

TABLE 9: LEVEL OF SERVICE SUMMARY - 2016, 2021 BUILD CONDITIONS w/MITIGATION

Intersection		FRIDAY PM PEAK HOUR			SATURDAY PM PEAK HOUR			Storage Capacity (Feet)
		Delay (Secs)	LOS	95th % (Feet)	Delay (Secs)	LOS	95th % (Feet)	
7th Street & Market Street	Overall Intersection	13.6	B	-	15.9	B	-	-
	EB Thru	14.1	B	103	15.9	B	221	450
	WB Thru/Right	11.6	B	68	9.6	A	62	450
	NB Left/Thru/Right	13.9	B	152	20.1	C	135	565
7th Street & Chestnut Street	Overall Intersection	15.4	B	-	13.5	B	-	-
	EB Thru/Left	10.8	B	180	11.3	B	165	450
	NB Thru/Right	21.2	C	134	16.6	B	90	285
8th Street & Market Street	Overall Intersection	13.5	B	-	13.7	B	-	-
	EB Thru/Right	10.2	B	117	9.8	A	80	450
	WB Thru	13.3	B	129	18.9	B	185	450
	SB Left/Thru/Right	18.8	B	193	15.6	B	186	750
8th Street & Chestnut Street	Overall Intersection	11.0	B	-	10.6	B	-	-
	EB Thru/Right	9.2	A	61	8.2	A	42	450
	SB Left/Thru	12.1	B	133	11.9	B	116	565
9th Street & Market Street	Overall Intersection	14.9	B	-	14.0	B	-	-
	EB Thru	16.8	B	220	14.7	B	175	450
	WB Thru/Right	9.9	A	106	12.1	B	116	450
	NB Left/Thru	14.9	B	130	13.7	B	114	-
	NB Right	16.3	B	108	16.7	B	95	150
9th Street & Chestnut Street	Overall Intersection	15.8	B	-	14.7	B	-	-
	EB Thru/Left	13.8	B	161	13.5	B	136	450
	NB Thru/Right	17.4	B	138	15.6	B	121	285
8th Street & Site Entrance	SB Thru/Right	0.0	A	0	0.0	A	0	-
8th Street & Parking Garage	WB Left	29.8	D	103	32.0	D	107	-
	SB Left/Thru	1.3	A	9	1.5	A	10	-
9th Street & Site Exit	WB Right	12.3	B	57	11.7	B	50	-
	NB Thru	0.0	A	0	0.0	A	0	-

Notes: m - Volume for 95<sup>th</sup> percentile queue is metered by upstream signal.

# - 95<sup>th</sup> percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

**SIGHT DISTANCE ANALYSIS**

All turning movements exiting the site will be required to make a right-turn and travel north toward Market Street since 9<sup>th</sup> Street is a one way northbound street. Per PennDOT standards, the recommended safe sight distance for passenger cars exiting driveways onto a two lane four to six lane *unsignalized* roadway is 250 feet looking to the left. Adequate sight distance exists to see from the proposed site driveway to the adjacent traffic signal at the intersection of 9<sup>th</sup> Street and Chestnut Street.

It should be noted that the adjacent traffic signal at 9<sup>th</sup> Street/Chestnut will "meter" traffic by providing gaps in the traffic stream to exiting the site. The proposed driveway will be approximately 200 feet south of the 9<sup>th</sup> Street and Market Street intersection.

**PARKING UTILIZATION ASSESSMENT**

Below is a summary of those public parking facilities within 5, 10 and 15-minute walking radii of the proposed casino complex. The following total existing parking spaces within these walking times to/from the proposed casino location are as follows:

- 5-Minute Walk: 5,416 spaces,
- 10-Minute Walk: 11,719 spaces,
- 15-Minute Walk: 20,277 spaces.

An analysis of the available three (3) public parking garages in the immediate vicinity surrounding the project site was conducted to determine the parking utilization during the peak hours of the proposed development. Parking vacancy counts were performed on Friday, October 26, 2012 on every hour from 3:00 PM to 8:00 PM and on Saturday, October 27, 2012 on every half-hour from 5:00 PM to 8:00 PM. The total amount of vacant spaces at each garage was counted for each time period. The counts were conducted at the parking garages located at 801 Filbert Street, at 781 Chestnut Street and on the southeast corner of the Chestnut Street & 9<sup>th</sup> Street intersection. FIGURE 14 indicates the location of the three parking garages where vacancy counts were conducted. The three parking garages analyzed have a total capacity of 2,337 spaces. TABLE 10 summarizes the total capacity for each garage included in the analysis. FIGURE 14 indicates the location of the parking facilities which total 20,277 spaces within the Center City urban area surrounding the proposed site.

TABLE 10: STUDY AREA PARKING GARAGE SUMMARY

Parking Garage	Location	Capacity
A	801 Filbert Street	1,222
B	781 Chestnut Street	383
C	Chestnut Street & 9 <sup>th</sup> Street	732
<b>Total</b>		<b>2,337</b>

During the Friday survey period, the peak occupancy for the parking supply was 65% (1,527 total vehicles parked and 810 spaces available) occurring from 3:00 PM to 4:00 PM. The parking occupancy rates decreased throughout the period. The average occupancy was 48% (1,116 total vehicles and 1,221 spaces available). During the Saturday period, the peak occupancy for the parking supply was 56% (1,303 total vehicles parked and 1,034 spaces available) occurring from 5:00 PM to 5:30 PM. The parking occupancy rates decreased throughout the period. The average occupancy was 47% (1,089 total vehicles and 1,248 spaces available).

Although Pennoni feels that a good portion of Casino patrons will be not require "existing" parking, either because they traveled to the site via transit, walking, casino shuttle or taxi, statistical data is not readily available to support any specific reduction in parking generation for a Central Business District casino venue. As indicated in FIGURE 15, the Center City area of Philadelphia contains numerous hotels (approximately 9,678 hotel rooms) and it is anticipated that many patrons of these hotels can and will visit MARKET8 at some point during their stay. As detailed in the "Trip Generation" section of this report, however, it can be assumed that of the total number of casino patrons visiting the complex on a Friday or Saturday evening, approximately 56-65% respectively will be arriving via automobile.

The City's Zoning Code (§14-405 SP-ENT Entertainment Special Purpose District - Licensed Gaming Facilities) requires 4 parking spaces for every 5 slot machine or gaming positions provided for patrons and guests. Accordingly, the proposed complex would thus need to accommodate 2,554 parking spaces.

Pennoni's Parking Utilization analysis shows that there are currently in excess of 2,800 parking spaces within a 5 minute walk available after 5:00 PM on an average (non-event) Friday and on an average (non-event) Saturday after 6:00 PM. Combined with the 1000 main casino complex parking spaces and the additional proposed 340 spaces at 733 Chestnut Street, the proposed complex can accommodate approximately 4,000 vehicles, immediately adjacent to the site, on an average Friday or Saturday evening. Extrapolating Pennoni's Parking Utilization analysis to those parking facilities within 5, 10 and 15-minute walking distances of MARKET8, the Center City area of Philadelphia will have more than adequate parking capacity to accommodate a proposed urban casino locale (See TABLE 11).

TABLE 11: WEEKEND PEAK HOUR PARKING AVAILABILITY WITH PROPOSED SITE

Walking Distance to Parking	Parking Capacity (spaces)	Parking Availability* (spaces)
5 Minutes	5,416 + 1000 - 293 + 340 = 6,463	4,055
10 Minutes	11,734	7,395
15 Minutes	20,292	11,940
Spaces Required per Zoning	2,554	2,554
<b>Total Excess Capacity Within 15-min Walk:</b>	<b>17,738</b>	<b>9,386</b>

\*After 5:00 PM on Fridays and 6:00 PM on Saturdays, based on avg. occupancy of 47% for existing facilities.

Suggested strategies that would further mitigate the need for an additional parking "immediately adjacent" to the site might include:

- "Real-time" parking management for casino parking;
- Shuttle bus service to/from MARKET8 and Center City Parking and/or Hotel Venues; and
- Off-site Parking Accommodation for Casino employees.

As noted, based on the approximate 50% availability of the three facilities studied herein, available parking for casino patrons will not be problematic. The available parking immediately adjacent to the site combined with the proposed underground parking within the site, and the additional proposed 340 spaces at 733 Chestnut Street exceeds the parking requirements of the zoning code.

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## FINDINGS AND RECOMMENDATIONS

### Findings

Development trips will be comprised of two main components: the 80,000 GSF Casino (with 3192 gaming positions, buffet, meeting room space) and approximately 30,000 GSF of Quality Restaurants as part of the proposed complex. Projected peak hour trips for the casino for Friday and Saturday evening peak periods are based on research and information obtained from other casino traffic studies within the Philadelphia area and nationally. Projected peak hour trips for the Quality Restaurant uses are based on data provided in ITE's *Trip Generation, 9<sup>th</sup> edition*.

The ingress access for the proposed casino's parking garage will be located on the west side of 8<sup>th</sup> Street; with the corresponding egress access onto 9<sup>th</sup> Street (See Figure 2). As 8<sup>th</sup> Street and 9<sup>th</sup> Street are one-way pairs, southbound and northbound, respectively, all casino-related traffic, including valet and trucks, will be entering or exiting via the Market Street intersections with 8<sup>th</sup> and 9<sup>th</sup> Streets. Loading docks will be located inside the entrance to the main complex parking garage, opposite the valet pick-up/by-pass. The ingress and egress points for the additional parking at 733 Chestnut Street will be located on the east side of 8<sup>th</sup> Street and the north side of Chestnut Street. As 8<sup>th</sup> Street is one-way southbound, the majority of casino-related traffic using the 8<sup>th</sup> Street/Chestnut Street garage will be entering via the Market Street intersection with 8<sup>th</sup> Street. As Chestnut Street is one-way eastbound, the majority of traffic exiting the 8<sup>th</sup> Street/Chestnut Street garage will be exiting via 8<sup>th</sup> Street and Chestnut Street to 7<sup>th</sup> Street to Market Street.

All study intersections are projected to operate at an overall and approach LOS of C or better for both the horizon year "No Build" and "Build" conditions. The following improvements can be implemented to minimize delay increases at the 9<sup>th</sup> Street and Market Street intersection under build conditions: optimize the traffic signal timings, restrict on-street parking along the east side of 9<sup>th</sup> Street to provide a separate north bound right turn lane. The site driveway exiting onto 9th Street (stop controlled right out only) will operate at LOS B in the Build condition. Subsequently, considering a "diminishing return" of impacts as traffic is distributed farther from the border intersections, these results would indicate that MARKET8 would have similar, nominal impacts at other intersections along primary ingress and egress transportation routes.

Comparing the net "As-of-Right" vehicle trips to those for the proposed casino shows a significant increase in traffic if the proposed Market East site were to be developed per existing land use development guidelines. Specifically, 79% more traffic would typically be generated during the weekday PM Peak Hour (versus MARKET8 traffic) and 6% more traffic would be generated during the typical Saturday Peak Hour.

The City's Zoning Code (*§14-405 SP-ENT Entertainment Special Purpose District - Licensed Gaming Facilities*) requires 4 parking spaces for every 5 slot machine or gaming positions provided for patrons and guests. Accordingly, the proposed complex would thus need to accommodate 2,554 parking spaces. Pennoni's Parking Utilization analysis shows that there are currently in excess of 2,800 parking spaces within a 5 minute walk available after 5:00 PM on an average (non-event) Friday and on an average (non-event) Saturday after 6:00 PM. Combined with the 1000 main casino complex parking spaces and the additional proposed 340 spaces at 733 Chestnut Street, the proposed complex can accommodate approximately 4,000 vehicles, immediately adjacent to the site, on an average Friday or Saturday evening. In fact, as the casino might not necessarily be a primary destination for all patrons (e.g., casino's often provide "after" dinner or "after" show entertainment), Pennoni feels that the zoning requirement for this urban center location may be conservative.

## Recommendations

### *Transportation*

The following traffic management strategies are suggested for the proposed MARKET8 site:

- Restriction of on-street parking along the east side of 9<sup>th</sup> Street 100 feet south of the facility exit drive north to the Market Street intersection to provide a separate north bound right turn lane.

This recommendation will significantly improve the operations of the 9<sup>th</sup> Street and Market Street intersection, while allowing safer, unimpeded egress from the casino parking garage.

Based on the analyses contained herein, Pennoni would also recommend minor mitigation measures for study intersections, specifically, optimization of the traffic signal timing at the intersections of:

- Market Street and 7<sup>th</sup> Street;
- Market Street and 8<sup>th</sup> Street;
- Market Street and 9<sup>th</sup> Street;
- South 7<sup>th</sup> Street and Chestnut Street;
- South 8<sup>th</sup> Street and Chestnut Street; and
- South 9<sup>th</sup> Street and Chestnut Street.

To ensure "positive guidance" to/from the casino complex and primary travel routes for non-local drivers, it is suggested that enhanced trail-blazing signage to and from the regional transportation routes be provided.

We also acknowledge the potential impact of realistic long-term traffic reduction strategies, such as:

- Encouraging greater use of mass transit as an alternative to driving via advertising and/or casino promotions;
- Working with SEPTA and Center City hotels to increase the frequency of bus and shuttle stops to the casino and/or creating a direct connection to the mass transit hub within the study area (8<sup>th</sup> and Market Street);

### *Parking*

The Zoning Codes states that "parking provided in this (Special Purpose) District must be adequately served by high-capacity roads or driveways approved by the Streets Department as being adequate to safely serve the ingress and egress of patrons and guests using the facility." This requirement is clearly met given the close proximity of the proposed casino site to I-95 and the Vine Street Expressway.

Suggested parking utilization strategies that would further reduce the need for on-site parking spaces would include:

- "Real-time" parking management for Casino parking;
- Shuttle bus service to/from the Casino and Center City Parking, Shopping venues, Hotels;
- Proposed VIP and/or Valet Parking, and
- Off-site Parking Accommodation for Casino employees.

### Conclusions

Based on the findings indicated in this study:

- Transit service to the 8th and Market location is extraordinary. The casino is in a prime location to access several modes of transit including buses, subways, and regional rail. As a regional transit hub, the site is well served as a destination, and functions as one of the region's major points of transfer between transit facilities.
- The casino is in a prime location to access I-95 and I-676 for regional access by vehicular traffic.
- Delays due to casino vehicular traffic are limited to less than 10 seconds beyond "no build" conditions at all studied intersections. Levels of service (LOS) for the "Build" conditions meet or exceed typical LOS requirements for urban settings.
- The available parking immediately adjacent to the site combined with the proposed parking within the site exceeds the parking requirements of the zoning code. The site, located within the City of Philadelphia's urban core, provides excellent flexibility for development program modifications through maximization strategies for on-site parking, or greater utilization rates benefitting nearby, off -site parking facilities.

If those recommendations suggested above are implemented as part of the MARKET8 project, there will be nominal impacts on the surrounding transportation system with the Center City section of Philadelphia.

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Market East Associates, L.P.

MARKET8  
City of Philadelphia  
February 2013

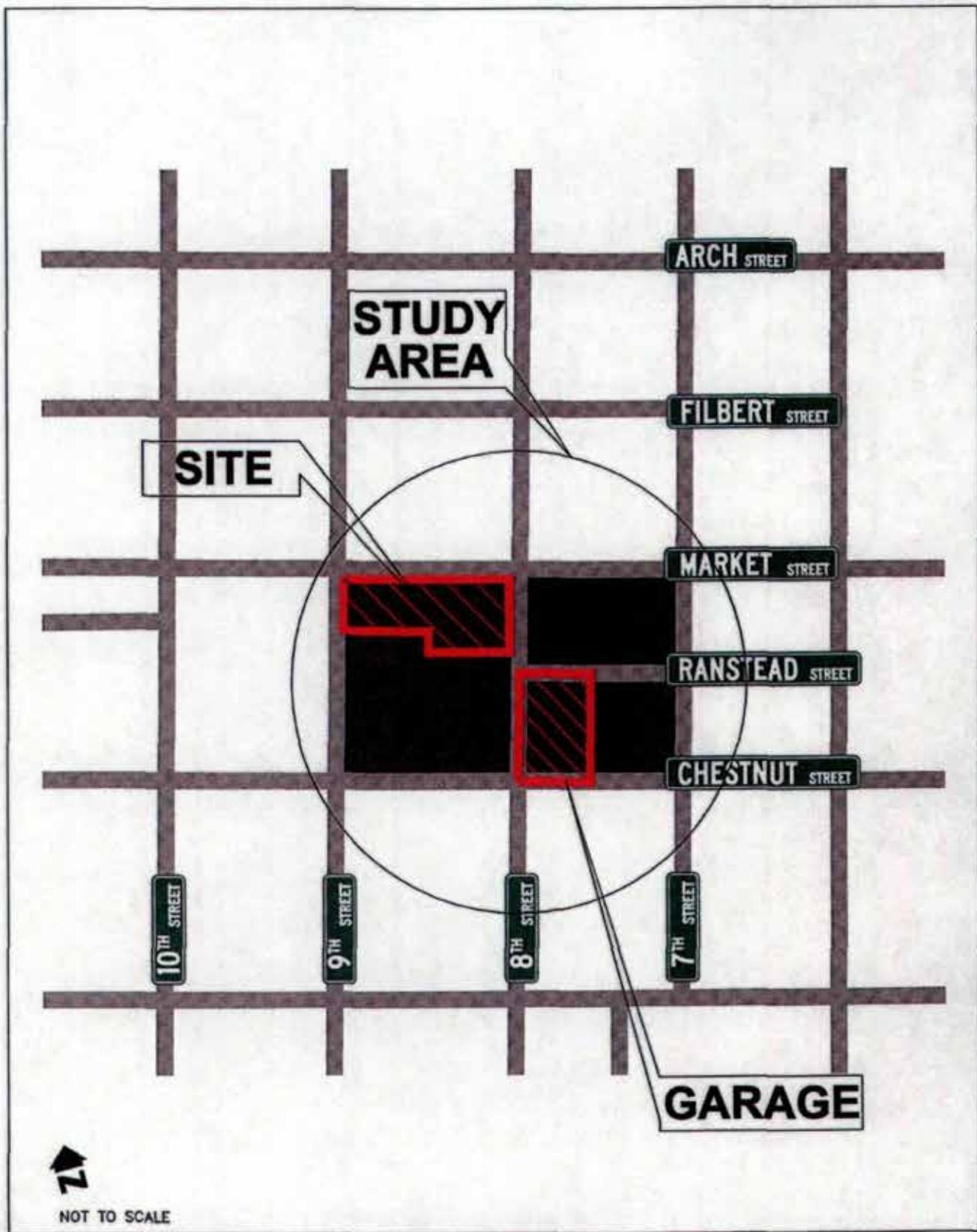
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# FIGURES

