



Federal Transit  
Administration

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Madison Street Corridor Bus Rapid Transit (BRT)

# Cumulative Impacts Technical Memorandum

Prepared for

**Seattle Department of Transportation  
Federal Transit Administration**

Lead Author

**Environmental Science Associates**

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# 1 Introduction

A cumulative impact is an impact on the environment that “results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7). The analysis provides the context in which the project’s direct effects are occurring, and shows the environmental implications of the interactions of the project with known and expected management activities. Cumulative impacts are discussed below in proportion to their significance. The assessment of cumulative impacts provided below considers past, present, and reasonably foreseeable future actions in the vicinity of the project area. It concludes that the project, in combination with these other past, present, and reasonably foreseeable future actions, would not contribute to adverse cumulative effects.

## 2 Project Description

The City of Seattle’s Department of Transportation (SDOT) proposes to provide new Bus Rapid Transit (BRT) service on Madison Street between 1<sup>st</sup> Avenue and Martin Luther King, Jr. Way East (MLK Jr. Way E.), Spring Street between 1<sup>st</sup> Avenue and 9<sup>th</sup> Avenue, and 1<sup>st</sup> Avenue and 9<sup>th</sup> Avenue between Madison Street and Spring Street as part of the Madison Street Corridor Bus Rapid Transit (Madison BRT) Project (Figures 1 and 2).

The Madison BRT Project is located in a dense and rapidly developing area that includes portions of Madison Valley, the Central District, Capitol Hill, First Hill, and Downtown Seattle. These areas are among the densest residential neighborhoods in the City and are sizable employment centers due to the presence of two major medical centers and Seattle University. Providing BRT service along this 2.4-mile corridor is identified in the Seattle Transit Master Plan and listed as a near-term action in the 2016 Move Seattle Strategic Vision. This project would improve transit capacity, travel time, reliability, and connectivity in an area that is highly urbanized and has a lower rate of automobile ownership than other parts of the city.

The Madison BRT Project would connect with dozens of bus routes, the Center City Connector Streetcar, the South Lake Union Street Car, and First Hill Streetcar, and would improve access to ferry service at the Colman Dock Ferry Terminal, First Hill medical institutions and housing, Seattle University, and Link light rail. As part of the project, pedestrian and bicycle access along the corridor would also be improved and enhancements would be made to the streetscape and public realm to increase comfort, visibility, and legibility in the Madison Street corridor.

Construction would start in 2018 and conclude in the fall of 2019.

