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TMP Update: Auto Level of Service Options

March 7th, 2022

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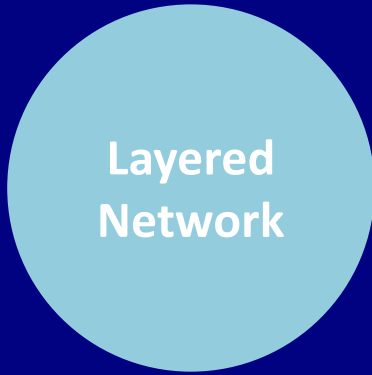
What is the Transportation Master Plan (TMP)?



Project Timeline

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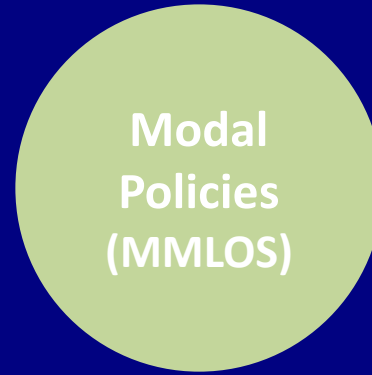




Layered
Network

Define locations of
facilities for each mode

Where to set standards
& expectations



Modal
Policies
(MMLOS)

Define acceptable
facilities for each
mode

What those
standards &
expectations should
be



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MMLOS Policy Considerations

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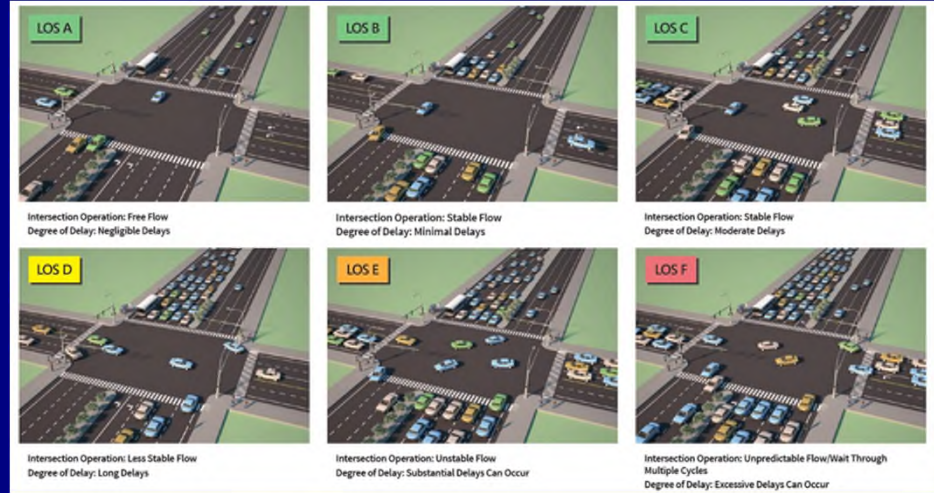
Network	Considerations
Pedestrian	<ul style="list-style-type: none">• Sidewalk Prioritization Plan projects• Land use context and street classification
Bike	<ul style="list-style-type: none">• Low stress/high comfort routes provided as frequently as practical
Transit	<ul style="list-style-type: none">• Existing and future transit service, as reflected in long range plans• Stop amenities dictated by Metro Facility Guidelines
Shared-Use Mobility	<ul style="list-style-type: none">• Mobility hubs• Shared-use mobility service
Auto/Freight	<ul style="list-style-type: none">• Vehicle delay at major intersections, with some flexibility to ensure that roadways are still comfortable for people walking, bicycling, using transit, and other non-vehicle modes• Land use context and street classification

Auto Policy Approach Discussion



What is Level of Service?

- Measures the average delay at an intersection for the highest peak hour of traffic; typically, the PM peak hour.
- Standard measure applied by many communities
- Follows Highway Capacity Manual methodologies

