Level-of-Service in Bellevue

Toward a Multimodal Approach to Mobility

MMLOS PRIORITIZING MODAL INVESTMENTS

TRANSPORTATION COMMISSION

MARCH 23, 2017

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MMLOS – PRIORITIZING MODAL INVESTMENTS

Objective at this Workshop:

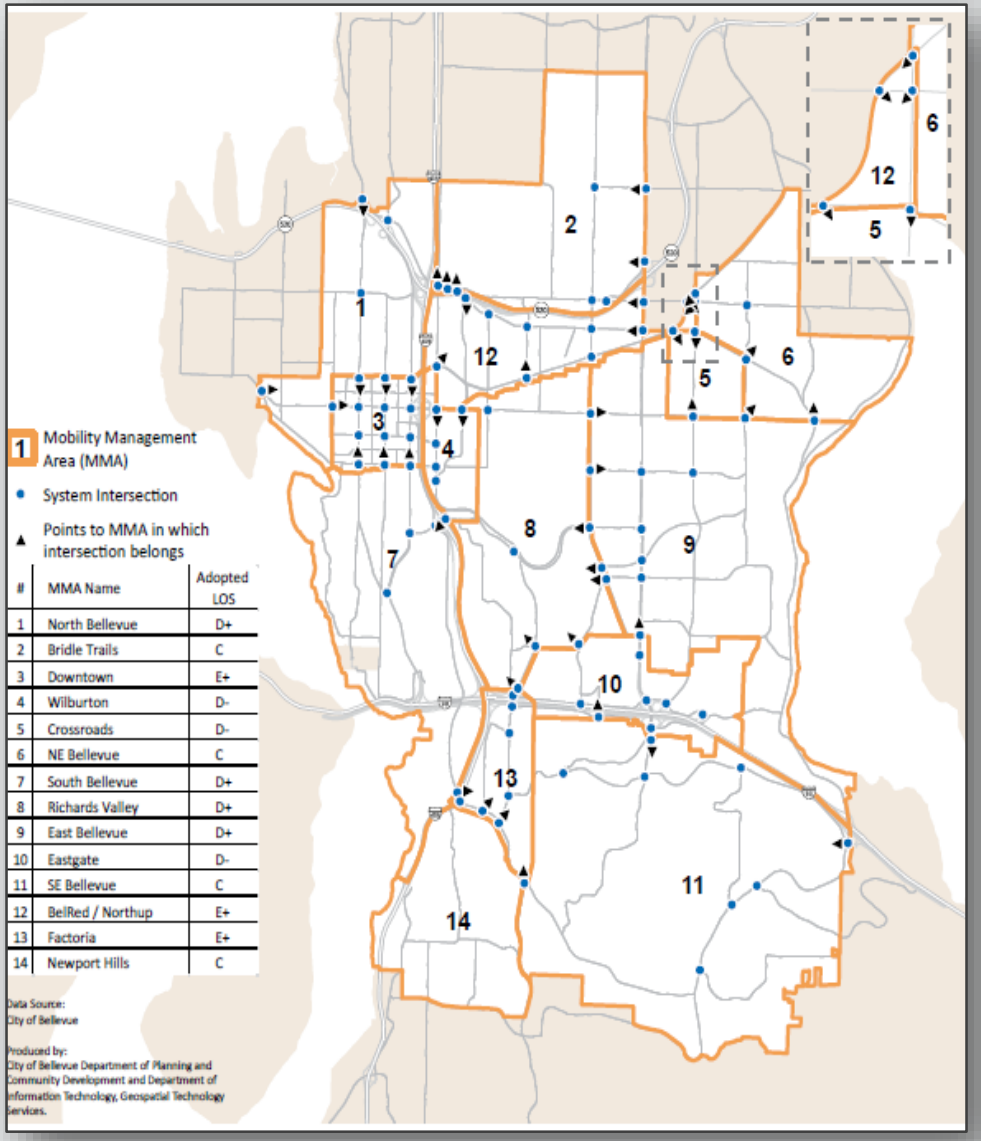
- ❑ **Review** metrics and standards for each mode