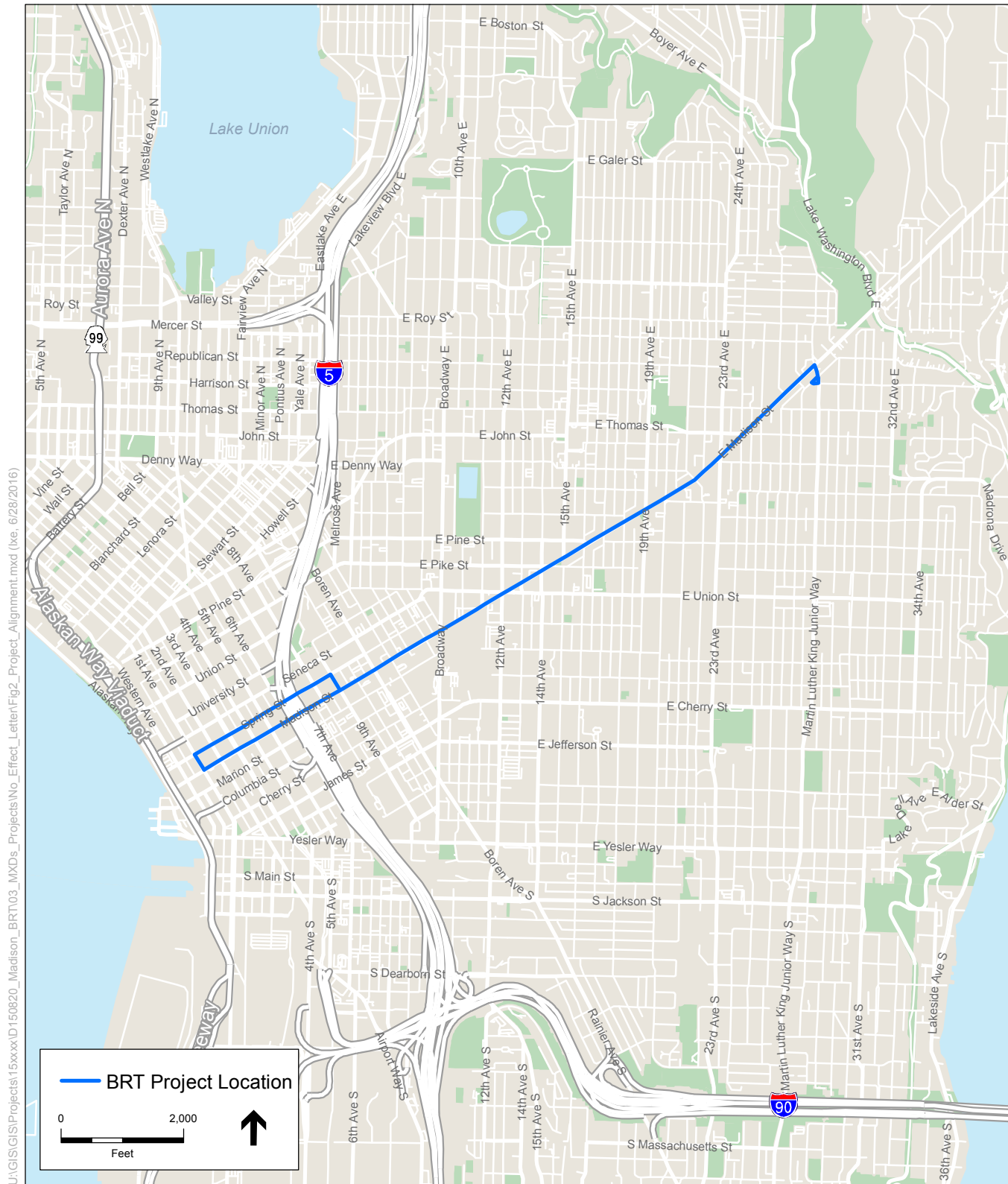
### 2.1 Description of Proposed Work

The Project would create a new BRT line along the Madison Street corridor. It would include approximately 11 BRT station areas with 21 directional platforms along the project corridor, new Transit Only Lanes (TOLs) and Business Access & Transit (BAT) lanes, pedestrian and bicycle improvements, and signal and utility upgrades along the corridor. The Madison BRT Project would replace portions of the King County Metro Route 12 where they would otherwise overlap. Metro anticipates they will revise Route 12 to compliment the BRT and continue to serve the east Capitol Hill areas as it currently does.



SOURCE:  
 Wa. Dept. of Ecology 2016; ESA 2016; OSM 2015.

SDOT Madison BRT Design . 150820  
**Figure 1**  
 Project Vicinity



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SOURCE:  
 Wa. Dept. of Ecology 2016; ESA 2016; OSM 2015.

SDOT Madison BRT Design . 150820  
**Figure 2**  
 Project Alignment

For the Madison BRT Project, 1.98 miles of new TOLs would be provided. TOLs would also be provided throughout the corridor to ensure adequate transit flow. This would include TOLs being placed in front of transit stops, to keep them from being blocked, and on 9<sup>th</sup> Avenue to ensure buses can easily make the transition from Spring Street to Madison Street. Approximately 0.82 mile of BAT lanes would be provided under the project.

The Madison BRT Project would use nine new buses, seven of which would be on the road at any one time. The buses would be 60-foot articulated low-floor vehicles with three doors on the right side and two on the left. The BRT would operate Monday through Saturday from 5 a.m. to 11 p.m. and on Sundays and holidays from 6 a.m. to 11 p.m. They would run every six minutes between 6 a.m. and 7 p.m. on weekdays and every 15 minutes during all other hours of operation.