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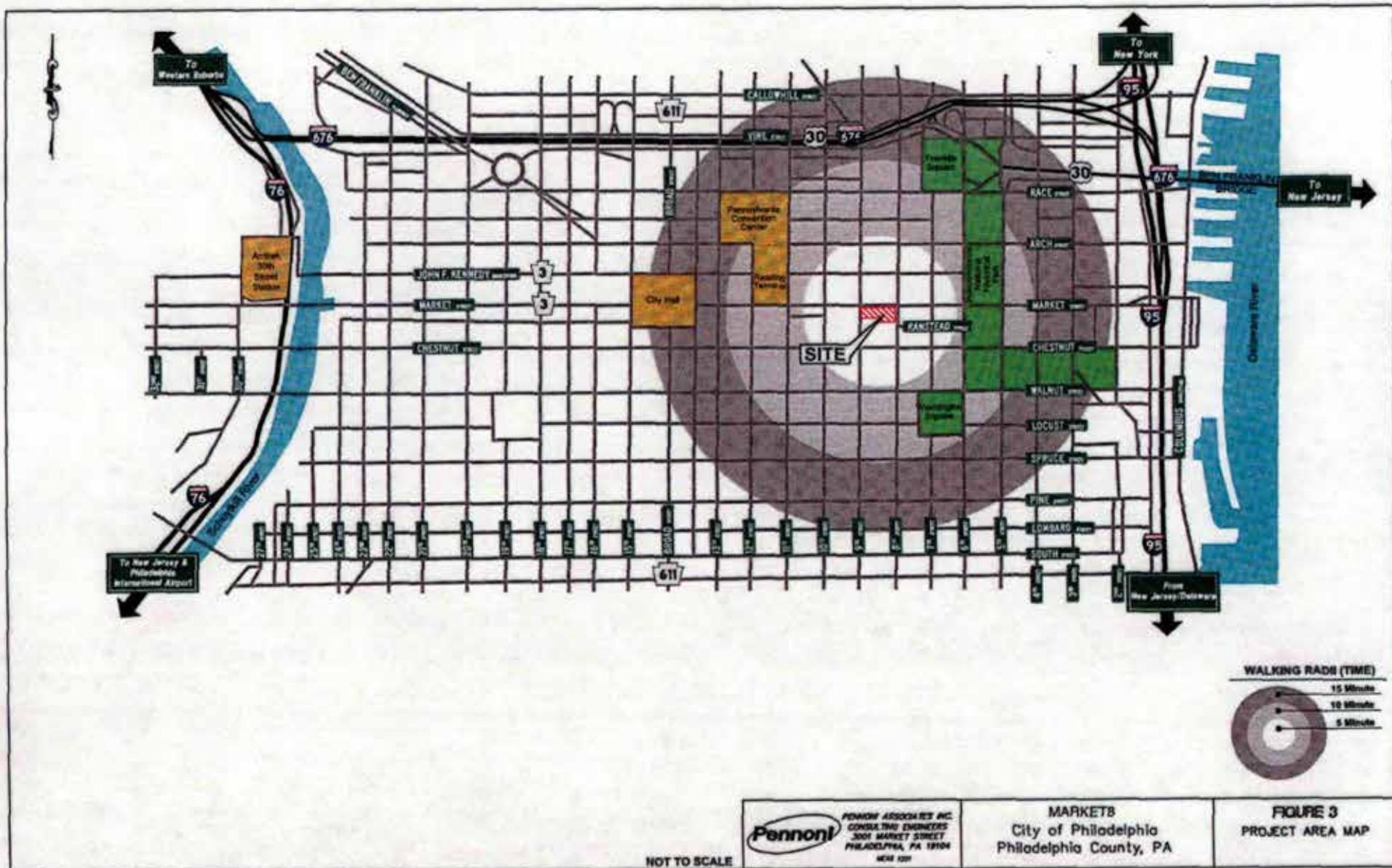


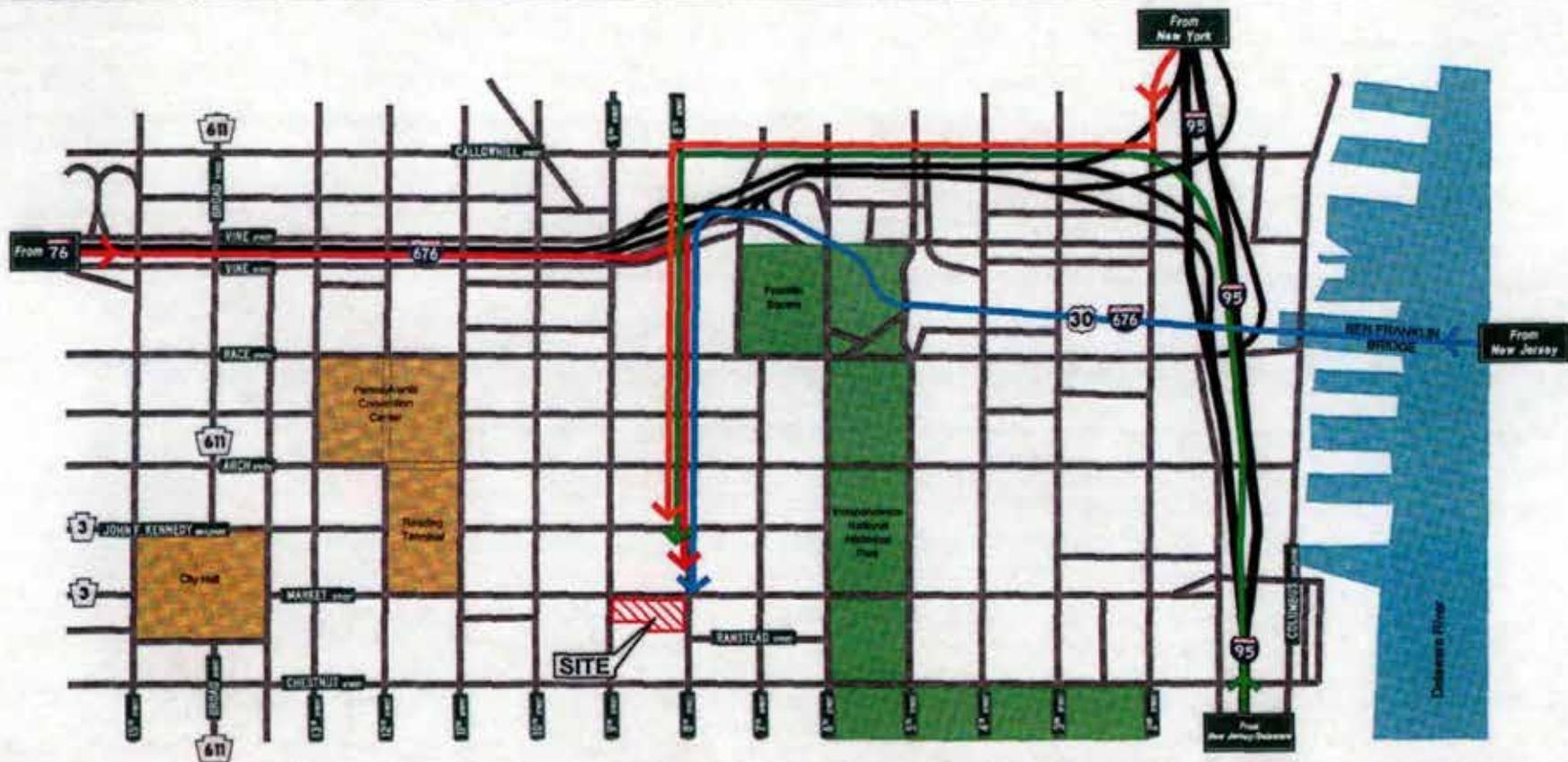


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**FIGURE 2**  
 STUDY AREA





**FROM EAST BOUND**



- Exit I-676 onto 8th Street
- South on 8th Street (5 blocks) to SITE

**FROM WEST BOUND**



- Exit I-676 onto 8th Street
- South on 8th Street (5 blocks) to SITE

**FROM NORTH BOUND**



- Exit I-95 onto Callowhill Street
- West on Callowhill Street to 8th Street
- South on 8th Street (5 blocks) to SITE

**FROM SOUTH BOUND**



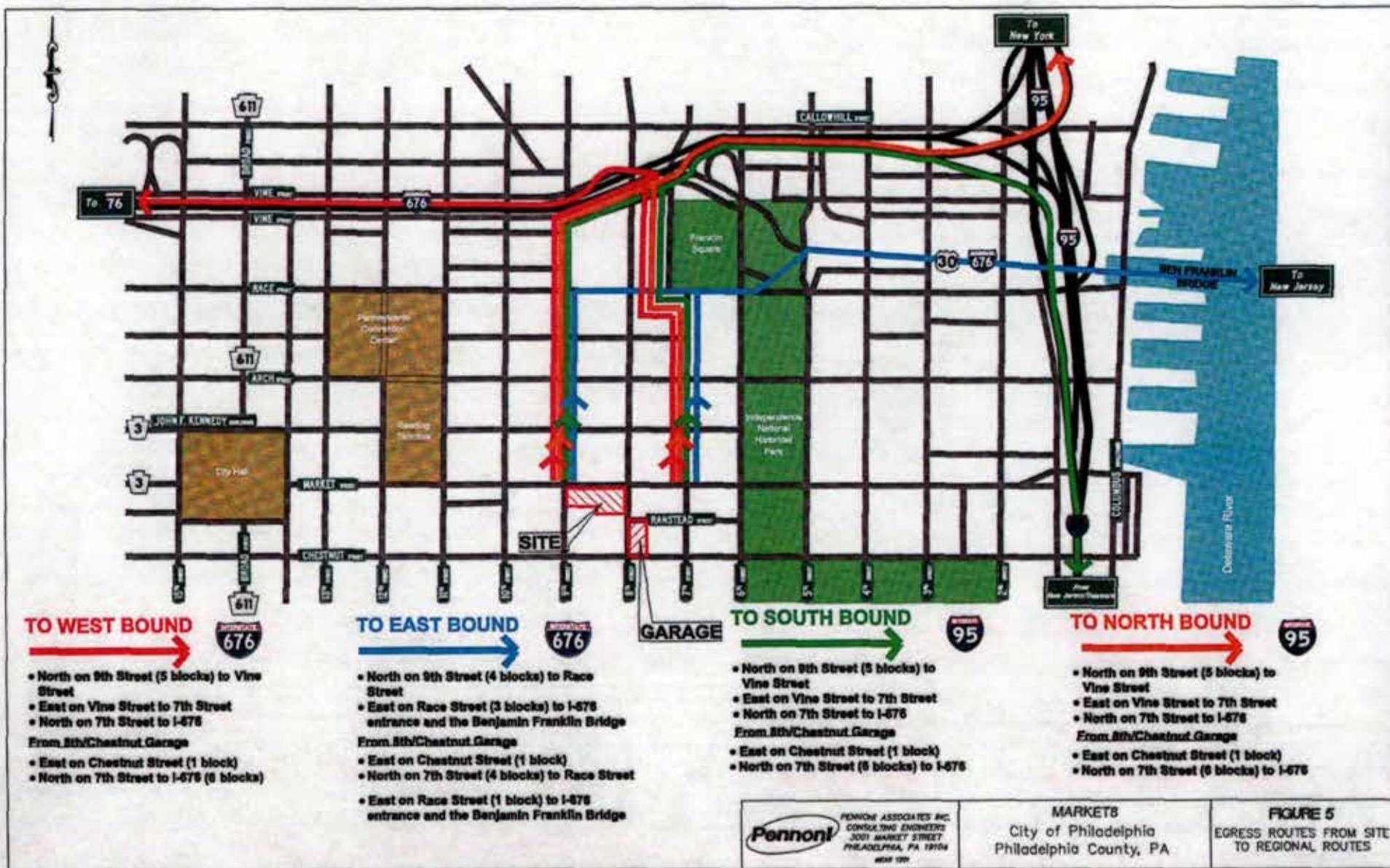
- Exit I-95 onto Callowhill Street
- West on Callowhill Street to 8th Street
- South on 8th Street (5 blocks) to SITE

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**FIGURE 4**  
 INGRESS ROUTES TO SITE  
 FROM REGIONAL ROUTES



- TO WEST BOUND**
- North on 9th Street (5 blocks) to Vine Street
  - East on Vine Street to 7th Street
  - North on 7th Street to I-676
- From 8th/Chestnut Garage
- East on Chestnut Street (1 block)
  - North on 7th Street to I-676 (6 blocks)

- TO EAST BOUND**
- North on 9th Street (4 blocks) to Race Street
  - East on Race Street (3 blocks) to I-676 entrance and the Benjamin Franklin Bridge
- From 8th/Chestnut Garage
- East on Chestnut Street (1 block)
  - North on 7th Street (4 blocks) to Race Street
- East on Race Street (1 block) to I-676 entrance and the Benjamin Franklin Bridge

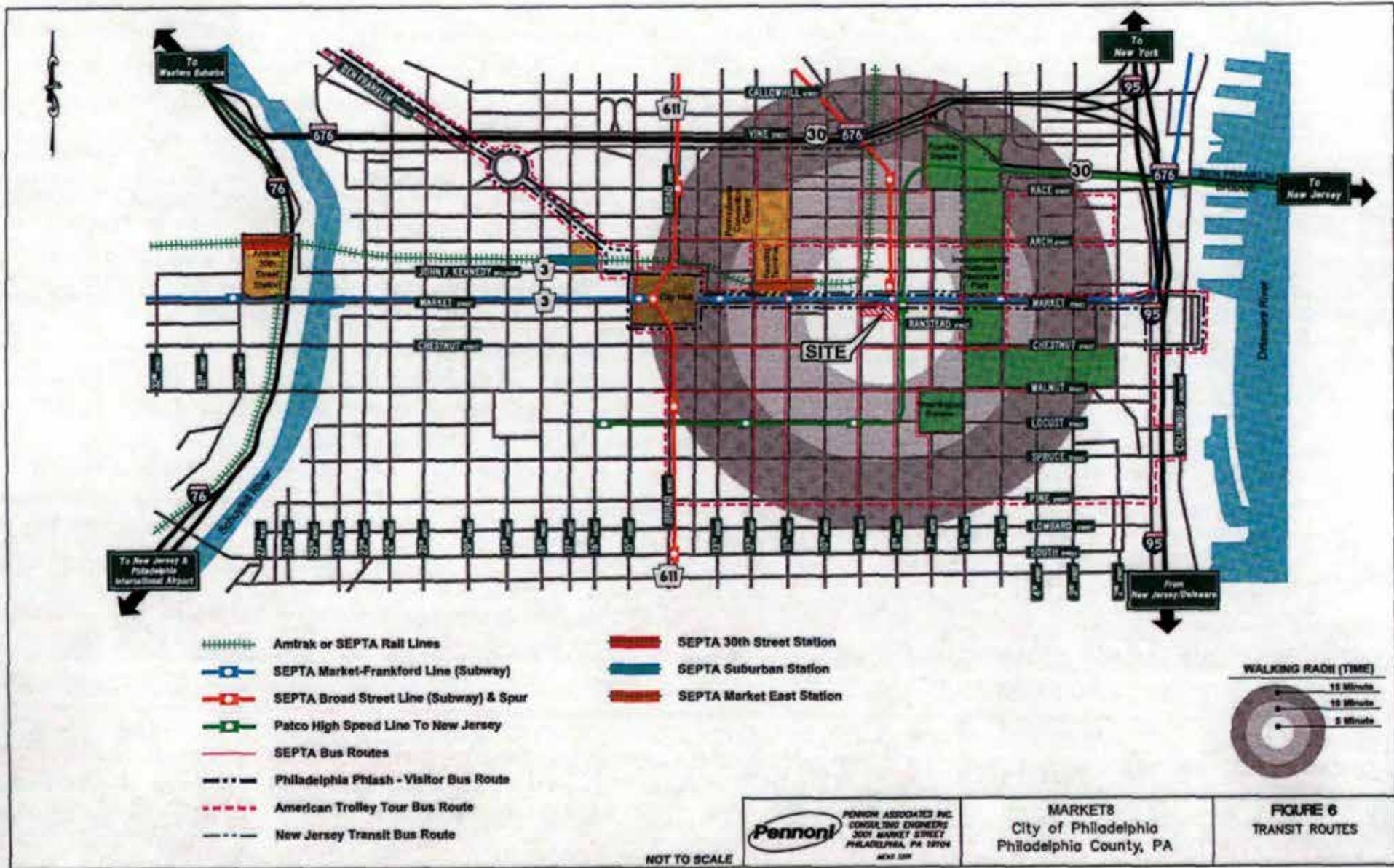
- TO SOUTH BOUND**
- North on 9th Street (5 blocks) to Vine Street
  - East on Vine Street to 7th Street
  - North on 7th Street to I-676
- From 8th/Chestnut Garage
- East on Chestnut Street (1 block)
  - North on 7th Street (6 blocks) to I-676

- TO NORTH BOUND**
- North on 9th Street (5 blocks) to Vine Street
  - East on Vine Street to 7th Street
  - North on 7th Street to I-676
- From 8th/Chestnut Garage
- East on Chestnut Street (1 block)
  - North on 7th Street (6 blocks) to I-676

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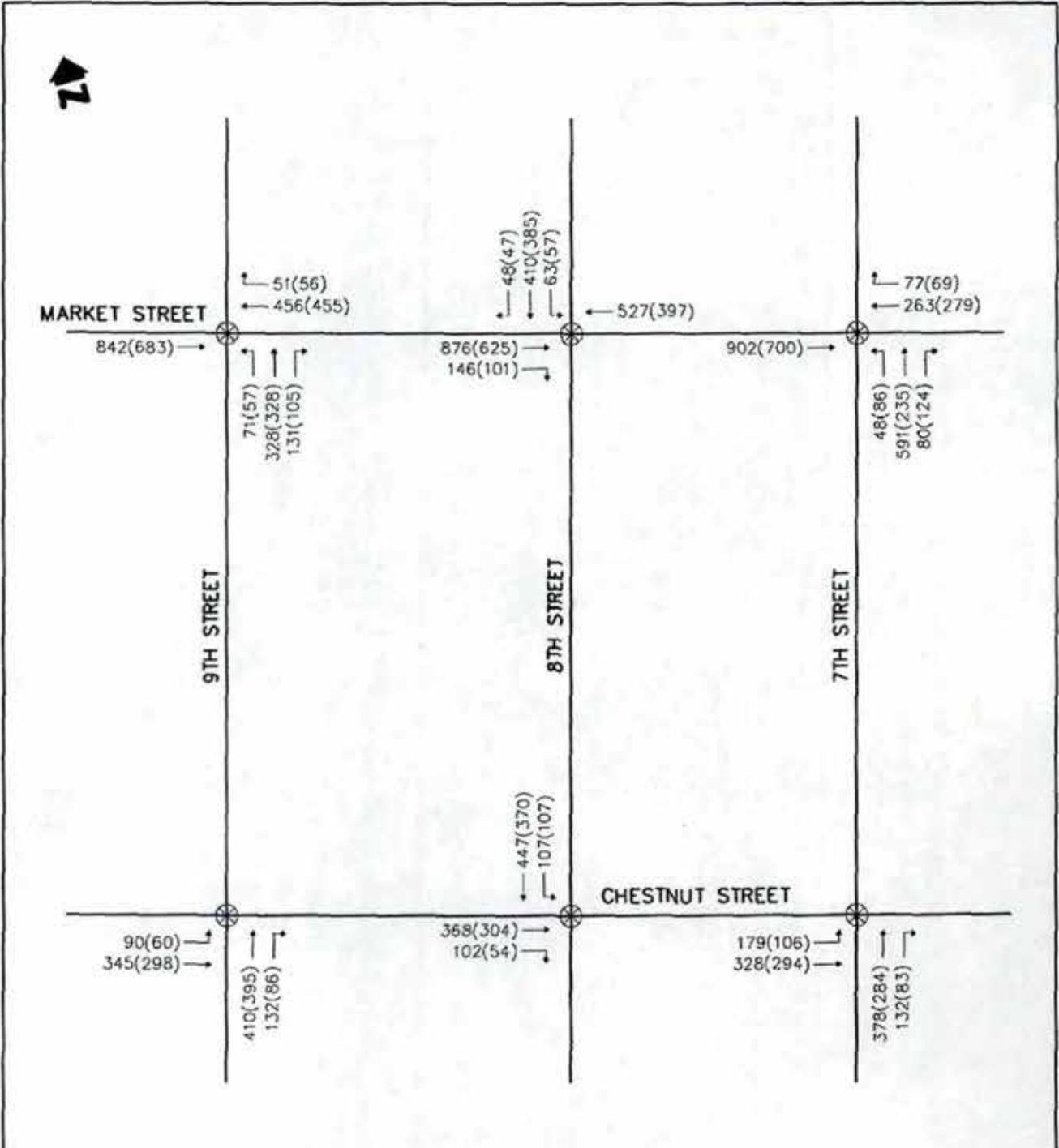
MARKET 8  
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**FIGURE 5**  
EGRESS ROUTES FROM SITE  
TO REGIONAL ROUTES