PART 1

CONFIRM AND FINALIZE MMLOS RECOMMENDATIONS FOR EACH MODE

VEHICLE LOS RECOMMENDED STANDARDS

- Retain system of Mobility Management Areas and volume/capacity ratio metrics at system intersections for transportation concurrency
- Use average delay at intersections for long range planning and evaluation



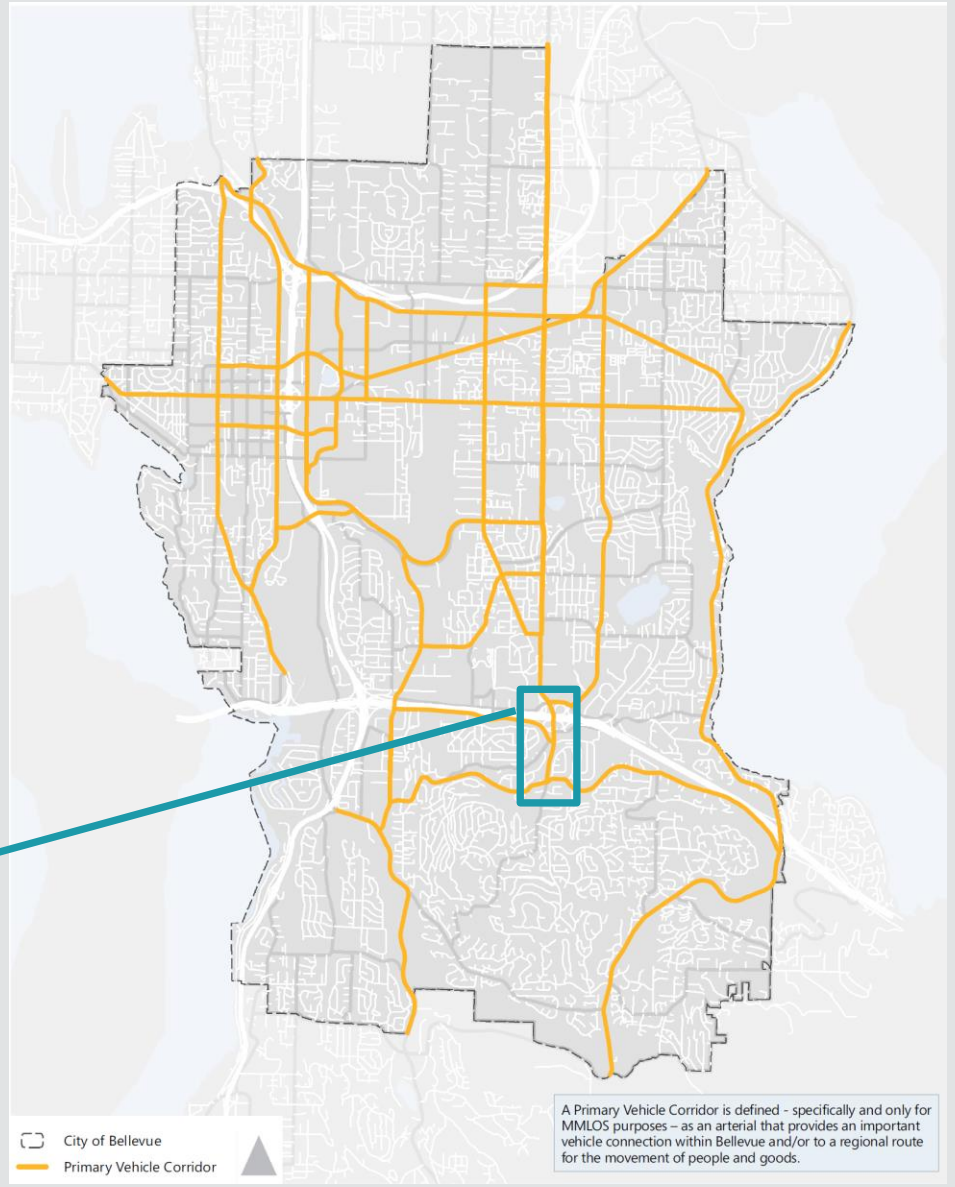
#	MMA Name	Adopted LOS
1	North Bellevue	D+
2	Bridle Trails	C
3	Downtown	E+
4	Wilburton	D-
5	Crossroads	D-
6	NE Bellevue	C
7	South Bellevue	D+
8	Richards Valley	D+
9	East Bellevue	D+
10	Eastgate	D-
11	SE Bellevue	C
12	BelRed / Northup	E+
13	Factoria	E+
14	Newport Hills	C