### **Parking**

Bus lanes must be at least 10.5 feet, and preferably 12 feet wide, according to American Public Transportation Association (APTA) standards (APTA, 2010). Many of the existing rights-of-way within the corridor would not allow for the addition of a new 10.5-foot-wide bus lane without the removal of on-street parking. The Madison BRT Project would remove 222 on-street parking spaces within the corridor, 10 of which would be passenger or delivery loading spaces, 113 would be street parking spaces, and 99 would be spaces that are restricted (currently allowing parking during non-peak hours only).

### **Paving**

Approximately 10 acres of roadway and sidewalk pavement would be replaced under the project. The TOL pavement would be replaced with Portland cement concrete pavement (PCCP) to increase the life of the BRT travel lanes.

### **Alterations to Existing Street Corridor**

According to APTA standards, bus lanes must be at least 10.5 feet wide (APTA, 2010). Many of the existing rights-of-way within the corridor would not allow for the addition of a new 10.5-foot-wide bus lane without the narrowing of other existing lanes. In certain sections of the roadway, existing general purpose lanes may need to be converted for BRT use. A list of the changes to the existing street corridor is provided below:

- Roadway curb widening on seven blocks of Madison Street;
- Full depth PCCP roadway restoration under proposed BRT travel lanes corridor wide;
- Sidewalk restoration and repairs impacting approximately 75 block faces;
- Storm water detention system construction underneath Madison Street (up to 72" detention pipe diameter);
- Corridor wide roadway restriping;
- Remove north/south crossing of Madison Street via Terry Avenue; and
- Remove left turn lanes on Madison Street to Minor Avenue, Summit Avenue, and Boylston Avenue.

### **Pedestrian and Bicycle Improvements**

Where the project is impacting the existing sidewalks along the corridor, repairs or replacements would be completed to restore them to ADA standards. Corner bulb-out sidewalk extensions would be provided at a number of locations, which reduce street crossing distance and increase visibility of pedestrians. In a few areas, sidewalks would be narrowed slightly to

accommodate left turn lanes. Existing Protected Bicycle Lanes (PBLs) would remain as well as new ones created.

Additional crosswalk and bicycle crossings would be provided at the intersection of 12<sup>th</sup> Avenue and Union Street, in accordance with the Seattle Bicycle Master Plan. A short segment of bicycle lane would be striped through the intersection of 24<sup>th</sup> Avenue and John Street and improvements to the sidewalk on Madison Street west of the intersection would be included in the project in order to facilitate through movements on the 24<sup>th</sup> Avenue greenway.

### **Utility Relocations**

Utilities are anticipated to be relocated where the roadway would be widened to accommodate BRT bus lanes and stations. There are approximately eight blocks that are proposed for widening. Utilities that would be relocated include roadway lighting, overhead contact systems, signals, storm drainage, overhead and underground power, and overhead and underground telecommunications. There are conflicts with proposed bus station amenities and existing utility systems that would require utility modifications and relocations.

## **3 Past, Present, and Reasonably Foreseeable Future Actions**

This cumulative impact assessment follows the approach recommended by the President's Council on Environmental Quality in *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ, 1997). For this assessment past, present, and reasonably foreseeable actions were considered. Past actions include continuing trends in urbanized development patterns up to the present; present actions are those projects by local, state, or federal agencies just completed or under construction; and reasonably foreseeable future actions are those that have obtained local, state, or federal government approval and thus could be under construction at any time between the present through 2019 (when the Madison BRT Project is complete).

Impacts from past actions include the transformation of the Madison Street corridor from a dense forest with steep terrain (20-30% grades) to a less steep transportation corridor flanked by a mixture of hospitals, clinics, retail businesses, churches, and residences. Present actions include the current trend of densification of mixed-use buildings and neighborhoods. There are office, retail, and residential developments in the project area that also include the supporting upgrades in infrastructure such as recent utility upgrades, and transportation and transit improvements.

