

TRANSIT SPEED & RELIABILITY

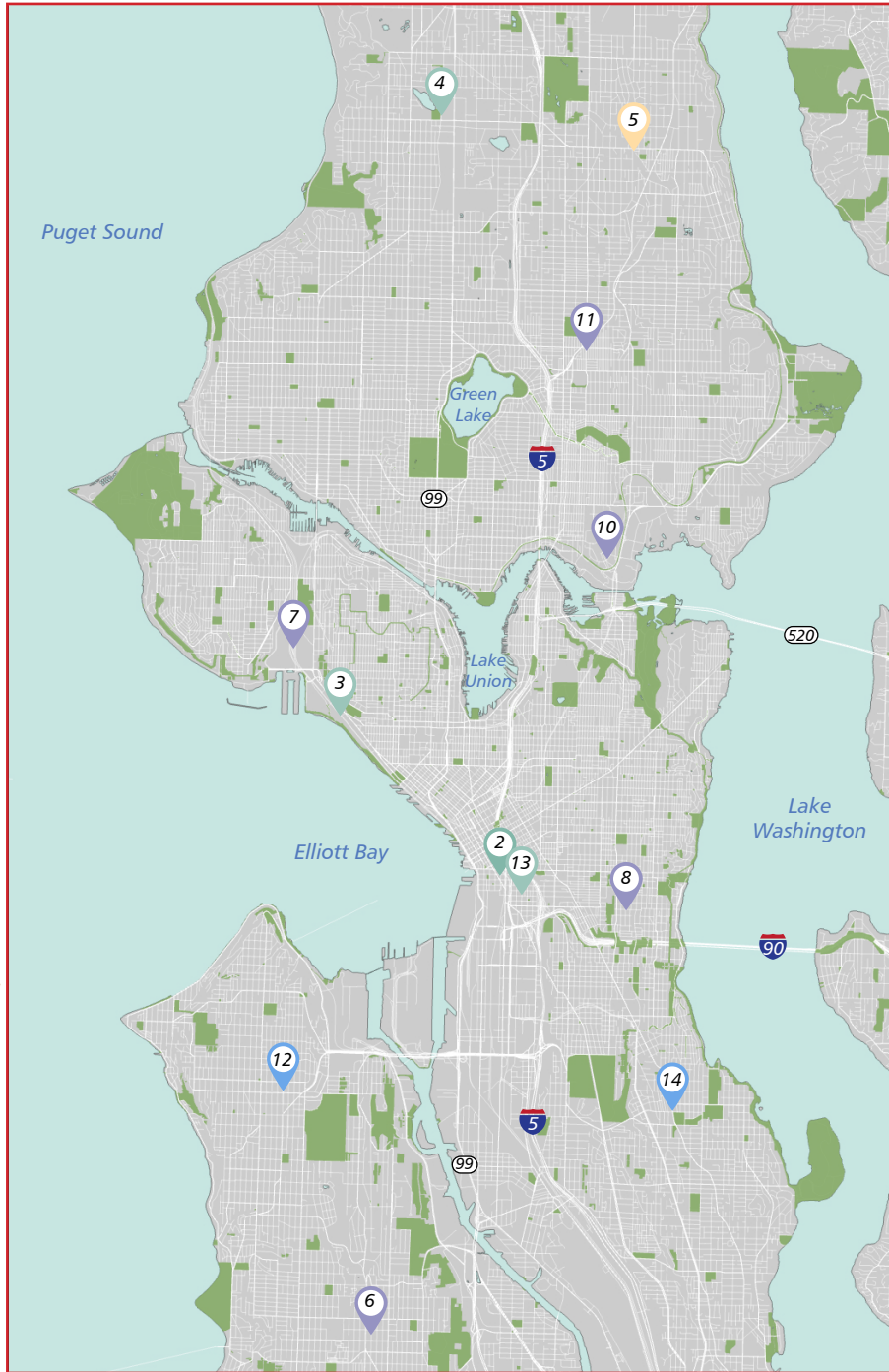
2023 ANNUAL SPOT IMPROVEMENTS END OF YEAR REPORT

This page intentionally left blank.

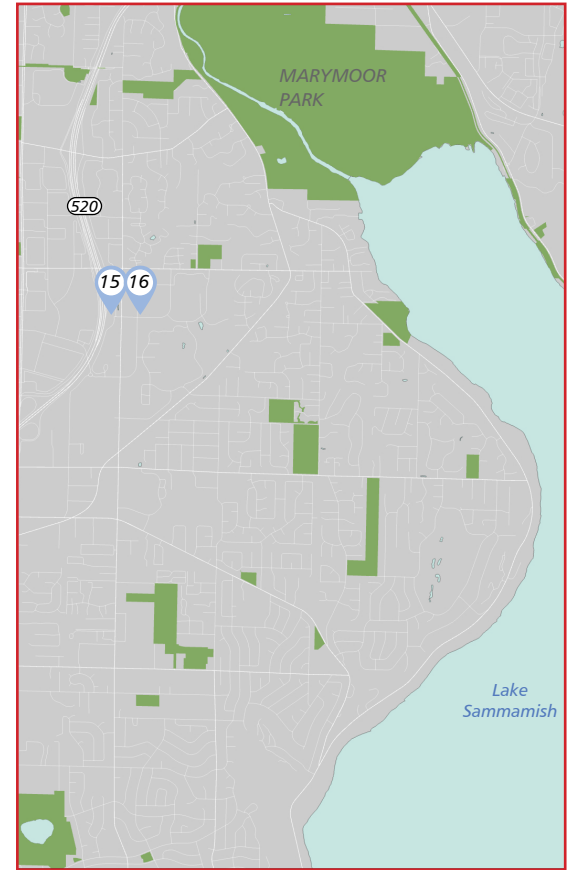
CONTENTS

INTRODUCTION	1
2023 SPOT IMPROVEMENTS	3
STREET AND INTERSECTION DESIGN	3
Union Avenue NE / NE 4th Street.....	4
2nd Avenue Extension / S Jackson Street	5
Elliott Avenue W / W Mercer Place	6
N 130th Street / Linden Avenue N	7
BUS STOPS AND ROUTING	8
NE 125th Street / 30th Avenue NE to 33rd Ave NE	8
TRAFFIC REGULATIONS	9
Delridge Way SW / SW Trenton Street.....	9
Elliott Avenue W / 15th Avenue W	10
S Dearborn Street / 24th Avenue S.....	11
I-5 Ramp Access to S 320th Park and Ride.....	12
NE Pacific Place / NE Montlake Boulevard.....	13
NE 80th Street / Lake City Way to 15th Avenue NE.....	14
SIGNALS	15
35th Avenue SW / SW Avalon Way.....	15
Seattle Boulevard / Dearborn Street / 5th Avenue S	16
Rainier Avenue S / S Alaska Street	17
156th Avenue NE / Redmond Technology Station	18
156th Avenue NE / Redmond Technology Station	19
ACKNOWLEDGMENTS	20

- 2 2ND AVE EXT / S JACKSON ST
- 3 ELLIOTT AVE W / W MERCER PL
- 4 N 130TH ST / LINDEN AVE N
- 5 NE 125TH ST / 30 AVE NE
- 6 DELRIDGE WAY SW / SW TRENTON ST
- 7 ELLIOTT AVE W / 15TH AVE NE BUS ONLY LANES
- 8 S DEARBORN ST / 24TH AVE S
- 10 NE PACIFIC PL / NE MONTLAKE BLVD
- 11 NE 80TH ST / LAKE CITY WAY
- 12 35TH AVE SW / SW AVALON WAY
- 13 SEATTLE BLVD / DEARBORN ST / 5TH AVE
- 14 RAINIER AVE S / S ALASKA ST
- 15 156TH AVE NE / REDMOND TECH STATION
- 16 156TH AVE NE / REDMOND TECH STATION



