Office of
Transportation and
Infrastructure Systems

Michael A. Carroll, P.E.
1401 John F. Kennedy Blvd Suite 1430
Philadelphia, PA. 19102
Phone: (215) 686-9003
Email: otis@phila.gov

May 20, 2024

Adam Thiel
Managing Director
City of Philadelphia

Re: Independent Traffic Analysis of the 76 Place Proposal

Dear Managing Director Thiel,

Johnson, Mirmiran & Thompson (JMT) has completed four memos as part of their 76 Place Transportation Impact Study (TIS) Independent Analyses. These memos were each focused on one topic, specifically Modal Split, Parking, Ride-hailing, and I-676 Operations. The following summarizes the key findings from each memo:

Modal Split

- A review of peer arenas confirmed that the assumed modal splits in the TIS are appropriate. **Particularly, 40% transit use is attainable but not a foregone conclusion**.
- **To attain a high level of transit ridership (and minimize auto trips), transit capacity and operations must be more carefully planned for and directly incorporated in the Transportation Event Management Plan (TEMP)**. Coordination is necessary with SEPTA and PATCO to determine what investments in service, staffing, and vehicles are required, and what transit improvements should be included as TIS mitigation measures.
- Beyond mitigation, a number of strategies must be included in the TEMP to incentivize arena attendees to utilize non-auto modes. Example strategies include:
    - **Each event ticket should include (at no extra charge) a transit pass (SEPTA and PATCO).**
    - **Event tickets should NOT include any discounted parking benefit.**
    - **Large-scale bike parking/bike valet services should be planned as well as coordination with Indego to ensure appropriate bikeshare capacity.**
- The TIS assumes the same share of auto trips as transit trips (40% each). If no more than 40% of attendees drive, traffic operations remain manageable. However, **even marginal increases in auto trips above that threshold would result in gridlock at critical intersections**. Therefore, exploring the potential of even marginally higher non-auto usage will be important.
- It is recommended that, once the arena is operating, the Sixers be required to report on event transportation operations at regular intervals (at least annually) and

Michael A. Carroll, P.E.
1401 John F. Kennedy Blvd Suite 1430
Philadelphia, PA. 19102
Phone: (215) 686-9003
Email: otis@phila.gov

specifically on attendee mode choices. **If the percentage of auto trips is higher than proposed, the Sixers should be held responsible for providing additional mitigation and strategies to increase non-auto trips to the proposed level**.

Parking

- **The vicinity of the arena has sufficient garage parking supply to meet the arena parking demand.**
- A review of peak seasonal data from Washington Square West garages confirmed that the **garages have capacity even when multiple theater events are being held nearby**.
- If average vehicle occupancy drops below the assumed 2.5, additional reserved parking could be needed to meet demand. JMT identified approximately 900 available spaces that could be provided at additional garages (Gateway Garage, Love Park Garage, Center Square Garage, and Family Courthouse Garage). The peak usage of these garages does not align with likely arena event peaks so it is likely that even more spaces would be available at these sites. One caveat is that, just like "if you build it, they'll come," **the more parking you provide, the easier and more likely it is that arena attendees choose to drive** instead of taking preferred modes. Given the sensitivity of traffic conditions to the mode of travel chosen by event attendees, caution must be used in determining if and where additional parking is considered.
- Strategies to improve parking operations include:
    - Updating existing on-street 3-hour parking to 2-hour parking, particularly in Chinatown, in order to reduce likelihood of arena attendees taking these spaces. Parking cell phone apps should be set up to not allow parking session extensions.
    - As identified in the TEMP, prepaid parking will allow more even dispersal of parking demand and ensure drivers are taking the most efficient route to their specific garage.
    - **Encouraging non-auto trips, as noted under the Modal Split heading above, and reducing parking demand will be the most effective strategies to minimize parking impacts**.

Ride-hailing

- **The proposed ride-hailing locations have substantially less available spaces than what is stated in the TIS (27 spaces vs. 45 spaces)**.
- **JMT proposed an additional location to help handle this gap in spaces** – the parking lane on the north side of the 900 block of Chestnut.

Office of
Transportation and
Infrastructure Systems

Michael A. Carroll, P.E.
1401 John F. Kennedy Blvd Suite 1430
Philadelphia, PA. 19102
Phone: (215) 686-9003
Email: otis@phila.gov

- **Utilizing garages for ride-hailing vehicle staging would improve operations**. Potential garages are Gateway Garage (15th & Spring) and Autopark at Olde City (2nd St. between Walnut St. and Chestnut St.).
- **Ride-hailing operations will need to be carefully geofenced** to ensure pickup/drop-off is contained to designated locations and does not block travel lanes, bus lanes, or bike lanes in the area.
- To further discourage issues with blocking of lanes, **traffic enforcement officers should be stationed at each ride-hailing location** (the TIS calls for them already being located at other key intersections in the area).

I-676 Operations

- Limitations of the Highway Capacity Software (HCS) and the available traffic counts underestimated current (and therefore future) congestion on I-676. Much of the congestion on I-676 is related to downstream interchanges with I-95 and I-76 which aren't considered in HCS for the ramp and mainline segments analyzed. This congestion indicates that existing traffic demand is obviously greater than what is observed in traffic counts.
- Therefore, while the results can't be interpreted out of context, they can support comparisons between No Build and Build scenarios to determine the effect of the arena. Such comparison shows a 4% to 12% increase in density, the standard HCS measure of congestion. **This level of increase in congestion is considered a minor impact on overall traffic operations**.

Sincerely,

Michael A. Carroll, P.E.
Deputy Managing Director
Office of Transportation and Infrastructure Systems
City of Philadelphia

CC: AS // KY // CP

MEMORANDUM

TO: Michael Carroll, PE
DATE: April 8, 2024
FROM: Tony Rauso, PE & Joanne Arellano, PE, PTOE
CC: Adam Smith, PE, PTOE & Richard Montanez, PE
PROJECT: 76 Place
JMT JOB NO.:19-03842-003
RE: 76 Place Transportation Impact Study Independent Analysis: Modal Split

The following memorandum summarizes our team's independent sensitivity analysis for modal split based on our approach discussed in the Executive Summary, dated January 5, 2024. Below is a summary of what analyses were performed in the 76 Place Transportation Impact Study (TIS), originally dated November 11, 2022, revised March 12, 2024, the 76 Place Transportation Event Management Plan (TEMP), dated March 2024, the independent sensitivity analysis performed by JMT, and recommendations for volume redistribution, modal splits, and vehicle occupancy.

SUMMARY OF KEY FINDINGS AND ASSUMPTIONS

- The TIS assumptions on how arena attendees will travel to and from events (modal split) and the number of passengers per vehicle (vehicle occupancy) have been verified based on a comparison of other arena data. **The TIS utilized a modal split of 40% auto, 10% taxi/ride-hail, 40% public transit, and 10% walk-only/other and a vehicle occupancy of 2.5 persons. The 40% public transit assumption is attainable if the recommended strategies to encourage non-auto trips are implemented**. Based on current transit capacity, 76 Place needs to support SEPTA and PATCO to ensure the improvement strategies can be achieved. **Auto trip percentages above 41% for 2.5 vehicle occupancy and 43% for 2.7 vehicle occupancy would have significant impacts on delays and queue lengths at key intersections.**
- The independent analysis focused on the Friday post-event peak as that time period depicts the impacts when most attendees would leave the arena within a shorter time as opposed to the pre-event peak when attendees can arrive at the arena at varying times. Additionally, the post-event peak can identify the traffic impacts of the arena as the study area does not operate with saturated conditions such as during the PM commuter or PM pre-event peak periods.

(continued on next page)

SUMMARY OF KEY FINDINGS AND ASSUMPTIONS (CONTINUED)

- The independent analysis adjusted the volume distributions based on four parameters: ticket holder routes, parking garage access, post-event roadway backups, and road closures.
- The sensitivity analysis evaluated vehicle occupancy scenarios of 2.0, 2.5 and 2.7 with various modal splits.
- The TIS provided arrival and departure time curves and determined that there would be **minimal overlap between the employees and spectators during the post-event period**.
- The TIS incorporated the Vine Street Highway Safety Improvement Program (HSIP) project and identified that the **Vine Street HSIP study area intersections can accommodate the additional arena traffic with signal timing modifications.**
- The following intersections along with the associated critical movement were identified as key intersections in the independent analysis as these locations had a significant impact on delays or queues as a result of the arena traffic:
    - Broad Street and Eastbound Vine Street Frontage Road (northbound right)
    - 7th Street and Race Street (northbound right)
    - 10th Street and Arch Street (westbound approach)
    - Broad Street and Sansom Street (northbound through)
- **The installation of traffic cameras at key locations could allow for the adjustment of signal timings for optimal corridor operation during pre-event and post event time periods. All cameras should be connected to the Traffic Operations Center (TOC) for remote operations.**
- Per the TIS, 10% of the attendees (1,850 people) are expected to be pedestrians or others. A portion of this percentage includes bicyclists that would need to park their bikes. **A review should be conducted on the existing bike racks in the vicinity of the site, including Indego rideshare docking stations, to determine if more are needed to accommodate the expected bicycle demand.**

The following paragraphs provide additional details regarding the methodology utilized for this independent analysis.

FRIDAY POST-EVENT VOLUME DISTRIBUTION

The independent analysis focused on the Friday post-event peak as that time period depicts the impacts when most attendees would leave the arena within a shorter time causing the greatest influx in spectator vehicles in the network as opposed to the pre-event peak when attendees can arrive at the arena at varying times. Additionally, the post-event peak can identify the traffic impacts of the arena as the study area does not operate with saturated conditions such as during the PM commuter or PM pre-event peak periods.

The TIS determined 21 off-street parking garage facilities for spectators, arena employees, and residents to utilize. Employee trip distributions and residential trip

distributions were based on U.S. Census Bureau Origin/Destination patterns. Spectator trip distributions were based on historical ticket data from spectators attending games at the existing Wells Fargo Center. The independent analysis adjusted the Friday post-event volume distributions based on four parameters: ticket holder routes, parking garage access, roadway backup and road closures. The Ticket Holder Routes diagram is shown in Appendix A (Figure 1).

Ticket Holder Routes

The spectator trip distributions provided by the TIS do not properly reflect the percentage distributions that are shown in the Ticket Holder Route diagram. The volumes were redistributed to better reflect the ticket holder routes.

The Ticket Holder Route diagram provided in the TIS shows about 34% of vehicles originating from the west and northwest. The TIS shows all these vehicles accessing the network via Vine Street, however, some spectators originating from the west and northwest may also access the arena via Market Street. 4% of vehicles using Vine Street were redistributed to Market Street. 2% of the vehicles originating from the northwest were also redistributed from Vine Street to access via 12th Street.

The TIS showed all spectators originating from the south via I-95 using Callowhill Street to access the arena. Some spectators may use I-95 to Broad Street to access garages south of the proposed arena. 5% of the total parked vehicles originally using Callowhill Street were redistributed to use northbound Broad Street and 13th Street to access garages on Sansom Street and Chestnut Street.

Parking Garage Access

Vehicles were redistributed to better reflect which garages spectators may use based on their origins. The TIS showed all vehicles originating from I-676 westbound using 8th Street to access garages. These vehicles were redistributed to have some spectators use 6th Street to access the garages on 6th Street and 7th Street. Vehicles originating from I-95 and using Callowhill Street were redistributed to have more spectators use 6th Street instead of 8th Street.

Post-Event Roadway Backups

The volume distribution provided by the TIS resulted in heavy traffic volumes on Race Street and 13th Street during the post-event peak hour. Some of these volumes were redistributed as it is expected some of those attendees would utilize an alternate route to avoid locations with long queues. 45% of vehicles originally utilizing Race Street to access I-676 were redistributed to 9th Street and Vine Street. Vehicles originating from garages on Sansom Street and Chestnut Street originally utilizing 13th Street and Vine Street to access I-676 were redistributed to Broad Street. These distributions are shown in Appendix A (Figure 27).

Road Closures

The TIS is proposing a partial temporary road closure on 10th Street and 11th Street between Filbert Street and Market Street. The partial closure is proposed on an as needed basis for event days during pre-event and post-event peak hours. As part of the sensitivity analysis, a full road closure and no road closure evaluation was done. As such, the volumes were adjusted to account for the varying road closure scenarios. The redistributed volumes are shown in Appendix A.

VINE STREET HIGHWAY SAFETY IMPROVEMENT PROGRAM

The Vine Street Highway Safety Improvement Program (HSIP) study area includes Vine Street between 8th Street and Broad Street, and the numbered cross streets connecting these two service roads from 8th Street to 13th Street. The HSIP project goal is to increase neighborhood connections by enhancing multimodal, inclusive mobility options in the Vine Street corridor. The TIS incorporated the Vine Street HSIP project into their model by removing a lane from each direction. However, from 9th Street to 12th Street on westbound Vine Street, the TIS did not model the appropriate turning lanes in this section. Per the TIS, the HSIP study area intersections can accommodate the additional arena traffic with signal timing modifications.

JMT did not incorporate the Vine Street Highway Safety Improvement Program project in the Independent Analysis. If applied, it is expected that the results would conclude that the arena traffic would not significantly impact traffic conditions. It is recommended that traffic cameras be installed at key corridor locations that could allow for the adjustment of signal timings for optimal corridor operation during pre-event and post event time periods. All cameras should be connected to the Traffic Operations Center (TOC) for remote operations.

MODAL SPLIT & VEHICLE OCCUPANCY RESEARCH

The modal split in the TIS was based on arena data from New York City (Barclays Center, Madison Square Garden, USTA Billie Jean King National Tennis Center), and San Francisco (Chase Center). The vehicle occupancy used in the TIS was based on the data from the New York City arenas. An average was calculated from the arena data to determine the mode split and vehicle occupancy to be used for the proposed arena. The mode split determined was 40% auto, 10% taxi/ride-hail, 40% public transit and 10% walk-only/other. The vehicle occupancy determined by the TIS was 2.5 people per vehicle. The modal split and vehicle occupancy data provided by the TIS are shown in Appendix B (Table 2).

Peer Arena and Stadium Research

The Independent Analysis team researched over 20 arenas and stadiums in major cities across the United States to find mode split and vehicle occupancy data. Many arenas had Transportation Management Plans and previous transit studies available online. The team

also contacted several arenas and public transit agencies for additional information. The following arenas, stadiums and public transit agencies were researched and/or contacted:

- Audi Field – Washington, D.C.
- Barclays Center – Brooklyn, NY
- Bell Center – Montreal, Quebec
- Capital One Arena – Washington, D.C.
- Chase Center – San Francisco, CA
- Delta Center – Salt Lake City, UT
- Golden 1 Center – Sacramento, CA
- Intuit Dome – Inglewood, CA
- Little Caesars Arena – Detroit, MI
- Lumen Field – Seattle, WA
- Madison Square Garden – Manhattan, NY
- Massachusetts Bay Transportation Authority – Boston, MA
- Metropolitan Atlanta Rapid Transit Authority – Atlanta, GA
- Oakland-Alameda County Coliseum – Oakland, CA
- Oracle Park – San Francisco, CA
- Paycom Center – Oklahoma City, OK
- Providence Park – Portland, OR
- RFK Stadium – Washington, D.C.
- Rocket Mortgage Field House – Cleveland, OH
- Scotia Bank Arena – Toronto, Ontario
- Sleep Train Arena – Sacramento, CA
- Spectrum Center – Charlotte, NC
- State Farm Arena – Atlanta, GA
- Suburban Mobility Authority for Regional Transportation – Detroit, MI
- TD Garden – Boston, MA
- T-Mobile Park – Seattle, WA
- United Center – Chicago, IL
- USTA Billie Jean King National Tennis Center – Queens, NY
- Utah Transit Authority – Salt Lake City, UT

Many venues did not have information available or the transit in the area was not comparable to the proposed arena location in Philadelphia. Additionally, stadiums exclusively used for football were excluded as the arrival patterns of spectators attending football games are not equivalent to spectators attending basketball games. A total of 13 peer arenas and stadiums were evaluated, including the 4 arenas considered as part of the TIS. Information, such as location, usage, maximum occupancy, transit accessibility, vehicle occupancy, and mode split, was determined for each peer venue and is shown in Table 1.

Table 1: General Peer Arena and Stadium Information

Facility	Location	Usage	Maximum Occupancy	Mode of Transit	Auto Vehicle Occupancy (persons)	Mode Split Auto / Transit / Other (percentage)
Barclays Center	Brooklyn, NY	Basketball	19,000	Subway, Bus	3.22	32.1 / 49.8 / 18.1
Madison Square Garden	Manhattan, NY	Basketball, Ice Hockey	19,500	Subway, Bus, Rail	2.20	33.7 / 46.5 / 19.8
USTA Billie Jean King National Tennis Center	Queens, NY	Tennis	45,896	Subway, Rail	2.01	25.9 / 54.4 / 19.7
Chase Center	San Francisco, CA	Basketball	18,064	Bus, Light Rail, Tram	N/A	53.8 / 46.2 / N/A
Oracle Park (AT&T Park)	San Francisco, CA	Baseball	42,300	Bus, Light Rail, Ferry	2.67	54.0 / 36.5 / 9.5
Audi Field	Washington, DC	Soccer	20,000	Bus	3.15	59.0 / 36.0 / 5.0
Oakland-Alameda County Coliseum	Oakland, CA	Baseball	46,867	Bus, Rail	N/A	70.0 / 24.0 / 7.0
Sleep Train Arena	Sacramento, CA	Basketball	17,317	N/A	2.27	N/A / N/A / N/A
Paycom Center	Oklahoma City, OK	Basketball	18,203	Bus, Light Rail	2.70	N/A / N/A / 2.0
Providence Park	Portland, OR	Soccer	25,218	Bus, Light Rail	2.39	47.0 / 33.0 / 21.0
Lumen Field (CenturyLink Field)	Seattle, WA	Football, Soccer	68,740 37,722	Bus, Light Rail, Tram	2.69	57.1 / 27.6 / 15.2
T-Mobile Park (Safeco Field)	Seattle, WA	Baseball	47,929	Bus, Light Rail, Tram	3.16	82.0 / 8.0 / 11.0
Overall Average					**2.65**	**52 / 37 / 14**
Arena Average					**2.48**	**37 / 49 / 17**

In Table 1, the values listed as “other” for mode split are a combination of taxi/ride-hail, walk-only, and other. The mode of transit for each arena was determined within a two-block radius or a 10-minute walk of the arena.

The mode split and vehicle occupancy for each peer venue was averaged to test the validity of the assumptions used in the TIS and determine a likely mode split and vehicle occupancy for the proposed arena. The overall average mode split determined by the peer arena and stadium research was 52% auto, 5% taxi/ride-hail, 37% public transit and 9% walk-only/other. The overall average vehicle occupancy determined was 2.65 people for auto and 2.37 people for taxi/ride-hail. Many stadiums often have lower non-auto mode shares due to spectators tailgating prior to events, so the best comparison is to other arenas. The arena average mode split determined was 37% auto, 7% taxi/ride-hail, 49% public transit and 10% walk-only/other. The arena average vehicle occupancy determined was 2.48 people for auto and 2.33 people for taxi/ride-hail. The modal split and vehicle occupancy data for the peer venues is shown in Appendix B.

As part of the independent analysis, the walk, transit and bike scores were obtained for the cities containing the peer arenas. These scores give a rating of the walking, biking, and public transit accessibility for the cities in the areas surrounding the arenas. The arena addresses were utilized to determine the location for the evaluation. Philadelphia and New York City both have a walk score of 99 and a transit score of 100. San Francisco has lower walk and transit scores. Therefore, utilizing an average of the modal split and vehicle occupancy data from New York City and San Francisco is considered reasonable for the proposed arena in Philadelphia. Table 2 shows the comparison in scores for Philadelphia, New York City and San Francisco. The additional peer arenas scores are shown in Appendix B.

Table 2: Peer Arena Walk, Transit, and Bike Scores

	Philadelphia	New York City	San Francisco
Walk Score	99	99	87
Transit Score	100	100	73
Bike Score	77	93	98

The assumptions for mode split and vehicle occupancy made in the TIS are sufficient. The additional data collected from the peer arenas did not support changes to the modal split and vehicle occupancy.

ARRIVAL AND DEPARTURE CURVES

The TIS provided arrival and departure curves for spectators and employees showing anticipated arrival and departure times. These curves reflect an event start time of 7:00 PM and an event end time of 9:30 PM. The arrival and departure figures are included in Appendix C.

The TIS anticipates many spectators will arrive over an hour before events to visit restaurants and retail in the area. Spectators are expected to start arriving at 5:00 PM. By the start of the event at 7:00 PM, it is expected that 90% of spectators will have arrived. The TIS also anticipates approximately 20% of spectators will leave prior to 9:30 PM which is the end of the event. Approximately 40% of spectators are expected to be out of the area within 30 minutes after the event.

Arena employees are expected to arrive several hours before the event start time. The TIS anticipates all employees will arrive by 4:30 PM for a 7:00 PM event. Based on the early arrival time of employees it is anticipated that there will be no overlap with spectators arriving during the pre-event time period which starts at 5:00 PM. The TIS expects employees to start leaving 30 minutes after the end of the event at 10:00 PM, with 50% expected to be out of the network by 10:30 PM. As most spectators are anticipated to have left by 10:00 PM, minimal overlap between the employees and spectators is expected in the post-event period.

Though it is anticipated there will be minimal overlap between employees and spectators, a conservative approach was taken for the independent sensitivity analysis. Spectator and employee volumes were modeled to leave at the same time in the post-event period. The sensitivity analysis methodology and results are discussed further in the following sections.

MODAL SPLIT SENSITIVITY ANALYSIS METHODOLOGY

The TIS determined a mode split of 40% auto, 10% taxi/ride-hail, 40% public transit and 10% walk-only/other. To assess the sensitivity of the roadway network surrounding the proposed arena and determine capacity constraints that would impact traffic operations, the independent analysis evaluated a range of mode split percentages and determined key intersections of impact. To eliminate variability outside of public transit/auto mode splits, the taxi/ride-hail and walk-only/other mode splits were maintained at 10% each.

The following scenarios were evaluated:

- 2.5 vehicle occupancy (TIS assumed vehicle occupancy)
  - 30% Auto / 50% Transit / 20% Other (taxi/ride-hail and walk-only/other)
  - 40% Auto / 40% Transit / 20% Other (taxi/ride-hail and walk-only/other)
  - 50% Auto / 30% Transit / 20% Other (taxi/ride-hail and walk-only/other)
  - 60% Auto / 20% Transit / 20% Other (taxi/ride-hail and walk-only/other)

- 2.0 vehicle occupancy
  - 25% Auto / 55% Transit / 20% Other (taxi/ride-hail and walk-only/other)
  - 30% Auto / 50% Transit / 20% Other (taxi/ride-hail and walk-only/other)
  - 35% Auto / 45% Transit / 20% Other (taxi/ride-hail and walk-only/other)
  - 40% Auto / 40% Transit / 20% Other (taxi/ride-hail and walk-only/other)

- 2.7 vehicle occupancy
  - 30% Auto / 50% Transit / 20% Other (taxi/ride-hail and walk-only/other)
  - 40% Auto / 40% Transit / 20% Other (taxi/ride-hail and walk-only/other)
  - 50% Auto / 30% Transit / 20% Other (taxi/ride-hail and walk-only/other)
  - 60% Auto / 20% Transit / 20% Other (taxi/ride-hail and walk-only/other)

For 2.0 vehicle occupancy, an additional scenario was analyzed at 25% auto, 55% transit and 20% other, due to the limitations of the Broad Street and Eastbound Vine Street Frontage Road (Intersection 7). A capacity constraint was not identifiable at Intersection 7 with a 30%, 35% or 40% auto modal split, therefore, the auto percentage was decreased to identify a capacity constraint.

Key intersections were decided based on locations that had increased capacity impacts in any variation of the scenarios. The key intersections currently operate with minimal constraints but when volumes increase from the proposed arena, the intersection operations worsen. There were several intersections that currently operate with constraints which were not considered as part of the key intersections, as additional volumes will cause the same constraints. The following key intersections along with the

corresponding critical movements were chosen to evaluate the impacts of the modal split modifications:

- Broad Street and Eastbound Vine Street Frontage Road (Intersection 7)
  - Northbound right
- 7th Street and Race Street (Intersection 10)
  - Northbound right
- 10th Street and Arch Street (Intersection 16)
  - Westbound approach
- Broad Street and Sansom Street (Intersection 72)
  - Northbound through

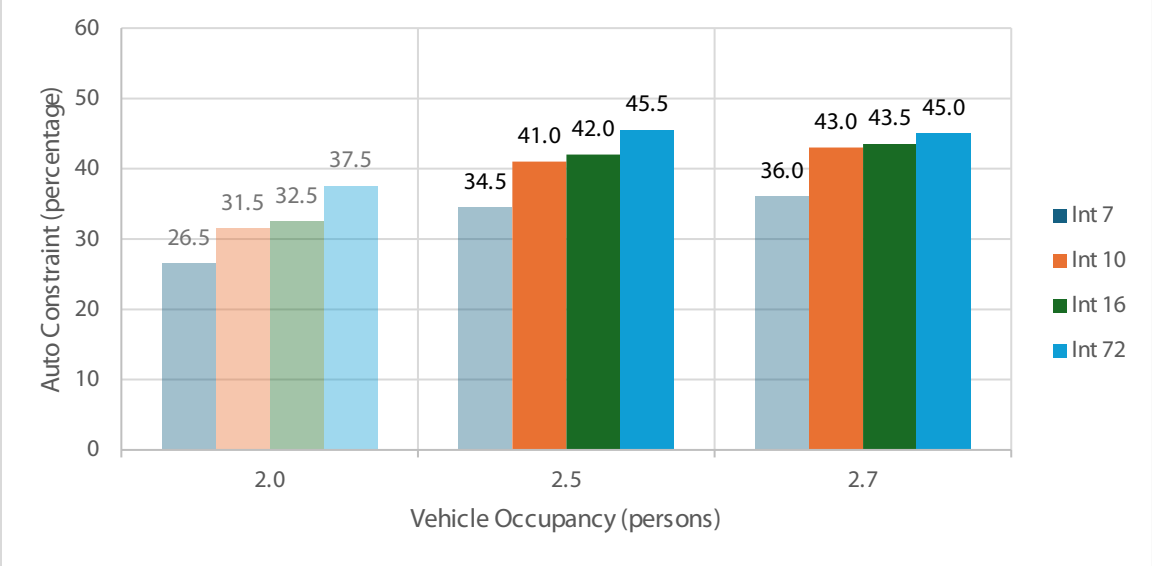
These intersections are expected to have a significant increase in delay or queue lengths as a result of the proposed arena during the Friday post-event peak period. The analysis assumptions used in the TIS independent analysis by JMT are included in Appendix D.

ANALYSIS RESULTS

The delays for critical movements at the key intersections were determined based on several modal split and vehicle occupancy scenarios utilizing Synchro/SimTraffic 11 software. The delays reported from SimTraffic were determined for each of the scenarios, as SimTraffic is a microsimulation software that considers driver vehicle behaviors when obtaining results. Graphs showing the delays for each intersection are included in Appendix D.

At each intersection, the maximum percentage of auto usage when capacity constraints impact the intersections was determined for each vehicle occupancy and modal split scenario. Capacity constraints were determined when a delay of 55 seconds or greater was met. A summary of these maximum percentages is shown in Figure 1.

Figure 1: Intersection Capacity Constraints Per Auto Usage



The 2.0 vehicle occupancy was evaluated to test the sensitivity of the intersections. The data is shown faded in Figure 1 due to its unrealistic nature and was neglected from the critical auto modal split percentage evaluation.

Intersection 7 is shown faded in Figure 1 due to its unrealistic auto percentage for 2.5 and 2.7 vehicle occupancy and was neglected from the critical auto modal split percentage evaluation.

The auto and transit mode splits are directly correlated, as the transit modal split percentage increases, the auto modal split percentage decreases. Table 3 shows the critical auto modal split percentages that would cause capacity constraints for each vehicle occupancy analyzed.

Table 3. Intersection Critical Auto Modal Split Percentages

	2.0 Vehicle Occupancy	2.5 Vehicle Occupancy	2.7 Vehicle Occupancy
Critical Auto Split	31.5%	41%	43%

At intersection 7, the maximum auto percentage is 36.0% with a 2.7 vehicle occupancy when the intersection experiences capacity constraints. At 2.0 and 2.5 vehicle occupancy, this intersection has a maximum auto percentage of 26.5% and 34.5%, respectively, at the start of experiencing capacity constraints.

At intersection 10, the maximum auto percentage is 43.0% with a 2.7 vehicle occupancy when the intersection experiences capacity constraints. At 2.0 and 2.5 vehicle occupancy, this intersection has a maximum transit percentage of 31.5% and 41.0%, respectively, at the start of experiencing capacity constraints.

At intersection 16, the maximum auto percentage is 43.5% with a 2.7 vehicle occupancy when the intersection experiences capacity constraints. At 2.0 and 2.5 vehicle occupancy, this intersection can have a maximum auto percentage of 32.5% and 42.0%, respectively, at the start of experiencing capacity constraints.

At intersection 72, the maximum auto percentage is 45.5% with a 2.5 vehicle occupancy when the intersection experiences capacity constraints. At 2.0 and 2.7 vehicle occupancy, this intersection can have a maximum auto percentage of 37.5% and 45.0%, respectively, at the start of experiencing capacity constraints.

Exclusions from the auto modal percentage include a vehicle occupancy of 2.0 and intersection 7 as shown in Figure 1. A focus was taken on the key intersections within Chinatown to limit disruptions to the neighborhood, so Intersection 72 was also excluded from the auto modal percentage. The auto modal percentage was determined by intersection 10 and intersection 16 at a vehicle occupancy of 2.5 and 2.7.

