



DRAFT

Arena Access Management Plan (AAMP)

Seattle Center Arena Renovation Project

■ Prepared for:



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1. Introduction

1.1 AAMP PURPOSE

The purpose of the Arena Access Management Plan (AAMP) is to outline strategies to provide safe, convenient, and efficient access for all people traveling to and from the redeveloped Seattle Center Arena (Arena). Due to the Arena's urban setting (located within the Seattle Center campus and adjacent to the Uptown, South Lake Union, and Belltown neighborhoods), access to the Arena focuses on strategies to encourage sustainable transportation modes and manage trips in private autos and ridehailing vehicles for Arena events with 10,000 or more persons in attendance. The AAMP seeks to reduce traffic congestion and transit delays caused by private vehicles and ridehailing trips while also minimizing conflicts between people walking, biking, and traveling in cars and on transit (bus, Monorail, and ultimately light rail). To increase the likelihood that Arena attendees have a positive experience traveling to and from the venue, strategies to increase the use of and attractiveness of transit, walking, and biking modes are proposed, along with traffic and ridehailing management techniques to ensure that people who travel via car effectively navigate to their parking, drop-off, and pick-up location with fewer delays than would occur under an unmanaged setting.

The AAMP is a flexible, 'living' document, which will be amended by the City and Oak View Group (OVG) annually, as conditions change, and based on experience and input from additional parties, including the City, Seattle Center, OVG, police and fire departments, and local transit agencies. It is likely that the AAMP will need to be updated in response to:

- *Changes in the roadway network (which would influence traffic management strategies);*
- *Changes in transportation technologies and their associated management methods and tools;*
- *Changes in transit service; or*
- *Observations of vehicular congestion, modal conflicts, and modal preferences during monitoring of hockey/basketball games, concerts, and other large events.*

It is also important for readers to recognize that this August 2018 version of the AAMP is an **initial draft**. As noted throughout the document, many of the agreements, details, and specifics required for a document of this magnitude are still in discussions and negotiations between many parties. This initial draft AAMP is being released concurrently with the Final Environmental Impact Statement (EIS) to provide more context to the mitigation measures recommended in the EIS. A



document like the AAMP is typically not finalized and released to the public until much closer to the first event at a venue when more of the details and negotiations have been finalized. Therefore, the public can expect that refinements to the AAMP will continue up until the time that permits are issued and the Arena hosts its first event. The final AAMP is likely to be published just prior to issuance of building permits. Updates to the event traffic management elements may occur prior to the first Arena event. As described in Chapter 10, the AAMP will be further refined during and after the first year of Arena operations as OVG and the City learn specific details about how people are traveling to the Arena and how best to manage travel, encourage sustainable access modes, and ensure a great attendee experience.

1.2 ROLES AND RESPONSIBILITIES

Similar to other sports and entertainment venues, it is expected that OVG will enter into agreement(s) with various agencies and/or vendors to provide the improvements necessary to implement this AAMP. Because Seattle Center, Seattle Department of Transportation (SDOT), and Seattle Police Department (SPD) all have roles for maintaining and operating the transportation system in the immediate project vicinity, they will have responsibility for collaboratively working with OVG to implement, operate, and/or oversee many of the recommended strategies contained in this AAMP.

Table 1 describes the roles and responsibilities for key agencies and entities involved in implementing the AAMP. It is expected that this table will change over time based on which agencies and organizations are required to play a role in the AAMP.

This document does not identify the specific entity which will carry out certain actions because contractual, logistical, and other details have not been finalized. As these details are finalized in the future, the AAMP will be updated to include more specific roles and responsibilities. The AAMP provides the public and City decision-makers with additional information about how the transportation system would be managed on event days, and what operational benefits can be expected from it.

**Table 1: Roles and Responsibilities**

Agency or Entity	Roles and Responsibilities
Oak View Group (OVG)	OVG, the entity responsible for the operation and maintenance of Seattle Center Arena, is the project sponsor and is responsible, with support from the City, for implementing the AAMP and complying with its monitoring and performance standards. They are also financially and contractually responsible for annually updating the AAMP.
Seattle Department of Construction and Inspections (SDCI)	SDCI manages permit review and approval across the City. SDCI works with developers and enforces conditions of approval as part of the permit review and approval process. SDCI, along with SDOT and Seattle Center will approve the AAMP and the subsequent/annual updates to ensure they meet the intent of the Seattle Center Arena Renovation Project Environmental Impact Statement and reduce the transportation impacts of Arena operations.
Seattle Department of Transportation (SDOT)	SDOT has jurisdiction over the City's public right-of-way (ROW), traffic operations, and on-street parking. It manages all surface transportation infrastructure and systems in the city, including roads, sidewalks, bicycle lanes, parking, and traffic control. Recommendations related to physical or operational changes to the ROW and/or traffic operations or circulation must be reviewed and approved by SDOT. SDOT, along with SDCI and Seattle Center will approve the AAMP and the subsequent/annual updates.
Seattle Center	Seattle Center has oversight for the Seattle Center campus which includes Seattle Center Arena and numerous other venues and resident organizations. Seattle Center is a critical partner on this project given their operation of the campus as a whole including agreements regarding the use of parking garages, curb space, Monorail, etc. Seattle Center, along with SDCI and SDOT will approve the AAMP and the subsequent/annual updates.
Seattle Police Department (SPD)	SPD is responsible for public safety and security emergency response, implementation of traffic control plans, incident management, and coordination with the Seattle Fire Department as needed.
Seattle Fire Department (SFD)	SFD provides emergency medical service, fire and rescue response, and fire prevention to the residents, visitors, and workers within Seattle.
King County Metro and Sound Transit (KCM and ST)	KCM and ST provide fixed-route bus service, light rail, vanpools, and paratransit throughout the county. Recommendations related to physical or operational changes to transit facilities or operations must be approved by KCM and/or ST.



1.3 REPORT ORGANIZATION

The remainder of this report consists of the following chapters, which are ordered such that discussions in later chapters build upon data and findings from earlier chapters.

- **Chapter 2 (Project Travel Characteristics)** – provides an overview of the project's size, types of events it would host and expected mode split in the absence of demand management strategies.
- **Chapter 3 (Demand Management Strategies)** – presents a demand management program to reduce auto mode share (including ridehailing) and increase the mode share of other modes by attendees and employees to reach the Arena.
- **Chapter 4 (Opening Day (2020) Physical Improvements)** – discusses physical improvements planned to be in place when the arena opens in Fall 2020.
- **Chapter 5 (Transit)** – discusses existing and planned transit service to the Arena.
- **Chapter 6 (Bicycle and Pedestrian)** – discusses existing and planned bicycle and pedestrian facilities that may be used to access the Arena along with on-site bicycle parking.
- **Chapter 7 (Parking)** – discusses the various parking facilities in the project vicinity, a planned parking reservation system, and an overview of "Parking Best Practices" that parking operators should follow.
- **Chapter 8 (Ridehailing)** – discusses plans to accommodate Transportation Network Company (e.g., Uber and Lyft) trips to and from the Arena vicinity.
- **Chapter 9 (Traffic, Parking, Transit, Ridehailing, and Pedestrian Management)** – discusses how the relationships between different travel modes can affect overall circulation. It includes a series of traffic management recommendations for pre-event and post-event conditions, and then presents the operational benefits associated with implementation of the physical improvement and AAMP under Opening Day (2020) conditions.
- **Chapter 10 (Performance Standards and Monitoring)** – presents a set of performance standards that describe the desired level of operating conditions that should be achieved during major events with the AAMP in place. It also discusses the mitigation monitoring plan that should be implemented once the arena is constructed and open to ensure that standards are met.



1.4 OVERVIEW OF CONDITIONS DURING LARGE EVENTS AT EXISTING KEYARENA

KeyArena currently hosts a variety of sporting events, concerts, and other activities/shows. Observations were made prior to and after several large events at KeyArena in Fall 2017, Spring 2018, and Summer 2018. The following observations were made:

- *During large events (i.e., 10,000 or more persons), roadways surrounding the venue become congested for a variety of reasons ranging from vehicle pick-ups/drop-offs especially along 1st Ave N, people in cars waiting to enter and exit garages, and overall large numbers of vehicles. Due to this congestion, buses were stuck in traffic and moved inefficiently to and through 1st Ave N.*
- *During pre-event conditions, no traffic management activities are in place.*
- *During post-event conditions, traffic control officers (TCOs) are situated along portions of 1st Ave N, Denny Way and Roy St to close portions of certain streets and manage traffic and pedestrian flows. Special event signal timings are also utilized along Mercer St.*

Technical Appendix A contains detailed observations/photos before and after the Kevin Hart Comedy Show, which occurred on Thursday, June 14, 2018. This event drew approximately 14,000 attendees. This appendix also displays the post-event traffic management plan currently in place for events with 10,000 attendees or more at KeyArena.

Note that the conditions documented in the observations of the events over 2017 and 2018 are expected to become more pronounced when the renovated Arena opens in 2020. As documented in the EIS, several factors will make traffic congestion, transit delay, and curb space management more challenging in the future:

- *Background traffic growth caused by ongoing development in the surrounding neighborhoods will make the pre-event traffic and transit congestion more severe.*
- *The renovated Arena will have a larger capacity and be able to host substantially more events per year than can be accommodated by KeyArena; these additional events will increase the frequency of event-related traffic congestion and transit delay.*
- *Ridehailing mode share is expected to continue to increase, resulting in more ridehailing vehicles seeking curb space and circulating before and after events at the renovated Arena, thus congesting streets.*



View of queued buses at the 1st Ave N/Denny Way intersection during the pre-event peak hour prior to the Kevin Hart Comedy Show on Thursday, June 14, 2018.

This observational data is helpful in identifying current motorist bottleneck locations, pinch-points for people walking, areas in which buses incur delay, curb space (flex zone) management challenges, and other operational impacts that the AAMP aims to mitigate.

Lessons learned from these observations include:

1. Pre-event traffic management (including use of TCOs) is necessary to improve traffic operations.
2. Parking garage operators should adhere to a set of “best practices” so that people in cars waiting to enter their garages or surface parking lots do not block City streets (bike and travel lanes) and sidewalks.
3. When people in cars circulate to look for on- and off-street parking, the roadway system becomes gridlocked. A parking reservation system is needed to reduce the number and frequency of people in cars adding to congestion. Additional on-street parking management is required to ensure that attendees do not improperly use on-street curb space meant for high-turnover uses.

**Lessons learned from these observations include:**

4. Curb space (flex zone) management along 1st Ave N (including prohibiting ridehailing pick-up/drop-offs) is critical to this street's overall operations including the need for buses to achieve on-time stop arrivals.

2. Project Travel Characteristics

The location of the renovated Arena is shown in Figure 1. In its opening year, the Arena is expected to host approximately 200 events per year. This would include 50 NHL games, 40 to 55 concerts, and 25 WNBA games along with roughly another 75 events. This equates to an event about four days per week. An NBA team would add another 50 events per year, but an NBA team is not expected by the Arena's opening year.

2.1 MODE SPLIT

The analysis in the EIS evaluated three peak-hour analysis periods: Weekday pre-event from 5:30 - 6:30 PM, Weekday post-event from 9:30 - 10:30 PM, and Saturday pre-event from 6:00 - 7:00 PM. The projected travel mode split for Arena attendees for opening day conditions for each of these time periods is summarized in Table 2. Refer to FEIS Appendix B, Tech Memo 5, Project Travel Characteristics – Year 2020 for supporting details. The mode shares in this table are based on current conditions and do not reflect implementation of any demand management strategies to encourage use of sustainable transportation modes.

As is typical for an EIS, the transportation analysis for the Arena Renovation Project EIS utilized a conservative approach to analyze project-specific impacts with an emphasis on not understating impacts to the roadway system. It is possible, and desirable, to shift many of those private vehicle trips to sustainable transportation modes (people taking transit, walking, and biking) through an aggressive demand management program. OVG is committed to implementing a demand management program that would, over time, achieve a lower auto mode share than is shown in Table 2. That program is outlined in Chapter 3 of this AAMP.

**Table 2: Baseline Mode Share Assumptions for Arena Attendees in 2020**

Travel Mode	Weekday NBA Game Pre-Event Peak Hour	Weekday NBA Game Post-Event Peak Hour	Saturday Concert Pre-Event Peak Hour	Notes
Private Vehicle	63%	67%	68%	Some of these trips may also include longer walks or bikeshare bicycle travel to the Arena to/from a remote lot/garage.
Bus	8%	6%	6%	Reflect transit trips to/from routes adjacent to Seattle Center. Bus/LINK light rail to Westlake & ferry trips are assumed to arrive to Arena by walk, bicycle, ridehailing, Monorail, or bus.
Ridehailing/Other Drop-off	15%	12%	15%	Percentages represent final primary mode of travel to/from Seattle Center vicinity. Travel by ferry, or bus/LINK light rail to Westlake Station is associated with some of these trips.
Walk	10%	10%	8%	
Monorail	3%	4%	2%	
Bicycle	1%	1%	1%	

Note: These mode shares, from the FEIS, are based on current conditions and do not reflect implementation of any demand management strategies to incentivize use of sustainable transportation modes. Refer to Chapter 10 for mode share goals.

Source: Prepared by Fehr & Peers, 2018.



- ▶ ▶ One-Way Street
- Tunnel
- Bridge/ Overcrossing
- ▨ Project Site
- Seattle Center



Figure 1

Project Location



Table 3 summarizes the project's daily vehicle trip generation. This represents the total number of private and ridehailing vehicles that would access the Arena on a day with a sold-out event. Also in the table are employee trips and trips for other ancillary purposes. Over the course of a typical event day, between 7,500 and 8,000 vehicles would arrive at and then leave the Arena.

Table 3: Daily Vehicle Trip Generation in 2020

Traveler Type	Weekday Daily Vehicle Trips with NBA Game			Saturday Daily Vehicle Trips with Concert		
	In	Out	Total	In	Out	Total
Attendees traveling by private vehicle	5,027	5,027	10,054	5,418	5,418	10,836
Attendees traveling by Ridehailing/Drop-off vehicle	2,154	2,154	4,308	2,150	2,150	4,300
Employees traveling by private vehicle	301	301	602	301	301	602
Employees traveling by Ridehailing /Drop-off	23	23	46	23	23	46
Miscellaneous ¹	50	50	100	75	75	150
Total	7,555	7,555	15,110	7,967	7,967	15,934

Notes:

¹ Miscellaneous trips include delivery vehicles, emergency vehicles, utility vehicles, etc.

Note: These daily vehicle trip generation forecasts are from the FEIS.

Source: Fehr & Peers, 2018.

The arrival and departure patterns for Arena events were studied to estimate the number of vehicles expected during the peak hour of adjacent roadway activity. The resulting peak hour vehicle generation is summarized in Table 4. Refer to FEIS Appendix B, Tech Memo 5, Project Travel Characteristics – Year 2020 for supporting details.