SEATTLE



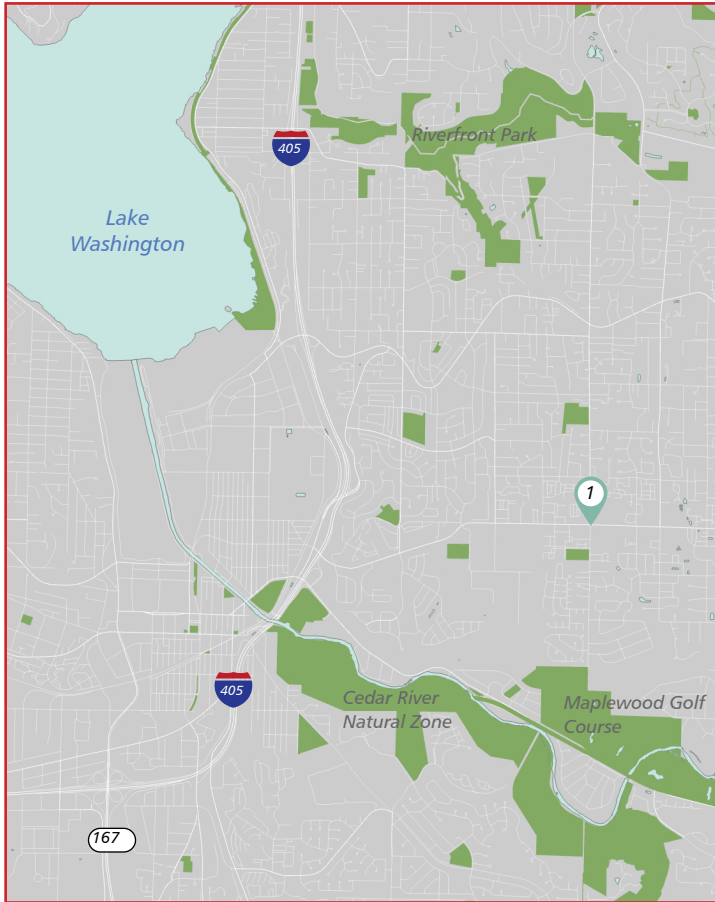
REDMOND

- Street and Intersection Design Improvement
- Bus Stops and Routing Improvement
- Traffic Regulations Improvement
- Signals Improvement

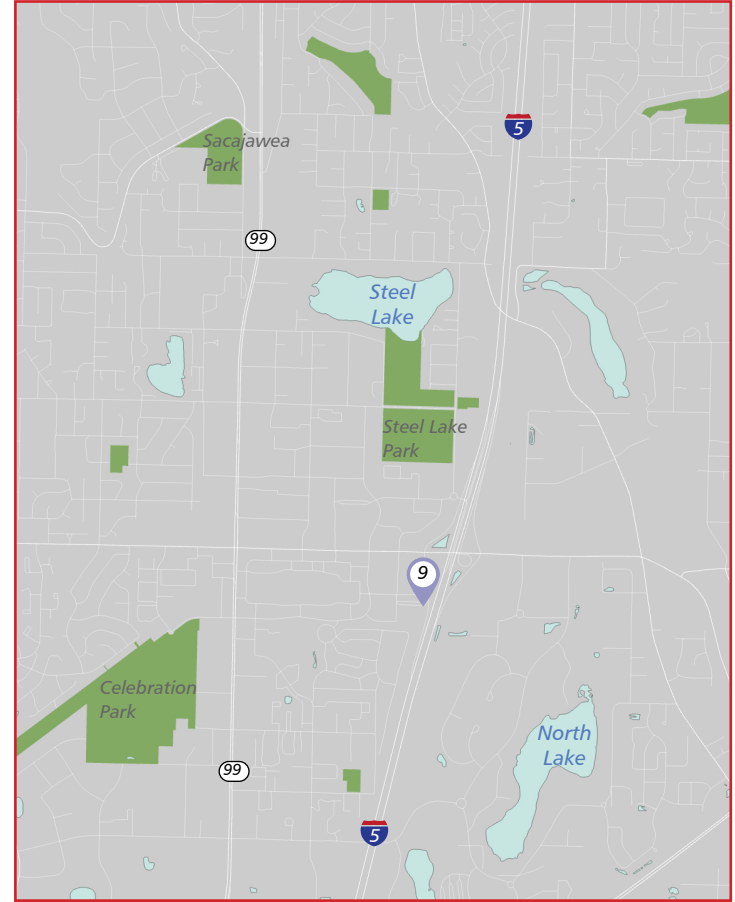


1 UNION AVE NE / NE 4TH ST

9 S 320TH ST PARK & RIDE



RENTON



FEDERAL WAY

- Street and Intersection Design Improvement
- Bus Stops and Routing Improvement
- Traffic Regulations Improvement
- Signals Improvement

INTRODUCTION

This annual report describes the spot improvements implemented in 2023 by local jurisdictions on behalf of Metro. Spot improvements are low-cost capital investments aimed at improving traffic problems and operational issues that affect bus travel times and reliability. Spot improvement projects are pursued to improve existing transit service or to support planned service restructures. Spot improvements can range in complexity from less complex projects, such as traffic signal timing adjustments, to more-complicated projects requiring design and public outreach, such as new bus-only lanes. Some projects support the safer operation of buses on city-owned streets by minimizing potential conflict with other roadway users; this results in safer and more-reliable transit operation, and reduced operator stress. All benefits from spot improvements help Metro deliver higher-quality service at lower cost and will increase attraction to public transit as a travel mode of choice.

The Spot Improvement Program supports King County Metro Mobility Framework policy recommendations to implement investments that increase speed, reliability, and safety. Spot improvement projects utilize a set of transit supportive strategies identified in [Metro's 2021 Transit Speed & Reliability Guidelines and Strategies](#). Examples of these transit supportive strategies are shown in the Speed and Reliability Toolbox Table on the following page, and the improvements featured in this report are grouped by strategy type.

A focus area in 2023 has been to re-establish a regular presence at Metro's seven bus bases, regularly attending base visits and Safety Committee meetings throughout 2023. This direct interaction with Transit Operators, Base Chiefs, Service Quality, and Safety is our best source of identification of problem areas and generation of Spot Improvement ideas. An ongoing challenge in 2023 has been the availability of city staff and crews to implement all the Spot Improvements requested by Metro. Due to this, the Speed & Reliability team has been able to prioritize both necessary and easy to implement projects while deferring more complex and/or larger worthwhile requests to later years.

The success of each implementation was made possible with the support of cities and their willingness to make operational changes to roadway infrastructure and traffic signal systems to benefit transit riders; many improvements provide benefits to other roadway users as well. In addition, several projects completed this year were made possible through funding by a WSDOT Regional Mobility Grant. For additional information regarding this program, please contact Owen Kehoe at 206-477-5811 or via email at owen.kehoe@kingcounty.gov.

Spot Improvement program 2023 expenditures: \$437,000 for investments to existing transit routes, and \$302,000 for improvements on modified transit routes to support service restructures in anticipation for the opening of new RapidRide Lines as well as Sound Transit LINK feeder routes. The total cost of improvements is \$740,000 to cover Metro staff time and reimbursed city costs to develop conceptual designs, develop final designs (when needed), construct improvements, as well as administer the spot improvement program as a whole.

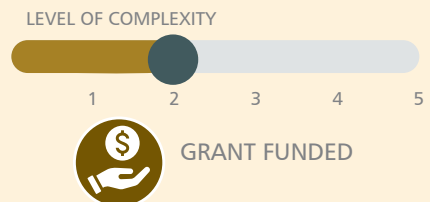
The **16** Spot improvement projects highlighted in this report benefited:

- » **100,000 Weekday Riders**
- » **49 Bus Routes**

Resulting in:

- » **Over \$700,000 in avoided additional operating cost annually; operating dollars that would otherwise need to be spent maintaining schedule reliability each year.**
- » **Improved bus operational safety at 9 locations in 2023.**

Spot improvements can range in complexity depending on the level of jurisdictional coordination, public outreach, design work, and funding sources needed. The complexity of the projects presented in this report are rated on a 1-5 scale, a "1" being the least complex project, for example a signal timing adjustment, to "5" for the most complicated of the projects, such as new bus-only lanes.



