

**APPENDIX G**  
**PARKING DISCIPLINE REPORT**

# First Hill Streetcar

## Parking Discipline Report

### 1 Introduction

This report describes the potential effects of the proposed First Hill Streetcar project on curb use, with an emphasis on the potential effects to on-street parking. In most locations, the streetcar will share a travel lane with general purpose vehicles. However, various roadway configuration changes are proposed for the project in order to achieve a balance of competing uses of the right-of-way for all modes of travel, parking and loading, and utilities. The City of Seattle strives to balance the diverse and competing needs for curb space, and considers the adjacent land uses both in terms of each specific block as well as the larger surrounding area. In general, the City's priorities (as presented in the Comprehensive Plan and other similar documents) do not support the use of on-street parking for long-term commuters. The City regulates the use of curb space to address competing needs, to assist in moving people and goods more efficiently, to support the vitality of business districts, and to create liveable neighborhoods. The First Hill Streetcar will operate primarily in mixed use commercial and residential districts, where the City prioritizes curb space as follows:

1. Transit use
2. Passenger and commercial vehicle loading zones
3. Short-term customer parking
4. Parking for shared (carpool) vehicles
5. Vehicular capacity

The potential effects on curb use and parking are analyzed in the context of these priorities.

### 2 Project Description

The City of Seattle, through a funding and cooperative agreement with Sound Transit, proposes to construct a new streetcar line to serve the Capitol Hill, First Hill, Central District, Chinatown/International District, and Pioneer Square areas in Seattle. This line would connect the First Hill employment/activity center to both the regional transit system and intercity passenger rail, provide local transit service, accommodate economic development, and contribute to neighborhood vitality. The system is expected to operate for 20 hours per day (approximately 5 am to 1 am), with ten minutes between streetcar arrivals during the peak hours and 15 minutes between arrivals during off-peak hours.

#### 2.1 Track Alignment and Roadway Configuration

The proposed track alignment and roadway configuration allows for mixed-flow operations of the streetcar and a balance of competing uses of the right-of-way for all modes of travel, parking and loading, and utilities.

A continuous, two-way separated bicycle facility (or “cycle track”) is proposed on the east side of Broadway, south of E Denny Way to address potential effects of streetcar tracks on bicycle travel, while also minimizing impacts to utilities. A two-lane roadway section with parking on both sides of the street is proposed along Broadway between E Howell Street and E Pine Street, and between E Spruce Street and E Yesler Way, and a three-lane section is proposed from E Pine Street to E Spruce Street. Parking or loading would be provided on one side of the street in the three-lane sections and on both sides of the street in the two lane sections. Additional right-turn pocket lanes would be provided at the southbound approaches to E Pine Street and E James Way.

On E Yesler Way from Broadway to 14th Avenue S, a two-lane section with periodic turn lanes would be provided (right turn onto Broadway and left turn onto 12th Avenue S). Bike lanes would be routed behind side platforms, and parking would be prohibited.

On 14th Avenue S, the existing two-lane section would be maintained, but the southbound lane would be converted to streetcar-only operations. The existing northbound bike lane would be maintained and routed behind the northbound side platform. Parking would be restricted on the west side of the street, and angled back-in parking would be added on the east side of the street between S Jackson and S Washington Streets.

On S Jackson Street, the streetcar tracks would be located in the left lanes of a five-lane roadway section between Rainier Avenue S and 8th Avenue S. Between 5th Avenue S and 8th Avenue S, a three-lane section is proposed. The streetcar tracks would be located in the left lane of two westbound lanes, and in the eastbound lane. On-street parking and loading would be maintained on both sides of the east of 6th Avenue S.

Several options are proposed for the track, roadway and stop platform configuration west of 6th Avenue S. Options 1A (“King Stub”) and 1B (“Main Stub”) feature a center stop platform east of 5th Avenue S and an exclusive streetcar lane extending from west of 5th Avenue S to a terminal platform on 2nd Avenue S, at either S King Street (1A) or S Main St (1B). Options 1A and 1B feature a five-lane section with the exclusive, bi-directional streetcar lane and two westbound and two eastbound general purpose lanes between 4th Avenue S and 5th Avenue S. Between 4th Avenue S and 2nd Avenue S, a three-lane roadway section (two westbound lanes and one eastbound lane) with a streetcar-only lane is proposed.