After analyzing the different modal split and vehicle occupancy scenarios, **the critical auto modal percentage is 41% for 2.5 vehicle occupancy and 43% for 2.7 vehicle occupancy.**

The TIS also evaluated a vehicle occupancy of 2.25 for 11 intersections within the network, including 2 key intersections identified by the independent analysis. The TIS determined that the overall delay difference between a 2.5 and 2.25 vehicle occupancy is negligible, as proposed signal timing improvements are expected to mitigate any impacts. It is expected these intersections will operate with a delay between what was determined for 2.5 and 2.0 vehicle occupancy. Table 4 shows the delay determined by the TIS for the key intersections for the Friday post-event period.

Table 4. TIS Vehicle Occupancy Analysis Delay Results at Key Intersections

	2.25 Vehicle Occupancy	**2.5 Vehicle Occupancy**
Intersection	Delay (sec)	
Intersection 7 (Northbound Right)	36.8	35.8
Intersection 72 (Northbound Through)	23.0	22.8

BICYCLE DEMAND ASSESSMENT

The TIS recommended that vehicle space along Market Street between 6th Street and Juniper Street be reallocated via road diets or configuration changes to accommodate bicycle infrastructure. The TIS does not contain specific information detailing what the bicycle infrastructure would include.

The TIS listed a potential safety improvement road diet along Market Street, including lane reductions and parking-protected bike lanes. The City is currently evaluating Market Street between Juniper Street and 6th Street as part of their Vision Zero Capital Plan. This section of Market Street has also been identified as a priority bus corridor as part of the City's Transit Plan.

Per the TIS, 10% of the attendees (1,850 people) are expected to be walkers or others, which includes bicyclists. A portion of this percentage includes bicyclists that would need to park their bikes. A review should be conducted on the existing bike racks in the vicinity of the site, including Indego rideshare docking stations, to determine if more are needed to accommodate the expected bicycle demand.

The provision of bike racks could be considered along the perimeter of the arena and centralized along the likely bikeway routes. Wayfinding signage and information posted on the arena website could be used to encourage event attendees to utilize certain bicycle routes. If the feasibility of bike racks is unlikely due to the limited sidewalk area and the existing and projected volume of pedestrians in the area, providing a bicycle valet system could be considered that utilizes parking garages for bicycle parking spaces. Bike parking should also be considered on off-street spaces. At the Golden 1 Center in Sacramento, California, the arena sets up a temporary event bicycle parking area that is staffed and fenced-off.

The installation of an Indego bikeshare along the perimeter of the arena should also be considered. At Audi Field in Washington D.C., a new bikeshare station was installed and it was implemented as a bottomless corral where there would be no limit to how many bicycles could be left at the bikeshare station.

10TH STREET & 11TH STREET CLOSURE ANALYSIS

The TIS proposed a temporary partial closure of 10th Street and 11th Street between Market Street and Filbert Street on event days during pre-event and post-event peak hours. One travel lane would be maintained along 10th Street and 11th Street for 15 to 30 minutes during the pre-event and post-event peak hours, while the other lane would be used as a temporary space for pedestrians. This partial closure could be implemented on an as needed basis for events. The TIS proposed temporary road closure locations are shown in Appendix A.

Closing 11th Street would impact SEPTA bus operations and closing 10th Street would disrupt the bike network in the area. Closing these streets would also have impacts to emergency services. Even a partial closure could have impacts to the surrounding intersections, so keeping these roads completely open was considered as part of the sensitivity analysis. To evaluate how the network would operate if these roads were to remain completely open, the volumes were redistributed and analyzed. The analysis was conducted using the TIS assumed 40% auto mode split volumes and a vehicle occupancy of 2.5. The following surrounding intersections were reviewed in this analysis:

- 11th Street and Filbert Street (Intersection 24)
- 10th Street and Filbert Street (Intersection 25)
- 11th Street and Market Street (Intersection 29)
- 10th Street and Market Street (Intersection 30)

During the post-event peak period, there is expected to be over 1,000 pedestrians utilizing the intersections within the first 15 minutes. This would cause significant pedestrian and vehicular conflicts at the Market Street and Filbert Street intersections between 10th Street and 11th Street. It is expected that pedestrians will cross in large groups and pedestrians at the tail-end of the group may disregard the signal changing and traverse into the intersection although vehicles have right-of-way. The large influx of pedestrians during this time could lead to possible capacity constraints for the first 15 to 20 minutes after the end of events. It is recommended that an adequate number of police officers or traffic enforcement officers be stationed at these intersections to help manage pedestrian movements.

However, the analysis results depict that all intersections are expected to operate at an acceptable LOS for auto with or without the road closure. A detailed microsimulation vehicular and pedestrian analysis (such as with VISSIM and VISWALK) should be performed to compare the impacts with or without the road closures. Table 5 shows the delay, in seconds, for each intersection approach for the road closure options during the Friday post-event period.

Table 5: 10th Street and 11th Street Closure Intersection Approach Delay (sec)

Intersection	Approach	No Road Closure*	Partial Road Closure**	Full Road Closure*
Intersection 24 Filbert St & 11th St	Northbound	9.2	10.5	-
	Eastbound	17.1	21.7	10.8
Intersection 25 Filbert St & 10th St	Southbound	24.8	15.2	16.9
Intersection 29 Market St & 11th St	Northbound	20.0	20.4	123.0
	Eastbound	2.9	4.6	5.9
	Westbound	6.8	11.0	4.1
Intersection 30 Market St & 10th St	Southbound	10.7	24.3	-
	Eastbound	17.3	17.0	13.2
	Westbound	13.2	12.8	11.6

*2031 Build delay from JMT Independent Analysis.
**2031 Build delay from 76 Place TIS Synchro analysis.

ARUP did perform a Pedestrian Flow Analysis for the 76 Place in November 2023 using a MassMotion model. Based on the results, the sidewalks surrounding the arena generally operate at acceptable levels of service during the post-event period and some congestion was noted outside the Market Street arena exit. It was also noted that the lane closures on 10th Street and 11th Street both provide additional circulation space around the arena site.

A pedestrian management plan should be established to manage Market Street with 10th Street and 11th Street to safely cross pedestrians. If the pedestrian management plan is found effective to clear pedestrians out of the intersections, consideration could be given to reduce the duration of the 10th Street and 11th Street road closures.

RECOMMENDATIONS

- TEMP – The Transportation Event Management Plan (TEMP) needs to contain all specific strategies and policies determined necessary by 76 Place for efficient operation during arena events. This should be in the form of a working document that can and should be adjusted once the arena is built to accommodate the traffic demands and minimize traffic impacts to the surrounding areas.
- Encourage Non-Auto Trips – To make the modal split attainable, non-auto trips should be encouraged. The following are recommended examples to encourage the use of other transit modes:
    - Transit Pass with Ticket Purchase – A transit pass should be included at no extra cost with every event ticket purchase.
    - Indego Bikeshare – The installation of Indego bikeshare should be considered along the perimeter of the arena. A bottomless corral for bicycles should also be considered.
- Transit Support – To ensure strategies to encourage public transit use can be achieved, 76 Place needs to support SEPTA and PATCO.
- Traffic Signal Cameras – It is recommended that cameras are installed at critical intersections within the study area so signal timings can be adjusted during pre-event and post-event periods. It is recommended for the arena to provide updates to the City's Traffic Operations Center (TOC) on expected end of event times so signal timings can be adjusted as needed to provide optimal corridor operations. The procedure for notifying the TOC should be specified within the TEMP.
- Emergency Vehicle Pre-Emption – Consideration should be taken to install emergency vehicle pre-emption along EMS corridors and within all emergency vehicles, as Philadelphia currently does not have this infrastructure throughout the city. Pre-emption would allow emergency vehicles to change the traffic signals along their route, clearing vehicles that may be causing back up due to the influx in spectators leaving after events.
- Pedestrian Analysis – It is recommended that a detailed pedestrian analysis be completed using VISSIM or VISWALK for the intersections directly around the proposed arena. The analysis should be done to determine intersection operation with and without the road closures on 10th Street and 11th Street.
- Parking Management Plan – Parking sub-zones could facilitate parking management and congestion by spreading traffic around and not utilize too many of the available parking spaces in different districts (i.e. Chinatown or Theatre District). Each sub-zone would contain parking garages within a geographic boundary and be assigned a threshold of vehicles that could use the zone without negatively effecting congestion. Once the threshold is exceeded, additional vehicles would be assigned to other sub-zones. The parking sub-zones would be done in coordination with advanced/pre-paid parking passes.
- Pedestrian Management Plan – A pedestrian management plan should be considered at Market Street and 10th Street and Market Street and 11th Street to improve pedestrian safety when crossing. Consideration should be given to only close 10th

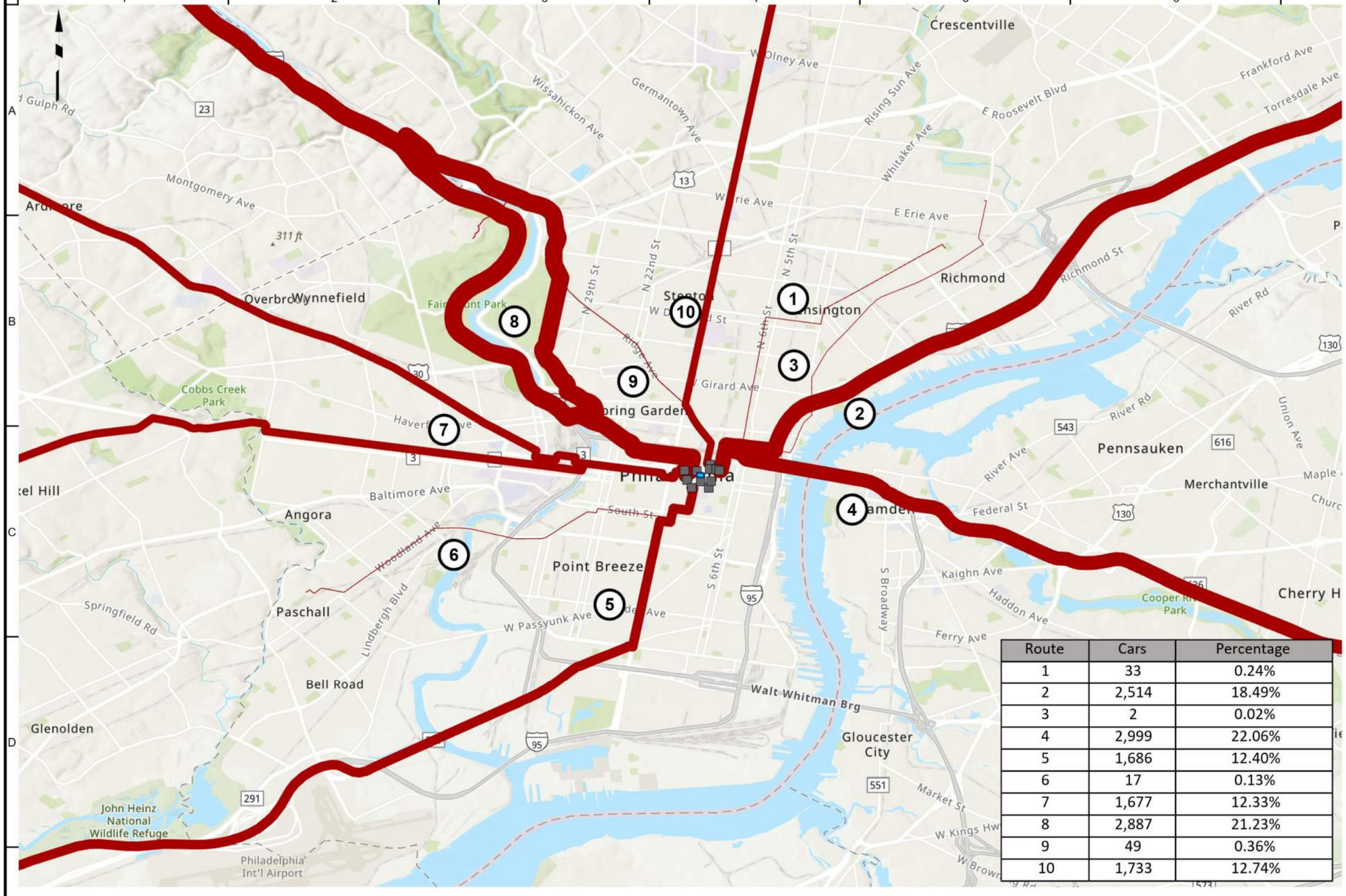
Street and 11th Street for the first 30 minutes post-event and keep the streets open pre-event.

- Off Street Bicycle Parking – It is recommended that bicycle parking is located off the street and within the sidewalk. Bicycle parking should not be located directly next to the arena due to high pedestrian volumes. A valet bike system should be considered if there is not adequate space for bike racks within the sidewalk.

Appendices

Appendix A – Volume Redistributions
Appendix B – Modal Split and Vehicle Occupancy Research
Appendix C – Arrival and Departure Curves
Appendix D – Analysis Assumptions and Results

Appendix A – Volume Redistributions



Route	Cars	Percentage
1	33	0.24%
2	2,514	18.49%
3	2	0.02%
4	2,999	22.06%
5	1,686	12.40%
6	17	0.13%
7	1,677	12.33%
8	2,887	21.23%
9	49	0.36%
10	1,733	12.74%

1.5 0 1.5
Miles

LANGAN
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com

Project
76 PLACE
PHILADELPHIA
PHILADELPHIA COUNTY PENNSYLVANIA

Figure Title
TICKET HOLDER ROUTES

Project No. 220173501
Date 9/29/2022
Scale 1"=1.5 miles
Drawn By MG
Figure No. 1

Path: \\langan.com\data\PHL\data5\220173501\Project Data\ArcGIS\APRX\220173501 - Traffic\220173501 - Traffic.aprx Date: 9/29/2022 User: mgeorgalas Time: 6:51 PM

LEGEND

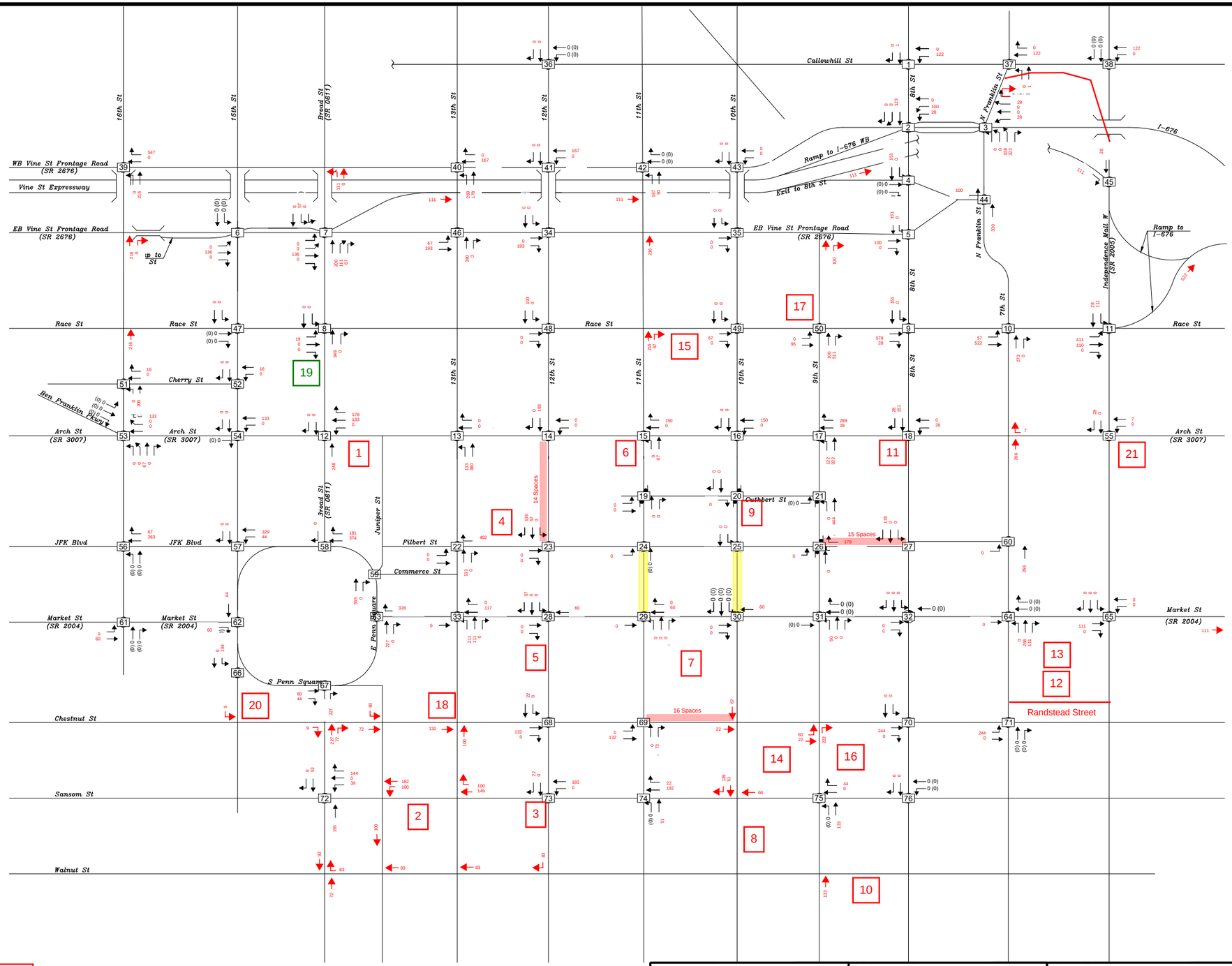
TRAFFIC SIGNAL
STOP SIGN
PRE-EVENT TRAFFIC VOLUMES (POST-EVENT TRAFFIC VOLUMES)

X Employee Only Parking Garage Location

X Parking Garage Location

Proposed Road Closure

Assumptions:
- 40% Auto, 40% Public Transit, 10% Ride-Hail, 10% Walk/Other
- 2.5 Vehicle Occupancy



Total Friday Post-Game
Auto Vehicle Trips - 2220 vehicles
Employee Vehicle Trips - 82 vehicles
Rideshare Vehicle Trips - 555 vehicles

LANGAN
Langan Engineering and Environmental Services, Inc.
1818 Market Street, Suite 3300
Philadelphia, PA 19103
T: 215.845.8900 F: 215.845.8901 www.langan.com

Project
76 PLACE
PHILADELPHIA
PHILADELPHIA COUNTY PENNSYLVANIA

Figure Title
SITE-GENERATED FRIDAY POST-EVENT PEAK TRAFFIC VOLUMES

Project No. 220173501
Date 2023-08-16
Drawn By AL
Checked By BMW

Figure No. E-52
Sheet 52 of 197

Filename: \\langan.com\data\PHL\data5\220173501\Project Data_Discipline\Traffic\Capacity Analysis\Volume Maps\Traffic\Report Figures.dwg Date: 8/16/2023 Time: 10:46 User: adas Style Table: Langan.stb Layout: SGTV_FRI_PRE_POS_T

Appendix B – Modal Split and Vehicle Occupancy Research

TIS Data

Table 2: Arena Spectators Mode Split and Average Vehicle Occupancy Comparison

Travel Mode	Arena Spectator-Generated Trip Mode Split						
	Barclays Center Weekend Sports Event (Brooklyn, NY)[1]	Madison Square Garden Weeknight Sports Event (Manhattan, NY)[2]	USTA Billie Jean King National Tennis Center (Queens, NY)[3]	Chase Center Weekday Sports Event (San Francisco, CA)[4]	Chase Center Weekend Sports Event (San Francisco, CA)[4]	Average of Existing Facilities	Proposed Arena (Philadelphia, PA)
Auto	32.1%	33.7%	25.9%	54.3%	53.3%	45.4%	**40.0%**
Taxi or Rideshare	6.4%	9.6%	11.9%				**10.0%**
Public Transit	49.8%	46.5%	54.4%	45.7%	46.7%	54.6%	**40.0%**
Charter Bus	2.2%	0.0%	4.2%				**0.0%**
Walk-Only/Other	9.5%	10.2%	3.6%				**10.0%**
Total	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	***100%***
Travel Mode	**Arena-Generated-Trip Average Vehicle Occupancy**						
Auto	3.22	2.20	2.01	N / A	N / A	2.48	**2.50**
Taxi or Rideshare	2.82	2.50	1.67			2.33	**2.50**

Notes:

(1) Barclays Center patron surveys at three weekend evening Nets games in January and February 2013, as reported in the *Barclays Center TDM Plan* .

(2) Madison Square Garden travel surveys conducted by Sam Schwartz in 2003 as part of the *Hudson Yards FGEIS* .

(3) USTA patron surveys in 2010 and 2011 and other documents as reported in the *USTA Billie Jean King National Tennis Center Strategic Vision FEIS* .

(4) Auto and non-auto mode share as presented in the *2019-2020 Chase Center Annual Transportation Reporting* document.

Independent Analysis Data

76 Place Modal Split Research Summary - All Facilities		Modal Split				Vehicle Occupancy		Walk[12]	Transit[12]	Bike[12]
Facility and Location	**Data Year**	**Auto**	**Transit**	**Taxi/Ridehail**	**Other**	**Auto**	**Taxi/Rideshare**	**Score**	**Score**	**Score**
Barclays Center - Brooklyn, NY (Weekend Sports Event)[1]	2013	32.1%	49.8%	6.4%	11.7%	3.22	2.82	99	100	93
Madison Square Garden - Manhattan, NY (Weeknight Sports Event)[1]	2003	33.7%	46.5%	9.6%	10.2%	2.20	2.50	99	100	93
USTA Billie Jean King National Tennis Center - Queens, NY[1]	2010-2011	25.9%	54.4%	11.9%	7.8%	2.01	1.67	40	85	49
Chase Center - San Francisco, CA (Weekday Sports Event)[1]	2019-2020	54.3%	45.7%	N/A	N/A	N/A	N/A	87	73	98
Chase Center - San Francisco, CA (Weekend Sports Event)[1]	2019-2021	53.3%	46.7%	N/A	N/A	N/A	N/A	87	73	98
Oracle Park (AT&T Park) - San Francisco, CA (Weekday Evening Sports Event)[2]	2007	54.0%	36.5%	1.5%	8.0%	2.67	N/A	88	82	90
Audi Field - Washington, DC (Weekday Evening Sports Event)[3]	2012	59.0%	36.0%	1.0%	4.0%	3.15	N/A	69	59	91
Oakland-Alameda County Coliseum - Oakland, CA (Weekday Evening Sports Event)[4]	2017	70.0%	24.0%	6.0%	1.0%	N/A	N/A	49	73	58
Sleep Train Arena - Sacramento, CA[5]	2012	N/A	N/A	N/A	N/A	2.27	N/A	26	28	41
Paycom Center - Oklahoma City[6]	2024	N/A	N/A	2.0%	N/A	2.70	N/A	54	66	54
Providence Park - Portland, Oregon[7]	2019	47.0%	33.0%	7.0%	14.0%	2.39	2.50	98	83	87
Lumen Field (CenturyLink Field) - Seattle, Washington[8]	2010	57.1%	27.6%	3.6%	11.6%	2.69	N/A	91	100	92
T-Mobile Park (Safeco Field) - Seattle, Washington[8]	2001	82.0%	8.0%	N/A	11.0%	3.16	N/A	73	98	91
NFL Survey for Central Business District Facilities[10,11]	1994	87.0%	21.0%	N/A	N/A	3.10	N/A	N/A	N/A	N/A
Average (All Facilities)		**55%**	**36%**	**5%**	**9%**	**2.69**	**2.37**	**73**	**79**	**78**
Average (Arenas used in TIS)		**40%**	**49%**	**9%**	**10%**	**2.48**	**2.33**	**81**	**90**	**83**
Average (Without NFL Survey)		**52%**	**37%**	**5%**	**9%**	**2.65**	**2.37**	**73**	**79**	**78**
Average (Without NFL)		**51%**	**38%**	**6%**	**8%**	**2.64**	**2.37**	**71**	**77**	**77**
Average (Without MLB)		**50%**	**40%**	**6%**	**10%**	**2.64**	**2.37**	**74**	**77**	**78**
Arena Average (Without MLB, NFL & MLS)		**37%**	**49%**	**7%**	**10%**	**2.48**	**2.33**	**68**	**75**	**71**
Proposed in 76 Place TIS Report		**40%**	**40%**	**10%**	**10%**	**2.50**	**2.50**	**99**	**100**	**77**

Notes:

The data shown is based on modal split information collected at each existing facility through direct correspondence from the facility or other methods outlined in each referenced report.

1. From *Transportation Impact Study 76 Place* prepared by Langan Engineering & Environmental Services, Inc. last revised September 15, 2023.
2. From *Draft Subsequent Environmental Impact Report* prepared by the Office of Community Investment and Infrastructure, dated June 5, 2015.
3. From *Draft Transportation Management Plan D.C. United Stadium* prepared by Gorove/Slade dated September 23, 2014.
4. From *Howard Terminal Draft Transportation Management Plan* prepared by Fehr & Peers, dated December 2020.
5. From *Transportation Management Plan for the Golden 1 Center* prepared by Fehr & Peers, dated September 2016.
6. From January 16, 2024 email correspondence with Paycom Center.
7. From *Providence Park Comprehensive Transportation Management Plan 2019 Season Report* dated January 2020.
8. From *Seattle Arena Multimodal Transportation Access and Parking Study* prepared by Horton Street, LLC dated May 23, 2012.
9. From *Transportation Management Plan - D.C. Major League Baseball Park* prepared by Gorove/Slade Associates, Inc. dated April 13, 2006.
10. From *Stadium Transportation Study NFL Stadium Survey* prepared by RK&K, The Wilson T. Ballard Co. and JMT, dated June 1994.
11. The following facilities are included: Georgia Dome in Atlanta, Soldier Field in Chicago, Riverfront Stadium in Cincinnati, Cleveland Stadium in Cleveland, Hoosier Dome in Indianapolis, LA Memorial Coliseum in Los Angeles, HH Humphrey Metrodome in Minnesota, Louisiana Superdome in New Orleans, Three Rivers Stadium in Pittsburgh, Kingdome in Seattle.
12. Walk, transit and bike scores were obtained from https://www.walkscore.com

Appendix C – Arrival and Departure Curves

Figure 2: Arena Spectator Arrival and Departure Trips

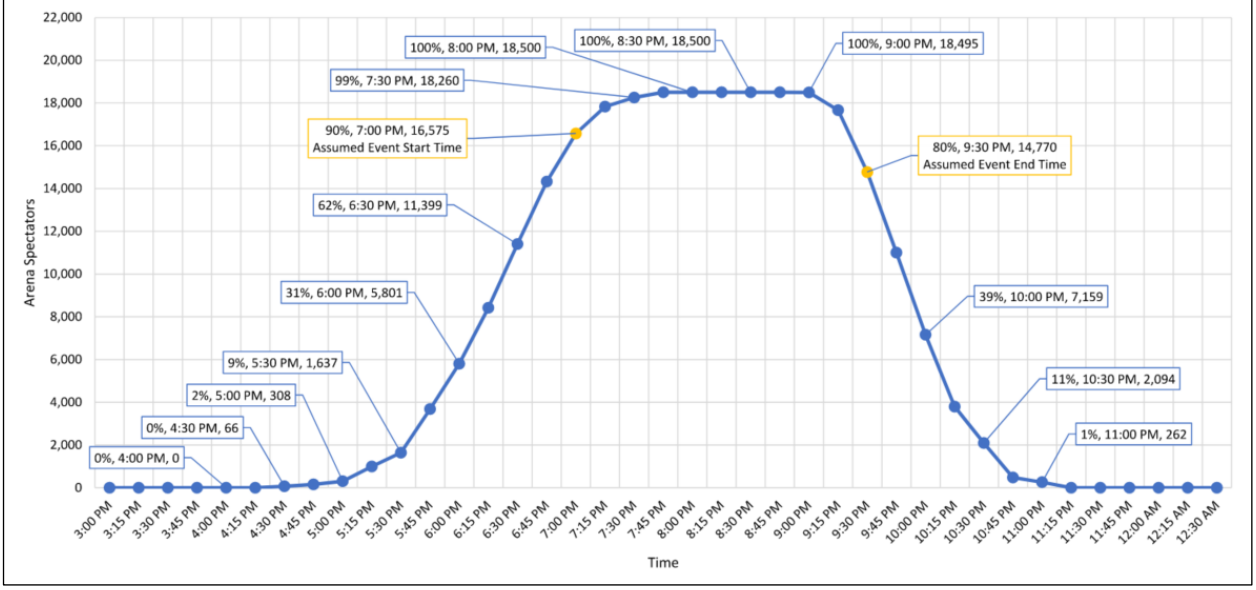
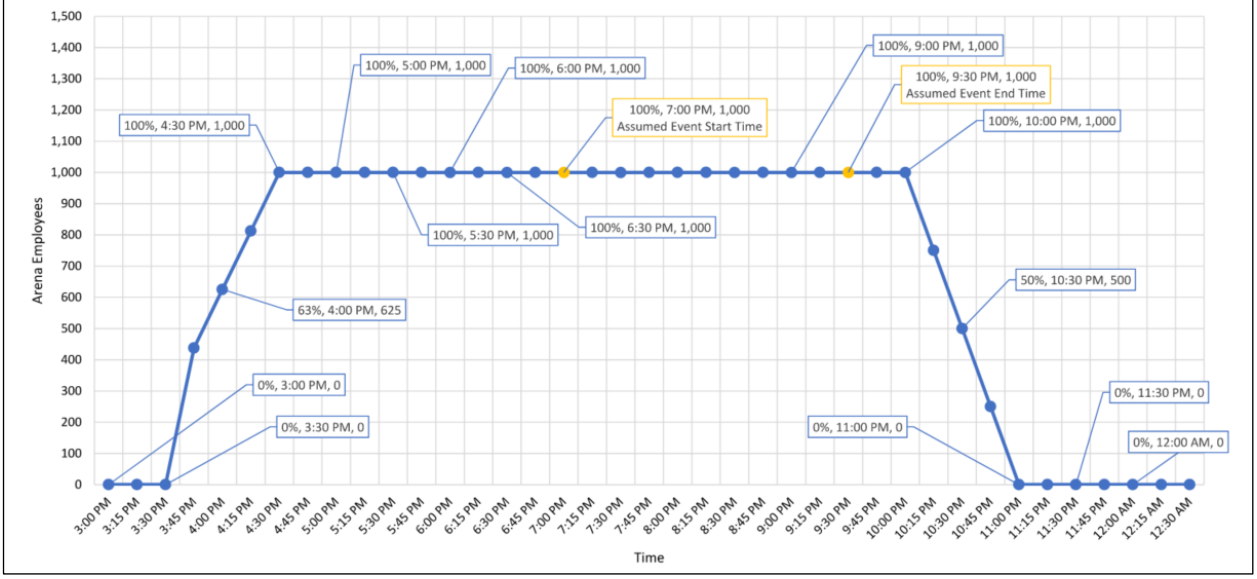


Figure 3: Arena Employee Arrival and Departure Trips



Appendix D - Analysis Assumptions and Results

76 Place Independent Analysis
Synchro Model Adjustments for Friday Post Event Peak Hour

General

- Updated all intersections to be CBD (Central Business District)
- Updated all speed limits per PA One Map
- Adjusted Positional Distances to reflect accurate lane usage
- Node 124
    - Changed Lane Alignment from Left to Right for proper utilization
- Intersection 22
    - Changed Lane Alignments to -NA for proper utilization

Volumes

- Adjusted volumes to be consistent with modifications identified as part of independent analysis
- Added volumes @ Node 102 for sim traffic purposes.
- Added dummy volumes at added intersections (139, 145, 128) to balance volumes.
- Intersection 19
    - Removed SBR volume (8) to satisfy simtraffic fatal error.
- Intersection 20
    - Removed WBR volume (4) to satisfy simtraffic fatal error.