**Table 4: Peak Hour Vehicle Trip Generation in 2020**

Traveler Type	Weekday NBA Game Pre-Event Peak Hour Vehicle Trips			Weekday NBA Game Post-Event Peak Hour Vehicle Trips			Saturday Concert Pre-Event Peak Hour Vehicle Trips		
	In	Out	Total	In	Out	Total	In	Out	Total
Attendees traveling by private vehicle	3,016	0	3,016	0	4,776	4,776	2,709	0	2,709
Attendees traveling by Ridehailing/drop-off vehicle	718	718	1,436	910	910	1,820	598	598	1,196
Employees traveling by private vehicle	30	0	30	0	60	60	30	0	30
Employees traveling by Ridehailing/Drop-off	2	2	4	4	4	8	2	2	4
Miscellaneous ¹	15	5	20	5	10	15	15	5	20
Total	3,781	725	4,506	919	5,760	6,679	3,354	605	3,959

¹ Miscellaneous trips include delivery vehicles, emergency vehicles, utility vehicles, etc.

Note: These daily vehicle trip generation forecasts are from the FEIS.

Source: Prepared by Fehr & Peers, 2018.



3. Demand Management Strategies

This chapter discusses strategies and programs designed to increase the use of sustainable transportation by event attendees and employees when accessing the Arena. This chapter is a key component of the AAMP because the EIS analysis indicated that there would be substantial traffic congestion, transit delays, and curb space management issues if OVG and the City cannot encourage more people to travel to Arena events at non-peak times using sustainable transportation modes. Beyond the practical matter of ensuring that the area around the Arena does not become gridlocked during events, improving travel options is consistent with the City of Seattle Comprehensive Plan policies to reduce the carbon/energy impact of transportation and maximize the people-moving capacity of City streets. This chapter discusses demand management strategies for both Arena attendees and employees. Given the difference in travel characteristics and magnitude of trips between Arena attendees and employees, this chapter focuses first on attendee demand management and then employee demand management.

3.1 MODE SHARE GOALS

This section identifies mode share goals for both Arena attendees and employees. The mode share goals for 2020 (opening day) are specifically targeted by the demand management strategies outlined in this chapter. In other words, OVG and the City are working to tailor demand management strategies to meet the 2020 mode share goals, but the future mode share goals may be updated in subsequent revisions to the AAMP based on actual performance, the effectiveness of current strategies, probable effectiveness of new strategies, changing transportation trends/technologies. The purpose of these mode share goals is to determine if the Arena is meeting the near-term goals and trending toward the long-term goals. If either the near-term goals are not being met or further progress toward the future goals is not occurring, then OVG and the City will revise and update the demand management strategies as part of the annual update process (see Chapter 10 for a discussion of the AAMP monitoring and update strategy). The near- and long-term goals may also be revised through the annual AAMP update.

Table 5 summarizes the attendee mode-share goals for 2020, 2025, and 2035. Mode share goals are defined for the pre-event peak and differ for NBA/NHL games and all other events (including concerts).

**Table 5: Attendee Mode Share Goals**

Travel Mode	2020		2025		2035	
	NBA/NHL Game Pre-Event Peak Hour	All Other Events Pre-Event Peak Hour	NBA/NHL Game Pre-Event Peak Hour	All Other Events Pre-Event Peak Hour	NBA/NHL Game Pre-Event Peak Hour	All Other Events Pre-Event Peak Hour
Private Vehicle ^{1,2}	55%	59%	45%	48%	31%	34%
Ridehailing/ Other Drop-off ²	15%	15%	17%	17%	20%	20%
Transit	15%	13%	19%	16%	30%	27%
Walk	10%	10%	11%	11%	12%	12%
Monorail	5%	4%	6%	6%	5%	5%
Bicycle	1%	1%	2%	2%	2%	2%

Note:

¹ In this table, private vehicle refers to parking personal vehicles within 0.5 miles of the Arena. People who park in remote lots (regional park-and-ride facilities, other lots that are part of the OVG parking reservation system, or other non-affiliated remote lots) and take another "last-mile" mode to the Arena are not included in this total. Note that NBA and NHL games have a lower private vehicle mode share than concerts and other events. This lower mode share reflects the fact that many NBA/NHL attendees are season ticket holders who show a higher likelihood to use non-auto modes to travel to games and are more accustomed to parking farther from the event to reduce time spent in traffic. The 2020 private vehicle mode share targets are aggressive (roughly 8 percent lower than the EIS estimated mode share) and would result in a reduction of about 410 vehicles arriving in the pre-event peak hour and 650 departing in the post-event peak hour. The pre- and post-event vehicle volumes differ because the pre-event arrivals are spread out over a longer time period.

² The two modes targeted for reduction (compared to the initial EIS mode shares) are private vehicles and ridehailing vehicles. These trips, along with non ridehailing drop-off trips, result in the greatest impact to traffic congestion and transit delays. The mode share goals for transit, walk, monorail, and bicycle are suggested based on forecasted attendee origin and the potential for these other modes to accommodate attendee travel to the Arena

³ These trips on the Monorail do not include "linked" trips from regional transit that stops at Westlake Center. Under the 2020 and 2025 scenarios, some of the transit mode share will use Monorail (and other modes) to complete the final mile trip between Westlake Center and the Arena. Monorail usage is expected to decrease in 2035 when light rail is extended between Westlake and Seattle Center.

Source: Prepared by Fehr & Peers, 2018.

Table 6 summarizes the employee mode-share goals for 2020, 2025, and 2035. As is typical for employee mode share goals in Seattle, these focus on single occupancy vehicle (SOV) trips.

**Table 6: Arena Employee Mode Share Goals**

Travel Mode	2020	2025	2035
SOV	30%	28%	25%

The Arena employee SOV mode share goals are based on a review of the current mode share data from the Seattle Center. Given the similar location and nature of work, this is a reasonable place to set mode share targets. Future employee mode share goals are lower and could be recalibrated in future versions of the AAMP based on the actual performance once the Arena is in operation. One challenge faced by the Arena in comparison to other employment sites is the work schedule. Seattle employee mode share goals are typically set for the 6-9 AM period when transit service is at its peak. In contrast, many Arena events would occur in the evening when there is less transit service, particularly in the post-event hours, for Arena employees to return home. In comparing to other employers in the Uptown area (*2017 Center City Commuter Mode Split Survey*, Commute Seattle), the Arena employee SOV mode share goals are lower than other large employers in the area and would be similar to employers in Belltown and South Lake Union.

3.2 ARENA ATTENDEE DEMAND MANAGEMENT

Attendee demand management focuses on encouraging travel options that move the most people. In practice, this means encouraging walking, biking, and transit, while discouraging private auto use and ridehailing.

With these goals in mind, it is also necessary to consider the land use and transportation network context around the Arena. Key factors considered while developing the demand management strategy include:

- *There is abundant parking around the Arena (more than 8,200 publicly available spaces) and the majority of this parking is outside the direct control of OVG. This large parking resource limits the ability for OVG completely control the parking marketplace (i.e., in terms of available supply and price).*
- *Uptown, Belltown, and South Lake Union are densely populated activity centers that have large numbers of residents, employees, and commercial activities that also require access to the area's transportation network and mobility services.*



- *The City of Seattle is working to improve the all ages and abilities bicycle network between the Seattle Center area and other neighborhoods in the City. As this network builds out, bicycling to Arena events will be more attractive to a greater number of people.*
- *Arena events occur amongst other Seattle Center Campus events that have separate attendee accommodations, requirements, and contractual commitments that cannot be superseded by activities at the Arena. Therefore, broad actions to prevent vehicle parking or ridehailing could negatively impact the other tenants at Seattle Center or impact contractual obligations.*

The above land use and transportation network context must be considered and actions to encourage sustainable travel options to the Arena should be balanced with the mobility needs of other businesses, residents, and organizations in the neighborhood. Based on the goals and above considerations, the following demand management strategies are proposed for opening day. Many strategies are still in the process of being finalized and/or negotiated, and the details will evolve before the Fall 2020 opening day; but the overall principles listed have a strong commitment from OVG and the City of Seattle.

Parking Management

- ***Parking Reservation System and Best Practices:*** *Chapter 7 describes the benefits of a parking reservation system and framework for best management practices that are required by private parking garages or lots in order to participate in the reservation system. OVG is committed to implementing a reservation and best practices system for Arena events within garages that they operate as well as other garages that they partner with.*
- ***Minimum parking fees for arena events:*** *OVG is proposing to increase the cost to park at OVG-operated garages during events at the Arena. Initially, OVG is targeting minimum parking fees of \$40-50 per vehicle (and potentially higher for premium parking), which is similar to what is charged at Safeco Field and Century Link Field for events. This level is roughly 30-60 percent higher than the current event parking price around Seattle Center. There is no proposed price established for non-Arena events, which may require that Seattle Center tenant organizations join the parking reservation system to ensure their attendees are not negatively impacted by higher parking fees. Seattle Center reserves the right to set the prices for parking during Arena events at the Mercer Garage and 5th Ave N Garage. Seattle Center is exploring revised pricing levels. Because OVG and Seattle Center control more than half of the parking around the Arena, higher fees at these parking garages could also lead to increased fees at surrounding private lots, which may discourage overall driving to the Arena.*



- **Preferential parking pricing for high-occupancy vehicles:** OVG is exploring the option to charge a lower cost (\$25-30) for high-occupancy vehicles with four or more passengers at OVG-operated garages. This option would only be considered if it can be demonstrated that it is feasible to check occupancy in a timely manner and implement this differential parking pricing system. High-occupancy vehicle parking can increase overall vehicle occupancy, resulting in fewer vehicle trips for each Arena event.
- **Lower-cost parking at more remote locations:** Through the parking reservation system, OVG has the ability to recommend additional remote parking facilities that will reduce the site specific traffic congestion impacts of Arena attendees that choose to drive to an event. The costs to park at these remote facilities is expected to be substantially less than at OVG-operated garages. While the specific price points are unknown, remote parking for CenturyLink Field and Safeco Field events range between \$10 and \$30. More remote parking also has an advantage in that it spreads out the departure timing for people leaving the event because it takes longer to reach the remote parking facilities. OVG is committed to an initial target of 15% of all parking reservations (about 800 vehicles) to be located at facilities more than a half-mile from the Arena. Ultimately, OVG would be interested in increasing this proportion to 20-25% depending on traffic congestion and attendee demand—future targets could be identified in updates to the AAMP. Connections to these remote parking facilities could be provided through free shuttles (that deliver attendees directly to the Arena plaza prior to the event and back to the garage after the event), Monorail passes, or free bikeshare access. Agreements to secure remote parking facilities and the connections to these facilities are ongoing.
- **Additional on-street parking management:** SDOT is committed to managing on-street parking and loading spaces in the neighborhoods surrounding the Seattle Center to prioritize neighborhood visitors, local businesses, and residents. Through a public process, the City will develop a plan to discourage Arena attendees from seeking free on-street parking and contributing to traffic congestion. These SDOT efforts support the reservation parking system by eliminating the benefit of circulating to find on-street parking.

Ridehailing Management

Chapters 8 and 9 describe the planned ridehailing management strategy including modifications to routing algorithms, advanced signage with Changeable Message Signs, and physical barriers (along 1st Ave N) to discourage pick-up and drop-off activities that would impact traffic and transit operations, and potentially the safety of people both walking and biking.

To complement the ridehailing management strategies outlined in Chapters 8 and 9, the wayfinding strategies identified later in this chapter help to ensure that attendees who use ridehailing services can reach the Arena before an event and find their ride after the event as designated pick-up locations.



In addition to the strategies above, SDOT, Seattle Center, and OVG are discussing a potential “geofence” near the Arena to provide additional ridehailing management.

- A geofence is only applicable to Transportation Network Companies (TNCs—e.g., Uber, Lyft and ReachNow) and is defined as a geographic area where typical pick-up and/or drop-off activities are regulated. Geofences are fairly common around major trip generators (arenas, stadiums, airports are typical examples).
- In their most common form, TNC passengers looking to be picked-up are directed to a specific location (which can be inside or outside of the geofence). The most familiar geofence to most people in the Seattle region is at SeaTac airport in which TNC riders must go to a specific location in the parking garage to meet their ride. The SeaTac geofence covers the entire main terminal and parking garage area, so anyone within that the geofence must go to the pick-up location within the garage. Some geofences also have drop-off restrictions or alternative ways to manage pick-up demand.
- Primary objectives of geofences are to geographically spread out ridehailing demand and control which streets/curbs the TNCs are operating from.

At this time, no details have been finalized on geofence operations related to the Arena (e.g., the geographic extent, the time limits of operations, or how pick-up or drop-offs would occur).

Transit Incentives

- **Subsidized transit passes:** *A number of King County Metro transit routes provide direct service to the Arena and Seattle Center. Additionally, the Westlake Station is a major regional transit hub that serves Link light rail and many regional Sound Transit and King County Metro routes that access major Arena markets in the surrounding suburban cities. OVG is currently in discussions with transit agencies on the feasibility of providing transit subsidies that are directly linked with an Arena event ticket.*
- **Monorail passes to Westlake:** *As noted earlier, the Westlake Station area is a major transit hub and is also easily accessible to the thousands of Downtown Seattle residents, hotel guests, and employees. OVG is in discussions with Seattle Center/Seattle Monorail Services on the feasibility of providing subsidized Monorail passes between Seattle Center and Westlake. This link would serve as a strong connection to Downtown transit, hotels, parking areas, residential areas, and employees.*
- **Improved weather protection to Monorail:** *To further encourage Monorail use, OVG is in discussions with Seattle Center on continuous weather protection between the Arena and the Monorail station. Discussions are*



preliminary, but this could be a permanent structure or a heavy-duty temporary structure that is assembled in the fall and removed in the spring.

Other Demand Management Strategies

- **Mobility App:** OVG is committed to developing and managing a mobility app for the Arena (which could also be integrated into an NBA/NHL team app) that could include features such as:
 - *Suggested ways to get to the Arena that is based on a user-specified origin location; the app would highlight transit options, walking/biking (if appropriate), allow for parking reservations, and provide ridehailing tips. Directions to regional park-and-ride facilities and the Monorail/transit connections between the Westlake transit hub and the Arena will be highlighted.*
 - *Wayfinding between key locations and the Arena—for example Westlake Center or remote parking lots; the app would highlight the different last-mile options including Monorail, transit (including the South Lake Union Streetcar), bikeshare, and walking routes.*
 - *Seattle Center Campus wayfinding—the app would help Arena attendees navigate the Seattle Center Campus to/from the Arena and other important locations like transit stops, ridehailing pick-up zones, and Monorail.*
 - *Travel reward systems-the app could include notifications, competitions, or other activities to encourage Arena attendees to use non-auto modes to travel to and from events. There are several local companies who have platforms that have been shown to result in commute mode shifts and these types of ideas can be brought to the mobility app, potentially linked with the partnerships with Seattle Center tenants and local businesses, which are described below.*
- **Wayfinding signs and additional lighting:** OVG is working with Seattle Center on developing permanent and temporary wayfinding signs that will direct people to and from the Arena throughout the Seattle Center Campus; wayfinding will also direct people to nearby transit stops and ridehailing pick-up zones. Pedestrian-scaled lighting could be provided within the Seattle Center campus along these walking routes where dark spots currently exist.
- **Partnerships with Seattle Center and area businesses:** OVG is in discussions with Seattle Center tenant organizations and adjacent businesses to form partnerships that would encourage Arena attendees to arrive early or stay late, thus spreading out the arrival and departure traffic to/from the Arena. These partnerships could be featured in the Mobility App, social media, various websites, etc.