VEHICLE LOS RECOMMENDED STANDARDS

Designate Primary Vehicle Corridors to evaluate traffic flow to assist in project identification and prioritization

Metric is actual vehicle speed as a percent of "typical urban travel time" along a defined corridor segment

Note: 150th Ave SE Corridor evaluation used travel time to analyze project benefits



PRIMARY VEHICLE CORRIDORS – RECOMMENDED METRIC AND STANDARDS

LOS	Average Speed Along a Defined Corridor Segment 5 Minutes per mile PM Peak is "Typical" urban travel time*
🟢	Less than 90% of typical urban travel time
🟢	90-110% of typical urban travel time
🟡	110-155% of typical urban travel time
🟠	155-200% of typical urban travel time
🔴	More than 200% of typical urban travel time

LOS	Recommended LOS Standard
🟢	North Bellevue, South Bellevue, Richards Valley, East Bellevue, NE Bellevue, Bridle Trails, Newport Hills
🟡	Wilburton, Crossroads
🟠	Downtown, BelRed, Factoria

* Based on the Highway Capacity Manual – Chapter 16

PEDESTRIAN LOS RECOMMENDED STANDARDS

Context: / Component	Downtown	Activity Centers	Neighborhood Shopping Center	Pedestrian Destinations	Elsewhere
Sidewalk Width and Landscape Buffer Width	Meet standards in the Downtown Land Use Code	Meet Land Use Code* or 16 feet for designated arterials in activity center.	13 feet adjacent to shopping center	13 feet total adjacent to pedestrian destination or within 100 feet of a FTN stop	Meet standards in the Design Manual (6-8 foot sidewalk and 4 foot landscape buffer = 10-12 feet total width)
Arterial Crossing Frequency**	Consistent with Downtown Transportation Plan (≤ 300 feet)	≤ 800 feet: Factoria ≤600 feet: Elsewhere	One crossing every 600 feet or less within shopping center area	Within 600 feet of destination's primary entrance. Within 300 feet of bus stop pair on FTN.	Not Applicable
Signalized Intersection Treatment	Meets Downtown Transportation Plan Designation	Meets Land Use Code* or Downtown Transportation Plan Enhanced	Per Design Manual	Per Design Manual	Per Design Manual