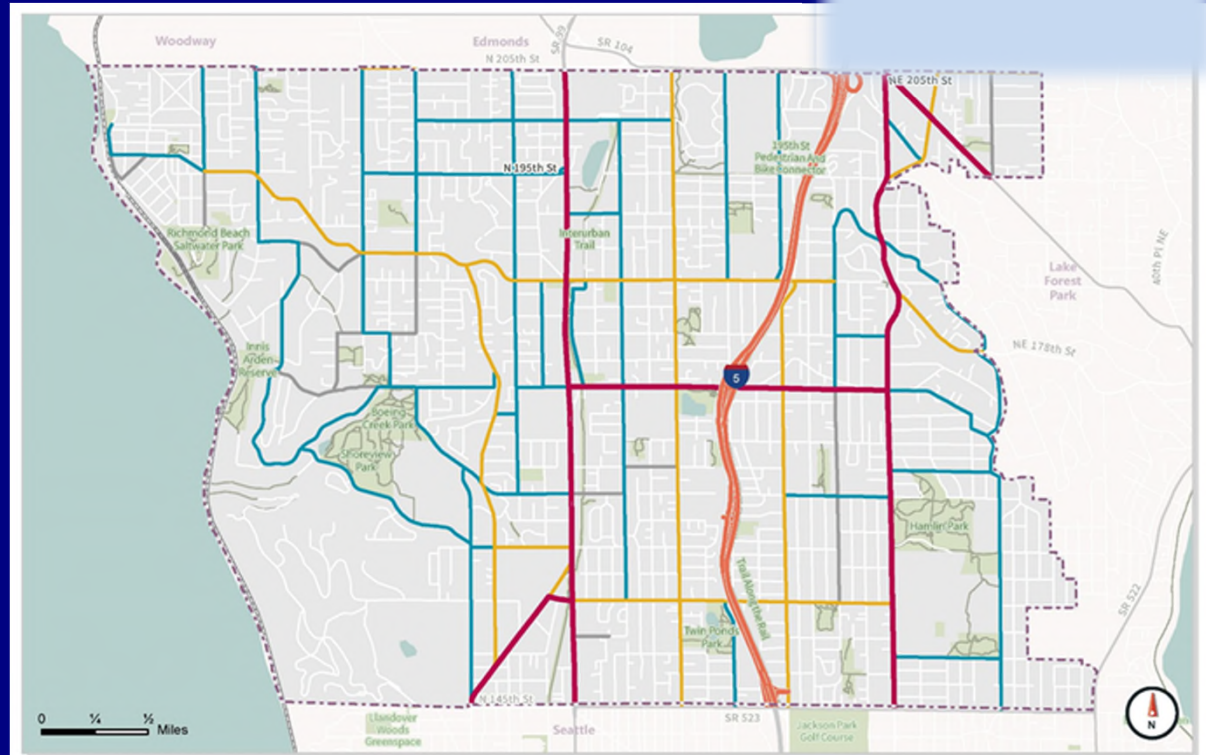


Level of Service	Signalized Intersections (seconds per vehicle)	Stop-Controlled Intersections (seconds per vehicle)
A	≤ 10	≤ 10
B	10 to 20	10 to 15
C	20 to 35	15 to 25
D	35 to 55	25 to 35
E	55 to 80	35 to 50
F	> 80	> 50

Existing Auto Policy

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- LOS D at signalized intersections on arterials and most unsignalized intersecting arterials
- Supplemental policy of V/C Ratio 0.90 or lower for principal & minor arterial segments
 - A few street segments are exempted



Menu of Intersection LOS Options

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Option	Description
1. Individual Intersection Approach (Status Quo)	Continue measuring delay at individual intersections on arterials with universal LOS D standard
2. District Approach by Centers (Preferred)	Continue measuring delay at individual intersections on arterials, but vary allowable LOS by area type: <ul style="list-style-type: none">• Candidate Countywide Centers and State Routes• Rest of the City
3. Districts & Corridor Averaging Approach	Continue measuring delay at intersections on arterials, but vary allowable LOS by area type: <ul style="list-style-type: none">• Residential• Commercial/High Density Measure volume-weighted average along corridors



Option 1: Individual Intersection Approach (Status Quo)

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Pros:

- Simple to oversee and consistent across City.
- Ensures relatively low vehicle delay across the City.