- **Mobility Coordinator:** OVG is committed to hiring/contracting with a Mobility Coordinator whose primary role would be to manage the day-to-day operations of the attendee mobility partnerships, promote and increase the effectiveness of the program with attendees, and serve as a resource for attendees who are interested in non-auto travel to the arena. It is likely that the Mobility Coordinator would also oversee the data collection and reporting for the performance standards and monitoring program described in Chapter 10.
- **Secure bicycle parking:** OVG could consider providing secure bicycle parking to ensure people feel comfortable leaving their bike while attending an event as a valet system will not be available for all events.

3.3 ARENA EMPLOYEE DEMAND MANAGEMENT

The Arena is expected to have up to 500 employees working events. This section describes the demand management program proposed to reduce single-occupant vehicle (SOV) trips by employees.

- **Subsidized transit passes and parking pricing:** OVG is committed to offering transit subsidies and charging market rates for parking for employees, subject to existing union labor agreements and other regulatory compliance requirements (e.g., City mandated employee commute trip reduction program).
- **Bicycle facilities:** As required by land use and building codes, OVG will meet several important code requirements that support employee travel by bicycle such as on-site showers and lockers and secure bicycle parking.
- **Mobility Coordinator:** In addition to their role managing attendee mobility programs, the mobility coordinator would also help to coordinate and manage travel by Arena employees. This person's primary role will be to manage the day-to-day operations of the employee commute trip reduction program, which could include the following features:
 - **New hire orientation:** New hires would be oriented to the different commute resources offered by OVG and provided with information on how to arrive by transit, how to form carpools, where to store bicycles, shower/locker facilities, etc.
 - **Ongoing information:** Serve as an ongoing resource for employees who have questions/concerns about their commute to work.
 - **Carpool/Vanpool matching:** Serve as a resource to help employees create and manage carpools and vanpools to the Arena, which may include assistance with identifying parking spaces for carpools and vanpools.



Chapter 10 identifies key performance standards related to the demand management program for attendee and employee travel. Specifically, mode share targets are identified for attendee travel and survey data identified to define a baseline mode share for employee travel. If the mode share performance standards are not being met, it is anticipated that the demand management strategies listed above will be amended or expanded to meet the performance standards.

4. Opening Day (2020) Physical Improvements

This chapter discusses physical improvements expected to be in place when the Arena opens.

4.1 BACKGROUND ROADWAY NETWORK IMPROVEMENTS

By 2020, the roadway network east of Seattle Center will look considerably different than it does today. Key changes are described below and illustrated on Figure 2:

- *The new SR 99 Tunnel will be open to traffic, which will include a new northbound off-ramp at Republican St/Dexter Ave, a southbound on-ramp on 6th Ave N, and northbound on-ramp and southbound off-ramp access at Harrison St.*
- *Local east-west streets (including Harrison St, Thomas St, and John St) will be 'reknitted' to connect across SR 99 at Dexter Ave N to provide alternate route options to Mercer St and Denny Way. Figure 2 shows the intersections in this area that will have traffic signals.*
- *Aurora Ave N will become a four-lane surface street between Harrison St and Denny Way.*
- *The missing segment of 6th Ave N (south of Harrison St) will be constructed to create a continuous roadway between Mercer St and Denny Way.*
- *Denny Way/3rd Ave will include a new transit-only signal that would accommodate buses traveling on northbound 3rd Ave. These buses currently turn left at Broad St and right at 1st Ave to reach Denny Way.*

4.2 ARENA-RELATED PHYSICAL IMPROVEMENTS

Based on the results of the EIS transportation impact analysis, a series of physical improvements were identified as mitigation measures for significant transportation impacts. These improvements



are intended to enhance operations for people using all modes of travel in the Arena vicinity. Discussions regarding financial responsibility for these and other improvements are ongoing between OVG and the City. Future permitting decisions will describe specific funding and implementation details.

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Figure 2: Opening Day (2020) Street Network



Figure 3 shows the physical improvements that were modeled to analyze potential mitigation that may help to improve circulation and safety in the Arena vicinity. Below are those key improvements, reasons for inclusion, and their expected effectiveness. However, without the AAMP's traffic and parking management strategies, the physical improvements alone would not improve operations and could actually worsen conditions beyond what was documented in the EIS.

- **1st Ave N and Queen Anne Ave N Bus-Only Lanes:** Congestion on 1st Ave N and Queen Anne Ave N delays on-time arrivals for buses that operate in this couplet, which may adversely affect ridership to the Arena. 1st Ave N and Queen Anne Ave N improvements will add bus-only lanes and relocation of the bike facility.
- **2nd Ave Lane Reconfiguration at Denny Way:** 2nd Ave would be reconfigured south of Denny Way to include a second southbound receiving lane, modifying the northern-most segment of the recently installed protected bike lane to direct northbound people on bikes to access the sidewalk. The second vehicle lane is necessary for serving the large number of post-event motorists leaving the 1st Ave N and Arena garages via 2nd Ave N.
- **All ages and abilities (AAA) bicycle connections:** Ensuring an AAA connected bicycle network will provide event attendees and employees the physical space to safely access the Arena. The all ages and abilities bicycle facility and connectivity to the Arena is still being analyzed.
- **Adaptive Signal Systems:** This type of smart technology collects traffic data in real time, coordinating traffic signals along a corridor to move people in cars efficiently while reducing travel time and increasing reliability of the transportation network. Streets that serve the nearby I-5 and SR 99, special events, or festivals that produce rapid changes in car volumes make these corridors ideal for adaptive traffic signals. This smart technology has been installed along the Mercer St corridor and will be installed along the Denny Way corridor, along with other important corridors in the vicinity of the Arena. SDOT is testing additional solutions for enhanced pedestrian mobility along these adaptive signal corridors.

Figure 4 displays existing and planned signalized intersections within the Arena's study area. It also shows which corridors already have adaptive signal systems, and which corridors are recommended to have them installed in the near-term. As is shown, adaptive/coordinated signal control is recommended for implementation along portions of Denny Way, Broad St, 1st Ave N, Queen Anne Ave N, and Harrison St.



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- | | | | |
|--|--|--|-------------------------------|
| | Intersection/Signal Modified to Prohibit Left-turn | | New Transit-Only Lane |
| | New Traffic Signal | | New Protected Bike Lane (PBL) |
| | New Transit-Only Traffic Signal | | Pedestrian Pathway |
| | Bus Stop | | Monorail Line |
| | RapidRide Stop | | Planned Street |
| | New Neighborhood Greenway Street | | Parking Garage |

Notes:

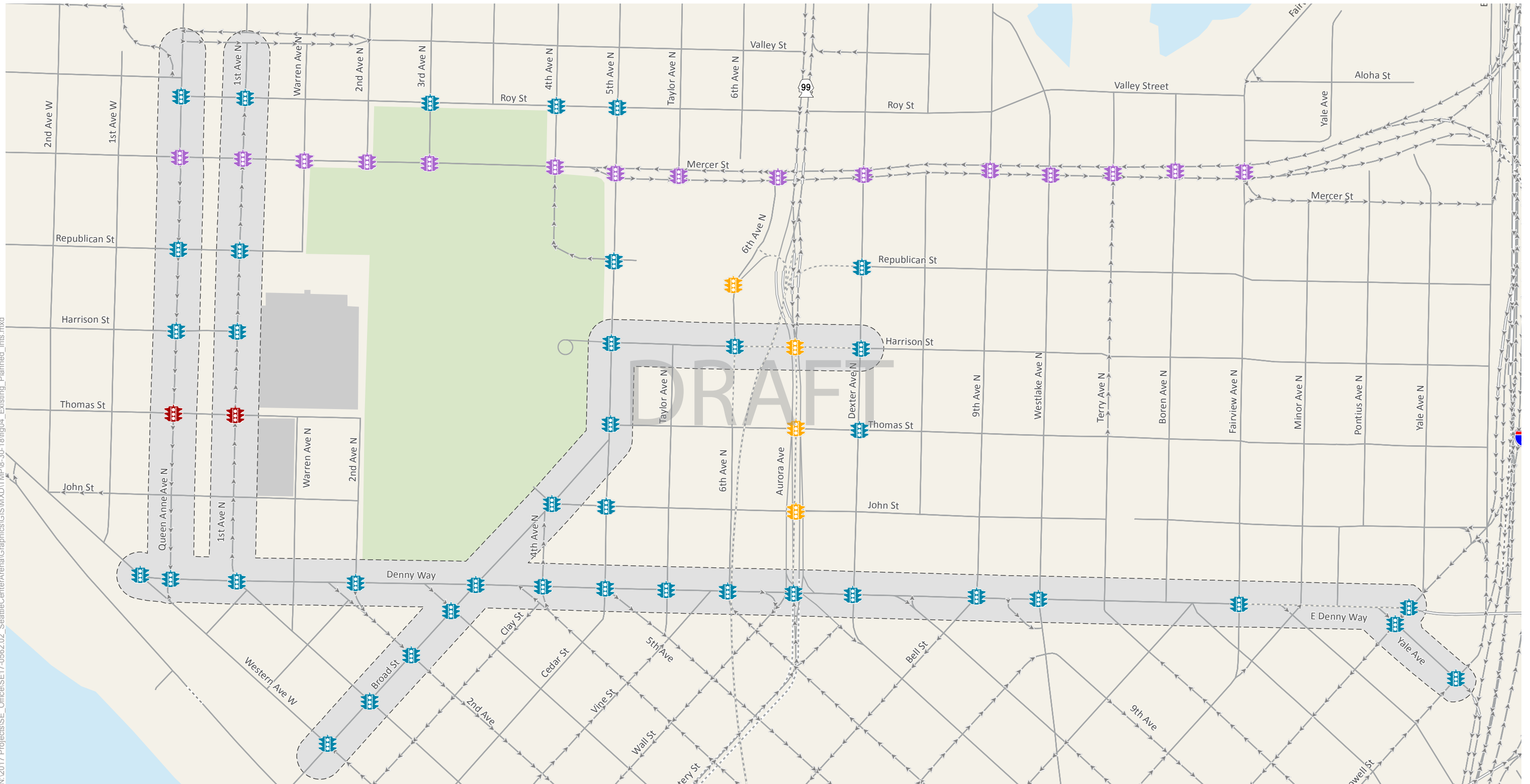
- Physical improvements shown on this figure most directly benefit traffic (including bicyclists, pedestrians, and bus riders). Additional improvements (e.g., pedestrian-scale lighting, bulbouts, wayfinding, transit shelters, upgraded garage ramp systems, Monorail Phase 1 improvements, expanded KCM bus service, etc.) are also included in the physical improvements list but not shown here.
- Refer to Figure 4 for map of planned adaptive/coordinated traffic signal upgrades.
- Some improvements are the responsibility of OVG, while others require a contribution from OVG with the remaining funds coming from the City or other funding sources.













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Figure 3

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-  Existing Adaptive Traffic Signal
-  Existing Non-Adaptive Traffic Signal
-  Planned Non-Adaptive Traffic Signal
-  Planned Traffic Signal Associated with Arena Mitigation
-  Corridor Recommended for Adaptive/Coordinated Traffic Signal Control Upgrades
-  One-Way Street
-  Planned Street
-  Bridge/ Overcrossing
-  Project Site
-  Seattle Center

Notes:

1. Map is not an exhaustive list of all existing/planned traffic signals within map extents. Rather, it is intended to show existing/planned signals along particularly relevant corridors.
2. Corridors identified in map as candidates for adaptive/coordinated signal control do not represent the entire list of upgrades planned by SDOT.

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Figure 4

Existing and Planned Signalized Intersections Operated With Adaptive/Coordinated Signal Control





5. Transit Element

5.1 EXISTING AND PLANNED TRANSIT SERVICE AND FACILITIES

The neighborhood surrounding the Arena has fixed-route bus service operated by King County Metro (KCM) as well as the Monorail located less than a 5-minute walk east of the Arena. The Monorail provides a two-minute ride connecting to Westlake in Downtown Seattle which is a regional transit hub including a variety of fixed-route bus service and Sound Transit's Link light rail. Buses operate north-south along the 1st Ave N and Queen Anne Ave N couplet immediately west of the Arena. East-west bus service is present on Denny Way and on Mercer St west of 1st Ave N. Bus stops are located on 1st Ave N, Queen Anne Ave N, 5th Ave N, and Denny Way.

The following transit-related improvements are recommended as mitigation for transit speed and reliability impacts identified in the EIS:

- *Convert a travel lane on 1st Ave N to a bus-only lane between Denny Way and Republican St and install a transit queue jump at Republican St, as approved by SDOT. This will allow for more reliable bus operations benefitting all riders along this corridor as well as encouraging attendees to use transit.*
- *Convert a travel lane of Queen Anne Ave N to a bus-only lane from Mercer St to John St, as approved by SDOT.*
- *Implement improvements to the Monorail to improve station configuration, accessibility, and transit integration. Improvements could be made to achieve better egress capacity at both the Westlake and Seattle Center terminals during post-event conditions as well as providing a first/last mile connection to the Arena that gets more people out of vehicles.*

5.2 EVENT TRANSIT OPERATIONS MANAGEMENT

Traffic management for event days, including bus stop locations/loading and bus staging, is discussed in Chapter 9. Event transit operations will benefit from bus-only lanes, transit queue jumps, and the presence of TCOs who will monitor curb space along 1st Ave N along the Arena frontage to ensure bus stops are not blocked. If these lanes become blocked by vehicle pick-ups/drop-offs or are frequently used by general purpose traffic, their travel time benefits will quickly erode. Thus, TCOs stationed along 1st Ave N (i.e., at John St, Thomas St, and near Harrison St) may issue citations for unlawful activity in these lanes.



5.3 PARATRANSIT AND OTHER TRANSIT CONSIDERATIONS

Paratransit services provide transportation to persons with disabilities who cannot access regular bus service. Paratransit vehicles will require curb space adjacent to the Arena to drop off and pick up disabled attendees. Paratransit vehicles will be directed to access the Arena from the eastern curbside loading lane along 1st Ave N. TCOs and/or curbside attendants will keep this curb lane clear of unauthorized drop-offs/pick-ups by ridehailing and private vehicles to ensure adequate paratransit access (refer to Chapter 9 for details).

Chapter 3 outlined several transit incentives being finalized by OVG with respect to Arena attendee and employee demand management. These measures are intended to incentivize and increase transit usage by event attendees and employees, thus reducing the traffic impacts of the project.