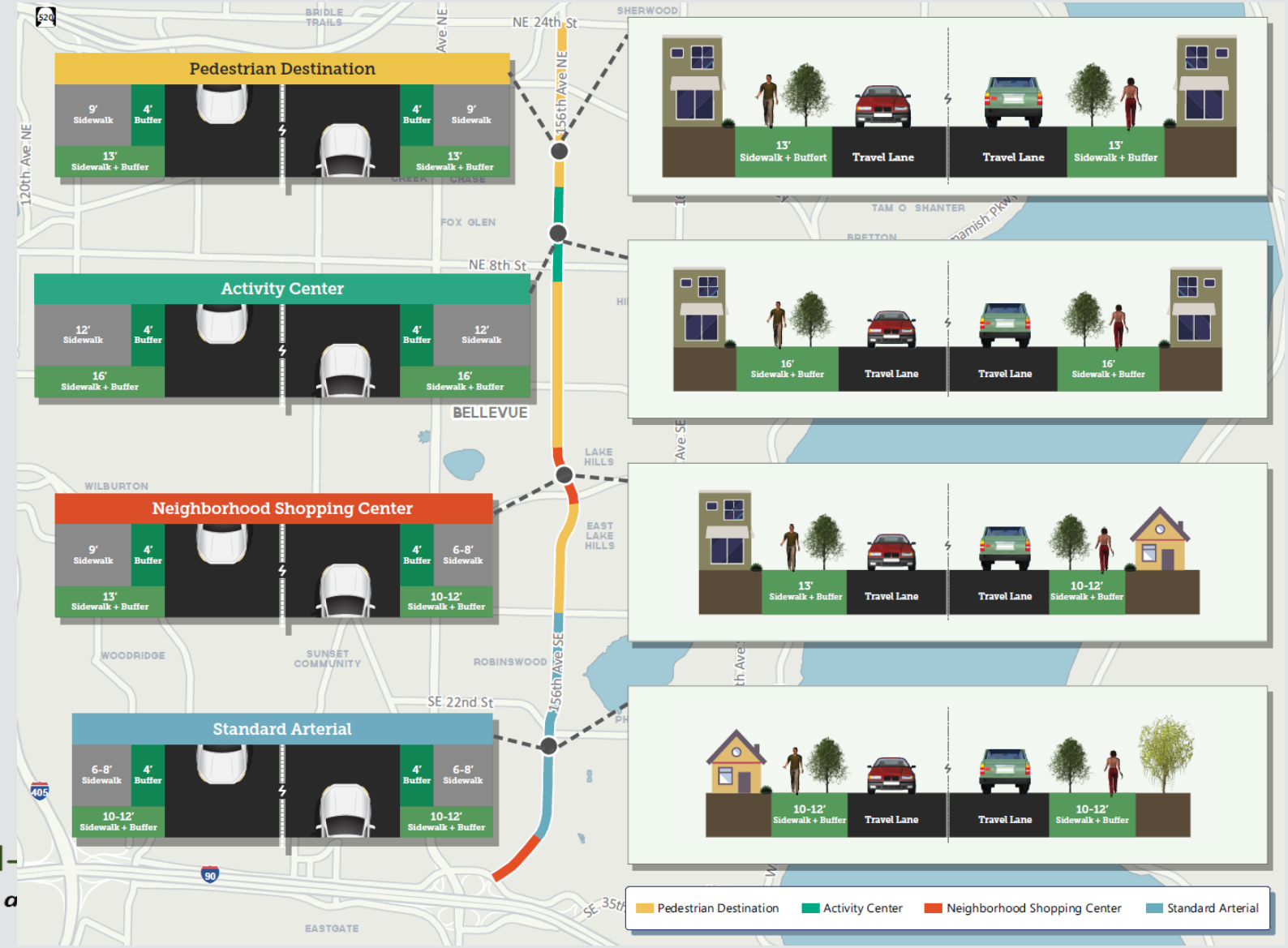
* Meets BelRed Land Use Code in BelRed Subarea

** Must be an appropriately marked and potentially signalized crossing at locations determined by the Transportation Department

PEDESTRIAN NETWORK LAND USE CONTEXT

1. **Downtown**
2. **Activity Center**
   - BelRed
   - Crossroads
   - Factoria
   - Wilburton
   - Eastgate
3. **Neighborhood Shopping Center**
   - Northtowne
   - Lake Hills
   - Newport Hills
   - Other similar centers
4. **Pedestrian Destination**
   - School
   - Park
   - Community Center
   - Frequent Transit Network Stop
   - Trail Crossing
   - Library
5. **Elsewhere in the City**