Geometry

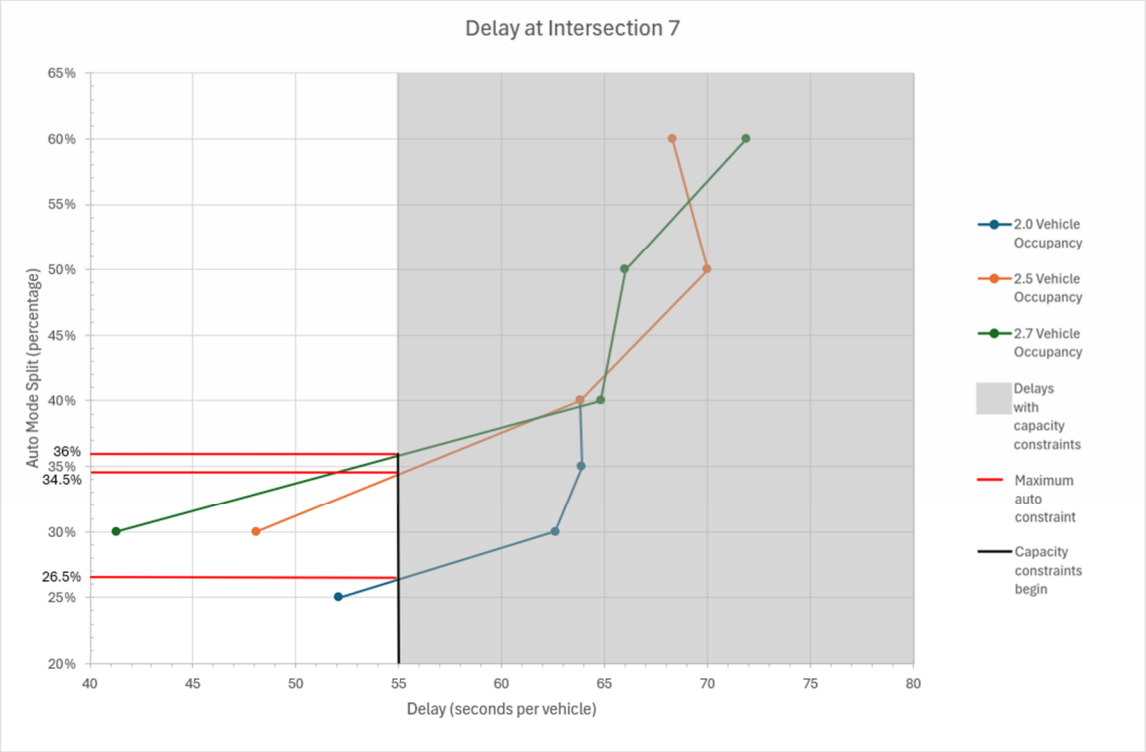
- Added Chestnut St/9th St intersection to the network
- Added Chestnut St/10th St intersection to the network
- Added signalized intersection on Broad St @ Cherry St
- Added merge from 2 to 1 lanes on I-676 On-Ramp @ Intersection 2
    - Node 121; Adjusted Simulation Setting “Positioning Distance” to 150’.
- Removed Stop Sign for SER at Intersection 45
- Intersection 20
    - Changed shared SB right/thru to a thru and moved the left turn volume to the thru
- Intersection 21
    - Changed NB shared thru/left to thru
- Intersection 29
    - Removed WBR
    - Changed NB shared thru/left and thru/right to exclusive left and right turns
- Intersection 63
    - Updated WBR to a dual WBR to match field conditions. Existing conditions have a bus only right turn that traffic uses when congested.
- Intersections 3 and 7
    - Updated geometry to match field conditions (added ramp)

        - Changed shared left thru for sim traffic to act as it would in existing condition
- Intersection 10
    - Added N Franklin/Race St Intersection for EBL
- Intersection 54
    - Added WBL 100' turn lane
- Updated geometry for Broad St

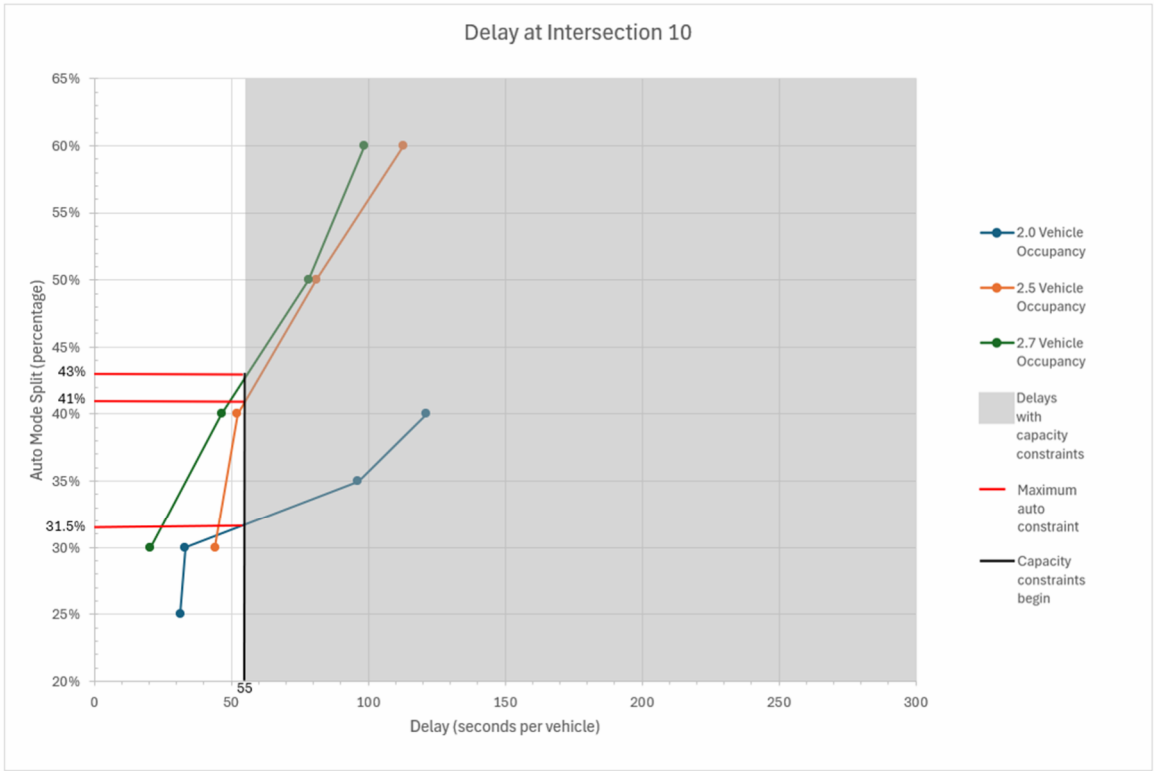
Timings

- Updated JFK/16th St signal timings per the As-Built Plan from Love Park Project (3 Seconds added to WB All Red)
- Updated Intersection 59 Ped Phase 4 from 2s of yellow to 3s to satisfy Y+AR greater than or equal to 3.
- Updated Intersection 66 Ped Phase 4 from 2.5s of yellow to 3s to satisfy Y+AR greater than or equal to 3.
- Pulled timings from TSAMS for new INTs: 139, 145, 128
- Intersection 26
    - Changed Reference Phase from 2+6 Unassigned to 2 – NBT
- Intersection 54
    - Reference Phase changed from 2+6 Unassigned to 6 – SBT
- Intersection 2
    - Modified Splits by a few seconds
- Intersection 44
    - Updated cycle length to 90s

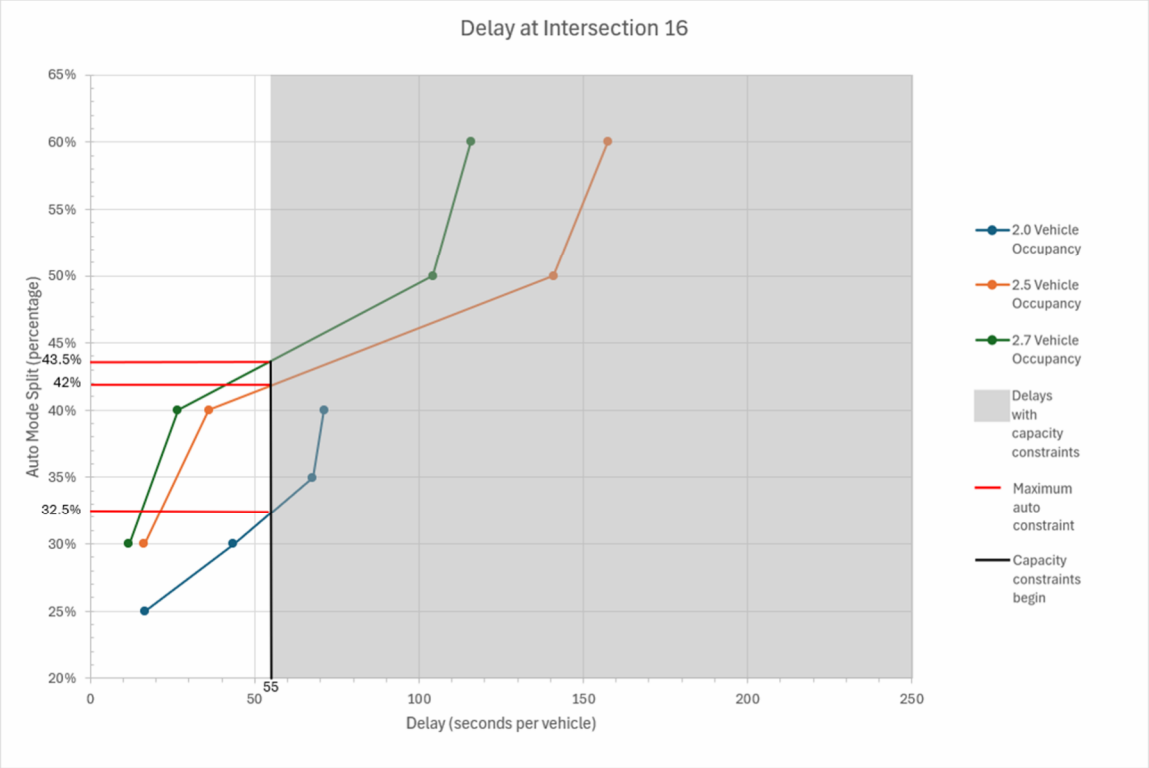
Intersection 7: Broad Street and Eastbound Vine Street Frontage Road



Intersection 10: 7th Street and Race Street



Intersection 16: 10th Street and Arch Street



Intersection 72: Broad Street and Sansom Street

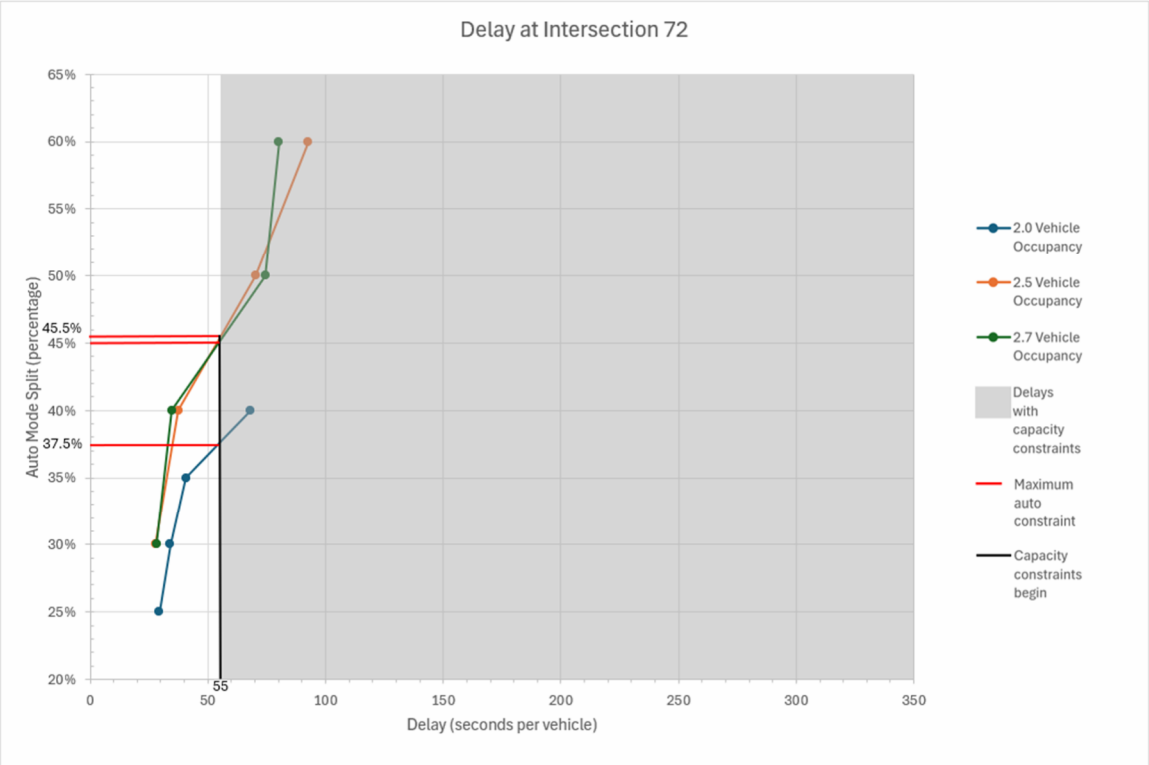


Table 1
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 30% Auto, 50% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	E (78.8)	D (48.1)	90	#435	400
Overall LOS	C (34.7)	D (44.7)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (13.1)	F (115.2)	630	113	517
Northbound Right Turn	B (11.9)	D (44.1)	630	59	498
Overall LOS	B (10.1)	D (50.8)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (13.1)	B (16.3)	365	128	202
Overall LOS	B (13.7)	B (19.1)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (37.8)	C (27.8)	205	#384	267
Westbound Approach[2]	B (19.3)	C (32.8)	240	303	374
Overall LOS	C (30.6)	C (32.7)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 2
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 40% Auto, 40% Transit, 20% Other

Intersection / Movement	LOS (delay) per TIS from Synchro (seconds per veh)	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per TIS from Synchro (feet)[4]	95th Percentile Queue per JMT from Synchro (feet)[4]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd							
Northbound Right Turn[1]	C (25.2)	F (110.7)	E (63.8)	90	149	#498	494
Overall LOS	C (23.8)	D (41.1)	D (47.2)	-	-	-	-
Intersection 10 7th St & Race St							
Northbound Through	B (12.4)	B (13.6)	F (134.9)	630	103	127	560
Northbound Right Turn	B (18.7)	B (11.9)	D (52.2)	630	214	59	541
Overall LOS	B (11.5)	B (11.1)	E (59.4)	-	-	-	-
Intersection 16 10th St & Arch St							
Westbound Approach[2]	A (8.5)	B (12.8)	C (36.0)	365	60	129	334
Overall LOS	A (9.8)	B (13.5)	C (33.7)	-	-	-	-
Intersection 72 Broad St & Sansom St							
Northbound Through	C (34.0)	D (39.5)	D (37.5)	205	324	#400	279
Westbound Approach[3]	C (25.1)	C (21.7)	E (76.2)	240	#417	351	848
Overall LOS	C (29.8)	C (31.8)	D (49.5)	-	-	-	-

1: TIS Synchro modeled two through lanes and one shared through/right turn lane. Based on existing field conditions, JMT Synchro modeled two through lanes and one right turn lane.
2: Westbound approach consists of one shared left turn/through lane and one through lane.
3: Westbound approach consists of one shared left turn/through/right turn lane.
4: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 3
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 50% Auto, 30% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	F (151.6)	E (70.7)	90	#560	473
Overall LOS	D (49.7)	D (48.5)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (14.2)	F (195.7)	630	144	610
Northbound Right Turn	B (11.9)	F (81.1)	630	59	634
Overall LOS	B (12.2)	F (80.2)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (12.9)	F (140.9)	365	147	499
Overall LOS	B (13.5)	F (105.5)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (41.8)	E (70.2)	205	#416	280
Westbound Approach[2]	C (25.3)	F (219.2)	240	#422	1198
Overall LOS	C (33.6)	F (97.2)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 4
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 60% Auto, 20% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	F (197.3)	E (68.6)	90	#624	513
Overall LOS	E (60.2)	D (49.5)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (14.9)	F (265.0)	630	161	599
Northbound Right Turn	B (11.9)	F (113.0)	630	59	637
Overall LOS	B (13.2)	F (95.6)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (13.3)	F (157.5)	365	#162	506
Overall LOS	B (13.7)	F (121.9)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (44.4)	F (92.6)	205	#431	276
Westbound Approach[2]	C (30.0)	F (314.7)	240	#519	1181
Overall LOS	D (36.0)	F (128.1)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 5
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game, 10th and 11th Street One Lane Closed – 40% Auto, 40% Transit, 20% Other

Intersection / Movement	LOS (delay) per TIS from Synchro (seconds per veh)	LOS (delay) per TIS from SimTraffic (seconds per veh)[3]	Existing Storage Length (feet)	95th Percentile Queue per TIS from Synchro (feet)[4]	95th Percentile Queue per TIS from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	D (35.8)	-	90	#278	223
Overall LOS	C (20.2)	-	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (12.4)	-	630	103	585
Northbound Right Turn	B (18.6)	-	630	213	580
Overall LOS	B (13.0)	-	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (11.7)	-	365	75	102
Overall LOS	B (12.2)	-	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	C (22.9)	-	205	275	288
Westbound Approach[2]	D (47.2)	-	240	#526	988
Overall LOS	C (28.5)	-	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The TIS did not provide delay results from SimTraffic.
4: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 6
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game, 10th and 11th Street Full Closure – 40% Auto, 40% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	F (110.7)	E (66.9)	90	#498	502
Overall LOS	D (41.1)	D (48.3)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (13.6)	F (161.3)	630	127	583
Northbound Right Turn	B (11.9)	E (62.6)	630	59	564
Overall LOS	B (11.2)	E (67.6)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (12.6)	B (12.9)	365	116	143
Overall LOS	B (12.6)	B (13.3)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (39.5)	C (28.8)	205	#400	272
Westbound Approach[2]	B (15.7)	C (27.6)	240	222	323
Overall LOS	C (31.3)	C (31.7)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 7
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 30% Auto, 50% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	E (72.9)	D (41.3)	90	#421	313
Overall LOS	C (32.9)	D (41.4)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (13.0)	D (48.9)	630	110	351
Northbound Right Turn	B (11.9)	C (20.5)	630	59	299
Overall LOS	A (9.8)	C (25.2)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (13.2)	B (11.7)	365	127	149
Overall LOS	B (13.8)	B (16.4)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (37.2)	C (28.3)	205	#379	270
Westbound Approach[2]	B (18.7)	C (32.2)	240	291	394
Overall LOS	C (30.2)	C (33.1)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 8
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 40% Auto, 40% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	F (99.9)	E (62.2)	90	#480	492
Overall LOS	D (38.4)	D (46.7)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (13.5)	F (120.3)	630	124	541
Northbound Right Turn	B (11.9)	E (58.9)	630	59	520
Overall LOS	B (10.7)	E (54.9)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (12.9)	C (32.3)	365	128	299
Overall LOS	B (13.6)	C (30.9)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (38.6)	D (38.3)	205	#392	288
Westbound Approach[2]	C (20.9)	E (84.2)	240	335	882
Overall LOS	C (31.2)	D (50.8)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 9
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 50% Auto, 30% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	F (137.1)	E (66.0)	90	#538	508
Overall LOS	D (46.1)	D (47.4)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (14.0)	F (240.0)	630	138	602
Northbound Right Turn	B (11.9)	E (78.3)	630	59	608
Overall LOS	B (11.7)	E (82.5)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (12.8)	F (104.2)	365	138	467
Overall LOS	B (13.5)	E (78.6)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (40.3)	E (74.4)	205	#406	279
Westbound Approach[2]	C (23.7)	F (200.5)	240	384	1191
Overall LOS	C (32.6)	F (96.3)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 10
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 60% Auto, 20% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	F (177.0)	E (71.9)	90	#596	478
Overall LOS	D (55.0)	D (48.8)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (14.6)	F (242.7)	630	153	584
Northbound Right Turn	B (11.9)	F (98.6)	630	59	637
Overall LOS	B (12.7)	F (92.3)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (13.1)	F (115.8)	365	158	516
Overall LOS	B (13.6)	F (96.6)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (42.5)	F (80.2)	205	#420	280
Westbound Approach[2]	C (27.6)	F (263.2)	240	#490	1222
Overall LOS	C (34.6)	F (110.5)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 11
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 25% Auto, 55% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	F (82.3)	D (52.1)	90	#443	451
Overall LOS	D (37.5)	D (46.8)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (13.2)	F (83.2)	630	114	446
Northbound Right Turn	B (11.9)	C (31.4)	630	59	418
Overall LOS	B (10.6)	D (38.0)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (13.1)	B (16.7)	365	129	199
Overall LOS	B (13.7)	B (18.9)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (39.5)	C (29.5)	205	#400	277
Westbound Approach[2]	B (19.8)	D (35.1)	240	313	425
Overall LOS	C (31.5)	C (34.1)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 12
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 30% Auto, 50% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	F (101.4)	E (62.6)	90	#482	508
Overall LOS	D (41.3)	D (47.3)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (13.5)	F (106.6)	630	124	508
Northbound Right Turn	B (11.9)	C (33.1)	630	59	436
Overall LOS	B (11.2)	D (45.5)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (12.9)	D (43.5)	365	130	333
Overall LOS	B (13.6)	C (34.3)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (40.9)	C (34.0)	205	#410	283
Westbound Approach[2]	C (21.4)	D (54.3)	240	345	702
Overall LOS	C (32.4)	D (41.4)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 13
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 35% Auto, 45% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	F (126.5)	E (63.9)	90	#524	485
Overall LOS	D (46.6)	D (48.9)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (13.8)	F (200.4)	630	134	602
Northbound Right Turn	B (11.9)	F (96.2)	630	59	614
Overall LOS	B (11.9)	E (77.4)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (12.8)	E (67.6)	365	133	464
Overall LOS	B (13.5)	E (61.4)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (42.3)	D (40.7)	205	#419	283
Westbound Approach[2]	C (23.3)	F (99.9)	240	380	1018
Overall LOS	C (33.5)	E (57.4)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 14
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 40% Auto, 40% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	F (151.6)	E (63.8)	90	#560	499
Overall LOS	D (52.0)	D (47.5)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (14.2)	F (199.0)	630	144	605
Northbound Right Turn	B (11.9)	F (121.2)	630	59	640
Overall LOS	B (12.6)	F (83.6)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (12.9)	E (71.1)	365	147	418
Overall LOS	B (13.5)	E (56.3)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (43.9)	E (68.3)	205	#428	278
Westbound Approach[2]	C (25.7)	F (243.0)	240	#438	1224
Overall LOS	C (34.7)	F (102.3)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 15
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 50% Auto, 30% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	F (208.0)	E (70.7)	90	#637	442
Overall LOS	E (65.0)	D (49.8)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (15.1)	F (300.8)	630	165	566
Northbound Right Turn	B (11.9)	F (131.9)	630	59	629
Overall LOS	B (13.8)	F (101.6)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (13.4)	F (132.1)	365	#163	497
Overall LOS	B (13.8)	F (106.0)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (47.8)	F (84.8)	205	#447	263
Westbound Approach[2]	C (32.6)	F (305.9)	240	#541	1189
Overall LOS	D (38.2)	F (121.7)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

Table 16
76 Place Transportation Impact Study
Peak Hour Levels Of Service (LOS)
Build Friday PM Post Game – 60% Auto, 20% Transit, 20% Other

Intersection / Movement	LOS (delay) per JMT from Synchro (seconds per veh)	LOS (delay) per JMT from SimTraffic (seconds per veh)	Existing Storage Length (feet)	95th Percentile Queue per JMT from Synchro (feet)[3]	95th Percentile Queue per JMT from SimTraffic (feet)
Intersection 7 Broad St/EB Vine St Frontage Rd					
Northbound Right Turn	F (266.7)	E (70.0)	90	#715	466
Overall LOS	E (79.7)	D (50.0)	-	-	-
Intersection 10 7th St & Race St					
Northbound Through	B (16.0)	F (291.0)	630	188	525
Northbound Right Turn	B (11.9)	F (173.3)	630	59	569
Overall LOS	B (15.0)	F (106.3)	-	-	-
Intersection 16 10th St & Arch St					
Westbound Approach[1]	B (13.8)	F (169.9)	365	#160	478
Overall LOS	B (14.1)	F (125.8)	-	-	-
Intersection 72 Broad St & Sansom St					
Northbound Through	D (52.6)	F (85.8)	205	#465	265
Westbound Approach[2]	D (43.8)	F (311.7)	240	#612	1062
Overall LOS	D (43.4)	F (122.5)	-	-	-

1: Westbound approach consists of one shared left turn/through lane and one through lane.
2: Westbound approach consists of one shared left turn/through/right turn lane.
3: The "#" indicates that the 95th percentile volume exceeds capacity, queue may be longer.

MEMORANDUM

TO: Michael Carroll, PE
DATE: April 8, 2024
FROM: Tony Rauso, PE & Joanne Arellano, PE, PTOE
CC: Adam Smith, PE, PTOE & Richard Montanez, PE
PROJECT: 76 Place
JMT JOB NO.:19-03842-003
RE: 76 Place Transportation Impact Study Independent Analyses – Parking

---

The following memorandum summarizes our team's independent sensitivity analysis for parking based on our approach discussed in the Executive Summary, dated January 5, 2024. Below is a summary of what analyses were performed in the 76 Place Transportation Impact Study (TIS), originally dated November 11, 2022, revised March 12, 2024, the 76 Place Transportation Event Management Plan (TEMP), dated March 2024, the independent sensitivity analysis performed by JMT, and recommendations for parking and truck loading operations.

SUMMARY OF KEY FINDINGS AND ASSUMPTIONS

Verified TIS Assumptions

- The TIS determined the proposed arena and associated residential development would require 3,470 parking spaces. The TIS selected 21 existing parking garages which, assuming a baseline utilization of 65%, have 3,561 available parking spaces that could be used.
- **Parking supply during concurrent events is adequate in the Washington Square West Neighborhood.** Actual parking garage utilization from Holiday 2023 dates have verified TIS assumptions and analysis.
- Two parking garages are proposed to be utilized by 76 Place in Chinatown. **The 65% utilization proposed in the TIS for the parking garages to be utilized in Chinatown was verified** by a 2017 Philadelphia Chinatown Development Corporation parking study. Additional recommendations regarding Chinatown impacts are located on page 2.

(continued on next page)

SUMMARY OF KEY FINDINGS AND ASSUMPTIONS (CONTINUED)

Modified TIS Assumptions

- The volume distributions proposed in the TIS do not accurately represent ticket holder routes, garage utilization based on spectator origins and possible spectator travel routes. As part of the independent sensitivity analysis, spectator auto volumes were redistributed to better reflect these parameters.
- The TIS assumed a vehicle occupancy of 2.5. **A vehicle occupancy equal to or lower than 2.4 would exceed** the garage capacity proposed in the TIS**.**
- Approximately **900 additional parking spaces (based on a 65% utilization rate) could be provided** in four additional parking garages (Gateway Garage, Love Park Garage, Center Square Garage and Family Courthouse Garage).
- **Truck access for loading and unloading will be underground** per the TIS. Specifying loading times during overnight and off-peak hours could reduce impacts to traffic within the area.

Additional Recommendations Not Included in the TIS

- Additional measures to improve operations include parking garage specific pricing, advance parking pass purchasing, and parking monitoring.
- Encouraging non-auto trips by **integrating free transit passes into event tickets** will lessen the parking demand and improve operations.
- Further investigation into accessible parking space demand and availability in proximity of the arena.
- All of the **on-street parking within Chinatown has a 3-hour restriction** after 4:00 PM from Monday to Saturday. **Recommend restriction be extended to Sunday** and restriction be **reduced to 2-hours from 8:00 AM to midnight**. Also recommend that the cell phone parking applications **not allow parking session extensions**. Chinatown or other neighborhood businesses could provide patrons with reduced parking garage prices through **validated parking**.
- Recommend adding more than the agreed upon 1,000 reserved parking spaces. **Any reserved spaces should not be within Chinatown limits.**
- Parking Garage usage could be more evenly dispersed by **encouraging prepaid parking and/or reservation systems.** Parkway Corporation is working in collaboration with 76 Place to include pre-paid parking reservations with ticket purchases.