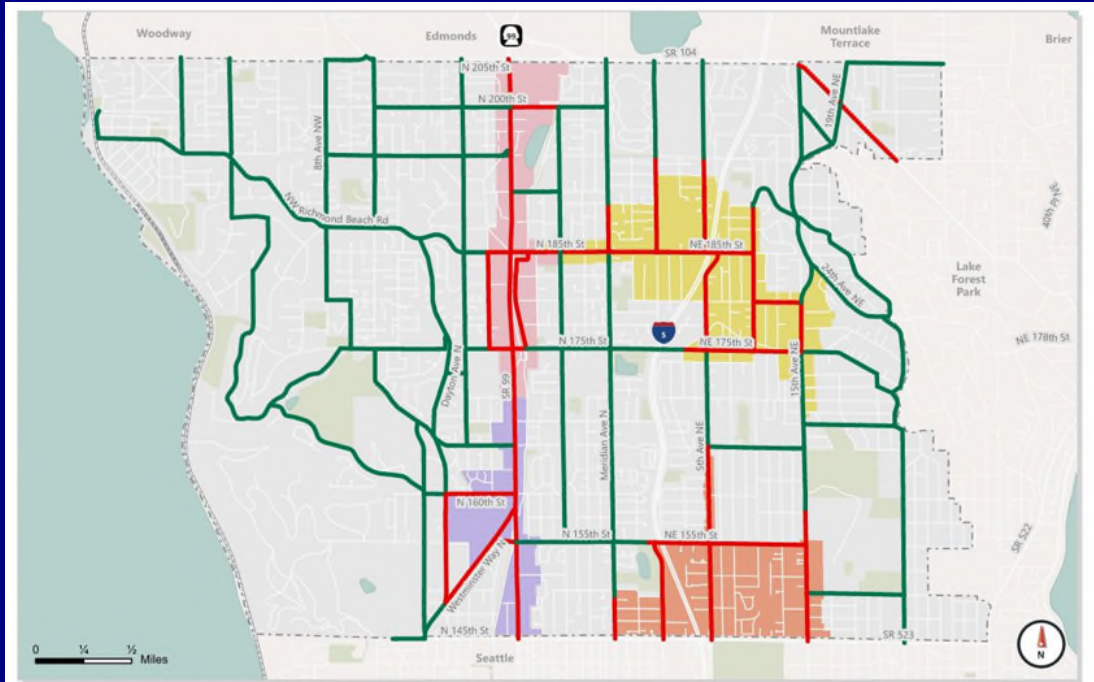
Cons:

- Requires highest number of mitigation projects resulting in high costs to developers and the City.
- Conflicts with other modal goals/priority networks (wider roadways for more vehicle capacity results in worse pedestrian/bicyclist environments).



Option 2: District Approach by Centers

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King County Candidate Countywide Centers

- 148th St Station Area
- 185th St Station Area
- Shoreline Place
- Town Center

City Boundary

Traffic Level of Service Standard