PEDESTRIAN LOS CROSS-SECTION EXAMPLES



Level-

Toward a

BICYCLE LOS RECOMMENDED CORRIDOR STANDARDS

Speed Limit (mph)	Arterial Traffic Volume*	No Marking	Sharrow Lane Marking	Striped Bike Lane	Buffered Bike Lane	Protected Bike Lane	Physically Separated Bikeway
≤25	<3k	1	1	1	1	1	1
	3-7k	3	2	2	2	1	1
	≥7k	3	3	2	2	1	1
30	<15k	4	3	2	2	1	1
	15-25k	4	4	3	3	3	1
	≥25k	4	4	3	3	3	1
35	<25k	4	4	3	3	3	1
	≥25k	4	4	4	3	3	1
40	Any volume	4	4	4	4	3	1

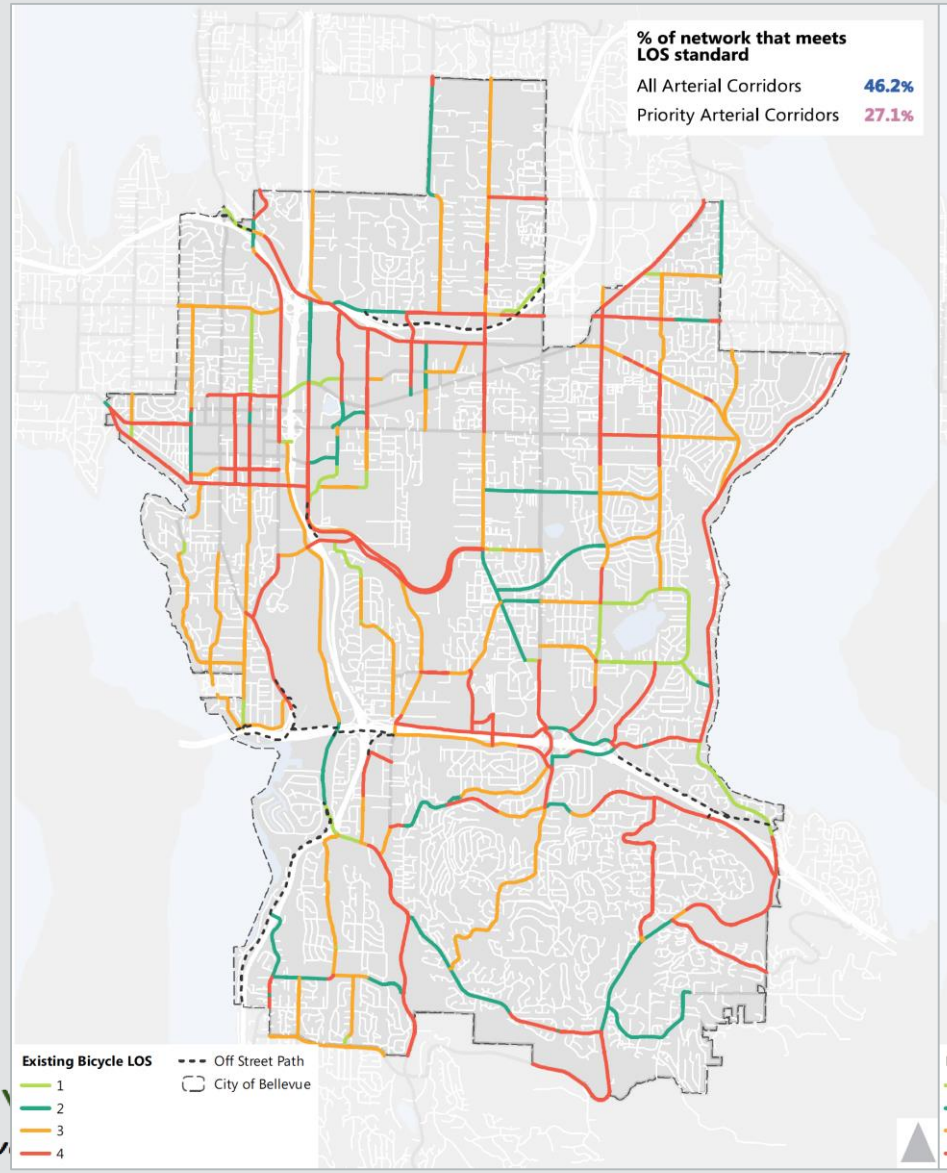
* Approximate volume thresholds
Number in each cell represents Bicycle LOS