SPEED AND RELIABILITY TOOLBOX TABLE

CHALLENGES													COST	COORDINATION
INTERSECTION	ROADWAY	FREWAY ON-RAMP	SIGNAL	RIGHT TURN	LEFT TURN	OTHER, TRAFFIC RELATED	INEFFICIENT ROUTE DESIGN	LEAVING BUS STOP	DWELL TIME	BUS ZONE CAPACITY	PEDESTRIANS	CYCLISTS		

\$: UNDER \$50,000
 \$\$: \$50,000-\$100,000
 \$\$\$: \$100,000-\$250,000
 \$\$\$\$: OVER \$250,000

STRATEGY

CONGESTION	DELAY	OPERATIONS	SAFETY	COST	COORDINATION
------------	-------	------------	--------	------	--------------



A. Street and Intersection Design

Dedicated Bus Lane	♦♦♦	♦♦♦		♦♦♦	♦♦♦	♦♦♦		♦♦	♦♦	♦♦♦	♦♦		♦	♦♦	\$ - \$\$\$	High
Queue Bypass (Short Bus Lane)	♦♦♦	♦♦	♦♦		♦♦	♦♦	♦♦	♦♦	♦♦				♦	♦	\$ - \$\$\$	High
Roadway Channelization	♦			♦	♦♦	♦♦		♦	♦				♦	♦	\$	Low/Medium
Turn Radius Improvements		♦			♦♦	♦♦									\$\$\$	Medium
Speed Hump Modifications							♦♦								\$ - \$	Low



B. Bus Stops and Routing

Bus Stop Location	♦			♦				♦	♦♦	♦	♦	♦♦	♦♦		\$\$ - \$\$\$	Medium
Route Design	♦	♦		♦				♦♦♦	♦	♦	♦				\$\$	High
Bus Stop Lengthening									♦	♦♦	♦♦♦				\$\$	High
Bus Bulbs									♦	♦♦	♦♦				\$\$ - \$\$\$	High
Boarding Islands									♦	♦♦	♦♦		♦♦		\$\$ - \$\$\$	High



C. Traffic Regulations

Turn Restrictions/Exemptions	♦			♦	♦♦	♦♦	♦	♦	♦				♦	♦	♦	\$	Low
Parking Removal/ Alterations		♦♦							♦♦							\$	Low



D. Signals

Passive Traffic Signal Retiming	♦♦	♦		♦♦	♦	♦		♦♦					♦	♦	♦	\$ - \$	Low
Transit Signal Priority (Active)	♦♦♦			♦♦♦	♦♦♦	♦♦♦	♦♦♦	♦♦♦								\$ - \$	Low
Signal Phase Modification	♦♦	♦		♦	♦		♦♦						♦			\$ - \$\$\$	Low-Medium
New Signal Installation	♦♦	♦		♦	♦		♦♦						♦			\$ - \$\$\$	Low-Medium
Queue Jumps	♦♦♦	♦♦	♦♦		♦♦	♦♦		♦♦	♦♦				♦	♦		\$ - \$\$\$	Medium

Benefits: ♦ LOW ♦♦ MEDIUM ♦♦♦ HIGH

2023 SPOT IMPROVEMENT EXAMPLES



SEATTLE BOULEVARD / 5TH AVENUE SOUTH / S DEARBORN STREET, SEATTLE



15TH AVENUE W, SEATTLE (SDOT PHOTO)

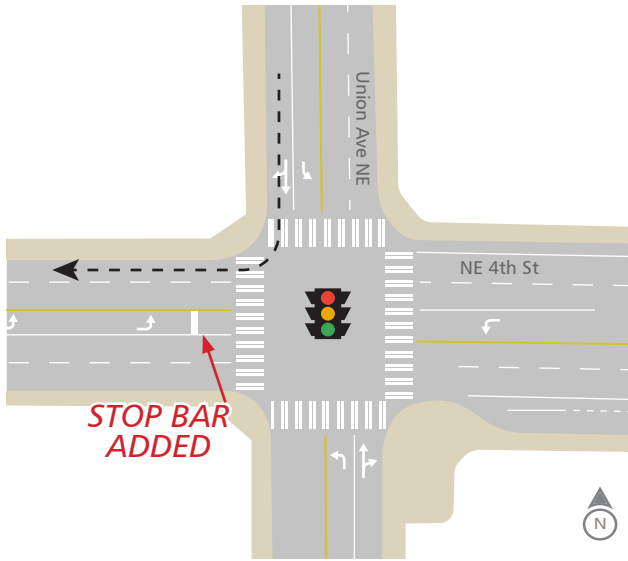


NE 156TH STREET / REDMOND TECHNOLOGY STATION, REDMOND



ELLIOTT AVENUE W / W MERCER PLACE, SEATTLE

 STREET AND INTERSECTION DESIGN



PROBLEM STATEMENT

Bus operators of the Route 105 must make a right turn from southbound Union Ave NE onto westbound NE 4th St before serving a bus zone on NE 4th St. The turn is tight and often requires operators to split lanes and/or use a portion of the eastbound left turn lane to avoid driving on the curb to complete the turn. The issue is compounded when the eastbound left turn lane on NE 4th St has left turning vehicles, as operators must avoid the vehicles to safely make the turn.

IMPROVEMENTS MADE

To make the turn safer for operators, a stop bar was added 15 feet back from the marked crosswalk. This provides more space for operators to make the turn, and allows them to use a portion of the eastbound left turn lane on NE 4th St to safely make the movement before serving the bus zone on NE 4th St.

PROJECT



 RENTON

METRO ROUTES IMPACTED: **105**

PROJECT PARTNERS



CITY OF RENTON
WASHINGTON



ACKNOWLEDGMENTS

Chris Barnes, Flora Lee, Blake Costa (Renton)

OPERATIONAL IMPROVEMENTS



17 SEC

DELAY REDUCED PER TRIP DURING THE PM PEAK PERIOD BETWEEN MAY 2023 AND AUGUST 2023

ROUTE BENEFIT



4 BUSES/HR

TRANSIT BENEFITS

DAILY PASSENGER BENEFIT ( = 1000 PERSONS)



900 RIDERS

2 2ND AVE EXT S / S JACKSON ST, SEATTLE

LEVEL OF COMPLEXITY

1

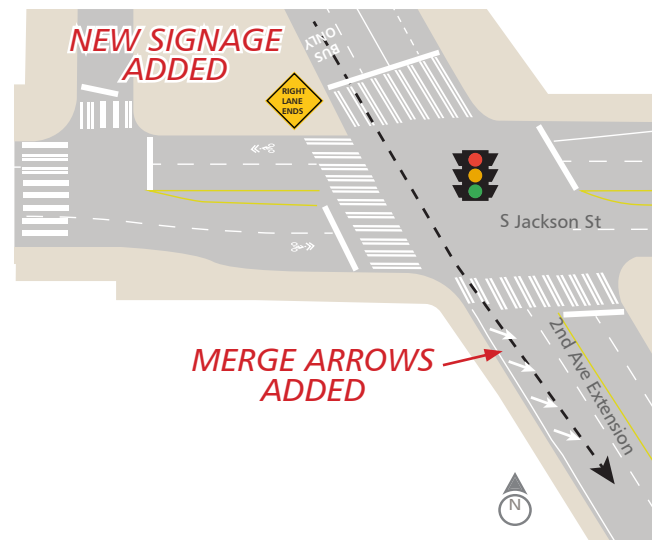
 STREET AND INTERSECTION DESIGN

PROBLEM STATEMENT

The southbound 2nd Ave bus lane ends just south of S Jackson St with a merge of the bus lane into the adjacent general-purpose lane. Although there is a queue jump signal to assist buses with the merge, operators had reported that other drivers were not merging properly and forcing buses into the curb. Other than one single sign, the roadway configuration offered few clues for drivers unfamiliar with the merge, and the roadway curvature made it difficult to perceive the narrowing roadway.

IMPROVEMENTS MADE

A series of merge arrows were installed on the roadway to highlight the merge area and an additional merge warning sign was added to the near side of the intersection. A white stripe was installed one foot from the curb to help operators keep their tires away from the curb.



PROJECT

METRO ROUTES IMPACTED: 101, 102, 111, 114, 124, 131, 132, 150, 162, 177, 190, 216, 217, 550

PROJECT PARTNERS



ACKNOWLEDGMENTS

Jonathan Dong, Reiner Blanco (SDOT)



 SEATTLE

TRANSIT BENEFITS

OPERATIONAL IMPROVEMENTS



11 SEC

DELAY REDUCED ON AVERAGE PER TRIP IN THE PM PEAK BETWEEN SEPTEMBER 2023 AND NOVEMBER 2023



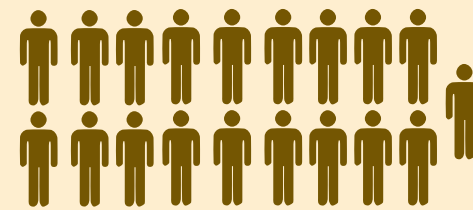
THE IMPROVEMENT PROVIDES ENHANCED SAFETY FOR BUS OPERATORS AND PASSENGERS.