- Intersection LOS D
- Intersection LOS E

City of Shoreline

**Traffic Level of
Service Standard**



Option 2: District Approach by Centers

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Pros:

- Maintains simplicity in development reviews as the measure applies to individual intersections.
- Most context sensitive option - helps avoid building infrastructure that is inappropriate in denser settings, but still requires mitigation in areas with less robust transportation choices.

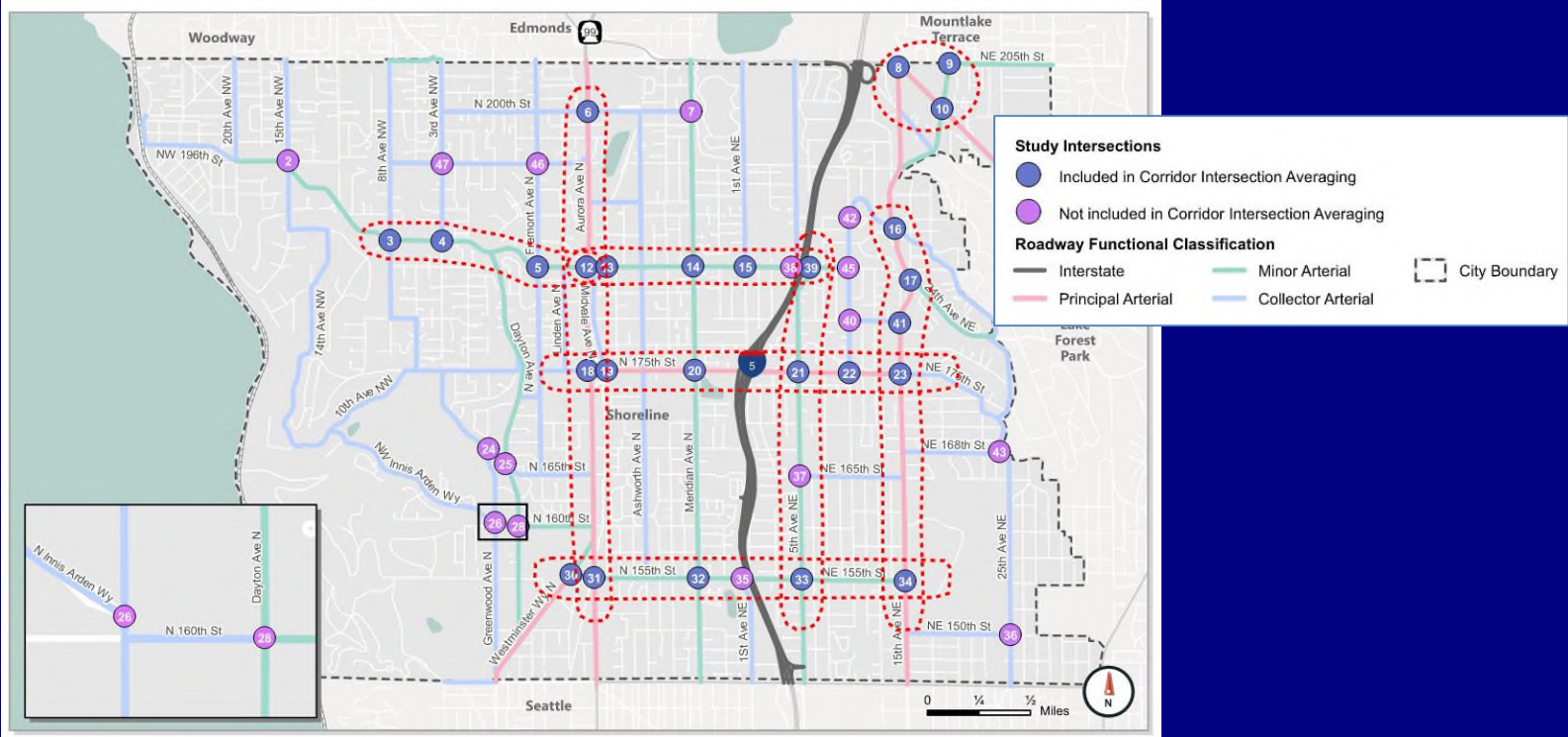
Cons:

- Can potentially lead to “edge issues”.



Option 3: Districts & Corridor Averaging Approach

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Option 3: Districts & Corridor Averaging Approach

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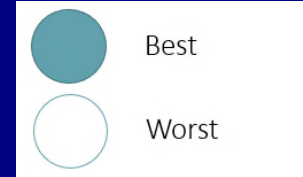
- Pros:
 - Provides flexibility in siting intersection capacity improvements; helps avoid building infrastructure that is inappropriate in denser settings
 - Potentially matches the “driver experience” – it’s delay along a route, not at a single location
- Cons:
 - Adds complexity to development analysis and review
 - Must be carefully crafted to avoid feeling arbitrary
 - Can potentially lead to “edge issues”
 - Allows significantly more vehicle delay than current standard



Comparison of Intersection LOS Options

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Option	Promotes Vehicle Capacity	Context Sensitive	Avoids Perception of Arbitrariness	Lower Capital Cost to Meet Targets
1. Individual Facilities/ Intersection Approach (Status Quo)				
2. District Approach by Centers (Preferred)				
3. Districts & Corridor Averaging Approach				

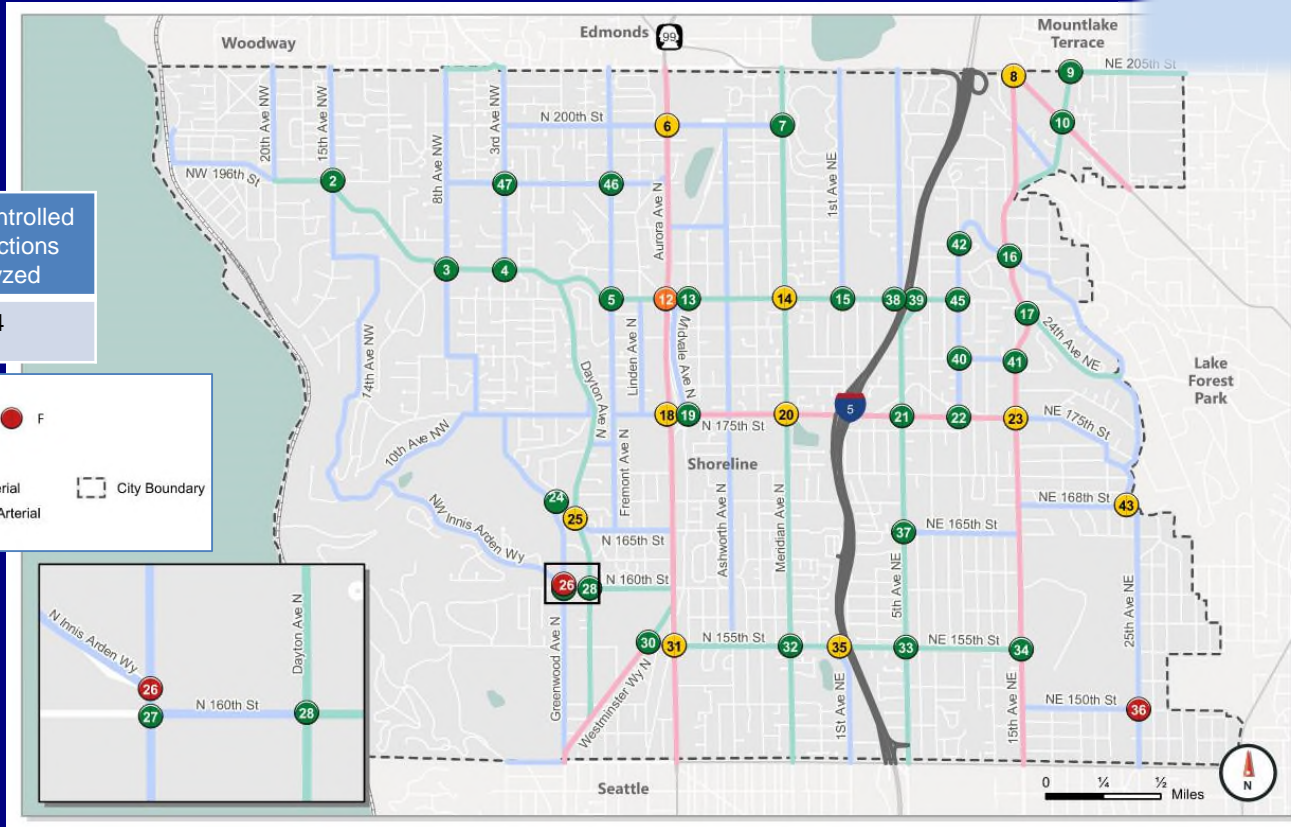


Modeling Analysis & Technical Findings



2019 Existing PM LOS

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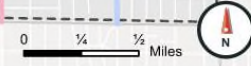
Signalized Intersections Analyzed	Stop Controlled Intersections Analyzed
28	14

Level of Service

- A - C (Green)
- D (Yellow)
- E (Orange)
- F (Red)

Roadway Functional Classification

- Interstate (Thick black line)
- Principal Arterial (Red line)
- Minor Arterial (Green line)
- Collector Arterial (Blue line)
- City Boundary (Dashed line)



2044 Baseline PM LOS

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Signalized Intersections Analyzed	Stop Controlled Intersections Analyzed
28	14