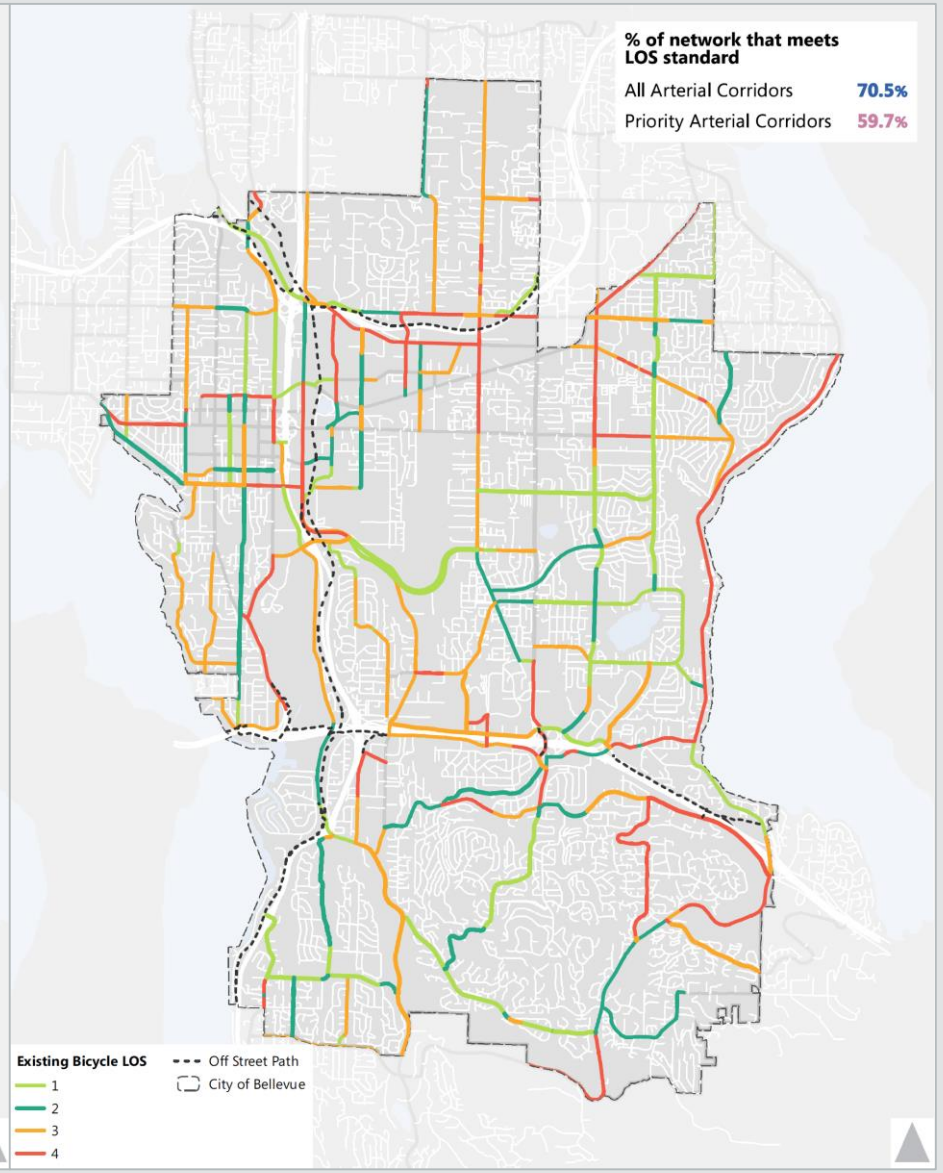
BICYCLE LOS RECOMMENDED INTERSECTION STANDARDS

Crossing Treatment: Bike LOS	Bike Signal	Crossing Treatment	Near-Side Intersection Treatment	Near-Side with Right Turn Lane Treatment
1	Bike signal on near and far side of intersection; leading bicycle phase or other bike-favorable signal timing as appropriate	Green solid or skip stripe	Green bike box; two-stage turn box as appropriate	Dutch intersection design 
		Median refuge Island with RRFB for unsignalized crossings	Curb ramp to wide sidewalk	
2	Bike signal on near and far side of intersection; leading bicycle phase or other bike-favorable signal timing, as appropriate	Dotted line extension/ elephant-foot striping	Standard bike box; two-stage turn box as appropriate	Green bike lane to the left of right turning lane; green skip stripe conflict zone
