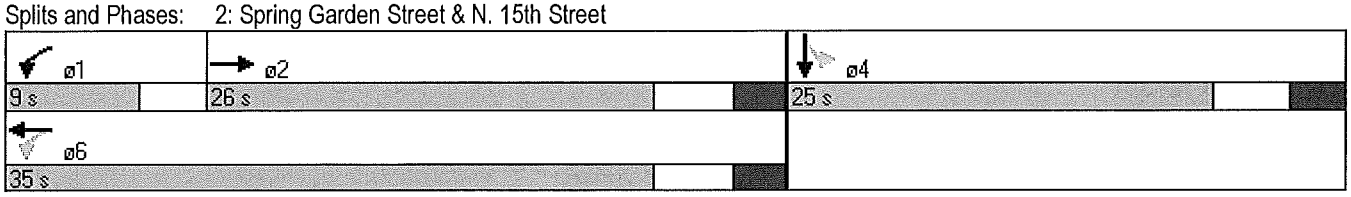
Timings
2: Spring Garden Street & N. 15th Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	784	121	698	78	306
Lane Group Flow (vph)	903	148	793	93	383
Turn Type		pm+pt		Perm	
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	0.97	0.67	0.57	0.25	0.91
Control Delay	39.1	26.5	13.1	17.6	49.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	26.5	13.1	17.6	49.0
Queue Length 50th (ft)	150	26	100	25	131
Queue Length 95th (ft)	m#276	#70	143	52	#278
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	929	220	1389	366	423
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.97	0.67	0.57	0.25	0.91

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 15 (25%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 70
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Spring Garden Street & N. 15th Street



HCM Unsignalized Intersection Capacity Analysis
3: Callowhill Street & Franklin Town Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	198	55	134	37	279	175	26	59	8	0	0	0
Peak Hour Factor	0.90	0.76	0.76	0.62	0.88	0.74	0.67	0.66	0.65	0.92	0.92	0.92
Hourly flow rate (vph)	220	72	176	60	317	236	39	89	12	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	469	613	141
Volume Left (vph)	220	60	39
Volume Right (vph)	176	236	12
Hadj (s)	-0.08	-0.20	0.08
Departure Headway (s)	5.1	4.8	6.5
Degree Utilization, x	0.66	0.82	0.25
Capacity (veh/h)	687	738	515
Control Delay (s)	17.4	25.7	11.7
Approach Delay (s)	17.4	25.7	11.7
Approach LOS	C	D	B

Intersection Summary			
Delay	20.9		
HCM Level of Service	C		
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
3: Callowhill Street & Franklin Town Boulevard

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	198	55	134	37	279	175	26	59	8	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.949			0.948			0.988				
Flt Protected		0.977			0.995			0.986				
Satd. Flow (prot)	0	1491	0	0	1424	0	0	1601	0	0	0	0
Flt Permitted		0.977			0.995			0.986				
Satd. Flow (perm)	0	1491	0	0	1424	0	0	1601	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			329			412			215	
Travel Time (s)		17.6			9.0			11.2			5.9	
Confl. Peds. (#/hr)	35		35	35		35	18		49	49		18
Confl. Bikes (#/hr)			5			8			1			2
Peak Hour Factor	0.90	0.76	0.76	0.62	0.88	0.74	0.67	0.66	0.65	0.92	0.92	0.92
Heavy Vehicles (%)	2%	13%	1%	0%	1%	1%	4%	2%	25%	2%	2%	2%
Parking (#/hr)					0			0				
Adj. Flow (vph)	220	72	176	60	317	236	39	89	12	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	468	0	0	613	0	0	140	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.14	1.19	1.14	1.16	1.32	1.16	1.17	1.14	1.17	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: CBD
Control Type: Unsignalized
Intersection Capacity Utilization 80.3% ICU Level of Service D
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
4: Callowhill Street & N. 17th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	0	62	156	333	0	0	0	0	0	226	94
Peak Hour Factor	0.92	0.92	0.78	0.83	0.85	0.92	0.92	0.92	0.92	0.92	0.86	0.76
Hourly flow rate (vph)	0	0	79	188	392	0	0	0	0	0	263	124

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total (vph)	79	188	392	386
Volume Left (vph)	0	188	0	0
Volume Right (vph)	79	0	0	124
Hadj (s)	-0.55	0.52	0.02	-0.16
Departure Headway (s)	5.4	6.3	5.7	5.3
Degree Utilization, x	0.12	0.33	0.63	0.57
Capacity (veh/h)	611	557	603	647
Control Delay (s)	9.1	11.1	16.7	15.1
Approach Delay (s)	9.1	14.8		15.1
Approach LOS	A	B		C

Intersection Summary			
Delay	14.5		
HCM Level of Service	B		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Callowhill Street & N. 17th Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	62	156	333	0	0	0	0	0	226	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.957	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1292	1547	1516	0	0	0	0	0	1395	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1292	1547	1516	0	0	0	0	0	1395	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		329			440			230			610	
Travel Time (s)		9.0			12.0			6.3			16.6	
Confl. Peds. (#/hr)	26		82	82		26	112		60	60		112
Confl. Bikes (#/hr)			1									20
Peak Hour Factor	0.92	0.92	0.78	0.83	0.85	0.92	0.92	0.92	0.92	0.92	0.86	0.76
Heavy Vehicles (%)	2%	2%	3%	1%	1%	2%	2%	2%	2%	2%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	79	188	392	0	0	0	0	0	263	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	79	188	392	0	0	0	0	0	387	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.30	1.20	1.31	1.15	1.14	1.14	1.14	1.12	1.36	1.12
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: CBD
Control Type: Unsignalized
Intersection Capacity Utilization 54.1% ICU Level of Service A
Analysis Period (min) 15

HCM Signalized Intersection Capacity Analysis
5: Callowhill Street & N. 16th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	365	136	82	542	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)					5.0			5.0				
Lane Util. Factor					0.95			0.95				
Frpb, ped/bikes					0.98			1.00				
Flpb, ped/bikes					1.00			0.98				
Frt					0.96			1.00				
Flt Protected					1.00			0.99				
Satd. Flow (prot)					2863			2995				
Flt Permitted					1.00			0.99				
Satd. Flow (perm)					2863			2995				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.80	0.77	0.84	0.85	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	456	177	98	638	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	68	0	0	20	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	565	0	0	716	0	0	0	0
Confl. Peds. (#/hr)	35		73	73		35	237		30	30		237
Confl. Bikes (#/hr)						4						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	1%	3%	4%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	5	0	0	0	0
Parking (#/hr)					0							
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					16.0			34.0				
Effective Green, g (s)					16.0			34.0				
Actuated g/C Ratio					0.27			0.57				
Clearance Time (s)					5.0			5.0				
Lane Grp Cap (vph)					763			1697				
v/s Ratio Prot					c0.20							
v/s Ratio Perm								0.24				
v/c Ratio					0.74			0.42				
Uniform Delay, d1					20.1			7.4				
Progression Factor					1.00			1.00				
Incremental Delay, d2					6.4			0.8				
Delay (s)					26.5			8.2				
Level of Service					C			A				
Approach Delay (s)		0.0			26.5			8.2			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

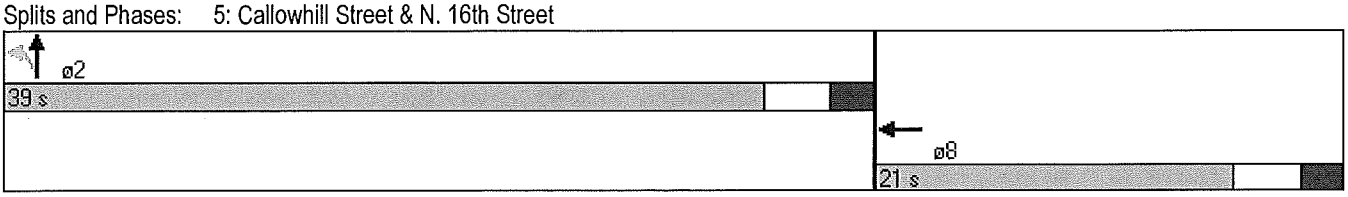
Timings
5: Callowhill Street & N. 16th Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	365	542
Lane Group Flow (vph)	633	736
Turn Type		
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	21.0	39.0
Total Split (s)	21.0	39.0
Total Split (%)	35.0%	65.0%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	0.76	0.43
Control Delay	24.6	7.9
Queue Delay	0.0	0.0
Total Delay	24.6	7.9
Queue Length 50th (ft)	93	65
Queue Length 95th (ft)	124	91
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	832	1716
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.76	0.43

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 17 (28%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed

Splits and Phases: 5: Callowhill Street & N. 16th Street



HCM Unsignalized Intersection Capacity Analysis
6: Callowhill Street & N. 15th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	0	0	129	344	0	0	0	0	0	512	62
Peak Hour Factor	0.92	0.92	0.92	0.75	0.93	0.92	0.92	0.92	0.92	0.92	0.96	0.86
Hourly flow rate (vph)	0	0	0	172	370	0	0	0	0	0	533	72

Direction, Lane #	WB 1	WB 2	SB 1
Volume Total (vph)	295	247	605
Volume Left (vph)	172	0	0
Volume Right (vph)	0	0	72
Hadj (s)	0.31	0.03	0.04
Departure Headway (s)	6.6	6.3	5.3
Degree Utilization, x	0.54	0.43	0.90
Capacity (veh/h)	533	555	668
Control Delay (s)	15.7	12.7	37.0
Approach Delay (s)	14.4		37.0
Approach LOS	B		E

Intersection Summary			
Delay	26.3		
HCM Level of Service	D		
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Callowhill Street & N. 15th Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	129	344	0	0	0	0	0	512	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			0%			0%			-3%	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt											0.984	
Flt Protected					0.984							
Satd. Flow (prot)	0	0	0	0	2996	0	0	0	0	0	1391	0
Flt Permitted					0.984							
Satd. Flow (perm)	0	0	0	0	2996	0	0	0	0	0	1391	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		460			480			146			1070	
Travel Time (s)		12.5			13.1			4.0			29.2	
Confl. Peds. (#/hr)	57		40	40		57	34		38	38		34
Confl. Bikes (#/hr)												1
Peak Hour Factor	0.92	0.92	0.92	0.75	0.93	0.92	0.92	0.92	0.92	0.92	0.96	0.86
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	2%	2%	2%	2%	6%	13%
Parking (#/hr)					0						0	
Adj. Flow (vph)	0	0	0	172	370	0	0	0	0	0	533	72
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	542	0	0	0	0	0	605	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.14	1.14	1.22	1.14	1.14	1.14	1.14	1.12	1.34	1.12
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: CBD
Control Type: Unsignalized
Intersection Capacity Utilization 59.1% ICU Level of Service B
Analysis Period (min) 15

HCM Signalized Intersection Capacity Analysis
7: Callowhill Street & N. Broad Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	60	274	88	0	792	0	0	791	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	11	12	12	10	12	12	10	12
Grade (%)		0%			3%			4%			-1%	
Total Lost time (s)				6.0	6.0			5.0			5.0	
Lane Util. Factor				1.00	0.95			0.91			0.95	
Frpb, ped/bikes				1.00	0.99			1.00			0.99	
Flpb, ped/bikes				0.96	1.00			1.00			1.00	
Frt				1.00	0.95			1.00			0.98	
Flt Protected				0.95	1.00			1.00			1.00	
Satd. Flow (prot)				1401	2906			4135			2891	
Flt Permitted				0.95	1.00			1.00			1.00	
Satd. Flow (perm)				1401	2906			4135			2891	
Peak-hour factor, PHF	0.92	0.92	0.92	0.68	0.92	0.64	0.25	0.87	0.92	0.92	0.87	0.78
Adj. Flow (vph)	0	0	0	88	298	138	0	910	0	0	909	101
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	88	436	0	0	910	0	0	1010	0
Confl. Peds. (#/hr)	32		43	43		32	166		89	89		166
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	0%	3%	2%	2%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Turn Type				Perm								
Protected Phases					8			2			6	
Permitted Phases				8								
Actuated Green, G (s)				27.0	27.0			52.0			52.0	
Effective Green, g (s)				27.0	27.0			52.0			52.0	
Actuated g/C Ratio				0.30	0.30			0.58			0.58	
Clearance Time (s)				6.0	6.0			5.0			5.0	
Lane Grp Cap (vph)				420	872			2389			1670	
v/s Ratio Prot					c0.15			0.22			c0.35	
v/s Ratio Perm				0.06								
v/c Ratio				0.21	0.50			0.38			0.60	
Uniform Delay, d1				23.5	25.9			10.3			12.3	
Progression Factor				1.00	1.00			1.87			0.55	
Incremental Delay, d2				1.1	2.0			0.4			1.3	
Delay (s)				24.7	28.0			19.6			8.1	
Level of Service				C	C			B			A	
Approach Delay (s)		0.0			27.4			19.6			8.1	
Approach LOS		A			C			B			A	

Intersection Summary			
HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

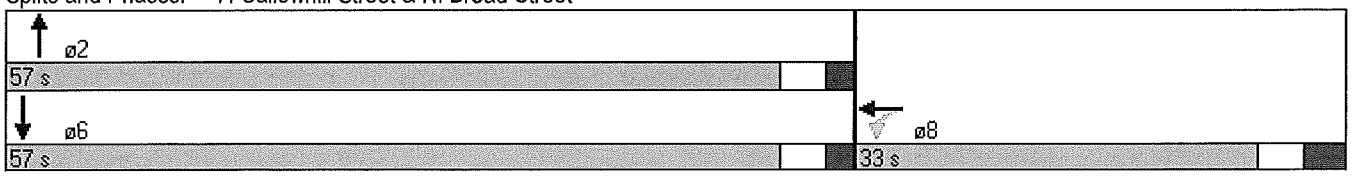
Timings
7: Callowhill Street & N. Broad Street

Lane Group	WBL	WBT	NBT	SBT
Lane Configurations				
Volume (vph)	60	274	792	791
Lane Group Flow (vph)	88	436	910	1010
Turn Type	Perm			
Protected Phases		8	2	6
Permitted Phases	8			
Minimum Split (s)	33.0	33.0	57.0	57.0
Total Split (s)	33.0	33.0	57.0	57.0
Total Split (%)	36.7%	36.7%	63.3%	63.3%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	5.0	5.0
Lead/Lag				
Lead-Lag Optimize?				
v/c Ratio	0.21	0.50	0.38	0.60
Control Delay	25.2	28.3	19.8	8.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.2	28.3	19.8	8.3
Queue Length 50th (ft)	37	106	182	66
Queue Length 95th (ft)	55	153	210	75
Internal Link Dist (ft)		550	480	990
Turn Bay Length (ft)	530			
Base Capacity (vph)	420	872	2389	1670
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.21	0.50	0.38	0.60

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 49 (54%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 7: Callowhill Street & N. Broad Street



HCM Signalized Intersection Capacity Analysis
8: WB Vine Street & N. 16th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	749	557	83	589	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Total Lost time (s)					5.3	5.3		6.0				
Lane Util. Factor					0.95	0.88		0.91				
Frpb, ped/bikes					1.00	0.94		1.00				
Flpb, ped/bikes					1.00	1.00		0.96				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3217	2310		4107				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3217	2310		4107				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.90	0.92	0.81	0.94	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	832	605	102	627	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	25	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	832	605	0	704	0	0	0	0
Confl. Peds. (#/hr)	69		33	33		69	336		16	16		336
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%	4%	5%	2%	2%	2%	2%
Turn Type						Perm	Perm					
Protected Phases					1			2				
Permitted Phases						1	2					
Actuated Green, G (s)					45.7	45.7		33.0				
Effective Green, g (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
Clearance Time (s)					5.3	5.3		6.0				
Lane Grp Cap (vph)					1634	1173		1506				
v/s Ratio Prot					0.26							
v/s Ratio Perm						c0.26		0.17				
v/c Ratio					0.51	0.52		0.47				
Uniform Delay, d1					14.7	14.8		21.8				
Progression Factor					0.59	0.58		1.12				
Incremental Delay, d2					0.8	1.2		0.9				
Delay (s)					9.5	9.8		25.4				
Level of Service					A	A		C				
Approach Delay (s)		0.0			9.6			25.4			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.3
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