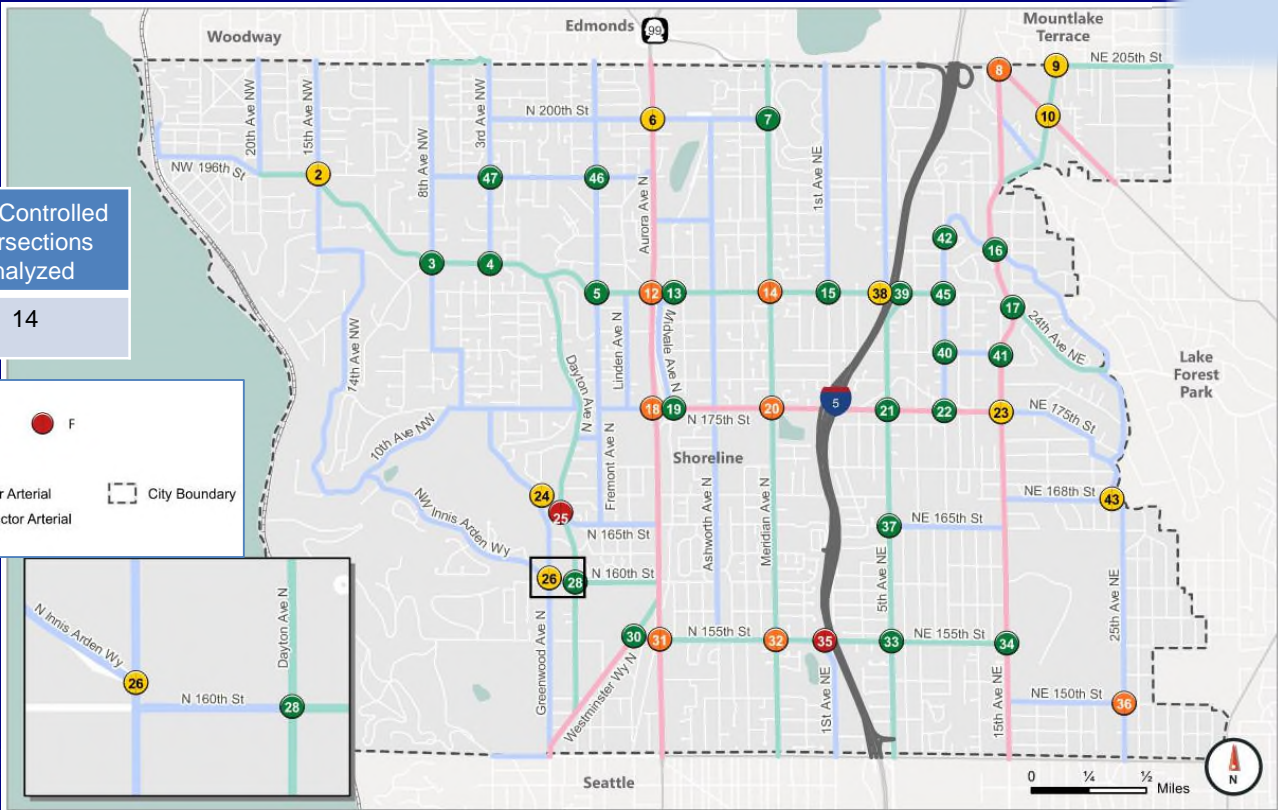
Level of Service

● A - C
 ● D
 ● E
 ● F

Roadway Functional Classification

— Interstate
 — Minor Arterial
 City Boundary

— Principal Arterial
 — Collector Arterial



#26 Dayton/Greenwood/Innis Arden intersection is assumed to be a roundabout under future conditions.

2044 Intersection Impacts Summary – Example

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LOS Option	Corridors	Signals	Stop- Controlled	Total Int's Needing Imp.
1. Individual Intersection Approach (Status Quo) LOS D or better (all intersections*)	-	3 of 28	3 of 14	6 of 42
2. District Approach by Centers (Preferred) LOS E or better (State Highways & Candidate Countywide Centers) LOS D or better (everywhere else)	-	2 of 28	3 of 14	5 of 42
3. Districts & Corridor Averaging Approach LOS D or better (isolated intersections) LOS E or better (averaging signals along corridors)	0 of 8**	0 of 28	3 of 14	3 of 42



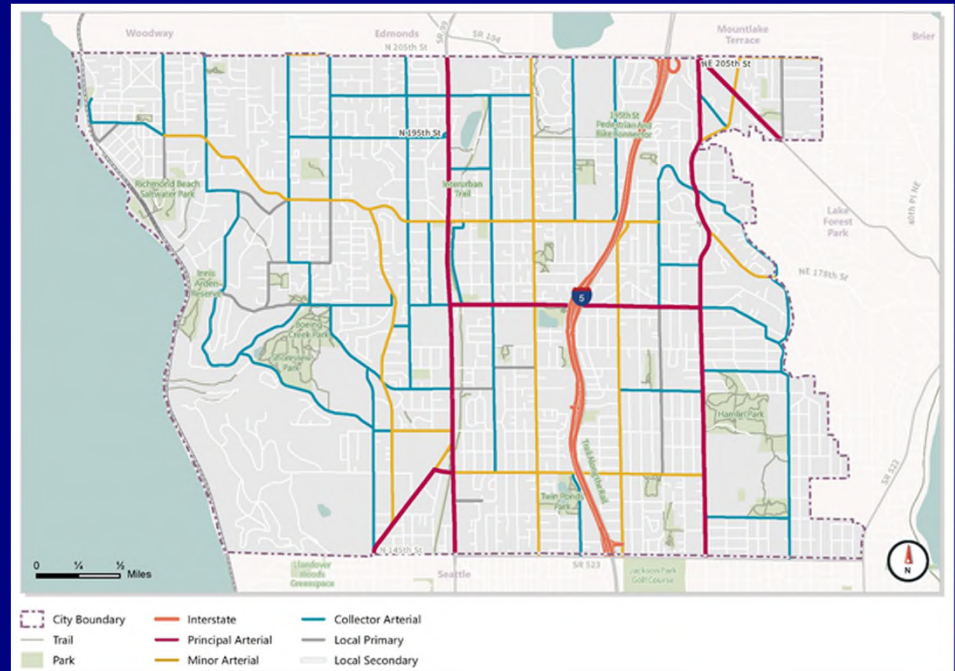
**Except those that are exempted along 15th and Dayton, and Aurora, which is a Highway of Statewide Significance*
***26 signalized study intersections are evaluated across 8 corridors*

