

# APPENDIX D: AUDIT METHODOLOGY



**Seattle**  
Department of  
Transportation

# FREE-FLOATING BIKE AUDIT METHODOLOGY- MONTHLY AND QUARTERLY

October 14, 2019

## AUDIT AREA DEFINITION METHODOLOGY

**Forming Audit Areas:** New Mobility staff have divided the city into 161 Audit Focus Areas. These areas are meant to be sections of the city that can be audited in roughly 3-5 hours. Staff began with existing census block groups, and either divided areas that were too large or combined areas that were too small to reasonably cover in 3-5 hours. Staff took slope, land use, and past bike share usage into consideration in making these judgements, and we plan to further refine this process in the future.

**Assigning Tiers:** Each audit area was assigned to a tier of 1-4, based upon 2018 bike share destination data. This was done by:

1. Beginning with the 2018 Trip Destination by Neighborhood report (January to September) and converting the trip end percent to trip end density (per acre).

2. Putting each neighborhood in 1 of 4 tiers based on the following:
  - a. Tier 1: Neighborhoods with more than 100 trip ends per acre (11 neighborhoods)
  - b. Tier 2: Neighborhoods with between 19 and 100 trip ends per acre (21 neighborhoods)
  - c. Tier 3: Neighborhoods with between 2 and 19 trip ends per acre (48 neighborhoods)
  - d. Tier 4: Neighborhoods with below 2 trip ends per acre (13 neighborhoods)
3. Assigning those same tiers to the corresponding Audit Area, using a spatial join in GIS, with a manual check to ensure that the Audit Area represented the tier it most overlaid.

**Sampling Method:** With each area having a tier assigned, we elected to perform the quarterly audits at the following rate:

- Tier 1: 6x per quarter
- Tier 2: 4x per quarter
- Tier 3: 2x per quarter
- Tier 4: 1x per quarter

The selected schedule is as follows:

1st Qtr. 2019		Neighborhood No.	Neighborhood Name
Tier 1			
		53.02A	UW Campus
		80.01	Belltown
		91-92	CID
Tier 2			
		31B	Sunset Hill
		96A	North Admiral
Tier 3			
		104.02	Mid-Beacon Hill
		42A	Windermere
Tier 4			
		-	
2nd Qtr. 2019		Neighborhood No.	Neighborhood Name
Tier 1			
	Apl	67A	Westlake
		72	South Lake Union
	May	47A	West Woodland
		48	Fremont
	Jun	49	Fremont
		81	Central Business District
Tier 2			
	Apl	60B	North Queen Anne
	May	61A	Portage Bay
		87	Minor
	Jun	97.01A	Alki
Tier 3			
	Apl		
	May		
	Jun	100.02	North Beacon Hill

		102A	Seward Park
Tier 4			
	Apl		
	May		
	Jun	117B	South Beacon Hill
3rd Qtr. 2019		Neighborhood No.	Neighborhood Name
Tier 1			
	Jul	47B	Adams
		70	Lower Queen Anne
	Aug	71	Lower Queen Anne
		73	South Lake Union
	Sep	80.01	Belltown
		91-92	CID
Tier 2			
	Jul	34	West Woodland
	Aug	50	Wallingford
		69	West Queen Anne
	Sep	85	Yesler Terrace
Tier 3			
	Jul	13	North College Park
	Aug	-	
	Sep	88	Mann
Tier 4			
	Jul	3	Haller Lake
	Aug	-	
	Sep	-	

4th Qtr. 2019		Neighborhood No.	Neighborhood Name
Tier 1			
	Oct	67A	Westlake
		72	South Lake Union
	Nov	47A	West Woodland
		48	Fremont
	Dec	49	Fremont
		81	Central Business District
Tier 2			
	Oct	38	Ravenna
	Nov	52	Wallingford
		68	East Queen Anne
	Dec	86	Minor
Tier 3			
	Oct	15	North Beach/ Blue Ridge
	Nov	-	
	Dec	118A	Dunlap
Tier 4			
	Oct	120	Arbor Heights
	Nov	-	
	Dec	-	

1st Qtr. 2020		Neighborhood No.	Neighborhood Name
Tier 1			
	Jan	47B	Adams
		70	Lower Queen Anne
	Feb	71	Lower Queen Anne
		73	South Lake Union
	Mar	80.01	Belltown
		91-92	CID
Tier 2			
	Jan	32A	Adams
	Feb	45	Wallingford
		64	Srevens
	Mar	84	First Hill
Tier 3			
	Jan	96B	Mount Baker
	Feb	-	
	Mar	103	Columbia City
Tier 4			
	Jan	112A	South Park
	Feb	-	
	Mar	-	

## MONTHLY AND QUARTERLY AUDIT METHODOLOGY

**Conducting Area Audits:** The objective of an area audit is to:

- Determine the number of each vendor's bikes that are in a specific area
- Determine how each bike conforms to established rules for correctly parking the bike following a rental (1.e. does the parked bike block the sidewalk, is an ADA blockage created, etc.)
- Determine the visible physical condition of each parked bike (i.e. is the bike visibly safe to operate, are there visible mechanical or electrical issues that impact the use of the bike, etc.)
- Determine the percentage of bikes that are available to rent through a sampling of tier 1 and 2 rentals

**Monthly Audits:** Monthly audits are conducted by visually inspecting all of each vendors parked bikes in an audit area. A portion of the bikes in tier 1 and 2 areas will be rented to verify the percent of rental available bikes reported by the bike vendors.

The current monthly rental standard is as follows:

- Audits in tiers 1 and 2: either 50% or up to 20 of each vendor's bikes will be rented. All Jump bikes that have a lighted wrench light will be included in a rental decision. This will confirm their availability for rental.

In addition, if a group of bikes are parked together, and they have similar inspectable characteristics and parking conditions, they are grouped and reported by vendor, indicating the number of a vendor's bikes that are present. Only a single bike identification number will be entered on the survey form for the group of bikes.

In cases of bikes being parked in walkway blocking, ADA blocking or with visible mechanical damage, a photo and/or a note can be included on the survey form to help explain the condition.

In evaluating the "Safe to Operate" description, the following features are included:

- Brakes: are the brake levers in place, do the brakes appear to work, is there any observable damage to the brakes or brake handles
- Pedals: are the pedals in place and in working order
- Tires and rims: are the tires inflated, are the rims straight, are there any broken spokes that would create a riding hazard
- Seat: is the seat in place and undamaged
- Lights: do the lights appear to be undamaged and correctly connected
- Handgrips: Are the handgrips in place and undamaged

In evaluating the "Good Working Order" description, the following features are included:

- All of the "Safe to Operate" features are included in this evaluation
- Phone and e-mail numbers: listed on the bike or basket
- Bell: is present and in working order
- Kick stand: is present and in good working order
- Lock: appears undamaged and in working order
- Battery: is present and appears undamaged

In the case of Jump bike, the bike has a visual "wrench" light that is on the handlebar. When this light is on, it indicates that there is either a mechanical or electrical problem with the bike. To keep the visual inspection compatible between Jump and Lime bikes (which don't have a "wrench light"), the auditor will make a note of the lighted wrench on a Jump bike, but will not use that indicator to down-grade the visual safety or mechanical condition of the bike.