Options 2A (“King Stub”) and 2B (“Main Stub”) feature a center platform stop located between 4th and 5th Avenues S, widening the roadway in this block by realigning the curbs on both sides of the street, and adding a dedicated right-turn only lane to 4th Avenue S in the westbound direction. West of 4th Avenue S, Options 2A and 2B would be the same as Options 1A and 1B.

Option 3 (“Main Loop”) is a terminal loop, with an inbound center stop platform on S Jackson Street west of 5th Avenue S. From 5th Avenue S to 2nd Avenue S on S Jackson Street, the streetcar tracks are located in the left westbound lane. There would be an exclusive trackway and a platform on 2nd Avenue S between S Jackson Street and S Main Street. There would be a mixed-flow alignment eastbound on S Main Street and southbound on 5th Avenue S to S Jackson Street, with an outbound platform north of S Jackson Street.

### **3 Methodology**

This section describes the study methodology for determining parking impacts. It describes the parking/loading inventory, route segments analyzed as parking/loading districts, the types of curb use covered, assumptions about how the proposed streetcar alignment would affect the parking, and loading uses of curb space.

### **3.1 Parking Inventory**

URS conducted a parking inventory by identifying the existing curb use on each side of the street for each block proposed to have streetcar tracks. Types of curb use were identified by signs and curb striping. The initial parking inventory was made using publicly available online aerial and eye-level imagery. This information was supplemented by a field visit on May 26, 2010 to gather details where signs and curbs were not visible and to verify the curb uses apparent in the online imagery.

Non-delineated parking areas are those where individual spaces are not marked. In these areas, it is up to the driver how close to park to the vehicles already present, so the capacity of non-delineated areas can vary. In most cases, the number of “spaces” in a non-delineated area was estimated by counting the number of cars already parked there. However, the capacity was difficult to estimate visually for non-delineated areas where few vehicles were parked. To estimate capacity of these areas, an average amount of space occupied per parked vehicle was estimated by measuring the parking density of other non-delineated areas that were completely full of parked vehicles, and that average density (20 feet per car) was applied to the linear measurement of non-full, non-delineated areas.

No field data about parking occupancy (utilization) were collected for this analysis. However, recent parking studies conducted for Seattle Department of Transportation (SDOT) in the First Hill (July 2009), Pike/Pine (September 2008), and Capitol Hill (August 2009) neighborhoods provide parking utilization data for some of the affected neighborhood districts.

### **3.2 Analysis Areas—Neighborhood Parking Districts**

The report identifies several analysis areas along the proposed streetcar route. These analysis areas reflect neighborhood parking districts that have a supply of on-street parking and loading spaces serving a common set of destinations:

1. Pioneer Square (west of 5th Avenue S & S Jackson Street)
2. S Jackson Street, 5th Avenue S to 10th Avenue S
3. S Jackson Street, 10th Avenue S to 14th Avenue S/Rainier Avenue S
4. 14th Avenue S/Rainier Avenue S to E Yesler Way/Boren Avenue
5. E Yesler Way, Boren Avenue to Broadway
6. Broadway, E Yesler Way to Boren Avenue
7. Broadway, Boren Avenue to E Madison Street
8. Broadway, E Madison Street to E Pine Street
9. Broadway, E Pine Street to E Denny Way

### 3.3 Types of Curb Use

The following types of curb use were documented during the parking inventory process:

- **Travel Lane:** No parking or stopping permitted.
- **Metered Parking:** Includes both traditional cash-metered spaces and those that use the more modern “pay-station” method, where a small window sticker is issued, indicating the time parking is allowed.
  - i. 2-hour
  - ii. 30-minute
  - iii. Motorcycle (2-hour, but specifically signed and striped for cycle use)
- **Free Parking**
  - i. Unrestricted
  - ii. 2-hour
  - iii. 1-hour
- **Passenger Loading Zone:** Signed with black letters on white background, accompanied by white curb striping, intended for very short-term parking while loading or unloading passengers (driver usually stays with the vehicle).
- **Truck Loading Zone:** Signed with black letters on a yellow background, accompanied by yellow curb striping and sometimes also metered, intended for very short-term parking while loading or unloading vehicles specifically designated as trucks.
- **Other Restricted:** Signed to allow only a specific type of vehicle, such as police, fire, ambulance, taxi, or other specially-marked vehicles.
- **Bus Stop:** Signed at the forward end with a yellow and white Metro bus sign and usually accompanied by alternating yellow and red curb striping. Two types of bus stops were examined for this study to determine the number of pullout stops that would be converted to inline stops.
  - i. “Inline” stops are located in travel lanes and buses block traffic in that lane while dwelling at the stop.
  - ii. “Pullout” stops are located in a non-travel lane and buses do not block traffic, but must wait for a gap in traffic to proceed after dwelling.
- **Bus Layover Area:** Signed with black letters on white background as “Metro Transit Vehicles Only 24 Hours,” accompanied by white curb striping. These are indicated as “other restricted” spaces in the inventory/impact matrices, and are for the use of Metro buses waiting to start a revenue trip.