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**LEGEND:**

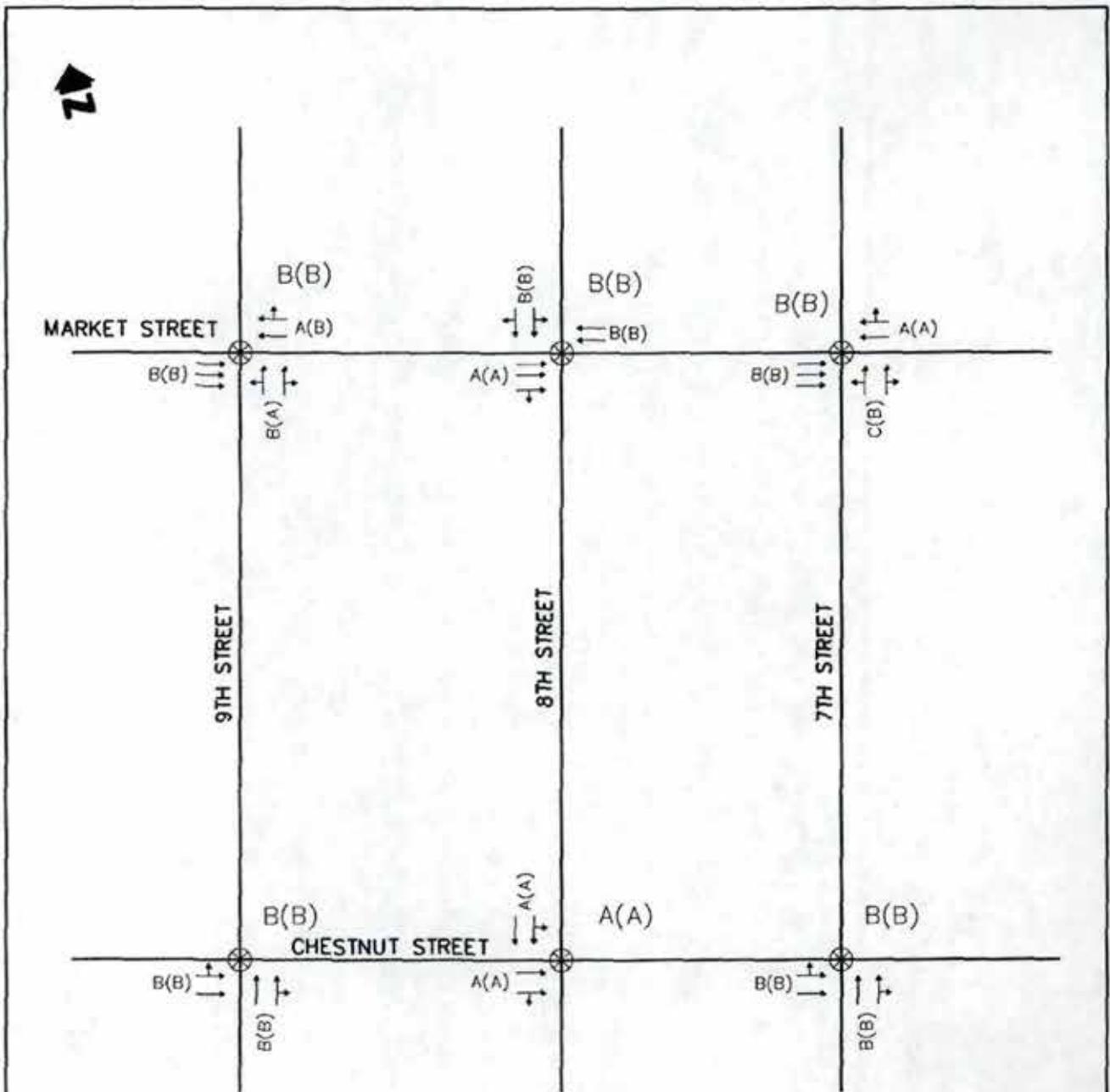
- ← 5(5) VOLUMES FRI PM (SAT PM)
- ⊗ SIGNALIZED
- ⊥ STOP-CONTROLLED
- NOT TO SCALE



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**FIGURE 7**  
 2012 EXISTING  
 PEAK HOUR VOLUMES



**LEGEND:**

A(A) OVERALL LEVELS OF SERVICE FRI PM (SAT PM)

← A(A) LEVELS OF SERVICE FRI PM (SAT PM)

⊗ SIGNALIZED

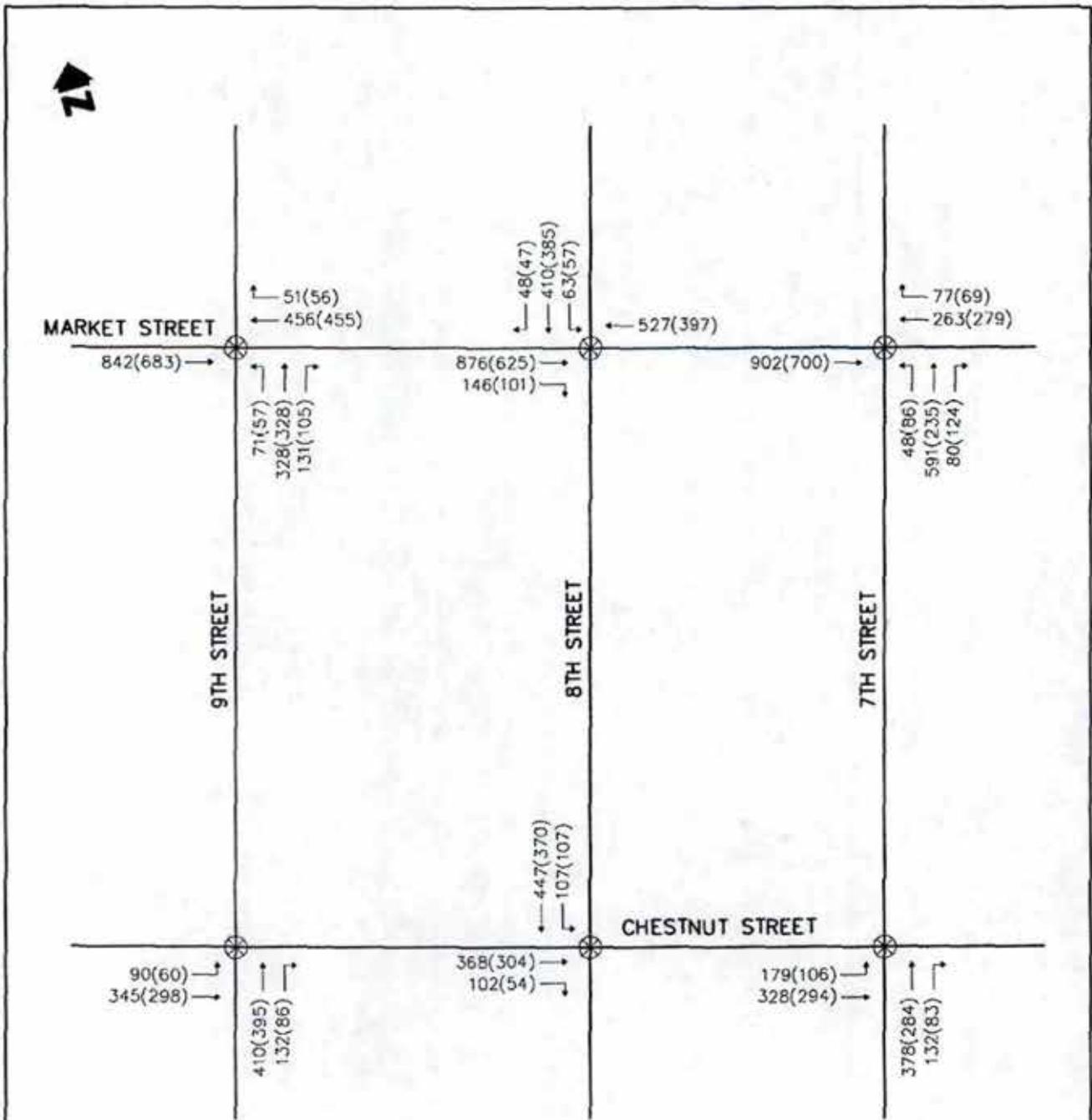
┆ STOP-CONTROLLED

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**FIGURE 8**  
 2012 EXISTING PEAK HOUR  
 LEVELS OF SERVICE



**LEGEND:**

- ← 5(5) VOLUMES FRI PM (SAT PM)
- ⊗ SIGNALIZED
- ⊥ STOP-CONTROLLED
- NOT TO SCALE

**Assumptions:**

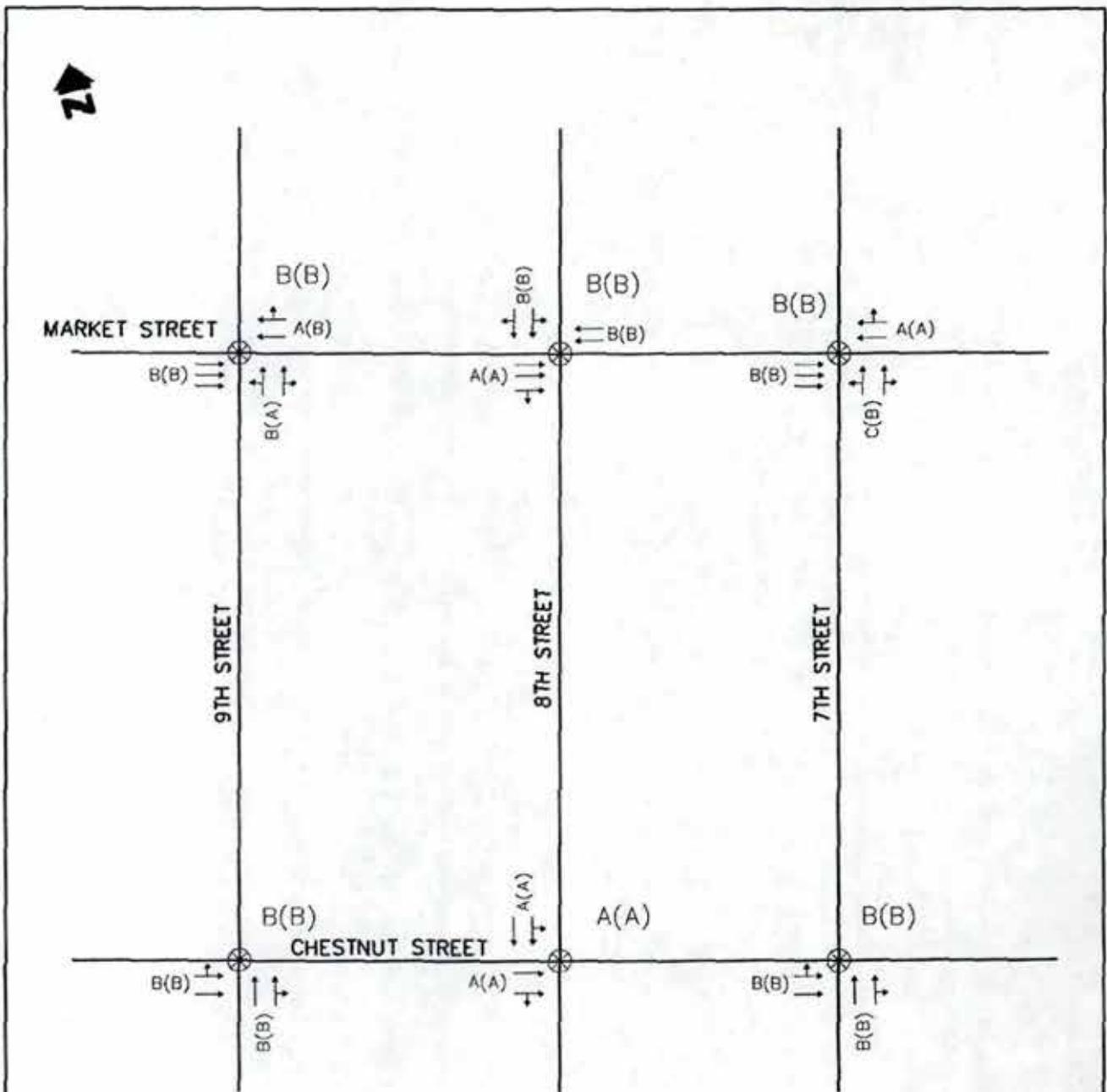
- 0% growth rate based on PennDOT Growth Factors Table for Sept. 2012 to July 2013
- No other development in study area



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**FIGURE 9**  
2016 OPENING DAY &  
2021 DESIGN YEAR  
NO-BUILD PEAK HOUR  
VOLUMES



**LEGEND:**

- A(A) OVERALL LEVELS OF SERVICE FRI PM (SAT PM)
- ← A(A) LEVELS OF SERVICE FRI PM (SAT PM)
- ⊗ SIGNALIZED
- | STOP-CONTROLLED
- NOT TO SCALE

**Assumptions:**

- 0% growth rate based on PennDOT Growth Factors Table for Sept. 2012 to July 2013
- No other development in study area



**LEGEND:**

← 5(5) ENTERING VOLUMES FRI PM (SAT PM)

→ 5(5) EXITING VOLUMES FRI PM (SAT PM)

⊗ SIGNALIZED

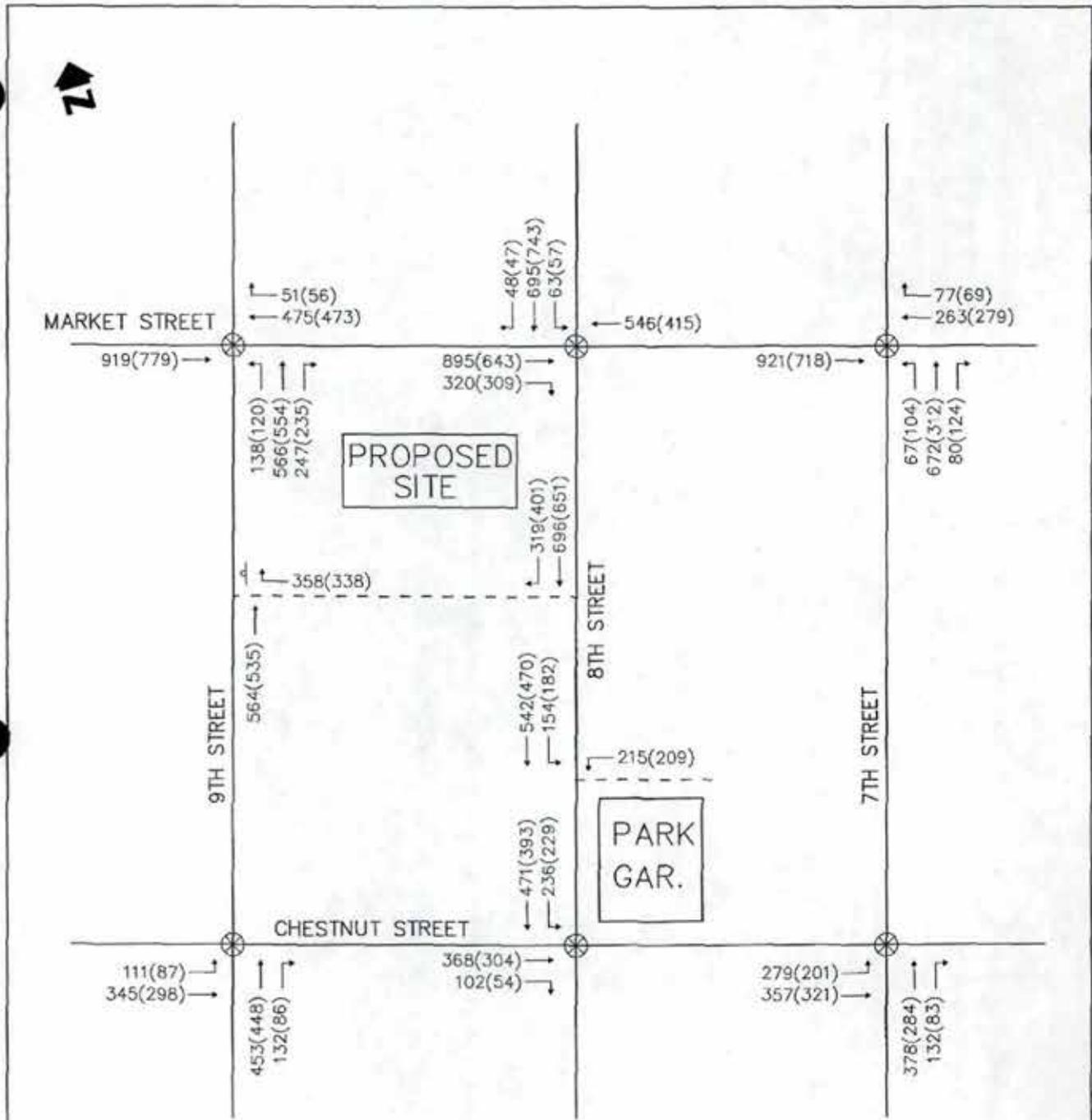
‡ STOP-CONTROLLED

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**FIGURE 11**  
 TRIP DISTRIBUTION  
 PEAK HOUR VOLUMES



**LEGEND:**

← 5(5) VOLUMES FRI PM (SAT PM)