ROUTE BENEFIT



48 BUSES/HR

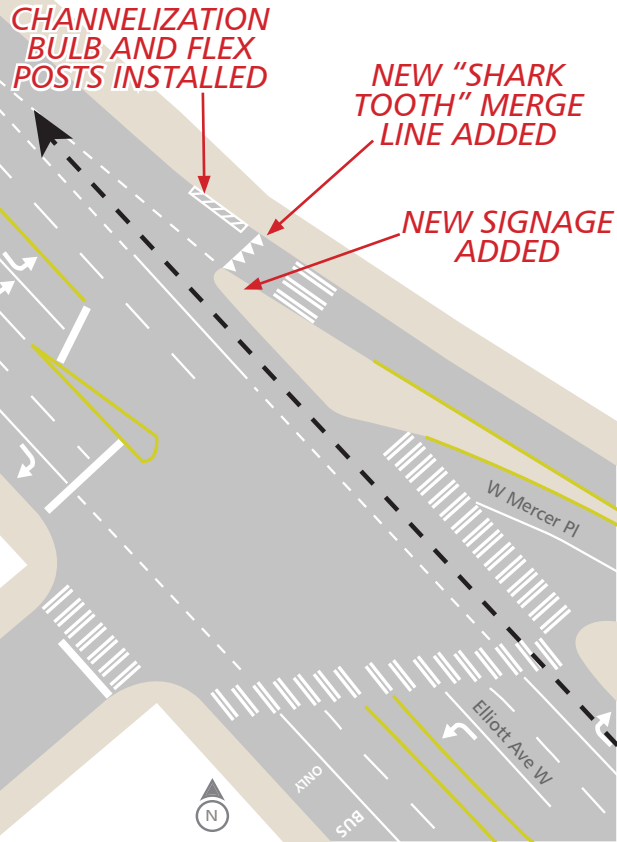
DAILY PASSENGER BENEFIT (1 person icon = 1000 PERSONS)



19,000+ RIDERS



STREET AND INTERSECTION DESIGN



ELLIOT AVE W / W MERCER PL, SEATTLE 3

PROBLEM STATEMENT

The northbound bus lane on Elliott Ave W merges with traffic from Mercer Pl W in a configuration resembling a freeway on-ramp. Vehicles approaching northbound Elliott Ave W from W Mercer Pl were not yielding to buses traveling northbound in the bus lane on Elliott Ave W, despite the presence of a yield sign.

IMPROVEMENTS MADE

The merging area was reconfigured by adding a “shark tooth” yield line, pavement markings and flex posts, and additional signage to clearly indicate to vehicles traveling on W Mercer Pl that they were required to yield to oncoming traffic.

PROJECT i



SEATTLE

METRO ROUTES IMPACTED: **17, 24, 33**

PROJECT PARTNERS



ACKNOWLEDGMENTS

Jonathan Dong, Reiner Blanco (SDOT)

OPERATIONAL IMPROVEMENTS



7 SEC

DELAY REDUCED ON AVERAGE PER TRIP IN THE AM PEAK BETWEEN JULY 2023 AND NOVEMBER 2023



THIS IMPROVEMENT ALLOWS BUSES TO SAFELY MAKE THE THROUGH MOVEMENT USING THE BUS ONLY LANE.

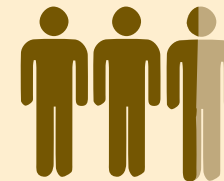
ROUTE BENEFIT



3 BUSES/HR

TRANSIT BENEFITS

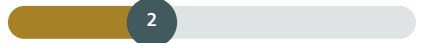
DAILY PASSENGER BENEFIT (= 1000 PERSONS)



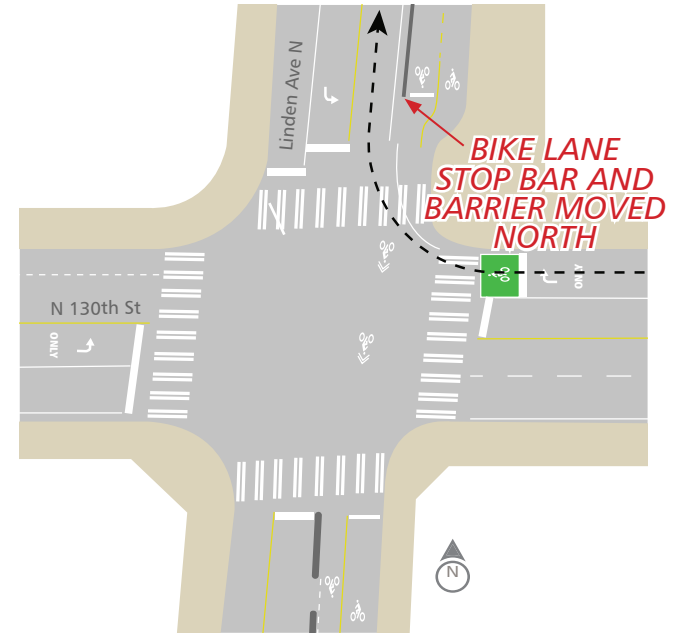
2,300 RIDERS

4 N 130TH ST / LINDEN AVE N, SEATTLE

LEVEL OF COMPLEXITY



STREET AND INTERSECTION DESIGN



PROBLEM STATEMENT

Buses could not make the westbound right turn from N 130th St to Linden Ave N without crossing the center line or contacting a concrete barrier that protects the two-way bike lanes. In addition to the safety concerns that this turn caused, buses were also delayed by the challenge of finding a break in traffic to make the maneuver safely.

IMPROVEMENTS MADE

SDOT crews removed a portion of the concrete barrier and shifted the southbound bike lane stop bar and traffic signal loop detector located on Linden Ave N about 10 feet north, away from turning buses. Buses can now make the turn more efficiently without putting waiting cyclists or oncoming traffic at risk.

PROJECT



METRO ROUTES IMPACTED: 345

PROJECT PARTNERS



ACKNOWLEDGMENTS

Jonathan Dong, Reiner Blanco (SDOT)



SEATTLE

TRANSIT BENEFITS

OPERATIONAL IMPROVEMENTS



13 SEC

DELAY REDUCED PER TRIP IN THE AM PEAK BETWEEN DECEMBER 2023 AND JANUARY 2024



THIS IMPROVEMENT PROVIDES ENHANCED SAFETY FOR OPERATORS AND CYCLISTS WHILE THE BUS MAKES THE RIGHT TURN

ROUTE BENEFIT



3 BUSES/HR

DAILY PASSENGER BENEFIT (1 person icon = 1000 PERSONS)



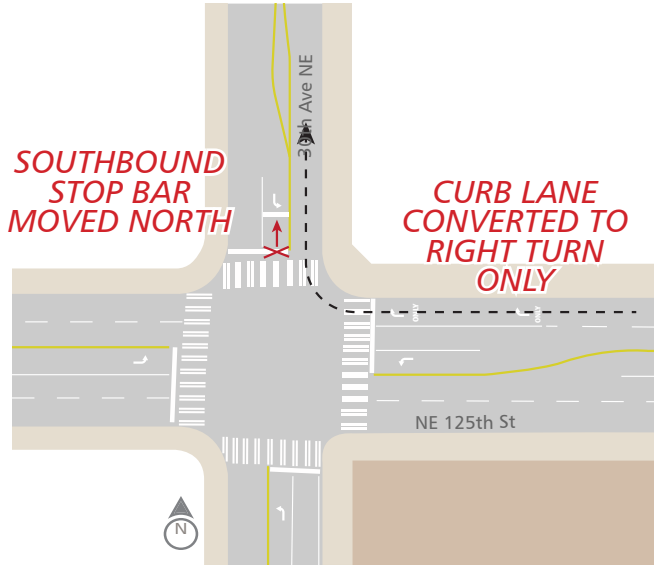
900 RIDERS



STREET AND INTERSECTION DESIGN



BUS STOPS AND ROUTING



PROBLEM STATEMENT

Buses traveling westbound on NE 125th St were unable to turn right at 30th Ave NE due to constrained turning space and oncoming traffic at the intersection. Due to this constraint, the Route 65 was using a longer pathway via 28th Ave NE. Westbound buses turning right on 28th Ave NE would drive over the curb, causing damage to the curb.