Reasonably foreseeable future actions (RFFAs) are actions that are considered likely to occur because they have been funded, approved, or are under consideration for regulatory permitting; the subject of an environmental review process under NEPA or SEPA; or part of an officially adopted planning document or publicly available development plan.

For the project to incur a cumulative impact it must cause an incremental impact that could not be avoided, minimized, or mitigated. This chapter only addresses impacts of past and present developments and reasonably foreseeable future actions that could interact with the Madison BRT Project. These projects were identified by searching City of Seattle webpages that list current projects and permitting requests.

A number of substantial capital projects could overlap with the construction of the Madison Street BRT Project. These include the waterfront, roadway, transit, and improvement projects listed in Table 1. In addition, there are approximately 1,250 open permits with the City of Seattle within a 0.25-mile radius of the project corridor (City of Seattle, 2016).

**Table 1 Substantial Capital Projects the Could Produce Cumulative Effects**

Project Name	Description	Construction Timing*
<b>Waterfront Projects</b>		
Terminal 46 Dock Rehabilitation, Crane Rail Extension and paving	Repairs container berth pile caps and deck panels, and repairs terminal apron and container yard and extend dock crane rail to allow an additional 100-foot gauge crane.	2015 – 2020
Railroad Way	Pedestrian gateway linking the waterfront to Pioneer Square and the stadiums	2017 – 2020
Main + Washington streets	Improvements to these streets in Pioneer Square between Alaskan Way and Occidental Avenue	Construction complete in 2018
Alaskan Way + Elliott Way	Rebuild to serve all modes of travel	Begin construction in 2019
Cycle Track	Two-way bike path located between the roadway and the promenade	Begin construction in 2019
Elliott Bay Seawall	Replaces seawall along Seattle's waterfront to protect critical infrastructure and utilities while enhancing the habitat through this area. Phase 1 would rebuild the seawall from Yesler Way to Virginia Street. Phase 2 would rebuild the seawall from Virginia St to Broad St and could restore Alaska Way to four lanes until Alaskan Way.	Construction of Phase 1 would occur in 2017 or later; Construction of Phase 2 would occur in 2022 or later; Construction timing of Madison Street to Yesler Way would occur in mid-2016.
Columbia Street	Improved sidewalks and transit corridor amenities will be added in place of the viaduct ramp to 1 <sup>st</sup> Avenue	Construction complete in 2019
Marion Street Bridge	Widen Marion Street pedestrian bridge between Alaskan Way and Western Avenue	Begin construction in 2019
Promenade	A landscaped promenade along the waterfront from Pine Street to Pioneer Square	2018 - 2022
Seneca Street	Removal of the Seneca Street viaduct ramp to 1 <sup>st</sup> Avenue and basic improvements	Begin construction in 2019
Waterfront Park	Redesigned	2019 - 2021
Union Street	Improvements between Alaskan Way and Western Avenue, including a new elevator and staircase.	Pier replacement is scheduled for 2019-20121; schedule is unknown for the remainder of work
Pike + Pine corridor	Pedestrian Improvements	Unknown
Pike Place Market's MarketFront	A waterfront-facing expansion of the Market featuring more small businesses, farmers, senior housing, public art, and a new neighborhood center.	2016 – 2018