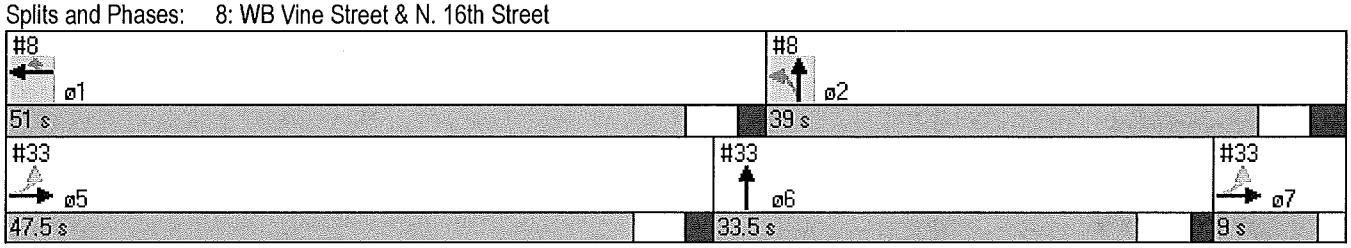
Timings
8: WB Vine Street & N. 16th Street

Lane Group	WBT	WBR	NBT	ø5	ø6	ø7
Lane Configurations						
Volume (vph)	749	557	589			
Lane Group Flow (vph)	832	605	729			
Turn Type		Perm				
Protected Phases	1		2	5	6	7
Permitted Phases		1				
Minimum Split (s)	51.0	51.0	39.0	47.5	33.5	9.0
Total Split (s)	51.0	51.0	39.0	47.5	33.5	9.0
Total Split (%)	56.7%	56.7%	43.3%	53%	37%	10%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	1.8	2.5	1.8	1.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0			
Total Lost Time (s)	5.3	5.3	6.0			
Lead/Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?						
v/c Ratio	0.51	0.52	0.48			
Control Delay	9.6	10.0	24.3			
Queue Delay	0.0	0.0	3.1			
Total Delay	9.6	10.0	27.4			
Queue Length 50th (ft)	95	75	110			
Queue Length 95th (ft)	m109	m88	146			
Internal Link Dist (ft)	380		90			
Turn Bay Length (ft)						
Base Capacity (vph)	1634	1173	1531			
Starvation Cap Reductn	0	0	674			
Spillback Cap Reductn	0	0	0			
Storage Cap Reductn	0	0	0			
Reduced v/c Ratio	0.51	0.52	0.85			

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: WB Vine Street & N. 16th Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	77	930	0	0	0	0	0	1205	345
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Total Lost time (s)					5.0						15.0	
Lane Util. Factor					0.91						0.86	
Frpb, ped/bikes					1.00						0.99	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.97	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					4425						5289	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					4425						5289	
Peak-hour factor, PHF	0.92	0.92	0.92	0.77	0.91	0.92	0.92	0.92	0.92	0.92	0.90	0.89
Adj. Flow (vph)	0	0	0	100	1022	0	0	0	0	0	1339	388
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	34	0
Lane Group Flow (vph)	0	0	0	0	1122	0	0	0	0	0	1693	0
Confl. Peds. (#/hr)	59		2	2		59	34		232	232		34
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	2%	2%	1%
Parking (#/hr)					0							
Turn Type				Perm								
Protected Phases					1						2	
Permitted Phases				1								
Actuated Green, G (s)					44.0						26.0	
Effective Green, g (s)					44.0						26.0	
Actuated g/C Ratio					0.49						0.29	
Clearance Time (s)					5.0						15.0	
Lane Grp Cap (vph)					2163						1528	
v/s Ratio Prot											c0.32	
v/s Ratio Perm					0.25							
v/c Ratio					0.52						1.11	
Uniform Delay, d1					15.7						32.0	
Progression Factor					0.35						1.00	
Incremental Delay, d2					0.7						58.6	
Delay (s)					6.2						90.6	
Level of Service					A						F	
Approach Delay (s)		0.0			6.2			0.0			90.6	
Approach LOS		A			A			A			F	

Intersection Summary			
HCM Average Control Delay	57.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

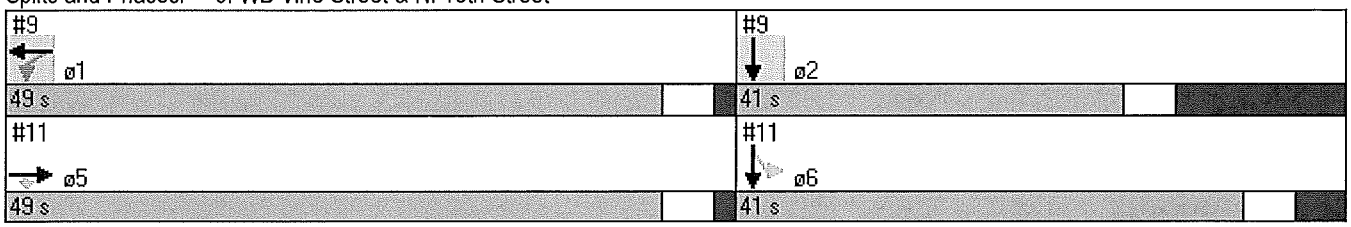
Timings
9: WB Vine Street & N. 15th Street

Lane Group	WBT	SBT	ø5	ø6
Lane Configurations				
Volume (vph)	930	1205		
Lane Group Flow (vph)	1122	1727		
Turn Type				
Protected Phases	1	2	5	6
Permitted Phases				
Minimum Split (s)	49.0	41.0	49.0	41.0
Total Split (s)	49.0	41.0	49.0	41.0
Total Split (%)	54.4%	45.6%	54%	46%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	11.5	1.5	3.5
Lost Time Adjust (s)	0.0	0.0		
Total Lost Time (s)	5.0	15.0		
Lead/Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?				
v/c Ratio	0.52	1.11		
Control Delay	6.3	88.6		
Queue Delay	0.0	9.3		
Total Delay	6.3	98.0		
Queue Length 50th (ft)	39	~323		
Queue Length 95th (ft)	46	#400		
Internal Link Dist (ft)	400	334		
Turn Bay Length (ft)				
Base Capacity (vph)	2164	1561		
Starvation Cap Reductn	0	0		
Spillback Cap Reductn	93	30		
Storage Cap Reductn	0	0		
Reduced v/c Ratio	0.54	1.13		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: WB Vine Street & N. 15th Street



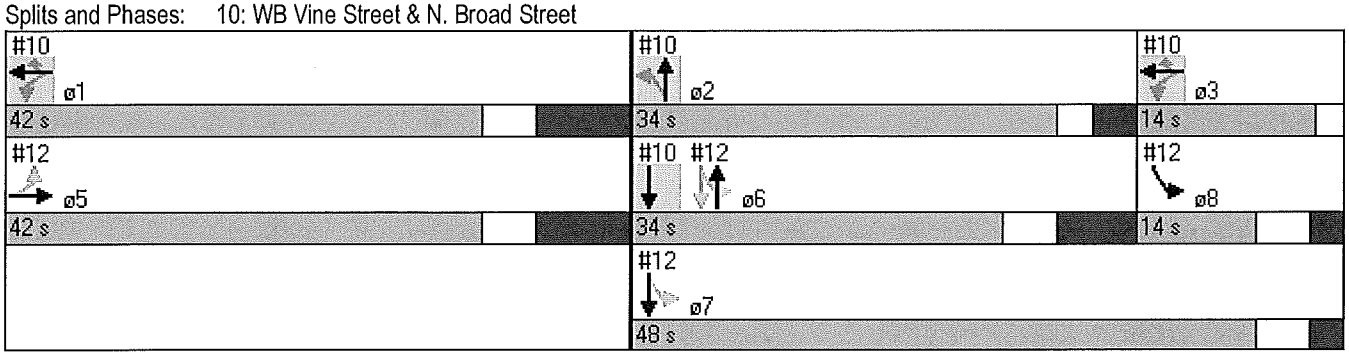
HCM Signalized Intersection Capacity Analysis
10: WB Vine Street & N. Broad Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	172	869	184	4	670	0	0	657	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Total Lost time (s)				10.0	10.0	10.0		5.4			9.0	
Lane Util. Factor				1.00	0.95	1.00		0.91			0.86	
Frpb, ped/bikes				1.00	1.00	0.92		1.00			0.95	
Flpb, ped/bikes				1.00	1.00	1.00		1.00			1.00	
Frt				1.00	1.00	0.85		1.00			0.97	
Flt Protected				0.95	1.00	1.00		1.00			1.00	
Satd. Flow (prot)				1584	3125	1289		4235			4874	
Flt Permitted				0.95	1.00	1.00		0.93			1.00	
Satd. Flow (perm)				1584	3125	1289		3930			4874	
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.92	0.81	0.50	0.87	0.92	0.92	0.92	0.91
Adj. Flow (vph)	0	0	0	200	945	227	8	770	0	0	714	144
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	200	945	227	0	778	0	0	858	0
Confl. Peds. (#/hr)	89		1	1		89	337		150	150		337
Confl. Bikes (#/hr)						39						11
Heavy Vehicles (%)	2%	2%	2%	2%	0%	3%	0%	3%	2%	2%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Turn Type				Perm		Perm	Perm					
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3	2					
Actuated Green, G (s)				46.0	46.0	46.0		28.6			25.0	
Effective Green, g (s)				44.0	44.0	44.0		28.6			25.0	
Actuated g/C Ratio				0.49	0.49	0.49		0.32			0.28	
Clearance Time (s)								5.4			9.0	
Lane Grp Cap (vph)				774	1528	630		1249			1354	
v/s Ratio Prot					c0.30						0.18	
v/s Ratio Perm				0.13		0.18		c0.20				
v/c Ratio				0.26	0.62	0.36		0.62			0.63	
Uniform Delay, d1				13.5	16.9	14.3		26.1			28.5	
Progression Factor				1.00	1.00	1.00		0.20			0.52	
Incremental Delay, d2				0.8	1.9	1.6		0.2			1.9	
Delay (s)				14.3	18.7	15.9		5.5			16.6	
Level of Service				B	B	B		A			B	
Approach Delay (s)		0.0			17.6			5.5			16.6	
Approach LOS		A			B			A			B	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	25.4
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Splits and Phases: 10: WB Vine Street & N. Broad Street



Timings
10: WB Vine Street & N. Broad Street

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	ø1	ø3	ø5	ø7	ø8
Lane Configurations											
Volume (vph)	172	869	184	4	670	657					
Lane Group Flow (vph)	200	945	227	0	778	858					
Turn Type	Perm		Perm	Perm							
Protected Phases		1 3!			2	6!	1	3	5	7	8
Permitted Phases	1 3!		1 3	2							
Minimum Split (s)				34.0	34.0	34.0	42.0	14.0	42.0	48.0	14.0
Total Split (s)	56.0	56.0	56.0	34.0	34.0	34.0	42.0	14.0	42.0	48.0	14.0
Total Split (%)	62.2%	62.2%	62.2%	37.8%	37.8%	37.8%	47%	16%	47%	53%	16%
Yellow Time (s)				2.4	2.4	3.6	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)				3.0	3.0	5.4	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0					
Total Lost Time (s)	10.0	10.0	10.0	5.4	5.4	9.0					
Lead/Lag				Lead	Lead	Lead		Lag			Lag
Lead-Lag Optimize?								Yes			
v/c Ratio	0.25	0.59	0.34		0.62	0.63					
Control Delay	13.3	17.3	14.9		5.6	16.7					
Queue Delay	0.0	0.0	0.0		7.5	0.3					
Total Delay	13.3	17.3	14.9		13.1	17.1					
Queue Length 50th (ft)	60	187	73		32	90					
Queue Length 95th (ft)	97	248	108		m28	119					
Internal Link Dist (ft)		550			90	480					
Turn Bay Length (ft)											
Base Capacity (vph)	810	1597	659		1248	1354					
Starvation Cap Reductn	0	0	0		423	0					
Spillback Cap Reductn	5	0	0		0	130					
Storage Cap Reductn	0	0	0		0	0					
Reduced v/c Ratio	0.25	0.59	0.34		0.94	0.70					

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

HCM Signalized Intersection Capacity Analysis
11: EB Vine Street & N. 15th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1255	242	0	0	0	0	0	0	442	737	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Total Lost time (s)		5.0	5.0							7.0	7.0	
Lane Util. Factor		0.86	0.88							1.00	0.91	
Frpb, ped/bikes		1.00	0.98							1.00	1.00	
Flpb, ped/bikes		1.00	1.00							0.88	1.00	
Frt		1.00	0.85							1.00	1.00	
Flt Protected		1.00	1.00							0.95	1.00	
Satd. Flow (prot)		5766	2377							1392	4294	
Flt Permitted		1.00	1.00							0.95	1.00	
Satd. Flow (perm)		5766	2377							1392	4294	
Peak-hour factor, PHF	0.92	0.92	0.75	0.92	0.92	0.92	0.92	0.92	0.92	0.90	0.84	0.92
Adj. Flow (vph)	0	1364	323	0	0	0	0	0	0	491	877	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	16	0	0
Lane Group Flow (vph)	0	1364	323	0	0	0	0	0	0	475	877	0
Confl. Peds. (#/hr)	1		19	19		1	19		147	147		19
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	1%	4%	2%	2%	2%	2%	2%	2%	1%	3%	2%
Turn Type			Perm							Perm		
Protected Phases		5									6	
Permitted Phases			5							6		
Actuated Green, G (s)		44.0	44.0							34.0	34.0	
Effective Green, g (s)		44.0	44.0							34.0	34.0	
Actuated g/C Ratio		0.49	0.49							0.38	0.38	
Clearance Time (s)		5.0	5.0							7.0	7.0	
Lane Grp Cap (vph)		2819	1162							526	1622	
v/s Ratio Prot		c0.24									0.20	
v/s Ratio Perm			0.14							c0.34		
v/c Ratio		0.48	0.28							0.90	0.54	
Uniform Delay, d1		15.4	13.6							26.5	21.9	
Progression Factor		1.02	0.99							0.21	0.12	
Incremental Delay, d2		0.6	0.6							2.7	0.1	
Delay (s)		16.3	14.0							8.3	2.7	
Level of Service		B	B							A	A	
Approach Delay (s)		15.9			0.0			0.0			4.8	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