IMPROVEMENTS MADE

The stop bar for southbound left turning vehicles from 30th Ave NE to NE 125th St was relocated roughly 25 feet north and a protected left turn phase was installed, allowing westbound buses to turn right without encroaching on the southbound left turn lane. Additionally, a westbound right turn only lane was installed with removal of one on-street parking space. With these changes in place, the routing for the Route 65 in the northbound direction was changed to turn directly from NE 125th St onto 30th Ave NE, which is a faster and more-direct pathway.

PROJECT **i**



METRO ROUTES IMPACTED: **65**

PROJECT PARTNERS



ACKNOWLEDGMENTS

Jonathan Dong, Bryce Beason, Andrew Natzel, Reiner Blanco (SDOT)

SEATTLE

OPERATIONAL IMPROVEMENTS



41 SEC

DELAY REDUCED PER TRIP IN THE AM PEAK BETWEEN MAY 2023 AND OCTOBER 2023



THE IMPROVEMENT ALSO PROVIDES ENHANCED SAFETY FOR BUS OPERATORS AND ELIMINATES POTENTIAL DAMAGE FROM BUSES REROUTING ON 28TH AVE NE.

ROUTE BENEFIT



4 BUSES/HR

TRANSIT BENEFITS

DAILY PASSENGER BENEFIT (= 1000 PERSONS)



3,330 RIDERS

6 DELRIDGE WAY SW / SW TRENTON ST, SEATTLE

LEVEL OF COMPLEXITY

2

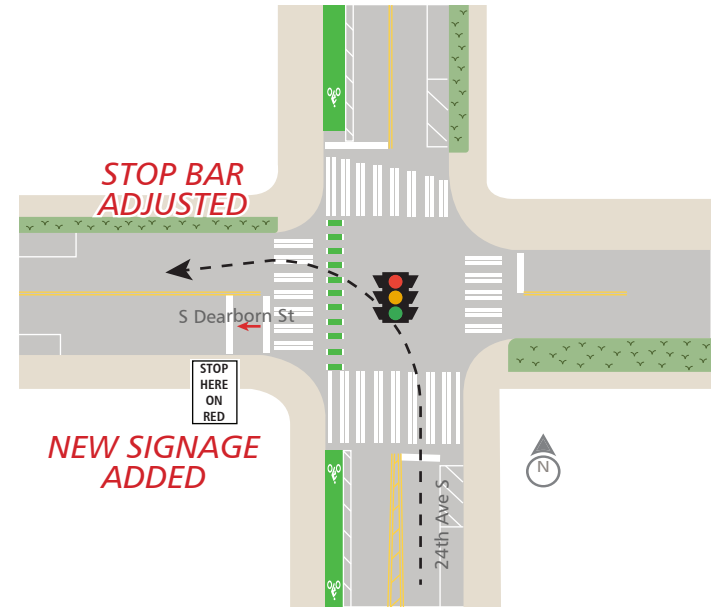
TRAFFIC REGULATIONS

PROBLEM STATEMENT

Making a northbound left turn from Delridge Way SW to SW Trenton St was difficult for buses due to the narrow geometry of the intersection and the presence of eastbound vehicles waiting past the stop bar at the signal.

IMPROVEMENTS MADE

The position of the eastbound stop bar was adjusted and a STOP HERE ON RED sign was installed to help improve compliance with the stop bar. These improvements were installed in conjunction with the Delridge Transit-Plus Multimodal Corridor (H Line) project.



PROJECT

i

METRO ROUTES IMPACTED: 60, 125

PROJECT PARTNERS



ACKNOWLEDGMENTS

Jonathan Dong (SDOT)



SEATTLE

TRANSIT BENEFITS

OPERATIONAL IMPROVEMENTS



26 SEC

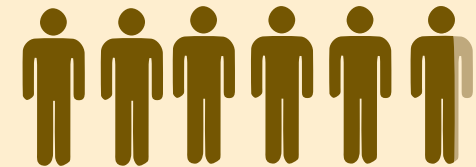
DELAY REDUCED BY 19 SECONDS PER TRIP IN THE AM AND 26 SECONDS PER TRIP IN THE PM PEAK BETWEEN DECEMBER 2022 AND MARCH 2023

ROUTE BENEFIT



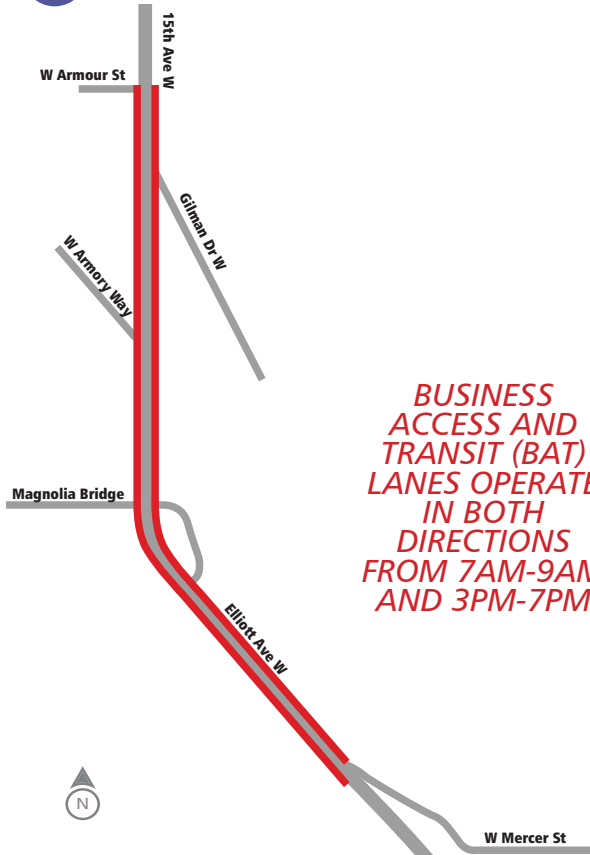
7 BUSES/HR

DAILY PASSENGER BENEFIT (1 person icon = 1000 PERSONS)



5,800 RIDERS

TRAFFIC REGULATIONS



PROBLEM STATEMENT

Buses traveling in the off-peak directions during the peak periods were getting stuck in traffic congestion along this busy corridor because the Business Access and Transit (BAT) lanes were only operational in the southbound direction during the AM Peak (7am-9am) and northbound during the PM Peak (3pm-7pm). Outside of these times, the curb lane was available for on-street parking and loading.

IMPROVEMENTS MADE

BAT lane hours were extended to apply to both directions of travel during both the AM and PM peak periods (7am-9am and 3pm-7pm). Regulatory signage was updated, loading zones were relocated, and a signal upgrade at 15th Ave W and W Dravus St was implemented.