⊗ SIGNALIZED

⊥ STOP-CONTROLLED

NOT TO SCALE

**Assumptions:**

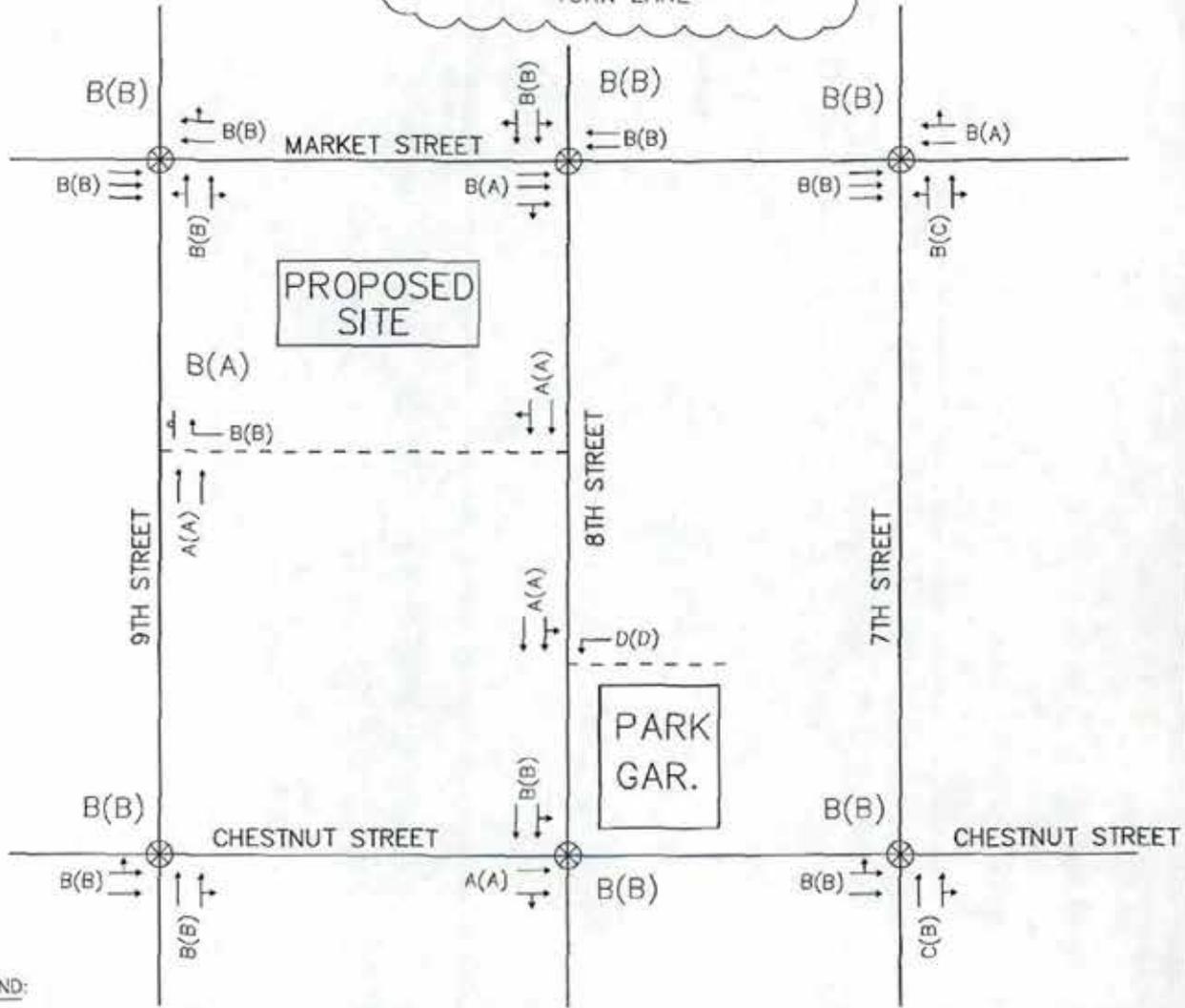
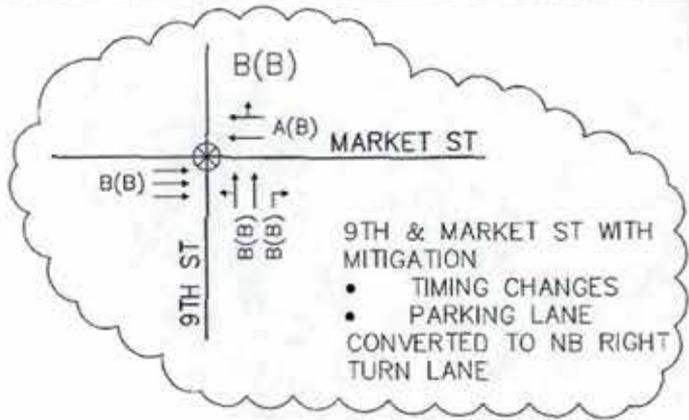
- 0% growth rate based on PennDOT Growth Factors Table for Sept. 2012 to July 2013
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**FIGURE 12**  
2016 OPENING DAY &  
2021 DESIGN YEAR  
BUILD PEAK HOUR  
VOLUMES



**LEGEND:**

- A(A) OVERALL LEVELS OF SERVICE FRI PM (SAT PM)
- ← A(A) LEVELS OF SERVICE FRI PM (SAT PM)
- ⊗ SIGNALIZED
- T STOP-CONTROLLED
- NOT TO SCALE

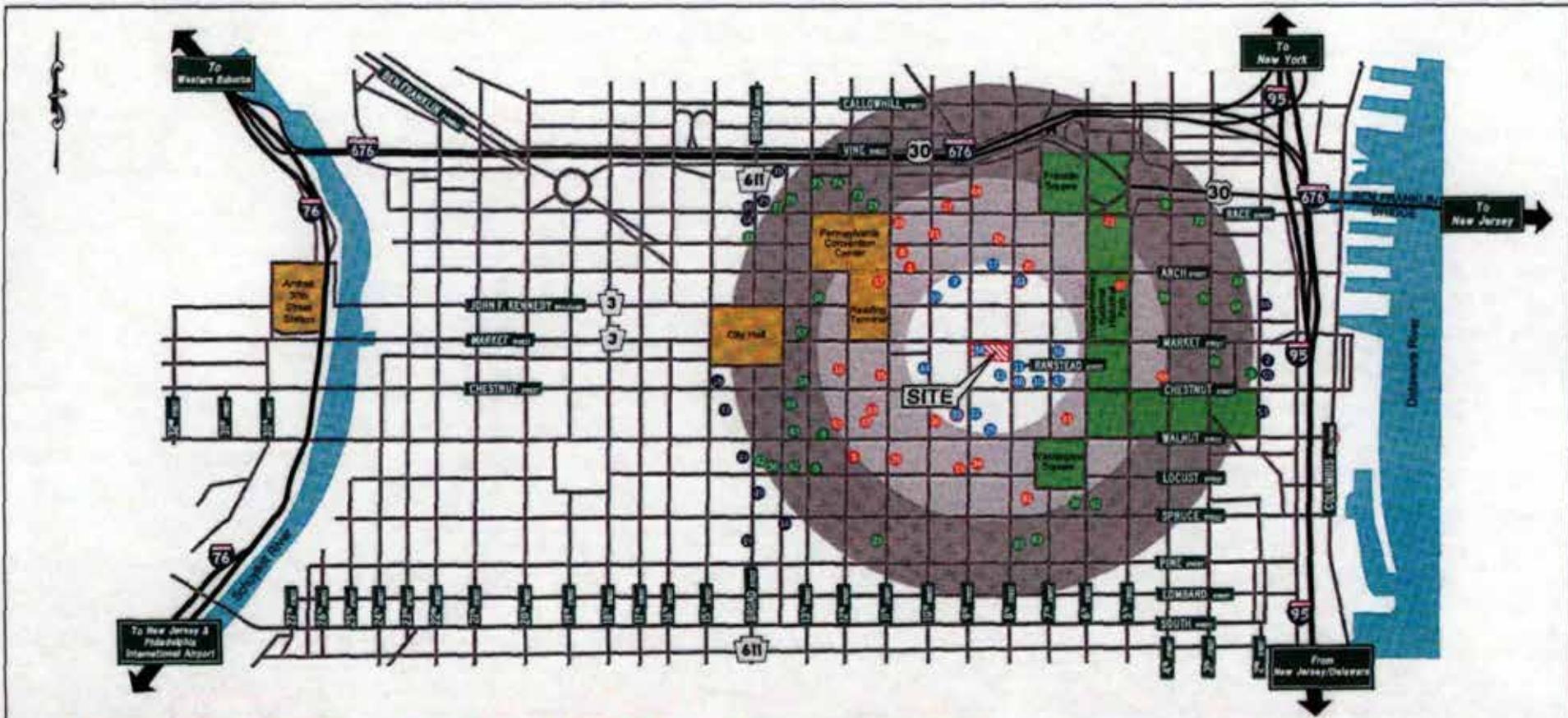
**Assumptions:**

- 0% growth rate based on PennDOT Growth Factors Table for Sept. 2012 to July 2013
- No other development in study area

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**FIGURE 13**  
 2016 OPENING DAY &  
 2021 DESIGN YEAR  
 BUILD PEAK HOUR  
 LEVELS OF SERVICE



**5 Minute Walking Radius / Capacity \* X**

47	155	383
85	187	497
89	732	450
75	293	850
121	330	1222

**10 Minute Walking Radius / Capacity \* X**

26	180	500
45	220	616
54	222	625
109	252	696
125	271	735
138	300	-
140	455	-
179	455	-

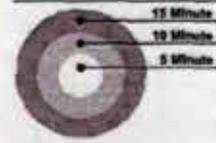
**15 Minute Walking Radius / Capacity \* X**

39	490	-
40	490	-
47	543	-
80	615	90
75	662	114
163	862	63
180	-	-
275	-	-
350	-	-
354	-	-

**15 Minute Walking Radius / Capacity \* X**

39	344	-
80	402	-
110	535	-
127	615	-
-	806	-

**WALKING RADIUS (TIME)**



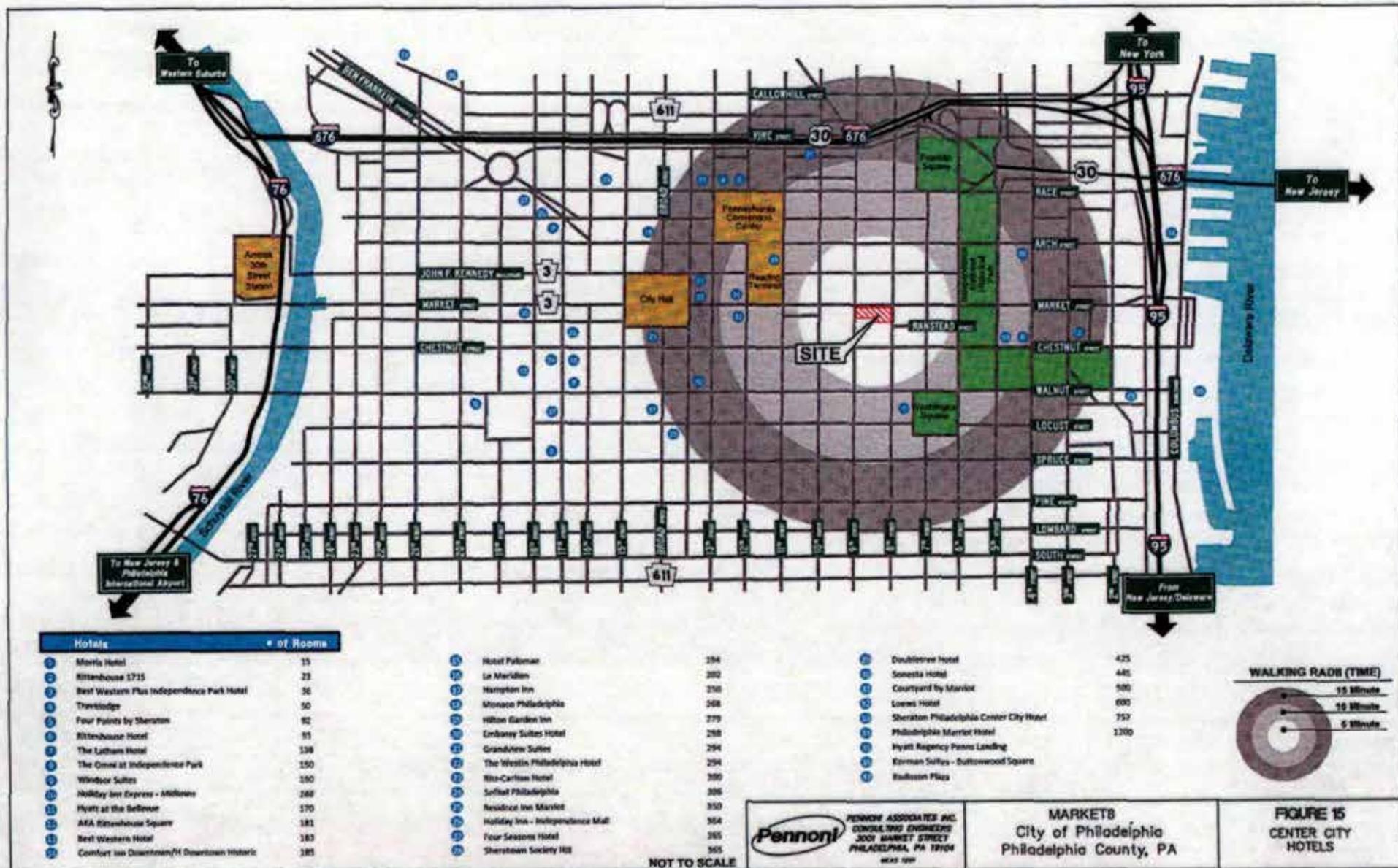
● INDICATES THE LOCATIONS OF THE PARKING FACILITIES WHERE VACANCY COUNTS WERE CONDUCTED.  
 - DENOTES PARKING FACILITIES WHERE PARKING CAPACITY DATA WAS NOT OBTAINED.

NOT TO SCALE

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**FIGURE 14**  
 CENTER CITY  
 PARKING FACILITIES



NOT TO SCALE

**Pennoni**  
 PENNON ASSOCIATES INC.  
 CONSULTING ENGINEERS  
 3009 MARKET STREET  
 PHILADELPHIA, PA 19104  
 800.222.1000

MARKETS  
 City of Philadelphia  
 Philadelphia County, PA

FIGURE 15  
 CENTER CITY  
 HOTELS

Market East Associates, L.P.

MARKET8  
City of Philadelphia  
February 2013

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## REFERENCE

## **ITE Trip Generation Data**

## **Land Use: 931 Quality Restaurant**

### **Description**

This land use consists of high quality, full-service eating establishments with typical duration of stay of at least one hour. Quality restaurants generally do not serve breakfast; some do not serve lunch; all serve dinner. This type of restaurant often requests and sometimes requires reservations and is generally not part of a chain. Patrons commonly wait to be seated, are served by a waiter/waitress, order from menus and pay for meals after they eat. While some of the study sites have lounge or bar facilities (serving alcoholic beverages), they are ancillary to the restaurant. High-turnover (sit-down) restaurant (Land Use 932) is a related use.

### **Additional Data**

Truck trips accounted for approximately 1 to 4 percent of the weekday traffic. The average for the sites that were surveyed was approximately 1.6 percent.

Vehicle occupancy ranged from 1.59 to 1.98 persons per automobile on an average weekday. The average for the sites that were surveyed was approximately 1.78.

The outdoor seating area is not included in the overall gross floor area. Therefore, the number of seats may be a more reliable independent variable on which to establish trip generation rates for facilities having significant outdoor seating.

The sites were surveyed between the 1970s and the 1990s throughout the United States.

### **Source Numbers**

13, 73, 88, 90, 98, 100, 126, 172, 260, 291, 301, 338, 339, 368, 437, 440

## Quality Restaurant (931)

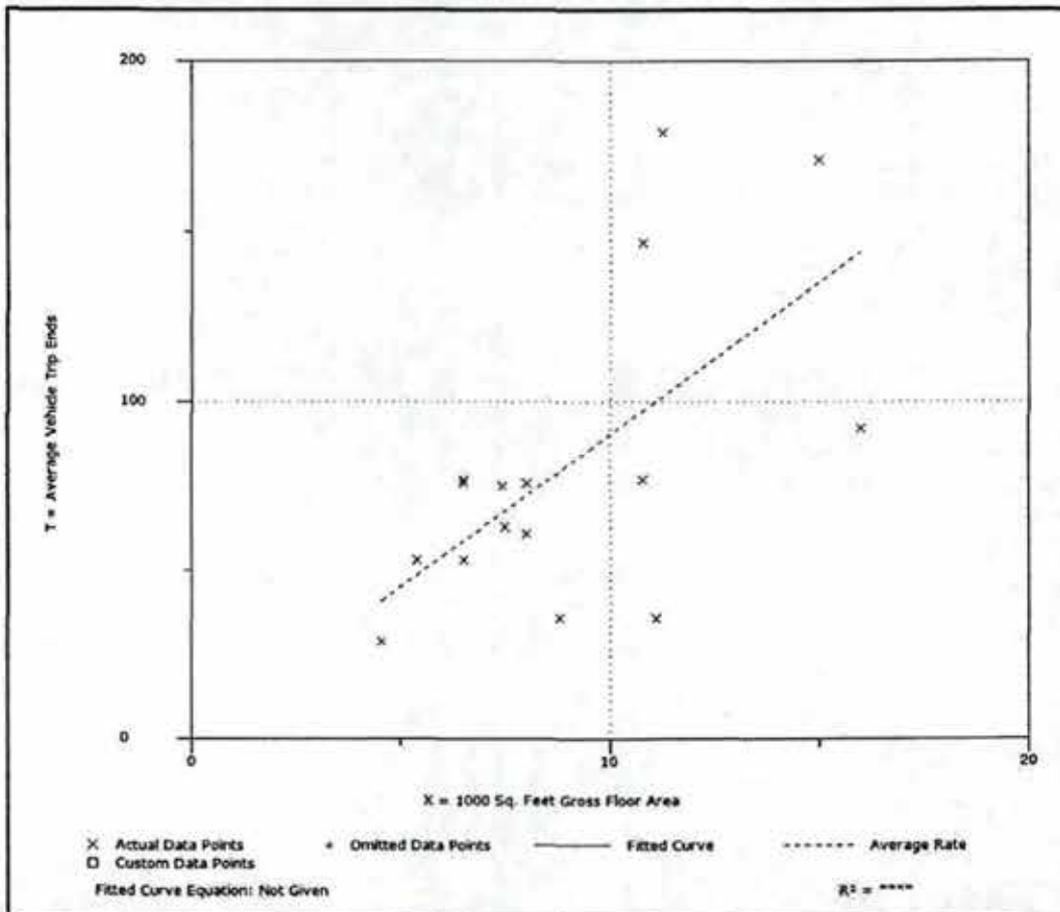
**Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area**  
**On a: Weekday**  
**P.M. Peak Hour of Generator**

Number of Studies: 16  
 Average 1000 Sq. Feet GFA: 9  
 Directional Distribution: 62% entering, 38% exiting

### Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
9.02	3.24 - 15.89	4.55

### Data Plot and Equation



## Quality Restaurant (931)

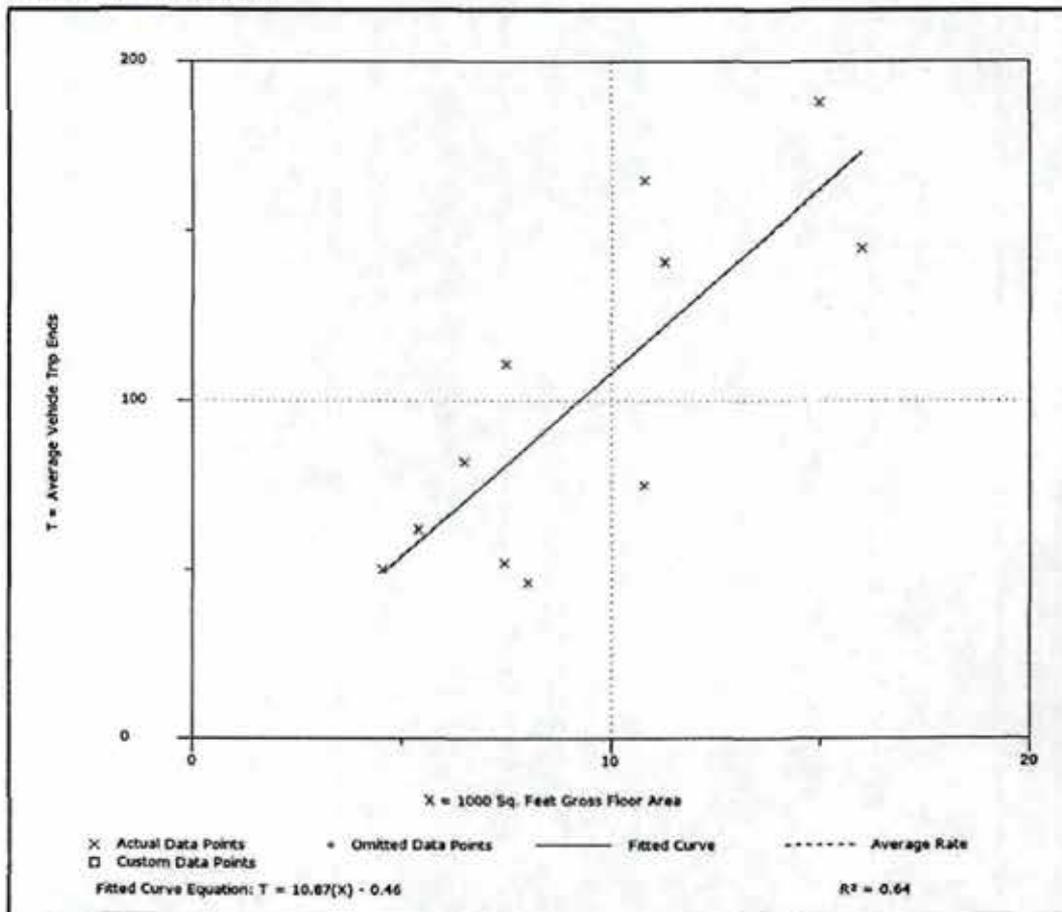
**Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area**  
**On a: Saturday**  
**Peak Hour of Generator**

Number of Studies: 11  
 Average 1000 Sq. Feet GFA: 9  
 Directional Distribution: 59% entering, 41% exiting

### Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
10.82	5.75 - 15.28	4.38

### Data Plot and Equation



Trip Generation: Wn Edison

## **Land Use: 473 Casino/Video Lottery Establishment**

### **Description**

Casino/video lottery establishments are businesses that provide electronic or manually-controlled slot machines. These facilities exist for the primary purpose of deriving revenue from gaming operations. Full food service is generally not provided at these facilities; however, refreshments and alcoholic beverages may be served. These facilities do not include full-service casinos or casino/hotel facilities such as those located in Las Vegas, Nevada or Atlantic City, New Jersey. Riverboat casinos are not included in this land use category.