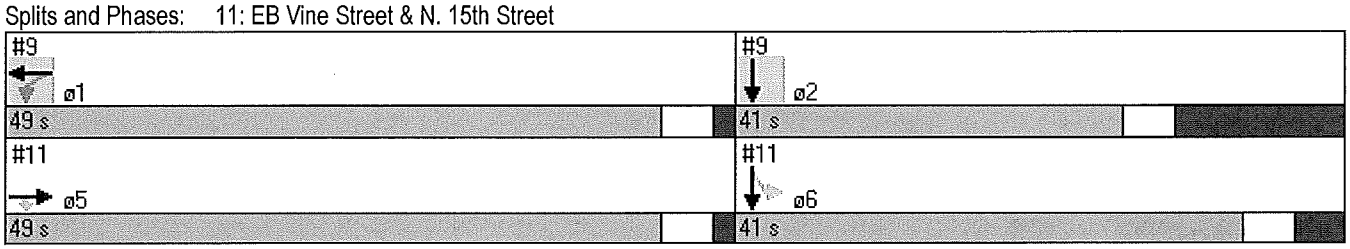
c Critical Lane Group

Lane Group	EBT	EBR	SBL	SBT	ø1	ø2
Lane Configurations						
Volume (vph)	1255	242	442	737		
Lane Group Flow (vph)	1364	323	491	877		
Turn Type		Perm	Perm			
Protected Phases	5			6	1	2
Permitted Phases		5	6			
Minimum Split (s)	49.0	49.0	41.0	41.0	49.0	41.0
Total Split (s)	49.0	49.0	41.0	41.0	49.0	41.0
Total Split (%)	54.4%	54.4%	45.6%	45.6%	54%	46%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	3.5	3.5	1.5	11.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.0	5.0	7.0	7.0		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						
v/c Ratio	0.48	0.28	0.91	0.54		
Control Delay	16.5	14.2	11.5	2.8		
Queue Delay	0.0	0.0	16.2	2.8		
Total Delay	16.5	14.2	27.6	5.6		
Queue Length 50th (ft)	140	53	25	16		
Queue Length 95th (ft)	165	60	m16	m15		
Internal Link Dist (ft)	2			90		
Turn Bay Length (ft)						
Base Capacity (vph)	2819	1162	541	1622		
Starvation Cap Reductn	0	0	54	608		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.48	0.28	1.01	0.86		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: EB Vine Street & N. 15th Street



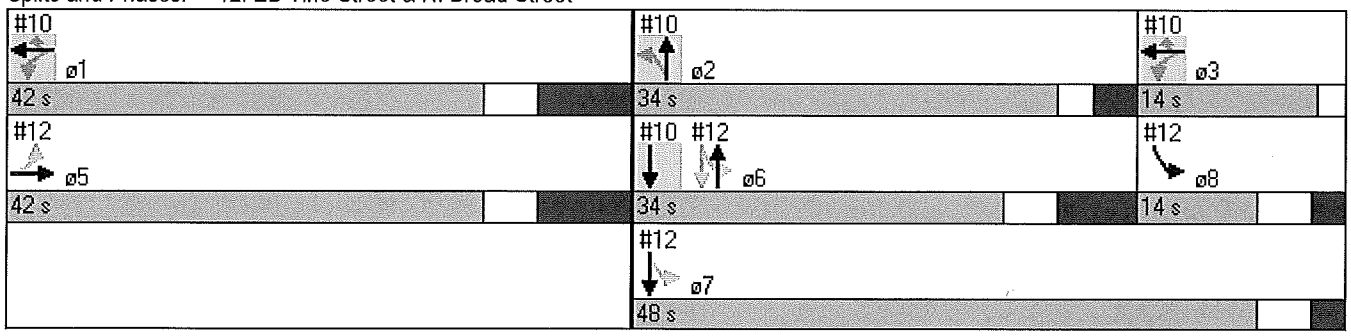
HCM Signalized Intersection Capacity Analysis
12: EB Vine Street & N. Broad Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	108	1460	64	0	0	0	0	567	426	214	682	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Total Lost time (s)		10.0						9.0		6.0	6.0	
Lane Util. Factor		0.86						0.91		1.00	0.91	
Frpb, ped/bikes		0.99						0.94		1.00	1.00	
Flpb, ped/bikes		1.00						1.00		1.00	1.00	
Frt		0.99						0.94		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		5652						3469		1574	4229	
Flt Permitted		1.00						1.00		0.17	1.00	
Satd. Flow (perm)		5652						3469		275	4229	
Peak-hour factor, PHF	0.92	0.94	0.67	0.92	0.92	0.92	0.92	0.85	0.92	0.92	0.88	0.92
Adj. Flow (vph)	117	1553	96	0	0	0	0	667	463	233	775	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1766	0	0	0	0	0	1130	0	233	775	0
Confl. Peds. (#/hr)	6		110	110		6	384		123	123		384
Confl. Bikes (#/hr)			7						16			
Heavy Vehicles (%)	3%	1%	3%	2%	2%	2%	2%	3%	8%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Turn Type	Perm									custom		
Protected Phases		5						6		8	7	
Permitted Phases	5									6 7	6 7	
Actuated Green, G (s)		32.0						25.0		42.0	42.0	
Effective Green, g (s)		32.0						25.0		42.0	42.0	
Actuated g/C Ratio		0.36						0.28		0.47	0.47	
Clearance Time (s)		10.0						9.0		6.0	6.0	
Lane Grp Cap (vph)		2010						964		244	1974	
v/s Ratio Prot								0.33		c0.08	0.18	
v/s Ratio Perm		0.31								c0.36		
v/c Ratio		0.88						1.60dr		0.95	0.39	
Uniform Delay, d1		27.2						32.5		28.4	15.7	
Progression Factor		0.50						1.00		0.67	0.38	
Incremental Delay, d2		4.8						88.6		43.6	0.5	
Delay (s)		18.5						121.1		62.8	6.5	
Level of Service		B						F		E	A	
Approach Delay (s)		18.5			0.0			121.1			19.5	
Approach LOS		B			A			F			B	

Intersection Summary			
HCM Average Control Delay	48.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Splits and Phases: 12: EB Vine Street & N. Broad Street



Timings
12: EB Vine Street & N. Broad Street

Lane Group	EBT	NBT	SBL	SBT	ø1	ø2	ø3
Lane Configurations							
Volume (vph)	1460	567	214	682			
Lane Group Flow (vph)	1766	1130	233	775			
Turn Type			custom				
Protected Phases	5	6	8	7	1	2	3
Permitted Phases			6 7	6 7			
Minimum Split (s)	42.0	34.0	14.0	48.0	42.0	34.0	14.0
Total Split (s)	42.0	34.0	14.0	48.0	42.0	34.0	14.0
Total Split (%)	46.7%	37.8%	15.6%	53.3%	47%	38%	16%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	2.4	2.0
All-Red Time (s)	6.4	5.4	2.4	2.4	6.4	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0			
Total Lost Time (s)	10.0	9.0	6.0	6.0			
Lead/Lag		Lead	Lag			Lead	Lag
Lead-Lag Optimize?							Yes
v/c Ratio	0.88	1.60dr	0.96	0.39			
Control Delay	19.1	120.0	70.2	6.5			
Queue Delay	0.0	0.0	49.1	0.7			
Total Delay	19.1	120.0	119.3	7.2			
Queue Length 50th (ft)	137	~283	92	32			
Queue Length 95th (ft)	m160	#339	#229	44			
Internal Link Dist (ft)	400	350		90			
Turn Bay Length (ft)			45				
Base Capacity (vph)	2010	964	243	1974			
Starvation Cap Reductn	0	0	35	798			
Spillback Cap Reductn	0	0	0	0			
Storage Cap Reductn	0	0	0	0			
Reduced v/c Ratio	0.88	1.17	1.12	0.66			

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	607	0	0	856	83	159	207	175	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	11	12	12	9	9	12	12	12
Total Lost time (s)	3.0	6.0			6.0			6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00			
Frpb, ped/bikes	1.00	1.00			0.98			1.00	0.93			
Flpb, ped/bikes	1.00	1.00			1.00			0.96	1.00			
Frt	1.00	1.00			0.98			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.98	1.00			
Satd. Flow (prot)	1484	2925			2828			1273	1193			
Flt Permitted	0.17	1.00			1.00			0.98	1.00			
Satd. Flow (perm)	272	2925			2828			1273	1193			
Peak-hour factor, PHF	0.77	0.94	0.92	0.92	0.95	0.74	0.90	0.92	0.86	0.92	0.92	0.92
Adj. Flow (vph)	84	646	0	0	901	112	177	225	203	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	0	70	0	0	0
Lane Group Flow (vph)	84	646	0	0	997	0	0	402	133	0	0	0
Confl. Peds. (#/hr)	58		107	107		58	76		45	45		76
Confl. Bikes (#/hr)			43			26			13			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%
Parking (#/hr)		0			0			0				
Turn Type	pm+pt						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	29.0	29.0			20.0			19.0	19.0			
Effective Green, g (s)	29.0	29.0			20.0			19.0	19.0			
Actuated g/C Ratio	0.48	0.48			0.33			0.32	0.32			
Clearance Time (s)	3.0	6.0			6.0			6.0	6.0			
Lane Grp Cap (vph)	253	1414			943			403	378			
v/s Ratio Prot	0.03	c0.22			c0.35							
v/s Ratio Perm	0.13							0.32	0.11			
v/c Ratio	0.33	0.46			1.06			1.00	0.35			
Uniform Delay, d1	10.3	10.3			20.0			20.5	15.8			
Progression Factor	1.00	1.00			1.71			1.00	1.00			
Incremental Delay, d2	3.5	1.1			28.6			44.2	2.6			
Delay (s)	13.8	11.3			62.9			64.7	18.3			
Level of Service	B	B			E			E	B			
Approach Delay (s)		11.6			62.9			49.1			0.0	
Approach LOS		B			E			D			A	

Intersection Summary			
HCM Average Control Delay	43.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Timings
13: Spring Garden Street & N. 18th Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	65	607	856	207	175
Lane Group Flow (vph)	84	646	1013	402	203
Turn Type	pm+pt				Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.32	0.46	1.06	1.00	0.45
Control Delay	10.3	11.6	62.4	69.5	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	11.6	62.4	69.5	12.2
Queue Length 50th (ft)	14	75	~217	143	27
Queue Length 95th (ft)	26	113	m#203	#303	71
Internal Link Dist (ft)		476	780	380	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	265	1414	958	403	448
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.46	1.06	1.00	0.45

Intersection Summary

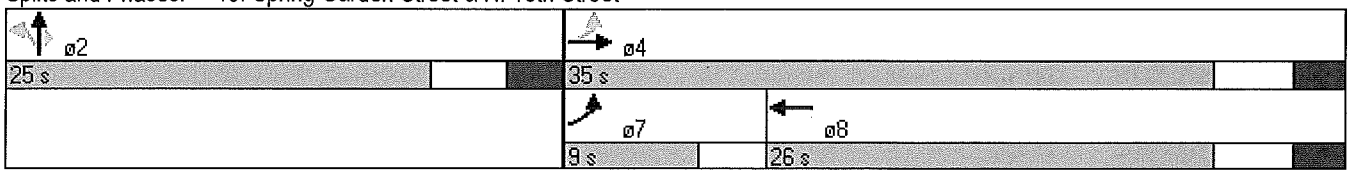
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Spring Garden Street & N. 18th Street



HCM Signalized Intersection Capacity Analysis
14: Spring Garden Street & N. Broad Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	820	38	3	743	81	0	810	49	140	810	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	11	12	10	11	12
Grade (%)		0%			0%			0%			-1%	
Total Lost time (s)		6.0			6.0			6.0		3.0	6.0	6.0
Lane Util. Factor		0.95			0.95			0.91		1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.99			0.99		1.00	1.00	0.80
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	1.00
Frt		0.99			0.98			0.99		1.00	1.00	0.85
Flt Protected		1.00			1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)		2876			2836			4330		1487	3064	1144
Flt Permitted		1.00			0.95			1.00		0.21	1.00	1.00
Satd. Flow (perm)		2876			2682			4330		330	3064	1144
Peak-hour factor, PHF	0.25	0.95	0.80	0.38	0.92	0.70	0.25	0.92	0.68	0.73	0.88	0.84
Adj. Flow (vph)	0	863	48	8	808	116	0	880	72	192	920	131
RTOR Reduction (vph)	0	0	0	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	911	0	0	932	0	0	942	0	192	920	131
Confl. Peds. (#/hr)	59		145	145		59	198		126	126		198
Confl. Bikes (#/hr)			40			39			16			26
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Parking (#/hr)		0			0							
Turn Type				Perm						pm+pt		Perm
Protected Phases		4			8			2		1	6	
Permitted Phases				8						6		6
Actuated Green, G (s)		34.0			34.0			35.0		44.0	44.0	44.0
Effective Green, g (s)		34.0			34.0			35.0		44.0	44.0	44.0
Actuated g/C Ratio		0.38			0.38			0.39		0.49	0.49	0.49
Clearance Time (s)		6.0			6.0			6.0		3.0	6.0	6.0
Lane Grp Cap (vph)		1086			1013			1684		238	1498	559
v/s Ratio Prot		0.32						0.22		c0.05	0.30	
v/s Ratio Perm					c0.35					c0.34		0.11
v/c Ratio		0.84			0.92			0.56		0.81	0.61	0.23
Uniform Delay, d1		25.5			26.7			21.5		15.7	16.8	13.3
Progression Factor		1.00			1.00			1.22		1.00	1.00	1.00
Incremental Delay, d2		7.8			14.6			1.3		24.6	1.9	1.0
Delay (s)		33.3			41.3			27.4		40.3	18.7	14.3
Level of Service		C			D			C		D	B	B
Approach Delay (s)		33.3			41.3			27.4			21.6	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM Average Control Delay	30.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

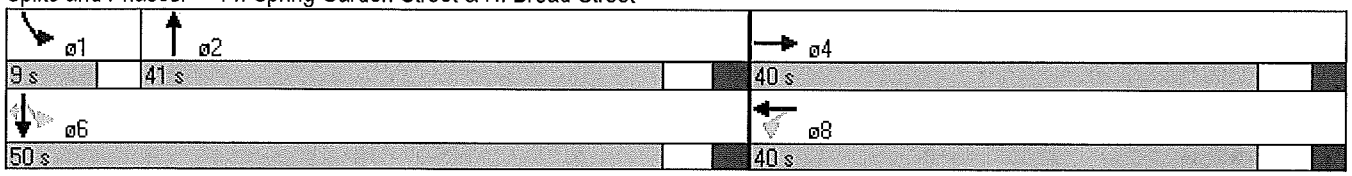
c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	820	3	743	810	140	810	110
Lane Group Flow (vph)	911	0	932	952	192	920	131
Turn Type		Perm			pm+pt		Perm
Protected Phases	4		8	2	1	6	
Permitted Phases		8			6		6
Minimum Split (s)	33.0	33.0	33.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	40.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.6	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.4	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag				Lag	Lead		
Lead-Lag Optimize?							
v/c Ratio	0.84		0.92	0.56	0.78	0.61	0.23
Control Delay	34.1		42.4	27.2	37.0	19.0	14.7
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	34.1		42.4	27.2	37.0	19.0	14.7
Queue Length 50th (ft)	243		261	126	57	192	41
Queue Length 95th (ft)	#335		#388	147	75	246	72
Internal Link Dist (ft)	400		550	990		290	
Turn Bay Length (ft)					170		
Base Capacity (vph)	1086		1013	1695	247	1498	559
Starvation Cap Reductn	0		0	0	0	0	0
Spillback Cap Reductn	0		0	0	0	0	0
Storage Cap Reductn	0		0	0	0	0	0
Reduced v/c Ratio	0.84		0.92	0.56	0.78	0.61	0.23

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Spring Garden Street & N. Broad Street