PROJECT



SEATTLE

METRO ROUTES IMPACTED: 17, 24, 32, 33, D LINE

PROJECT PARTNERS



ACKNOWLEDGMENTS

James Le, Christine Alar (SDOT)

OPERATIONAL IMPROVEMENTS



5-12 SEC

DELAY REDUCED BY 5 SECONDS PER TRIP IN THE AM PEAK AND 12 SECONDS IN THE PM PEAK BETWEEN OCTOBER 2019 AND OCTOBER 2023

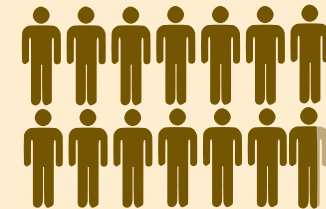
ROUTE BENEFIT



30 BUSES/HR

TRANSIT BENEFITS

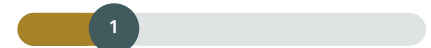
DAILY PASSENGER BENEFIT (1 person icon = 1000 PERSONS)



13,700 RIDERS

8 S DEARBORN ST / 24TH AVE S, SEATTLE

LEVEL OF COMPLEXITY

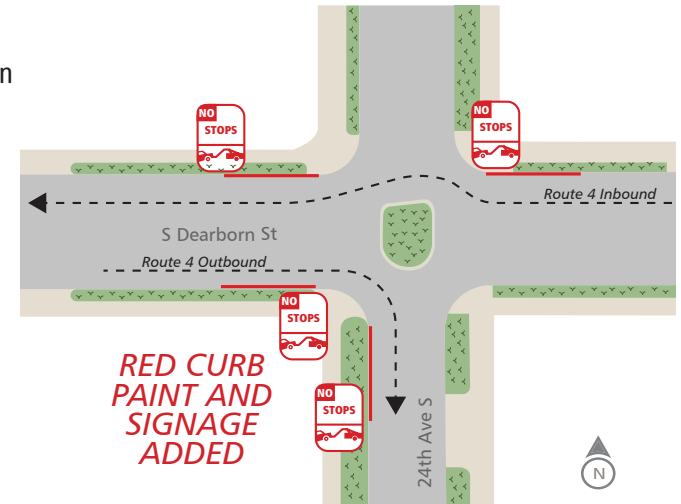


PROBLEM STATEMENT

Bus operators of the Route 4 must navigate around a traffic circle while make a right turn from S Dearborn St onto 24th Ave S. Operators reported vehicles parking within 10 feet of the intersection, making right turns difficult. The Route 4 operates on overhead trolley wire and a supervisor is dispatched for any event that requires the bus to reverse. The wait time for a supervisor to come onsite adds more delay for trips that are impacted by parked vehicles.

IMPROVEMENTS MADE

Parking restrictions near intersections between 23rd Ave S and Martin Luther King Jr. Way were clearly marked with red curb paint and signed to prevent vehicles from parking within 20 feet of an intersection or curb ramp (parking is restricted 20 feet from an intersection or curb ramp per city code). This ensures buses can navigate through the intersection without being blocked by parked cars.



PROJECT *i*

METRO ROUTES IMPACTED: 4

PROJECT PARTNERS



ACKNOWLEDGMENTS

Jonathan Dong (SDOT), Fred Perez



TRANSIT BENEFITS

OPERATIONAL IMPROVEMENTS



17 SEC

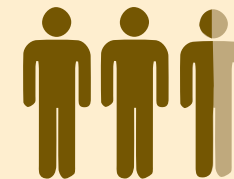
DELAY REDUCED ON AVERAGE PER TRIP BETWEEN AUGUST 2022 AND AUGUST 2023

ROUTE BENEFIT



2 BUSES/HR

DAILY PASSENGER BENEFIT (1 person icon = 1000 PERSONS)



2,500 RIDERS

TRAFFIC REGULATIONS



PROBLEM STATEMENT

Bus and paratransit operators and non-transit drivers were confused as to who could access the Federal Way Park & Ride from the southbound I-5 on-ramp at S 320th St. The signage and supplemental pavement markings were not providing clear directions for selecting the appropriate lane for high occupancy vehicles to enter I-5 southbound.

IMPROVEMENTS MADE

WSDOT crews removed old "DO NOT ENTER" signage and installed new "RESTRICTED BUS ONLY" signage for the off-ramp to the S 320th St Park & Ride to clearly mark the lane was not intended as an HOV bypass lane to enter I-5 South.

PROJECT



FEDERAL WAY

METRO ROUTES IMPACTED: 177, 193, METRO ACCESS, PIERCE TRANSIT ON-DEMAND

PROJECT PARTNERS



ACKNOWLEDGMENTS

Josh Shippy, Christina Strand (WSDOT)

OPERATIONAL IMPROVEMENTS



THE IMPROVEMENT PROVIDES ENHANCED SAFETY FOR TRANSIT CUSTOMERS BY ENSURING GENERAL PURPOSE VEHICLES DO NOT ENTER THE PARK & RIDE FACILITY

ROUTE BENEFIT



7 BUSES/HR

TRANSIT BENEFITS

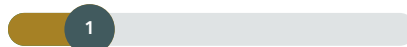
DAILY PASSENGER BENEFIT (1 person icon = 1000 PERSONS)



400 RIDERS

10 NE PACIFIC PL / NE MONTLAKE BLVD, SEATTLE

LEVEL OF COMPLEXITY



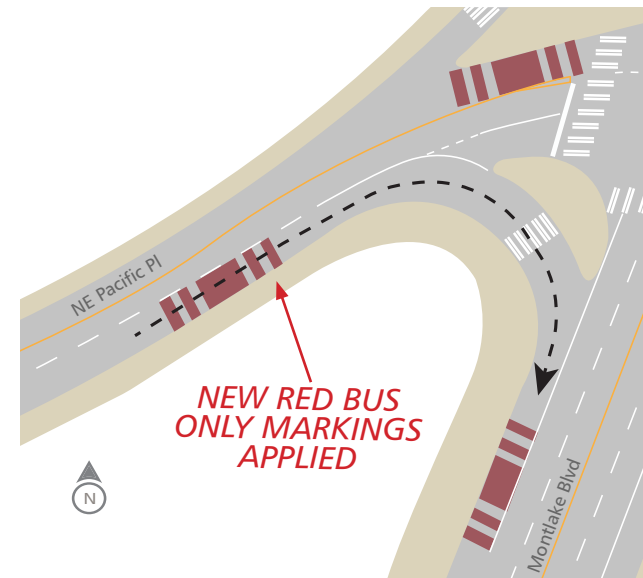
TRAFFIC REGULATIONS

PROBLEM STATEMENT

General purpose vehicles traveling eastbound on NE Pacific Pl towards Montlake Blvd were utilizing the designated bus-only right turn slip-lane to turn into the southbound transit lane and delaying bus travel times.

IMPROVEMENTS MADE

Red bus lane markings were installed along the slip lane to emphasize the bus-only lane. The addition of red markings increases compliance with the bus-only lane and reduces the potential for general purpose vehicles to unintentionally use the bus-only slip lane.



PROJECT i

METRO ROUTES IMPACTED: 44, 255, ST 542, ST 556

PROJECT PARTNERS



ACKNOWLEDGMENTS

Jonathan Dong (SDOT)



SEATTLE

TRANSIT BENEFITS

OPERATIONAL IMPROVEMENTS



14 SEC

DELAY REDUCED ON AVERAGE PER TRIP IN THE PM PEAK BETWEEN APRIL 2023 AND AUGUST 2023

ROUTE BENEFIT



11 BUSES/HR

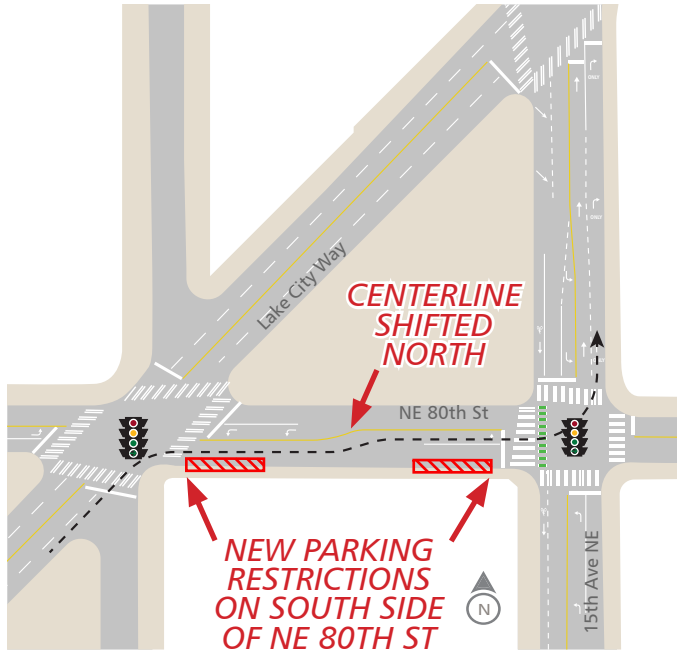
DAILY PASSENGER BENEFIT (= 1000 PERSONS)



3,850 RIDERS

TRAFFIC SIGNALS

NE 80TH ST / LAKE CITY WAY TO 15TH AVE NE, SEATTLE



PROBLEM STATEMENT

Buses turning right from Lake City Way to NE 80th St were having difficulty when vehicles were parked near the SW corner of 15th Ave NE and NE 80th St. In addition, buses turning left from NE 80th St to 15th Ave NE often blocked through travel due to narrow lane widths compounded by parked vehicles along NE 80th St.