Overlook Walk	Connection between Pike Place Market and the waterfront that takes pedestrians over the new Alaskan Way.	2018 - 2022
Seattle Aquarium expansion	Additions to create new exhibition, education and event space.	2021 - 2022
Pier 62/63 + Floating Dock	Major improvements to Pier 62/63, including adding a floating dock, are in a future phase of the waterfront projects.	2017 - 2020
Bell Street Park extension	Extension of the Bell Street Park between 1 <sup>st</sup> Avenue and Elliott Avenue.	Begin Construction in 2020
<b>Alaskan Way Viaduct Replacement Program</b>		
SR 99 Tunnel	A two-mile-long tunnel beneath downtown Seattle.	Portions complete in 2017. Tunnel expected to open in 2019. Others still to be determined.
New Highway	A mile-long stretch of new highway that connects to the south entrance of the tunnel, near Seattle's stadiums.	
New Overpass	A new overpass at the south end of downtown that allows traffic to bypass train blockages near Seattle's busiest port terminal.	
Demolition of Existing Viaduct	Demolition of the viaduct's downtown waterfront section.	
New Alaskan Way	A new Alaskan Way surface street along the waterfront that connects SR 99 to downtown.	
Battery Street Portal Site	Redevelopment of the Battery Street site	
<b>Other Transportation Improvement Projects</b>		
Multimodal Terminal at Colman Dock	Replaces the aging and seismically vulnerable components of Colman Dock.	2017 – 2023
Center City Connector	A new segment of Seattle's streetcar system linking South Lake Union and First Hill Streetcar line.	2018
23 <sup>rd</sup> Ave Corridor - Phase 1	Rebuilds the section of 23 <sup>rd</sup> Ave from four lanes to three wider lanes, with one lane as a two-way center turn lane. It also includes utility upgrades and sidewalk improvements.	Early 2017
<b>Other</b>		
Cayton Corner Park	Adds a public green space to the busy Madison corridor.	2018
New Office Tower	SW corner of 5th & Madison 37-story office tower	Complete in September 2016

\* Information on construction timing is based on schedules made available to the public by the sponsoring agencies. Some of these dates may change.



## 4 Cumulative Effects

The following sections discuss potential construction and operational cumulative impacts when the Madison BRT Project effects are combined with those of the RFFAs.

### 4.1 Construction Impacts

The City of Seattle is experiencing a construction boom. This, coupled with the construction of several projects listed in Table 1, could result in overlap with the Madison BRT Project. Cumulative and indirect effects from combined projects generally include increased transportation impacts, including additional delays in travel time and temporary detours, additional noise and vibration, and release of air pollutants. These cumulative impacts would be addressed through coordination with other project proponents, use of construction best management practices (BMPs), adherence to City codes and permits, and use of a traffic control plan. Therefore, cumulative construction impacts are not expected to be significant.

The Station construction period for the entire Madison BRT Project is anticipated to last from 2018 to the fall of 2019, with construction at any one location likely to last approximately one month. Station phases/work will include: utility work (if present), site/civil work for the station platform and sidewalk, road way work, OCS poles, installing the above ground station amenities (shelter, wind screens, railing, etc.), electrical wiring, and landscaping. If necessary, some parts of construction may be completed at night and on weekends to minimize potential traffic impacts. Pedestrian access around the stations will be maintained throughout the project.

The final project design will take into consideration existing utilities and infrastructure when determining the final location of new transit facilities to minimize potential conflicts. SDOT will continue to work with the local utility providers, public agencies, and property owners to avoid/minimize potential disruptions and to coordinate construction with any other planned projects in the vicinity of the proposed work. All Madison BRT Project work will be scheduled to minimize local impacts to the extent practical.

No cumulative or indirect impacts are anticipated from construction of the Madison BRT Project.

### 4.2 Operational Impacts

#### Transportation

The traffic analysis for the Madison BRT Project examined the roadway network within the Madison Street corridor, all bisecting roadways, and roadways within the immediate vicinity that could reasonably be effected by the infrastructure and operational changes proposed as part of the project. For example, the analysis took into consideration those roads where diversion traffic may spill over.

Although there are no reasonably foreseeable projects proposed to increase roadway capacity, cumulative effects on transportation over the long term would be anticipated to be neutral, and possibly beneficial, as the transportation networks operate more safely and efficiently. With the implementation of transit projects such as the Madison BRT, Center City Connector, Sound Transit Light Rail and others, the public's use of mass transit is expected to increase, thus lessening the pressure on the general purpose roadway network.

Collectively, the RFFAs and the Madison BRT Project are removing parking and eliminating some general purpose travel lanes in downtown Seattle. To address the cumulative effects of

multiple changes to the roadway network and transit systems and improve regional connections in downtown Seattle, SDOT is jointly developing a Center City Mobility plan with King County, Sound Transit, and the Downtown Seattle Association. The plan will establish a transportation vision for 2035 and create a near-term transit operations and transportation management plan by mid-2016, along with a public realm plan for enhancing the right-of-way to better serve residents, employees, shoppers, and visitors. SDOT is also working on a Center City parking strategy to manage parking throughout the downtown area.