PROJECTED (BUILD) CONDITIONS

HCM Signalized Intersection Capacity Analysis
1: Spring Garden Street & N. 16th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	140	675	0	0	824	93	158	435	238	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	11	12	12	12	12	12	12	12
Grade (%)		0%			2%			3%			0%	
Total Lost time (s)	3.0	6.0			6.0			6.0				
Lane Util. Factor	1.00	0.95			0.95			0.95				
Frpb, ped/bikes	1.00	1.00			0.98			0.93				
Flpb, ped/bikes	1.00	1.00			1.00			0.98				
Frt	1.00	1.00			0.98			0.95				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1349	2902			2801			2665				
Flt Permitted	0.17	1.00			1.00			0.99				
Satd. Flow (perm)	247	2902			2801			2665				
Peak-hour factor, PHF	0.88	0.88	0.91	0.92	0.95	0.82	0.88	0.94	0.83	0.92	0.92	0.92
Adj. Flow (vph)	159	767	0	0	867	113	180	463	287	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	159	767	0	0	980	0	0	930	0	0	0	0
Confl. Peds. (#/hr)	83		457	457		83	93		191	191		93
Confl. Bikes (#/hr)						51			14			
Heavy Vehicles (%)	1%	2%	2%	2%	1%	3%	0%	2%	4%	2%	2%	2%
Bus Blockages (#/hr)	0	4	0	0	4	0	0	5	0	0	0	0
Parking (#/hr)	0	0			0	0						
Turn Type	pm+pt						Perm					
Protected Phases	7	4			8			2				
Permitted Phases	4						2					
Actuated Green, G (s)	29.0	29.0			20.0			19.0				
Effective Green, g (s)	29.0	29.0			20.0			19.0				
Actuated g/C Ratio	0.48	0.48			0.33			0.32				
Clearance Time (s)	3.0	6.0			6.0			6.0				
Lane Grp Cap (vph)	230	1403			934			844				
v/s Ratio Prot	c0.07	0.26			c0.35							
v/s Ratio Perm	0.27							0.35				
v/c Ratio	0.69	0.55			1.05			1.10				
Uniform Delay, d1	11.0	10.9			20.0			20.5				
Progression Factor	1.01	0.97			0.55			1.18				
Incremental Delay, d2	14.5	1.4			41.2			58.2				
Delay (s)	25.6	11.9			52.2			82.3				
Level of Service	C	B			D			F				
Approach Delay (s)		14.3			52.2			82.3			0.0	
Approach LOS		B			D			F			A	

Intersection Summary			
HCM Average Control Delay	49.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

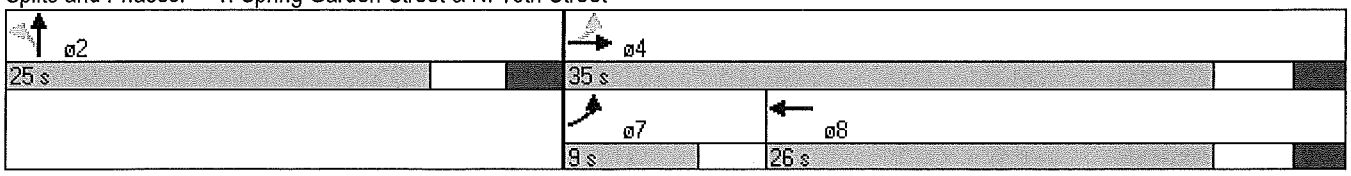
Timings
1: Spring Garden Street & N. 16th Street

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	140	675	824	435
Lane Group Flow (vph)	159	767	980	930
Turn Type	pm+pt			
Protected Phases	7	4	8	2
Permitted Phases	4			
Minimum Split (s)	9.0	35.0	26.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?				
v/c Ratio	0.66	0.55	1.05	1.10
Control Delay	22.8	12.2	56.9	84.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	22.8	12.2	56.9	84.5
Queue Length 50th (ft)	39	118	~212	~210
Queue Length 95th (ft)	#84	176	m#293	m#287
Internal Link Dist (ft)		780	380	990
Turn Bay Length (ft)	140			
Base Capacity (vph)	241	1403	934	844
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.66	0.55	1.05	1.10

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 36 (60%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Spring Garden Street & N. 16th Street



HCM Signalized Intersection Capacity Analysis
2: Spring Garden Street & N. 15th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	819	74	148	698	0	0	0	0	82	324	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	10	11	12	12	12	12	9	10	12
Grade (%)		0%			2%			0%			0%	
Total Lost time (s)		6.0		3.0	6.0					6.0	6.0	
Lane Util. Factor		0.95		1.00	0.95					1.00	1.00	
Frpb, ped/bikes		0.94		1.00	1.00					1.00	0.97	
Flpb, ped/bikes		1.00		0.99	1.00					0.83	1.00	
Frt		0.99		1.00	1.00					1.00	0.98	
Flt Protected		1.00		0.95	1.00					0.95	1.00	
Satd. Flow (prot)		2774		1271	2873					1118	1338	
Flt Permitted		1.00		0.17	1.00					0.95	1.00	
Satd. Flow (perm)		2774		233	2873					1118	1338	
Peak-hour factor, PHF	0.92	0.96	0.79	0.82	0.88	0.92	0.92	0.92	0.92	0.84	0.96	0.97
Adj. Flow (vph)	0	853	94	180	793	0	0	0	0	98	338	64
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	947	0	180	793	0	0	0	0	98	402	0
Confl. Peds. (#/hr)	124		473	473		124	132		155	155		132
Confl. Bikes (#/hr)			5									
Heavy Vehicles (%)	2%	2%	24%	5%	2%	2%	2%	2%	2%	8%	2%	3%
Bus Blockages (#/hr)	0	4	0	0	4	0	0	0	0	0	0	0
Parking (#/hr)	0		0	0	0						0	
Turn Type				pm+pt						Perm		
Protected Phases		2		1	6						4	
Permitted Phases				6						4		
Actuated Green, G (s)		20.0		29.0	29.0					19.0	19.0	
Effective Green, g (s)		20.0		29.0	29.0					19.0	19.0	
Actuated g/C Ratio		0.33		0.48	0.48					0.32	0.32	
Clearance Time (s)		6.0		3.0	6.0					6.0	6.0	
Lane Grp Cap (vph)		925		216	1389					354	424	
v/s Ratio Prot		c0.34		c0.08	0.28						c0.30	
v/s Ratio Perm				0.32						0.09		
v/c Ratio		1.02		0.83	0.57					0.28	0.95	
Uniform Delay, d1		20.0		11.3	11.1					15.4	20.0	
Progression Factor		0.51		1.00	1.00					1.00	1.00	
Incremental Delay, d2		31.0		29.8	1.7					1.9	32.5	
Delay (s)		41.3		41.1	12.8					17.3	52.5	
Level of Service		D		D	B					B	D	
Approach Delay (s)		41.3			18.0			0.0			45.6	
Approach LOS		D			B			A			D	

Intersection Summary			
HCM Average Control Delay	32.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Timings
2: Spring Garden Street & N. 15th Street

Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Volume (vph)	819	148	698	82	324
Lane Group Flow (vph)	947	180	793	98	402
Turn Type		pm+pt		Perm	
Protected Phases	2	1	6		4
Permitted Phases		6		4	
Minimum Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (s)	26.0	9.0	35.0	25.0	25.0
Total Split (%)	43.3%	15.0%	58.3%	41.7%	41.7%
Yellow Time (s)	3.6	3.0	3.6	3.4	3.4
All-Red Time (s)	2.4	0.0	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	3.0	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?					
v/c Ratio	1.02	0.81	0.57	0.28	0.95
Control Delay	45.9	41.2	13.1	18.0	56.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	41.2	13.1	18.0	56.8
Queue Length 50th (ft)	~85	32	100	26	140
Queue Length 95th (ft)	m#252	#102	143	55	#295
Internal Link Dist (ft)	380		400		290
Turn Bay Length (ft)		115		100	
Base Capacity (vph)	925	221	1389	354	424
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.02	0.81	0.57	0.28	0.95

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 34 (57%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Spring Garden Street & N. 15th Street

ø1	ø2	ø4
9 s	26 s	25 s
ø6		
35 s		

HCM Unsignalized Intersection Capacity Analysis
3: Callowhill Street & Franklin Town Boulevard

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	198	55	134	37	329	188	26	59	8	0	0	0
Peak Hour Factor	0.90	0.76	0.76	0.62	0.88	0.74	0.67	0.66	0.65	0.92	0.92	0.92
Hourly flow rate (vph)	220	72	176	60	374	254	39	89	12	0	0	0

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	469	688	141
Volume Left (vph)	220	60	39
Volume Right (vph)	176	254	12
Hadj (s)	-0.08	-0.19	0.08
Departure Headway (s)	5.2	4.8	6.7
Degree Utilization, x	0.68	0.93	0.26
Capacity (veh/h)	672	688	515
Control Delay (s)	18.3	39.1	12.0
Approach Delay (s)	18.3	39.1	12.0
Approach LOS	C	E	B

Intersection Summary			
Delay	28.6		
HCM Level of Service	D		
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

Lanes, Volumes, Timings
3: Callowhill Street & Franklin Town Boulevard

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	198	55	134	37	329	188	26	59	8	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	11	12	12	12	12	12	16	12	12	12	12
Grade (%)		-1%			2%			3%			0%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.949			0.950			0.988				
Flt Protected		0.977			0.996			0.986				
Satd. Flow (prot)	0	1491	0	0	1429	0	0	1601	0	0	0	0
Flt Permitted		0.977			0.996			0.986				
Satd. Flow (perm)	0	1491	0	0	1429	0	0	1601	0	0	0	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		646			329			412			215	
Travel Time (s)		17.6			9.0			11.2			5.9	
Confl. Peds. (#/hr)	55		51	51		55	18		49	49		18
Confl. Bikes (#/hr)			5			8			1			2
Peak Hour Factor	0.90	0.76	0.76	0.62	0.88	0.74	0.67	0.66	0.65	0.92	0.92	0.92
Heavy Vehicles (%)	2%	13%	1%	0%	1%	1%	4%	2%	25%	2%	2%	2%
Parking (#/hr)					0			0				
Adj. Flow (vph)	220	72	176	60	374	254	39	89	12	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	468	0	0	688	0	0	140	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.14	1.19	1.14	1.16	1.32	1.16	1.17	1.14	1.17	1.14	1.14	1.14
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary

Area Type: CBD
Control Type: Unsignalized
Intersection Capacity Utilization 84.8% ICU Level of Service E
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
4: Callowhill Street & N. 17th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	0	62	156	349	0	0	0	0	0	261	141
Peak Hour Factor	0.92	0.92	0.78	0.83	0.85	0.92	0.92	0.92	0.92	0.92	0.86	0.76
Hourly flow rate (vph)	0	0	79	188	411	0	0	0	0	0	303	186

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total (vph)	79	188	411	489
Volume Left (vph)	0	188	0	0
Volume Right (vph)	79	0	0	186
Hadj (s)	-0.55	0.52	0.02	-0.20
Departure Headway (s)	5.8	6.6	6.1	5.4
Degree Utilization, x	0.13	0.34	0.69	0.73
Capacity (veh/h)	560	528	572	651
Control Delay (s)	9.6	11.8	20.5	21.4
Approach Delay (s)	9.6	17.8		21.4
Approach LOS	A	C		C

Intersection Summary			
Delay	18.8		
HCM Level of Service	C		
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Callowhill Street & N. 17th Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	62	156	349	0	0	0	0	0	261	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	11	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			-4%	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt			0.865								0.949	
Flt Protected				0.950								
Satd. Flow (prot)	0	0	1292	1547	1516	0	0	0	0	0	1386	0
Flt Permitted				0.950								
Satd. Flow (perm)	0	0	1292	1547	1516	0	0	0	0	0	1386	0
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		329			440			230			610	
Travel Time (s)		9.0			12.0			6.3			16.6	
Confl. Peds. (#/hr)	46		98	98		46	112		60	60		112
Confl. Bikes (#/hr)			1									20
Peak Hour Factor	0.92	0.92	0.78	0.83	0.85	0.92	0.92	0.92	0.92	0.92	0.86	0.76
Heavy Vehicles (%)	2%	2%	3%	1%	1%	2%	2%	2%	2%	2%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	5	0
Parking (#/hr)			0		0						0	
Adj. Flow (vph)	0	0	79	188	411	0	0	0	0	0	303	186
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	79	188	411	0	0	0	0	0	489	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.14	1.14	1.30	1.20	1.31	1.15	1.14	1.14	1.14	1.12	1.36	1.12
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	CBD
Control Type: Unsignalized	
Intersection Capacity Utilization 59.8%	ICU Level of Service B
Analysis Period (min) 15	

HCM Signalized Intersection Capacity Analysis
5: Callowhill Street & N. 16th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	381	273	82	792	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)					5.0			5.0				
Lane Util. Factor					0.95			0.95				
Frpb, ped/bikes					0.98			1.00				
Flpb, ped/bikes					1.00			0.97				
Frt					0.94			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					2779			2969				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					2779			2969				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.80	0.77	0.84	0.85	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	476	355	98	932	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	78	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	753	0	0	1024	0	0	0	0
Confl. Peds. (#/hr)	35		195	195		35	528		30	30		528
Confl. Bikes (#/hr)						4						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	1%	3%	4%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	5	0	0	0	0
Parking (#/hr)					0							
Turn Type							Perm					
Protected Phases					8			2				
Permitted Phases							2					
Actuated Green, G (s)					16.0			34.0				
Effective Green, g (s)					16.0			34.0				
Actuated g/C Ratio					0.27			0.57				
Clearance Time (s)					5.0			5.0				
Lane Grp Cap (vph)					741			1682				
v/s Ratio Prot					c0.27							
v/s Ratio Perm								0.35				
v/c Ratio					1.02			0.61				
Uniform Delay, d1					22.0			8.6				
Progression Factor					0.38			1.00				
Incremental Delay, d2					33.8			1.7				
Delay (s)					42.2			10.3				
Level of Service					D			B				
Approach Delay (s)		0.0			42.2			10.3			0.0	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

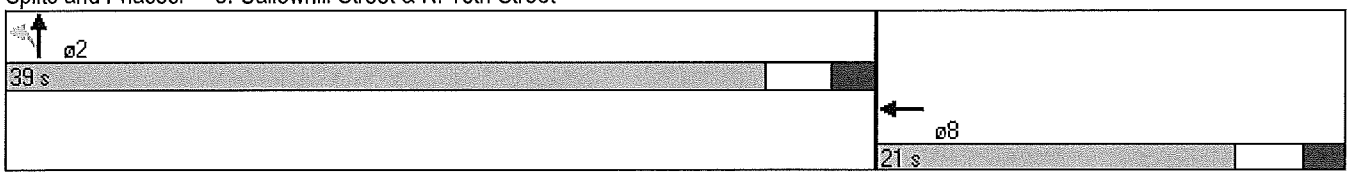
Timings
5: Callowhill Street & N. 16th Street

Lane Group	WBT	NBT
Lane Configurations		
Volume (vph)	381	792
Lane Group Flow (vph)	831	1030
Turn Type		
Protected Phases	8	2
Permitted Phases		
Minimum Split (s)	21.0	39.0
Total Split (s)	21.0	39.0
Total Split (%)	35.0%	65.0%
Yellow Time (s)	3.0	3.0
All-Red Time (s)	2.0	2.0
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	5.0	5.0
Lead/Lag		
Lead-Lag Optimize?		
v/c Ratio	1.01	0.61
Control Delay	44.1	10.4
Queue Delay	0.0	0.0
Total Delay	44.1	10.4
Queue Length 50th (ft)	~40	113
Queue Length 95th (ft)	#191	150
Internal Link Dist (ft)	380	136
Turn Bay Length (ft)		
Base Capacity (vph)	820	1688
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.01	0.61

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 36 (60%), Referenced to phase 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Callowhill Street & N. 16th Street