### 3.4 Assumptions

Where and how to allow and restrict parking is the decision of the City of Seattle, and it can change at any time. Where the changes associated with the proposed streetcar would reduce the number of parking spaces on a block face, this analysis is consistent with SDOT policy in the assumption that curb uses are prioritized as follows:

#### Residential Areas

1. Transit use (bus stops and spaces for bus layover)
2. Passenger and commercial vehicle loading zones
3. Parking for local residents and for shared vehicles
4. Vehicular capacity

#### Business/Commercial and Mixed-Use Areas

1. Transit use (bus stops and spaces for bus layover)
2. Passenger and commercial vehicle loading zones
3. Short-term customer parking (time limit signs and paid parking typically for 1 or 2 hours)
4. Parking for shared vehicles
5. Vehicular capacity

As such, when a reduction in spaces is required on a block that contains more than one type of parking space, the analysis incorporates an assumption that the 2-hour and unlimited spaces are reduced first. Where parking would remain unaffected by the proposed project, this analysis assumes that the number and type of spaces on that block would remain the same as today.

## 4 Affected Environment

The affected environment is the curb space currently designated for on-street parking along the proposed streetcar alignment, together with other curb space designated for parking on adjacent and perpendicular streets in proximity to the streetcar alignment. Table 1 presents the existing curb space inventory along the proposed streetcar alignment.

The inventory of curb use indicated a total of 547 spaces along the entire potential streetcar alignment in the 39-block study area. However, the three terminus options in the Pioneer Square Area differ in terms of which blocks they would affect—no single terminus option would use every block included in the inventory. Table 2 summarizes the existing curb space inventory by terminus option.

**Table 1 – Existing Curb Space Inventory**

Street	From	To	Metered			Free			Load		Other Restricted
			2hr	30m	Motor-cycle	2hr	1hr	Any	Psgr	Truck	
2nd Ave. *	King St.	Jackson St.	20						2		
2nd Ave. *	Jackson St.	Main St.	13						1		4**
Main St.*	2nd Ave.	3rd Ave.	5		1						1***
Main St.*	3rd Ave.	4th Ave.								2	11**
Main St.*	4th Ave.	5th Ave.	4						1		
5th Ave. *	Main St.	Jackson St.									1***
Jackson St.	2nd Ave.	3rd Ave.									
Jackson St.	3rd Ave.	2nd Ave. Ext.									
Jackson St.	2nd Ave. Ext.	4th Ave.									
Jackson St.	4th Ave.	5th Ave.									
Jackson St.	5th Ave.	6th Ave.	12		1						
Jackson St.	6th Ave.	Maynard Ave.	14								
Jackson St.	Maynard Ave.	7th Ave.	6	2					1	1	
Jackson St.	7th Ave.	8th Ave.	9								
Jackson St.	8th Ave.	10th Ave.				14				2	
Jackson St.	10th Ave.	12th Ave.				12				4	
Jackson St.	12th Ave.	14th Ave.				13	15			1	
14th Ave.	Jackson St.	Main St.				13				2	
14th Ave.	Main St.	Washington						20			
14th Ave.	Washington	Yesler Way						20			
Yesler Way	14th Ave.	12th Ave.						31			
Yesler Way	12th Ave.	Boren Ave.									
Yesler Way	Boren Ave.	10th Ave.									
Yesler Way	10th Ave.	Broadway				9					
Broadway	Yesler Way	Fir St.				25				1	
Broadway	Fir St.	Spruce St.				7			1		
Broadway	Spruce St.	Alder/Boren				21			1		
Broadway	Alder/Boren	Terrace St.				7			1	1	
Broadway	Terrace St.	Jefferson St.				17			1		
Broadway	Jefferson St.	James St.				19				2	
Broadway	James St.	Cherry St.	4						1		
Broadway	Cherry St.	Columbia St.	6						6		
Broadway	Columbia St.	Marion St.	13						1		
Broadway	Marion St.	Madison St.	13								
Broadway	Madison St.	Union St.	33		1						
Broadway	Union St.	Pike St.	17								
Broadway	Pike St.	Pine St.	8	4						1	
Broadway	Pine St.	Howell St.	38	2					4		
Broadway	Howell St.	Denny Way	21	2							