One important transit consideration is capacity. While most routes that access the Arena have adequate capacity during pre- and post-event conditions, the EIS identified limited capacity on routes to Ballard and the U District during post event conditions that must be mitigated (the EIS identified solutions and those are being discussed by OVG and KCM). Also, during pre-event conditions, routes from Downtown could have capacity constraints if the bus mode share increases by 2 percent over the EIS estimates. This could result in transit capacity limitations if the mode share targets identified in Chapter 3 are achieved. Chapter 10 outlines monitoring during major Arena events (more than 10,000 attendees) that would identify transit capacity issues on routes between Downtown and the Arena.

6. Bicycle and Pedestrian Element

The area surrounding the Arena will experience a large number of people walking before and after events as attendees access nearby bus stops, parking garages, the Monorail, residences, employment, restaurant locations, and in the future, a nearby Link Light Rail Station. Strategies identified in the AAMP leverage the existing pedestrian facility network in Uptown and Seattle Center with a combination of crossing enhancements, signage, additional lighting within Seattle Center campus, and a temporary roadway closure to prioritize people walking and minimize modal conflicts.



6.1 EXISTING PEDESTRIAN AND BICYCLE FACILITIES

The pedestrian network surrounding the Arena is well developed. The vast majority of streets have complete sidewalks (curb, street trees, and standard sidewalk width) and most intersections near Seattle Center and on main arterials have crosswalks. Some of the sidewalks could have improvements made to lessen the impact of heaving tree roots on the walking area.

Existing bicycle facilities in the vicinity of the Arena consist of two-way protected bicycle lanes, one-way protected bicycle lanes, and sharrows (a pavement marking indicating that the roadway is shared by both people driving cars and riding bikes). There is not currently an all ages and abilities (a protected bicycle lane, neighborhood greenway, or off-street trail) connected bicycle network between Downtown and the renovated Arena. Riding a bike is permitted across the Seattle Center campus. Bicycle connectivity to the east will be enhanced by the reconnection of John St, Thomas St, and Harrison St across SR 99 to Dexter Ave N in 2020 after the SR 99 Tunnel project opens and once bike lanes are connected along Thomas St to the Seattle Center campus.

6.2 ARENA PEDESTRIAN TRAVEL DEMAND AND ACCESS

Nearly 19,000 attendees will access the Arena at a sold-out event. A small number of those (approximately 5%) would enter the Arena from the underground garage, while the rest would use nearby pedestrian facilities surrounding the Arena as they travel from either nearby land uses or from other modes/parking facilities. The EIS includes an analysis of likely pedestrian travel demand patterns based on the forecasted modes of arrival and locations of transit stops and parking garages. Just over half of the attendees are expected to travel through the Seattle Center campus and approach the Arena from the east though their walk may begin to the north or east of the campus. The remaining attendees would be roughly evenly split on their approaches from the west and south of the Arena.

The main general admission entry point for the Arena will be through the atrium on the south side of the Arena. The atrium can be accessed from a large plaza with frontage on Thomas St to the south, 1st Ave N to the west, and the Seattle Center campus to the east. Some staff, players, coaches, media, and premium ticket holders may enter from the underground parking garage and therefore not enter the building from the surface pedestrian facilities. Egress would occur from the west, south, and east sides of the Arena.

The EIS recommended that the following pedestrian improvements be in place at the time the Arena opens in 2020:



- *Bulb-outs at non-arterial corners of 1st Ave N/Harrison St and widening of crosswalks to 20 feet on all legs.*
- *Bulb-outs at non-arterial corners of 1st Ave N/Republican St and widening of crosswalks to 20 feet on all legs.*
- *Widening of crosswalks at 5th Ave N/Harrison St (all 4 crosswalks).*
- *New traffic signal at 1st Ave N/Thomas St.*
- *New traffic signal at Queen Anne Ave N/Thomas St.*

6.3 ARENA BICYCLE TRAVEL DEMAND AND ACCESS

Table 2 indicates that 1% of attendees are expected to ride a bike to the Arena. This equates to roughly 200 bicyclists for a sold-out event. Bicycle access to the Arena may change as follows:

- *An all ages and abilities bicycle facility connected network and access to the Seattle Center campus. The goal of the bicycle facility routing will be to ensure people riding bikes can access the Arena front door via a new traffic signal at 1st Ave N and Thomas St. The Thomas St neighborhood greenway between 1st Ave N and Queen Anne Ave N will ensure a seamless connection for people riding bikes.*
- *The reconfiguration of the south leg of 2nd Ave/Denny Way intersection to include a second southbound receiving lane would modify a segment of the recently installed 2nd Ave PBL. The second lane is necessary for serving the large number of post-event people in cars leaving the 1st Ave N and Arena garages via 2nd Ave N. People riding bikes can and will use the bike connection to 2nd Ave N to access their destination.*
- *To accommodate bicycle parking needs from event attendees, OVG's design has so far identified bike racks to accommodate roughly 100 bicycles between the Arena parcel and the 1st Ave N Garage parcel to the south. All permanent bike racks will meet SDOT bike parking design standards. As the design is finalized, additional permanent bike parking may be identified. In addition, as part of code requirements, the bike rack supply will be supplemented with a bike valet system, which is a staffed area where attendees can securely store their bicycles. The scope of the bike valet could be adjusted based on specific attendance thresholds and event types based on data collected during the first year of Arena operations when actual bicycle parking utilization data is known. OVG is responsible for coordinating efforts to implement the bike valet system, including selection of a bicycle parking operator. OVG or its bicycle parking operator will meet regularly with City and Seattle Center staff to review the upcoming the Arena events calendar and determine the dates, capacity, equipment, and staffing needs for upcoming events. The provision of bike valet parking will be scalable depending on the size/type of the event, time of year, and the popularity of bicycling to events over time.*



In addition to attendees' use of their personal bicycles, the City's recent legislation to allow continued operation of dockless bikeshare will be a large component of bike access and parking demand. Because the Arena could attract large numbers of bikeshare bicycles, providing designated parking areas is necessary to avoid disorganized bike parking that interferes with pedestrian flow and ADA accessibility. OVG, Seattle Center, and the City are coordinating on potential locations for designated bikeshare parking both within OVG's site as well as on nearby city property (subject to approval by Seattle Center and/or SDOT). The goal of the bikeshare parking is to be accessible in the pre-event condition, visible in the post-event condition, all while maintaining good pedestrian flow and ADA accessibility. OVG's Mobility Coordinator will work with bikeshare operators to ensure orderly staging of bikes during and after events and to ensure adequate supply of bikes for post-event demand.

7. Parking Element

A fundamental goal of the AAMP is to reduce overall parking demand generated by the Arena, particularly within a half-mile, to reduce the negative impacts from parking on traffic congestion and transit delays. For people who choose to park near the Arena, this chapter discusses the available parking in the project vicinity, means by which traffic management strategies will handle inbound and outbound garage flows, the planned parking reservation system, and the "Parking Best Practices" program that parking operators should follow.

7.1 AVAILABLE PARKING SUPPLY AND ANTICIPATED DEMAND

There are currently about 8,200 publicly available parking spaces in the vicinity (approximately a half-mile) of Seattle Center. Off-street lots and garages represent 62% of the total parking supply. The three garages currently operated by Seattle Center (Mercer St Garage, 1st Ave N Garage, and 5th Ave N Garage) consist of a combined 2,944 spaces, which is 58% of the total off-street supply in the area. During an evening peak hour with no event at Key Arena, 33% of the available supply is typically occupied. On-street parking is occupied to a much greater degree than off-street parking (67% versus 11%, respectively).

The project will add a new 450-space parking garage under the Arena. Additionally, new private parking facilities are expected to become available by 2020 along Dexter Ave N. Under 2020 conditions with the Average Seattle Center Attendance scenario analyzed in the EIS, a sold-out event at the renovated Arena would cause 82% of available parking on a weekday evening and 92%



of available parking on a Saturday evening to be occupied. When added parking demand associated with “Above Average” activity at Seattle Center is considered, 91% of available spaces on a weekday evening and 96% of available spaces on a Saturday evening would be occupied. These estimates do not reflect any of the demand management strategies discussed in Chapter 3, which are intended to discourage motorists to access the Arena.

7.2 ANTICIPATED USE OF SEATTLE CENTER/OVG GARAGES

OVG will operate the 1st Ave N and the Seattle Center Arena garages, while Seattle Center will continue to operate the Mercer St and 5th Ave N garages. The two OVG garages are anticipated to be used primarily by season/premium ticketholders, while the two Seattle Center garages will be used by a variety of groups including season ticketholders, single-game ticket buyers (through a reservation system), employees, and non-Arena attendees.

7.3 TRAFFIC MANAGEMENT STRATEGIES FOR ENTRY/EXIT TO GARAGES

Figure 5 shows the planned routing of vehicle trips into the 1st Ave N and Arena garages during pre-event conditions and Figure 6 shows the post-event routing plans. Premium ticketholders accessing these garages will expect a positive customer experience, which will require special traffic management strategies to achieve, as described below:

- **Pre-Event Inbound:** Signage will be placed along westbound Denny Way to advise motorists of routes that should be used to access these garages. The Arena Garage will be accessed primarily from 2nd Ave N (but would also be accessed from John St). The 1st Ave N Garage will be accessed from Warren Ave N and John St. Cones will be used to create a dedicated westbound right-turn only lane on Denny Way at Warren Ave N to facilitate right-turning traffic. TCOs will be present on Warren Ave N and 2nd Ave N north of Denny Way for two purposes: (1) check credentials of entering vehicles¹ to facilitate local access, and (2) manage conflicting

¹ Checking credentials is expected to involve a visual verification of a garage access pass (the Arena and 1st Ave N garages are expected to be reserved for premium ticket holders who have a reservation to park) or confirmation that a vehicle belongs to a local resident/employee. Generally the presence of a TCO asking questions deters many would-be drop-offs and reduces congestion in the area even though some unauthorized drop-offs may be able to talk their way into the area.



movements between right-turning motorists and people walking along the north side of Denny Way so that queuing/delays are reduced on Denny Way.

- **Post-Event Outbound:** *Motorists from both garages will be directed to 2nd Ave N where they will continue straight (southbound) beyond Denny Way and through downtown Seattle (left-turns onto Denny Way are prohibited). Motorists from the 1st Ave N garage that exit onto John St will also be directed eastbound toward 2nd Ave N. To efficiently empty these garages, the post-event condition requires a robust traffic management strategy that includes partially closed streets, multiple TCOs, coning patterns (that provide two temporary southbound travel lanes between John St and Denny Way), and coordinated traffic signals.*

No special routing or advanced signage is planned for motorists entering the Mercer St and 5th Ave N garages. However, special routing of post-event traffic and other temporary traffic controls are needed to efficiently empty these large garages. Planned management activities are summarized below:

- **Post-Event Outbound from Mercer St Garage:** *Vehicles will exit onto 3rd Ave N, 4th Ave N, and Roy St. Lane assignments will be temporarily changed on southbound 3rd Ave N and 4th Ave N to provide two southbound left-turn lanes. The east leg crosswalks at the Mercer St/3rd Ave N and Mercer St/4th Ave N intersections will be temporarily closed. This requires temporary lane assignments, signs, and cones.*
- **Post-Event Outbound from 5th Ave N Garage:** *Vehicles can exit directly onto either 5th Ave N or Harrison St. Because congestion is expected on eastbound Mercer St during post-event conditions, it is preferable for the majority of outbound garage trips to exit onto Harrison St and travel east (toward SR 99) or southbound on 5th Ave N through downtown Seattle. Motorists will be restricted from turning right from Harrison St to 5th Ave N northbound to avoid sending more motorists to Mercer St. This requires TCOs, parking attendants, turn lane restrictions, and other strategies.*

7.4 PARKING RESERVATION SYSTEM AND BEST PRACTICES

Field observations during large events at KeyArena suggest that some of the congestion could be avoided if event attendees had reserved parking in advance versus circulating to find an available space. Additionally, many parking garage operators exacerbate congestion on public streets due to their inefficient payment collection methods and signage practices

OVG and the Seattle Center are in discussions about expanding the City's ePark real-time parking supply availability system and OVG is committed to developing a parking reservation system at



garages near Seattle Center. Such systems are in operation near some other major sports and entertainment venues and have proven effective in reducing the adverse effects associated with searching for available parking.

Participation in the online reservation system in the Seattle Center vicinity could be made available to both public and private garage/lot operators. However, participation in the program would be contingent upon the operator's willingness to agree to implement a series of "Parking Best Practices". These practices consist of methods for minimizing motorist/pedestrian/bicycle conflicts and vehicle queues waiting to enter a garage/lot (through proper sign placement, payment collection, etc.). Additionally, placement of parking attendants at certain garage entry/exit points is necessary to manage pedestrian-vehicle interactions. Parking garage operators who do not comply with these best practices would not be permitted to continue to participate in the online parking reservation system.

The parking reservation system would be prominently featured (along with information on using other modes of travel to the Arena) at the time of ticket purchase. As part of the parking reservation, suggested arrival/departure times will be included to help minimize congestion/modal conflicts and improve the experience for attendees. Additional details regarding parking management are described in Chapter 3 – Demand Management Strategies.

7.5 ON-STREET PARKING MANAGEMENT

The larger number of Arena events, along with the increased seating capacity of the Arena could result in greater demand for off-street parking. Field observations indicate that 1st Ave N and Queen Anne Ave N, and connecting streets, between W Roy Street and W Denny Way are congested during pre-game conditions as motorists circulate to find available parking (both on- and off-street). To further encourage drivers to make use of parking reservations and off-street lots, SDOT staff will update on-street parking management in the area bounded by Queen Anne Ave N and 2nd Ave N south to Denny Way and north to Roy Street. SDOT will manage these streets through combination of Restricted Parking Zone (RPZ) expansion, time limits, and graduated rates to prioritize parking for local residents and businesses and discourage Arena attendees from seeking convenient, underpriced parking in this area.



8. Ridehailing Element

This chapter discusses plans to manage ridehailing vehicles, predominantly the Transportation Network Company (TNC—e.g., Uber and Lyft) trips to and from the Arena vicinity. Some of these strategies would also apply to taxis. Similar to other elements of the AAMP, ridehailing management strategies will be evaluated and updated annually, as needed.

8.1 STRATEGIES

The City and OVG will work with ridehailing providers on a number of strategies to manage ridehailing congestion and curb space demands during pre- and post-event conditions. The primary outcomes being sought through ridehailing management include:

- *Dispersing demand away from congested curb spaces and streets that are expected to have heavy traffic.*
- *Reducing the likelihood that improper pick-ups and drop-offs will block travel lanes, transit stops/lanes, bike lanes, or crosswalks.*
- *Shifting ridehailing operations away from key transit streets.*
- *Orienting ridehailing pick-up activities away from major traffic corridors.*
- *Establishing clear staging locations and ingress routes to limit areawide traffic congestion and transit delays.*

The ridehailing strategies will be combined with the demand management strategies described in Chapter 3 to ensure that the Arena area is not overwhelmed with ridehailing vehicles before and after events.