HCM Signalized Intersection Capacity Analysis
6: Callowhill Street & N. 15th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	129	505	0	0	0	0	0	710	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			0%			0%			-3%	
Total Lost time (s)					5.0						5.0	5.0
Lane Util. Factor					0.95						1.00	1.00
Frpb, ped/bikes					1.00						1.00	0.95
Flpb, ped/bikes					0.99						1.00	1.00
Frt					1.00						1.00	0.85
Flt Protected					0.99						1.00	1.00
Satd. Flow (prot)					2972						1425	1240
Flt Permitted					0.99						1.00	1.00
Satd. Flow (perm)					2972						1425	1240
Peak-hour factor, PHF	0.92	0.92	0.92	0.75	0.93	0.92	0.92	0.92	0.92	0.92	0.96	0.86
Adj. Flow (vph)	0	0	0	172	543	0	0	0	0	0	740	107
RTOR Reduction (vph)	0	0	0	0	32	0	0	0	0	0	0	17
Lane Group Flow (vph)	0	0	0	0	683	0	0	0	0	0	740	90
Confl. Peds. (#/hr)	57		40	40		57	34		313	313		34
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	2%	2%	2%	0%	2%	2%	2%	2%	2%	2%	6%	13%
Parking (#/hr)					0						0	
Turn Type				Perm								Perm
Protected Phases					8						6	
Permitted Phases				8								6
Actuated Green, G (s)					16.0						34.0	34.0
Effective Green, g (s)					16.0						34.0	34.0
Actuated g/C Ratio					0.27						0.57	0.57
Clearance Time (s)					5.0						5.0	5.0
Lane Grp Cap (vph)					793						808	703
v/s Ratio Prot											c0.52	
v/s Ratio Perm					0.23							0.07
v/c Ratio					0.86						0.92	0.13
Uniform Delay, d1					20.9						11.7	6.1
Progression Factor					1.00						1.10	0.97
Incremental Delay, d2					11.9						13.3	0.3
Delay (s)					32.8						26.1	6.2
Level of Service					C						C	A
Approach Delay (s)		0.0			32.8			0.0			23.6	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

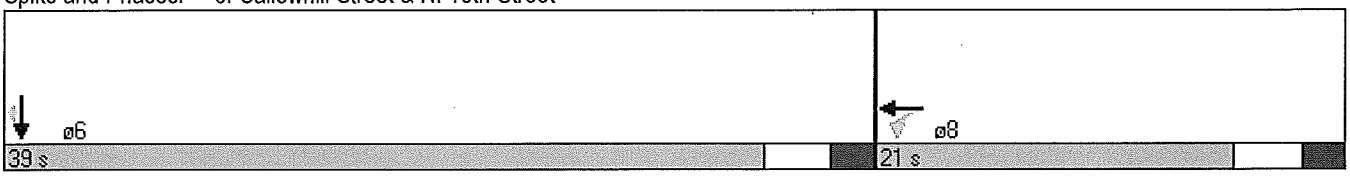
Timings
6: Callowhill Street & N. 15th Street

Lane Group	WBT	SBT	SBR
Lane Configurations			
Volume (vph)	505	710	92
Lane Group Flow (vph)	715	740	107
Turn Type			Perm
Protected Phases	8	6	
Permitted Phases			6
Minimum Split (s)	21.0	21.0	21.0
Total Split (s)	21.0	39.0	39.0
Total Split (%)	35.0%	65.0%	65.0%
Yellow Time (s)	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0
Lead/Lag			
Lead-Lag Optimize?			
v/c Ratio	0.87	0.92	0.15
Control Delay	33.4	29.1	4.6
Queue Delay	0.0	0.0	0.0
Total Delay	33.4	29.1	4.6
Queue Length 50th (ft)	121	244	11
Queue Length 95th (ft)	#215	m#357	m17
Internal Link Dist (ft)	400	990	
Turn Bay Length (ft)			100
Base Capacity (vph)	824	808	720
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.87	0.92	0.15

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 39 (65%), Referenced to phase 8:WBTL, Start of Yellow
Natural Cycle: 65
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Callowhill Street & N. 15th Street



HCM Signalized Intersection Capacity Analysis
7: Callowhill Street & N. Broad Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	60	296	88	198	780	0	0	856	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	10	11	12	12	10	12	12	10	12
Grade (%)		0%			3%			4%			-1%	
Total Lost time (s)				6.0	6.0		3.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95		1.00	0.91			0.95	1.00
Frpb, ped/bikes				1.00	0.96		1.00	1.00			1.00	0.69
Flpb, ped/bikes				0.82	1.00		0.99	1.00			1.00	1.00
Frt				1.00	0.96		1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1195	2844		1578	4135			2958	1002
Flt Permitted				0.95	1.00		0.18	1.00			1.00	1.00
Satd. Flow (perm)				1195	2844		305	4135			2958	1002
Peak-hour factor, PHF	0.92	0.92	0.92	0.68	0.92	0.64	0.90	0.87	0.92	0.92	0.87	0.78
Adj. Flow (vph)	0	0	0	88	322	138	220	897	0	0	984	156
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	88	460	0	220	897	0	0	984	156
Confl. Peds. (#/hr)	115		184	184		115	545		89	89		545
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	0%	3%	2%	2%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Turn Type				Perm			pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8			2					6
Actuated Green, G (s)				27.0	27.0		52.0	52.0			43.0	43.0
Effective Green, g (s)				27.0	27.0		52.0	52.0			43.0	43.0
Actuated g/C Ratio				0.30	0.30		0.58	0.58			0.48	0.48
Clearance Time (s)				6.0	6.0		3.0	5.0			5.0	5.0
Lane Grp Cap (vph)				359	853		261	2389			1413	479
v/s Ratio Prot					c0.16		c0.06	0.22			0.33	
v/s Ratio Perm				0.07			c0.43					0.16
v/c Ratio				0.25	0.54		0.84	0.38			0.70	0.33
Uniform Delay, d1				23.8	26.3		12.6	10.2			18.4	14.5
Progression Factor				1.00	1.00		1.87	1.37			0.71	0.85
Incremental Delay, d2				1.6	2.4		19.9	0.3			2.3	1.5
Delay (s)				25.4	28.7		43.4	14.3			15.4	13.9
Level of Service				C	C		D	B			B	B
Approach Delay (s)		0.0			28.2			20.1			15.2	
Approach LOS		A			C			C			B	

Intersection Summary			
HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

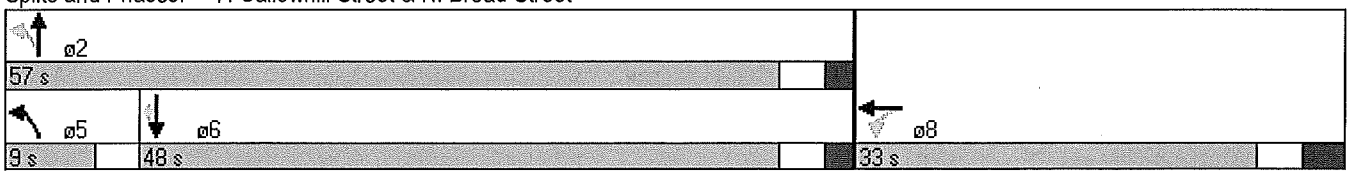
Timings
7: Callowhill Street & N. Broad Street

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	60	296	198	780	856	122
Lane Group Flow (vph)	88	460	220	897	984	156
Turn Type	Perm		pm+pt			Perm
Protected Phases		8	5	2	6	
Permitted Phases	8		2			6
Minimum Split (s)	33.0	33.0	9.0	57.0	37.0	37.0
Total Split (s)	33.0	33.0	9.0	57.0	48.0	48.0
Total Split (%)	36.7%	36.7%	10.0%	63.3%	53.3%	53.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	0.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	3.0	5.0	5.0	5.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
v/c Ratio	0.25	0.54	0.84	0.38	0.70	0.33
Control Delay	26.1	29.1	40.3	14.5	15.7	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	29.1	40.3	14.5	15.7	14.4
Queue Length 50th (ft)	38	114	101	165	102	29
Queue Length 95th (ft)	56	163	m#163	194	m171	m60
Internal Link Dist (ft)		550		480	990	
Turn Bay Length (ft)	530		125			100
Base Capacity (vph)	359	853	261	2389	1413	479
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.54	0.84	0.38	0.70	0.33

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 43 (48%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 90
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Callowhill Street & N. Broad Street



HCM Signalized Intersection Capacity Analysis
8: WB Vine Street & N. 16th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	749	755	83	722	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	11	12	11	12	12	12	12
Grade (%)		0%			0%			-1%			0%	
Total Lost time (s)					5.3	5.3		6.0				
Lane Util. Factor					0.95	0.88		0.91				
Frpb, ped/bikes					1.00	0.94		1.00				
Flpb, ped/bikes					1.00	1.00		0.96				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3217	2310		4111				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3217	2310		4111				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.90	0.92	0.81	0.94	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	832	821	102	768	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	19	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	832	821	0	851	0	0	0	0
Confl. Peds. (#/hr)	69		33	33		69	611		16	16		611
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%	4%	5%	2%	2%	2%	2%
Turn Type						Perm	Perm					
Protected Phases					1			2				
Permitted Phases						1	2					
Actuated Green, G (s)					45.7	45.7		33.0				
Effective Green, g (s)					45.7	45.7		33.0				
Actuated g/C Ratio					0.51	0.51		0.37				
Clearance Time (s)					5.3	5.3		6.0				
Lane Grp Cap (vph)					1634	1173		1507				
v/s Ratio Prot					0.26							
v/s Ratio Perm						c0.36		0.21				
v/c Ratio					0.51	0.70		0.56				
Uniform Delay, d1					14.7	16.9		22.8				
Progression Factor					0.62	0.59		1.00				
Incremental Delay, d2					0.7	2.1		1.3				
Delay (s)					9.8	12.0		24.1				
Level of Service					A	B		C				
Approach Delay (s)		0.0			10.9			24.1			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.3
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

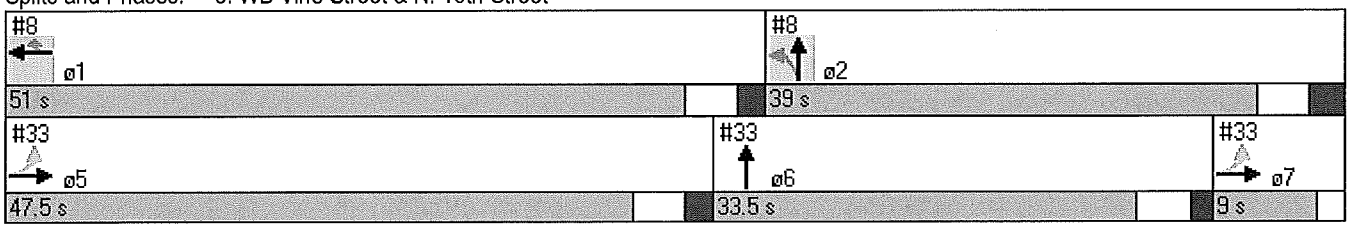
c Critical Lane Group

Lane Group	WBT	WBR	NBT	ø5	ø6	ø7
Lane Configurations						
Volume (vph)	749	755	722			
Lane Group Flow (vph)	832	821	870			
Turn Type		Perm				
Protected Phases	1		2	5	6	7
Permitted Phases		1				
Minimum Split (s)	51.0	51.0	39.0	47.5	33.5	9.0
Total Split (s)	51.0	51.0	39.0	47.5	33.5	9.0
Total Split (%)	56.7%	56.7%	43.3%	53%	37%	10%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	1.8	1.8	2.5	1.8	1.5	0.0
Lost Time Adjust (s)	0.0	0.0	0.0			
Total Lost Time (s)	5.3	5.3	6.0			
Lead/Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?						
v/c Ratio	0.51	0.70	0.57			
Control Delay	9.9	12.4	23.5			
Queue Delay	0.0	0.0	8.1			
Total Delay	9.9	12.4	31.6			
Queue Length 50th (ft)	96	102	130			
Queue Length 95th (ft)	m108	m115	166			
Internal Link Dist (ft)	380		90			
Turn Bay Length (ft)						
Base Capacity (vph)	1634	1173	1526			
Starvation Cap Reductn	0	0	613			
Spillback Cap Reductn	0	0	0			
Storage Cap Reductn	0	0	0			
Reduced v/c Ratio	0.51	0.70	0.95			

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 1:WBT and 5:, Start of Green
Natural Cycle: 90
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: WB Vine Street & N. 16th Street



HCM Signalized Intersection Capacity Analysis
9: WB Vine Street & N. 15th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	77	972	0	0	0	0	0	1410	502
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		0%			1%			0%			2%	
Total Lost time (s)					5.0						15.0	
Lane Util. Factor					0.91						0.86	
Frpb, ped/bikes					1.00						0.99	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.96	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					4426						5248	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					4426						5248	
Peak-hour factor, PHF	0.92	0.92	0.92	0.77	0.91	0.92	0.92	0.92	0.92	0.92	0.90	0.89
Adj. Flow (vph)	0	0	0	100	1068	0	0	0	0	0	1567	564
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	0	0	0	1168	0	0	0	0	0	2119	0
Confl. Peds. (#/hr)	59		2	2		59	34		507	507		34
Heavy Vehicles (%)	2%	2%	2%	1%	1%	2%	2%	2%	2%	2%	2%	1%
Parking (#/hr)					0							
Turn Type				Perm								
Protected Phases					1						2	
Permitted Phases				1								
Actuated Green, G (s)					36.0						34.0	
Effective Green, g (s)					36.0						34.0	
Actuated g/C Ratio					0.40						0.38	
Clearance Time (s)					5.0						15.0	
Lane Grp Cap (vph)					1770						1983	
v/s Ratio Prot											c0.40	
v/s Ratio Perm					0.26							
v/c Ratio					0.66						1.07	
Uniform Delay, d1					22.0						28.0	
Progression Factor					0.50						1.00	
Incremental Delay, d2					1.5						41.4	
Delay (s)					12.4						69.4	
Level of Service					B						E	
Approach Delay (s)		0.0			12.4			0.0			69.4	
Approach LOS		A			B			A			E	

Intersection Summary			
HCM Average Control Delay	49.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	35.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

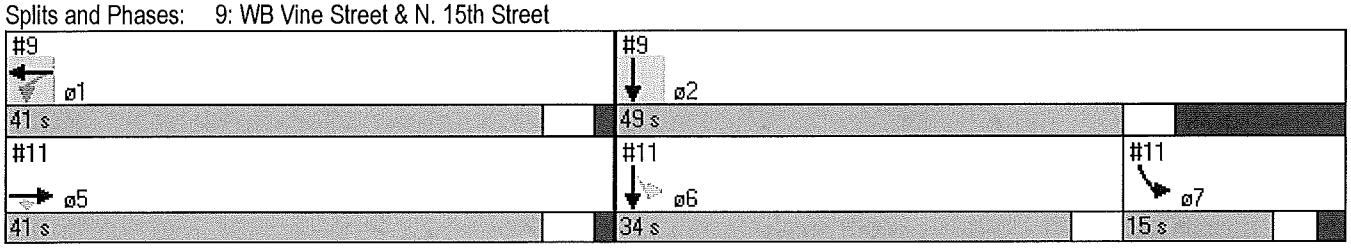
Timings
9: WB Vine Street & N. 15th Street

Lane Group	WBT	SBT	ø5	ø6	ø7
Lane Configurations					
Volume (vph)	972	1410			
Lane Group Flow (vph)	1168	2131			
Turn Type					
Protected Phases	1	2	5	6	7
Permitted Phases					
Minimum Split (s)	43.0	41.0	43.0	32.0	15.0
Total Split (s)	41.0	49.0	41.0	34.0	15.0
Total Split (%)	45.6%	54.4%	46%	38%	17%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.0
All-Red Time (s)	1.5	11.5	1.5	0.0	2.0
Lost Time Adjust (s)	0.0	0.0			
Total Lost Time (s)	5.0	15.0			
Lead/Lag				Lead	Lag
Lead-Lag Optimize?					
v/c Ratio	0.66	1.07			
Control Delay	12.6	69.7			
Queue Delay	0.9	63.4			
Total Delay	13.5	133.1			
Queue Length 50th (ft)	79	~393			
Queue Length 95th (ft)	93	#470			
Internal Link Dist (ft)	400	334			
Turn Bay Length (ft)					
Base Capacity (vph)	1771	1994			
Starvation Cap Reductn	0	0			
Spillback Cap Reductn	319	239			
Storage Cap Reductn	0	0			
Reduced v/c Ratio	0.80	1.21			