		Green colored conflict areas with lane markings		
		HAWK or RRFB with median island for unsignalized crossings		
3	Initial green cycle length is adequate for bicycle to clear intersection	Sharrow lane markings	None	For right turn lane >150' through bike lane to left of right turn lane
				For right turn lane < 150' either above treatment or combined bike/turn lane with narrow (4') green striped bike lane
Trail	Signalization as warranted	Green solid or skip stripe	N/A	N/A

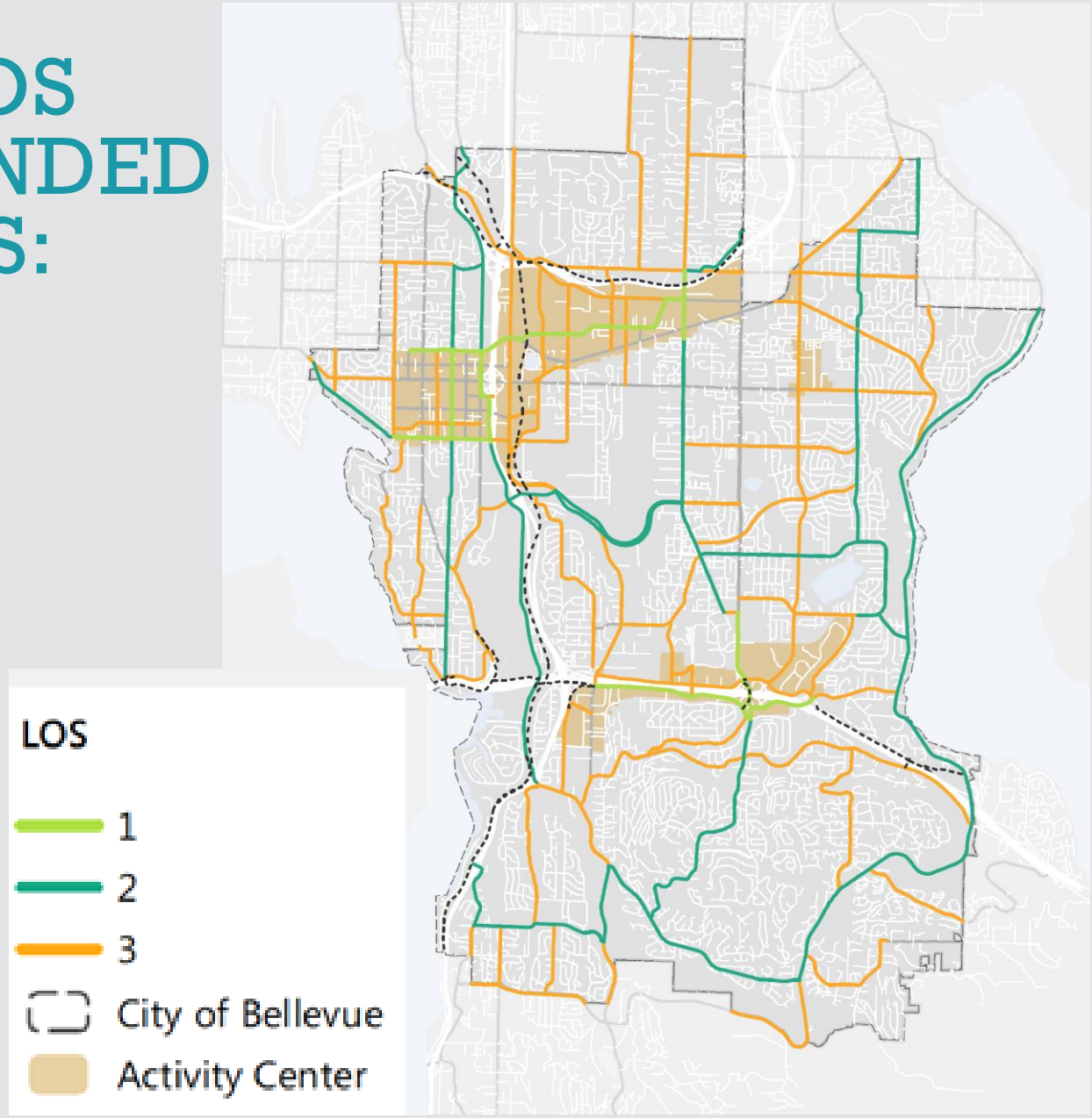
RRFB – **R**ectangular **R**apidly **F**lashing **B**eacon
HAWK - **H**igh-intensity **A**ctivated cross **WalK**