The main strategies that will be employed for ridehailing management include:

- **Curb Space Management:** *Using a mix of TCOs, physical barriers, and pick-up zones (both signed taxi areas and zones designated in ridehailing apps), the curb space will be managed to geographically spread out demand, reduce improper pick-ups and drop-offs and create a more predictable ridehailing environment.*
- **Routing Algorithm Modifications:** *Ridehailing companies can update their mapping/routing algorithms to restrict traffic from certain streets. This is an important aspect of reducing traffic congestion on key transit streets like 1st Ave N and Queen Anne Ave N.*

In addition to curb space management and routing algorithm modifications, OVG and the City of Seattle are exploring geofencing options for ridehailing vehicles (see pages 18 and 19 for a



description of geofencing). At this time no agreements have been made, but all parties understand the need to manage ridehailing vehicles during major Arena events and geofencing could be an option that is further defined in later versions of this AAMP.

The following sections describe what specific strategies will be employed during pre- and post-event conditions, the timeframes for implementation, and the attendance levels that would trigger the response.

8.2 PRE-EVENT CONDITIONS

The primary strategies employed during pre-event conditions are curb space management along 1st Ave N and routing algorithm modifications to deter ridehailing vehicles from traveling along 1st Ave N and Queen Anne Ave N. The blocks south of the Arena, including the area bounded by Thomas St, 2nd Ave N, Denny Way, and 1st Ave N would also be excluded from the routing algorithm along with the blocks of Republican St and Warren Ave immediately north of the Arena.

The traffic management plan shown on Figure 5 includes the placement of a continuous barricade along the east side of 1st Ave N from south of Thomas St to Harrison St to physically prohibit drop-offs and pick-ups from occurring on this critical street segment. Temporary changeable message signs (CMS) are planned to be situated along the inbound directions of Mercer St, Denny Way, and 1st Ave to advise motorists that attendee drop-offs are prohibited along 1st Ave N. Field observations at existing KeyArena indicate that drop-offs and pick-ups along 1st Ave N are frequent and contribute to congestion. These restrictions would apply to TNCs, taxis, and other private vehicles.

- **Time Period:** *Would occur during the one-hour prior to an event's scheduled start time. The strategies would terminate 30 minutes after the event's scheduled start time, although the physical barriers on 1st Ave N would remain throughout the event since they are also used for post-event ridehailing management.*
- **Trigger:** *Would occur for all events at the Arena that would draw 10,000 or more attendees.*

8.3 POST-EVENT CONDITIONS

Post-event conditions cause much greater competition for curb space than pre-event conditions because most attendees exit the venue at about the same time and ridehailing vehicles are often present waiting for them. Planning efforts have determined that there is not enough curb space (flex zone) available near or bordering the Seattle Center campus to accommodate the expected



level of post-event ridehailing activity (910 vehicles during a weekday NBA/NHL game) as stated in the FEIS. Therefore, the demand management strategies identified in Chapter 3 identify measures to discourage ridehailing and increase the use of transit, walking, and bicycling. Additionally, the same curb space management, temporary barriers, changeable message signs, and routing algorithm modifications proposed under pre-event conditions would be in place during post-event conditions. Post-event time periods and attendance triggers are as follows:

- **Time period:** 30 minutes prior to scheduled end of event to 60 minutes after the event concludes.
- **Trigger:** Would occur for all events at the Arena that would draw 10,000 or more attendees.

The specifics of the strategies, time periods, and triggers will be updated annually based on observed performance—see Chapter 10 for additional details.

9. Traffic, Parking, Transit, Ridehailing, and Pedestrian Management

An integrated approach for managing people driving or riding in cars, people walking and biking, and using transit is necessary within the Arena vicinity. This chapter presents recommended management activities by corridor, first for pre-event conditions and then for post-event conditions. When compared to other chapters of the AAMP this chapter, which serves as a ‘playbook’ of sorts, is more detailed so that readers and users of the AAMP have an understanding of its details and rationale for recommended strategies.

However, before presenting these strategies, the following desired operational outcomes are listed below. While this is not an exhaustive list of the AAMP’s objectives, it provides insight into many of the recommended strategies that follow.

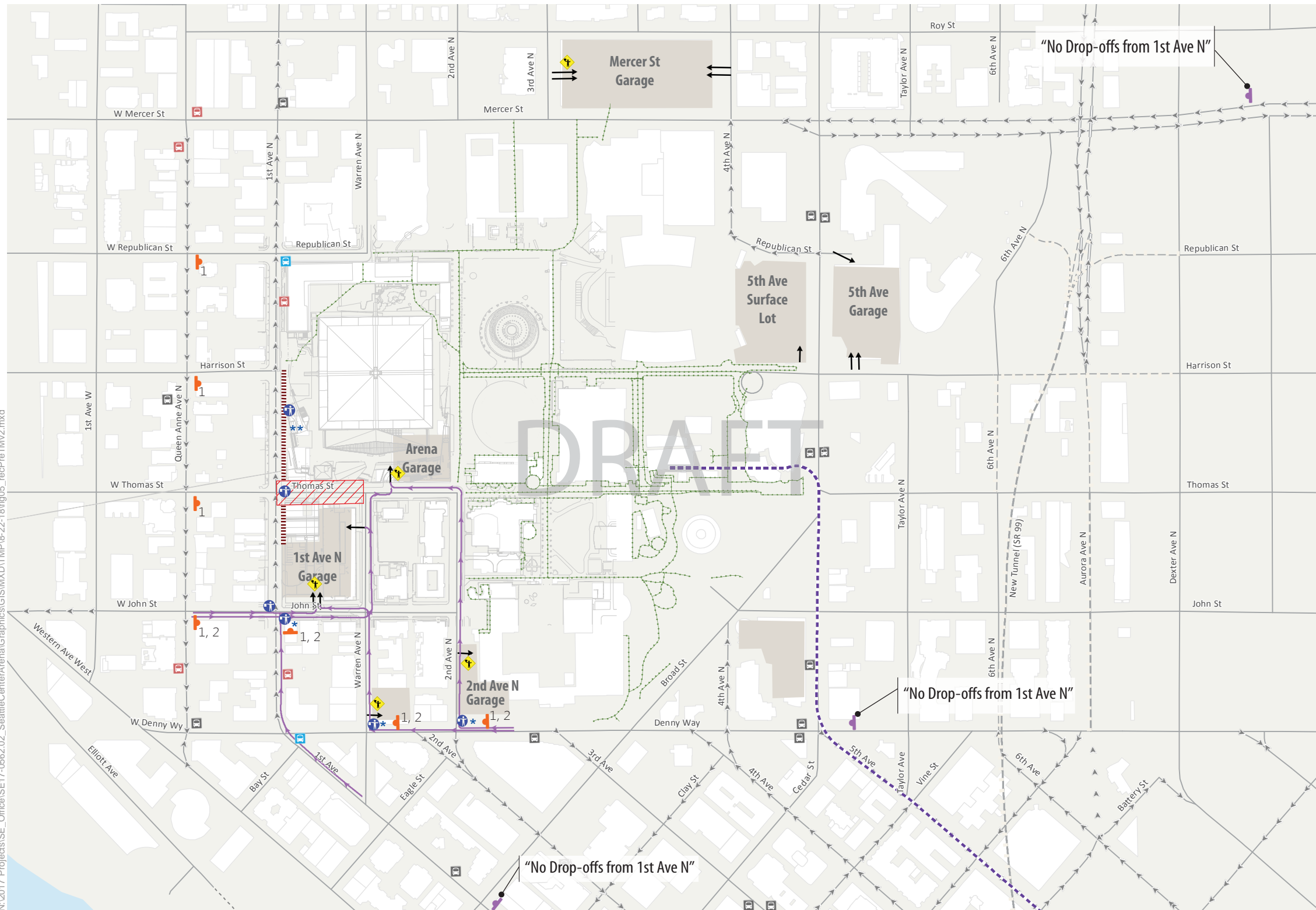
- *Minimize potential conflicts between people walking, biking, taking transit and other vehicles to ensure a safe environment around the Arena.*
- *Prevent excessive delay to buses traveling along 1st Ave N and Queen Anne Ave N so as to enhance this travel mode as a leading option for event attendees. Taking transit to and from the Arena should be as seamless as possible as buses can move the most number of people.*



- *Restrict ridehailing and other drop-off/pick-up vehicles on 1st Ave N and Queen Anne Ave N and reduce conflicts with people walking or biking.*
- *Limit segments of 2nd Ave N, Warren Ave N, and John St located north of Denny Way and east of 1st Ave N to local traffic and attendees traveling to/from the 1st Ave N and Arena Garages.*
- *Ensure the four OVG/Seattle Center garages have pre-event parking reservation systems and post-event traffic management strategies to be emptied in an efficient manner.*

Figures 5 and 6 illustrate the recommended traffic management measures for pre-event and post-event conditions, respectively. Pre-event measures would typically begin one-hour prior to the event's start time. Post-event measures would be in place prior to the event's conclusion and typically for 45 minutes to one-hour afterward (depending on how long it takes for cars, pedestrians, buses, etc. to empty the area). These figures are referenced throughout the remainder of this chapter.

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- | | | | | | | | |
|--|----------------------------------|--|---|--|----------------|--|----------------|
| | Traffic Control Officer (TCO) | | Changeable Message Sign | | Bus Stop | | Monorail |
| | Important Parking Attendant Role | | Temporary Special Event Signage
1 - Local Traffic Only
2 - 1st Ave and Arena Garage | | RapidRide Stop | | Planned Street |
| | Operate Bus Lane Queue Jump | | Temporary Barricade | | Garage Ingress | | Garage Routing |
| | | | Pedestrian Pathway | | Streets Closed | | Parking Garage |

*TCO's positioned on 2nd Ave N, Warren Ave N, and John St to check motorist credentials (non-credentialed motorists who enter will be directed to WB John St or SB Warren Ave N to exit).

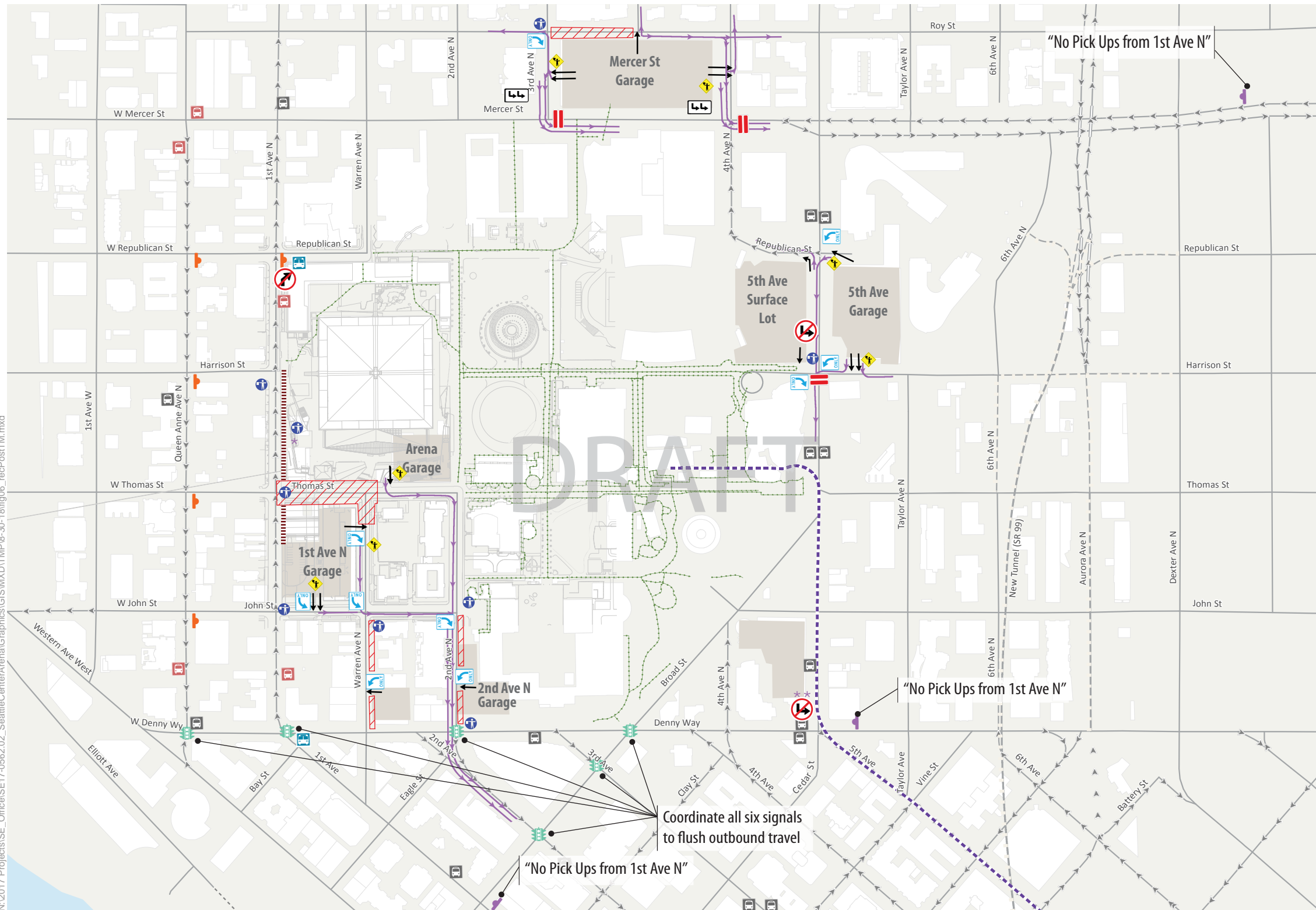
**Two openings of barricade would be provided to enable designated vehicles (i.e., paratransit, shuttle buses) to access curb lane.

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Figure 5



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- | | | | | | | | |
|--|--|--|---|--|---------------------|--|----------------|
| | Temporary Modified Lane Assignment | | Temporary No Left or Right Turn at Signal | | Bus Stop | | Streets Closed |
| | Traffic Control Officers | | Temporarily Close Crosswalk | | RapidRide Stop | | Monorail |
| | Important Parking Attendant Role | | Left-turn Only Signage | | Temporary Barricade | | Planned Street |
| | Changeable Message Sign | | Right-Turn Only Signage | | Pedestrian Pathway | | Garage Egress |
| | Temporary Special Event Signage:
Local Traffic Only | | Signal Coordination | | Parking Garage | | Garage Routing |
| | Operate Bus Lane Queue Jump | | | | | | |

- * Two openings of barricade would be provided to enable designated vehicles (i.e., paratransit, shuttle buses) to access curb lane.
 - ** Continuing left/through movement onto 5th Ave south of Denny Way would be permitted.
- Note: Potential geofence area and specific pick-up locations under study.