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 88 (98%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 100
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: WB Vine Street & N. 15th Street



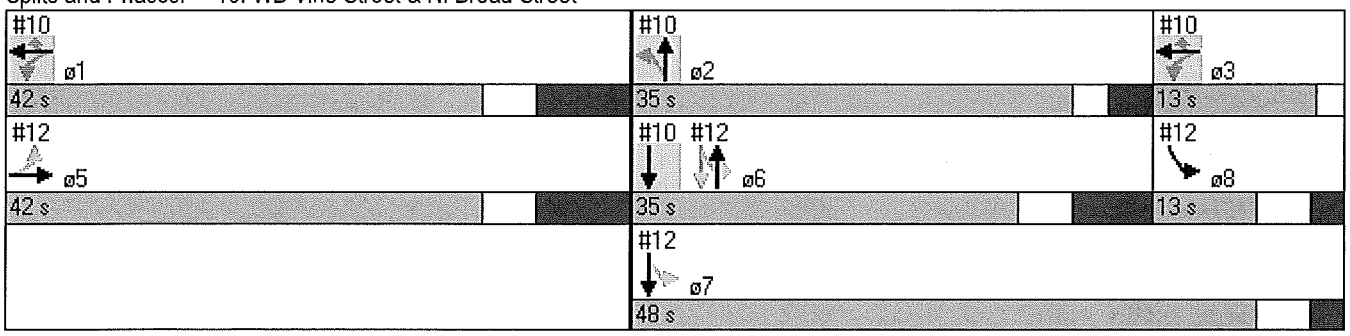
HCM Signalized Intersection Capacity Analysis
10: WB Vine Street & N. Broad Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	172	877	203	12	836	0	0	709	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	11	12	12	10	12	12	10	12
Grade (%)		0%			1%			-1%			1%	
Total Lost time (s)				10.0	10.0	10.0		5.4			9.0	
Lane Util. Factor				1.00	0.95	1.00		0.91			0.86	
Frpb, ped/bikes				1.00	1.00	0.91		1.00			0.93	
Flpb, ped/bikes				1.00	1.00	1.00		1.00			1.00	
Frt				1.00	1.00	0.85		1.00			0.97	
Flt Protected				0.95	1.00	1.00		1.00			1.00	
Satd. Flow (prot)				1584	3125	1274		4229			4798	
Flt Permitted				0.95	1.00	1.00		0.89			1.00	
Satd. Flow (perm)				1584	3125	1274		3769			4798	
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.92	0.81	0.50	0.87	0.92	0.92	0.92	0.91
Adj. Flow (vph)	0	0	0	200	953	251	24	961	0	0	771	173
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	200	953	251	0	985	0	0	944	0
Confl. Peds. (#/hr)	105		1	1		105	558		222	222		558
Confl. Bikes (#/hr)						39						11
Heavy Vehicles (%)	2%	2%	2%	2%	0%	3%	0%	3%	2%	2%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	2	0	0	5	0
Turn Type				Perm		Perm	Perm					
Protected Phases					1 3!			2			6!	
Permitted Phases				1 3!		1 3	2					
Actuated Green, G (s)				45.0	45.0	45.0		29.6			26.0	
Effective Green, g (s)				43.0	43.0	43.0		29.6			26.0	
Actuated g/C Ratio				0.48	0.48	0.48		0.33			0.29	
Clearance Time (s)								5.4			9.0	
Lane Grp Cap (vph)				757	1493	609		1240			1386	
v/s Ratio Prot					c0.30						0.20	
v/s Ratio Perm				0.13		0.20		c0.26				
v/c Ratio				0.26	0.64	0.41		0.79			0.68	
Uniform Delay, d1				14.0	17.7	15.3		27.4			28.3	
Progression Factor				1.00	1.00	1.00		0.32			0.55	
Incremental Delay, d2				0.9	2.1	2.1		2.1			2.0	
Delay (s)				14.9	19.8	17.3		10.9			17.6	
Level of Service				B	B	B		B			B	
Approach Delay (s)		0.0			18.6			10.9			17.6	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	25.4
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Splits and Phases: 10: WB Vine Street & N. Broad Street



Timings
10: WB Vine Street & N. Broad Street

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT	ø1	ø3	ø5	ø7	ø8
Lane Configurations											
Volume (vph)	172	877	203	12	836	709					
Lane Group Flow (vph)	200	953	251	0	985	944					
Turn Type	Perm		Perm	Perm							
Protected Phases		1 3!			2	6!	1	3	5	7	8
Permitted Phases	1 3!		1 3	2							
Minimum Split (s)				34.0	34.0	34.0	42.0	13.0	42.0	48.0	13.0
Total Split (s)	55.0	55.0	55.0	35.0	35.0	35.0	42.0	13.0	42.0	48.0	13.0
Total Split (%)	61.1%	61.1%	61.1%	38.9%	38.9%	38.9%	47%	14%	47%	53%	14%
Yellow Time (s)				2.4	2.4	3.6	3.6	2.0	3.6	3.6	3.6
All-Red Time (s)				3.0	3.0	5.4	6.4	0.0	6.4	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0					
Total Lost Time (s)	10.0	10.0	10.0	5.4	5.4	9.0					
Lead/Lag				Lead	Lead	Lead		Lag			Lag
Lead-Lag Optimize?								Yes			
v/c Ratio	0.25	0.61	0.39		0.79	0.68					
Control Delay	14.0	18.3	16.4		11.0	17.8					
Queue Delay	0.0	0.0	0.0		12.0	0.4					
Total Delay	14.0	18.3	16.4		23.0	18.2					
Queue Length 50th (ft)	62	195	85		64	124					
Queue Length 95th (ft)	99	258	124		m75	197					
Internal Link Dist (ft)		550			90	480					
Turn Bay Length (ft)											
Base Capacity (vph)	792	1563	637		1239	1387					
Starvation Cap Reductn	0	0	0		245	0					
Spillback Cap Reductn	13	0	0		0	122					
Storage Cap Reductn	0	0	0		0	0					
Reduced v/c Ratio	0.26	0.61	0.39		0.99	0.75					

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 2 (2%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 130
Control Type: Pretimed
m Volume for 95th percentile queue is metered by upstream signal.
! Phase conflict between lane groups.

HCM Signalized Intersection Capacity Analysis
11: EB Vine Street & N. 15th Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1331	343	0	0	0	0	0	0	609	775	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	11	12
Grade (%)		2%			0%			0%			4%	
Total Lost time (s)		5.0	5.0							5.0	3.5	
Lane Util. Factor		0.86	0.88							1.00	0.91	
Frpb, ped/bikes		1.00	0.97							1.00	1.00	
Flpb, ped/bikes		1.00	1.00							0.67	1.00	
Frt		1.00	0.85							1.00	1.00	
Flt Protected		1.00	1.00							0.95	1.00	
Satd. Flow (prot)		5766	2372							1052	4294	
Flt Permitted		1.00	1.00							0.95	1.00	
Satd. Flow (perm)		5766	2372							1052	4294	
Peak-hour factor, PHF	0.92	0.92	0.75	0.92	0.92	0.92	0.92	0.92	0.92	0.90	0.84	0.92
Adj. Flow (vph)	0	1447	457	0	0	0	0	0	0	677	923	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	4	0	0
Lane Group Flow (vph)	0	1447	457	0	0	0	0	0	0	673	923	0
Confl. Peds. (#/hr)	1		19	19		1	19		422	422		19
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	1%	4%	2%	2%	2%	2%	2%	2%	1%	3%	2%
Turn Type			Perm							pm+pt		
Protected Phases		5								7	6	
Permitted Phases			5							6		
Actuated Green, G (s)		36.0	36.0							40.5	30.5	
Effective Green, g (s)		36.0	36.0							40.5	30.5	
Actuated g/C Ratio		0.40	0.40							0.45	0.34	
Clearance Time (s)		5.0	5.0							5.0	3.5	
Lane Grp Cap (vph)		2306	949							473	1455	
v/s Ratio Prot		c0.25								c0.16	0.21	
v/s Ratio Perm			0.19							0.48		
v/c Ratio		0.63	0.48							1.42	0.63	
Uniform Delay, d1		21.6	20.1							24.8	25.1	
Progression Factor		0.93	0.98							0.33	0.55	
Incremental Delay, d2		1.2	1.7							191.6	0.2	
Delay (s)		21.4	21.4							199.7	13.9	
Level of Service		C	C							F	B	
Approach Delay (s)		21.4			0.0			0.0			92.5	
Approach LOS		C			A			A			F	

Intersection Summary			
HCM Average Control Delay	53.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	SBL	SBT	ø1	ø2
Lane Configurations						
Volume (vph)	1331	343	609	775		
Lane Group Flow (vph)	1447	457	677	923		
Turn Type		Perm	pm+pt			
Protected Phases	5		7	6	1	2
Permitted Phases		5	6			
Minimum Split (s)	43.0	43.0	15.0	32.0	43.0	41.0
Total Split (s)	41.0	41.0	15.0	34.0	41.0	49.0
Total Split (%)	45.6%	45.6%	16.7%	37.8%	46%	54%
Yellow Time (s)	3.5	3.5	3.0	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	2.0	0.0	1.5	11.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.0	5.0	5.0	3.5		
Lead/Lag			Lag	Lead		
Lead-Lag Optimize?						
v/c Ratio	0.63	0.48	1.33	0.63		
Control Delay	21.6	21.7	165.9	14.0		
Queue Delay	0.0	0.0	70.4	16.9		
Total Delay	21.6	21.7	236.3	31.0		
Queue Length 50th (ft)	173	96	~371	60		
Queue Length 95th (ft)	200	98	m#334	m57		
Internal Link Dist (ft)	2			90		
Turn Bay Length (ft)						
Base Capacity (vph)	2306	949	509	1455		
Starvation Cap Reductn	0	0	54	537		
Spillback Cap Reductn	0	0	0	0		
Storage Cap Reductn	0	0	0	0		
Reduced v/c Ratio	0.63	0.48	1.49	1.01		

Intersection Summary

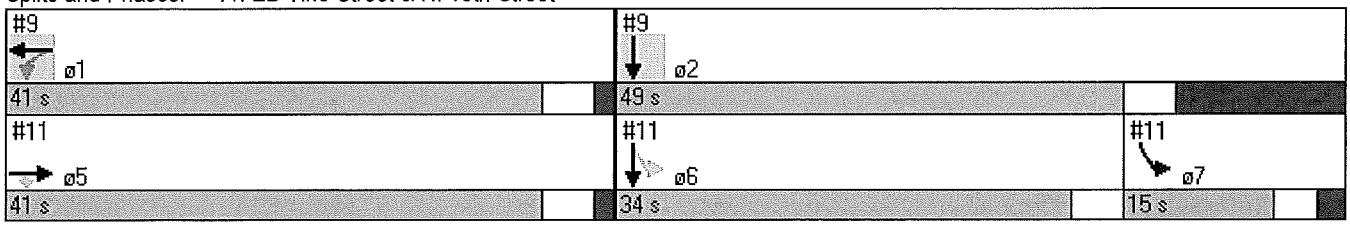
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 88 (98%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 100
Control Type: Pretimed

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: EB Vine Street & N. 15th Street



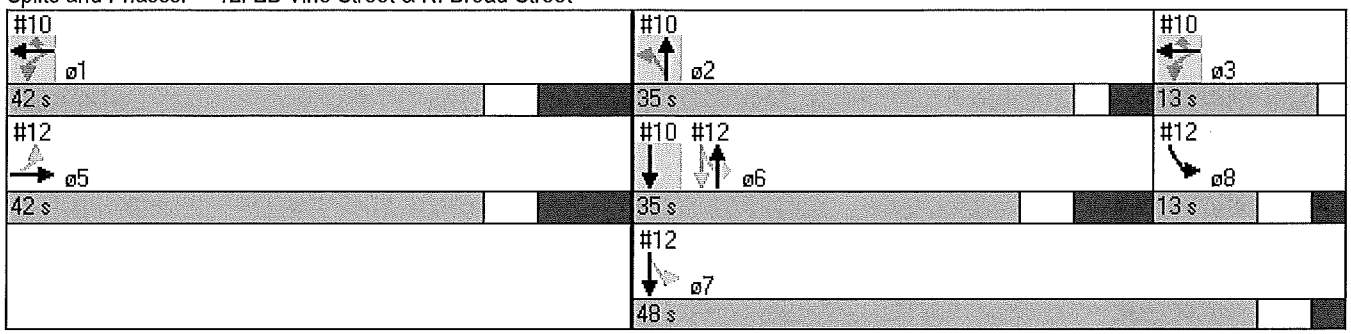
HCM Signalized Intersection Capacity Analysis
12: EB Vine Street & N. Broad Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	248	1563	64	0	0	0	0	601	426	259	688	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	10	12	12	10	12
Grade (%)		2%			0%			2%			2%	
Total Lost time (s)		10.0						9.0	9.0	6.0	6.0	
Lane Util. Factor		0.86						0.95	1.00	1.00	0.91	
Frpb, ped/bikes		0.99						1.00	0.78	1.00	1.00	
Flpb, ped/bikes		1.00						1.00	1.00	0.99	1.00	
Frt		0.99						1.00	0.85	1.00	1.00	
Flt Protected		0.99						1.00	1.00	0.95	1.00	
Satd. Flow (prot)		5633						2740	1041	1559	4229	
Flt Permitted		0.99						1.00	1.00	0.30	1.00	
Satd. Flow (perm)		5633						2740	1041	490	4229	
Peak-hour factor, PHF	0.92	0.94	0.67	0.92	0.92	0.92	0.92	0.85	0.92	0.92	0.88	0.92
Adj. Flow (vph)	270	1663	96	0	0	0	0	707	463	282	782	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2029	0	0	0	0	0	707	463	282	782	0
Confl. Peds. (#/hr)	6		119	119		6	605		195	195		605
Confl. Bikes (#/hr)			7						16			
Heavy Vehicles (%)	3%	1%	3%	2%	2%	2%	2%	3%	8%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	30	0	0	0	0
Turn Type	Perm								Perm	custom		
Protected Phases		5						6		8	7	
Permitted Phases	5								6	6 7	6 7	
Actuated Green, G (s)		32.0						26.0	26.0	42.0	42.0	
Effective Green, g (s)		32.0						26.0	26.0	42.0	42.0	
Actuated g/C Ratio		0.36						0.29	0.29	0.47	0.47	
Clearance Time (s)		10.0						9.0	9.0	6.0	6.0	
Lane Grp Cap (vph)		2003						792	301	312	1974	
v/s Ratio Prot								0.26		c0.07	0.18	
v/s Ratio Perm		0.36							c0.44	0.35		
v/c Ratio		1.01						0.89	1.54	0.90	0.40	
Uniform Delay, d1		29.0						30.7	32.0	26.4	15.7	
Progression Factor		0.48						1.00	1.00	0.63	0.40	
Incremental Delay, d2		17.5						14.5	258.2	28.0	0.5	
Delay (s)		31.3						45.2	290.2	44.8	6.7	
Level of Service		C						D	F	D	A	
Approach Delay (s)		31.3			0.0			142.2			16.8	
Approach LOS		C			A			F			B	