### **Air Quality and Greenhouse Gas**

Many of the transit improvement and roadway RFFAs are enhancing transit or non-motorized transportation which reduces GHGs and other pollutants. The operation of the Madison BRT Project in combination with other RFFAs (Link Extension, Center City Connector, Third Avenue improvements, and implementation of the Bicycle Master Plan) would result in long-term cumulative benefit in air quality and reduced GHG emissions through the increased use of transit and the transition from petroleum-fueled transit fleets to electric vehicles.

### **Environmental Justice, Social and Community**

The Madison BRT Project, together with many of the other RFFAs, would improve convenient, reliable, and frequent transit service in the project vicinity and would improve connections to other areas of the city and would connect social services. This would result in better access to community facilities, employment, and education within and outside of the study area. Increased transit access would also result in improved quality of life for persons working and living in the study area, especially those who do not own an automobile. Together with implementation of the Bicycle Master Plan and Pedestrian Master Plan projects, it would also make the study area more pedestrian and bicycle friendly by including improvements to sidewalks, curb ramps, landscaping, and bicycle facilities. In addition, the project would upgrade crosswalks to meet ADA guidelines.

### **Other Effects**

Other areas of the environment were analyzed for potential cumulative and indirect impacts from the proposed project such as Land Use, Hazardous Materials, Cultural Resources, Biological resources, Visual Quality, and Energy. The project is consistent with local and regional plans and policies. Many of these plans include goals and policies to improve transit accessibility and support greater densities and mixtures of land uses. The Madison BRT Project would provide convenient, reliable, and frequent transit service that connects the neighborhoods in the study area with the neighborhoods around the city through connections with dozens of bus routes, Link light rail, the Center City Streetcar, the First Hill Streetcar, and the Colman Dock Ferry Terminal. No long-term cumulative effects were identified.

## **5 Mitigation Measures for Cumulative Effects**

During operation, the Madison BRT Project would result in predominantly beneficial effects and would not require mitigation measures. SDOT acknowledges that implementation of the Madison BRT project will degrade operation for general purpose traffic at some intersections along the corridor. The project goal is to improve transit capacity, reliability, and connectivity since transit is the mode which carries the majority of people through the corridor. SDOT will continue to look into opportunities to improve operations at these locations through additional analysis and design workshops. Measures such as updating traffic counts, additional signal coordination, revisions to traffic signal phasing, relocating pedestrian and bicycle crossings, and improvements to other modes will be analyzed as potential mitigation.

SDOT will continue to look for opportunities to create new parking and loading areas as the Madison BRT Project design progresses. SDOT will continue to coordinate with the business and property owners along the corridor that would be directly affected by parking removal. If necessary, SDOT will relocate property access points to side streets in order to maintain loading and unloading areas and access points. SDOT is also working on a Center City parking strategy to manage parking throughout the downtown area.

When combined with the RFFAs, the project does have the potential to contribute to the cumulative impacts during construction. In this case, mitigation measures for the project would substantially reduce potential impacts to less than significant. The following measures to minimize harm would be added when collaborating with other project construction planning efforts for impacts related to the Madison BRT Project:

- Utilize BMPs to reduce air quality and noise impacts;
- Comply with all applicable noise regulations;
- Stagger projects and construction staging to maintain continued access, and provide directional signage that clearly directs visitors to businesses in the study area;
- Coordinate with simultaneous construction projects to shield staging areas, stagger construction periods when possible, and provide distractions in the form of community art or learning opportunities;
- Coordinate with service providers on circulation as it relates to emergency service routes and confirm that adequate accessibility can be maintained throughout construction; and
- Coordinate two-way communication between collective construction projects and businesses on construction schedules, changes, and potential detour routes, and provide regularly scheduled construction updates.

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