

## BUS TRAVEL TIME ANALYSIS OVERVIEW

The bus travel time analysis for the corridor alternatives consists of two components: 1) the estimated travel time benefits from bus lane treatments; and 2) the change in corridor travel time based on traffic operations and intersection delay.

The assumptions for each are presented in the following two sections, with the analysis results at the end.

## BASELINE CONDITIONS

Bus travel times and travel speeds for all AC Transit routes in the study area were calculated using stop-level arrival data provided by AC Transit for February 2020. For the analysis of proposed alternatives, the PM peak hour and peak direction were used, and the transit routes with the greatest end-to-end coverage was used as the basis for the analysis. For the Telegraph corridor, Line 6 northbound was used; for the Bancroft corridor, Line 79 northbound was used. The baseline bus travel times and speeds are shown below.

### Baseline bus travel time and travel speeds

Corridor	Bus Route	Direction	Average Time (m:ss), PM Peak	Average Speed (mph), PM Peak
Telegraph Ave.	6	Northbound	3:56	8
Bancroft Way	79	Northbound	5:46	11

*Data from AC Transit for February 2020.*

## SUMMARY OF RESEARCH ON BUS LANE TRAVEL TIME BENEFITS

The following manuals and studies were used as a basis for a qualitative estimate of potential travel time benefits associated with the addition of bus-only lanes along the project corridors:

**Transit Quality and Level of Service Manual, 3<sup>rd</sup> Edition** - The Transit Quality and Level of Service Manual (TQLSM) breaks down some of the travel time benefits associated with bus lane treatments as compared to mixed traffic. The TQLSM methodology starts with a fully grade-separated busway, where buses would operate at 100% of their potential speed. As the bus lane treatment gets closer to mixed traffic, the potential speed drops to about 80% for a median bus lane, 60% for a curb-running bus lane, and about 35% of their potential speed for buses operating within mixed traffic.

**National Association of City Transportation Officials (NACTO)** - The NACTO Transit Street Design Guide offers guidance and considerations for transit amenities such as dedicated bus lane treatments. While the guide does not state specific travel time benefits for bus lanes, it does offer qualitative considerations for assessing various bus lane treatments:

- Curb-running bus lane
  - At intersections with a high volume of turning movements, the curbside lane may need to drop to maintain traffic flow.
  - Curb-running bus lanes are prone to encroachment by loading, deliveries, and taxicabs.

- Offset bus lane
  - Offset bus lanes in commercial areas are prone to encroachment due to double-parking, deliveries, and taxicabs; enforcement is critical.

**Portland, OR** - As part of its Rose Lane Transit Priority Project (2020), the Portland (OR) Bureau of Transportation analyzed the travel time benefits associated with prior bus lane pilot projects. Along the NW Everett corridor, an offset bus lane completed in 2019 has resulted in delay reductions ranging from 25% to 38% across five bus routes, with an average of 31%. Along the SW Madison corridor, a curb-running bus/bike lane implemented in 2019 has resulted in delay reductions ranging from 26% to 76% across four bus routes, with an average of 58%.

**Washington, DC** - The Bus Priority Program Toolbox (2020) completed by the District of Columbia Department of Transportation (DDOT) documents travel time savings by bus lane treatment. For curb-running bus lanes, DDOT estimates a travel time savings of between 10 and 15 percent in areas with high levels of congestion and 5 percent in areas with low congestion. Offset bus lanes were shown to have travel time savings of between 15 and 25 percent in areas of high congestion and 5 percent in areas with low congestion.

## TRAFFIC OPERATIONS

In addition to the changes in bus travel time associated with bus lane conditions, bus travel times will also be affected by overall traffic operations, in particular where buses are in mixed traffic. The results of the Synchro traffic operations analysis were used to estimate changes to intersection delay for end-to-end travel.

## ANALYSIS RESULTS

The table below summarizes the results of the bus travel time analysis for the corridor alternatives along Bancroft Way and Telegraph Avenue.

Corridor	Option	Bus Lane Configuration	Change from Existing Condition	Estimated Travel Time Change		
				Due to Busway (1)	Due to Intersection Traffic Operations	Total
Bancroft Way	1	Fully exclusive, curb-running bus lane along the north side	Extend existing curb-running bus lane	Reduction of approximately 10%/ 35 seconds 10%(2)	N/A (3)	Reduction of approximately 35 seconds
	2	Fully exclusive, floating bus lane along the north side	Reconfigure existing bus lane to place bikeway at north curbside	Reduction of approximately 10%/ 35 seconds (2)	N/A (3)	Reduction of approximately 35 seconds
	3	None	Remove existing bus lane; convert to two-way operations	Increase of approximately 5%/ 20 seconds (2)	Increase of approximately 2.3 minutes	Increase of approximately 2.6 minutes
Telegraph Ave.	1	Floating bus lane with intermittent parking and loading zone pockets. Bus lane used for right turns.	Add bus lane	Reduction of approximately 8%/ 20 seconds	N/A (3)	Reduction of approximately 8%/ 20 seconds
	2	None	Convert to two-way operations	None	Increase of approximately 90 seconds	Increase of approximately 90 seconds
	3	Same as Option 1	Add bus lane	Reduction of approximately 8%/ 20 seconds	N/A (3)	Reduction of approximately 8%/ 20 seconds
	4	Same as Option 1	Add bus lane	Reduction of approximately 8%/ 20 seconds	N/A (3)	Reduction of approximately 8%/ 20 seconds

Notes:

1. For both the Bancroft and Telegraph corridors, a moderate level of congestion is assumed based on the results of the Synchro traffic operations analysis for existing conditions.
2. Bancroft Way has an existing curb-running busway for approximately 0.3 mi. In calculating the travel time benefits, a weighted average calculation was used across the corridor length.
3. Since buses will use the exclusive bus lane and not the general-purpose lane, no additional intersection delay is assumed.