Intersection Summary			
HCM Average Control Delay	58.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	104.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Splits and Phases: 12: EB Vine Street & N. Broad Street



Lane Group	EBT	NBT	NBR	SBL	SBT	ø1	ø2	ø3
Lane Configurations								
Volume (vph)	1563	601	426	259	688			
Lane Group Flow (vph)	2029	707	463	282	782			
Turn Type			Perm	custom				
Protected Phases	5	6		8	7	1	2	3
Permitted Phases			6	6 7	6 7			
Minimum Split (s)	42.0	34.0	34.0	13.0	48.0	42.0	34.0	13.0
Total Split (s)	42.0	35.0	35.0	13.0	48.0	42.0	35.0	13.0
Total Split (%)	46.7%	38.9%	38.9%	14.4%	53.3%	47%	39%	14%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	2.4	2.0
All-Red Time (s)	6.4	5.4	5.4	2.4	2.4	6.4	3.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	10.0	9.0	9.0	6.0	6.0			
Lead/Lag		Lead	Lead	Lag			Lead	Lag
Lead-Lag Optimize?								Yes
v/c Ratio	1.01	0.89	1.54	0.92	0.40			
Control Delay	33.7	46.3	285.5	51.8	6.8			
Queue Delay	1.6	9.2	0.0	285.6	0.8			
Total Delay	35.2	55.5	285.5	337.5	7.6			
Queue Length 50th (ft)	~364	202	~374	88	34			
Queue Length 95th (ft)	m#153	#276	#559	#137	45			
Internal Link Dist (ft)	400	350			90			
Turn Bay Length (ft)				45				
Base Capacity (vph)	2002	792	301	307	1974			
Starvation Cap Reductn	0	0	0	136	830			
Spillback Cap Reductn	10	71	0	0	0			
Storage Cap Reductn	0	0	0	0	0			
Reduced v/c Ratio	1.02	0.98	1.54	1.65	0.68			

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 2 (2%), Referenced to phase 1:WBTL and 5:, Start of Green
Natural Cycle: 130
Control Type: Pretimed
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	629	0	0	878	83	172	207	175	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	12	11	12	12	9	9	12	12	12
Total Lost time (s)	3.0	6.0			6.0			6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00			
Frpb, ped/bikes	1.00	1.00			0.98			1.00	0.93			
Flpb, ped/bikes	1.00	1.00			1.00			0.96	1.00			
Frt	1.00	1.00			0.98			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.98	1.00			
Satd. Flow (prot)	1483	2925			2821			1270	1193			
Flt Permitted	0.17	1.00			1.00			0.98	1.00			
Satd. Flow (perm)	271	2925			2821			1270	1193			
Peak-hour factor, PHF	0.77	0.94	0.92	0.92	0.95	0.74	0.90	0.92	0.86	0.92	0.92	0.92
Adj. Flow (vph)	84	669	0	0	924	112	191	225	203	0	0	0
RTOR Reduction (vph)	0	0	0	0	15	0	0	0	59	0	0	0
Lane Group Flow (vph)	84	669	0	0	1021	0	0	416	144	0	0	0
Confl. Peds. (#/hr)	74		127	127		74	76		45	45		76
Confl. Bikes (#/hr)			43			26			13			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%
Parking (#/hr)		0			0			0				
Turn Type	pm+pt						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	29.0	29.0			20.0			19.0	19.0			
Effective Green, g (s)	29.0	29.0			20.0			19.0	19.0			
Actuated g/C Ratio	0.48	0.48			0.33			0.32	0.32			
Clearance Time (s)	3.0	6.0			6.0			6.0	6.0			
Lane Grp Cap (vph)	252	1414			940			402	378			
v/s Ratio Prot	0.03	c0.23			c0.36							
v/s Ratio Perm	0.13							0.33	0.12			
v/c Ratio	0.33	0.47			1.09			1.03	0.38			
Uniform Delay, d1	10.4	10.4			20.0			20.5	15.9			
Progression Factor	1.00	1.00			0.32			1.00	1.00			
Incremental Delay, d2	3.5	1.1			40.7			54.2	2.9			
Delay (s)	14.0	11.5			47.1			74.7	18.8			
Level of Service	B	B			D			E	B			
Approach Delay (s)		11.8			47.1			56.4			0.0	
Approach LOS		B			D			E			A	

Intersection Summary			
HCM Average Control Delay	38.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Timings
13: Spring Garden Street & N. 18th Street

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	65	629	878	207	175
Lane Group Flow (vph)	84	669	1036	416	203
Turn Type	pm+pt				Perm
Protected Phases	7	4	8	2	
Permitted Phases	4				2
Minimum Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (s)	9.0	35.0	26.0	25.0	25.0
Total Split (%)	15.0%	58.3%	43.3%	41.7%	41.7%
Yellow Time (s)	3.0	3.6	3.6	3.4	3.4
All-Red Time (s)	0.0	2.4	2.4	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?					
v/c Ratio	0.32	0.47	1.08	1.03	0.46
Control Delay	10.3	11.8	52.0	79.4	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	11.8	52.0	79.4	13.7
Queue Length 50th (ft)	14	79	~208	~158	32
Queue Length 95th (ft)	26	118	m#34	#317	77
Internal Link Dist (ft)		476	780	380	
Turn Bay Length (ft)	145				150
Base Capacity (vph)	264	1414	956	402	437
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.47	1.08	1.03	0.46

Intersection Summary

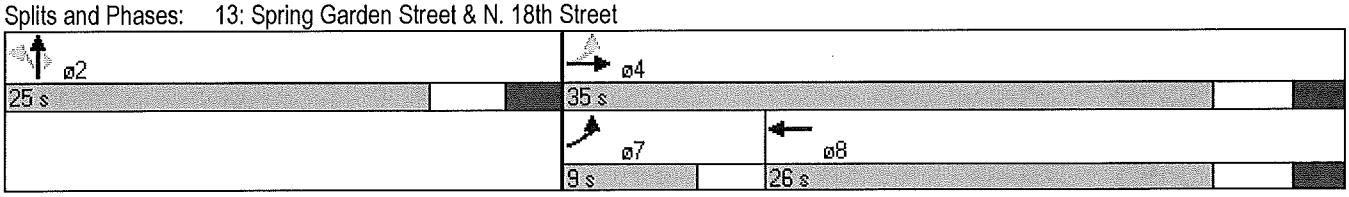
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Spring Garden Street & N. 18th Street



HCM Signalized Intersection Capacity Analysis
14: Spring Garden Street & N. Broad Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	842	55	3	770	81	0	810	49	140	837	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	12	12	11	12	12	11	12	10	11	12
Grade (%)		0%			0%			0%			-1%	
Total Lost time (s)		6.0			6.0			6.0		3.0	6.0	6.0
Lane Util. Factor		0.95			0.95			0.91		1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.99			0.99		1.00	1.00	0.74
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	1.00
Frt		0.99			0.98			0.99		1.00	1.00	0.85
Flt Protected		1.00			1.00			1.00		0.95	1.00	1.00
Satd. Flow (prot)		2852			2834			4330		1487	3064	1064
Flt Permitted		1.00			0.94			1.00		0.21	1.00	1.00
Satd. Flow (perm)		2852			2678			4330		330	3064	1064
Peak-hour factor, PHF	0.25	0.95	0.80	0.38	0.92	0.70	0.25	0.92	0.68	0.73	0.88	0.84
Adj. Flow (vph)	0	886	69	8	837	116	0	880	72	192	951	131
RTOR Reduction (vph)	0	0	0	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	0	955	0	0	961	0	0	942	0	192	951	131
Confl. Peds. (#/hr)	75		171	171		75	261		126	126		261
Confl. Bikes (#/hr)			40			39			16			26
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Parking (#/hr)		0			0							
Turn Type				Perm						pm+pt		Perm
Protected Phases		4			8			2		1	6	
Permitted Phases				8						6		6
Actuated Green, G (s)		34.0			34.0			35.0		44.0	44.0	44.0
Effective Green, g (s)		34.0			34.0			35.0		44.0	44.0	44.0
Actuated g/C Ratio		0.38			0.38			0.39		0.49	0.49	0.49
Clearance Time (s)		6.0			6.0			6.0		3.0	6.0	6.0
Lane Grp Cap (vph)		1077			1012			1684		238	1498	520
v/s Ratio Prot		0.33						0.22		c0.05	0.31	
v/s Ratio Perm					c0.36					c0.34		0.12
v/c Ratio		0.89			0.95			0.56		0.81	0.63	0.25
Uniform Delay, d1		26.2			27.2			21.5		15.7	17.0	13.4
Progression Factor		1.00			1.00			0.45		1.00	1.00	1.00
Incremental Delay, d2		10.8			18.5			1.3		24.6	2.1	1.2
Delay (s)		37.0			45.6			11.0		40.3	19.1	14.6
Level of Service		D			D			B		D	B	B
Approach Delay (s)		37.0			45.6			11.0			21.8	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM Average Control Delay	28.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

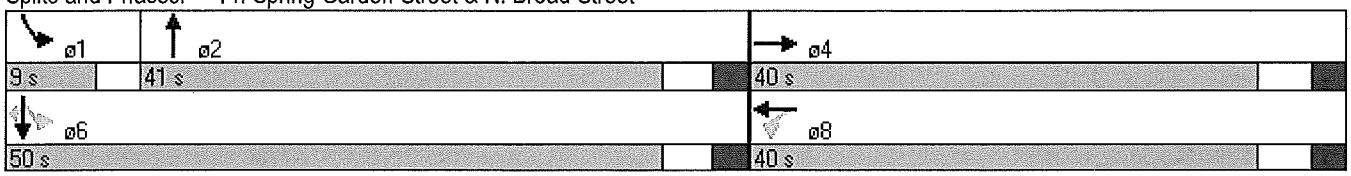
Timings
14: Spring Garden Street & N. Broad Street

Lane Group	EBT	WBL	WBT	NBT	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	842	3	770	810	140	837	110
Lane Group Flow (vph)	955	0	961	952	192	951	131
Turn Type		Perm			pm+pt		Perm
Protected Phases	4		8	2	1	6	
Permitted Phases		8			6		6
Minimum Split (s)	33.0	33.0	33.0	35.0	9.0	35.0	35.0
Total Split (s)	40.0	40.0	40.0	41.0	9.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	45.6%	10.0%	55.6%	55.6%
Yellow Time (s)	3.6	3.6	3.6	3.4	3.0	3.4	3.4
All-Red Time (s)	2.4	2.4	2.4	2.6	0.0	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag				Lag	Lead		
Lead-Lag Optimize?							
v/c Ratio	0.89		0.95	0.56	0.78	0.63	0.25
Control Delay	37.9		46.9	10.9	37.0	19.5	15.1
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	37.9		46.9	10.9	37.0	19.5	15.1
Queue Length 50th (ft)	262		274	50	57	201	42
Queue Length 95th (ft)	#383		#408	102	75	257	73
Internal Link Dist (ft)	400		550	990		290	
Turn Bay Length (ft)					170		
Base Capacity (vph)	1077		1012	1695	247	1498	520
Starvation Cap Reductn	0		0	0	0	0	0
Spillback Cap Reductn	0		0	0	0	0	0
Storage Cap Reductn	0		0	0	0	0	0
Reduced v/c Ratio	0.89		0.95	0.56	0.78	0.63	0.25

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 2 (2%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Spring Garden Street & N. Broad Street



Average Intersection Delay Calculations

Vine Street (Local) and N. 15th Street

NODE #9/11

Existing Conditions

Friday Weekday P.M. Peak Hour

Movement	Volumes	Avg. Delay	Total Delay
WB L	77	6.0	462.0
WB T	919	6.0	5514.0
SB T	1191	83.1	98972.1
SB R	335	83.1	27838.5
EB T	1244	15.9	19779.6
EB R	232	15.9	3688.8
SB L	428	4.4	1883.2
SB T	737	4.4	3242.8
Total	5163		161381.0
Overall Delay	**31.3**		
LOS	**C**		

Base (No-Build) Conditions

Friday Weekday P.M. Peak Hour

Movement	Volumes	Avg. Delay	Total Delay
WB L	77	6.2	477.4
WB T	930	6.2	5766.0
SB T	1205	90.6	109173.0
SB R	345	90.6	31257.0
EB T	1255	15.9	19954.5
EB R	242	15.9	3847.8
SB L	442	4.8	2121.6
SB T	737	4.8	3537.6
Total	5233		176134.9
Overall Delay	**33.7**		
LOS	**C**		

Projected (Build) Conditions with Mitigation

Friday Weekday P.M. Peak Hour

Movement	Volumes	Avg. Delay	Total Delay
WB L	77	12.4	954.8
WB T	972	12.4	12052.8
SB T	1410	69.4	97854.0
SB R	502	69.4	34838.8
EB T	1331	21.4	28483.4
EB R	343	21.4	7340.2
SB L	609	92.5	56332.5
SB T	775	92.5	71687.5
Total	6019		309544.0
Overall Delay	**51.4**		
LOS	**D**		

Vine Street (Local) and N. Broad Street

NODE #10/12

Existing Conditions

Friday Weekday P.M. Peak Hour

Movement	Volumes	Avg. Delay	Total Delay
WB L	172	17.6	3027.2
WB T	865	17.6	15224.0
WB R	182	17.6	3203.2
NB T	648	5.0	3240.0
SB T	645	16.2	10449.0
SB R	124	16.2	2008.8
EB L	88	18.0	1584.0
EB T	1455	18.0	26190.0
EB R	64	18.0	1152.0
NB T	565	120.8	68252.0
NB R	426	120.8	51460.8
SB L	205	17.5	3587.5
SB T	679	17.5	11882.5
Total	6118		201261.0
Overall Delay	**32.9**		
LOS	**C**		

Base (No-Build) Conditions

Friday Weekday P.M. Peak Hour

Movement	Volumes	Avg. Delay	Total Delay
WB L	172	17.6	3027.2
WB T	869	17.6	15294.4
WB R	184	17.6	3238.4
NB T	670	5.5	3685.0
SB T	657	16.6	10906.2
SB R	131	16.6	2174.6
EB L	108	18.5	1998.0
EB T	1460	18.5	27010.0
EB R	64	18.5	1184.0
NB T	567	121.1	68663.7
NB R	426	121.1	51588.6
SB L	214	19.5	4173.0
SB T	682	19.5	13299.0
Total	6204		206242.1
Overall Delay	**33.2**		
LOS	**C**		

Projected (Build) Conditions with Mitigation

Friday Weekday P.M. Peak Hour

Movement	Volumes	Avg. Delay	Total Delay
WB L	172	18.6	3199.2
WB T	877	18.6	16312.2
WB R	203	18.6	3775.8
NB T	836	10.9	9112.4
SB T	709	17.6	12478.4
SB R	157	17.6	2763.2
EB L	248	31.3	7762.4
EB T	1563	31.3	48921.9
EB R	64	31.3	2003.2
NB T	601	142.2	85462.2
NB R	426	142.2	60577.2
SB L	259	16.8	4351.2
SB T	688	16.8	11558.4
Total	6803		268277.7
Overall Delay	**39.4**		
LOS	**D**		

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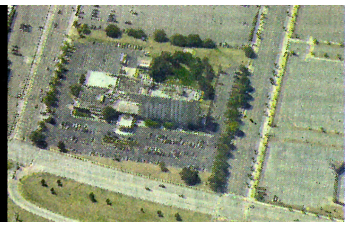
JAMES J. ANDERSON SITE: On the Delaware River next to I-95's Girard Avenue interchange



HOLIDAY INN: Packer Ave. at the Walt Whitman Bridge

8TH AND MARKET STREETS: Former DisneyQuest site, now a parking lot

Changing Skyline *By Inga Saffron*

More than a casino

Bart Blatstein's plan for an "entertainment resort" on North Broad – retail stores, restaurants, and a theater, along with a casino – is a big step up from suburban-style slots barns.