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Figure 6

Recommended Post-Event Traffic Management



9.1 PRE-EVENT CONDITIONS

1st Ave N / Queen Anne Ave N

- *To reduce delays and facilitate required lane changes for buses traveling on 1st Ave N, a transit queue jump at Republican St will be provided. The existing transit queue jump on 1st Ave at Denny Way will remain.*
- *Temporary 'Local Traffic Only' signs are placed directly east of Queen Anne Ave N in the eastbound directions at Republican St, Harrison St, Thomas St, and John St to discourage usage of these streets for ridehailing or other drop-offs.*
- *A temporary, continuous barricade is positioned on the east side of 1st Ave N from just south of Thomas St to Harrison St to physically prohibit drop-offs. Drop-offs would not be able to occur on the west side of the street due to the presence of the PBL. It is expected that the combined effects of advanced messaging (via CMS), TNC routing updates, 'Local Traffic Only' signs on east-west streets, and physical barriers to drop-off will largely discourage these unwanted actions.*
- *TCOs will be present on 1st Ave N at the following locations and for the following purposes:*
 - **1st Ave N/John St:** *Two TCOs will be required to assign right-of-way among vehicles, buses, bicycles, and pedestrians. They will also check motorist credentials (i.e., local resident/business, or parking pass to the 1st Ave N or Arena garages as they enter John St east of 1st Ave N).*
 - **1st Ave N/Thomas St:** *One TCO will be assigned to primarily be a visible presence, but also handle unusual activities (e.g., truck desiring to enter closed portion of Thomas St).*
 - **1st Ave N barricade north of Thomas St:** *One TCO will be assigned to primarily be a visible presence, but may assist paratransit vehicles and shuttle bus operators who are granted permission to use the curb lane located between the barricade and sidewalk (see below). They may also need to monitor the block north of Harrison St for illegal drop-off activity within the KCM bus layover area.*
- *The following describes the recommended barricade system to be located on the east side of 1st Ave N:*
 - *A 200-foot continuous barricade would be located between the Arena truck-access driveway and Thomas St. Operation of this barricade will require temporarily prohibiting on-street parking during events. The travel lane provided between the barricade and curb could be used for remote shuttle drop-offs/pick-ups (operated as part of the Demand Management Program – see Chapter 3).*



- *Along the Arena frontage, the barricade would extend for about 350 feet and have two 20-foot wide openings to enable permitted vehicles to enter/exit the lane between the barricade and curb. This lane would serve primarily paratransit vehicles and remote shuttle buses.*

Denny Way

- *The third westbound travel lane on Denny Way begins approximately 100 feet east of Warren Ave N. Using signage and cones, this lane would be designated as a temporary right-turn only lane onto northbound Warren Ave N and 1st Ave N.*
- *TCOs will be present on Warren Ave N and 2nd Ave N north of Denny Way to check motorist credentials (i.e., local resident/business to facilitate church and Pacific Science Center garage use, or parking pass to the 1st Ave N or Arena garages) as they enter these streets. They may also need to manage vehicle/pedestrian conflicts so as to avoid vehicle queuing on westbound Denny Way due to heavy pedestrian flows. While the credential system may not be a perfect solution, it will nonetheless serve as a visual deterrent to people in cars using these streets to access the Arena. Without some type of deterrent, these streets could be overwhelmed by cars looking to drop-off/pick-up passengers, find parking, etc.*

The AAMP does not currently recommend placement of TCOs or other special traffic management strategies during pre-event conditions along segments of Mercer St, 5th Ave N, Broad St, or Roy St. It is expected that the parking reservation system and best practices guide to be adopted by parking garage operators and a mobility app will allow attendees to make better travel option choices.

The pre-event traffic management plan contemplates a total of six (6) TCOs distributed to the south and west of the Arena. Each of these positions are considered essential to the AAMP's effectiveness.

9.2 POST-EVENT CONDITIONS

The post-event traffic management plan is based on a maximum of 10 available TCOs for a typical event. The descriptions that follow place these personnel in the most critical locations to maximize their effectiveness.

1st Ave N / Queen Anne Ave N

- *The pre-event traffic management elements would be similar for post-event conditions. However, a single TCO would be placed on 1st Ave N at John St, Thomas St, the barricade along the Arena frontage, and Harrison St. Their roles would range from ROW assignment, curb space management, and physical presence.*



- *Additionally, a no right-turn sign would be placed on 1st Ave N at Republican St to discourage motorists from using this route as a short-cut to reach Mercer St.*

Denny Way

Field observations during recent events at KeyArena reveal that the Denny Way/2nd Ave N intersection is critical to emptying garages and streets south of the Arena. The project would add a new 450-space garage under the Arena, with its trips passing through this intersection. The physical improvement list identifies modification of a segment of the protected bike lane on 2nd Ave south of Denny Way so that two southbound receiving lanes can be provided.

- *The Denny Way/2nd Ave N intersection would be controlled by an upgraded traffic signal (unlike current conditions in which two TCOs manually assign ROW).*
- *Traffic signals on Denny Way at Queen Anne Ave N/Western Ave, 1st Ave N, 2nd Ave N, and Broad St should be coordinated to facilitate eastbound traffic progression. Traffic signals on 2nd Ave at Denny Way and Broad St should be coordinated to facilitate southbound traffic progression.*

2nd Ave N

- *The northbound travel lane between Denny Way and John St would be closed. To accommodate two streams of exiting motorists (one from southbound 2nd Ave N, and one from eastbound John St), a two-lane southbound coning pattern would be provided on 2nd Ave N starting at John St and extending to Denny Way. This would enable two continuous lanes of traffic approaching and departing Denny Way, which would be a substantial improvement over the current single lane. TCOs would be situated on 2nd Ave N at Denny Way and John St to be a physical presence, but not assign ROW. The coning pattern and operations of this segment will be complicated due to exiting traffic from the 2nd Ave Garage and vehicles parked on the east side of the street.*

Warren Ave N

- *The northbound travel lane between Denny Way and John St would be closed. Highly visible temporary signs should be placed on the southbound Warren Ave N approach to Denny Way indicating that left and through movements are prohibited. A TCO would be stationed at the John St/Warren Ave N intersection to assign ROW.*



John St

- *Motorists exiting the 1st Ave N Garage will be directed to the east on John St to access 2nd Ave N. No special traffic management is proposed along this segment, aside from parking attendants who will manage the outbound flow from the garage.*

Mercer St

- *The east leg crosswalk will be closed at the Mercer St/3rd Ave N intersection to facilitate the movement of southbound left-turns from 3rd Ave N. Additionally, 3rd Ave N will be temporarily signed to consist of dual-southbound left turn lanes (no right turns allowed) because right turns would conflict with the large number of people walking in the west leg crosswalk.*
- *The 4th Ave N approach to Mercer St will be temporarily signed to consist of one left and one shared left/right lane. The southbound right-turn may be permitted at this location due to fewer conflicting right-turning motorists and pedestrian crossings.*
- *Mercer St signal timings should be adjusted to better facilitate eastbound travel (particularly between 5th Ave N and Dexter Ave N). This would include extended eastbound through movement green times.*

5th Ave N

- *As shown on Figure 6, a variety of turn movement restrictions will be in place at the 5th Ave N/Harrison St intersection for post-event conditions. A TCO will be present at the intersection to monitor heavy pedestrian flows crossing 5th Ave N, but will not assign ROW.*
- *The 5th Ave N Garage features exiting lanes onto 5th Ave N (at a signalized access opposite Republican St) and directly onto Harrison St. Based on traffic simulation analysis of opening day conditions, the majority of people driving cars should be directed to eastbound Harrison St to access SR 99 or continue eastbound on Harrison St. Some people in cars may also be directed to southbound 5th Ave N to continue through downtown Seattle. One or more parking attendants are necessary at the Harrison St driveway to manage conflicting exiting garage traffic and people walking. Motorists will be restricted from turning right from Harrison St onto northbound 5th Ave N so as to avoid adding to congestion along Mercer St.*
- *At the 5th Ave N/Denny Way intersection, southbound left-turns (onto Denny Way) will be temporarily prohibited to direct traffic through relatively uncongested downtown streets to access I-5, versus the more congested Denny Way corridor. Signage is recommended on southbound 5th Ave N and at the intersection advising motorists of this prohibited movement.*



Roy St

- *The segment of Roy St between 3rd Ave N and Nob Hill Ave N/Mercer Garage driveway will be closed in both directions. To accommodate this, a TCO will be present at the Roy St/3rd Ave N intersection.*

9.3 EFFECTIVENESS OF PHYSICAL IMPROVEMENTS AND AAMP TRAFFIC MANAGEMENT STRATEGIES

This section analyzes how the physical improvements and recommended AAMP traffic management strategies would improve opening year (2020) weekday pre-event and post-event peak hour conditions. The EIS scenario of 2020 Average Seattle Center Attendance Conditions with Alternative 1 was selected as the starting point for this analysis. The Vissim micro-simulation model representing this scenario was modified as follows to represent the combined effects of the physical improvements and recommended AAMP traffic management strategies:

- *The drop-off / pick-up locations of ridehailing vehicles was modified from the EIS assumptions (i.e., no restrictions in place) to instead represent conditions as described in Chapters 8 and 9 of this report.*
- *The physical improvements described in Chapter 4 of this report were coded into the model. Note that the model includes not only general purpose vehicular travel lanes, but also bus-only lanes, transit queue jumps, ridehailing vehicle drop-offs and staging, and bicycle facilities.*
- *The various traffic management strategies described in this chapter were coded into the model including coordinated traffic signals, closed streets, turn movement restrictions, and temporary lane assignments.*

In order to isolate the benefits of the physical improvements and determine the value of the event traffic management, mode shares were kept the same. This analysis does not consider how implementation of demand management strategies (see Chapter 3) could affect mode share and the changes in the number of vehicles traveling to and from the Arena vicinity. Accordingly, the volumes of traffic entering/exiting the study area (i.e., generally bounded by Western Ave, Roy St/Valley St, I-5 and downtown) are nearly identical between the scenario analyzed in the EIS and this analysis. If the lower mode shares identified in Chapter 3 were considered in the model, there would be even less congestion than is reported in this document.

Table B-1 in Technical Appendix B reports the average delay and LOS under 2020 weekday pre-event and post-event peak hour conditions at 40 intersections located in the Arena vicinity with the physical improvements and recommended AAMP traffic management strategies in place. These results are then compared against the 2020 Average Seattle Center Attendance Conditions



Alternative 1 and No Action Alternative EIS scenarios. Since the physical improvements and recommended AAMP traffic management strategies will only produce operational changes in the Arena vicinity, Vissim model results are not presented for the entire study area, which consists of 75 intersections.

According to Table B-1, the combined effects of the physical improvements and the AAMP would cause two fewer intersection impacts under pre-event conditions and ten fewer intersection impacts under post-event conditions when compared to EIS results for Alternative 1. These 40 study intersections would experience a notable decrease in their average delay, reduced from 122 to 78 seconds per vehicle during the pre-event peak hour and reduced from 123 to 73 seconds per vehicle during the post-event peak hour. This occurs as a result of the redistribution of TNC trips, rerouting of vehicles exiting some garages, and various traffic management strategies. The physical improvements and AAMP are effective because they accomplish the following:

- *Provide bus-only lanes on 1st Ave N and Queen Anne Ave N, which improves on-time bus performance (see Table B-2 in Technical Appendix B) and enhances travel by bus as a leading travel choice to reach the Arena. For the segments of 1st Ave N and Queen Anne Ave N between Denny Way and Mercer St, the bus-only lanes (and other enhancements) provide a 1-minute northbound travel time savings and a 5.5-minute southbound travel time savings during the pre-event peak hour when compared to EIS results for Alternative 1.*
- *Restrict the use of ridehailing vehicles along 1st Ave N and Queen Anne Ave N, thereby reducing congestion and freeing up curb space for other uses along 1st Ave N (e.g., remote shuttle buses and paratransit).*
- *Provide an all ages and abilities bicycle connection to encourage bicycle travel.*
- *Reduce conflicts between vehicles and pedestrian/bicyclists at numerous intersections through TCO placement and vehicle turn restrictions.*
- *Reduce the amount of time required to exit garages and empty streets after events conclude which benefits both Arena attendees and the residents/businesses in the area.*

The EIS identified significant intersection impacts based on the average delay per vehicle served. However, the reported LOS at an intersection does not tell the full story when dealing with corridors that are at or near capacity. Table B-3 compares the number of vehicles able to be served during the pre-event and post-event peak hours at selected intersections with Alternative 1, both without and with the physical improvements and AAMP in place. This table reveals the following:



- *The physical improvements and traffic management/parking reservation system increases the total number of vehicles that can be served within each peak hour. The AAMP causes vehicle demand to slightly decrease at some intersections (due to changes in routing of TNCs and reassignment of garage trips).*

10. Performance Standards and Monitoring

This chapter presents the Performance Standards against which the Arena operations will be measured. This chapter also describes the monitoring methods to be undertaken during the first year of operations.

10.1 PERFORMANCE STANDARDS

The AAMP was recommended as a mitigation measure for transportation impacts that occurred across multiple travel modes. The AAMP includes various Performance Standards that must be met in order to demonstrate that the significance of impacts have been reduced.

Once the Arena is in operation and initial monitoring results are available, the measured results will be compared against these criteria. If not achieved, OVG is required to work with the appropriate agency or stakeholder group (i.e., City of Seattle, King County Metro, Seattle Center, etc.) to identify and implement additional measures to satisfy the criteria. The following Performance Standards, which would apply to Opening Day (2020) conditions only, have been developed:

1. **Private Vehicle Mode Share for Attendees:** *No more than 55% of NHL /NBA game attendees use their own private vehicle to travel and park within a half-mile of the Arena. No more than 59% of concert and other events attendees use their own private vehicle to travel and park within a half-mile of the Arena. See Table 5 in Chapter 3 for additional mode share targets.*
2. **Ridehailing Mode Share for Attendees:** *As documented in Table 5 of Chapter 3, ridehailing mode share is no greater than 15% (i.e., current levels) in the pre-event condition for any event at the Arena.*
3. **Parking Reservation System:** *At least 50% of NHL/NBA game attendees who drive reserve a space through the parking reservation system. At least 15% of these reservations occur at facilities situated at least a half mile from the Arena.*
4. **Garage Ingress:** *Field observations do not reveal vehicle queues entering garages/lots participating in the Best Practices program that cause traffic to spill back at least one block.*



5. **Garage Egress:** *It takes no longer than 30 minutes to empty the 1st Ave N and Arena Garages.*
6. **Transit Delay:** *Bus speeds along key transit routes along 1st Ave N, Queen Anne Ave N, Denny Way, and 5th Ave N are not substantially degraded based on empirical with and without event bus running times.*
7. **Bicycle Parking:** *Bicycle parking demand does not exceed the available on-site supply during NHL hockey/NBA basketball games and concerts/other non-sporting events. Parked bikes do not noticeably impede the movement of people walking or Seattle Center operations and post-event bikeshare bicycles are situated in the designated parking locations to better facilitate access to bikes post-event. No more than 2% of bikeshare bicycles are blocking pedestrian, bicycle, or vehicle access areas. Adequate bikeshare bicycles available in the post-event condition (e.g., at least a handful of bikeshare bicycles are still present near the Arena egress points 60 minutes after the event ends).*
8. **Pedestrian Facilities:** *Field observations during NHL/NBA games and concerts/other non-sporting events do not reveal that people walking spill out of sidewalks onto streets with moving vehicles or out of crosswalks (due to pedestrian density) when crossing the street.*
9. **Private Vehicle SOV Mode Share for Employees:** *A commute trip survey will be conducted within the first six months of Arena operations to establish a baseline for Arena employees (all full and part-time employees). Arena employees will have an SOV mode share of 30% or less.*

10.2 MONITORING ACTIVITIES AND DOCUMENTATION

The following monitoring activities will occur during the first year of Arena operations.