The table below is a summary of the key findings and assumptions.

Key Assumption	TIS Approach	Sensitivity Adjustments	Observed Results
Parking Garages	21 locations	25 locations	Increased number of parking spaces/no adverse impacts.
Parking Spaces Available	3,561	4,453	Increased number of parking spaces/no adverse impacts.
Vehicle Occupancy	2.5*	2.0**	Required 650 more parking spaces which is not available within the TIS proposed 21 garages.

* A 2.5 vehicle occupancy was validated based on peer arena research.
** A 2.0 vehicle occupancy was used for sensitivity analysis purposes only.

The following paragraphs provide additional details regarding the methodology utilized for this independent analysis.

PARKING GARAGE UTILIZATION

Parking garage utilization is the number of occupied spaces within a garage that is generated by existing developments. The TIS conducted a parking survey on 31 parking garages in 2022 to determine the average garage utilization. The survey was conducted across multiple Friday and Saturday evenings from 5:30 PM to 7:30 PM. The parking survey determined an average garage utilization of 34% for Friday evenings and 42% for Saturday evenings. From the parking survey, 15 parking garages were projected to be used by the proposed arena development, and 6 additional garages were added to be used, for a total of 21 proposed parking garages. The parking survey locations and summary are included in Appendix A (Table G-1).

In coordination with the Philadelphia City Planning Commission, an overall parking garage utilization of 65% was used by the TIS.

Available Parking Spaces

Using 21 parking garages at a 65% utilization, the TIS determined that 3,561 parking spaces would be available for spectators and arena employees. A map showing the parking garage locations and projected garage assignments is included in Appendix A (Figure G-1 and Table G-2).

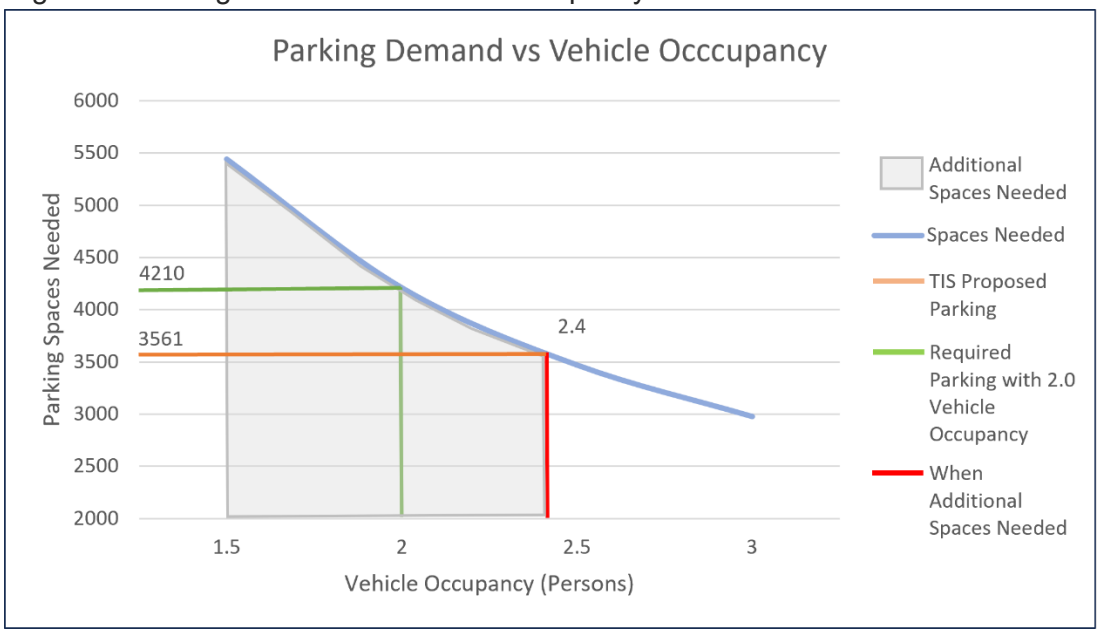
Based on a 40% auto modal split and vehicle occupancy of 2.5 for auto, the TIS determined for a sold-out event, a total of 3,470 parking spaces would be needed. Table 1 shows how the total parking spaces needed value was obtained.

Table 1: Total Parking Spaces Needed

	Spectators	Employees	Residential	Total
Parking Spaces Needed	2,960	328	182	3,470

As part of the independent sensitivity analysis, the team reviewed a range of values to determine the potential impact of variation in vehicle occupancy. A lower vehicle occupancy for spectators traveling by auto would require additional parking spaces. Based on a vehicle occupancy of 2.0 and a 40% modal split for auto, spectators would need 3,700 parking spaces. Including 328 spaces for employees and 182 spaces for residential, a total of 4,210 parking spaces would be needed. Figure 1 shows the parking demand based on vehicle occupancy and where additional parking spaces are needed.

Figure 1: Parking Demand vs Vehicle Occupancy



As shown in Figure 1, additional parking spaces would be needed with a vehicle occupancy of 2.4 and below.

ACCESSIBLE PARKING

The TIS did not propose any recommendations for accessible parking. As part of the independent analysis, the availability of accessible parking spaces within 1,000 feet of the new arena was studied. This boundary was established as between Broad Street/Penn Square, and 8th Street west and east, and between Spring Street and Walnut Street, north and south. The study area can be seen in Appendix B.

All City Streets within the study area were surveyed through desktop review for on-street accessible parking. In addition to on-street parking, parking garages within 1,000 feet were also considered to contribute to the overall accessible parking spaces total. Fifteen (15) parking facilities were determined to be within 1,000 feet of the new arena. Based on the existing capacity of each facility, the assumed amount of accessible parking spaces was determined based on Table 208.2 of the 2010 ADA Standards for Accessible Design,

which provides guidance on ratios between overall parking spaces to accessible parking spaces. In addition, 65% utilization was assumed for these facilities.

For comparison purposes, accessible parking spaces at the existing arena (Wells Fargo Center) were also counted. The results of this analysis are summarized in Table 2.

Table 2: Accessible Parking Spaces

Existing Street-Parking Accessible Spaces	Existing Available Facility Accessible Spaces[1]	Total Existing Accessible Spaces for Arena Use	Proposed Demand for Accessible Spaces at New Arena[2]	Existing Wells Fargo Center Arena Accessible Spaces
40	60	100	195	80

1. Total Available Parking garage ADA spaces = 173 Spaces (based on Table 208.2 of the 2010 ADA Standards). Utilization of 65% yields 60 available ADA Spaces.
2. Minimum Parking Demand based on 18,500-person arena (based on Table 208.2 of the 2010 ADA Standards).

Based on the proposed demand, the TIS should consider adding 95 accessible spaces at the new arena.

GARAGE OCCUPANCY DURING CONCURRENT EVENTS

There are several theaters located south of the proposed project site that utilize parking garages during shows. Some parking garages will need to be utilized by arena spectators and theater spectators at the same time. Parkway Corporation and LAZ Parking PA, which own several parking garages in Philadelphia, provided garage occupancy data during theater shows for some parking garages that are proposed to be utilized by arena spectators. Parkway Corporation and LAZ Parking PA provided data between November 2023 and December 2023 for the 12th and Walnut Garage, the Wanamaker Garage, and the Walnut Towers Garage.

Patriot Parking Inc., which also owns parking lots and garages in Philadelphia, also provided utilization rates during evening periods for their parking garage located at 1308 Sansom Street. This garage is also proposed to be utilized by arena spectators. On typical evenings from Sunday to Wednesday, the approximate utilization is 83%. On typical evenings from Thursday to Saturday, the approximate utilization is 94%.

A map showing the theater locations and parking garages is included in Appendix A (Figure E-23).

Garage Utilization Comparison

The data provided by Parkway Corporation and LAZ Parking PA was analyzed to determine the parking garage utilization during peak theater events. Walnut Street Theatre held 50 events between November 21st, 2023, and December 29th, 2023. These theater

events occurred weekly, Tuesday through Sunday. Data from 30 events were considered for weekday evening events, and data from 12 events were considered for Saturday events. Events occurring on Sunday were not included as part of the analysis. Theater events occurred at several set times each week, including 2:00 pm, 7:00 pm, 7:30 pm and 8:00 pm. There were also 2 Saturday events that occurred at 11:00 am and 4:00 pm.

The Kimmel Cultural Campus, which includes the Kimmel Center, Academy of Music, Miller Theater and Forrest Theatre, held several events between November 22nd, 2023 and December 31st, 2023. Events mainly occur at 7:00 pm, 7:30 pm and 8:00 pm. There are several event dates and times that occur concurrent with Walnut Theater Events and would require patrons to utilize some of the same parking garages.

There are several dates in December with overlapping theater events at the Walnut Street Theatre and Kimmel Cultural Campus theaters. Theater goers attending these events would utilize some of the same garages. The data provided by the parking companies was reviewed for these specific dates and times and showed an average parking garage utilization between 46% and 60%. When multiple theater events take place at the same time, parking garage utilization shows an average below 65%. The full Walnut Street Theatre 2023-2024 Mainstage Performance Schedule and 2023 Holiday Season Kimmel Cultural Campus Schedule is included in Appendix C.

Entry and exit times were provided for vehicles utilizing each garage. To account for a wide range of theater patron arrival times, the arrival window analyzed includes two hours prior to each event and thirty minutes after the start of each event. The vehicles were totaled to determine the number of spaces occupied during each show time. The highest number of spaces occupied in each garage during weekday evening events and Saturday events were used to determine the worst-case scenario utilization. Table 3 and Table 4 depict the average weekday and Saturday parking garage utilization for each parking garage during November and December 2023.

Table 3: Weekday Concurrent Event Garage Utilization

	12th St and Walnut Garage	Wanamaker Garage	Walnut Towers Garage	Patriot Parking Garage
Spaces Available	616	660	598	450
Maximum Spaces Occupied	379	379	282	423
Utilization*	**62%**	**57%**	**47%**	**94%**

*Utilization from Patriot Parking Garage was given through correspondence with the garage representative. All other utilization was calculated from the data received from Parkway Corporation and LAZ Parking PA.

Table 4: Saturday Concurrent Event Garage Utilization

	12th St and Walnut Garage	Wanamaker Garage	Walnut Towers Garage	Patriot Parking Garage
Spaces Available	616	660	598	450
Maximum Spaces Occupied	345	434	264	423
Utilization*	**56%**	**66%**	**44%**	**94%**

*Utilization from Patriot Parking Garage was given through correspondence with the garage representative. All other utilization was calculated from the data received from Parkway Corporation and LAZ Parking PA.

The average weekday and Saturday utilization rate during concurrent events of the four garages is 65%. This supports the 65% utilization rate that was used in the TIS. Due to high utilization in the Patriot Parking Garage, the TIS should consider removing this garage as a recommendation and provide another garage recommendation.

PARKING GARAGE DISTRIBUTIONS

As part of the independent analysis, the volumes were redistributed to better reflect the ticket holder routes and ensure vehicles are utilizing garages that are easily accessible based on their origin. The ticket holder route diagram and redistributed auto volume diagrams are shown in Appendix D.

West and Northwest Vehicle Redistributions

The TIS showed 34% of vehicles originating from the west and northwest accessing the network via Vine Street. Volumes were redistributed to reflect some spectators accessing the network via Market Street and 12th Street. Market Street and 12th Street have direct access to parking garages. Redistributing these volumes more accurately reflects routes spectators may take, as all spectators are unlikely to take Vine Street due to possible congestion. 4% of vehicles were redistributed to Market Street and 2% of vehicles were redistributed to 12th Street.

Southern Vehicle Redistributions

The TIS showed no vehicles utilizing Broad Street to access the network. Broad Street is accessible via I-95 northbound, and spectators would be able to easily access parking garages from Broad Street. Volumes were redistributed to reflect spectators from south of the City that may use Broad Street and 13th Street. 5% of vehicles originally using Callowhill Street were redistributed to use northbound Broad Street and 13th Street. These vehicles were distributed to parking garages south of the arena, including garage #2 and garage #18.

6th Street Redistributions

The TIS showed all vehicles originating from I-676 westbound and 20% of vehicles originating from I-95 using 8th Street to access garages. These vehicles were redistributed to have some spectators use 6th Street to access parking garages #12, #13 and #21 on 6th Street and 7th Street. An additional 3% of vehicles were redistributed from Callowhill Street to utilize 6th Street. 6% of vehicles from I-676 westbound that were continuing onto Vine Street were redistributed to 6th Street. The garages on 6th Street and 7th Street are in the direct vicinity of I-95 and I-676 and spectators will be able to easily access on-ramps when leaving events. These redistributions could also reduce congestion on 8th Street.

Additional Garage Locations

There are over 12,000 off-street parking spaces available in Center City Philadelphia. The independent analysis reviewed additional parking garages in the area for potential use by spectators and arena employees. Variations to modal split or vehicle occupancy may result in an increase in needed parking spaces which would not be accommodated within the assigned parking garages listed in the TIS. The additional parking garages assessed include the Gateway Garage, Love Park Garage, Center Square Garage and Family Courthouse Garage. The additional parking garage locations are shown in Appendix A (Figure E-23).

Gateway Garage is located at 15th Street and Spring Street. This garage has 1,050 total spaces. Love Park Garage is located at 15th Street and John F Kennedy Boulevard and has 810 total spaces. Center Square Garage is located on 16th Street between Market Street and Chestnut Street. The garage has 425 total spaces. The Family Courthouse Garage is located on 15th Street between Cherry Street and Arch Street and has 265 total spaces. Assuming 65% utilization, these garages could provide approximately 900 additional parking spaces for spectators and arena employees. Due to variation in vehicle occupancy and modal split, 76 Place should consider adding more than the agreed upon 1,000 reserved spaces. Any reserved spaces should not be within Chinatown limits.

The TIS assigned arena auto trips to nearby parking garages based on likely travel routes of spectators. They assigned vehicles to parking garages within a 5-to-10-minute walk of the proposed arena. The Love Park Garage and Center Square Garage are 0.5 miles from the proposed stadium and the Family Courthouse Garage is 0.6 miles from the proposed arena. These three garages would be a 10-to-15-minute walk. The Gateway Garage is 0.8 miles from the proposed arena and would be approximately a 17-minute walk. This garage is in the direct vicinity of the I-676 on and off ramps and would be easily accessible for spectators from I-676/I-95.

By using additional garages outside the nearby parking zone, more parking spaces would be available for spectators and there would be a reduction in congestion in the general vicinity of the proposed arena. Parking that is further from the arena could have a reduced rate compared to parking facilities close to the arena.

TRUCK LOADING

Currently, truck access to the Fashion District mall is provided by an underground ramp on the southern side of Arch Street between 8th Street and 9th Street. The TIS states that the proposed arena is expected to use the same underground ramp entrance as the shopping mall. The underground loading dock can handle up to 30 tractor trailers.

Other arenas have developed plans to specify how trucks access the sites and define times for loading and unloading. The Sacramento Kings arena, Golden 1 Center, in Sacramento, California has specified designated routes for trucks to use for deliveries. The arena has also specified unloading during overnight hours and has policies during weeknight events to minimize impacts to the evening peak commuter period.

The TIS did not specify loading times for the arena. It has been specified that when trailers are not being used, they will be staged offsite and away from the arena and surrounding community. It is anticipated that equipment and goods for events will be unloaded in advance of arena events and should not conflict with arena traffic. To ensure limited impact to general traffic within the area, it is recommended to schedule truck access during overnight and off-peak times.

NEIGHBORHOOD IMPACTS

Within Chinatown, the TIS has proposed two garages to be utilized for arena events, with a total of 110 spaces assigned. According to a 2017 parking study in Chinatown, parking lot utilization ranges from 63% to 86%. On-street parking was not included in the study. The study noted that parking garage and parking lot usage is underutilized. An additional study in 2018 determined that most parking activity is from 11:00 AM to 11:00 PM on Friday through Sunday and 95% of drivers stay for less than 2 hours. For the two garages within Chinatown proposed to be utilized by spectators, the study noted a 65% utilization for one and did not have data for the other. The TIS uses a 65% utilization rate for all garages to account for other patrons also utilizing the garages.

An additional Chinatown parking study was conducted in March 2024 to gather information regarding on-street parking utilization along Arch Street and Race Street between 7th Street and 10th Street. The study was conducted on Tuesday, Thursday, and Friday over three time periods. In the morning (10:00 AM to 2:00 PM), there was an average utilization of 79.65%. In the afternoon (2:00 PM to 6:00 PM), there was an average utilization of 72.73%. In the evening (6:00 PM to 10:00 PM), there was an average utilization of 64.24%. The study concluded that there is much lower utilization during the evening period at all study locations except the 900 block of Race Street and the 900 block of Arch Street. These two blocks are located close to the proposed arena and have the highest utilization in the evening period of all the study locations.

On-street parking was excluded from the TIS parking analysis and is not recommended for spectators to utilize. To deter spectators from using on-street parking, modifications to on-street parking time restrictions are recommended. In Chinatown, parking restrictions are in place Monday through Saturday. On-street parking within the neighborhood is restricted to 2 hours from 8:00 AM to 4:00 PM and 3 hours after 4:00 PM. Currently, on-street parking in Chinatown is only restricted until 10:00 PM. Spectators may park and remain parked until after 10:00 PM when the restriction is lifted. These spectators would not receive a parking ticket after 10:00 PM while remaining parked for longer than the restriction. To avoid this situation, it is recommended that the 2-hour parking restriction extend from 8:00 AM to midnight. The parking restrictions may limit arena spectators from utilizing on-street parking when attending events as most events last upwards of 2.5 hours. It is also recommended to extend the parking restriction to Sunday.

The March 2024 Chinatown parking study determined that there is a high turnover rate at the on-street parking study locations closest to the arena. This suggests that many vehicles do not stay for extended periods of time and lowering the parking limit to 2 hours would likely work well for these locations.

The Washington Square West neighborhood has several on-street parking restrictions. Walnut Street, Spruce Street and Pine Street have 2-hour limits. Locust Street is restricted to 2 hours from 8:00 AM to 4:00 PM and 3 hours after 4:00 PM. Most streets have parking limits Monday through Saturday which end at 10:00 PM. Walnut Street also has parking restrictions on Sunday. To deter spectators, implementing an overall 2-hour parking restriction Monday through Sunday should be considered. Increasing the restriction until midnight should also be considered.

To ensure vehicles are restricted to the implemented time limits, cell phone parking applications have the ability to restrict users from extending parking over multiple 2-hour parking time periods. For patrons using businesses within Chinatown or other nearby neighborhoods, reduced parking fees could be provided. The reduced parking rates would be effective when a patron received a validated ticket from the business.

ADDITIONAL RECOMMENDATIONS

The TIS proposed a Transportation Event Management Plan (TEMP) that will further mitigate potential impacts during events. The TEMP should be a working document to adapt strategies based on actual event operations. The current version of the TEMP mentions a Parking Management Plan but does not provide details regarding parking facilities and routes. The TEMP could be updated to provide a parking management plan that takes into account the actual parking garage utilization rates and assigns more parking to those with less utilization rates, keeping in mind the roadway network traffic operations.

The additional recommendations provided below were obtained from other stadiums, ballparks, and arenas, and based on additional parking data and should be incorporated into the TEMP.

- Parking Garage Pricing – Parking garage pricing is increased for garages closest to the proposed stadium to encourage spectators to use garages further for the arena and reduce congestion in the vicinity of the arena.

- Season Ticket Holder Parking – Season ticket holders should be given the option to choose whether to purchase pre-paid parking passes or utilize free transit passes for each game. The options should be presented at the time of season ticket purchasing and/or within the weeks prior to the game.

- Advanced/Pre-paid Parking Passes – Allow spectators to purchase parking garage passes when purchasing event tickets. Parking passes can be purchased for specific garage locations to reduce the queuing time at garages. This will also ensure spectators go directly to a specific garage rather than driving around the network looking for an open parking garage. Pre-paid parking could also encourage parking to be more dispersed throughout the network. Parkway Corporation is working in collaboration with 76 Place to integrate parking reservation purchasing with ticket purchases. Parking reservations would be an additional cost on top of event ticket costs.

- Create a series of parking sub-zones within a Parking Management Plan – Parking sub-zones could facilitate parking management and congestion by spreading traffic around and not utilize too much of the available parking spaces in different districts (i.e. Chinatown or Theatre District). Each sub-zone would contain parking garages within a geographic boundary and be assigned a threshold of vehicles that could use the zone without negatively effecting congestion. Once the threshold is exceeded, additional vehicles would be assigned to other sub-zones. The parking sub-zones would be done in coordination with advanced/pre-paid parking passes.

- Managed Parking Plan – Include a Managed Parking Plan in the TEMP to consider a utilization rate higher than 65% for parking garages within Chinatown and the Theater Districts which would reduce the amount of available spaces for the proposed arena.

- Accessible Parking Demand – Coordination with the developer to both assure that adequate accessible parking is provided per ADA guidelines within close proximity to the arena.

- Neighborhood Parking Intrusion Monitoring – Define boundaries of various parking districts to ensure arena parking does not intrude on parking for

residents and patrons of the surrounding neighborhoods. Encourage ticketing for vehicles parking in garages and lots not meant for arena spectators. The Los Angeles Clippers arena enforces ticketing for vehicles without permits who park in certain neighborhoods. Increased posting of appropriate signage indicating the parking restrictions currently included in the Municipal Code will allow the Philadelphia Police Department and/or the Philadelphia Parking Authority to ticket vehicles without a permit.

- Parking Monitoring – Monitor parking garage utilization and conduct fan travel surveys on a regular basis to assess how spectators are arriving at the arena. Develop a parking application that can provide real-time parking garage occupancy to allow spectators to know available parking spaces prior to arrival.

- Traffic Control Personnel – Develop a traffic control personnel location plan to implement during arena events to help control flow of roadways, pedestrians, and shuttle buses nearby to the arena and deter undesirable drop-off activity. The TEMP proposes for the use of police officers and crossing guards to assist with traffic and pedestrian operations and illustrates potential locations for these personnel.

- Shuttle Service – Consider providing shuttle service for parking lots that would be over a 15-minute walk away (0.75 Miles at 3 MPH).

- Website Information – Ensure the arena website contains information regarding the designated parking lots and the recommended driving routes to access those lots. The TEMP does propose a dedicated transportation page on its website that would contain directions to parking lots as well as promote all modes of travel by listing critical information for each.

- Transit Pass with Ticket Purchase – To encourage non-auto travel modes, spectators should receive a transit pass at no extra cost with their event ticket purchase. The TEMP mentions that 76 Place has committed to include transit fares in the price of events at the arena only for season ticket holders for the first year. Consider including transit fares in the price of events at the arena for all spectators for years beyond the first year.

Appendix A – Parking Garage and Theater Locations
Appendix B – Accessible Parking
Appendix C – 2023-2024 Theater Event Schedules
Appendix D – Auto Trip Redistribution

Appendix A – Parking Garage and Theater Locations

Figure G-1: Off-Street Parking Survey Facilities

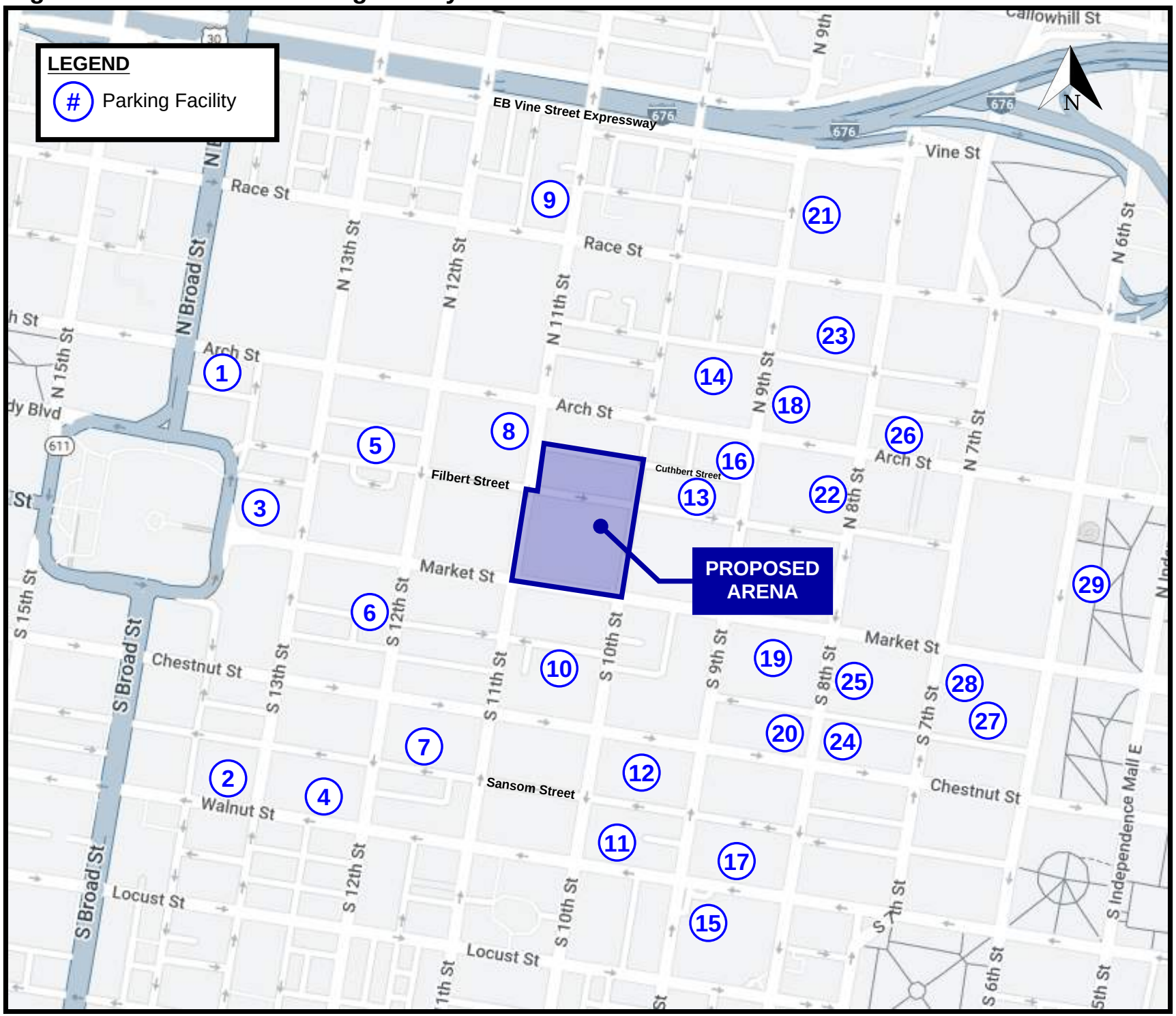


Table G-1: Off-Street Parking Facility Utilization Summary

ID	Name/Operator	Capacity[1,2]	Utilized Spaces		Available Spaces		Utilization Rates	
			Friday[2]	Saturday[2]	Friday[2]	Saturday[2]	Friday[2]	Saturday[2]
1	The Convention Center Parking Facility	584	193	200	391	384	33%	34%
2	Patriot Parking	550	330	385	220	165	60%	70%
3	1301 Market Street	106	71	94	35	12	67%	89%
4	Parkway 12th and Walnut Street	580	304	376	276	204	52%	65%
5	Parkway 12th & Filbert Garage	908	401	638	507	270	44%	70%
6	Loews Philadelphia Hotel Parking	320	160	320	160	0	50%	100%
7	iParkit	61	49	56	12	5	80%	92%
8	Convention Center Garage	658	190	397	468	261	29%	60%
9	Parkway 1127 Race Lot	264	77	103	187	161	29%	39%
10	AutoPark at Jefferson	385	62	90	323	295	16%	23%
11	iParkit 925 Walnut Street	34	13	27	21	7	38%	79%
12	iParkit TJU Lot	69	65	69	4	0	94%	100%
13	The AutoPark at the Fashion District	736	240	239	496	497	33%	32%
14	Hua Da Parking Lot	25	12	11	13	14	48%	44%
15	Parkway Walnut Towers Garage	473	147	124	326	349	31%	26%
16	912 Arch Street Parking Lot	75	36	68	39	7	48%	91%
17	Parkway Walnut Street Theater Lot	143	29	32	114	111	20%	22%
18	Parkway 9th & Arch Lot	129	39	42	90	87	30%	33%
19	8th and Market Lot	206	75	102	131	104	36%	50%
20	8th and Chestnut	80	23	27	57	53	29%	34%
21	E-Z Park	473	206	205	267	268	44%	43%
22	Parkade on 8th	575	101	49	474	526	18%	9%
23	Parkway TUSPM	131	30	29	101	102	23%	22%
24	733 Chestnut Garage	182	21	70	161	112	12%	38%
25	8th and Ludlow	30	23	27	7	3	77%	90%
26	Parkway 8th & Arch Lot	183	17	19	166	164	9%	10%
27	Parkway 100 Independence Mall West	57	15	26	42	31	26%	46%
28	618 Market Street Garage	288	207	234	81	54	72%	81%
29	Autopark Independence Mall (PPA)	590	135	120	455	470	23%	20%
30	Circa Centre	1,704	247	193	1,457	1,511	14%	11%
31	Cira South	392	178	214	214	178	45%	55%
Total		**10,991**	**3,696**	**4,586**	**7,295**	**6,405**	**34%**	**42%**

Notes:
1) Parking spaces available for use on an hourly basis (i.e. excluding all spaces reserved for monthly parkers or others).
2) Parking surveys conducted on May 13, 14, 20, and June 3, 4, 10, 11, 2022.