Gather round, folks. It's time once again for Philadelphia to play everyone's favorite game of chance: Choose a casino location.

It's been seven years since the city went through the arduous exercise of evaluating site proposals for two state-mandated slots parlors — only to find it had been subjected to a bait-and-switch of historic proportions. What Philadelphia was promised during that process were a pair of glamorous entertainment complexes packed with hotel and condo towers, theaters, and restaurants. What the city got instead was a Walmart-size barn with slot machines called SugarHouse.

Now, because one of the state's handpicked licensees, Foxwoods, went bust, the city gets to roll the dice again on its second casino. The deadline for applications is Nov. 15 and from three to six bids are expected. While the state Gaming Control Board will decide the winner in late 2013, the city can start lobbying now for a project that is more than a suburban-style highway box.

Bart Blatstein, the developer behind Northern Liberties' transformative Piazza project, has already offered a template for what that urban alternative might look like. Last week, at a high-end version of an all-you-can-eat buffet — one that drew a pack of political heavyweights — Blatstein rolled out a $700 million casino-and-shopping proposal for the former Inquirer and Daily News building at Broad and Callowhill Streets called "The Provence."

It's easy to make fun of the plan's kitschier aspects, such as the faux French village perched on the casino roof. But if you strip away the architecture and focus on the project's components, there is no doubt that the mix of retail, restaurants, spas, and theater ups the ante for the rest of the pack. This is really a shopping mall with a

See **SKYLINE** on D5

Developer Bart Blatstein has unveiled the first proposal for the city's second casino, a complex at Broad and Callowhill Streets called the Provence, pictured in an artist's rendering below. Other sites for possible bids are, from top left, a Delaware waterfront site north of SugarHouse; a stadium-district site near the Walt Whitman Bridge; a surface parking lot at Eighth and Market Streets. TOM GRALISH / Staff Photographer; STEVEN M. FALK / Staff Photographer; CYNTHIA GREER / Staff Artist; Steelman Partners

FORMER INQUIRER/DAILY NEWS SITE: On Callowhill Street between Broad and 16th Streets

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Standing on the roof of the former state office building at Broad and Spring Garden Sts., Bart Blatstein outlined his plans to turn the former Inquirer and Daily News building, in the background, into a casino and resort called the Provence. DAVID MAIALETTI / Staff

Changing Skyline *By Inga Saffron*

Urban casino site could be a winner

SKYLINE from D1

casino attached, and it is a less destructive, more modern way to package gambling in a city such as Philadelphia.

Unlike the proposals we saw in the first round, Blatstein's casino development would occupy a downtown location that is just as easy to reach by foot or transit as by car. The site plan reflects — celebrates, actually — that urban condition with a prominent entrance and street-level restaurants. If the other applicants expect to be credible, they're going to have to match that urban sensibility.

It's not clear how serious the six possible contenders are, but on Thursday an operator announced interest in the Holiday Inn site on Packer Avenue. The word on the street is that operators are looking at a Delaware waterfront site north of SugarHouse as well as sites on East Market Street, across from the Convention Center, and in Nicetown.

While any of the developers could, theoretically, come up with a better mixed-use design than Blatstein's, the car-oriented locations start with a disadvantage. They're too far off the beaten track to lure free-spending tourists and conventioneers. SugarHouse, it should be noted, has yet to produce a single spin-off business, unless you count a short-lived pawnshop across the street. The Provence and the other downtown sites have the advantage of being close to the Convention Center.

Of course, you can already hear the wails of opposition echoing across the city. Not downtown! Not in the historic newspaper tower! It feels good to shut your eyes, cover your ears, and announce you're firmly opposed to gambling.

Unfortunately, Philadelphia doesn't have a choice in the matter, not since former Gov. Ed Rendell and then-State Sen. Vince Fumo rammed through a bill in 2004 that legalized two gaming parlors here and took zoning control away from the city. The most productive thing the Nutter administration can do now is work to amass political support at home and in Harrisburg so it can get the best deal, economically and civically.

The strength of Blatstein's proposal, designed by Las Vegas' Steelman Partners, is that it updates the casino form. For years, top casinos in Vegas, Singapore, and Macao have been devoting more floor space to what are called "non-gaming activities." Their owners now earn more than half their revenue from stores, restaurants, concerts, and convention meetings, making the casino a kind of a loss leader.

Given that Pennsylvania taxes gambling revenue at 54 percent, while everything else pays a much lower rate, it makes sense for a developer to pack in the non-gaming stuff. At Provence, the retail and entertainment will occupy as much, if not more, floor space than the actual casino.

You also have to give Blatstein credit for cannily zeroing in on a site that is simultaneously urban and auto-friendly. While the Provence would be sited on Callowhill Street like any downtown building, with a large glass facade oriented toward the Center City skyline, its front door would face the I-676 cloverleaf linking the New Jersey and Pennsylvania suburbs. The access gives it an advantage over a rumored downtown competitor, the parking lot at Eighth and Market Streets.

Blatstein's proposal calls for a large new structure on Callowhill, between 15th and 16th Streets. The casino would occupy the entire second floor and span 15th Street into The Inquirer's old newsroom, a vast, soaring space. Blatstein says he would make the newspaper tower, which fronts Broad Street, into a hotel, preserving a historic building.

At the west end of the project, he would erect a sky bridge over 16th Street to provide access to an existing, 800-car parking garage. An additional 600 spaces would be built under the new casino structure, while 300 more could fit on the ground floor of the newsroom building. The total — 1,700 spaces — is about half the size of the garage SugarHouse wants to build on the waterfront. More important, Blatstein insists he can reach that number without building a new above-ground parking structure. The huge garages, as much as the demands of gambling, are what make casino buildings so unattractive.

It has been 13 years since Blatstein acquired the Schmidts Brewery site, and he's learned quite a bit about urban projects. The Provence would have a walkable sidewalk along its entire Callowhill side, as well as five restaurant and retail lots along the street. There is no porte-cochere drop-off. Instead, cars would be valet parked in the back, from an entrance off 16th Street.

Visitors arriving by foot would enter a high-ceilinged lobby. Borrowing a popular feature from Las Vegas' Bellagio, Blatstein envisions a giant "conservatory" greenhouse on the ground floor. Gamblers would take an escalator to the 120,000-square-foot casino, which would include a smaller, 25,000-square-foot VIP section aimed at high rollers.

Those uninterested in gambling could keep riding the escalator to the third level. This is where Blatstein envisions his French village, a three-level theme park of shopping, nightlife, and spas, and a 2,200-seat concert hall. Think of it as NewMarket in the sky.

A stucco Versailles, however, would be all wrong, not just as architecture, but as branding. Blatstein can't seem to resist the urge to replicate European architecture, even though it's impossible for a commercial project to build it in a way that isn't completely tacky. Years ago, he proposed a version of the Spanish Steps at Penn's Landing, and his first design for the Piazza was styled to look like the Piazza Navona.

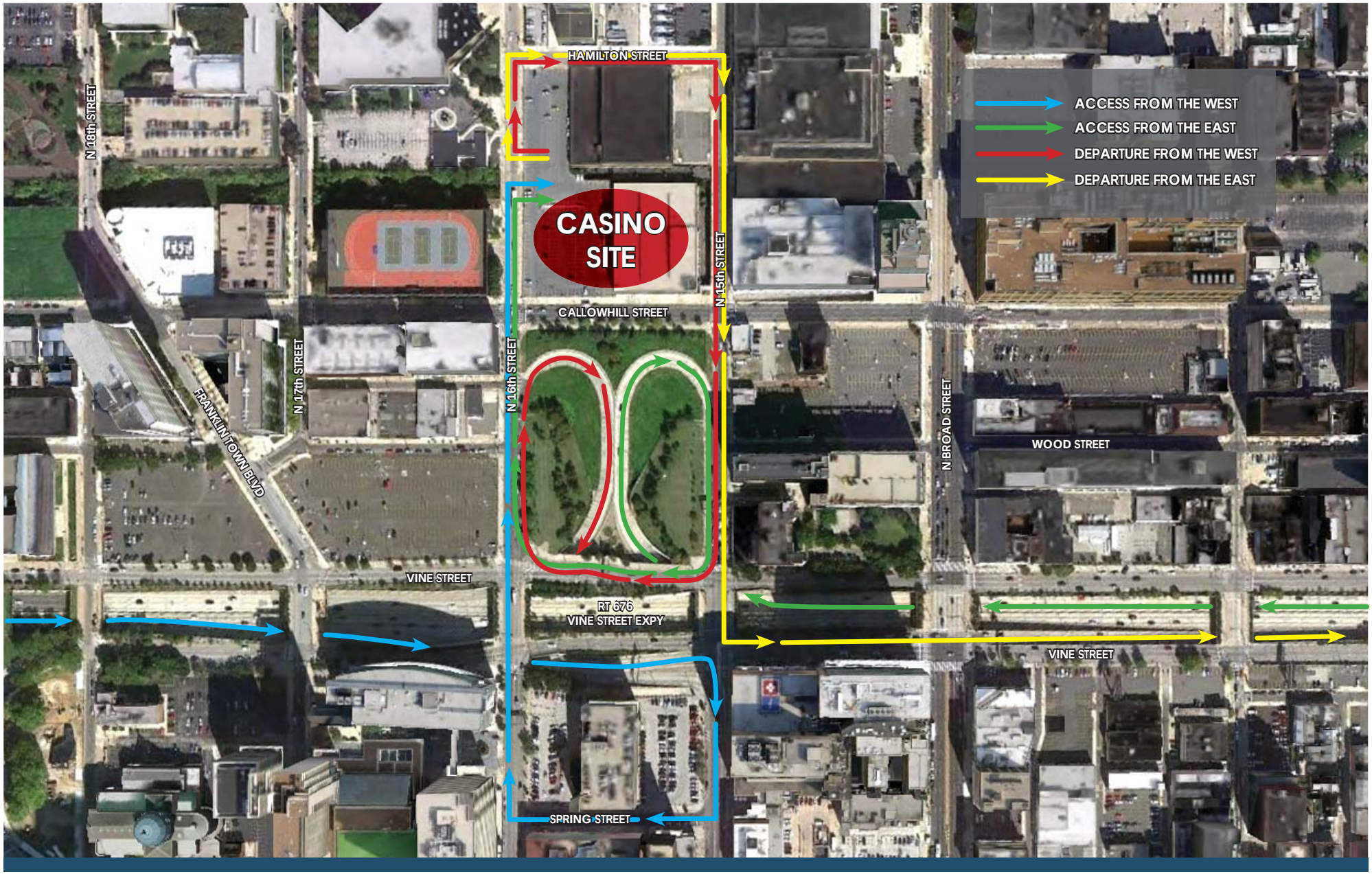
The architects who completed the Piazza, Erdy McHenry, ultimately persuaded him to build in a modern style that captured the essence of Philadelphia's rough-edged urbanity. A casino with an urban theme needs a design that conveys that quality — say, something along the lines of Andre Balazs' Standard Hotel in New York, similarly perched over the High Line. Or, put Northern Liberties on the roof. It's a good bet that this is not the last version of the Provence we'll see.

As Philadelphia knows too well, developers seeking casino licenses start by trotting out gauzy renderings of Paris, France, but end up building something more like Paris, Texas. What if Blatstein calls it quits after building the second-story casino?

He insists that won't happen because his tight urban site requires him to construct the entire project at once. "Even if it's physically possible to build in phases," he says, "I won't do it."

Good to hear the strong words. But this time the city should get it in writing.

Contact Inga Saffron at 215-854-2213 or isaffron@phillynews.com, or follow on Twitter @ingasaffron.



Traffic Flow Analysis

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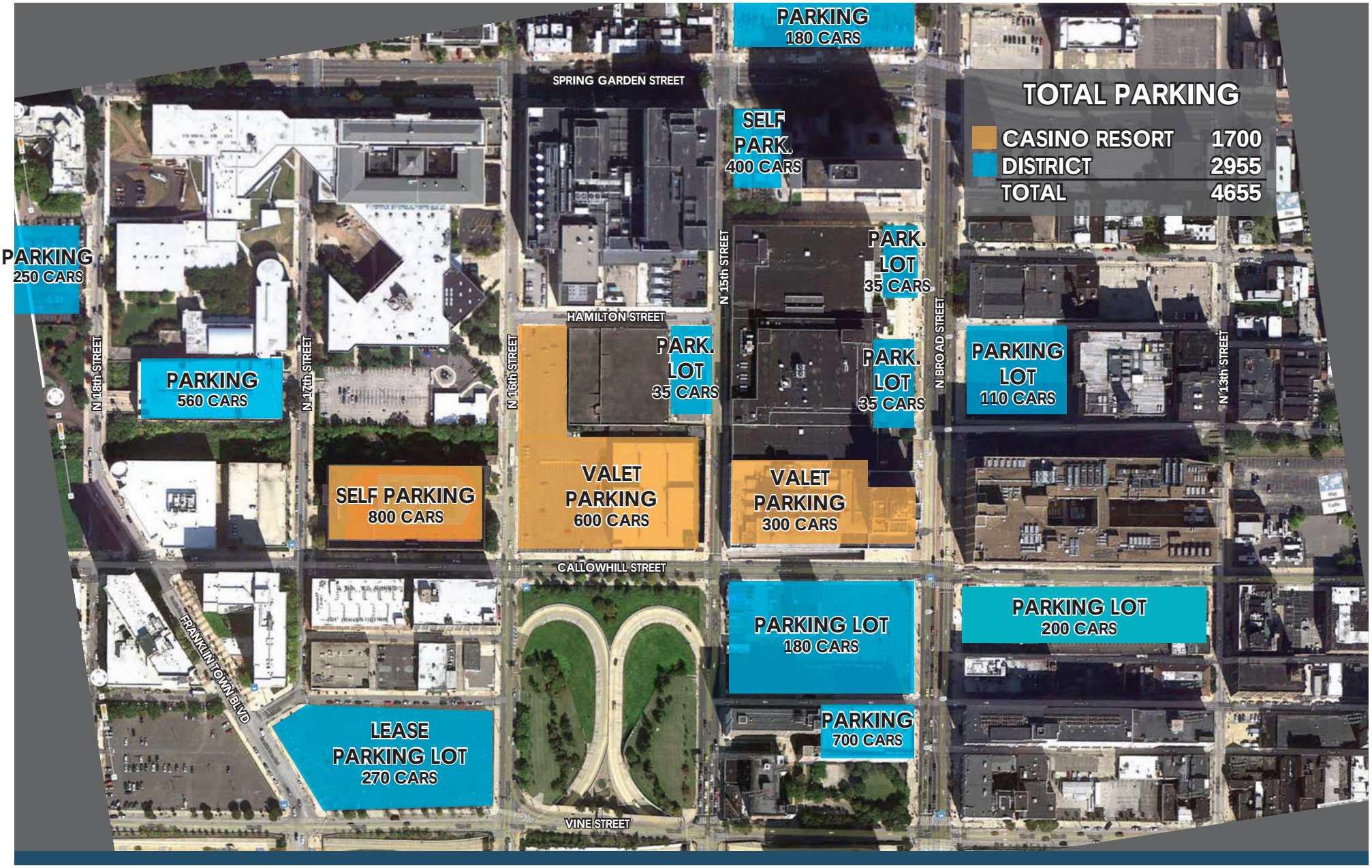

Parking Transportation Analysis

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