IMPROVEMENTS MADE

Channelization changes were implemented along the length of the block, shifting the centerline north and adding width to the eastbound through travel lane and the left turn lane onto 15th Ave NE. Parking restrictions were implemented at both ends of the block on the south side to allow the bus to safely and efficiently complete the turning movement.

PROJECT i



SEATTLE

METRO, COMMUNITY TRANSIT, AND SOUND TRANSIT ROUTES

IMPACTED: **73**

PROJECT PARTNERS



ACKNOWLEDGMENTS

Jonathan Dong, Fred Perez, Alex Jiricek (SDOT)

OPERATIONAL IMPROVEMENTS



14 SEC

DELAY REDUCED ON AVERAGE PER TRIP IN THE AM PEAK BETWEEN MAY 2023 AND AUGUST 2023

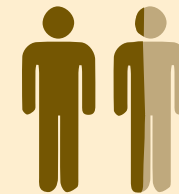
ROUTE BENEFIT



4 BUSES/HR

TRANSIT BENEFITS

DAILY PASSENGER BENEFIT (= 1000 PERSONS)



1,250 RIDERS

12 35TH AVE SW / SW AVALON WAY, SEATTLE

LEVEL OF COMPLEXITY

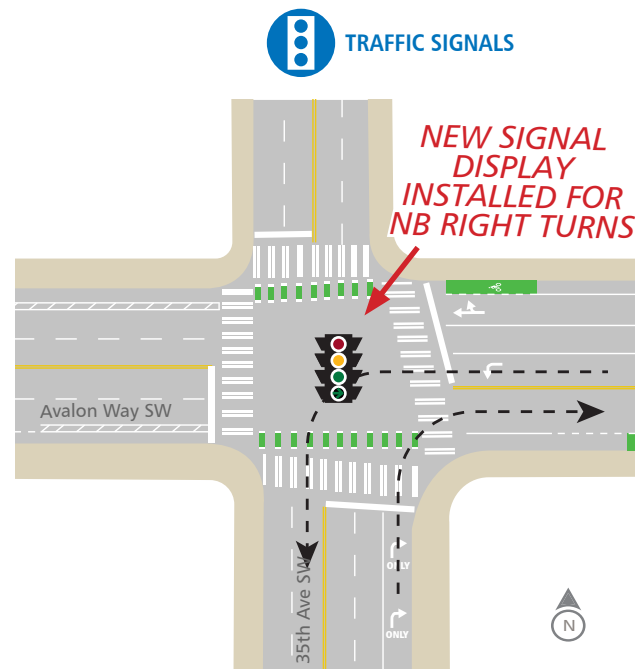
2

PROBLEM STATEMENT

Northbound buses heading from West Seattle to downtown Seattle via Avalon Way and the West Seattle Bridge were delayed at the intersection when making the right turn from 35th Ave SW onto SW Avalon Way.

IMPROVEMENTS MADE

SDOT installed a new traffic signal display at the intersection to facilitate a new protected right turn phase that would run at the same time as the westbound left turn. This required the installation of a new signal pole on the northeast corner of the intersection to support the new signal display. The issue was originally identified in 2019, with planning for implementation to begin in 2020.



PROJECT

i

METRO ROUTES IMPACTED: 21, 50, C LINE

PROJECT PARTNERS



ACKNOWLEDGMENTS

Jonathan Dong, Laura Wojcicki (SDOT)



SEATTLE

TRANSIT BENEFITS

OPERATIONAL IMPROVEMENTS



41 SEC

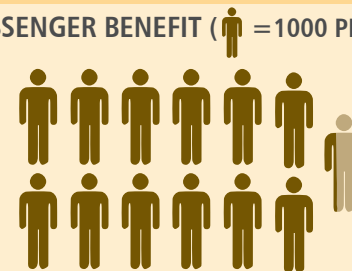
DELAY REDUCED AT THE INTERSECTION BETWEEN OCTOBER 2019 AND OCTOBER 2023

ROUTE BENEFIT



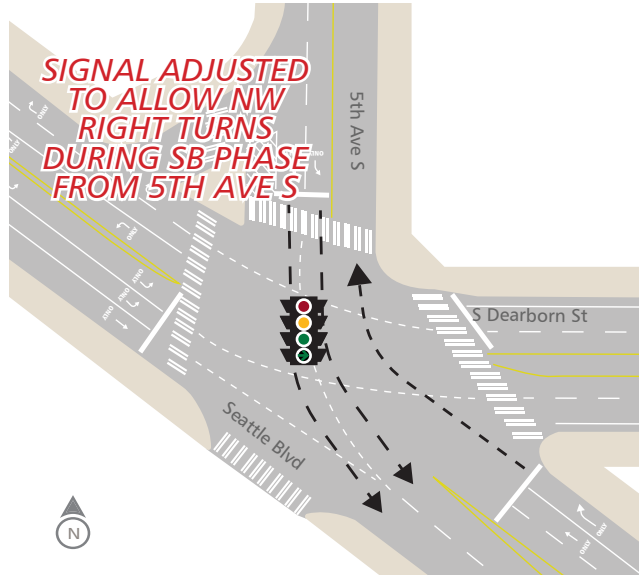
13 BUSES/HR

DAILY PASSENGER BENEFIT (1 person icon = 1000 PERSONS)



12,200 RIDERS

TRAFFIC SIGNALS



SEATTLE BLVD / 5TH AVE S / S DEARBORN ST, SEATTLE 13

PROBLEM STATEMENT

The traffic signal timing at this intersection needed to be adjusted to reduce delay for coaches entering from Seattle Blvd in the NW direction and turning right onto 5th Ave S. A right turn arrow is provided for the NW turn from Seattle Blvd onto 5th Ave S, but the right turn signal was not activating along with the green signal for southbound 5th Ave S.

IMPROVEMENTS MADE

SDOT revised the signal configuration so that the NW right turn arrow from Seattle Blvd onto 5th Ave S would run during the signal phase for vehicles traveling southbound on 5th Ave S. There are no traffic conflicts between these two movements, and they can safely occur concurrently.

PROJECT i



METRO, COMMUNITY TRANSIT, AND SOUND TRANSIT ROUTES

IMPACTED: **DEADHEADS**

PROJECT PARTNERS



ACKNOWLEDGMENTS

Laura Wojcicki (SDOT)

SEATTLE

OPERATIONAL IMPROVEMENTS

THIS IMPROVEMENT SUPPORTS DEADHEAD ROUTING TO THE TERMINAL, WHERE MULTIPLE ROUTES START REVENUE SERVICE. TRANSIT DATA IS LIMITED FOR DEADHEAD ROUTING.

ROUTE BENEFIT



DEADHEAD ROUTING

TRANSIT BENEFITS

DAILY PASSENGER BENEFIT (= 1000 PERSONS)



RIDERS BENEFIT FROM THIS IMPROVEMENT WITH INCREASED RELIABILITY THAT THE BUS WILL BE AT THE STARTING LOCATION AT THE SCHEDULED TIME

14 RAINIER AVE S / S ALASKA ST, SEATTLE

LEVEL OF COMPLEXITY

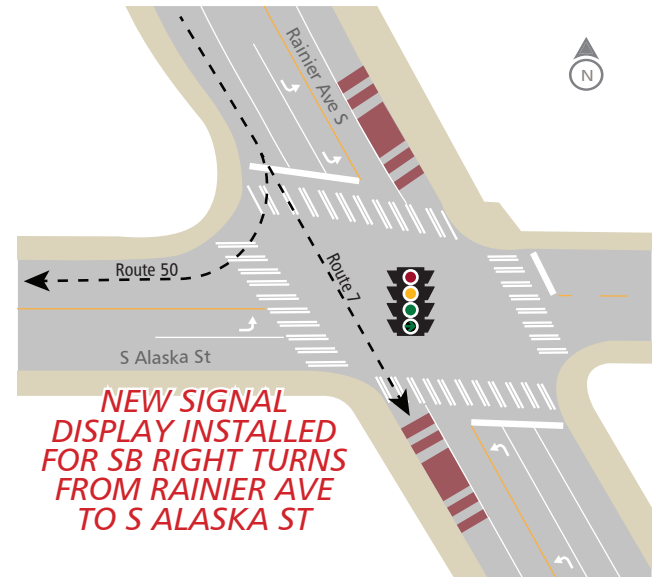


PROBLEM STATEMENT

In Summer 2022, SDOT implemented a new southbound Business Access and Transit (BAT) lane on Rainier Ave S between S Oregon St and S Edmunds St by converting the existing curbside general-purpose travel lane, effectively creating a right-turn-only pocket lane southbound at S Alaska St. However, operators were still experiencing delay due to a high volume of traffic turning right from southbound Rainier Ave S to westbound S Alaska St.