LEGEND

TRAFFIC SIGNAL

STOP SIGN

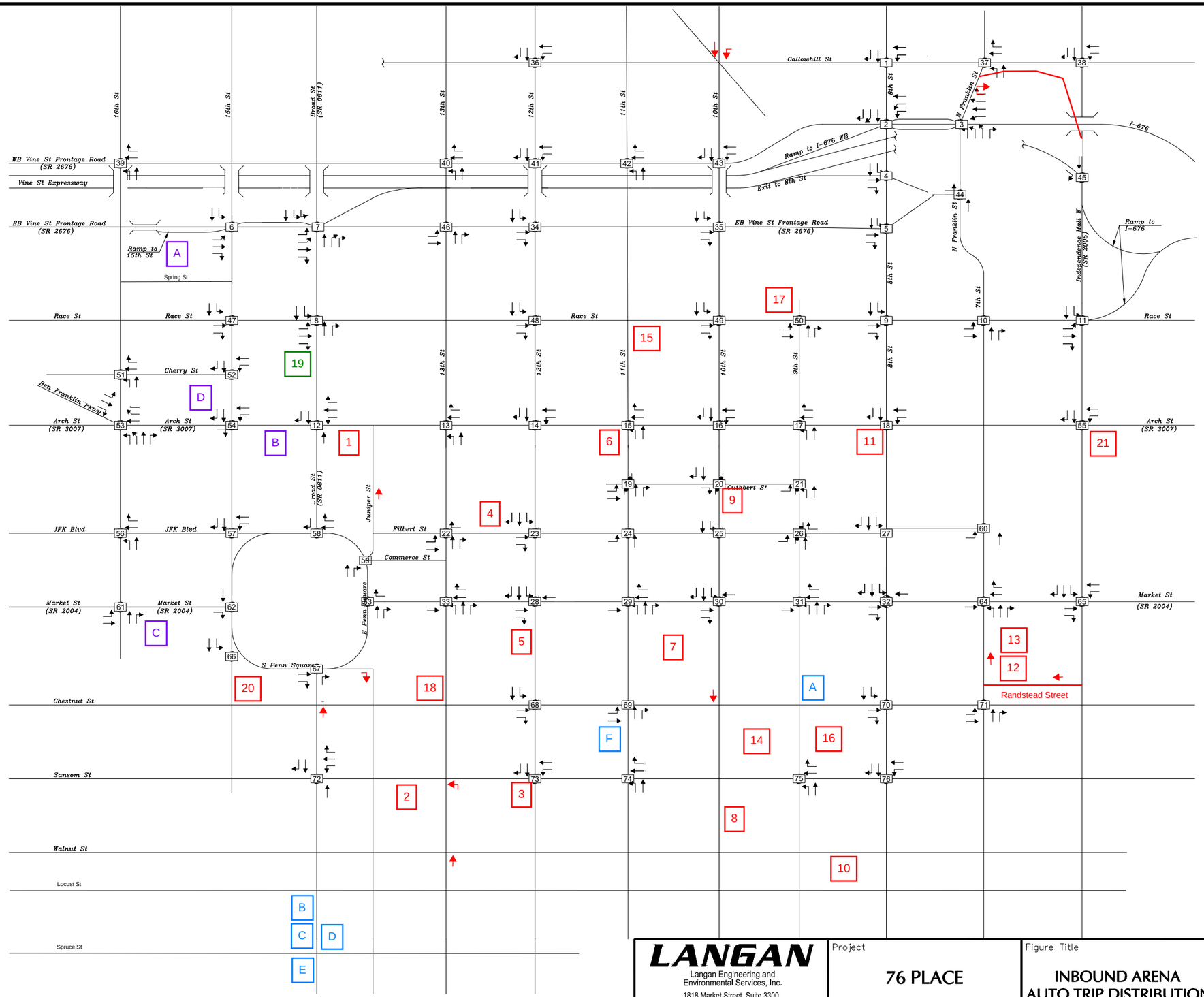
TRAFFIC DISTRIBUTION PERCENTAGE

X Employee Only Parking Garage Location

X Parking Garage Location

X Additional Garage Location

X Theatre Location



LANGAN Langan Engineering and Environmental Services, Inc. 1818 Market Street, Suite 3300 Philadelphia, PA 19103 T: 215.845.8900 F: 215.845.8901 www.langan.com	Project 76 PLACE PHILADELPHIA PHILADELPHIA COUNTY PENNSYLVANIA	Figure Title INBOUND ARENA AUTO TRIP DISTRIBUTION PERCENTAGES	Project No. 220173501 Date 2023-08-16 Drawn By AL Checked By BMW	Figure No. E-23 Sheet 23 of 197	

Filename: \\langan.com\data\PHL\data5\220173501\Project Data_Discipline\Traffic\Capacity Analysis\Volume Maps\Traffic\Report Figures.dwg Date: 8/16/2023 Time: 10:40 User: adas Style Table: Langan.stb Layout: ARENA_AUTO_IN%

Table G-2: Projected Parking Assignments

ID[1]	Name	Address	Capacity[2]	Available Spaces[3]	Assigned Spaces
1	Realen Convention Center Garage	1324-42 Arch Street	540	189	187
2	Patriot 1305 Walnut Garage	1308 Sansom Street	430	151	149
3	Parkway 12th & Walnut Garage	1201 Walnut Street	616	216	214
4	Parkway 12th & Filbert Garage	1201 Filbert Street	862	302	299
5	SP+ Loews Philadelphia Hotel Garage	1200 Market Street	300	105	104
6	SP+ Convention Center Garage	1100 Arch Street	735	257	255
7	PPA AutoPark at Jefferson Garage	14-18 S 10th Street	450	158	156
8	iParkit 925 Walnut Garage	925 Walnut Street	200	70	69
9	PPA The AutoPark at the Fashion District Garage	44 N 9th Street	850	298	295
10	Parkway Walnut Towers Garage	221 S 9th Street	598	209	208
11	PPA Parkade on 8th Garage	801 Filbert Street	1,222	428	424
12	Parkway 100 Independence Mall Garage	655 Ranstead Street	111	39	39
13	Bex Park 618 Market Garage	618 Market Street	330	116	115
14	iParkit Jefferson Garage	107 S 10th Street	676	237	235
15	Park America Chinatown Garage	1030 Race Street	223	78	77
16	The Franklin Garage	879 Sansom Street	151	53	52
17	929 Race Garage	929 Race Street	96	34	33
18	LAZ Parking Wanamaker Garage	1301 Chestnut Street	660	231	229
19	Parkway Broad & Race Garage	150 N Broad Street	402	141	139
20	LAZ Parking 1441 Chestnut Street Garage	1441 Chestnut Street	110	39	35
21	PPA Autopark Independence Mall (PPA) Garage	41 N 6th Street	612	214	154
TOTAL			**10,174**	**3,561**	**3,469**

Notes:

1) Off-street parking facilities selected in coordination with Philadelphia Streets Department (PSD), Philadelphia Office of Transportation Infrastructure, and Sustainability (OTIS) and key stakeholders.

2) Off-street parking facility capacities based on field parking surveys and desktop research.

3) Existing off-street parking utilization of 65% was provided by Philadelphia City Planning Commission.

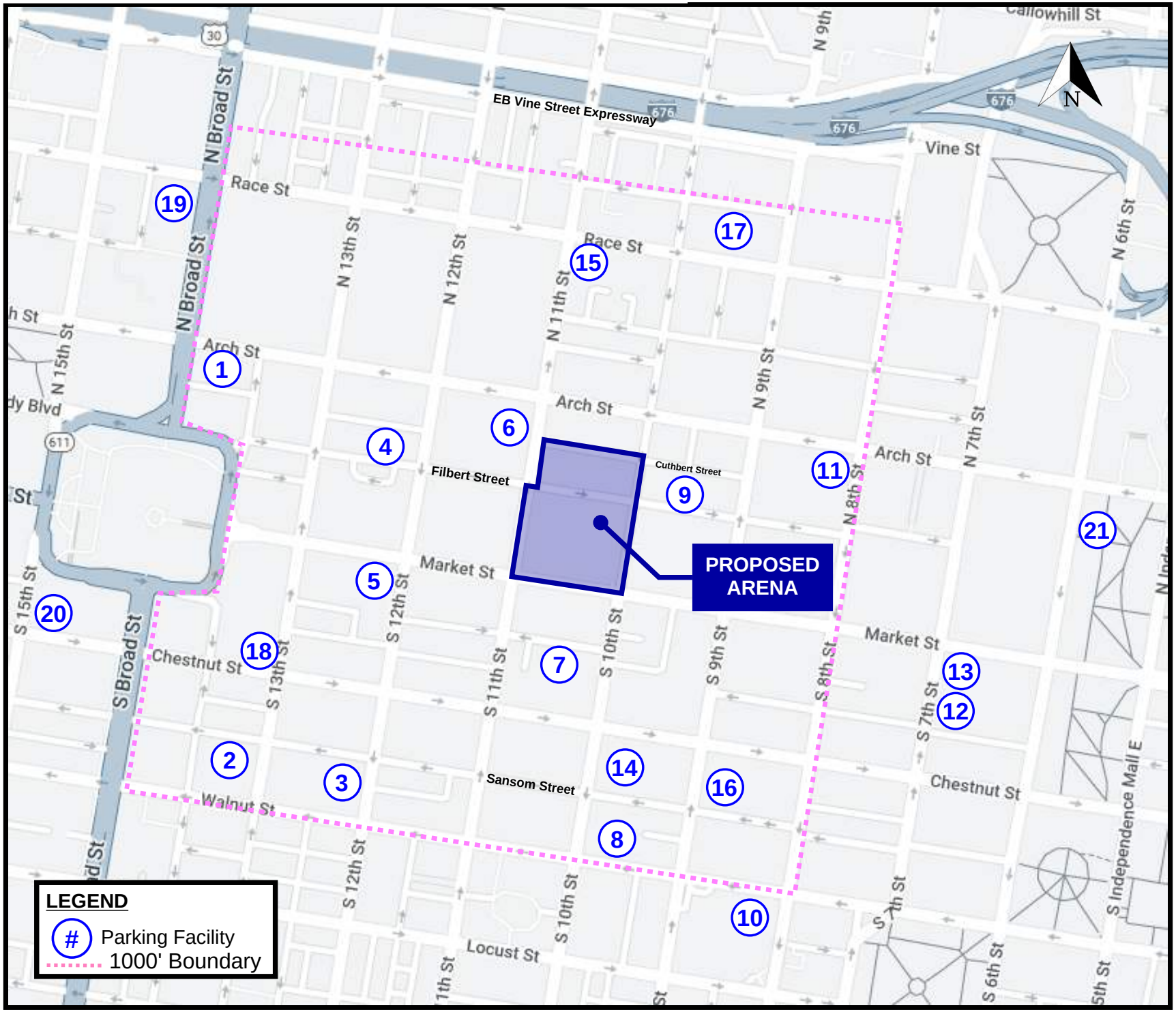
Additional Parking Garage Locations				
ID	Name	Address	Capacity	Available Spaces*
A	PPA Gateway Garage	1540 Vine Street	1050	368
B	Love Park Garage	1501 John F Kennedy Boulevard	810	284
C	Parkway Center Square Garage	31 S. 16th Street	425	149
D	PPA Family Courthouse Garage	1503 Arch Street	265	93
		Total	2550	893

*Assumes 65% existing off-street parking utilization

Theater Locations		
ID	Name	Address
A	Walnut Street Theatre	825 Walnut Street
B	Academy of Music	240 S. Broad Street
C	Miller Theater	250 S. Broad Street
D	The Wilma Theater	265 S. Broad Street
E	Kimmel Center for the Performing Arts	300 S. Broad Street
F	Forrest Theatre	1114 Walnut Street

Appendix B – Accessible Parking

1000' Boundary around New Arena and Adjacent Parking Facilities



Appendix C – 2023-2024 Theater Event Schedules

2023–24 Mainstage Performance Schedule

Please note that some productions may be extended beyond the performances listed.

View the Mainstage shows for the 2023-24 Season · **Download the Season Brochure**

Week A	Beast	Woolf	Groucho	Beautiful
Tuesday Evening Preview (7:30pm)	Nov 21	Jan 9	Feb 13	Mar 26
Wednesday Evening Preview (7:30pm)	Nov 22	Jan 10	Feb 14	Mar 27
Thursday Evening Preview (7:30pm)	Dec 21*	Jan 11	Feb 15	Mar 28
Friday Evening Preview (8pm)	Nov 24	Jan 12	Feb 16	Mar 29
Saturday Matinee Preview (2pm)	Nov 25	Jan 13	Feb 17	Mar 30
Saturday Evening Preview (8pm)	Nov 25	Jan 13	Feb 17	Mar 30
Sunday Matinee Preview (2pm)	Nov 26	Jan 14	Feb 18	Mar 31
Sunday Evening Preview (7pm)	Nov 26	Jan 14	Feb 18	Mar 31
Week B	**Beast**	**Woolf**	**Groucho**	**Beautiful**
Tuesday Evening Preview (7:30pm)	Nov 28	Jan 16	Feb 20	Apr 2
Wednesday Evening · Opening Night (7pm)	Nov 29	Jan 17	Feb 21	Apr 3
Thursday Evening (7:30pm)	Nov 30	Jan 18	Feb 22	Apr 4
Friday Evening (8pm)	Dec 1	Jan 19	Feb 23	Apr 5
Saturday Matinee (2pm)	Dec 2	Jan 20	Feb 24	Apr 6
Saturday Evening (8pm)	Dec 2	Jan 20	Feb 24	Apr 6
Sunday Matinee (2pm)	Dec 3	Jan 21	Feb 25	Apr 7
Sunday Evening (7pm)	Dec 3	Jan 21	Feb 25	Apr 7
Week C	**Beast**	**Woolf**	**Groucho**	**Beautiful**
Tuesday Evening (7:30pm)	Dec 5	Jan 23	Feb 27	Apr 9
Wednesday Matinee (2pm)	Dec 6	Jan 24	Feb 28	Apr 10
Wednesday Evening (7:30pm)	Dec 6	Jan 24	Feb 28	Apr 10
Thursday Matinee (2pm)	Dec 7	Jan 25	Feb 29	Apr 11
Thursday Evening (7:30pm)	Dec 7	Jan 25	Feb 29	Apr 11
Friday Evening (8pm)	Dec 8	Jan 26	Mar 1	Apr 12
Saturday Matinee (2pm)	Dec 9	Jan 27	Mar 2	Apr 13
Saturday Evening (8pm)	Dec 9	Jan 27	Mar 2	Apr 13
Sunday Matinee (2pm)	Dec 10	Jan 28	Mar 3	Apr 14
Week D	**Beast**	**Woolf**	**Groucho**	**Beautiful**
Wednesday Matinee (2pm)	Dec 13	Jan 31	Mar 6	Apr 17
Wednesday Evening (7:30pm)	Dec 13	Jan 31	Mar 6	Apr 17
Thursday Matinee (2pm)	Dec 14	Feb 1	Mar 7	Apr 18
Thursday Evening (7:30pm)	Dec 14	Feb 1	Mar 7	Apr 18
Friday Evening (8pm)	Dec 15	Feb 2	Mar 8	Apr 19
Saturday Matinee (2pm)	Dec 16	Feb 3	Mar 9	Apr 20
Saturday Evening (8pm)	Dec 16	Feb 3	Mar 9	Apr 20
Sunday Matinee (2pm)	Dec 17	Feb 4	Mar 10	Apr 21

Week E	Beast
Tuesday Evening (7:30pm)	Dec 19
Wednesday Matinee (2pm)	Dec 20
Wednesday Evening (7:30pm)	Dec 20
Thursday Matinee (2pm)	Dec 21
Thursday Evening (7:30pm)	Dec 21
Friday Evening (showtimes vary)	Dec 22
Saturday Matinee (showtimes vary)	Dec 23
Saturday Evening (showtimes vary)	Dec 23
Sunday Matinee (2pm)	
Week F	**Beast**
Tuesday Evening (7pm)	Dec 26
Wednesday Matinee (2pm)	Dec 27
Wednesday Evening (7pm)	Dec 27
Thursday Matinee (2pm)	Dec 28
Thursday Evening (7pm)	Dec 28
Friday Evening (7pm)	Dec 29
Saturday Matinee (11am)	Dec 30
Saturday Evening (4pm)	Dec 30
Sunday Matinee (2pm)	Dec 31

Schedule Notes

The Week A performance of *Beauty and the Beast* has been moved to December 21 due to the Thanksgiving holiday.
All affected subscribers have been seated in their regular subscription seats for the new performance.

Share it!
Experience holiday magic @KimmelCC (Twitter/X)/@KimmelCulturalCampus (Facebook/Instagram) with returning favorites and new traditions. The season of giving kicks off with annual @WMGK Turkey Drop and runs through @philorch #NewYearsEve and Lunar New Year celebration. Info at www.kimmelculturalcampus.org.

Press Contacts:
Lauren A. Woodard Hall
484-832-1963
lhall@kimmelculturalcampus.org

THE PHILADELPHIA ORCHESTRA AND KIMMEL CULTURAL CAMPUS CELEBRATE THE MOST WONDERFUL TIME OF THE YEAR WITH FULL LINEUP OF MAGICAL AND MEMORABLE EVENTS

From the signature sounds of The Philadelphia Orchestra's holiday programs to the dazzling spectacle of *Cirque Dreams Holidaze;* and beloved traditions like *A Soulful Christmas*, Philadelphia Ballet's George Balanchine's *The Nutcracker*®, and film classics like *Elf*™ in Concert

Plus, give back with us: mark your calendars for expanded WMGK Turkey Drop benefiting CityTeam on Tuesday, November 21

FOR IMMEDIATE RELEASE (November 1, 2023) – The Philadelphia Orchestra and the Kimmel Cultural Campus celebrate the 2023 holiday season with an array of joyful events reflecting the broad interests of the diverse region.

"The magic of togetherness is alive on our Campus this holiday season," said Matías Tarnopolsky, president and CEO of The Philadelphia Orchestra and Kimmel Center. "With an array of presentations, from orchestral to dance, jazz to gospel, and more, we are a home for transformative artistic experiences as we look ahead to a bright 2024."

The seasonal celebration kicks off this year with the annual WMGK Turkey Drop, as the station broadcasts live from the front of the Kimmel Center building on Broad Street (November 21); expanded this year to run 6 a.m. – 12 p.m., all are invited to donate frozen turkeys in-person that day or make monetary donations, benefitting neighbors at CityTeam. Later that week, the Kimmel Cultural Campus returns to the Benjamin Franklin Parkway – once again taking part in the **6ABC Dunkin' Thanksgiving Day Parade** (November 23), with performances from an array of Campus programs: from the Broadway tours of Disney's *Frozen*, Stephen Sondheim's *Company*, and *Ain't Too Proud: The Life and Times of the Temptations*, to a very exciting guest appearance from the Broadway tour of *Mrs. Doubtfire*, the artistry of our esteemed Resident Company & Philadelphia's own, PHILADANCO!, and a special performance from The Philadelphia Orchestra led by Music and Artistic Director Yannick Nézet-Séguin.

The Philadelphia Orchestra presents a variety of holiday events, including **Disney Tim Burton's *The Nightmare Before Christmas*** (November 24 – 26); ***The Glorious Sound of Christmas*** (December 14 – 16); ***Children's Holiday Spectacular*** (December 16), ***Messiah*** (December 20 – 21); **Elf™ in Concert** (December 22-23); the annual ***New Year's Celebration*** (December 31); and ***Lunar New Year*** (January 12).

Philadelphia Ballet proudly presents the return of **George Balanchine's *The Nutcracker*®** (December 8 – 30), a dazzling holiday classic brought to life by more than 70 world-class, professional dancers and the Philadelphia Ballet Orchestra.

Holiday memories abound in a rare opportunity to witness "The Queens of Christmas" (*Entertainment Weekly*) in the internationally acclaimed ***The Jinkx & DeLa Holiday Show*** (December 8). ***A Very Philly Christmas*** (December 1 – 23) brings together new vibrant renditions of holiday classics and pop favorites in an unforgettable Philly-style holiday concert with music from the No Name Pops. Seasonal favorite ***A Soulful Christmas*** (December 13) returns for its 10th anniversary; the evening is filled with Gospel favorites, regional choirs, inspirational messages, and ends with the "Finale of Lights". A two-time GRAMMY® Award-winner and one of jazz's newest sensations comes to celebrate the holidays with ***Samara Joy: A Joyful Holiday featuring The McLendon Family*** (December 22). ***Cirque Dreams Holidaze*** (December 26 – 31) returns this season by popular demand as a part of the Broadway series – with their Broadway-style production around an infusion of contemporary circus arts that is sure to dazzle.

BELOW IS A FULL, DETAILED LIST OF HOLIDAY-RELATED PROGRAMMING ON THE KIMMEL CULTURAL CAMPUS. For up-to-date listings and information, please visit www.kimmelculturalcampus.org.

22ND ANNUAL WMGK TURKEY DROP
November 22, 2023, 6:00 a.m. – 12:00 p.m. • Kimmel Cultural Campus. Outside Broad Street doors of Kimmel Center building

Join the WMGK air staff as they broadcast live on the Kimmel Cultural Campus outside of the Kimmel Center for the Performing Arts. They will be collecting frozen turkeys and monetary donations for CityTeam Philadelphia, an organization that provides holiday meals to less

fortunate families in the Philadelphia region. Warm up with hot chocolate and coffee provided by Garces Events when you stop by to make your donation.

Checks should be made to: *CityTeam Philadelphia.* No food other than turkeys will be accepted.

6ABC DUNKIN' THANKSGIVING DAY PARADE
November 23, 2023, Times Vary • Benjamin Franklin Parkway

This annual Philadelphia tradition on the Benjamin Franklin Parkway will once again feature appearances from Kimmel Cultural Campus' touring shows, including Disney's *Frozen*, *Company*, and *Ain't Too Proud: The Life and Times of the Temptations*, plus, expect a very special guest appearance from the Broadway tour of *Mrs. Doubtfire*. Plus, the artistry of esteemed Resident Company & Philadelphia's own, PHILADANCO!, and a special performance from The Philadelphia Orchestra led by Music and Artistic Director Yannick Nézet-Séguin.

DISNEY TIM BURTON'S *THE NIGHTMARE BEFORE CHRISTMAS*
The Philadelphia Orchestra
November 24 – 26, 2023, Times Vary • Verizon Hall on the Kimmel Cultural Campus

Bored with the same old scare-and-scream routine, Pumpkin King Jack Skellington longs to spread the joy of Christmas! But his merry mission puts Santa in jeopardy and creates a nightmare for good little boys and girls everywhere in Tim Burton's stop-action animation classic. *Your* Philadelphia Orchestra performs the brilliantly evocative Danny Elfman score live as the film plays on a giant screen above the stage—an unforgettable holiday season treat.

Conductor: Constantine Kitsopoulos
Elfman *The Nightmare Before Christmas* (complete with film)

This performance is part of the Kimmel's Family Discovery Series, generously sponsored by Dietz & Watson. The Philadelphia Orchestra Family Concerts are funded in part by the Zisman Family Foundation.

FREE pre-concert entertainment in the Plaza is planned for this performance. Ticket holders for *The Nightmare Before Christmas* on November 25 are invited to a pre-concert holiday celebration from 12 p.m. to 1:30 p.m. in the Commonwealth Plaza. Holiday fun for families includes live jazz by John Dimase and Lora Sherrod, an arts and crafts station, and family photo opportunities with Santa Claus AND Jack Skellington!

A VERY PHILLY CHRISTMAS
December 1 – 23, 2023, Times Vary • Verizon Hall on the Kimmel Cultural Campus

Enrico Lopez-Yañez, a conductor renowned for his showmanship and flair, leads The No Name Pops orchestra along with a talented cast of Broadway vocalists, dancers, and local choirs. And of course, expect a visit from the jolliest one of all, Santa! It's a multi-generational, one-of-a-kind artistic experience this holiday season.

Philly does everything better, and that includes the holidays! You'll hear holiday classics and pop favorites in sparkling new arrangements; the No Name Pops deliver sizzling, swinging, and soaring renditions of your favorite holiday tunes, including "It's the Most Wonderful Time of the Year," "All I Want for Christmas Is You," "Winter Wonderland," "Go Tell It on The Moutain," "Rudolph the Red-Nosed Reindeer," "Jingle Bells," (and some surprise new favorites).

Each holiday event is an extravaganza, with cameos from beloved Philadelphia mascots, a dancer kick line, incredible vocal performances, and magical moments for children of all ages. Some lucky kids may even be called up onstage with the performers! Plus, come early to write your letters to Santa, enjoy some fun and free pre-concert entertainment, and indulge in seasonal treats.

Conductor: Enrico Lopez-Yañez

MATT ROGERS: *HAVE YOU HEARD OF CHRISTMAS? ALBUM TOUR*
Presented in association with Live Nation
December 1, 2023, 8:00 p.m. • Miller Theater on the Kimmel Cultural Campus

Named one of *Variety*'s “10 Comics to Watch,” Matt Rogers is a multi-hyphenate creative on the rise with undeniable talent and charm. Rogers most recently headlined his debut comedy special based on his sold-out live show of the same name, *Have You Heard of Christmas*?, premiering to much praise on Showtime.

This success was on the heels of his standout performance in the revolutionary queer romantic comedy, *Fire Island*, opposite Bowen Yang and Joel Kim Booster. The groundbreaking film earned the Ensemble Tribute at the 2022 Gotham Awards and several award nominations, including the 2023 PGA Awards, 2023 Emmy Awards, and the 2023 GLAAD Media Awards. That same year, he was heralded for his scene-stealing performance in the Showtime comedy series, *I Love That For You*, created by Vanessa Bayer and Jeremy Beiler.

Rogers is also the host of the widely popular podcast "Las Culturistas" alongside Yang, which recently won “Podcast of the Year” at the 2023 iHeartRadio Podcast Awards. The duo recently hosted their second annual Culture Awards at the Lincoln Center in New York in front of a live audience spanning over 3,000 people – with guest appearances that included Cate Blanchett, Ariana Grande, and Andy Cohen

GEORGE BLANCHINE’S *THE NUTCRACKER*®
Philadelphia Ballet
December 8 – 30, 2023, Times Vary • Academy of Music on the Kimmel Cultural Campus

Toast the season with George Balanchine’s treasured classic—a whimsical remembrance of good tidings gone by. *The Nutcracker* leaps from the stage with prize-fighting mice, gallant toy soldiers, dancing candy canes, and waltzing flowers. Tchaikovsky’s glorious score guides young Marie and her Prince through a fantastical dreamworld in this beloved holiday tradition.

Composer: Peter Ilyich Tchaikovsky

THE JINKX & DELA HOLIDAY SHOW
Presented in association with BenDeLaCreme Presents
December 8, 2023, 8:00 p.m. • Miller Theater on the Kimmel Cultural Campus

You better watch out, you better not cry, because "The Queens of Christmas" (*Entertainment Weekly*) are coming to town with a brand-new edition of the internationally acclaimed *The Jinkx & DeLa Holiday Show*!

Another holiday season brings another year of fabulous spectacle, whip-smart comedy, brand new songs, and annual favorites. Join the sugary DeLa and spicy Jinkx for an evening *The New York Times* says is "sure to lift your spirits and make you howl with laughter".

VIP packages available at www.kimmelculturalcampus.org.

A SOULFUL CHRISTMAS
December 12, 2023, 7:30 p.m. • Verizon Hall on the Kimmel Cultural Campus

The 10th annual *A Soulful Christmas* returns to bring together some of the area's finest churches and community choirs for a night of soul-stirring music, spoken words and movement.

Creator and *D*irector Dr. J. Donald Dumpson returns to lead the inspiring, uplifting gathering of regional choristers and clergy, sharing holiday spirituals, gospel favorites, and inspirational messages of good-will. The program culminates in a spectacular closing to the evening with a visually mesmerizing "Finale of Lights." This year, the event is held in honor of Dr. J. Donald Dumpson, Creator and Director, for 50 years in music ministry.

Participating choirs include African Methodist Episcopal Church Mass Choir, Arch Street Presbyterian Church, Deliverance Evangelistic Church, Enon Tabernacle Baptist Church, Gospel Music Preservation Alliance, Mount Carmel Baptist Church, PA Commonwealth C.O.G.I.C. Mass Choir, Philadelphia Catholic Gospel Mass Choir, Philadelphia Heritage Chorale, and the A Soulful Christmas Youth Mass Choir.

Citywide Praise Dancers and Universal African Dance and Drum Ensemble will electrify the audience with movement and sounds borne of the African diaspora. Austin Woodlin is the evening's music director, with Evelyn Simpson Curenton on the Fred J. Cooper Memorial pipe organ and Brian LeNair Williams on saxophone.

J. Donald Dumpson is the President of Diverse Arts Solutions, Minister of Music and Arts at Arch Street Presbyterian Church, and the founder of Philadelphia Heritage Chorale. He has served with the faculties at various places like Westminster Choir College of Rider University, Cheyney University of Pennsylvania, and Philadelphia's School District High School for Creative and Performing Arts. In 2018, Dr. Dumpson was the Artistic and Music Director for "The Gospel Roots of Rock and Soul" sponsored by the Pew Foundation. He was also the chorus master of The Philadelphia Orchestra's premiere of *Healing Tones* by Hannibal Lokumbe with Music and Artistic Director Yannick Nézet-Séguin as the conductor.

A Soulful Christmas 2023 will be hosted by Patty Jackson (WDAS 105.3 FM) and Craig Hayes (WIMG, 1300 Trenton, NJ).

Each year, *A Soulful Christmas* honors a musical legend, and the 2023 honoree is Carol Antrom. Christan, Servant of The Lord Jesus Christ, Gospel Songwriter, Church Musician, Choir Director, Singer, and Elementary School Teacher. These are some of the many facets, the many aspects, the many dimensions of Carol Diane Antrom. Read the full bio here.

A Soulful Christmas is generously sponsored by PECO.

THE GLORIOUS SOUND OF CHRISTMAS®
The Philadelphia Orchestra
December 14 – 16, 2023, 7:00 p.m. • Verizon Hall on the Kimmel Cultural Campus

You can almost hear the stamping of the reindeer hooves on the roof with these concerts, beloved by fans since the iconic *Glorious Sounds of Christmas*® recording with Eugene Ormandy and the Orchestra was released in 1962.