Initial Events Monitoring Plan

- *The first two regular season hockey or basketball games at the Arena.*
- *The first two concerts at the Arena.*

The purpose of the Initial Events Monitoring Plan is to identify the initial weaknesses in the AAMP elements and to implement improvements as soon as possible to enable a safer and more enjoyable experience at the Arena. The monitoring will identify areas for improvement in the event planning/operations and recommend measures that can be quickly implemented to resolve these issues.

This effort will consist of collecting observational data to assess which elements of the AAMP need to be immediately modified in advance of subsequent events. Prior to each scheduled monitoring



event, a meeting will be held with the City, Seattle Center, and OVG to identify the specific monitoring locations, durations, and staffing responsibilities. A follow-up meeting will occur during the week immediately following each event to discuss the monitoring observations and identify what modifications to the AAMP should be implemented for subsequent events.

A written record of observations, and suggested improvements after each monitoring event will be prepared and be available for public review at City offices.

First Year Typical Events Monitoring Plan

- *Two typical mid-season hockey or basketball games at the Arena.*
- *Two typical concerts at the Arena.*

All four monitoring events should have at least 17,000 expected attendees. It is recommended that events should not be chosen on days in which other venues at Seattle Center are also hosting large events. Selection of such dates would likely mask the individual effects of the renovated Arena versus the effects of the other events. By waiting until mid-season, travel patterns and behavior will have normalized so that a representative sample is collected. It also allows for the benefits of the initial event monitoring and any associated AAMP refinements to take effect.

Additionally, during the first year of Arena operations, an online survey should be distributed to all NHL/NBA season ticketholders and single-game ticket purchasers for a couple of selected dates. The online survey should inquire about attendee mode share, use of parking reservation system, and other factors. Collection of this data is critical to evaluating the project's compliance with the Performance Standards.

The online survey and monitoring events will provide a representative sample of operating conditions at the Arena and will be measured against the Performance Standards. Prior to monitoring these events, a meeting will be held with the City, Seattle Center, and OVG to identify the specific monitoring locations, durations, and staffing responsibilities. The monitoring effort will focus on the AAMP elements and Performance Standards contained in this document. The monitoring effort will include both observational and empirical data collection.

First Year Employee Travel Monitoring Plan

Within the first year of Arena operations, employees at the Arena and Seattle Center shall be surveyed to identify their commute mode share, focusing primarily on SOV travel. This will establish



a benchmark for mode share that can be improved on in future years. Additionally, OVG's Mobility Coordinator will track utilization of quantifiable data such as ORCA card usage, bicycle parking usage, or employee parking in OVG/Seattle Center garages. These data points will also be used to benchmark mode share for future improvement.

The results of the four monitored events, online survey, and employee surveys/data collection will be documented in the "*Seattle Center Arena Year One Travel Monitoring Report*." This report will include photos, charts, and observational notes of site operations. It will include an assessment of the extent to which the established Performance Standards are met, exceeded, or are unmet. For those standards that are not met, specific recommendations will be provided to implement additional measures to achieve the criteria. The report will be submitted to the City for review. Once finalized, the report will be made available to the public through the City and OVG websites.

Ongoing Monitoring Plan

Like other event transportation management plans in Seattle, the AAMP should be updated annually to demonstrate consistency with the mode share goals and respond to changing attendee travel patterns, new transportation technologies, new transit options, etc. SDCI will work with OVG to establish the timing for the AAMP annual update, but the summer may be a reasonable time frame since that overlaps with the off-season for the NHL and NBA.

10.3 TRIGGERS FOR AAMP DEPLOYMENT

Full implementation of the AAMP is recommended for all Arena events that are expected to accommodate at least 10,000 persons at one time. The attendee and employee demand management programs are assumed to be in place as of day of opening and there are no attendance thresholds for these programs.

The selection of 10,000 attendees as a triggering threshold is based on observations for three separate events at KeyArena that each attracted over 10,000 persons and was operated with no pre-event and modest post-event traffic management. In all three instances, congested conditions were observed which could have been improved by a program similar to the AAMP.

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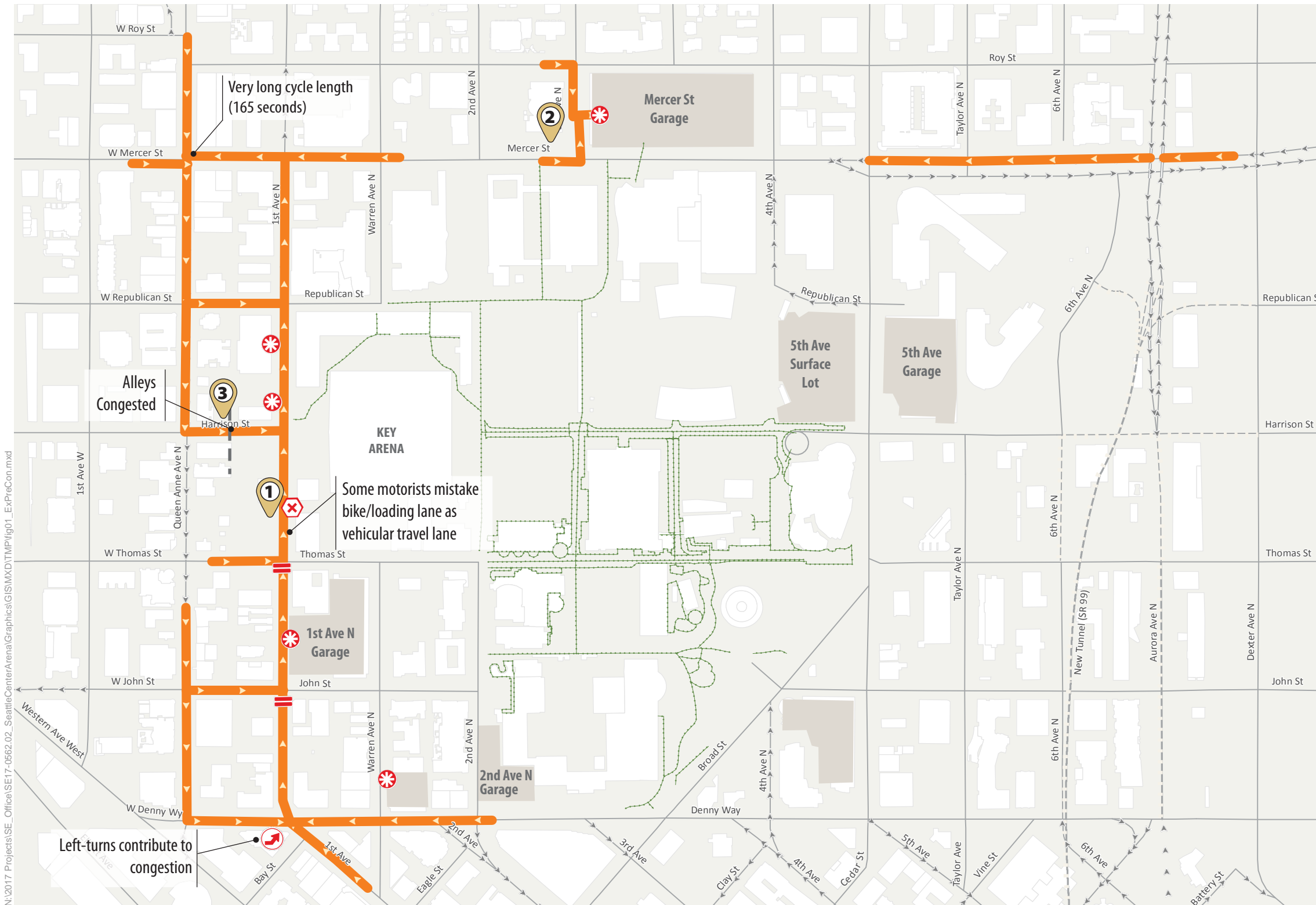
Technical Appendices

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Appendix A

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- Event Related Congestion
- Pedestrian Pathway
- Monorail Line
- Planned Street
- Parking Garage
- Parking Garage Operations Adversely Affected Adjacent Street
- Parked Vehicle in Loading Zone
- Challenging Pedestrian Crossing (Given lack of signalized crosswalk)
- Problematic Left-turn

Note:
Based on observations at Kevin Hart Comedy Show at Key Arena that began at 7:00 PM on Thursday, June 14th, 2018.

1st Ave N Congestion



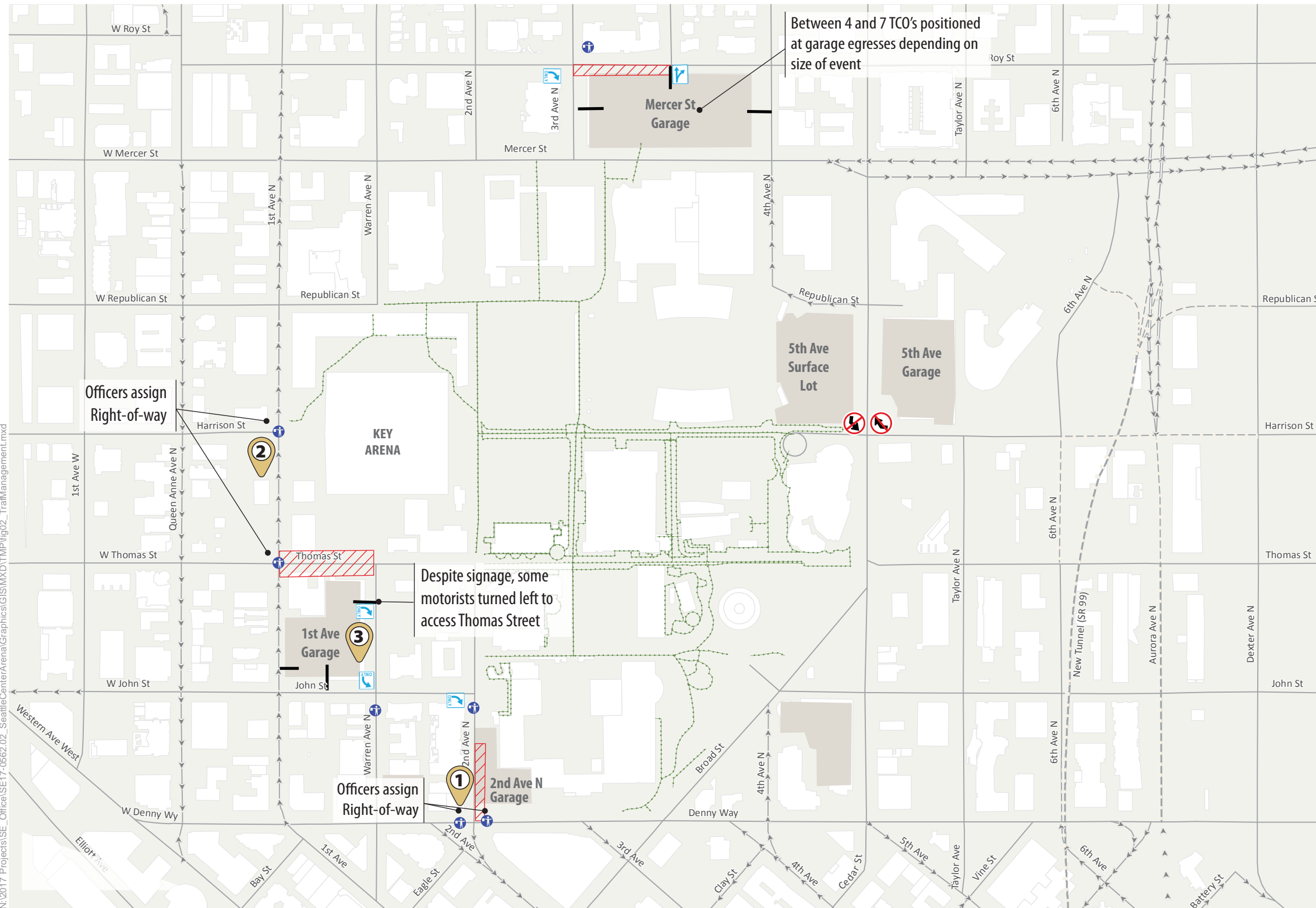
Mercer Garage Queuing



Alley Usage



Figure A-1



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- Pedestrian Pathway
- Monorail Line
- Planned Street
- Parking Garage Exit
- Parking Garage
- Street Closure
- T Traffic Control Officer
- ⊘ Temporary Prohibited Movement
- ↑ Temporary Signage Showing Permitted Movement

Note:
Based on observations at Kevin Hart Comedy Show at Key Arena that ended at 10:00 PM on Thursday, June 14th, 2018.