### **Additional Data**

Trip generation rates for full-service casinos and casino/hotel facilities are not included in this land use.

The sites were surveyed in the 1990s in South Dakota.

### **Source Number**

359

## Casino/Video Lottery Establishment (473)

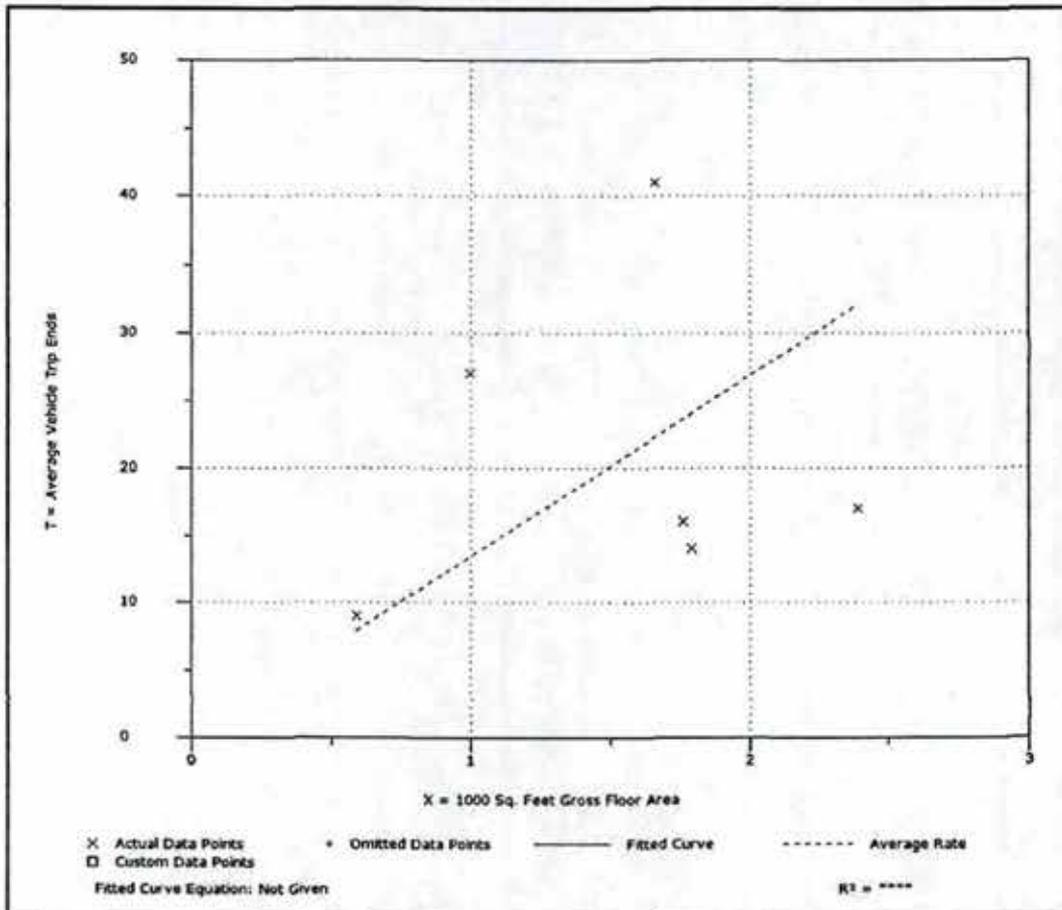
**Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area**  
**On a: Weekday**  
**Peak Hour of Adjacent Street Traffic**  
**One Hour Between 4 and 6 p.m.**

Number of Studies: 6  
 Average 1000 Sq. Feet GFA: 2  
 Directional Distribution: 56% entering, 44% exiting

### Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
13.43	7.08 - 27.00	8.65

### Data Plot and Equation



**ITE Multi-Use Development  
Trip Generation  
and Internal Capture Summary**

Analyst TLM  
 Date 2-4-13

### MULTI-USE DEVELOPMENT TRIP GENERATION AND INTERNAL CAPTURE SUMMARY

Name of Dvlpmt \_\_\_\_\_  
 Time Period Fri Peak Hour

#### LAND USE A CASINO

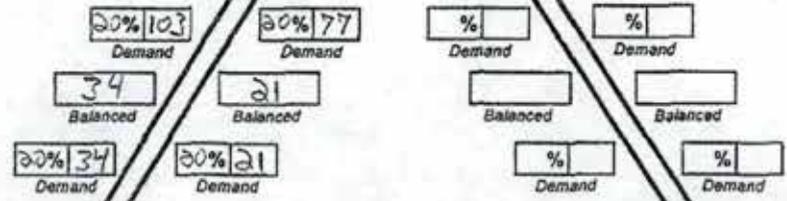
ITE LU Code <u>Site Data</u>			
Size <u>3192 gaming positions</u>			
	Total	Internal	External
Enter	387	21	366
Exit	513	34	479
Total	900	55	845
%	100%	6%	94%

#### LAND USE B Restaurants

ITE LU Code <u>931 - Quality Restaurants</u>			
Size <u>30,000 SF</u>			
	Total	Internal	External
Enter	168	34	134
Exit	103	21	82
Total	271	55	216
%	100%	20%	80%

#### LAND USE C \_\_\_\_\_

ITE LU Code _____			
Size _____			
	Total	Internal	External
Enter			
Exit			
Total			
%			



	LAND USE A	LAND USE B	LAND USE C	TOTAL
Enter	366	134		500
Exit	479	82		561
Total	845	216		1061
Single-Use Trip Gen. Est.	900	271		1171

Source: Kaku Associates, Inc.

INTERNAL CAPTURE 9.4% 9%

Analyst TLM  
 Date 2-4-13

### MULTI-USE DEVELOPMENT TRIP GENERATION AND INTERNAL CAPTURE SUMMARY

Name of Dvlp't SAT Peak Hour  
 Time Period SAT Peak Hour

#### LAND USE A CASINO

ITE LU Code Site Data  
 Size 3192 gaming positions

	Total	Internal	External
Enter	468	27	441
Exit	432	38	394
Total	900	65	835
%	100%	7%	93%

Exit to External   
 Enter from External

#### LAND USE B Restaurants

ITE LU Code 931 - Quality Restaurants  
 Size 30,000 SF

	Total	Internal	External
Enter	191	38	153
Exit	134	27	107
Total	325	65	260
%	100%	20%	80%

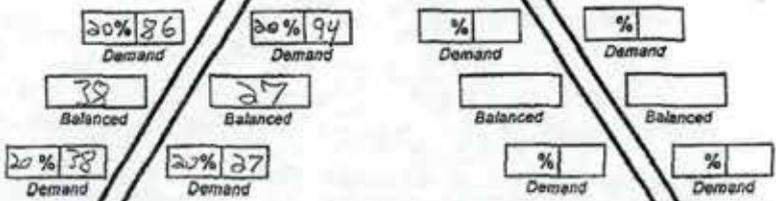
Exit to External   
 Enter from External

#### LAND USE C \_\_\_\_\_

ITE LU Code \_\_\_\_\_  
 Size \_\_\_\_\_

	Total	Internal	External
Enter			
Exit			
Total			
%			

Enter from External   
 Exit to External



	LAND USE A	LAND USE B	LAND USE C	TOTAL	
Enter	441	153		594	
Exit	394	107		501	
Total	835	260		1095	
Single-Use Trip Gen. Est.	900	325		1225	INTERNAL CAPTURE 10.6%

11%

Source: Kaku Associates, Inc.

**Philadelphia Gaming Advisory Task  
Force**

**Interim Report of Findings**

Executive Summary of the

**INTERIM  
REPORT OF  
FINDINGS**

Philadelphia Gaming Advisory Task Force

TABLE 3: Casino Visitation Patterns by Time of Day

		Morning	Afternoon	Adj. To	Rush Hour	Evening	Night	Graveyard	Adj. To
		8-11a	11a-4p	3-hour period	4p-7p	7p-10p	10p-1a	1a-8a	3-hour period
Monday - Thursday	average	8%	30%	18%	17%	18.5%	14.5%	12%	5.1%
	peak	10%	33%	19.8%	20%	20%	17%	14%	6.0%
Friday	average	7%	18%	10.8%	12%	18%	18%	27%	11.6%
	peak	9%	21%	12.6%	15%	22%	20.5%	30%	12.9%
Saturday	average	9%	24%	14.4%	15%	17.5%	16.5%	18%	7.7%
	peak	11.5%	26.5%	15.9%	17.5%	22%	19%	20.5%	8.8%
Sunday	average	7.5%	29%	17.4%	20%	18.5%	14%	11%	4.7%
	peak	10%	31.5%	18.9%	22.5%	21%	16%	13%	5.6%

Source: Innovation Group

### Mode of Arrival

With up to 5,000 slot machines per gaming facility and between 12,000 and 36,000 visitors per day, traffic and parking demands generated by Philadelphia slots-only casinos will be substantial. Understanding how gamers are likely to arrive at Philadelphia slots parlors is a necessary first step in assessing the potential traffic impacts associated with casino development. Graph 2 displays the expected typical distribution of transportation modes for a casino located in a given area of the City.

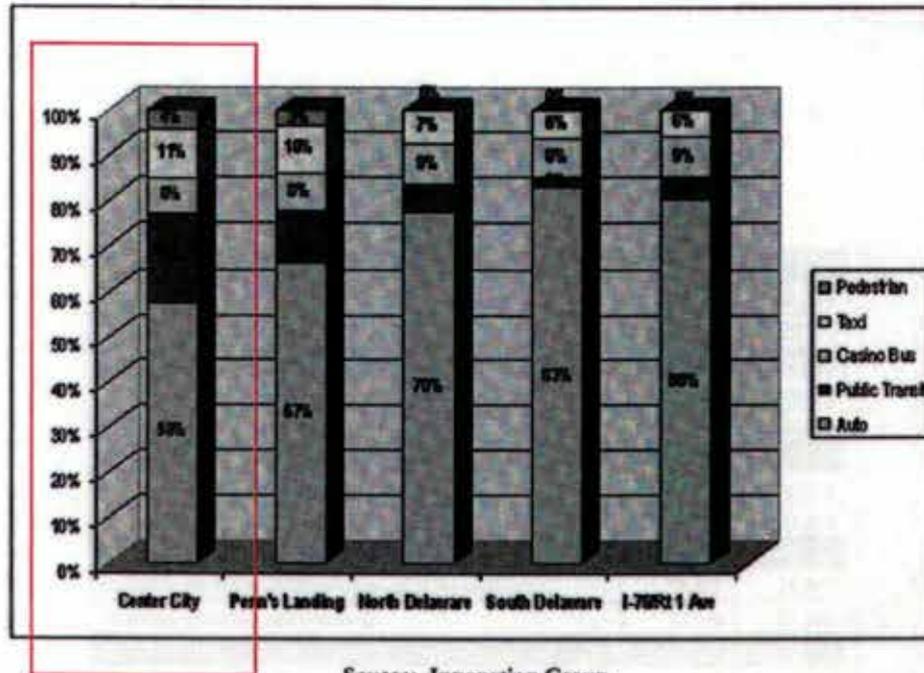
Private automobile will be the overwhelming preferred mode of arrival at Philadelphia gaming sites, with more than half of gamers expected to drive to a casino in or near Center City, and more than three-quarters arriving by car at other sites in the city. Philadelphia casinos are expected to rely on chartered buses significantly less than Atlantic City, but still will draw approximately 8 percent of their visitors by coach.

Public transit share would be significant only for casinos located in Center City and, to a lesser degree, at Penn's Landing. Despite Philadelphia's extensive transit infrastructure, it is anticipated that no more than 20 percent of casino customers would arrive via transit at a Center City site, and as little as two percent for a site along the South Delaware.

More than half of regional survey respondents (52 percent) claim that having public transportation proximate to a Philadelphia casino would be important to them. However, current behavior heavily favoring personal automobile use – 83 percent of respondents said they drive into the city for leisure activity – suggests that while people may think transit is important in general or for others, they personally will continue to drive.

Pedestrian volume to Philadelphia casino locations will be minimal except for Center City or Penn's Landing locations, and taxi volumes would be maximized at sites in, or close to, Center City.

GRAPH 2: Mode of Arrival



Source: Innovation Group

### Transportation Access Analysis

In order to assess traffic impacts, the Task Force conducted a detailed analysis of existing and projected traffic volumes on streets surrounding potential gaming sites, as well as an engineering review of the capacity of those streets and intersections to carry the increased volumes. A summary of current traffic volumes on major roads near potential gaming sites and the projected additional traffic demand generated by casino development at each site are presented in Tables 4 and 5. For each site, the numbers in the first row are current traffic volumes based on electronic counts of vehicles conducted during May 2005. The second row shows

the estimated number of additional vehicles on weekdays and Saturdays if a slots-only casino were to be placed at that location. The estimates vary between sites for two main reasons: (1) Based on Task Force projections, different sites will experience different levels of visitation based on their varying proximity and accessibility to patrons and (2) it is estimated that some sites will draw more patrons by public transit and therefore the number of automobiles would be less.

It is important to note that conclusions about potential congestion problems at these sites cannot be drawn without analyzing projected traffic volumes within the context of existing roadway and intersection capacity and without an understanding of peak traffic volumes. A projected sharp increase in traffic volume

## **Casino Trip Generation Comparisons**

**Phase 2 Site Plan Breakdown  
Usage Breakdown**

Casino	2,500	positions
Phase II Showroom	15,750	
Retail	36,750	
Office	42,000	

**Friday PM Peak Adj. Street Traffic**

ITE Code	Description	Rate	Trips
	Casino/Video Lottery		
473	Establishment	0.3	750
932	Quality Restaurant	0.009	142
820	Shopping Center	EQN	325 $=0.67 \cdot \ln(40,050/1000)+3.37$
	Single Tenant Office		
715	Building	EQN	99 $=1.52 \cdot (60,304/1000)+34.88$
	<b>Total</b>		<b>1316</b>

**Phase 2 Site Plan Breakdown  
Usage Breakdown**

Casino	2,500	positions
Phase II Showroom	15,750	
Retail	36,750	
Office	42,000	

**Saturday PM Adj. Street Traffic**

ITE Code	Description	Rate	Trips
	Casino/Video Lottery		
473	Establishment	0.3	750
932	Quality Restaurant	0.01082	170
820	Shopping Center	EQN	447 $=0.65 \cdot \ln(40,050/1000)+3.76$
	General Office Building		
720	General Office Building	0.00041	17 $=1.52 \cdot (60,304/1000)+34.88$
	<b>Total</b>		<b>1385</b>

**Enter/Exit Distribution**

	Volume			In	Out
	In	Out	Total		
<b>Sugarhouse TIS</b>					
<i>Friday PM Peak</i>					
Interim - 1500 Slots	221	256	477	46%	54%
Phase I - 3000 Slots	382	456	838	46%	54%
Phase II - 5000 Slots, Event Center, Hotel	698	675	1373	51%	49%
Phase III - Hotel Expansion	771	757	1528	50%	50%
<b>Orth-Rodgers Foxwoods TIS</b>					
<i>Friday Late Afternoon (3 PM)</i>					
Phase I - 3000 Slots	440	210	650	68%	32%
Phase II - 5000 Slots	572	273	845	68%	32%
<i>Friday Late Evening (10 PM)</i>					
Phase I	875	760	1635	54%	46%
Phase II	1138	988	2126	54%	46%
<i>Saturday Late Afternoon (3 PM)</i>					
Phase I	690	425	1115	62%	38%
Phase II	966	595	1561	62%	38%
<i>Saturday Late Evening (10 PM)</i>					
Phase I	1000	960	1960	51%	49%
Phase II	1400	1344	2744	51%	49%
<b>SugarHouse November 2010</b>					
<i>Friday Late Afternoon (3-6 PM)</i>					
1700 Gaming positions	600	792	1392	43%	57%
<i>Saturday Early Afternoon (12-4 PM)</i>					
1700 Gaming positions	964	882	1846	52%	48%
<b>ITE Code 473 - Casino/Video Lottery Establishment</b>					
<b>Weekday PM Peak Hour of Adjacent Street Traffic</b>					
				56%	44%

**Orth-Rodgers Foxwoods TIS**

*Friday Late Afternoon (3 PM)*

Phase I - 3000 Slots

Phase II - 5000 Slots

*Saturday Late Afternoon (3 PM)*

Phase I - 3000 Slots

Phase II - 5000 Slots

**South Philadelphia Penns Landing**

*Friday Late Afternoon (3 PM)*

Phase 1A - 1700 Gaming Positions

Phase 1B - 2500 Gaming Positions

*Saturday Late Afternoon (3 PM)*

Phase 1A - 1700 Gaming Positions

Phase 1B - 2500 Gaming Positions

Volume				
In	Out	Total	In	Out
440	210	650	68%	32%
572	273	845	68%	32%
690	425	1115	62%	38%
966	595	1561	62%	38%
193	257	450	43%	57%
323	427	750	43%	57%
234	216	450	52%	48%
390	360	750	52%	48%

Foxwoods/Orth-Rodgers			
Peak Hour	Total trips	Slot Positions	Trips/Position
Friday 3 PM	650	3000	0.22
Friday 10 PM	1635	3000	0.55
Saturday 1 PM	1115	3000	0.37
Saturday 10 PM	1960	3000	0.65
Friday 3 PM	845	5000	0.17
Friday 10 PM	2126	5000	0.43
Saturday 1 PM	1561	5000	0.31
Saturday 10 PM	2744	5000	0.55

Total trips derived from developer, no rate calculation used in trip generation

SugarHouse			
Phase	Total trips	Slot Positions	Trips/Position
Interim	477	1500	0.32
Phase I Casino	838	3000	0.28
Event Center/Hotel	1373	5000	0.27
Hotel Tower	1528	5000	0.31

SugarHouse - November 2010			
	Avg. Trips/Hr	Slot Positions	Trips/Position
Friday 3-6 PM	464	1700	0.282 <del>0.27</del>
Saturday 12-4 PM	462	1700	0.282 <del>0.27</del>

actual counts

Bensalem - Parx			
Peak Hour	Total trips	Slot Positions	Trips/Position
Weekday Evening	1074	3000	0.36
Saturday Midday	756	3000	0.25
Saturday Evening	1431	3000	0.48