IMPROVEMENTS MADE

SDOT crews installed a new right turn arrow for the southbound approach that runs concurrently with the left turn signal phase from eastbound S Alaska St to northbound Rainier Ave S. The right turn arrow allows traffic to complete a right turn without stopping during the phase, which reduces delay both to the Route 50 making the southbound right turn, as well as the Route 7 using the BAT lane to make the through movement on southbound Rainier Ave S.



PROJECT



METRO ROUTES IMPACTED: 7, 50

PROJECT PARTNERS



ACKNOWLEDGMENTS

Jonathan Dong, James Le (SDOT)



TRANSIT BENEFITS

OPERATIONAL IMPROVEMENTS



5-11 SEC

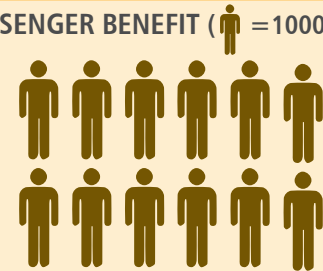
DELAY REDUCED BY 11 SECONDS PER TRIP IN THE AM PEAK AND 5 SECONDS PER TRIP IN THE PM PEAK BETWEEN OCTOBER 2019 AND OCTOBER 2023

ROUTE BENEFIT



11 BUSES/HR

DAILY PASSENGER BENEFIT (1 person icon = 1000 PERSONS)



12,000 RIDERS

TRAFFIC SIGNALS

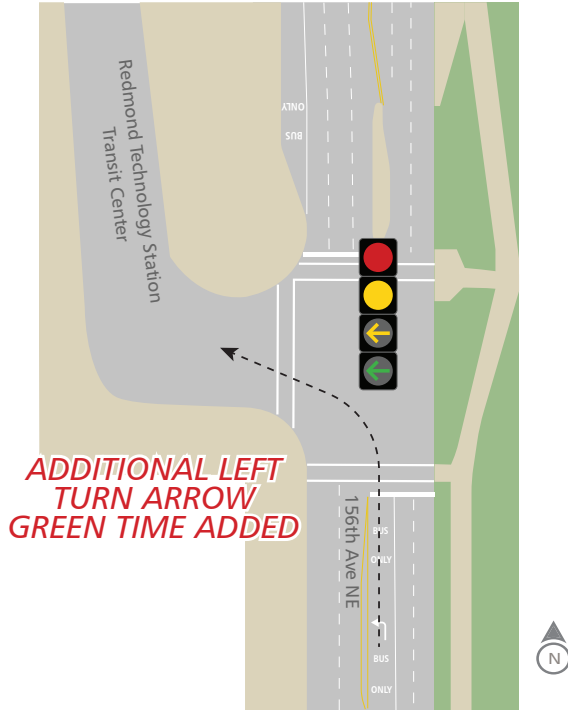
156TH AVE NE / REDMOND TECH STATION, REDMOND

PROBLEM STATEMENT

Operators turning left from northbound 156th Ave NE into the Redmond Technology Station were getting delayed at the intersection. The signal includes a green left turn phase, as well as a yellow flashing left turn phase. However, operators were frequently unable to make the left turn during the green protected left turn phase due to the signal timing.

IMPROVEMENTS MADE

The green left turn arrow time was extended for northbound left turning vehicles. This allows operators to be able to make the left turn more frequently during the protected green phase, reducing delay and improving safety.



PROJECT *i*

METRO, COMMUNITY TRANSIT, AND SOUND TRANSIT ROUTES IMPACTED: **245, B LINE**

PROJECT PARTNERS

ACKNOWLEDGMENTS
Hidemi Tsuru, Michael Love, Dan Kerr (Redmond)

REDMOND

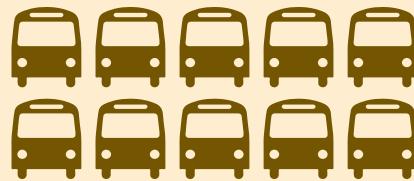
OPERATIONAL IMPROVEMENTS



17 SEC

DELAY REDUCED ON AVERAGE PER TRIP IN THE AM AND PM PEAK BETWEEN SEPTEMBER 2023 AND NOVEMBER 2023

ROUTE BENEFIT



10 BUSES/HR

TRANSIT BENEFITS

DAILY PASSENGER BENEFIT (= 1000 PERSONS)



7,400 RIDERS

16 156TH AVE NE / REDMOND TECH STATION, REDMOND

LEVEL OF COMPLEXITY



GRANT FUNDED
WSDOT REGIONAL MOBILITY GRANT

1

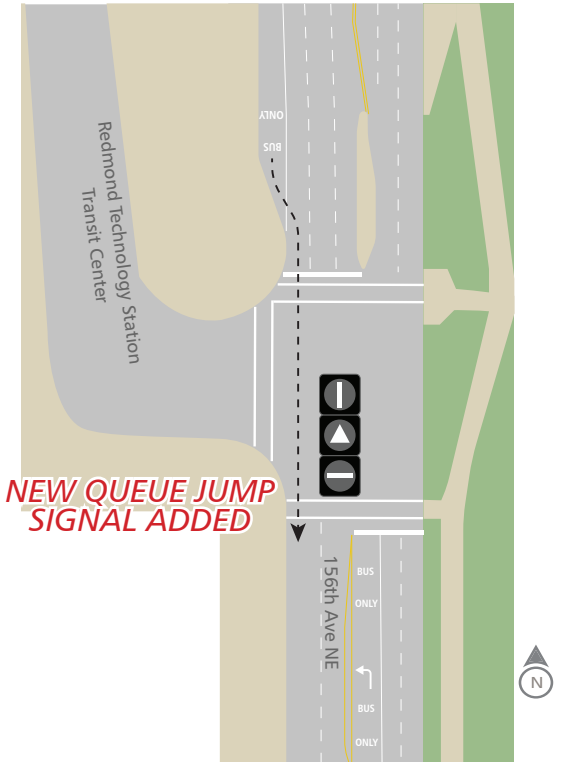
TRAFFIC SIGNALS

PROBLEM STATEMENT

Route 245 and the RapidRide B Line serve a near-side stop while traveling southbound on 156th Ave NE at the Redmond Technology Station. After servicing this pullout stop, operators had difficulty reentering traffic to continue southbound.

IMPROVEMENTS MADE

A queue jump signal was installed in the transit only right turn lane at the intersection. The queue jump allows operators to bypass queued general-purpose traffic by giving buses priority through the intersection prior to the general-purpose green light. This provides an easy merge for buses after servicing the stop.



PROJECT

METRO ROUTES IMPACTED: **245, B LINE**

PROJECT PARTNERS



ACKNOWLEDGMENTS

Hidemi Tsuru, Michael Love, Dan Kerr (Redmond)



REDMOND

TRANSIT BENEFITS

OPERATIONAL IMPROVEMENTS



18 SEC

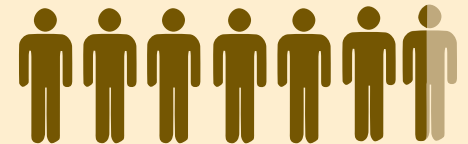
DELAY REDUCED ON AVERAGE PER TRIP IN THE AM PEAK BETWEEN SEPTEMBER 2023 AND NOVEMBER 2023

ROUTE BENEFIT



10 BUSES/HR

DAILY PASSENGER BENEFIT (1 person icon = 1000 PERSONS)



7,400 RIDERS