Supplementing Intersection LOS - V/C Ratio

V Peak hour traffic **volume**
in peak direction

C Theoretical **capacity** in
peak hour direction

Current standard – V/C of
0.90 or lower on Principal and
Minor Arterials



Menu of Supplemental V/C Options

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Alternative	Description
Option 1: V/C ratio for principal/minor arterials (Status Quo)	Continue using V/C Ratio of 0.90 or lower for principal/minor arterials.
Option 2: V/C ratio for Principal/Minor arterials – District Approach by Centers (Preferred)	V/C Ratio of 1.10 or lower for principal/minor arterials in Candidate Countywide Centers and along State Routes. V/C Ratio of 0.90 or lower for principal/minor arterials everywhere else. Consistently relates to intersection LOS.
Option 3: No supplemental measure	Remove V/C measure altogether



Option 1: V/C Ratio 0.90 or lower for Principal & Minor Arterials (Status Quo)

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Pros:

- Provides a non-intersection based metric for Principal and Minor Arterials



Cons:

- Simplistic methodology prescribes one solution to mitigate impacts (typically roadway widening) which conflicts with modal priorities in growth areas
- Adhering to 0.90 standard in areas of growth may be cost prohibitive given necessary ROW acquisition to accomplish widening
- Adds complexity to development review and is not an industry standard



Option 2: Refined V/C ratio for Principal & Minor Arterials in Centers (preferred)

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Pros:

- Provides non-intersection-based metric for Principal and Minor Arterials
- More context sensitive: helps avoid building infrastructure that is inappropriate in a setting
- Consistent with intersection LOS standard



Cons:

- Prescribes one solution to mitigate impacts (typically roadway widening)
- Adds complexity to development review and is not an industry standard



Option 3: Remove V/C Ratio as a supplemental LOS standard

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Pros:

- Removes a metric that is not routinely applied as an industry standard
- Simplifies development review
- Does not force a solution of widening corridors to achieve the standard
- Avoids building infrastructure that is inappropriate in a setting

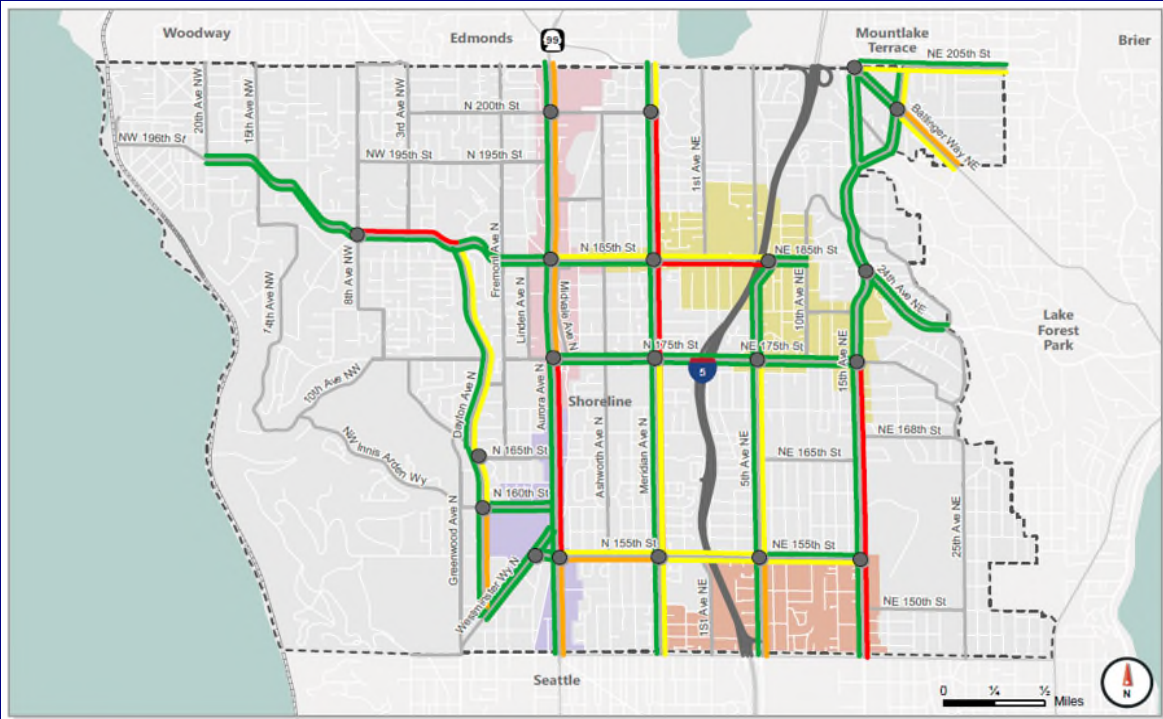
Cons:

- Removes a non-intersection-based metric for Principal and Minor Arterials



Segment V/C Results (2044)

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City Boundary
King County Candidate Countywide Centers