One of *Your* Philadelphia Orchestra's favorites guest conductors—and a favorite with orchestras around the world—William Eddins returns to lead this rousing celebration, and the Orchestra's own Charlotte Blake Alston adds charm and history to the occasion. Order early to reserve the best seats for a joyful holiday celebration with family and friends!

Conductor: William Eddins
Speaker: Charlotte Blake Alston
Chorus: Mendelssohn Chorus of Philadelphia

CLASSICAL NUTCRACKER
The Rock School
December 15 – 17, 2023, Times Vary • Miller Theater on Kimmel Cultural Campus

Classical Nutcracker is a "treat for the whole family!" as its ushers in the spirit of the holiday season by bringing young Clara's fairytale to life on the Miller Theater stage. Celebrate with the Silberhaus family and friends in the warmth of their home and watch the surroundings magically transform before your eyes. Toy soldiers come to life and battle enchanted mice under the tree in the drawing room until an enchanted snowstorm transports Clara to a mystical Land of the Sweets ruled by the Sugar Plum Fairy.

Children of all ages delight in the charm, beauty, and grandeur of this beloved holiday classic featuring a cast of over 100 performers and award-winning dancers from around the world. Classic Nutcracker features timeless music by Tchaikovsky and choreography by The Rock School's own Peter Stark after Marius Petipa's original.

Composer: Pyotr Ilyich Tchaikovsky
Choreography: Peter Stark

CHILDREN'S HOLIDAY SPECTACULAR
The Philadelphia Orchestra
December 16, 2023, 11:30 a.m. • Verizon Hall on the Kimmel Cultural Campus

Do you hear the sleigh bells jingling? Ring, ting, tingling too? The holidays are finally here and so is everyone's favorite family tradition! Celebrate with *Your* Philadelphia Orchestra and fill your Saturday with sing-alongs, sounds of the season, and special guests! And make sure you listen closely—you never know who might pay a special visit to the Verizon Hall.

Conductor: Austin Chanu

Recommended for ages 5-12.

This performance is part of the Kimmel's Family Discovery Series, generously sponsored by Dietz & Watson. The Philadelphia Orchestra Family Concerts are funded in part by Zisman Family Foundation.

CHRISTMAS FROM NOTRE DAME
With the Notre Dame Glee Club and Symphony Orchestra
December 19, 2023, 7:30 p.m. • Verizon Hall on the Kimmel Cultural Campus

For the first time, after many years of sellout performances on campus, the University of Notre Dame Men's Glee Club and Symphony Orchestra will present their annual holiday program Christmas From Notre Dame on tour, with concerts in Chicago, Cincinnati, Pittsburgh, Philadelphia, and New York City. The wide-ranging program will include selections from Tchaikovsky's *Nutcracker Suite* as well as other traditional and contemporary music for the season, singalong carols, and popular holiday favorites from the Great American Songbook. Don't miss this unique and memorable family evening of musical cheer—the best holiday entertainment value in town!

The concert is a benefit for Feeding America, with all proceeds from a collection and merchandise sales to be directed to a local food bank.

MESSIAH
The Philadelphia Orchestra
December 20 – 21, 2023, 7:00 p.m. • Verizon Hall on the Kimmel Cultural Campus

For fans of Handel's most famous work, it's hard to imagine a more fascinating character to conduct than Nicholas McGegan—unless, of course, you could raise Handel himself to do the job. McGegan is regarded as one of the foremost scholars of early music, and out of his prolific 100+ recording discography, he has released more than 50 albums devoted to the music of Handel. His scholarly obsession with Baroque music informs his wonderfully witty writings and stage commentary, making him a favorite of audiences. Experience this beloved classic in the hands of a master, a joy to be shared this holiday season.

Conductor: Nicholas McGegan
Soprano: Sherezade Panthaki
Countertenor: Reginald Mobely
Tenor: Thomas Cooley
Bass-baritone: Dashon Burton
Chorus: Philadelphia Symphonic Choir

Handel *Messiah*

***ELF*™ IN CONCERT**
The Philadelphia Orchestra
December 22 – 23, 2023, Times Vary • Verizon Hall on the Kimmel Cultural Campus

Buddy was accidentally transported to the North Pole as a toddler and raised to adulthood among Santa's elves. Unable to shake the feeling that he doesn't fit in, the adult Buddy travels to New York, in full elf uniform, in search of his real father. This holiday season, relive this heartwarming holiday classic on a giant screen as The Philadelphia Orchestra plays every note of John Debney's wonderful score live to picture in Elf™ in Concert!

Conductor: Justin Freer
Debney *Elf* (complete with film)

Recommended for ages 8+.

This performance is part of the Kimmel's Family Discovery Series, generously sponsored by Dietz & Watson. The Philadelphia Orchestra Family Concerts are funded in part by Zisman Family Foundation.

SAMARA JOY
A Joyful Holiday featuring The McLendon Family
December 22, 2023, 7:30 p.m. • Miller Theater on the Kimmel Cultural Campus

Samara Joy, one of jazz's newest stars, celebrates the holidays on the Kimmel Campus!

Grammy Award winning vocalist Samara Joy, one of jazz's newest stars, celebrates the holidays on the Kimmel Campus! Her voice, rich and velvety yet precociously refined, has already earned her fans like Anita Baker and Regina King, along with appearances on the TODAY Show, The Tonight Show with Jimmy Fallon, The Late Show with Stephen Colbert, CBS Mornings, MSNBC, The Kelly Clarkson Show, The Jennifer Hudson Show, and more. In addition, she's earned millions of likes on TikTok - cementing her status as the first Gen Z jazz star. Joy comes from a musical family with deep roots in Philadelphia, and for this Joy-ous occasion she is joined members of her talented musical family to deliver a joyful holiday celebration that blends jazz, gospel and R&B.

This show is part of the 2023-24 Jazz Series.

FREE pre-concert entertainment in the Plaza is planned for this performance. Ticket holders are invited to a holiday cabaret featuring the Tim Brey Trio from 5:00 p.m. to 7:00 p.m. in the Commonwealth Plaza, as well as a cocktail tasting.

CIRQUE DREAMS HOLIDAZE
Presented in association with The Shubert Organization
December 26 – 31, 2023, Times Vary • Miller Theater on the Kimmel Cultural Campus

Cirque Dreams Holidaze dazzles with a brilliant and whimsical family holiday spectacular! This annual tradition wraps a Broadway-style production around an infusion of contemporary circus arts. As lights dim and the music swells, audiences will have visions of sugar plums dancing in their heads as a fantastical cast of holiday storybook characters come to life. *Broadway World* exclaims, “Lose yourself for 90 minutes and go back to those wonderful dreams you had as a kid.”

Featuring an ensemble of aerial circus acts, sleight-of-hand jugglers, fun-loving skippers, breath-catching acrobatics, and much more, the *Dayton Daily News* proclaims, “A new set of eyes should be added to my Christmas list… there’s no way the stunts I witnessed onstage actually happen as most of them aren’t humanly possible.”

Imaginative and fun for the whole family, *Cirque Dreams Holidaze* features a world-renowned cast of performers accompanied by an original music score including new twists on the seasonal favorites such as “Deck the Halls,” “Winter Wonderland,” and “Rockin’ Around the Christmas Tree.” Singers, dancers, penguins, toy soldiers, and reindeer invoke the dreams behind a child’s eye on the most magical of nights. Amidst a backdrop of new sets, scenery, and storylines, this family friendly production is sure to put a twinkle in your eye!

Recommended for ages 5 and older.

This performance is part of the 2023-24 Broadway Series. This performance is also part of the Kimmel’s Family Discovery Series, generously sponsored by Dietz & Watson.

NEW YEAR’S CELEBRATION
The Philadelphia Orchestra
December 31, 2023, 7:00 p.m. • Verizon Hall on the Kimmel Cultural Campus

Whether you like donning your fanciest duds or prefer comfortable footwear and a cozy sweater for your holiday celebrations, this concert offers a spectacular way to mark the end of the old year and the dawning of a new one! Leading the program of beloved favorites is conductor Thomas Wilkins (Hollywood Bowl Orchestra, Boston Symphony Orchestra), famed for eliciting “electrifying” sounds from his orchestras, with “musicianship that generates passion and excitement from his players” (*Sarasota Observer)*. Make your plans now for an unforgettable celebration!

Conductor: Thomas Wilkins
Speaker: Charlotte Blake Alston

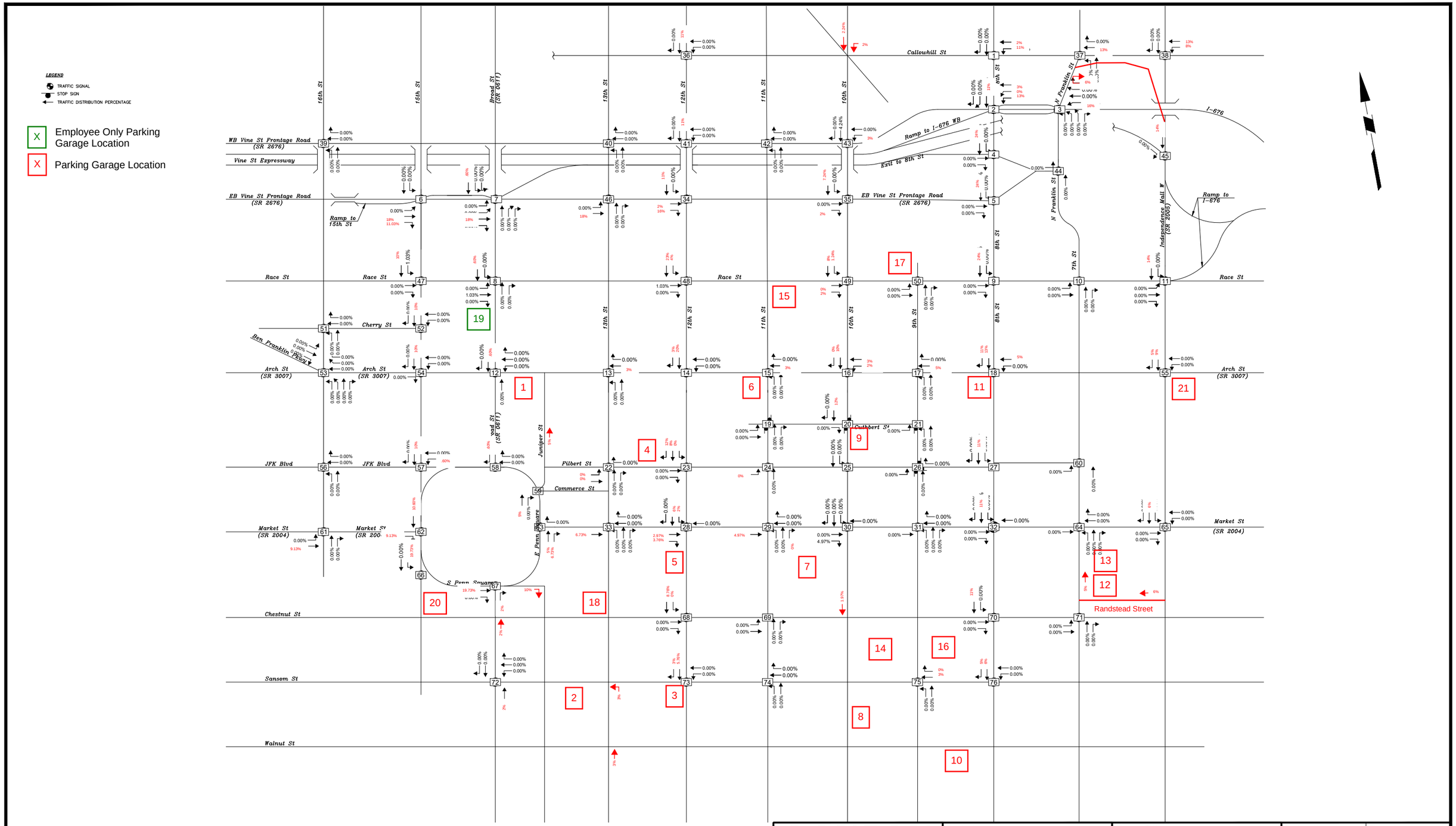
LUNAR NEW YEAR
The Philadelphia Orchestra
January 12, 2024, 8:00 p.m. • Verizon Hall on the Kimmel Cultural Campus

Join the Orchestra and special guests to celebrate Lunar New Year! This family-friendly performance features repertoire in honor of the Year of the Dragon.

Conductor: Long Yu

# # #

Appendix D – Auto Trip Redistribution



LANGAN Langan Engineering and Environmental Services, Inc. 1818 Market Street, Suite 3300 Philadelphia, PA 19103 T: 215.845.8900 F: 215.845.8901 www.langan.com	Project 76 PLACE PHILADELPHIA PHILADELPHIA COUNTY PENNSYLVANIA	Figure Title INBOUND ARENA AUTO TRIP DISTRIBUTION PERCENTAGES	Project No. 220173501 Date 2023-08-16 Drawn By AL Checked By BMW	Figure No. E-23 Sheet 23 of 197

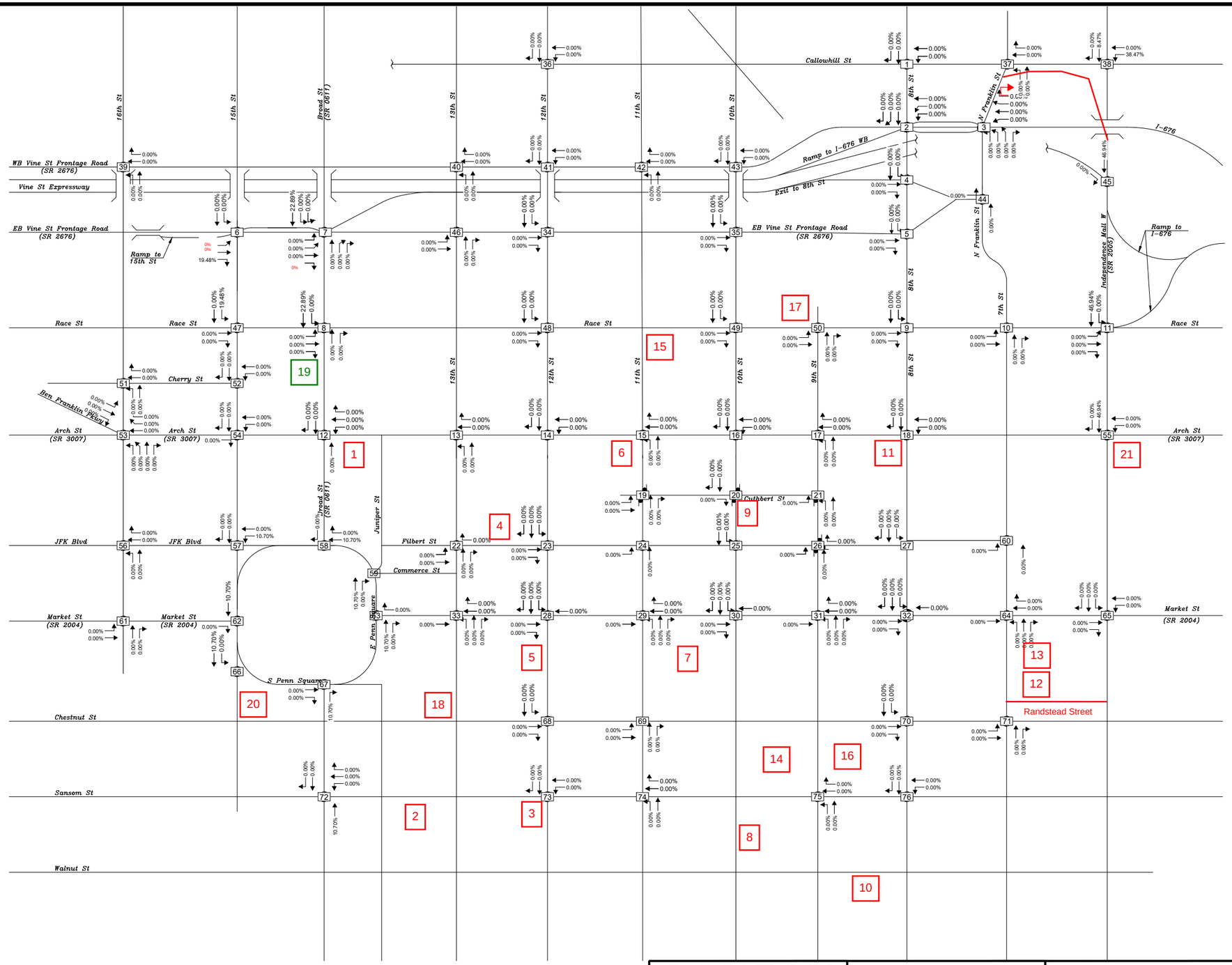
Filename: \\langan.com\data\PHL\data5\220173501\Project Data_Discipline\Traffic\Capacity Analysis\Volume Maps\Traffic\Report Figures.dwg Date: 8/16/2023 Time: 10:40 User: adas Style Table: Langan.stb Layout: ARENA_AUTO_IN%

LEGEND

- TRAFFIC SIGNAL
- STOP SIGN
- TRAFFIC DISTRIBUTION PERCENTAGE

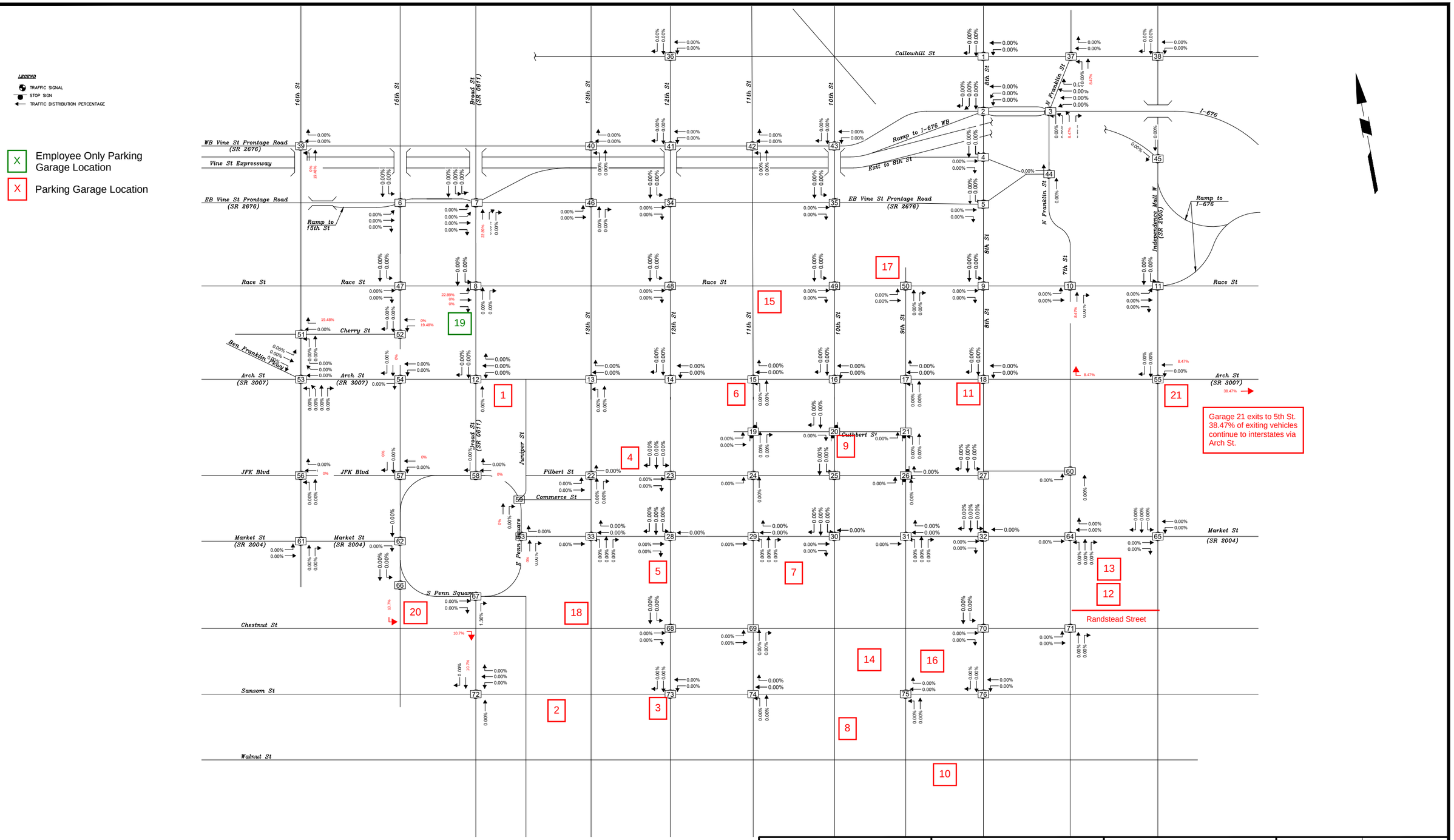
X Employee Only Parking Garage Location

X Parking Garage Location



LANGAN Langan Engineering and Environmental Services, Inc. 1818 Market Street, Suite 3300 Philadelphia, PA 19103 T: 215.845.8900 F: 215.845.8901 www.langan.com	Project 76 PLACE PHILADELPHIA PHILADELPHIA COUNTY PENNSYLVANIA	Figure Title INBOUND EMPLOYEE AUTO TRIP DISTRIBUTION PERCENTAGES	Project No. 220173501 Date 2023-08-16 Drawn By AL Checked By BMW	Figure No. E-33 Sheet 33 of 197

Filename: \\langan.com\data\PHL\data5\220173501\Project Data_Discipline\Traffic\Capacity Analysis\Volume Maps\Traffic\Report Figures.dwg Date: 8/16/2023 Time: 10:42 User: adas Style Table: Langan.stb Layout: EMPLO_AUTO_IN%



LANGAN Langan Engineering and Environmental Services, Inc. 1818 Market Street, Suite 3300 Philadelphia, PA 19103 T: 215.845.8900 F: 215.845.8901 www.langan.com	Project 76 PLACE PHILADELPHIA PHILADELPHIA COUNTY PENNSYLVANIA	Figure Title OUTBOUND EMPLOYEE AUTO TRIP DISTRIBUTION PERCENTAGES	Project No. 220173501 Date 2023-08-16 Drawn By AL Checked By BMW	Figure No. E-34 Sheet 34 of 197	

MEMORANDUM

TO: Michael Carroll, PE
DATE: March 27, 2024
FROM: Tony Rauso, PE & Joanne Arellano, PE, PTOE
CC: Adam Smith, PE, PTOE & Richard Montanez, PE
PROJECT: 76 Place
JMT JOB NO.:19-03842-003
RE: 76 Place Transportation Impact Study Independent Analysis: Ride-hailing

---

The following memorandum summarizes our team's independent sensitivity analysis for ride-hailing based on our approach discussed in the Executive Summary, dated January 5, 2024. Below is a summary of what analyses were performed in the 76 Place Transportation Impact Study (TIS), originally dated November 11, 2022, revised March 12, 2024, the 76 Place Transportation Event Management Plan (TEMP), dated March 2024, the independent sensitivity analysis performed by JMT, and recommendations for improved ride-hailing efficiency and operations.

SUMMARY OF KEY FINDINGS & ASSUMPTIONS

- Using the three proposed ride-hailing locations within the current TIS, there are **27 feasible spaces** for loading/unloading (as opposed to 45 presented in the current TIS).
- Under the current TIS, the total load time for loading spectators into all rideshare vehicles will be approximately **42 minutes** (assuming a two-minute loading time per trip).
- One additional ride-hailing location, along the 900 block of Chestnut Street, has been determined feasible to provide additional loading/unloading spaces.
- With additional loading/unloading spaces, the **total load time can be decreased to approximately 30 minutes** (assuming a two-minute loading time per trip).
- Ride-hail staging areas in nearby parking facilities can improve operations. Potential areas include Gateway Garage at 15th Street and Spring Street and the Autopark at Olde City on 2nd Street between Walnut Street and Chestnut Street.
- Coordinate with Thomas Jefferson Hospital to minimize conflicts with the loading zone proposed within the current TIS which is across from the Hospital on Chestnut Street between 10th Street and 11th Street.
- Additional measures could improve operations including geofencing, wayfinding signage, website information, and traffic control personnel to facilitate loading zone operations.
- **The two-minute spectator load time is adequate**, if not conservative. We believe time can decrease with proper staging and as users queue up.
- **An overall load time less than 30 minutes**, with the potential to decrease, will not adversely affect traffic operations and appears acceptable in the post-event scenario.

The table below is a summary of the key findings and assumptions.

Key Assumption	Proposed TIS Approach	Sensitivity Adjustments	Observed Results
Loading/Unloading Locations	3 Locations	4 Locations	Decreased total load time/no adverse impacts.
Loading/Unloading Spaces	45 Total/27 feasible	37 Total/37 feasible	Decreased total load time/no adverse impacts.
Spectator Load Time	N/A	2 minutes and 1 minute	Decreased total load time/no adverse impacts.

The following paragraphs provide additional details regarding the methodology utilized for this independent analysis.

PROPOSED TIS RECOMMENDED RIDE-HAIL LOCATIONS

The proposed TIS recommended three locations for ride-hailing pick-up and drop-off. The locations are 12th Street, Filbert Street, and Chestnut Street and result in a total of 45 20-foot loading spaces between the three locations.

12th Street Loading Zone

The recommended loading zone is along the western curbline of 12th Street between Arch Street and Filbert Street. This portion of 12th Street is approximately 300 feet with an 11-foot-wide side street, a 20-foot ADA parking space, 10 feet of no stopping for a fire hydrant zone and 85 feet for hotel loading. The proposed TIS has recommended this location to accommodate 14 ride-hail vehicles, but due to the fire hydrant zone, the ADA space, and the hotel loading, which should remain open during events, the curbline would only allow a loading zone of approximately 185 feet, accommodating approximately 9 ride-hail vehicles at a time. Along the curbline to be utilized, there is currently a two-to-three-hour parking zone. Bus routes 23 and 45 travel along 12th Street, but there are no bus stops within the recommended loading zone. As buses are traversing along the roadway, their travel time could be impacted by ride-hail vehicles maneuvering in and out of the loading zone. Having traffic control personnel present at the loading zones would help facilitate pick-up and drop-off activity and minimize disruptions to the traffic flow along 12th Street.

Filbert Street Loading Zone

The recommended loading zone is along the northern curbline of Filbert Street between 8th Street and 9th Street. This portion of Filbert Street is approximately

380 feet with 40 feet of handicap parking and 40 feet of no stopping for a parking garage exit driveway. The rest of the curbline currently has a 130-foot no stopping zone, a 100-foot press-only parking zone and a 70-foot two-to-three-hour parking zone. The proposed TIS recommended to use these zones for loading which would allow a loading zone of approximately 300 feet and would accommodate approximately 15 ride-hail vehicles at a time. However, only the two-to-three-hour parking zone should be considered, resulting in only 3 ride-hail vehicle loading spaces. There are no bus routes or bus stops within the recommended loading area.

Chestnut Street Loading Zone

The recommended loading zone is along the northern curbline of Chestnut Street between 10th Street and 11th Street. This portion of Chestnut Street is approximately 320 feet. The proposed TIS recommends for the entirety of the curbline to be utilized, which would accommodate approximately 16 ride-hail vehicles. Along the curbline, there is currently a 20-foot ADA parking space, a loading zone, a two-to-three-hour parking zone and a 12-hour parking zone. The ADA space would reduce the recommended ride-hail spaces and would only allow for 15 vehicles. Bus routes 9, 21, 38 and 42 travel along Chestnut Street within an exclusive bus lane. There are no bus stops within the recommended loading zone. This recommended loading zone is located across from Thomas Jefferson Hospital. To minimize conflicts with the ongoing Hospital master plan process, coordination with the Hospital should be completed. Chestnut Street between 9th Street and 10th Street could also be utilized to minimize any conflicts with Thomas Jefferson Hospital. This location is discussed further in the Recommended Additional Loading Locations section below.

Due to existing parking restrictions along the ride-hail loading locations recommended by the proposed TIS, the actual loading spaces available would be 27.

Ride-hail Trips

The proposed TIS has determined that 555 ride-hail vehicles will be needed for Friday Post-Event spectators. This is the worst-case scenario trip generation and was used to determine if the recommended loading areas will be able to accommodate the vehicles.

Based on a review of the recommended loading zones, a total of approximately 27 ride-hailing spaces could be provided. The 555 ride-hail vehicles divided between the 27 spaces would require approximately 20.6 cycles of vehicles to load spectators post event. Spectator load times of 1 and 2 minutes per vehicle were assumed for variability due to congestion, hailing complications and post-event operations. Spectator load time is the time it takes for one rideshare vehicle to be loaded by spectators. Based on the cycles of vehicles needed and loading time, the spectators projected to utilize ride-hail would be fully loaded in approximately 42 minutes with a 2-minute spectator loading time and 21 minutes with a 1-minute spectator loading time. Total load time is the time it

takes for all rideshare vehicles to be loaded by all spectators. A total loading time of 30 minutes or less is considered efficient.

Additional loading spaces would improve efficiency as there is a direct correlation between the number of ride-hailing loading spaces recommended and the total time to load ride-hailing spectators. Figure 1 shows that as the number of loading spaces available increases, the time to fully load spectators decreases.

Figure 1: Total Loading Time Vs Available Loading Spaces

Ride-hail vehicles entering and exiting the network were considered as part of the traffic analysis to see how they operate within the network alongside spectators leaving the arena post-event. Ride-hail drivers traveling to the loading locations will be traveling into the network and generally will travel against the flow of traffic leaving the parking garages. Once leaving the loading zones, ride-hail drivers will use the network in a similar manner as spectators leaving the arena.

RECOMMENDED ADDITIONAL LOADING LOCATION

The independent traffic analysis has determined an additional viable loading zone along Chestnut Street between 9th Street and 10th Street.