Denny/2nd Ave N Traffic Control



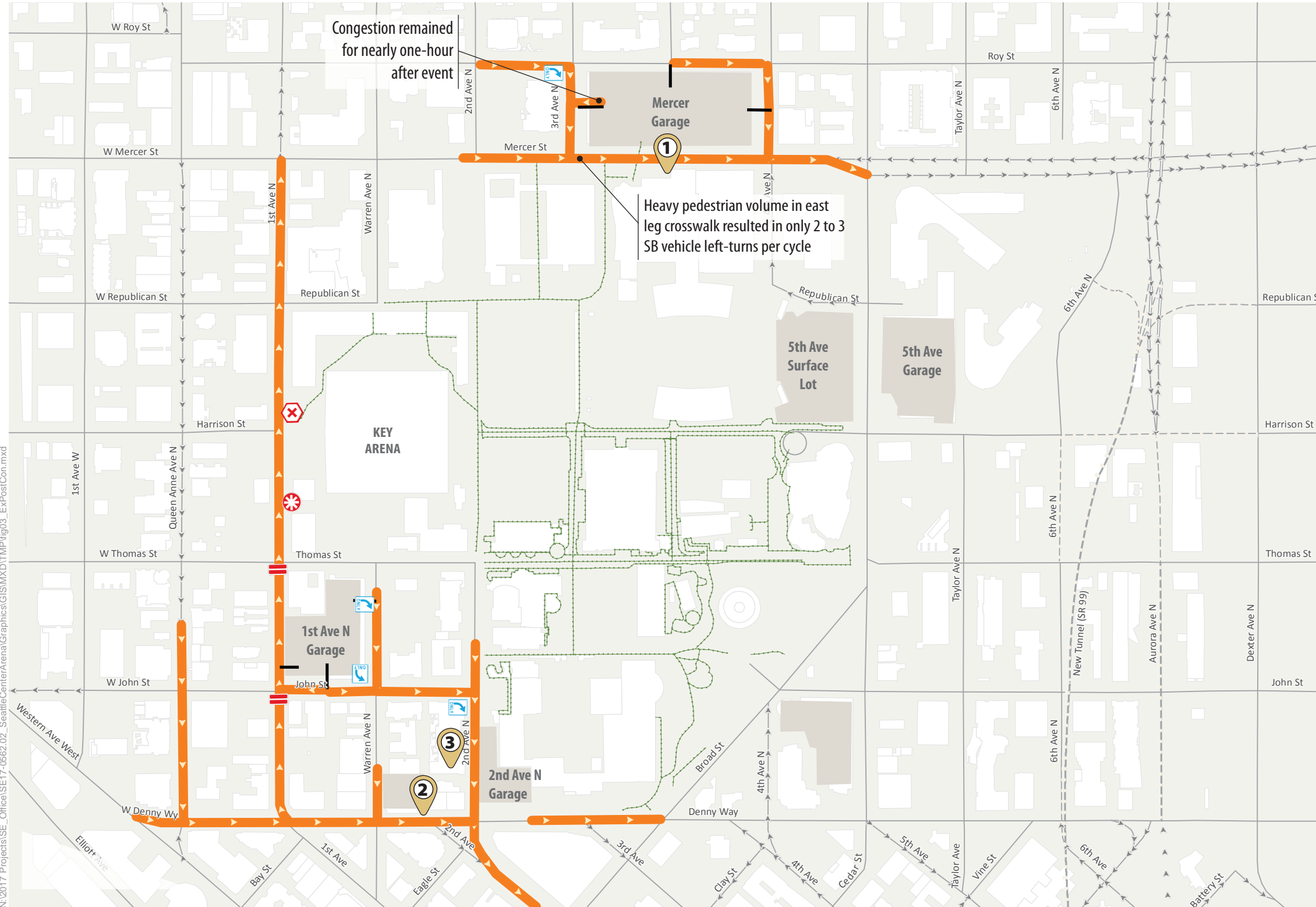
Traffic Control Officer at 1st Ave N/Harrison St



Warren/John Traffic Control



Figure A-2



Congestion remained for nearly one-hour after event

Heavy pedestrian volume in east leg crosswalk resulted in only 2 to 3 SB vehicle left-turns per cycle

Mercer Garage

5th Ave Surface Lot

5th Ave Garage

KEY ARENA

1st Ave N Garage

2nd Ave N Garage

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- ▶ Event Related Congestion
- - - Pedestrian Pathway
- - - Monorail Line
- - - Planned Street
- = Challenging Pedestrian Crossing (Given lack of signalized crosswalk)
- ⊗ Heavy Competition for Curbspace by TNCs, Pick-ups, Taxis and Paratransit
- ⊗ Vehicles/Limos Block Bus Dwell Area
- ↑ Temporary signage showing permitted movements
- Parking Garage Exit
- Parking Garage

Note:
Based on observations at Kevin Hart Comedy Show at Key Arena that ended at 10:00 PM on Thursday, June 14th, 2018.

EB Mercer St Congestion



EB Denny St Traffic Congestion



SB 2nd Ave N Congestion



Figure A-3



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Appendix B

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Table B-1: Intersection Level of Service – 2020 Average Seattle Center Weekday Conditions

#	Intersection	Traffic Control	No Action		Plus Project			
					No Mitigation		with AAMP and Physical Improvements	
			Pre-Event Pk Hr	Post-Event Pk Hr	Pre-Event Pk Hr	Post-Event Pk Hr	Pre-Event Pk Hr	Post-Event Pk Hr
1	Mercer St/Queen Anne Ave N	Traffic Signal	F / 158	B / 13	F / 132	F / 195	E / 55	C / 24
2	Mercer St/1 st Ave N	Traffic Signal	F / 257	B / 11	F / 217	F / 293	E / 57	D / 45
3	Mercer St/Warren Ave N	Traffic Signal	F / 189	A / 5	F / 178	F / 133	D / 47	F / 90
4	Mercer St/2nd Ave N	Traffic Signal	F / 146	A / 2	F / 103	F / 172	D / 53	F / 95
5	Mercer St/3rd Ave N	Traffic Signal	F / 120	A / 7	F / 89	F / 108	D / 53	F / 122
6	Mercer St/4th Ave N	Traffic Signal	F / 207	A / 2	F / 151	F / 180	F / 96	F / 121
7	Mercer St/5th Ave N	Traffic Signal	F / 102	C / 34	F / 104	F / 123	F / 113	E / 69
8	Mercer St/6th Ave N	Traffic Signal	F / 161	A / 1	F / 135	F / 105	F / 86	D / 49
9	Mercer St/Dexter Ave N	Traffic Signal	F / 123	C / 30	F / 197	F / 112	F / 124	F / 89
15	Queen Anne Ave N/Republican St	Traffic Signal	D / 38	B / 11	F / 371	B / 14	F / 83	B / 15
16	1st Ave N/Republican St	Traffic Signal	F / 263	B / 13	D / 39	F / 461	D / 36	C / 26
17	5th Ave N/Republican St	Traffic Signal	8 / A	A / 5	A / 8	F / 89	F / 148	F / 135
18	Queen Anne Ave N/Harrison St	Traffic Signal	F / 186	A / 6	F / 353	A / 10	F / 91	A / 5
19	1st Ave N/Harrison St	Traffic Signal	F / 219	B / 11	F / 198	F / 254	E / 56	A / 7
20	5th Ave N/Harrison St	Traffic Signal	12 / B	A / 9	C / 25	E / 66	F / 133	F / 147
21	Queen Anne Ave N/Thomas St	Traffic Signal	F / 450	A / 7	F / 373	A / 9	E / 61	D / 46
22	1st Ave N/Thomas St	Traffic Signal	F / 123	A / 8	F / 261	F / 97	E / 63	B / 15
23	5th Ave N/Thomas St/Broad St	Traffic Signal	D / 44	C / 30	E / 70	F / 144	F / 163	F / 164
26	Broad St/John St	Traffic Signal	B / 14	A / 10	C / 23	E / 70	F / 99	C / 30
27	5th Ave N/John St	Traffic Signal	E / 50	A / 6	E / 73	E / 50	F / 93	F / 86
28	Denny Way/Western Ave	Traffic Signal	F / 129	A / 9	F / 117	B / 13	F / 89	C / 22
28a	Denny Way/Queen Anne Ave N	Traffic Signal	F / 96	B / 12	F / 101	B / 18		
31	Denny Way/2nd Ave N	Traffic Signal	D / 45	A / 4	E / 69	D / 37	D / 52	B / 18
32	Denny Way/Broad St	Traffic Signal	F / 96	A / 10	F / 135	B / 17	E / 64	C / 28

Table B-1: Intersection Level of Service – 2020 Average Seattle Center Weekday Conditions

#	Intersection	Traffic Control	No Action		Plus Project			
					No Mitigation		with AAMP and Physical Improvements	
			Pre-Event Pk Hr	Post-Event Pk Hr	Pre-Event Pk Hr	Post-Event Pk Hr	Pre-Event Pk Hr	Post-Event Pk Hr
33	Denny Way/5th Ave N	Traffic Signal	F / 101	A / 10	F / 103	F / 87	E / 71	E / 63
34	Denny Way/Taylor Ave N	Traffic Signal	E / 73	A / 6	E / 71	D / 38	E / 61	A / 10
35	Denny Way/6th Ave N	Traffic Signal	F / 109	B / 13	F / 151	E / 67	F / 104	D / 36
36	Denny Way/Aurora Ave N/7th Ave	Traffic Signal	F / 94	B / 18	F / 98	F / 128	E / 79	D / 52
37	Denny Way/Dexter Ave N	Traffic Signal	E / 65	B / 16	F / 86	E / 79	F / 123	E / 60
54	Queen Anne Ave N/Roy St	Traffic Signal	F / 245	C / 25	F / 191	F / 304	D / 48	C / 25
55	1st Ave N/Roy St	Traffic Signal	F / 147	A / 7	E / 76	F / 137	B / 19	B / 17
56	3rd Ave N/Roy St	Traffic Signal	F / 119	A / 9	C / 34	F / 144	A / 8	F / 116
57	4th Ave N/Roy St	Traffic Signal	D / 49	A / 8	D / 47	F / 323	C / 26	F / 248
58	5th Ave N/Roy St	Traffic Signal	F / 163	B / 14	F / 175	F / 381	E / 56	F / 433
59	6th Ave N/SR 99 SB On-ramp	Traffic Signal	A / 10	A / 6	A / 9	A / 7	B / 16	D / 44
60	Dexter Ave N/SR 99 NB Off-ramp	Traffic Signal	F / 137	A / 10	E / 71	B / 11	F / 192	F / 112
61	6th Ave N/Harrison St	Traffic Signal	A / 10	A / 7	B / 11	F / 278	C / 34	E / 71
62	Aurora Ave/Harrison St	Traffic Signal	E / 66	C / 25	E / 77	E / 75	F / 103	E / 69
63	Dexter Ave N /Harrison St	Traffic Signal	E / 75	A / 10	E / 77	C / 25	F / 134	E / 70
70	Mercer St/Taylor Ave N	Traffic Signal	E / 72	B / 16	F / 142	E / 71	E / 77	C / 26
Intersections Operating at LOS F			24	0	23	22	17	13
Intersections Operating at LOS E			6	0	8	7	11	6
Intersections at LOS D or Better			10 (25%)	40 (100%)	9 (23%)	11 (28%)	12 (30%)	21 (53%)
Average Intersection Delay (sec/veh)			117	12	122	123	78	73
Impacted Intersections			-	-	14	29	12	19

Notes:

- For signalized intersections, average delay (expressed in seconds per vehicle) is the weighted average of all vehicles passing through the intersection.
- Shaded cells represent significant intersection impacts.

Source: Fehr & Peers, 2018.

Table B-2: Travel Time/Speed Comparison – 2020 Average Seattle Center Weekday Conditions

Corridor	Pre-Event Peak Hour Plus Project			
	No Mitigation		with AAMP and Physical Improvements	
	Average Travel Speed	Average Travel Time	Average Travel Speed	Average Travel Time
WB Mercer St from Fairview Ave to 4th Ave N (General Purpose Travel)	5 mph	-	6 mph	-
EB Mercer St from 4th Ave N to Fairview Ave (General Purpose Travel)	2 mph	-	4 mph	-
WB Denny Way from Yale/Stewart to Taylor Ave N (General Purpose Travel)	5.5 mph	-	3.5 mph	-
EB Denny Way from Taylor Ave N to Yale/Stewart (General Purpose Travel)	2 mph	-	2.7 mph	-
NB 1st Ave N from Denny Way to Mercer St (Bus-Only Travel)	-	6.8 minutes	-	5.8 minutes
SB 1st Ave N from Mercer St to Denny Way (Bus-Only Travel)	-	11.8 minutes	-	6.3 minutes

Notes:

- Average travel speed more applicable/relatable for commute corridors such as Mercer St and Denny Way.
- Average travel time more applicable for buses since this metric relates to on-time arrival performance (travel time starts/ends at the midpoint of the intersection on either end of corridor).

Source: Fehr & Peers, 2018.

Table B-3: Vehicles Served Comparison – 2020 Average Seattle Center Weekday Conditions

Intersection	Plus Project							
	No Mitigation				with AAMP and Physical Improvements			
	Pre-Event Pk Hr		Post-Event Pk Hr		Pre-Event Pk Hr		Post-Event Pk Hr	
	Vehicles Served	% Demand Served	Vehicles Served	% Demand Served	Vehicles Served	% Demand Served	Vehicles Served	% Demand Served
Mercer St/ 1st Ave N	1,127	52%	721	57%	1,635	75%	961	95%
Denny Way / 1st Ave N	2,507	69%	1,490	99%	2,865	85%	981	98%
Denny Way/Broad St	2,442	67%	1,650	91%	3,023	83%	1,645	94%
Mercer St/5th Ave N	-	-	1,977	53%	-	-	2,359	82%

Notes:

- *Percent demand served is the ratio of the number of vehicles that passed through the entire during the modeled peak hour versus the total demand estimated to pass through the intersection. In the central part of large networks like this, when percent demand served reaches 85% to 90%, the conclusion is that most of the travel demand is able to be accommodated.*

Source: Fehr & Peers, 2018.

Table B-4: Maximum Vehicle Queues – 2020 Average Seattle Center Weekday Conditions

Intersection	Movement	Plus Project Conditions with AAMP and Physical Improvements			
		Pre-Event Peak Hour		Post-Event Peak Hour	
		Maximum Queue (ft)	Spills into Upstream Intersection?	Maximum Queue (ft)	Spills into Upstream Intersection?
Mercer St/Queen Anne Ave N	EB TH	325	Yes	150	No
	SB TH	375	Yes	275	Yes
	WB LT	250	Yes	150	No
	WB TH	250	Yes	175	No
Mercer St/ 1st Ave N	NB LT	525	Yes	200	No
	NB TH/RT	525	Yes	225	No
	EB TH	325	Yes	225	No
	WB TH	225	No	225	No
Mercer St/5th Ave N	EB TH	300	Yes	300	Yes
	WB LT	350	Yes	275	Yes
	WB TH	350	Yes	275	Yes
	NB RT	475	Yes	325	Yes
	SB TH	300	Yes	350	Yes
Mercer St/Dexter Ave N	EB LT	500	Yes	475	Yes
	EB TH	500	Yes	475	Yes
	NB TH	475	Yes	450	Yes
	SB TH	350	Yes	375	Yes
	SB RT	350	Yes	375	Yes
	WB LT	650	Yes	500	Yes
	WB TH	650	Yes	500	Yes
Denny Way/Queen Anne Ave N/Western Ave	WB TH	225	No	125	No
	EB TH	850	Yes	150	No
	NB TH	425	Yes	200	No
	SB LT	425	Yes	150	No

Table B-4: Maximum Vehicle Queues – 2020 Average Seattle Center Weekday Conditions

Intersection	Movement	Plus Project Conditions with AAMP and Physical Improvements			
		Pre-Event Peak Hour		Post-Event Peak Hour	
		Maximum Queue (ft)	Spills into Upstream Intersection?	Maximum Queue (ft)	Spills into Upstream Intersection?
Denny Way/1st Ave N	SB RT	425	Yes	150	No
	EB TH	525	Yes	225	Yes
	WB TH	300	Yes	150	No
	NB TH	775	Yes	50	No
Denny Way/2 nd Ave N	SB TH	125	Yes	400	Yes
	EB TH	400	Yes	200	No
	WB TH	425	Yes	150	No
Denny Way/5 th Ave N	NB TH	225	No	250	Yes
	SB LT	400	Yes	475	Yes
	EB TH	375	Yes	150	No
	WB TH	325	Yes	250	Yes
5 th Ave N/Harrison St	NB TH	500	Yes	450	Yes
	SB TH	475	Yes	475	Yes
	EB LT/TH/RT	275	Yes	225	Yes
	WB LT/TH/RT	525	Yes	625	Yes
1 st Ave N/John St	NB TH	525	Yes	100	No

Notes:

- Maximum vehicle queues are 'per lane' and rounded up to the nearest 25 feet.
- In some instances, through traffic blocks access to turn lane. In these instances, left- and right-turn lane maximum queues represent vehicles queued in the through lanes.
- Maximum queues reported for specific movements at particularly critical intersections in Arena vicinity.

Source: Fehr & Peers, 2018.

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