BICYCLE LOS: EXISTING VS BRIP





BICYCLE LOS RECOMMENDED STANDARDS:



TRANSIT LOS: RECOMMENDED STOPS/STATIONS STANDARDS

Context: / Component	Local Stop Transit Master Plan	Primary Stop Transit Master Plan	Frequent Transit/ RapidRide Stop Transit Master Plan
Weather Protection*	Yes, 25+ daily boardings	Yes	Yes
Seating*	Yes, near uses like retail, schools, healthcare, or senior housing	Yes	Yes
Transit Landing Zone**	15-30' long	40' long	60' long
Wayfinding***	No	Yes	Yes

* Building mounted weather protection and seating is preferred where building abuts the back of the sidewalk

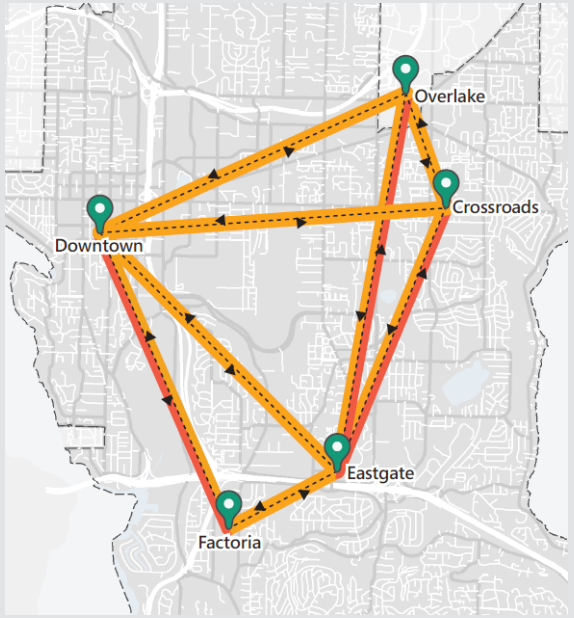
** Passenger Landing Zone is a solid paved surface between the back of curb and sidewalk to facilitate passenger boarding and alighting. The width will match the landscape buffer. Street trees in tree wells will meet the curbside landscape buffer requirement in this zone.

*** To be determined by City staff

TRANSIT LOS: RECOMMENDED SPEED STANDARDS

1. Applied to Frequent Transit Network (FTN) Connections between Activity Centers
2. Based on target speeds in Transit Master Plan
3. Standard: 14 mph or faster on FTN connections

Existing (2016) Transit Speeds



LOS Rating	Speed
	<10 mph
	10-14 mph
	>14 mph

MMLOS RECOMMENDATIONS

End of Part 1

Discussion

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THANK YOU!

CHRIS BREILAND AND DON SAMDAHL

FEHR & PEERS