Along the northern curbline between 9th Street and 10th Street, there is a 20-foot ADA parking space, 80 feet of loading zone, 50' feet of police parking and 150 feet of two-to-three-hour parking. The recommended ride-hail loading zone would be 230 feet and use the existing loading zone and parking zone. Assuming 20 feet space per vehicle, approximately 10 vehicles could be accommodated.

Utilizing the 12th Street and Chestnut Street loading zones recommended in the proposed TIS and the one additional loading zone, a total of 37 spaces could be

provided. The additional ride-hail loading spaces would reduce the total loading time to 30 minutes. A map showing the recommended loading zones from the proposed TIS and the additional loading zone is enclosed.

RECOMMENDED STAGING LOCATIONS

The proposed TEMP recommended that parking garages and surface lots could be considered for ride-hail staging and pick-up and drop off operations but did not provide any recommendations for specific locations. As part of the independent traffic analysis, our team has reviewed several options for staging ride-hail vehicles. These locations can be utilized by ride-hail drivers to wait for spectators to be picked up post-event.

Parking Garage Staging

Parking garages could also be utilized for ride-hail staging. Ride-hail vehicles would be given a designated section to park in the garages until needing to pick up spectators. Parkway, who own several parking garages within Philadelphia and throughout the United States, have used this type of staging operation previously in their garages in Las Vegas. Ride-hail companies would need to coordinate with the arena to ensure vehicles leave the staging areas in timed intervals to pick up spectators in an efficient manner to minimize traffic impacts. Coordination would also be required to ensure drivers not originating from the staging area are not able to accept rides at the designated pickup spots.

It is recommended to have staging areas to the east and west of the arena to ensure ride-hailing drivers can access the loading areas efficiently. The garages used for staging should be separate from garages used by spectators. Ride-hail drivers going to staging locations would be traveling against exiting spectators and would have minimal impact to spectator traffic. Potential garages to utilize for staging include the Gateway Garage to the west at 15th Street and Spring Street and Autopark at Olde City to the east on 2nd Street between Walnut Street and Chestnut Street. The Gateway Garage ride-hail drivers would utilize Race Street and 12th Street to load passengers at the 12th Street loading zone. The Autopark ride-hail drivers would load at the Chestnut Street and Filbert Street loading zones and access via Walnut Street and Arch Street.

ADDITIONAL RECOMMENDATIONS

Based on research obtained from other stadiums, ballparks, and arenas, the following additional implementation strategies are recommended:

- Ride-Hail Zone Designation – Create a geofence that works with the ride-hailing apps to encourage riders to only use designated pick-up and drop-off locations. Cones with signs on top could also be setup by arena employees to designate ride-hail locations. Temporary electronic signage could be installed dictating ride-hail only loading. Police officers could also be

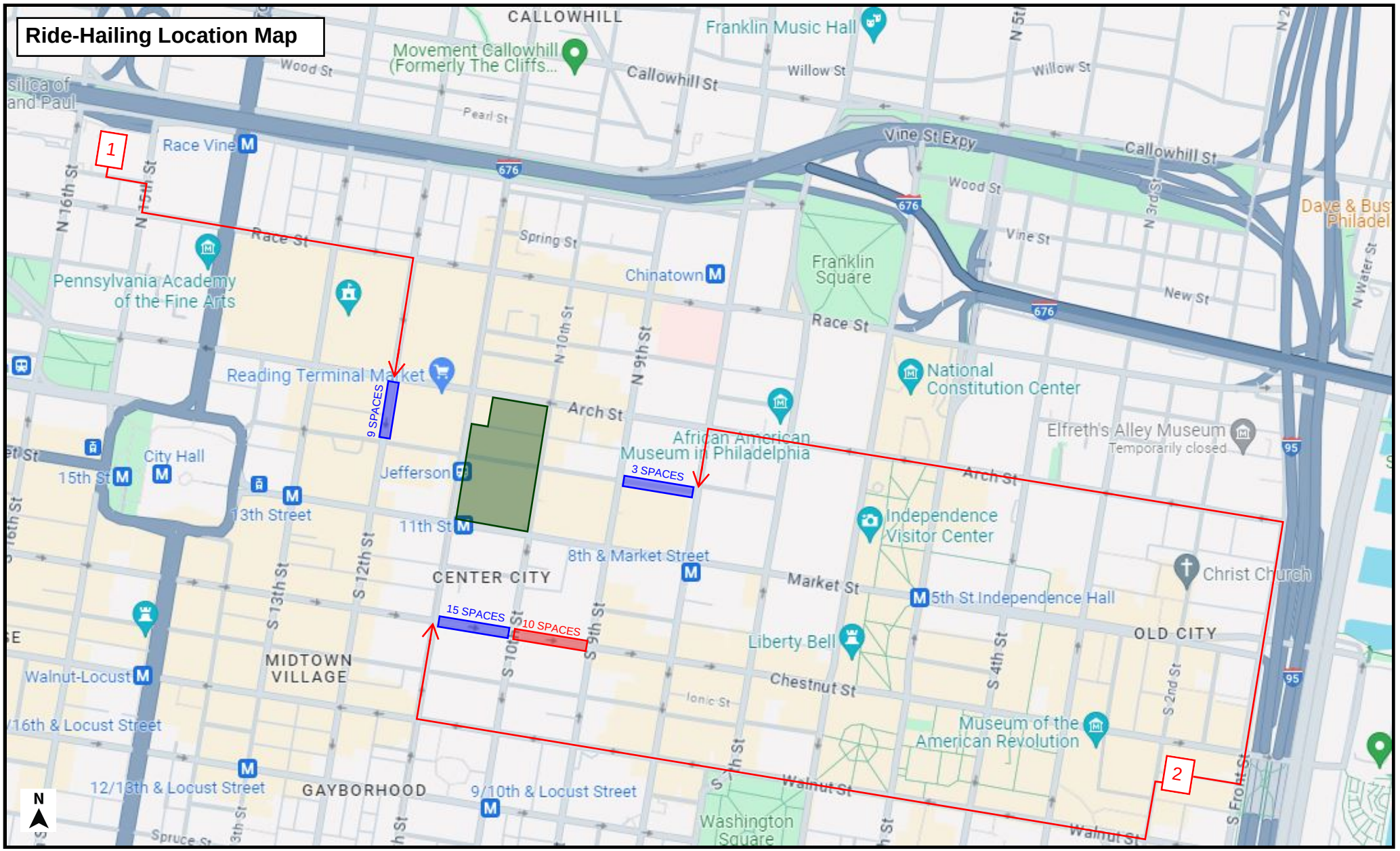
instructed to issue citations for pick-up and drop-off at undesignated locations within 1,000 feet of the proposed arena.

- Traffic Control Officers – The TEMP states that the proposed arena will staff police officers and crossing guards staged at critical locations to assist in event operations. It is recommended to have traffic control officers located at the designated ride-hail loading locations at least 60 minutes prior to the beginning of the event and 45 minutes after the end of the event to help facilitate pick-up and drop-off activity. The traffic control officers should also be situated at locations needed to deter undesirable drop-off activity and minimize disruptions to bus traffic flow.

- Temporary and Permanent Wayfinding Signage – The TEMP recommends providing signage, which may also include VMS (variable message signs). The independent analysis agrees with this recommendation to direct people to the ride-hailing loading zones and staging areas.

- Website Information – The TEMP recommends creating a designated transportation page on the proposed arena website to provide critical information to spectators. Ensure the arena website contains information regarding the designated ride-hail drop-off and pick-up locations. A statement should be included summarizing the walking distance and the estimated walking time to the arena.

Enclosure – Ride-hail Location Map


Ride-Hailing Location Map
CALLOWHILL
Franklin Music Hall
Movement Callowhill (Formerly The Cliffs...
Callowhill St
Willow St
Wood St
Pearl St
Vine St Expy
676
Race Vine
1
Race St
Spring St
Pennsylvania Academy of the Fine Arts
Chinatown
Franklin Square
Vine St
New St
Reading Terminal Market
9 SPACES
Arch St
National Constitution Center
African American Museum in Philadelphia
3 SPACES
Elfreth's Alley Museum
Temporarily closed
City Hall
15th St
Jefferson
13th Street
11th St
Independence Visitor Center
8th & Market Street
CENTER CITY
Market St
Christ Church
5th St Independence Hall
15 SPACES
10 SPACES
Liberty Bell
OLD CITY
MIDTOWN VILLAGE
Walnut-Locust
Chestnut St
Ionic St
16th & Locust Street
Museum of the American Revolution
2
12/13th & Locust Street
GAYBORHOOD
9/10th & Locust Street
Washington Square
Walnut St
Spruce St
N
LEGEND
Project Site -
TIS Loading Location -
Additional Loading Location -
Gateway Parking Garage - 1
Autopark Parking Garage - 2
Staging Access Routes -

MEMORANDUM

TO: Michael Carroll, PE
DATE: April 5, 2024
FROM: Tony Rauso, PE & Joanne Arellano, PE, PTOE
CC: Adam Smith, PE, PTOE & Richard Montanez, PE
PROJECT: 76 Place
JMT JOB NO.:19-03842-003
RE: 76 Place Transportation Impact Study Independent Analysis: I-676

The following memorandum summarizes our team's independent analysis for I-676. The study area was along I-676 from 16th Street to 8th Street as well as the westbound I-676 off ramp at Callowhill Street and 3rd Street. This analysis was conducted to address concerns raised to the City regarding the traffic impacts of the proposed 76 Place to the I-676 corridor.

SUMMARY OF KEY FINDINGS

- Merge (on-ramp), diverge (off-ramp), segment, and weaving analyses were conducted within the study area along I-676 from 16th Street to 8th Street as well as the westbound I-676 off ramp at Callowhill Street and 3rd Street.
- The following peak hours were analyzed: weekday commuter PM peak hour (4-6 PM), weekday pregame (6-8 PM), weekday postgame (9-11 PM), and Friday postgame (9-11 PM). The following scenarios were analyzed: 2024 Existing, 2031 No Build (without arena), and 2031 Build (with arena).
- Due to saturated conditions within the study area, historical hourly volume collection utilized in the analysis may have been limited to roadway capacity and may be lower than the actual demand. As a result of the data limitations, the merge, diverge, and segment analyses do not depict capacity constraints. However, it is acknowledged that congestion exists within the study area, especially during the weekday commuter AM and PM peak hours.
- A comparison between 2031 No Build and 2031 Build conditions indicates that **the arena traffic does not have a significant impact on traffic conditions along the merge, diverge, segment, and weaving study areas.** The traffic conditions would operate similarly with or without the arena.
- The intersection analysis at the **westbound I-676 off ramp at Callowhill Street and 3rd Street depicts capacity constraints** during the weekday PM and pregame peak periods with the proposed arena. **It is recommended that traffic camera coverage be expanded to include the Callowhill Street and 3rd Street/westbound I-676 off ramp intersection** for the Traffic Operations Center (TOC) to adjust signal timings as needed.

(continued on next page)

SUMMARY OF KEY FINDINGS (CONTINUED)

- **It is also recommended that a traffic officer be located at the Callowhill Street and 3rd Street/westbound I-676 off ramp intersection** during the pregame event peak period to help manage vehicular and pedestrian movements.
- The diverge analyses do not take into account downstream intersections. As such, it is acknowledged that during peak periods, some signalized intersections downstream from the off ramps may experience capacity constraints that could impact vehicles traversing along the off ramps.
- On average, from the 2031 No Build to 2031 Build scenarios, a 4% to 12% increase in density during the weekday or Friday postgame time periods would occur. **Although increases in density would occur in the 2031 Build scenario, the increases would have minimal impacts on traffic conditions.**

The following paragraphs provide additional details regarding the methodology utilized for this independent analysis.

STUDY LOCATIONS & SCENARIOS ANALYZED

The independent analysis encompassed the following merge, diverge, intersection, and segment study locations:

- WB I-676 on ramp at 16th Street (merge analysis)
- EB I-676 off ramp at 15th Street (diverge analysis)
- EB I-676 on ramp at Broad Street (merge analysis)
- EB I-676 off ramp at 8th Street (diverge analysis)
- WB I-676 on ramp at 8th Street (merge analysis)
- WB I-676 off ramp at Callowhill Street/N. 3rd Street (intersection analysis)
- EB and WB I-676 between Broad Street and 12th Street (segment analysis)
- EB I-676 between Broad Street on ramp and 8th Street off ramp (weaving analysis)

The analysis scenarios included existing, 2031 No Build, and 2031 Build conditions for the following time periods:

- Weekday PM Peak (4-6 PM)
- Weekday Pregame (6-8 PM)
- Weekday Postgame (9-11 PM)
- Friday Postgame (9-11 PM)

VOLUME DEVELOPMENT

The volumes utilized were based on information obtained from the PennDOT Traffic Information Repository (TIRe), data from the City, and from the 76 Place TIS. Any factors

applied were taken from the PennDOT Traffic Data Report 2022. Appendix A includes volume diagrams detailing the methodology and the volumes utilized in the analysis.

The 2024 hourly volumes were developed utilizing historical average daily traffic (ADT), historical hourly traffic, and current (2024) ADT. Due to saturated conditions within the study area and existing bottlenecks downstream, historical hourly volumes may have been limited to roadway capacity and may be lower than the actual demand. Furthermore, the 2024 hourly traffic volumes were developed by adjusting the historical hourly traffic volumes to reflect the proportion of historical ADT and 2024 ADT. The 2024 ADT is lower than the historical ADT, and so the 2024 hourly traffic volumes utilized in this analysis are lower than the historical hourly traffic volumes. It is acknowledged that the calculated 2024 hourly volumes may be lower than the actual demand within the study area.

ANALYSIS RESULTS & CONCLUSIONS

The analysis for the merge, diverge, segment, and weaving analyses were conducted utilizing Highway Capacity Software (HCS 2023). Synchro 11 software was used for the WB I-676 off ramp intersection at Callowhill Street. Appendix B contains summary tables of the analysis results.

It is acknowledged that there is existing congestion within the study area. Due to data collection limitations, the hourly volumes utilized for analysis may be lower than the actual demand. As such, the purpose of the analysis results within this memo is to draw comparative conclusions about the traffic impacts of the proposed arena. A microsimulation traffic software, such as VISSIM, could be used to capture the existing congestion and oversaturated conditions within and downstream from the study area and account for impacts from nearby bottlenecks such as along I-76. However, additional data, such as travel times and speed data, are not included as part of the TIS and would be required to complete a microsimulation. Based on the available traffic data, HCS software was utilized in this independent analysis which does not take into account impacts from downstream bottlenecks.

A comparison between 2031 No Build and 2031 Build conditions indicates that the arena traffic does not have a significant impact on traffic conditions along the merge, diverge, segment, and weaving study areas. The traffic conditions would operate similarly with or without the arena.

Based on the results, the merge and diverge analyses at the on and off ramps do not depict any capacity constraints with or without the construction of the proposed arena. Note, the diverge analyses do not take into account downstream intersections. As such, it is acknowledged that during the weekday PM and pregame peak periods, some signalized intersections downstream from the off ramps may experience capacity constraints that could impact vehicles traversing along the off ramps.

The segment analysis along I-676 between Broad Street and 12th Street, does not depict capacity constraints with or without the construction of the proposed arena.

The weaving analysis along I-676 between 11th Street and 10th Street depicts capacity constraints during the weekday PM and pregame peak periods with or without the construction of the proposed arena.

On average, from the 2031 No Build to 2031 Build scenarios, the analyzed ramps would experience a 10% increase in density during the weekday postgame and a 12% increase in density during the Friday postgame. The analyzed roadway segments would experience a 4% and 5% increase in density during the weekday postgame and Friday postgame time periods, respectively. The analyzed weaving segment would experience a 6% and 7% increase in density during the weekday postgame and Friday postgame time periods, respectively. Although increases in density would occur in the 2031 Build scenario, the increases would have minimal impacts on traffic conditions.

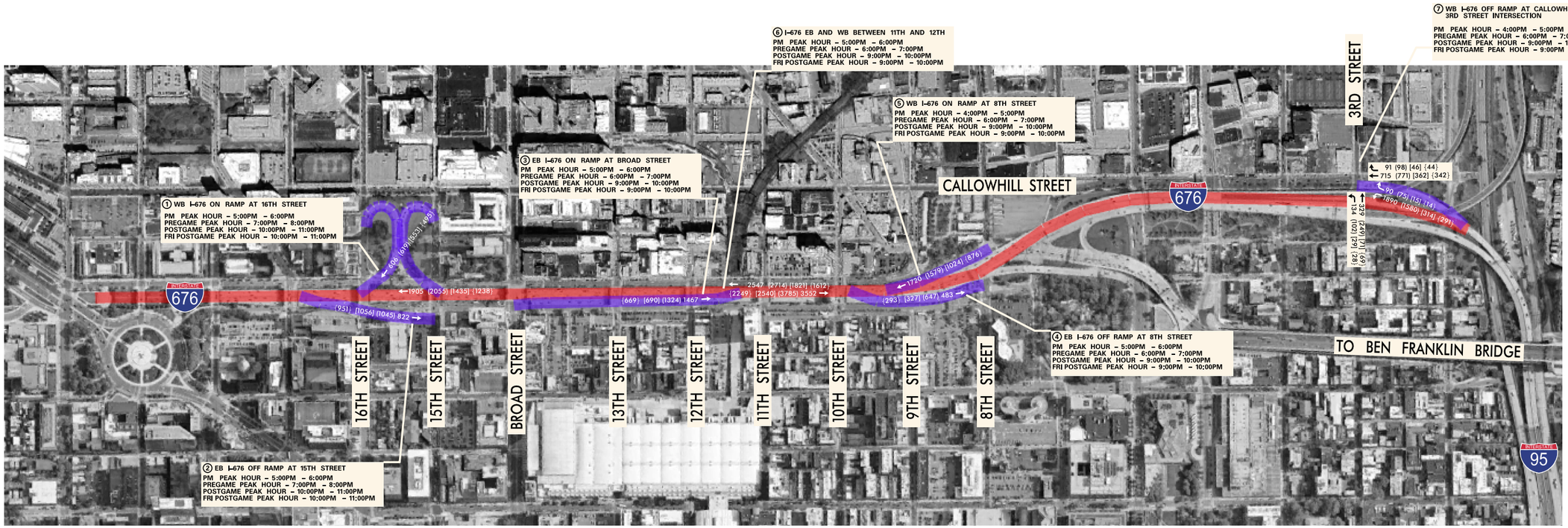
The intersection analysis at the WB I-676 off ramp at Callowhill Street/N. 3rd Street depicts capacity constraints during the weekday PM and pregame peak periods with the proposed arena. Capacity constraints would not occur during the other peak periods analyzed. There is an existing traffic camera along I-676 between 3rd Street and 4th Street which does not currently appear to capture the Callowhill Street and 3rd Street/westbound I-676 off ramp intersection. It is recommended that traffic camera coverage be expanded to include the Callowhill Street and 3rd Street/westbound I-676 off ramp intersection for the Traffic Operations Center (TOC) to adjust signal timings as needed during peak periods. If the existing traffic camera is not able to provide coverage of the intersection, a new traffic camera may need to be installed. Additionally, a traffic officer should be present at the intersection during the pregame event peak period to help manage vehicular and pedestrian movements.

Appendix

Appendix A – Volumes
Appendix B – Analysis Results

APPENDIX

Appendix A – Volume Development



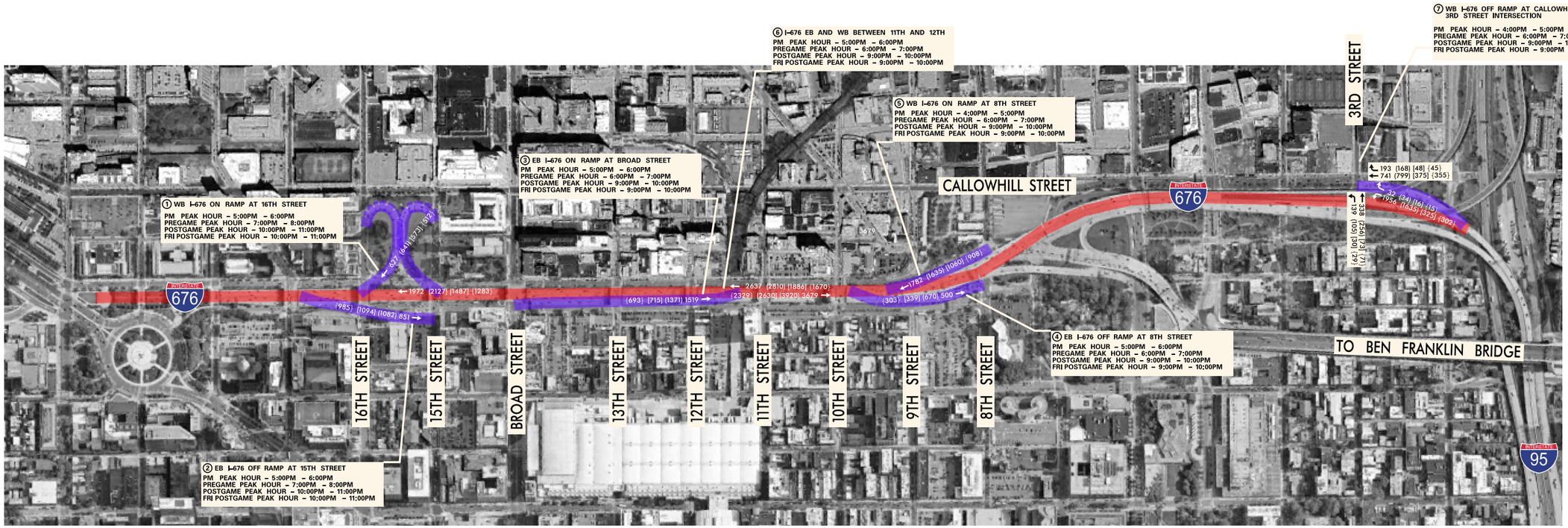
LEGEND

XX (XX) [XX] {XX}	PM (PREGAME) [POSTGAME] {FRI POSTGAME} PEAK HOUR VOLUMES
ⓧ	INTERSECTION NUMBER

76 PLACE I–676 TRAFFIC ANALYSIS – 2024 EXISTING VOLUME DIAGRAM

SHEET NO.
1
TOTAL SHTS.
3

PLOTTED BY: SMILLER3 DATE: 3/22/2024
Q:\2019\1903842.003_76_Place_Review_and_...\CADD\Traffic\76 Place Volume Figure.dgn



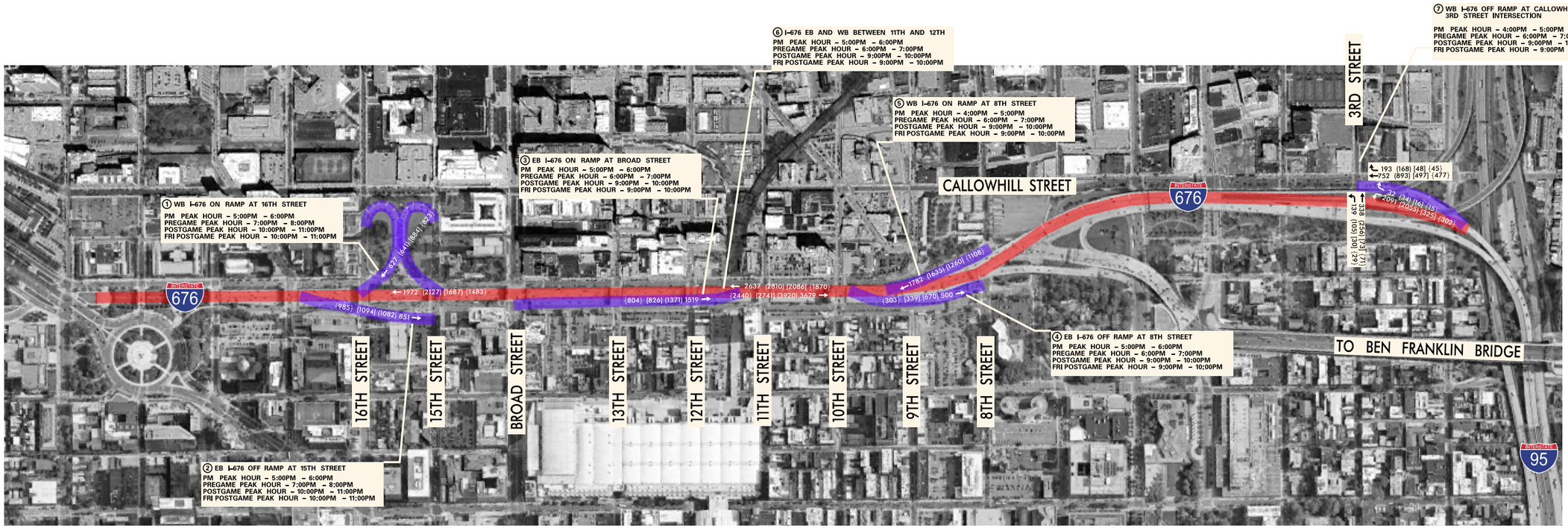
LEGEND

XX (XX) [XX] {XX}	PM (PREGAME) [POSTGAME] {FRI POSTGAME} PEAK HOUR VOLUMES
ⓧ	INTERSECTION NUMBER

PLOTTED BY: SMILLER3 DATE: 3/22/2024
Q:\2019\1903842_003_76_Place_Review_and_...\CADD\Traffic\76 Place Volume Figure.dgn

76 PLACE I–676 TRAFFIC ANALYSIS – 2031 NO BUILD

SHEET NO. 2
TOTAL SHTS. 3



LEGEND

XX (XX) [XX] {XX}	PM (PREGAME) [POSTGAME] {FRI POSTGAME} PEAK HOUR VOLUMES
ⓧ	INTERSECTION NUMBER

PLOTTED BY: SMILLER3 DATE: 3/22/2024
Q:\2019\1903842_003_76_Place_Review_and_...\CADD\Traffic\76 Place Volume Figure.dgn

76 PLACE I-676 TRAFFIC ANALYSIS – 2031 BUILD

SHEET NO. 3
TOTAL SHTS. 3

Weekday PM (4 PM - 6 PM)																				
Location #	Location	TMS Site Number	Date of Volume Collection	Day of the Week	Historical ADT[2]	Historical Peak Hour[2]	Historical Peak Hour Volume[2]	PHV % of ADT	2024 ADT[3]	2024 Existing PHV[4]	2031 No build PHV[5]	2022 Friday PHV From TIS (5PM)[6]	2022 Weekday PHV from TIS[7]	2024 Existing PHV	2031 No Build PHV	Arena Site Traffic Auto[8]	Arena Site Traffic Ridehail[9]	Arena Site Traffic Employee[10]	Residential Site Traffic[11]	2031 Build PHV
1	WB I-676 on ramp at 16th Street	37977	Oct. 21, 2021	Thursday	12155	5:00 PM	697	5.734%	10567	**606**	**627**					0	0	0	0	**627**
2	EB I-676 off ramp at 15th Street[6]											733	814	**822**	**851**	0	0	0	0	**851**
3	EB I-676 on ramp at Broad Street	37979	Nov. 8 2016	Tuesday	20414	5:00 PM	1613	7.901%	18568	**1467**	**1519**					0	0	0	0	**1519**
4	EB I-676 off ramp at 8th Street	37980	Oct. 13, 2016	Thursday	9357	5:00 PM	517	5.525%	8746	**483**	**500**					0	0	0	0	**500**
5	WB I-676 on ramp at 8th Street	37982	Oct. 12, 2016	Wednesday	28784	4:00 PM	1754	6.094%	28233	**1720**	**1782**					0	0	0	0	**1782**
6	Segment: I-676 between 12th Street and 11th Street (EB)[1]	48438	June. 7, 2023	Wednesday	153364	5:00 PM	8736	5.696%	62368	**3552**	**3679**					0	0	0	0	**3679**
7	Segment: I-676 between 12th Street and 11th Street (WB)[1]	48438	June. 7, 2023	Wednesday	153364	5:00 PM	7396	4.823%	52808	**2547**	**2637**					0	0	0	0	**2637**

Growth Rate[5]: 1.0355

[1] Historical ADT was taken from the TMS site between 11th Street and 10th Street and is not directional. The 2024 ADT was taken from TIRe and is directional. This historical peak hour volumes are calculated based on the directional ratio of the 2024 ADT.

[2] Historical ADT and peak hour volume taken from PennDOT TIRe website.

[3] 2024 ADT taken from PennDOT TIRe website.

[4] 2024 Peak Hour Volume calculated by multiplying 2024 ADT and PHV % of ADT.

[5] 2031 No Build volume calculated assuming an annual growth rate of 0.05% consistent with the TIS.

[6] Due to inconsistent data provided on the TIRe database, volumes for the EB I-676 off ramp at 15th Street were calculated using 2022 Friday peak hour volumes taken from turning movement counts for Vine Street & 15th Street included in the 76 Place TIS Prepared by Langan Engineering & Environmental Services, Inc. dated 9/15/2023.

[7] 2022 Peak Hour Volume is based on Friday data from TIS with the Friday Factors.

[8] Arena Site Traffic Auto from TIS Figure E25.

[9] Arena Site Traffic Ridehail from TIS Figures E30 & E40.

[10] Arena Site Traffic Employee from TIS Figure E35.

[11] Arena Site Traffic Residential from TIS Figure E45.