- 148th St Station Area
- 185th St Station Area
- Shoreline Place
- Town Center

Intersections used to estimate segment volumes

V/C Ratio

- <= 0.8
- 0.8 - 0.9
- 0.9 - 1.0
- > 1.0

**Roadway Segment
Volume-to-Capacity Ratio (2044)**

- Current exemptions from 0.90 V/C standard:
- 15th Ave NE (NE 150th St to NE 175th St)
 - Dayton Ave N (N 175th St to N 185th St)



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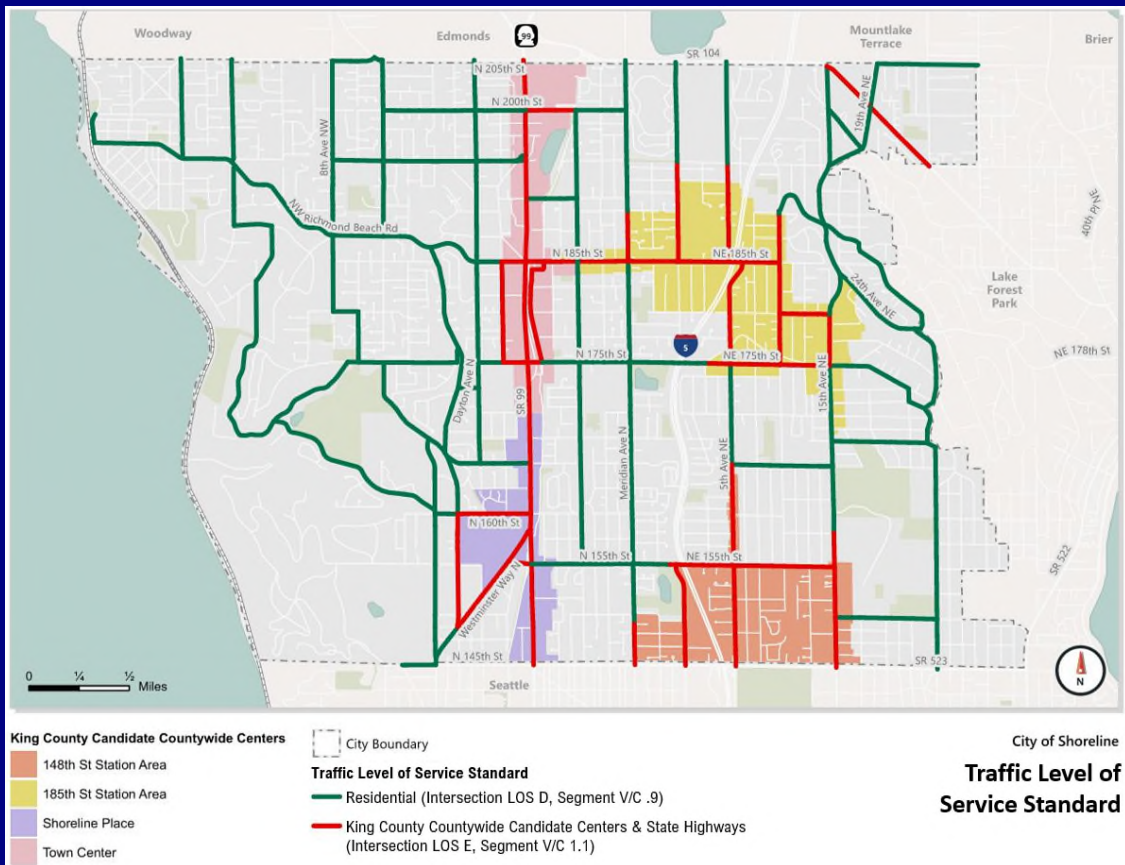
2044 Intersection Impacts Summary – Example

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Supplemental LOS Option	Corridors Requiring Vehicle Capacity Improvements or Exemption
1. V/C of 0.90 or lower	9
2. V/C Consistent with District Approach by Centers (Preferred) 1.10 or lower (State Highways & Candidate Countywide Centers) 0.90 or lower (everywhere else)	4
3. Remove V/C	0 - NA

Summary

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Staff Preference - District Approach by Centers

Arterial Intersections:

- LOS E for intersections within Candidate Countywide Centers and on State Routes
- LOS D for the rest of the City

Principal & Minor Arterial Segments:

- V/C 1.10 within Candidate Countywide Centers and on State Routes
- V/C 0.90 for the rest of City

Next Steps

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- Return to Council in late March & early April
- Draft prioritization process
- Draft modal plans and policies
- Conduct Outreach Series 3



Discussion

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Thank you!

Contact

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Visit the project webpage at
shorelinewa.gov/tmp