Shaded Cells = curb lane is a travel lane

\* Segment not included in one or more terminus options

\*\* Fire Department Vehicles Only

\*\*\* Metro Bus Layover Only

**Table 2 – Existing Curb Space Inventory Summary by Terminus Option**

Alternative	Metered			Free			Load		Other Restricted	Total
	2hr	30m	Motor-cycle	2hr	1hr	Any	Psggr	Truck		
King Stub	214	10	2	157	15	71	19	15	0	<b>503</b>
Main Stub	207	10	2	157	15	71	18	15	4	<b>499</b>
Main Loop	216	10	3	157	15	71	19	17	17	<b>525</b>

## 5 Environmental Impacts

The City designates some curb spaces for on-street parking and loading to support the vitality of business districts and to create liveable neighborhoods. Impacts are measured by subtracting the number of parking spaces available after the proposed improvement from the number of parking spaces available today on those blocks affected by the streetcar.

Table 3 presents the changes in use of curb space for Analysis Areas 2 through 9, and Table 4 presents the changes in use of curb space for Analysis Area 1 (Analysis Area 1 is presented in a separate table because it has three terminus options for which comparisons may be useful). Table 5 presents the aggregate changes in use of curb space (the total for all segments, broken down by terminus option).

The three recent SDOT parking studies reviewed for this work indicate that while it varies widely from one block to the next, average utilization of on-street parking in the First Hill, Pike/Pine, and Capitol Hill neighborhoods is approximately 75%. This corresponds to the level of parking utilization SDOT considers to be the threshold at which additional parking management techniques may be necessary. As such, any potential reduction in physical space available is likely to increase utilization of existing parking spaces if no additional parking management measures are undertaken by SDOT. Utilization above 85% can result in delays and frustration for drivers searching for parking, as well as additional traffic congestion as drivers circulate looking or waiting for available parking.

Curb space changes would generally be the same for the short-term (2013) and long range (2030) time horizons.

Out of 23 existing pull-out bus stops, 10 are anticipated to be converted to inline stops.

**Table 3 – Changes in Use of Curb Space for Analysis Areas 2 through 9**

Alternative	Metered			Free			Load		Other Restricted	Total
	2hr	30m	Motorcycle	2hr	1hr	Any	Psg	Truck		
<b>Segment 2: Jackson, 5th to 10th</b>										
Existing	41	2	1	14	0	0	1	3	0	<b>62</b>
Proposed	21	2	0	14	0	0	1	2	0	<b>40</b>
Reduction	20	0	1	0	0	0	0	1	0	<b>22</b>
% Reduction	49%	-	100%	-	-	-	-	33%	-	<b>35%</b>
<b>Segment 3: Jackson, 10th to 14th/Rainier</b>										
Existing	0	0	0	25	15	0	0	5	0	<b>45</b>
Proposed	0	0	0	0	0	0	0	0	0	<b>0</b>
Reduction	0	0	0	25	15	0	0	5	0	<b>45</b>
% Reduction	-	-	-	100%	100%	-	-	100%	-	<b>100%</b>
<b>Segment 4: 14th/Rainier to Yesler/Boren</b>										
Existing	0	0	0	13	0	71	0	2	0	<b>86</b>
Proposed	0	0	0	13	0	14	0	1	0	<b>28</b>
Reduction	0	0	0	0	0	57	0	1	0	<b>58</b>
% Reduction	-	-	-	0%	-	80%	-	50%	-	<b>67%</b>
<b>Segment 5: Yesler, Boren to Broadway</b>										
Existing	0	0	0	9	0	0	0	0	0	<b>9</b>
Proposed	0	0	0	0	0	0	0	0	0	<b>0</b>
Reduction	0	0	0	9	0	0	0	0	0	<b>9</b>
% Reduction	-	-	-	100%	-	-	-	-	-	<b>100%</b>
<b>Segment 6: Broadway, Yesler to Boren</b>										
Existing	0	0	0	53	0	0	2	1	0	<b>56</b>
Proposed	0	0	0	35	0	0	2	1	0	<b>38</b>
Reduction	0	0	0	18	0	0	0	0	0	<b>18</b>
% Reduction	-	-	-	34%	-	-	0%	0%	-	<b>32%</b>
<b>Segment 7: Broadway, Boren to Madison</b>										
Existing	36	0	0	43	0	0	10	3	0	<b>92</b>
Proposed	17	0	0	24	0	0	8	1	0	<b>50</b>
Reduction	19	0	0	19	0	0	2	2	0	<b>42</b>
% Reduction	53%	-	-	44%	-	-	20%	67%	-	<b>46%</b>
<b>Segment 8: Broadway, Madison to Pine</b>										
Existing	58	4	1	0	0	0	0	1	0	<b>64</b>
Proposed	30	2	1	0	0	0	0	1	0	<b>34</b>
Reduction	28	2	0	0	0	0	0	0	0	<b>30</b>
% Reduction	48%	50%	0%	-	-	-	-	0%	-	<b>47%</b>
<b>Segment 9: Broadway, Pine to Denny</b>										
Existing	59	4	0	0	0	0	4	0	0	<b>67</b>
Proposed	38	2	0	0	0	0	4	0	0	<b>44</b>
Reduction	21	2	0	0	0	0	0	0	0	<b>23</b>
% Reduction	36%	50%	-	-	-	-	0%	-	-	<b>34%</b>