Weekday Pregame (6 PM - 8 PM)																				
Location #	Location	TMS Site Number	Date of Volume Collection	Day of the Week	Historical ADT [2]	Historical Peak Hour[2]	Historical Peak Hour Volume[2]	PHV % of ADT	2024 ADT[3]	2024 Existing PHV[4]	2031 No Build PHV[5]	2022 Friday PHV From TIS (7PM)[6]	Weekday PHV from TIS [7]	2024 Existing PHV	2031 No Build PHV	Arena Site Traffic Auto [8]	Arena Site Traffic Ridehail [9]	Arena Site Traffic Employee [10]	Residential Site Traffic [11]	2031 Build PHV
1	WB I-676 on ramp at 16th Street	37977	Oct. 21, 2021	Thursday	12155	7:00 PM	712	5.858%	10567	**619**	**641**					0	0	0	0	**641**
2	EB I-676 off ramp at 15th Street											932	1035	**1045**	**1082**	0	0	0	0	**1082**
3	EB I-676 on ramp at Broad Street	37979	Nov. 8 2016	Tuesday	20414	6:00 PM	1456	7.132%	18568	**1324**	**1371**					0	0	0	0	**1371**
4	EB I-676 off ramp at 8th Street	37980	Oct. 13, 2016	Thursday	9357	6:00 PM	692	7.396%	8746	**647**	**670**					0	0	0	0	**670**
5	WB I-676 on ramp at 8th Street	37982	Oct. 12, 2016	Wednesday	28784	6:00 PM	1610	5.593%	28233	**1579**	**1635**					0	0	0	0	**1635**
6	Segment: I-676 between 12th Street and 11th Street (EB)[1]	48438	June. 7, 2023	Wednesday	153364	6:00 PM	9308	6.069%	62368	**3785**	**3920**					0	0	0	0	**3920**
7	Segment: I-676 between 12th Street and 11th Street (WB)[1]	48438	June. 7, 2023	Wednesday	153364	6:00 PM	7882	5.139%	52808	**2714**	**2810**					0	0	0	0	**2810**

Growth Rate[5]: 1.0355

[1] Historical ADT was taken from the TMS site between 11th Street and 10th Street and is not directional. The 2024 ADT was taken from TIRe and is directional. This historical peak hour volumes are calculated based on the directional ratio of the 2024 ADT.

[2] Historical ADT and peak hour volume taken from PennDOT TIRe website.

[3] 2024 ADT taken from PennDOT TIRe website.

[4] 2024 Peak Hour Volume calculated by multiplying 2024 ADT and PHV % of ADT.

[5] 2031 No Build volume calculated assuming an annual growth rate of 0.05% consistent with the TIS.

[6] Due to inconsistent data provided on the TIRe database, volumes for the EB I-676 off ramp at 15th Street were calculated using 2022 Friday peak hour volumes taken from turning movement counts for Vine Street & 15th Street included in the 76 Place TIS Prepared by Langan Engineering & Environmental Services, Inc. dated 9/15/2023.

[7] 2022 Peak Hour Volume is based on Friday data from TIS with the Friday Factors.

[8] Arena Site Traffic Auto from TIS Figure E26.

[9] Arena Site Traffic Ridehail from TIS Figures E31 & E41.

[10] Arena Site Traffic Employee from TIS Figure E36.

[11] Arena Site Traffic Residential from TIS Figure E45.

Weekday Postgame (9 PM - 11 PM)																				
Location #	Location	TMS Site Number	Date of Volume Collection	Day of the Week	Historical ADT [2]	Historical Peak Hour [2]	Historical Peak Hour Volume [2]	PHV % of ADT	2024 ADT [3]	2024 Existing PHV [4]	2031 No Build PHV [5]	2022 Friday PHV from TIS (10PM) [6]	2022 Weekday PHV from TIS [7]	2024 Existing PHV	2031 No Build PHV	Arena Site Traffic Auto [8]	Arena Site Traffic Ridehail [9]	Arena Site Traffic Employee [10]	Residential Site Traffic [11]	2031 Build PHV
1	WB I-676 on ramp at 16th Street	37977	Oct. 21, 2021	Thursday	12155	10:00 PM	636	5.232%	10567	**553**	**573**					311	0	0	0	**884**
2	EB I-676 off ramp at 15th Street											942	1046	**1056**	**1094**	0	0	0	0	**1094**
3	EB I-676 on ramp at Broad Street	37979	Nov. 8 2016	Tuesday	20414	9:00 PM	759	3.718%	18568	**690**	**715**					111	0	0	0	**826**
4	EB I-676 off ramp at 8th Street	37980	Oct. 13, 2016	Thursday	9357	9:00 PM	350	3.741%	8746	**327**	**339**					0	0	0	0	**339**
5	WB I-676 on ramp at 8th Street	37982	Oct. 12, 2016	Wednesday	28784	9:00 PM	1044	3.627%	28233	**1024**	**1060**					200	0	0	0	**1260**
6	Segment: I-676 between 12th Street and 11th Street (EB)[1]	48438	June. 7, 2023	Wednesday	153364	9:00 PM	6246	4.072%	62368	**2540**	**2630**					111	0	0	0	**2741**
7	Segment: I-676 between 12th Street and 11th Street (WB)[1]	48438	June. 7, 2023	Wednesday	153364	9:00 PM	5288	3.448%	52808	**1821**	**1886**					200	0	0	0	**2086**

Growth Rate[5]: 1.0355

[1] Historical ADT was taken from the TMS site between 11th Street and 10th Street and is not directional. The 2024 ADT was taken from TIRe and is directional. This historical peak hour volumes are calculated based on the directional ratio of the 2024 ADT.

[2] Historical ADT and peak hour volume taken from PennDOT TIRe website.

[3] 2024 ADT taken from PennDOT TIRe website.

[4] 2024 Peak Hour Volume calculated by multiplying 2024 ADT and PHV % of ADT.

[5] 2031 No Build volume calculated assuming an annual growth rate of 0.05%.

[6] Due to inconsistent data provided on the TIRe database, volumes for the EB I-676 off ramp at 15th Street were calculated using 2022 Friday peak hour volumes taken from turning movement counts for Vine Street & 15th Street included in the 76 Place TIS Prepared by Langan Engineering &

[7] 2022 Peak Hour Volume is based on Friday data from TIS with the Friday Factors.

[8] Arena Site Traffic Auto from TIS Figure E27.

[9] Arena Site Traffic Ridehail from TIS Figures E32 & E42.

[10] Arena Site Traffic Employee from TIS Figure E37.

[11] Arena Site Traffic Residential from TIS Figure E45.

Friday Postgame (9 PM - 11 PM)																						
Location #	Location	TMS Site Number	Date of Volume Collection	Day of the Week	Historical ADT [2]	Historical Peak Hour[2]	Historical Peak Hour Volume[2]	2024 ADT[3]	TPG [4]	Day of Week by Month Factor [5]	Friday Factor [5]	% Difference	Historical PHV Adjusted to Friday[6]	2024 Existing Friday PHV[7]	2022 Friday PHV from TIS (9PM)[8]	2024 Friday Existing PHV	2031 Friday No Build PHV	2031 No Build PHV[9]	Arena Site Traffic Auto[10]	Arena Site Traffic Ridehail[11]	Arena Site Traffic Employee[12]	Residential Site Traffic[13]	2031 Build PHV
1	WB I-676 on ramp at 16th Street	37977	Oct. 21, 2021	Thursday	12155	10:00 PM	636	10567	1	0.723	0.647	-11%	569	**495**				**512**	311	0	0	0	**823**
2	EB I-676 off ramp at 15th Street[8]														942	**951**	**985**		0	0	0	0	**985**
3	EB I-676 on ramp at Broad Street	37979	Nov. 8 2016	Tuesday	20414	9:00 PM	759	18568	1	0.747	0.724	-3%	736	**669**				**693**	111	0	0	0	**804**
4	EB I-676 off ramp at 8th Street	37980	Oct. 13, 2016	Thursday	9357	9:00 PM	350	8746	1	0.723	0.647	-11%	313	**293**				**303**	0	0	0	0	**303**
5	WB I-676 on ramp at 8th Street	37982	Oct. 12, 2016	Wednesday	28784	9:00 PM	1044	28233	1	0.756	0.647	-14%	893	**876**				**908**	200	0	0	0	**1108**
6	Segment: I-676 between 12th Street and 11th Street (EB)[1]	48438	June. 7, 2023	Wednesday	153364	9:00 PM	6246	62368	1	0.751	0.665	-11%	5530	**2249**				**2329**	111	0	0	0	**2440**
7	Segment: I-676 between 12th Street and 11th Street (WB)[1]	48438	June. 7, 2023	Wednesday	153364	9:00 PM	5288	52808	1	0.751	0.665	-11%	4683	**1612**				**1670**	200	0	0	0	**1870**

Growth Rate[5]: 1.0355

[1] Historical ADT was taken from the TMS site between 11th Street and 10th Street and is not directional. The 2024 ADT was taken from TIRe and is directional. This historical peak hour volumes are calculated based on the directional ratio of the 2024 ADT.

[2] Historical ADT and peak hour volume taken from PennDOT TIRe website.

[3] 2024 ADT taken from PennDOT TIRe website.

[4] TPG from PennDOT TIRe website.

[5] Day of the Week by Month Factor from 2022 Pennsylvania Traffic Data Report (Table 355 of https://gis.penndot.pa.gov/BPR_PDF_FILES/Documents/Traffic/Traffic_Information/Annual_Report/2022/2022_Traffic_Information_Report.pdf).

[6] Historical peak hour volumes were adjusted by the ratio between day of the week factor and Friday factor.

[7] 2024 Peak Hour Volume calculated by multiplying 2024 ADT and PHV % of ADT.

[8] Due to inconsistent data provided on the TIRe database, volumes for the EB I-676 off ramp at 15th Street were calculated using 2022 Friday peak hour volumes taken from turning movement counts for Vine Street & 15th Street included in the 76 Place TIS Prepared by Langan Engineering & Environmental Services, Inc. dated 9/15/2023.

[9] 2031 No Build volume calculated assuming an annual growth rate of 0.05%.

[10] Arena Site Traffic Auto from TIS Figure E27.

[11] Arena Site Traffic Ridehail from TIS Figures E32 & E42.

[12] Arena Site Traffic Employee from TIS Figure E37.

[13] Arena Site Traffic Residential from TIS Figure E45.

WB I-676 Off Ramp/Callowhill Street/N. 3rd Street							
		Westbound Callowhill St		Northwestbound 676 Off Ramp		Northbound 3rd Street	
		Through	Right	Bear left	Right[26]	Left	Through
Historical Turning Movement Counts[1]		353	45	306	15	28	69
Growth to 2024[2]		362	46	314	15	29	71
Growth to 2031[2]		375	48	325	16	30	73
2024 No Build Weekday Postgame (9-11 PM)		**362**	**46**	**314**	**15**	**29**	**71**
2031 No Build Weekday Postgame (9-11 PM)		**375**	**48**	**325**	**16**	**30**	**73**
Weekday Postgame Site Trips							
	Arena Site Traffic Auto[3]	0	0	0	0	0	0
	Arena Site Traffic Ridehail[4]	122	0	0	0	0	0
	Arena Site Traffic Employee[5]	0	0	0	0	0	0
	Arena Site Traffic Employee Taxi[6]	0	0	0	0	0	0
	Residential Site Traffic[7]	0	0	0	0	0	0
2031 Build Weekday Postgame (9-11 PM)		**497**	**48**	**325**	**16**	**30**	**73**
2024 No Build Friday Postgame PHV (9-11 PM)[8]		**342**	**44**	**291**	**14**	**28**	**69**
2031 No Build Friday Postgame PHV (9-11 PM)[8]		**355**	**45**	**302**	**15**	**29**	**71**
	Friday Factor	0.795	0.795	0.722	0.722	0.855	0.855
	Weekday Factor	0.841	0.841	0.778	0.778	0.877	0.877
Friday Postgame Site Trips							
	Arena Site Traffic Auto[9]	0	0	0	0	0	0
	Arena Site Traffic Ridehail[10]	122	0	0	0	0	0
	Arena Site Traffic Employee[11]	0	0	0	0	0	0
	Arena Site Traffic Employee Taxi[12]	0	0	0	0	0	0
	Residential Site Traffic[13]	0	0	0	0	0	0
2031 Build Friday Postgame PHV (9-11 PM)		**477**	**45**	**302**	**15**	**29**	**71**
2024 No Build Weekday Pregame (6-9 PM)[14]		**771**	**98**	**1580**	**75**	**102**	**249**
2031 No Build Weekday Pregame (6-9 PM)[14]		**799**	**168**	**1635**	**34**	**105**	**256**
Weekday Pregame Site Trips							
	Arena Site Traffic Auto[15]	0	0	420	0	0	0
	Arena Site Traffic Ridehail[16]	94	0	0	0	0	0
	Arena Site Traffic Employee[17]	0	0	0	0	0	0
	Arena Site Traffic Employee Taxi[18]	0	0	0	0	0	0
	Residential Site Traffic[19]	0	0	0	0	0	0
2031 Build Weekday Pregame PHV (6-9 PM)		**893**	**168**	**2055**	**34**	**105**	**256**
2024 No Build Weekday PM Peak Hour (4-6 PM)[20]		**715**	**91**	**1890**	**90**	**134**	**329**
2031 No Build Weekday PM Peak Hour (4-6 PM)[20]		**741**	**193**	**1956**	**32**	**139**	**338**
Weekday PM Peak Hour Site Trips							
	Arena Site Traffic Auto[21]	0	0	51	0	0	0
	Arena Site Traffic Ridehail[22]	11	0	0	0	0	0
	Arena Site Traffic Employee[23]	0	0	71	0	0	0
	Arena Site Traffic Employee Taxi[24]	0	0	0	0	0	0
	Residential Site Traffic[25]	0	0	13	0	0	0
2031 Build Weekday PM PHV (4-6 PM)		**752**	**193**	**2091**	**32**	**139**	**338**

[1] Historical count data taken from I-95 Cap Project Synchro file. Volumes are 11 PM hour and are assumed to be weekday data from 2019.

[2] 2031 No Build volume calculated assuming an annual growth rate of 0.05%.

[3] Volumes taken from TIS Figure E-27 Markups.

[4] Volumes taken from TIS Figure E-32. Ridehail trips are assumed to be local trips using Callowhill Road.

[5] Volumes taken from E-37 Markups.

[6] Volumes taken from TIS Figure E-40.

[7] Volumes taken from TIS Figure E-45.

[8] Day of the Week by Month Factors from 2022 Pennsylvania Traffic Data Report (Table 355 of https://gis.penndot.pa.gov/BPR_PDF_FILES/Documents/Traffic/Traffic_Information/Annual_Report/2022/2022_Traffic_Information_Report.pdf). Due to a lack of available information on what month and day of the week traffic counts were collected, monthly values were averaged for the Friday factor and Tuesday, Wednesday, and Thursday values were averaged for the weekday factor.

[9] Volumes taken from TIS Figure E-27 Markups.

[10] Volumes taken from TIS figure E-32. Ridehail trips are assumed to be local trips using Callowhill Road.

[11] Volumes taken from TIS Figure E-37 Markups.

[12] Volumes taken from TIS Figure E-40.

[13] Volumes taken from TIS Figure E-45.

[14] Conversion to No Build Weekday Pregame PHV was calculated by multiplying No Build Weekday Postgame PHV by the proportion of historical hourly volume. Historical hourly volume taken from PennDOT TIRe website.

[15] Volumes taken from TIS Figure E-26. Arena Auto Trips are assumed to be trips using 676 off-ramp.

[16] Volumes taken from TIS Figure E-31. Ridehail trips are assumed to be local trips using Callowhill Road.

[17] Volumes taken from TIS Figure E-36.

[18] Volumes taken from TIS Figure E-42.

[19] Volumes taken from TIS Figure E-45.

[20] Conversion to No Build Weekday PM PHV was calculated by multiplying No Build Weekday Postgame PHV by the proportion of historical hourly volume. Historical hourly volume taken from PennDOT TIRe website.

[21] Volumes taken from TIS Figure E-25. Arena Auto Trips are assumed to be trips using 676 off-ramp.

[22] Volumes taken from TIS Figure E-30. Ridehail trips are assumed to be local trips using Callowhill Road.

[23] Volumes taken from TIS Figure E-35. Employee Trips are assumed to be trips using 676 off-ramp.

[24] Volumes taken from TIS Figure E-41.

[25] Volumes taken from TIS Figure E-45. Residential Trips are assumed to be trips using 676 off-ramp.

[26] Due to a lack of available data, the 676 off-ramp right turn volume was assumed to be 5% of the bear left volume.

TPG 1					
Month	**Friday**	Tues	Wed	Thurs	Weekday
Jan	0.943	0.924	0.907	0.906	0.912
Feb	0.894	0.88	0.864	0.864	0.869
Mar	0.735	0.83	0.855	0.803	0.829
Apr	0.696	0.795	0.761	0.747	0.768
May	0.692	0.773	0.761	0.724	0.753
Jun	0.665	0.769	0.751	0.718	0.746
Jul	0.645	0.75	0.729	0.705	0.728
Aug	0.65	0.75	0.728	0.694	0.724
Sep	0.656	0.779	0.759	0.722	0.753
Oct	0.647	0.78	0.756	0.723	0.753
Nov	0.724	0.747	0.73	0.798	0.758
Dec	0.711	0.749	0.731	0.734	0.738
Average	**0.722**	**0.794**	**0.778**	**0.762**	**0.778**

TPG 3					
Month	**Friday**	Tues	Wed	Thurs	Weekday
Jan	0.974	1.024	0.941	0.957	0.974
Feb	0.921	0.926	0.888	0.905	0.906
Mar	0.795	0.882	0.886	0.86	0.876
Apr	0.777	0.861	0.829	0.823	0.838
May	0.752	0.806	0.791	0.767	0.788
Jun	0.736	0.815	0.794	0.786	0.798
Jul	0.754	0.828	0.806	0.786	0.807
Aug	0.74	0.813	0.781	0.77	0.788
Sep	0.739	0.824	0.803	0.778	0.802
Oct	0.744	0.826	0.808	0.797	0.810
Nov	0.83	0.839	0.824	0.955	0.873
Dec	0.779	0.844	0.809	0.832	0.828
Average	**0.795**	**0.857**	**0.830**	**0.835**	**0.841**

TPG 5					
Month	**Friday**	Tues	Wed	Thurs	Weekday
Jan	1.014	1.016	0.964	0.958	0.979
Feb	0.976	0.949	0.906	0.901	0.919
Mar	0.836	0.901	0.903	0.863	0.889
Apr	0.793	0.87	0.836	0.825	0.844
May	0.805	0.809	0.82	0.776	0.802
Jun	0.792	0.858	0.839	0.826	0.841
Jul	0.84	0.878	0.874	0.841	0.864
Aug	0.833	0.89	0.86	0.851	0.867
Sep	0.784	0.857	0.836	0.802	0.832
Oct	0.802	0.869	0.851	0.823	0.848
Nov	0.904	0.877	0.881	1.031	0.930
Dec	0.877	0.937	0.878	0.905	0.907
Average	**0.855**	**0.893**	**0.871**	**0.867**	**0.877**

Historical Hourly Volumes[14]			
Time	676 Ramp	Callowhill	3rd Street
4:00 PM	1330	395	454
5:00 PM	1329	367	523
6:00 PM	1112	426	396
7:00 PM	687	420	264
8:00 PM	441	318	192
9:00 PM	443	315	174
10:00 PM	480	282	144
11:00 PM	221	200	113

TMS Site 37977: Traffic Monitoring Report

Location Description: From N. 16th St. to I-676 west.

Location 1 - WB I-676 on ramp at 16th Street

Details

Type of Count	VOLUME
Type of Site	Portable
Schedule	1 TIME/YR
Duration	24 HRS
Frequency Cycle	05
Cycle Year	03

Location

County	PHILADELPHIA (67)
Route	8059
Segment	0250
Offset	0330
Latitude	39.95941
Longitude	-75.16468

Map

Traffic Data

Hour	Volume	Volume Graph
12:00 AM	245	
01:00 AM	123	
02:00 AM	74	
03:00 AM	84	
04:00 AM	76	
05:00 AM	184	
06:00 AM	446	
07:00 AM	724	
08:00 AM	708	
09:00 AM	591	
10:00 PM	523	
11:00 AM	658	
12:00 PM	699	
01:00 PM	694	
02:00 PM	690	
03:00 PM	588	
04:00 PM	596	
05:00 PM	697	
06:00 PM	595	
07:00 PM	712	
08:00 PM	738	
09:00 PM	593	
10:00 PM	636	
11:00 PM	481	

TMS Site 37979: Traffic Monitoring Report

Location Description: From PA 611 to I-676 east. Location 3 - EB I-676 on ramp at Broad Street

Details

Type of Count	VOLUME
Type of Site	Portable
Schedule	1 TIME/YR
Duration	24 HRS
Frequency Cycle	05
Cycle Year	03

Location

County	PHILADELPHIA (67)
Route	8059
Segment	0750
Offset	0230
Latitude	39.95747
Longitude	-75.16011

Map

Traffic Data

Hour	Volume	Volume Graph
12:00 AM	273	
01:00 AM	204	
02:00 AM	124	
03:00 AM	96	
04:00 AM	113	
05:00 AM	275	
06:00 AM	704	
07:00 AM	1,159	
08:00 AM	1,138	
09:00 AM	988	
10:00 AM	960	
11:00 AM	1,046	
12:00 PM	972	
01:00 PM	1,054	
02:00 PM	1,320	
03:00 PM	1,505	
04:00 PM	1,497	
05:00 PM	1,613	
06:00 PM	1,456	
07:00 PM	1,065	
08:00 PM	928	
09:00 PM	759	
10:00 PM	606	
11:00 PM	559	

TMS Site 37980: Traffic Monitoring Report

Location 4 - EB I-676 off ramp at 8th Street

Location Description: Off ramp from I-676 east to N. 8th St. 39.95672, -75.15370

Details

Type of Count	VOLUME
Type of Site	Portable
Schedule	1 TIME/YR
Duration	24 HRS
Frequency Cycle	05
Cycle Year	03

Location

County	PHILADELPHIA (67)
Route	8061
Segment	0010
Offset	0184
Latitude	39.95667
Longitude	-75.15386

Map

Traffic Data

Hour	Volume	Volume Graph
12:00 AM	22	
01:00 AM	7	
02:00 AM	10	
03:00 AM	9	
04:00 AM	99	
05:00 AM	414	
06:00 AM	565	
07:00 AM	791	
08:00 AM	783	
09:00 AM	686	
10:00 AM	567	
11:00 AM	567	
12:00 PM	490	
01:00 PM	502	
02:00 PM	308	
03:00 PM	341	
04:00 PM	361	
05:00 PM	517	
06:00 PM	692	
07:00 PM	511	
08:00 PM	547	
09:00 PM	350	
10:00 PM	165	
11:00 PM	53	

TMS Site 37982: Traffic Monitoring Report

Location 5 - WB I-676 on ramp at 8th Street

Location Description: From N. 8th St. to I-676 west. 39.95700, -75.15357

Details

Type of Count	VOLUME
Type of Site	Portable
Schedule	1 TIME/YR
Duration	24 HRS
Frequency Cycle	05
Cycle Year	03

Location

County	PHILADELPHIA (67)
Route	8061
Segment	0250
Offset	0160
Latitude	39.95706
Longitude	-75.1534

Map

Traffic Data

Hour	Volume	Volume Graph
12:00 AM	123	
01:00 AM	97	
02:00 AM	86	
03:00 AM	94	
04:00 AM	515	
05:00 AM	1,681	
06:00 AM	1,986	
07:00 AM	1,785	
08:00 AM	1,576	
09:00 AM	1,677	
10:00 AM	1,629	
11:00 AM	1,507	
12:00 PM	1,478	
01:00 PM	1,588	
02:00 PM	1,565	
03:00 PM	1,571	
04:00 PM	1,754	
05:00 PM	1,639	
06:00 PM	1,610	
07:00 PM	1,503	
08:00 PM	1,422	
09:00 PM	1,044	
10:00 PM	628	
11:00 PM	226	

TMS Site 48438: Traffic Monitoring Report

Location Description: Between Broad Street Exit and Eighth Street Exit

Location 6&7 - I-676 between 12th Street and 11th Street (EB & WB)

Details

Type of Count	AI MACHINE CLASS
Type of Site	Portable
Schedule	1 TIME/YR
Duration	24 HRS
Frequency Cycle	01
Cycle Year	01

Location

County	PHILADELPHIA (67)
Route	0676
Segment	0010
Offset	2238
Latitude	39.95703
Longitude	-75.15619

Map

Traffic Data

Hour	Volume	Trucks	Truck %	Volume Graph
12:00 AM	2,100	81	3.9	
01:00 AM	1,347	99	7.3	
02:00 AM	981	110	11.2	
03:00 AM	1,074	158	14.7	
04:00 AM	1,786	276	15.5	
05:00 AM	5,306	486	9.2	
06:00 AM	8,516	541	6.4	
07:00 AM	9,625	437	4.5	
08:00 AM	8,929	479	5.4	
09:00 AM	8,544	705	8.3	
10:00 AM	8,267	706	8.5	
11:00 AM	8,196	582	7.1	
12:00 PM	8,356	642	7.7	
01:00 PM	8,664	578	6.7	
02:00 PM	9,041	432	4.8	
03:00 PM	8,679	338	3.9	
04:00 PM	8,037	239	3	
05:00 PM	8,066	193	2.4	
06:00 PM	8,595	192	2.2	
07:00 PM	7,984	195	2.4	
08:00 PM	6,978	147	2.1	
09:00 PM	5,767	97	1.7	
10:00 PM	4,802	98	2	
11:00 PM	3,724	76	2	

Appendix B – Analysis Results

Table Ia
76 Place Independent Analysis
Peak Hour Levels Of Service (LOS) - 2024 Existing

Intersection	Overall LOS (delay) from Synchro (seconds per vehicle)			
	Weekday PM	**Weekday Pregame**	**Weekday Postgame**	**Friday Postgame**
WB I-676 Off Ramp/Callowhill Street/N. 3rd Street	E (65.0)	C (29.8)	B (18.3)	B (18.2)

Table Ib
76 Place Independent Analysis
Peak Hour Levels Of Service (LOS) - 2024 Existing

Intersection	LOS (Density) from HCS (passenger cars/mile/lane)			
	Weekday PM	**Weekday Pregame**	**Weekday Postgame**	**Friday Postgame**
WB I-676 On Ramp at 16th Street	B (17.7)	B (19.1)	B (13.2)	B (11.0)
EB I-676 Off Ramp at 15th Street	B (10.8)	B (14.4)	A (8.5)	A (5.9)
EB I-676 On Ramp at Broad Street	C (26.3)	D (28.5)	B (17.9)	B (15.4)
EB I-676 Off Ramp at 8th Street	C (23.9)	C (24.6)	B (18.6)	B (17.0)
WB I-676 On Ramp at 8th Street	B (17.5)	B (19.0)	B (11.5)	A (9.7)
EB I-676 segment between Broad Street and 12th Street	C (25.7)	D (30.4)	C (22.8)	C (19.5)
WB I-676 segment between Broad Street and 12th Street	C (20.5)	C (21.8)	B (14.6)	B (12.9)
EB I-676 weave between Broad Street On Ramp and 8th Street Off Ramp	E (35.2)	E (38.2)	C (21.7)	B (19.0)

Table IIa
76 Place Independent Analysis
Peak Hour Levels Of Service (LOS) - 2031 No Build

Intersection	Overall LOS (delay) from Synchro (seconds per vehicle)			
	Weekday PM	Weekday Pregame	Weekday Postgame	Friday Postgame
WB I-676 Off Ramp/Callowhill Street/N. 3rd Street	E (74.5)	C (33.6)	B (18.4)	B (18.3)

Table IIb
76 Place Independent Analysis
Peak Hour Levels Of Service (LOS) - 2031 No Build

Intersection	Density LOS from HCS (passenger cars/mile/lane)			
	Weekday PM	Weekday Pregame	Weekday Postgame	Friday Postgame
WB I-676 On Ramp at 16th Street	B (18.5)	B (19.9)	B (13.8)	B (11.5)
EB I-676 Off Ramp at 15th Street	B (11.5)	B (15.2)	A (9.2)	A (6.5)
EB I-676 On Ramp at Broad Street	C (27.4)	D (29.6)	B (18.7)	B (16.1)
EB I-676 Off Ramp at 8th Street	C (24.5)	C (25.3)	B (19.1)	B (17.4)
WB I-676 On Ramp at 8th Street	B (18.2)	B (19.8)	B (12.0)	B (10.2)
EB I-676 segment between Broad Street and 12th Street	D (26.6)	D (31.4)	C (23.6)	C (20.2)
WB I-676 segment between Broad Street and 12th Street	C (21.2)	C (22.6)	B (15.2)	B (13.4)
EB I-676 weave between Broad Street On Ramp and 8th Street Off Ramp	E (36.9)	E (40.2)	C (22.7)	B (19.7)

Table IIIa
76 Place Independent Analysis
Peak Hour Levels Of Service (LOS) - 2031 Build

Intersection	Overall LOS (delay) from Synchro (seconds per vehicle)			
	Weekday PM	Weekday Pregame	Weekday Postgame	Friday Postgame
WB I-676 Off Ramp/Callowhill Street/N. 3rd Street	F (96.6)	F (90.9)	B (19.5)	B (19.4)

Table IIIb
76 Place Independent Analysis
Peak Hour Levels Of Service (LOS) - 2031 Build

Intersection	Density in Ramp Influence Area LOS from HCS (passenger cars/mile/lane)			
	Weekday PM	Weekday Pregame	Weekday Postgame	Friday Postgame
WB I-676 On Ramp at 16th Street	B (18.5)	B (19.9)	B (18.1)	B (15.8)
EB I-676 Off Ramp at 15th Street	B (11.5)	B (15.2)	A (9.2)	A (6.5)
EB I-676 On Ramp at Broad Street	C (27.4)	D (29.6)	B (19.6)	B (17.0)
EB I-676 Off Ramp at 8th Street	C (24.5)	C (25.3)	B (19.8)	B (18.1)
WB I-676 On Ramp at 8th Street	B (18.2)	B (19.8)	B (13.7)	B (11.9)
EB I-676 segment between Broad Street and 12th Street	D (26.6)	D (31.4)	C (23.6)	C (20.2)
WB I-676 segment between Broad Street and 12th Street	C (21.2)	C (22.6)	B (16.7)	B (15.0)
EB I-676 weave between Broad Street On Ramp and 8th Street Off Ramp	E (36.9)	E (40.2)	C (24.1)	C (21.0)