Rates derived from ITE articles and Delaware Park counts

## Sugar House Casino Count Data Summary, November 2010

Time Period	South Casino Driveway			Main Casino Driveway			North Casino Driveway			Casino Total			
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	
Friday 11-19-10	3:00	1	2	3	27	18	45	39	46	85	67	66	133
	3:15	0	3	3	30	18	48	38	29	67	48	50	98
	3:30	2	3	5	27	21	48	32	53	85	61	77	138
	3:45	2	5	7	20	18	38	36	54	90	58	77	135
	4:00	0	1	1	18	31	49	31	46	77	49	78	127
	4:15	0	4	4	20	18	38	31	46	77	55	68	119
	4:30	2	2	4	26	24	50	38	43	81	66	69	135
	4:45	3	5	8	18	15	33	39	24	63	60	44	104
	5:00	0	1	1	23	18	41	25	47	72	48	66	114
	5:15	1	3	4	25	25	50	39	50	79	55	78	133
	5:30	0	2	2	29	24	53	42	43	85	71	69	140
	5:45	2	1	3	19	19	38	35	30	65	56	50	106

Friday PM Peak	
3:00-4:00	504
3:15-4:15	488
3:30-4:30	519
3:45-4:45	516
4:00-5:00	485
4:15-5:15	472
4:30-5:30	488
4:45-5:45	481
5:00-6:00	493

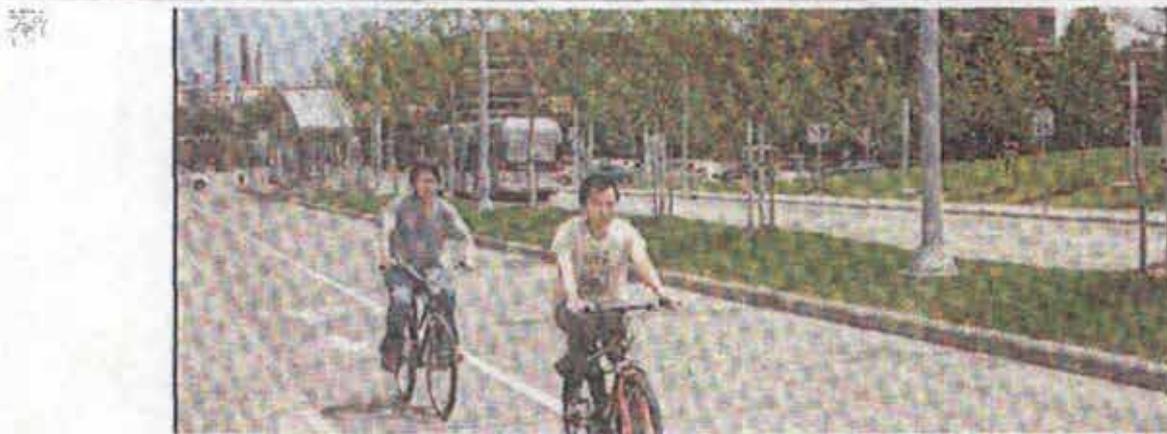
Time Period	South Casino Driveway			Main Casino Driveway			North Casino Driveway			Casino Total			
	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	
Saturday 11-13-10	9:00	1	9	10	48	33	81	34	58	92	83	102	185
	9:15	4	3	7	50	33	83	45	61	106	99	97	206
	9:30	1	6	7	30	41	71	28	47	75	59	94	153
	9:45	7	6	13	54	43	97	43	72	115	104	121	225
	10:00	8	6	15	47	48	95	34	69	103	90	123	213
	10:15	6	6	12	41	35	76	29	52	81	76	93	169
	10:30	4	7	11	36	42	78	42	42	84	81	91	173
	10:45	5	5	10	43	39	82	46	54	100	94	98	192
	12:00	2	0	2	32	12	44	35	54	89	69	66	135
	12:15	2	2	4	28	14	42	34	34	68	64	50	114
	12:30	2	2	4	31	11	42	27	23	50	60	36	96
	12:45	1	3	4	34	13	47	23	33	56	58	49	107
	1:00	0	4	4	20	12	32	23	32	55	43	48	91
	1:15	2	3	5	21	11	32	17	30	47	40	44	84
	1:30	2	7	9	25	17	42	32	14	46	59	38	97
	1:45	4	3	7	25	17	42	33	28	61	62	48	110
	2:00	3	5	8	35	12	47	32	49	81	70	66	136
	2:15	4	0	4	31	26	57	37	29	66	72	55	127
	2:30	1	6	7	29	25	54	16	36	52	46	67	113
	2:45	5	4	9	36	19	55	22	34	56	63	57	120
	3:00	4	7	11	32	16	48	22	28	50	58	51	109
	3:15	4	2	6	28	20	48	33	30	63	65	52	117
	3:30	1	7	8	30	22	52	35	41	76	66	70	136
	3:45	1	4	5	33	29	62	35	52	87	68	85	154

Saturday Peak	
9:00-9:15	759
9:15-10:15	787
9:30-10:30	760
9:45-10:45	780
10:00-11:00	747
12:00-1:00	452
12:15-1:15	408
12:30-1:30	378
12:45-1:45	379
1:00-2:00	382
1:15-2:15	427
1:30-2:30	470
1:45-2:45	486
2:00-3:00	496
2:15-3:15	469
2:30-3:30	459
2:45-3:45	482
3:00-4:00	516

Phase 2 Site Plan Breakdown		Friday PM Peak Generator					
Floor Use	Area (SF)		ITE Code	Description	Rate	Trips	
<b>First Floor</b>							
Casino Floor	58,067		473	Casino/Video Lottery Establishment	0.01343	780	
Phase IB Casino	23,429		473	Casino/Video Lottery Establishment	0.01343	315	
Phase II Casino	9,250		473	Casino/Video Lottery Establishment	0.01343	124	
High Limit Tables	2,148		473	Casino/Video Lottery Establishment	0.01343	29	
Asian Gaming	4,200		473	Casino/Video Lottery Establishment	0.01343	56	
Grab n Go	2,489		933	Fast-Food Restaurant w/o Drive-Through Restaurant High Turnover Sit Down	0.0524	130	
Noodle Bar	2,546		932	Restaurant High Turnover Sit Down	0.01849	47	
Phase II Buffet	19,350		932	Restaurant High Turnover Sit Down	0.01849	358	
Phase II Restaurant	2,000		932	Restaurant High Turnover Sit Down	0.01849	37	
		Central location	925	Drinking Place	0.01549	31	
			925	Drinking Place	0.01549	81	
Phase II Retail	1,900		820	Shopping Center	EQN	45	"=0.67*LN(1,900/1000)+3.37"
Phase II Retail	1,400		820	Shopping Center	EQN	36	"=0.67*LN(1,400/1000)+3.37"
<b>Detached</b>							
Phase II Retail	17,500	Columbus	820	Shopping Center	EQN	198	"=0.67*LN(17,500/1000)+3.37"
Phase II Retail	19,250	Columbus	820	Shopping Center	EQN	211	"=0.67*LN(19,250/1000)+3.37"
<b>Second Floor</b>							
Admin	5,354		715	Single Tenant Office Building	EQN	43	"=1.52*(5,354/1000)+34.88"
Phase II Meeting Rooms	5,200		715	Single Tenant Office Building	EQN	43	"=1.52*(5,200/1000)+34.88"
Phase II Conf Center	42,000		715	Single Tenant Office Building	EQN	99	"=1.52*(42,000/1000)+34.88"
Phase II Meeting Rooms	7,750		715	Single Tenant Office Building	EQN	47	"=1.52*(7,750/1000)+34.88"
		Bar/gaming?	925	Drinking Place	0.01549	46	
Steakhouse	5,000	Luxury restaurant	931	Quality Restaurant High Turnover Sit Down	0.009	45	
Phase II Restaurant	4,250		932	Restaurant	0.01849	79	

Phase 2 Site Plan Breakdown		Friday PM Peak Generator				
Floor Use	Area (SF)	ITE Code	Description	Rate	Trips	
Phase II Restaurant	6,000	932	High Turnover Sit Down Restaurant	0.01849	111	
			<b>Total</b>		<b>2991</b>	
<b>Usage Breakdown</b>						
Casino	97,094	473	Casino/Video Lottery Establishment	0.01343	1304	
Restaurant	41,635	932	High Turnover Sit Down Restaurant	0.01849	770	
Retail	40,050	820	Shopping Center	EQN	345	*=0.67*LN(40,050/1000)+3.37*
		925	Drinking Place	0.01549	159	
Office	60,304	715	Single Tenant Office Building	EQN	127	*=1.52*(60,304/1000)+34.88*
			<b>Total</b>		<b>2704</b>	
	91,941	820	Shopping Center	EQN	601	

 [Development](#) [Marketing](#) [Placemaking](#) [Urban Planning](#) [About](#)

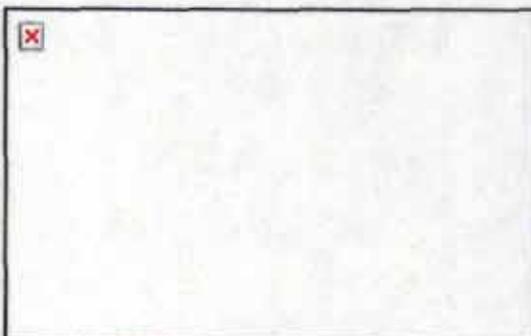


[1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#)

Nov  
18  
2011

## Making the Most of a Downtown Casino

### BACKGROUND



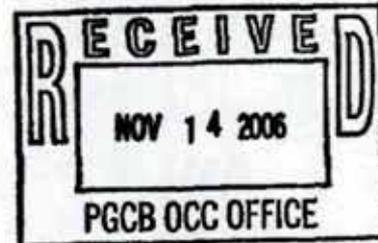
On November 3, 2009, Ohio voters approved a constitutional amendment (Issue 3) to allow four casinos to be built in state. The amendment specified that the Cincinnati casino would be located downtown on a 20 acre parking lot which abuts the Central Business District and four very diverse neighborhoods. Particularly because of the casino's unique location, Cincinnati residents, business owners and local stakeholders asked how the investment and energy of the casino development could create a positive and synergistic relationship with the residential neighborhoods and business districts that surround it.



November 13, 2006

Project C050619

Mr. Frank T. Donaghue  
Chief Counsel  
Pennsylvania Gaming Control Board  
303 Walnut Street Strawberry Square  
Verizon Towers 5<sup>th</sup> Floor  
Harrisburg, PA 17101



Traffic Impact Study Correspondence 11/8/06  
Harrah's Station Square Casino  
City of Pittsburgh  
Allegheny County, PA

Dear Mr. Donaghue:

Thank you for your correspondence on November 9, 2006 (copy enclosed) regarding our traffic impact study. The study submitted to the Pennsylvania Gaming Control Board (PGCB) was an initial study. We have completed and submitted an expanded and updated report dated October 2006 and Addendum 1 dated November 2006, which addresses design year 2018 traffic conditions. The expanded and updated report and Addendum 1 were developed based on scoping meetings with the City of Pittsburgh and PennDOT and comments contained in the initial review by McCormick Taylor dated September 7, 2006.

The following are our responses to the comments contained in the November 8, 2006 letter from Mr. Albert Federico of McCormick Taylor to Mr. Glenn Rowe of the Pennsylvania Department of Transportation (copy enclosed).

**Comment 1 (Approach):** It would be appropriate for the engineer preparing this analysis to have stamped and signed the report. *The applicant has indicated that the pending revised study will be stamped and sealed by a licensed engineer.*

Response: An expanded and updated study report and Addendum 1 have been developed. They have been stamped and signed by a licensed engineer.

**Comment 2 (Approach):** The analysis included an evaluation of two peak periods: the weekday evening and Saturday late-evening. *The applicant has indicated that the pending revised study will include a third evaluation period: Friday evening.*

Response: An expanded and updated study report and Addendum 1 have been developed and include a Friday evening evaluation period. The Friday peak hour to be studied (4:30 pm – 5:30 pm) was determined at a meeting with staff of the City of Pittsburgh Planning Department.

**Comment 3 (Approach):** The analysis did not address impacts to the intersection(s) of Carson Street and the West End Bridge (West End Circle). The evaluation of the operation of these intersections is considered appropriate. *The applicant has indicated that a pending revised study will include an evaluation if this intersection.*

Response: Traffic data has been collected at the intersections of the West End Circle and at the north end of the West End Bridge. Both the existing and the planned new configurations of the West End Circle have been analyzed for 2008 and planned new configuration only for 2018

design year conditions. The results are included in our expanded and updated study report and Addendum 1 as requested.

**Comment 4 (Data Collection):** All intersections, except for the entrance to the Wabash Tunnel, were counted manually. The applicant has indicated that the pending revised study will include counts of this intersection.

Response: The Wabash Tunnel (HOV facility) intersection at W. Carson Street has been counted from 4:00 PM to 6 PM on a non-Friday weekday, from 4:00 PM to 6:00 PM on a Friday, and on a Saturday from 5 PM to 7 PM. During these time periods, the tunnel is open to outbound traffic only. Traffic count data for this intersection has been included in Volume 2 of 2 (Appendices) of our expanded and updated study report. The left turns and right turns into the tunnel were counted. The through volumes were balanced based on counts at adjacent intersections.

**Comment 5 (Data Collection):** The study did not include manual turning movement traffic count data within the technical appendix.

Response: All manual turning movement count data is included in Volume 2 of 2 (Appendices) of the expanded and updated study report.

**Comment 6 (Trip Generation):** Due to the lack of available data in ITE Trip Generation regarding gaming facilities, the trip generation estimates for the gaming facility were based upon patronage and employment figures provided by Harrah's. However, no documentation of these figures is included in the technical appendix.

Response: Documentation of the trip estimates is included in the expanded and updated traffic study report. The trip generation estimates were developed based upon patronage and employment estimates provided by Harrah's, Downtown travel characteristics developed in conjunction with the City of Pittsburgh Planning Department and hourly distribution estimates from traffic studies of existing casinos documented by the Institute of Transportation Engineers (ITE). The patronage estimates provided by Harrah's are higher than those used for other gaming facilities in Pennsylvania. The travel characteristics for patrons and employees reflect the travel modes currently available at Station Square and vehicle occupancy surveys conducted at existing gaming facilities. These characteristics, which are documented in the report, were reviewed with the City of Pittsburgh Planning Department and modified based upon their input.

**Comment 7 (Trip Generation):** When comparing trip generation estimates for the gaming component of the three Pittsburgh gaming sites, the trip generation for Harrah's Station Square Casino is significantly lower than that for the other gaming sites. Factors that may be contributing to the assumed lower trip generation may include:

- The significant percentage of patrons assumed to utilize non-automotive modes of travel: 30 percent of patrons and 50 percent of employees. The applicant has indicated that the pending revised study will include revised modal splits.

Response: The expanded and updated traffic study report includes revised modal splits. As previously stated in the October 12, 2006 response to comments:

Station Square is currently a transportation hub served by many forms of public transportation (e.g. Light Rail, Bus and Incline Rail) as well as private services such as charter bus service and shuttle bus service to/from the Downtown and Southside. Our previous traffic study estimated the following mode split for casino patrons during peak hours on design days:

- 70% Auto/Taxi/Limo
- 15% Public Transit (Light Rail and Bus)
- 10% Private Charter, Downtown Shuttle and South Side Shuttle
- 5% Inclines, Boat Service, Bicycle and Walk

We met with the City of Pittsburgh Planning Department and they agreed that these percentages were acceptable for peak-hour design conditions for weekdays at Station Square. However, the City recommended that a lower percentage be used for Public Transit on Saturdays because there is less service to Station Square on weekends. After reviewing transit schedules for Saturdays, we are using the following mode split for the peak design hour on Saturdays:

- 77.5% Auto/Taxi/Limo
- 7.5% Public Transit (Light Rail and Bus)
- 10% Private Charter, Downtown Shuttle and South Side Shuttle
- 5% Inclines, Boat Service, Bicycle and Walk

The use of public transportation modes (light rail and bus) is estimated to be higher for casino employees than for casino patrons based upon the current Downtown Pittsburgh employee travel characteristics. The City of Pittsburgh Planning Department has reviewed and accepted these updated mode split percentages for casino patrons and employees.

- The low percentage of daily patrons assumed to arrive during the peak period:  
5.9 percent of the daily patrons during the evening peak hour.

Response: The existing peak traffic volumes on the streets in the Station Square study area occur between 4:30 pm and 5:30 pm on weekdays and between 5:45 pm and 6:45 pm on Saturdays. Those were the peak traffic periods selected for analysis in discussion with the City of Pittsburgh. A study of gaming casino traffic by Paul C. Box and William Bunte published in ITE Journal in March 1998 identified the hourly distribution of inbound and outbound traffic to casinos (with 24 hour operations) on weekdays and weekends. That study identified the following hourly distributions for gaming casino traffic:

		Inbound	Outbound
Weekday	5:00-6:00 pm	5.9%	6.6%
Saturday	6:00-7:00 pm	7.8%	6.9%

These percentages were used in the Station Square transportation analysis. Higher percentages of patron traffic occur on weekdays after 6:00 pm based upon the Box/Bunte study results, but the traffic volumes on the streets in the study area are lower during these periods. The 4:30 -5:30 pm period was the critical weekday traffic period. The Saturday percentages represent the highest hour of the day and reflect that 5:45 pm - 6:45 pm is when traffic is currently highest at Station Square.

- The assumed vehicle occupancy of 2.5 persons per vehicle for patrons and 1.1 persons per vehicle for employees.

Response: In the expanded and updated study, documentation is provided of vehicle occupancy surveys that were conducted at existing gaming facilities. This information is presented below.

**Surveys of Vehicle Occupancy Rates at Existing Gaming Facilities**

Casino Application	Existing Casino Surveyed	Size	Location	Survey Results
Presque Isle Downs - Erie	The Mountaineer Track & Gaming	80,000 sf of gaming 3,200 slot machines	Chester, West Virginia	2.60 patrons/ vehicle
Chester Downs Philadelphia	Atlantic City Casinos	13 Major Casinos 1.3 Million SF	Atlantic City, New Jersey	2.40 patrons/ vehicle
Majestic Star Pittsburgh	Casino Niagara	95,000 sf of gaming	Ontario, Canada	2.30 patrons/ vehicle
Trump Casino Philadelphia	Delaware Park	2,500 slot machines	New Castle, Delaware	2.25 patrons/ vehicle
Poconos Downs Racing	Saratoga Raceway	55,000 sf of gaming 1,300 slot machines	Saratoga, New York	2.20 patrons/ vehicle
Isle of Capri Pittsburgh	San Pablo Lytton Casino	800 slot machines 30 table games	San Pablo, California	1.18 patrons/ vehicle

Based upon these findings and review and input from The City of Pittsburgh Planning Department, a vehicle occupancy factor of 2.35 persons per vehicle was selected to convert patron person trips to vehicle trips. No specific surveys were conducted for current employees at Station Square, but it was expected that the employee vehicle occupancies will be much lower and closer to national averages of 1.1 per vehicle.

- The significant 20% reduction assumed for interaction between gaming patrons and the existing Station Square uses. The applicant has indicated that the pending revised study will include revised capture assumptions accounting for the significantly larger generation from the gaming site.

Response: Our determination of new trips for the Casino considered the capture of existing trips generated by Station Square. Existing development at Station Square includes 30 retail shops, 25 restaurants and night clubs, 400 hotel rooms and related meeting/banquet facilities, office space and the Gateway Clipper fleet docks. During survey hours on weekdays and Saturdays, peak hour traffic counts at the Station Square driveways ranged from between 1100 vehicles per hour to 1218 vehicles per hour. Many of these current visitors will be attracted to extend their stays and visit the Casino as part of their activities at Station Square.