**Table 4 – Changes in Use of Curb Space for Analysis Area 1: Pioneer Square (west of 5th & Jackson)**

Alternative	Metered			Free			Load		Other Restricted	Total
	2hr	30m	Motor-cycle	2hr	1hr	Any	Psggr	Truck		
<b>King Street Stub Terminus Option</b>										
Existing	20	0	0	0	0	0	2	0	0	22
Proposed	0	0	0	0	0	0	0	0	0	0
Reduction	20	0	0	0	0	0	2	0	0	22
% Reduction	100%	-	-	-	-	-	100%	-	-	100%
<b>Main Street Stub Terminus Option</b>										
Existing	13	0	0	0	0	0	1	0	4	18
Proposed	0	0	0	0	0	0	0	0	0	0
Reduction	13	0	0	0	0	0	1	0	4	18
% Reduction	100%	-	-	-	-	-	100%	-	100%	100%
<b>Main Street Loop Terminus Option</b>										
Existing	22	0	1	0	0	0	1	3	17	44
Proposed	4	0	0	0	0	0	0	2	6	12
Reduction	18	0	1	0	0	0	1	1	11	32
% Reduction	82%	-	100%	-	-	-	100%	33%	65%	73%

**Table 5 – Aggregate Changes in Use of Curb Space (Total for All Segments by Terminus Option)**

Alternative	Metered			Free			Load		Other Restricted	Total
	2hr	30m	Motor-cycle	2hr	1hr	Any	Psggr	Truck		
<b>Proposed Project-Wide Parking &amp; Loading Spaces by Terminus Option</b>										
King Stub	106	6	1	86	0	14	15	6	0	234
Main Stub	106	6	1	86	0	14	15	6	0	234
Main Loop	110	6	1	86	0	14	15	8	6	246
<b>Net Project-Wide Reduction in Parking and Loading Spaces by Terminus Option</b>										
King Stub	108	4	1	71	15	57	4	9	0	269
Main Stub	101	4	1	71	15	57	3	9	4	265
Main Loop	106	4	2	71	15	57	3	10	11	279

## 6 Mitigation

The proposed changes in curb space are consistent with the City’s parking and curb space prioritization policies. Some analysis areas show a significant reduction in on-street parking available along the streetcar route (though there are no changes to the supply available on adjacent and perpendicular streets in the same areas). The project will provide enhanced access to these neighborhood districts, which will mitigate this impact on customer access to businesses. Additionally, for customer trips that would not be served by the streetcar, the project will mitigate the impacts on short-term parking through the following parking management measures:

- Installing parking wayfinding signage in affected neighborhood districts, as well as on-line parking maps and information consistent with the City’s E-Park program. This will include static wayfinding signs and may include real-time parking information signs with participating private parking garages. These measures will enhance ease of access to and utilization of off-street short-term parking for customers.

- Implementing on-street parking management measures in affected neighborhood districts, including increased use of time-limited and paid parking where high parking utilization ratios (approaching 85%) indicate that these measures would be effective in increasing the availability of short-term customer parking.