Internal capture rate refers to the percentage of internal trips that occur within a mixed-use development as a result of interaction between compatible land uses. The rate reflects the percentage of trips generated by one of the uses that will visit other uses within the development without requiring additional external trips. The Institute of Transportation Engineers (ITE) presents discussion of internal capture rates in their Trip Generation Handbook and provides guidelines and procedures for utilizing these rates.

Although data surveys of internal capture rates are limited, the Institute of Transportation Engineers provides guidelines for capture rates within a mixed-use development. For different types of retail uses within a mixed-use development, they identify three internal capture rates:

Midday Peak Hour	29%
PM Peak Hour	20%
Daily	30%

Station Square is currently a mixed-use development and will continue to be a mixed-use development in the future with the proposed Harrah's Casino. Given the compatibility of the Casino with the existing restaurant and night club uses, this interaction is expected to be significant. The 20% internal capture rate identified by ITE for PM peak hour trips was used to reflect existing Station Square patrons who will visit the casino while at Station Square. PennDOT has accepted the 20% internal capture between uses in other mixed-use projects that include casinos. Our analysis used the 20% reduction for the lower of the existing inbound or outbound movement, resulting in less than a 20% capture rate. The calculations for internal capture are listed below:

	Internal Capture Rate		Total
	Inbound	Outbound	
<b>Design Weekday (4:30 – 5:30 PM)</b>			
Existing Station Square Trips	281	819	1100
Internal Capture Trips	56	56	112 (10%)
<b>Design Friday (4:30 – 5:30 PM)</b>			
Existing Station Square Trips	489	728	1218
Internal Capture Trips	98	98	196 (16%)
<b>Design Saturday (5:45 – 6:45 PM)</b>			
Existing Station Square	863	294	1157]
Internal Capture Trips	59	59	118 (10%)

**Comment 8 (Trip Generation):** The overall concept plan for Harrah's Station Square includes retail, restaurant and hotel uses ("Phase 2") not accounted for in the project trip generation.

Response: The project trip generation analysis for 2008 conditions identified trips generated by patrons and employees of the casino, which included trips to the ancillary retail and restaurant uses within the casino. Major retail and restaurant uses already exist at Station Square and their traffic is included in the background traffic counts. The patronage and employment forecasts by Harrah's include casino and ancillary retail and restaurant facilities. The Harrah's patronage forecasts were very high when compared to other gaming facilities proposed for Pennsylvania. The 2008 trip estimates did not include new hotel rooms because the Sheraton Hotel already exists at Station Square and the additional hotel rooms were not proposed until after 2008. In the expanded and updated transportation analysis that includes 2018 traffic conditions,

additional traffic generation is included for new hotel rooms, as well as, residential units that are proposed on the East parcel. At the same time the existing restaurant and night club uses on the East Parcel are to be eliminated. Also, commuter parking that is currently permitted at Station Square will be eliminated in order to have sufficient parking for the development program. The traffic generation associated with the restaurant/night club uses on the East Parcel and the commuter parking operations were taken out of the existing background traffic numbers for 2018.

**Comment 9 (Analytical Approach):** Verification of the base peak hour volumes and related factors utilized in the analysis could not be completed as the manual turning movement traffic count data were not provided.

Response: All manual turning count data is included in Volume 2 of 2 (Appendices) of the expanded and updated study report.

**Comment 10 (Analytical Approach):** The lane configuration and geometry of the intersections appear to be modeled appropriately for existing conditions; however several improvements proposed to mitigate traffic impacts which are noted in the body of the study do not appear to be incorporated into the "build" condition models (i.e. additional Carson Street left turn lane at the Main Access).

Response: These discrepancies have been addressed in the expanded and updated study report.

**Comment 11 (Analytical Approach):** Based on the information provided it appears that the signal phasing operations at the traffic signals appear to be modeled appropriately in Synchro, with the following exceptions.

- Numerous reports include phases noted as having been modeled with phasing conflicts; however the reporting format (HCM) used by the applicant did not provide sufficient information to verify the validity of these errors.

Response: Conflicts were reported at some locations due to non-standard NEMA phasing. These locations were viewed on SymTraffic and observed to run correctly with no vehicular conflicts.

- The green time allocated to selected phases at several signalized intersections is below the seven second minimum typically required by PennDOT. It should be noted that this may be a result of the reporting format (HCM) used by the applicant and not necessarily an error in the modeling.

Response: This has been addressed in the expanded and updated traffic study report and Addendum 1.

**Comment 12 (Analytical Approach):** The capacity analysis utilizes the maximum permissible peak hour factor (1.00) without supporting justification. The applicant has indicated that the factors were derived from the counted volumes; however factors of 1.00 indicate a perfectly balanced traffic flow over an entire hour and are not typically encountered with such frequency. The use of a higher than appropriate peak hour factor can significantly influence the results of the capacity analysis.

**Response:** The peak hour factors were derived from the manual turning movement counts. They were determined based on the peak 15 minute volumes of the total intersection within the peak hour, not the individual peak hour of each approach. All manual turning count data is included in Volume 2 of 2 (Appendices) of the expanded and updated study report.

**Comment 13 (Analytical Approach):** The study does not include an evaluation of future conditions 10 years after the project build out, which is typically required by PennDOT for a highway occupancy permit (HOP) submission. *The applicant has indicated that the pending revised study will include the 10 year build out analysis.*

**Response:** Addendum 1 to the expanded and updated traffic study report contains evaluations of the 2018 design year traffic conditions. This includes future hotel and residential condominium trip generation.

**Comment 14 (Analytical Approach):** The analysis did not provide an evaluation of vehicle queuing and determinations regarding the adequacy of existing and/or proposed turn lane lengths. *The applicant has indicated that the pending revised study will include queuing analyses.*

**Response:** The addendum to the expanded and updated traffic study report will contain an evaluation of existing and proposed turn lane and through lane lengths.

**Comment 15 (Analytical Approach):** The analysis does not address the issues associated with potential staging of parking during facility construction, specifically how the removal of the West Lot will be addressed.

**Response:** Currently, the West Lot is primarily used for event parking for scheduled events at the amphitheater and special functions at Station Square. At the start of construction, the amphitheater will be closed permanently and special events will not be scheduled at Station Square during this period. Also, commuter parking will be eliminated at Station Square to increase the availability of parking for Station Square patrons. The parking program includes a horizontal expansion of the existing parking garage to achieve approximately 200 new parking spaces in that location. These spaces are expected to be completed and available during construction of the casino.

**Comment 16 (Evaluation of the Recommended Improvements):** The proposed mitigation includes widening the existing east access driveway at Arlington Avenue and Carson Street to provide dual left turn lanes and an exclusive right turn lane; however the intersection is still projected to operate with a deficient level of service "E" for two of the movements. Additionally the existing elevated rail lines and associated structures will increase the complexity of any potential improvements.

**Response:** Sufficient mitigation is proposed in accordance with PennDOT traffic impact study requirements. The specific requirement is that for intersections where existing levels of service are at LOS D, E, or F, they can remain at LOS D, E, or F respectively if the delay (in seconds) is decreased or improve from LOS F to E or LOS E to D. The proposed mitigation for the Carson Street at Arlington Avenue Intersection keeps the level of service the same while decreasing the delay or improves level of service.

**Comment 17 (Evaluation of the Recommended Improvements):** This proposed improvements to the intersection of Commerce Street and Carson Street include modifying the traffic signal to operate with inefficient split-phasing. Improvement alternatives which permit concurrent signal phasing (i.e. without the shared through/left-turn lane) should be explored.

Response: The intersection operates at an acceptable LOS C or better for all approaches with split-phasing and a left/left-through lane conditions. Without this lane configuration, the level of service for Commerce Street will operate at LOS D. Further, the approach opposite Commerce Street is a private parking lot with no through traffic.

**Comments 18 (Evaluation of the Recommended Improvements):** The analysis recommends a traffic signal at the new Carson Street egress; however, supporting signal warrant analyses are not provided in the technical appendix. The applicant has indicated that the pending revised study will include signal warrant analyses.

Response: This new intersection has been eliminated from the proposed casino site plan. A new traffic signal is proposed at the existing intersection west of the existing parking garage. This existing intersection will become Casino Drive and will serve as the primary access to the existing garage and to/from the casino porte cochere pick-up/drop-off and to/from valet parking. A traffic signal warrant analysis has been provided for the Casino Drive intersection in the expanded and updated transportation analysis.

**Comment 19 (Evaluation of the Recommended Improvements):** The report notes that , at the intersection of Carson Street and Smithfield Street, a pedestrian overpass across Carson Street will be constructed. In addition to improvements at this intersection, pedestrian accommodations should be adequately addressed at each of the signalized intersections. This includes proper delineation, ADA accommodations, adequate crossing times and pedestrian indications. The investigation of pedestrian count down timers may also be appropriate.

Response: The primary pedestrian movements in the vicinity of Station Square are related to walking trips across the Smithfield Bridge to/from Downtown and to/from the bus stops, light rail station and Incline rail station. The pedestrian overpass across Carson Street will redirect most of the pedestrian traffic away from the Smithfield Street intersection with Carson Street. Accommodations to pedestrian traffic, including pedestrian count down timers will be investigated for each of the intersections evaluated in the study except for the intersections located through the West End Circle. No pedestrian facilities are available at the Circle nor were there any pedestrians observed during the counted periods. Also, the whole West End Circle is going to be reconstructed starting next spring (2007) with construction finishing up in 2009.

**Comment 20 (Evaluation of the Recommended Improvements):** The mitigation plan assumes the interconnection of the six traffic signals along Carson Street within the study area and programmed to operate as a system providing coordinated progressive traffic movements.

Response: Yes, that is correct.

**Comment 21 (Evaluation of the Recommended Improvements):** The report discusses the implementation of an internal traffic management plan, the utilization of ITS technologies and the establishment of a transportation management center. The use of these mitigation measures will require long-term participation and financial support of local and state agencies.

Response: The use of ITS technologies and establishment of a traffic management center at Station Square is part of the overall transportation improvement program to upgrade both traffic and parking conditions. The observation of real-time traffic and parking conditions with strategically located CCTV cameras will permit quick response by the Transportation Manager at Station Square to adjust traffic flow patterns and parking operations within the site through use of dynamic message signs. PennDOT has already confirmed that they currently have a fiber link to Station Square from their traffic management center that will allow them to receive the video feed from the proposed CCTV cameras and to assist with incident management activities. Until the City of Pittsburgh progresses with their ITS program, coordination from the Station Square traffic management center will take place using standard telephone communications. The Station Square ITS program will be designed and coordinated with the City of Pittsburgh for future connection.

**Comment 22 (Evaluation of the Recommended Improvements):** Except as noted above, it appears that the proposed improvements adequately mitigate the project impacts based on the results presented in the analysis. It should be noted that the omissions in the capacity analysis (as noted above) may be influencing the reported results and the analyzed operation of the intersection. Additionally the inclusion of the evaluation of the 2018 design year may identify additional deficiencies requiring mitigation.

Response: The expanded and updated study report includes all of the manual turning movement counts. Addendum 1 dated addresses 2018 design year conditions.

#### Highway Occupancy Permit Issues

- o This study does not include an evaluation of future conditions 10 years after the project build-out date, which is typically required by PennDOT for a highway occupancy permit (HOP) submission.

Response: The 2018 design year analysis has been completed and is included as Addendum 1 of the expanded and updated study report.

- o The need to address the 10 year analysis as well as the various inconsistencies in the analysis (i.e. Peak Hour Factors) may result in additional mitigation requirements that will impact the HOP process.

Response: The 2018 design year analysis has been completed and is included as Addendum 1 of the expanded and updated study report. The peak hour factors shown in the Synchro output can be seen in Volume 2 of 2 (Appendices) of the expanded and updated study report.

Mr. Frank T. Donoghue, Chief Counsel  
PA Gaming Control Board  
Project C050619  
November 13, 2006

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- o **Potential widening improvements to Carson Street may be constrained by Mount Washington to the south and/or existing development to the north. Where widening is proposed, the acquisition of new right-of-way and need for retaining walls on the Mount Washington side of Carson Street should be considered.**

Response: The intent is to accomplish the additional widening of Carson Street within available ROW or utilizing land available within Station Square. During the design phase consideration will be given to the acquisition of new ROW or use of retaining walls, if that becomes necessary.

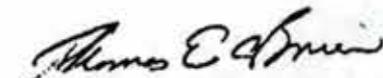
- o **Insufficient information was available to adequately assess the potential impacts of proposed improvements to existing utilities. However, transportation improvements within urban locations such as the proposed site typically require extensive utility coordination and relocation.**

Response: Station Square is in a very urban setting with existing utilities located within and adjacent to the existing roadways. It is expected that utility coordination and relocations will be included in the extensive transportation program that has been proposed.

If you have any questions or require additional information, please call me at 412.476.2000, extension 1722.

Sincerely,

GAI Consultants, Inc.



for David F. Kundrat, P.E.  
Project Traffic Engineer

Enclosures  
DFK:MSG/ptm

Cc: Mr. Albert Federico, McCormick Taylor  
Ms. Susan Hensel, PGCB  
Mr. Victor Stabille, Dilworth Paxon

**APPENDIX O**

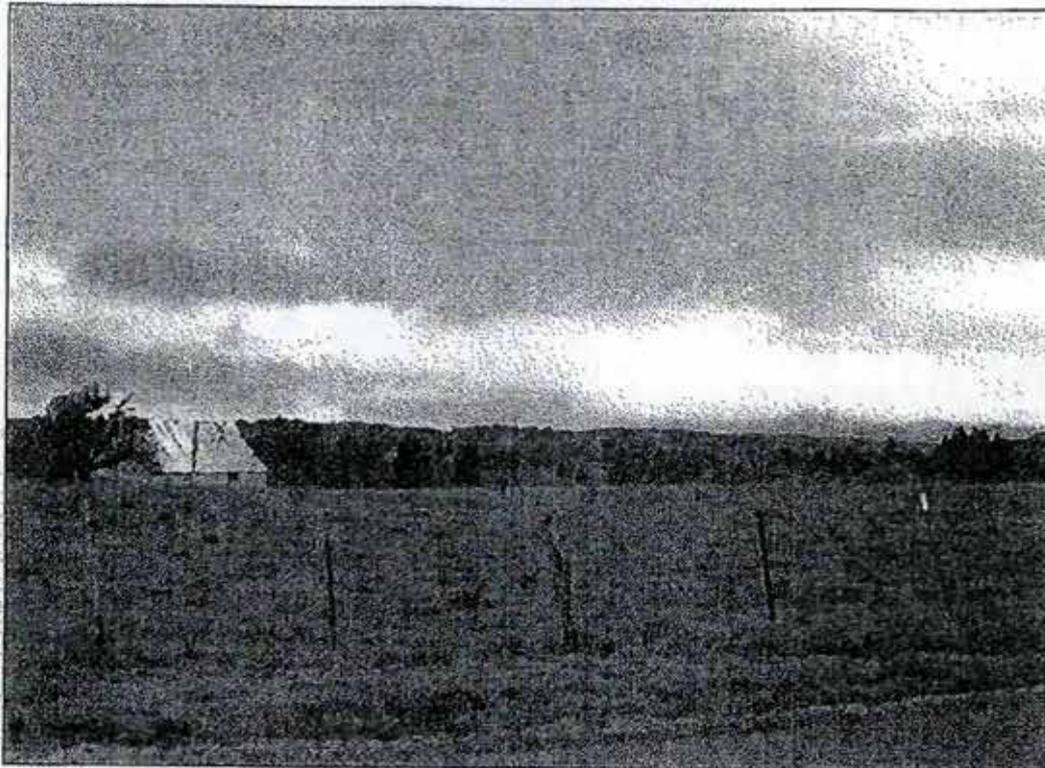
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**SUPPLEMENTAL TRAFFIC IMPACT STUDY  
(PARSONS, 2006E)**

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**COWLITZ INDIAN TRIBE  
CASINO PROJECT**

**Traffic Impact Study  
-Supplemental Report-**



*Prepared for*  
The Cowlitz Tribe

December 2006  
Revised April 2007

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*Existing Transit Service*

Currently, C-TRAN does not provide direct, regularly scheduled transit service to either of the specific site alternatives. In March 2005, C-TRAN adopted a new service and taxing boundary, which formerly was all of Clark County. The newly implemented boundary includes the City of Vancouver and its Urban Growth Boundary (UGB), plus the city limits only of the cities of Battle Ground, Ridgefield, LaCenter, and the town of Yacolt. Transit service is provided by the North County Connector, which provides the cities of La Center, Ridgefield, Battle Ground, and Town of Yacolt with fully accessible dial-a-ride and regular stop service within city limits only. These cities will be connected to the Vancouver UGB via "non-service" transportation corridors, meaning that transit service along these corridors will operate in a closed-door, express mode and passengers will not be able to board or de-board buses while traveling in these areas.<sup>7</sup> For purposes of this study, the sites are not expected to have regular transit service anytime in the foreseeable future.

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<sup>7</sup> <http://www.c-tran.com/>

## EXAMINATION OF SITE ALTERNATIVES

### TRIP GENERATION

Understanding the trip generation characteristics of this facility is fundamental to determining the associated traffic impacts and roadway mitigation measures. Because this is a regional generator that is distinctive with respect to planned land-uses in Clark County, the trip generation rates to be used for the overall Traffic Impact Study are intended to reflect its regional nature. Traffic impact studies of similar types of casinos elsewhere will be referenced in the following methodology.

This supplemental report updates the previous trip generation methodology with additional site data collection and very conservative assumptions regarding retail, the RV park, event trips, and casino trips. Additionally, investigation was made to determine the site's weekday peak hour as compared to the previous work which focused on the roadway system's weekday peak hour, to determine if analyzing the site peak results in any changes to impacts or mitigation.

#### *Methodology*

Casino trip generation case-studies were used to estimate vehicle trips; these studies are generally analogous to the context of the Cowlitz Casino project site: rural or suburban fringe, lack of a well-established traffic circulation system, little or no fixed-route transit service, and no competing casino-resorts within 50 miles of the site. However, these case studies are limited, as the trip generation characteristics of casinos found in large clusters, like those in Las Vegas, Nevada are not directly transferable to the Cowlitz Casino site.

Certain characteristics, such as size, location and type of casino complex contribute to the trip generation of the development. Other pertinent characteristics include the number of on-site hotel rooms, the total square footage (SF) of the casino gaming-floor area (GFA), and/or the total number of employees. Other characteristics include whether the casino has convention space, a conference or entertainment venue, retail uses such as restaurants, or lounges and convenience stores. For this analysis, the square footage of the casino GFA will be used as the primary trip generation variable, plus the proposed 5,000 seat multi-purpose room and on-site hotel.

#### *Trip Rate Comparison*

The following sources were utilized to establish trip generation rates for the Cowlitz Casino. While many casino trip generation studies base the trip rate on the number of gaming positions, for the Cowlitz Casino alternatives the trip rate per square foot of gaming floor was the preferred method because of the perceived limitation that using a gaming position rate would place on the development proposals. In other words, the initial phase of the Cowlitz Casino may be limited to a certain number of gaming positions, but could add gaming positions in future expansions even though the square footage may remain the same. The Draft EIS assumed approximately 3,930 gaming positions for the gaming square footage contained in Alternatives A and B.

In all cases where data were available, there are indications that the peak time for casino site trips is 6-7 p.m. weekdays, while the road system peak is 5-6 p.m. weekdays. Thus, separate PM peak trip generation will be calculated: one for the system peak (5-6 p.m.), and the other for

the site peak (6-7 p.m.). This affects all casino-related trips, including those attending a concert event.

In the following citations, the weekday PM peak-hour trip rate on both a 1,000 GFA average as well as the corresponding rate per gaming position is listed for comparative purposes:

1. Tulalip Tribal Casino – Marysville, Washington (empirical trip data collected) – this site was counted on a summer peak Friday evening as well as on summer peak Saturday evenings both without and with event traffic. This casino is located within one hour of much of the Seattle/Everett metropolitan area. It has a 2,300-seat amphitheatre and restaurants/retail shops within the casino area. This site was selected due to similarities with the Cowlitz site. The resultant trip rates were 18.0 and 15.5 trips per 1,000 gross square feet for PM peak weekday and Saturday peak hour, respectively, or 0.62 weekday PM peak trips and 0.54 Saturday peak trips per gaming position.
2. Muckleshoot Indian Tribe Casino – Auburn, Washington (empirical trip data collected) – this site was counted on a peak Friday summer evening. While it does not have a concert/event venue nor does it have on-site lodging, it was selected for counting due to its being located within 20 miles of the Seattle and Tacoma metropolitan areas, similar to the location of the proposed Cowlitz Casino within 20 miles of the Portland/Vancouver metropolitan area. The resultant weekday PM peak rates were 10.40 trips per 1,000 gross square feet of gaming area and 0.31 trips per gaming position.
3. Spirit Mountain Casino – Grand Ronde, Oregon (empirical trip data collected). During the weekday PM peak-hour the two entrances were observed from 4:00-5:00 PM on a peak Friday – the resulting trip rate for these observations was 6.4/1,000 sq ft. casino gaming floor area for the weekday PM peak hour or 0.30 trips per gaming position.
4. Emerald Queen Casino – Tacoma, Washington (empirical trip data collected). During the weekday PM peak-hour the two entrances were observed from 4:00-5:00 PM – the resulting trip rate for these observations was 3.7/1,000 sq ft. casino gaming floor area.
5. Mohegan Sun Casino – Connecticut. Traffic counts from an independent traffic audit were compiled and reviewed for comparisons to trip rates from the west coast casinos, the relationship between peak hour and daily traffic volumes, and traffic arrival characteristics on days of events at the events center. This study indicates that the weekday and Saturday peak hour trip generation rates are less than those observed for the west coast sites, but the daily trip generation rate is higher. The trip generation rates are 4.4 daily and 0.35 PM peak hour trips per gaming position weekdays and 5.6 daily and 0.45 peak hour trips per gaming position for Saturdays.
6. Shingle Springs Rancheria Hotel-Casino Traffic Study – Trip rate information from "Shingle Springs Rancheria Interchange Transportation/Circulation," completed by David Evans and Associates, Inc. in August 2002, was used. Trip generation within the Shingle Springs traffic study was based on surveys of inbound/outbound traffic at five northern California Indian gaming casinos ranging in size from 17,300 sq ft. to 70,000 sq ft. during PM peak hours – 4:00-6:00 - on weekdays in October, 1988 and May, 1999. Sites included: Alturas Casino; Elk Valley; Lucky 7; Rolling Hills and Twin Pines casinos. The trip rate for the weekday PM peak hour in this study is 4.95/1,000 square feet casino gaming floor.

7. Gaming Casino Traffic, Paul Box and William Bunte, ITE Journal, March 1998. Examined casino trips at two casinos located near St. Louis, MO: Casino St. Charles (2,500 gaming positions) and Casino Queen. The Casino St. Charles observed weekday PM trip rates were 0.54 trips per gaming position during the site peak (6-7 p.m.) and 0.43 trips per gaming position for the surrounding roadway system peak (4:30 to 5:30 p.m.); the Saturday peak rate was 0.64 trips per gaming position. Thus, the trip generation rate for the system peak is 80 percent of the trip rate for the site peak during the p.m. peak period. The report also concluded that between 7 and 8 percent of the daily total trip generation occurred during the PM peak weekday hour. The Casino Queen (East St. Louis, IL) has 1,200 gaming positions and exhibited rates of 0.57 trips per gaming position for the weekday p.m. peak hour.
8. San Diego County Casino Study – The San Diego County Department of Public Works prepared a study of casino trip generation titled "Report on the Potential Impacts of Tribal Gaming on Northern and Eastern San Diego County." Based on surveys of numerous southern California Indian gaming casinos, the San Diego reports established that traffic for gaming casinos should assume a trip generation rate of 100 trips per 1,000 square feet of gaming floor on an average weekday (all day). The trip rate for the weekday PM peak hour is 3.93/1,000 sq ft. casino gaming floor area.
9. Jamul Indian Village FEIS – The "Jamul Indian Village FEIS" was referenced as it is an EIS that examined 4 casino alternatives for placing 101 acres into federal trust for the Tribal Government. The preferred alternative included the development of a hotel and casino complex, events center, tribal offices and other ancillary uses on-site. For comparison to the Cowlitz proposal, Alternative D was chosen as the most suitable, with 74,376 square feet of gaming floor and a 300 room hotel, among other similarities. The trip rate for the weekday PM peak hour is 4.94/1,000 sq ft. of casino gaming floor area.
10. Gun Lake Casino Traffic Study – this study was used because of its similarities to the Cowlitz proposal: it is located on a state highway; the character of the surrounding area is predominately tourism in a rural setting; and the casino has two restaurants (though not a hotel). The casino itself is comprised of 98,879 square feet of gaming space and includes 2,500 slot machines and 92 gaming tables. The restaurants include casual dining, buffet style, fast food and bars/lounges, plus an on-site retail component. The trip rate cited in this study is 6.81/1,000 square feet casino gaming floor area.
11. Enterprise Rancheria Casino-Hotel Traffic Impact Study – this study was used because of its similarities and extensive research. The Enterprise trip generation rates were established by plotting rates for 7 casinos ranging in size from 17,000 sq ft. to 447,600 sq ft. with a best-fit curve. The resulting weekday PM peak hour trip rate cited is 3.93/1,000 sq ft. casino gaming floor area.
12. Chinook Winds Casino – Lincoln City, Oregon (Empirical trip data collected). Casino is similar in size to what is proposed under site alternatives A, B, and E and includes restaurants, an adjacent hotel/motel, and an entertainment center. During the weekday PM peak-hour the two entrances were observed from 4:00-5:00 PM – the resulting trip rate for these observations was 4.8/1,000 sq ft. casino gaming floor area.

Empirical data collected at Chinook Winds Casino, Spirit Mountain Casino and Emerald Queen Casino, coupled with the other studies of similar casino/resorts provided additional comparisons and a reasonableness check to the final trip generation calculations.

Analysis of the empirical data leads to the conclusion that the presence of an adjoining hotel and restaurants reduces the overall PM peak hour trip rate compared to adding the trip generation for each separate use. In other words, guests at the hotel would patronize the casino and simply walk between them, and guests of the casino also tend to use the on-site restaurant and other site amenities, thus generating far fewer vehicle trips.

A review of the independently-collected traffic counts indicates that the Mohegan Sun's Friday peak hour trip generation rate may be lower than the empirical data collected for the West Coast casinos, but also has significantly higher daily trip generation rates than what was observed for the West Coast sites. To be conservative, the higher casino-only peak hour trip generation rates calculated from the West Coast casinos will be used for peak hour traffic impact analysis, while the higher daily trip rate from the Mohegan Sun casino complex will be used to estimate daily traffic and air quality impacts.

The following casino trip generation rates will be used for this study:

- Weekday AM peak hour: 2.95 trips per 1,000 gross square feet of gaming floor area (GFA)
- Weekday *system* PM peak hour: 9.18 trips per 1,000 gross square feet or 0.31 trips per gaming position
- Weekday *site* PM peak hour: 10.94 trips per 1000 GFA.
- Weekday daily trips: 74.63 trips per 1,000 gross square feet or 2.54 daily trips per gaming position
- Saturday peak hour: 15.50 trips per 1,000 gross square feet or 0.53 trips per gaming position
- Saturday daily trips: 93.24 trips per 1,000 gross square feet or 3.24 daily trips per gaming position.

Note: there are questions as to the reasonableness of the weekday PM peak casino trip rate. It should be noted that the trips above are purely those that would be generated by the casino gaming area only; if the other trips not associated with an event are factored in, the resultant overall trip generation rate is 17.41 trips per 1,000 gross floor area or 0.59 trips per gaming position, which is on the high side of the observed casino counts (which include all trips to the sites studied) mentioned above.

#### *Hotel Trips*

The Shingle Springs DEIR found that when a hotel is part of a casino-hotel establishment, the hotel portion of the project would generate 2.06 trips per room on an average weekday. The ITE Trip Generation Manual shows that a standard hotel (land-use #310) will generate 8.23 trips per room on an average weekday. Thus, the Shingle Springs casino study found that a hotel at a casino (in a semi-rural environment) will generate 25% of the trips a stand-alone hotel would generate on an average weekday. The reduced number accounts for those who stay at the hotel and walk, rather than drive, to the associated casino and other amenities. Observations at the other sites for which empirical data were collected corroborate this.

With the Cowlitz Casino and its retail and restaurant amenities on-site, guests are more likely to access these types of services while they're all on-site and via walking modes, which will not effect vehicle trip generation nor roadway levels-of-service. Therefore, a 75% reduction in trip generation for the hotel portion of the Cowlitz casino project was originally assumed. However, further investigation indicated that there is potential for the hotel to attract pass-by (transient

lodging) trips off of I-5 that are not casino-destination trips, due to lack of other hotels in the area and associated with growth in the La Center area. Thus, a 50% trip reduction for trip internalization will be assumed instead of the 75% reduction in the original report.

#### *Multi-Purpose Event Center*

In all of the gaming alternatives (excluding Alternative D) the Cowlitz Casino site plan includes a Multi-purpose room with seating for 5,000 people; it is projected that approximately 20 to 30 events will occur on an annual basis (approximately one large event every three weeks) that will have the potential of filling most of the seats. There may be smaller events.

In accordance with the study methodology approved by Clark County, Ridgefield and WSDOT, the PM peak weekday, and Saturday peak hour trip generation rates include an "85<sup>th</sup> percentile event" at the Multi-purpose room, which is consistent with the assumptions for The Amphitheatre at Clark County. An 85<sup>th</sup> percentile event means an event that has a higher attendance than 85% of the events and a lower attendance than 15% of events. Using The Amphitheatre at Clark County as an example, their 85<sup>th</sup> percentile event in 2005 drew 8,400 people, or approximately half of the seating capacity. In 2006, of the 11 concerts, the 85<sup>th</sup> percentile concert attendance was 12,000, or approximately 67 percent of the capacity.

Thus, to be conservative, it was decided to analyze an event that fills 85 percent of the seats, or in this case, an event which attracts 4,250 people, as the 85<sup>th</sup> percentile event for this study. It is assumed that for each of the 20 to 30 concerts or events per year, 15% will have a higher attendance and 85% will have a lower attendance.

Based on the report "Mode Split at Large Special Events" (Charles Green for the Transportation Research Board, presented January 1991), a weekday PM Peak event would experience average auto occupancy of 2.62. Based on traffic observations for the Mohegan Sun events center, auto occupancies range from 1.8 to 2.2 persons per vehicle. To be conservative for the Cowlitz analysis, a low-end average auto occupancy of 1.8 persons per vehicle will be used. Thus, 4,250 event attendees will arrive in approximately 2,400 vehicles.

The Mohegan Sun Casino in Connecticut is required by its state permit to have an independent auditor monitor traffic flows around the casino site. This casino has a large events complex (10,000 seats, twice the size of the proposed events center at the Cowlitz site) which hosts concerts and a resident WNBA basketball team. Traffic counts were collected on event and non-event days for weekdays, Fridays, and weekend days. The result of this analysis indicates that the presence of the casino/hotel, restaurant, and entertainment facilities affects arrivals and departures on event days, and is also measurably different than arrival/departure characteristics for a stand-alone facility such as an amphitheatre or an arena. Thus, instead of almost 50 percent of vehicles arriving to an events site in the one hour period prior to a concert (during the transportation system's peak hour) or other large entertainment event, such as what has been observed at the Clark County Amphitheatre or other similar events, the Mohegan Sun site experiences significantly less event-related traffic impacts during the weekday PM peak hour.

According to Cowlitz and Mohegan Sun representatives, weekday and Saturday evening events will likely have 8:00 starting times, compared with 7:00/7:30 p.m. starting times for events at other entertainment venues in the Portland/Vancouver area. The later starting time is due to the desire to encourage attendees to take advantage of other offerings at the casino/resort, including the casino, restaurant, and hotel. The later starting time has a secondary implication:

the number of vehicles arriving to an event during the 4:45-5:45 p.m. weekday transportation system peak hour is less than what would occur for an earlier-starting event. Based on an 8:00 p.m. event start time (consistent with the Mohegan Sun events center), approximately 8% of those traveling to an event at the Cowlitz facility would arrive during the transportation system's peak hour (roughly 4:45 to 5:45 pm) and has a peak of approximately 19% of its arrivals occurring during the 6 to 7 p.m. hour, which is after the system's weekday peak. Since this casino is located approximately 90 to 120 minutes from the New York and Boston metropolitan areas, many concert-goers may arrive earlier to avoid traffic peaks on the area's roadway system; thus, the 19 percent peak arrival rate is probably lower than what the Cowlitz site would experience.

More detail regarding the Mohegan Sun counts and the calculations that derived the traffic numbers shown in this report are found in supporting data sheets that are available upon request.

Data collected at the Tulalip Casino site indicates that approximately 42 percent of the event-goers arrive in the one-hour period prior to the start of the event. This would put arrivals in the 6:30 to 7:30 time frame. For the purposes of this analysis, they are assumed to arrive at the site between 6 and 7 p.m. although many will arrive much later for an event that starts at 8:00 p.m.

Based on traffic counts in the site vicinity, the transportation system PM peak hour is 5 to 6 p.m. Using event-day counts taken by the Mohegan Sun Casino as well as the Mode Split at Large Special Events paper, approximately one-third (33%) of the attendees will arrive in the 5 to 6 p.m. time period.

#### *Other*

Another conservative assumption was that no trip reduction will be taken for "pass-by" trips, which are those people already traveling on the roadway system who decide to deviate from their travel path into the site.

Checking 24-hour traffic counts by hour in the area of the I-5/La Center interchange (ramp counts as well as La Center Road counts and also in Ridgefield), the 6-7 p.m. time period on weekdays carries approximately 75 percent of the 5-6 p.m. peak hour traffic volumes. For a sensitivity analysis, two Year 2010 PM peak scenarios were analyzed for the I-5/La Center interchange area to determine the "worst case" scenario to be analyzed in this report:

- *System PM Peak Hour*, which is the 5-6 p.m. period, using peak hour traffic projections for the system plus the 5-6 p.m. trip generation estimates for Alternative A/B
- *Site Peak Hour*, which is the 6-7 p.m. time period, using the site's peak trip generation estimates plus 75 percent of the road system peak hour volumes.

Tables 4-7 show the trips generated by the Cowlitz Casino proposal based on the trip generation rates summarized above.

The following table compares the trip generation estimates from the Draft EIS traffic analysis to the revised trip generation calculations for this supplemental report:

**Table 4: Trip Generation Changes Cowlitz Casino Alternatives A and B<sup>6</sup>**

Land Use and Time Period	Previous	Revised	Difference
<b>Casino Trips</b>			
Weekday (Daily)	8,302	10,000	+1,698
Saturday (Daily)	12,508	12,750	+242
Weekday AM Peak Hr	396	396	NC
Weekday Road System PM Peak Hour	664	1231	+567
Weekday Site Peak Hr <sup>9</sup>	664	1468	+804
Saturday Peak Hr	926	944	+18
<b>Hotel Trips</b>			
Weekday (Daily)	514	1028	+514
Saturday (Daily)	512	1024	+512
Weekday AM Peak Hr	35	70	+35
Weekday Road System PM Peak Hour	38	61	+23
Weekday PM Site Peak Hr	38	76	+38
Saturday Peak Hr	45	90	+45
<b>Retail Trips</b>			
Weekday (Daily)	0	686	+686
Saturday (Daily)	0	800	+800
Weekday AM Peak Hr	0	16	+16
Weekday Road System PM Peak Hour			
Weekday Site PM Peak Hr	0	61	+61
Saturday Peak Hr	0	80	+80
<b>Events Center Trips</b>			
Weekday (Daily)	4,800	4,800	NC
Saturday (Daily)	4,800	4,800	NC
Weekday AM Peak Hr	n/a	n/a	NC
Weekday Road System PM Peak Hour	480	966	+486
Weekday Site PM Peak Hr	480	1259	+779
Saturday Peak Hr	480	1259	+779
<b>RV Park Trips</b>			
Weekday (Daily)	0	200	+200
Saturday (Daily)	0	200	+200
Weekday AM Peak Hr	0	40	+40
Weekday Road System PM Peak Hour	0	60	+60
Weekday Site PM Peak Hr	0	74	+74
Saturday Peak Hr	0	70	+70

<sup>6</sup> Note: similar changes will be made to Alternative C and E. Alternative D does not have casino, hotel and other uses, and as such there will be no changes to trip generation for that alternative.

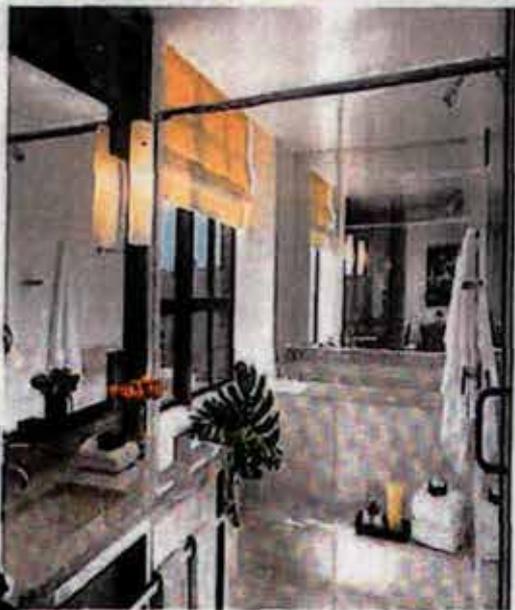
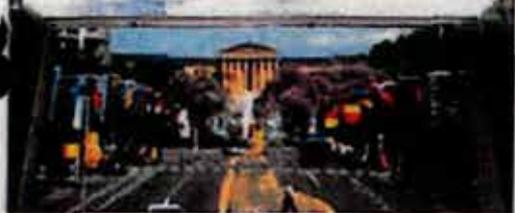
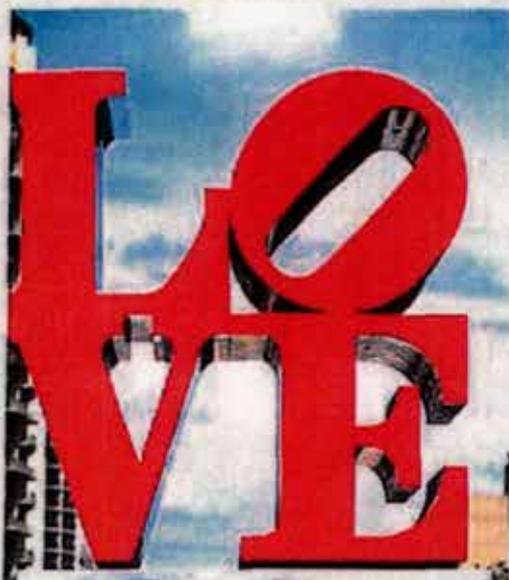
<sup>9</sup> This formerly was assumed to occur during the road system peak hour.

## Hotels

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