King County

Annual Report

Transportation Concurrency Management Program

2012 Annual Update

September 2012

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Introduction

Since 1995, the King County Department of Transportation's Transportation Concurrency Management (TCM) Program has been reviewing development proposals to ensure that an adequate road network is available to accommodate any additional traffic associated with the proposals. These efforts satisfy the requirements of the 1990 Growth Management Act, Revised Code of Washington 36.70A.070(6)(e), and the concurrency policy contained in the King County Comprehensive Plan. This annual report on TCM satisfies King County Code 14.70.270.B, which requires an annual report explaining the technical assumptions and parameters used to update the concurrency map that serves as the County's basis for determining concurrency.

The current *2010 Transportation Concurrency Map*, effective June 1, 2011, was based on travel time data collected in the spring 2010. The 2011 Transportation Concurrency Update included a revised *Transportation Concurrency Travel Shed Boundaries* map adopted in January 2012, reflecting boundary changes due to several major annexations that became effective in 2010 and 2011. The 2012 Annual Update contains both a *2012 Transportation Concurrency Map* (see Attachment A) and a revised *Transportation Concurrency Travel Shed Boundaries* map (see Attachment B).

Changes and Findings

The 2012 data collection effort marked the first time since 2009 that all TCM program monitored roads were sampled. Data was collected on all principal and minor arterial corridors in unincorporated King County and selected state highways during the spring 2012. However, due to resource constraints, the TCM program limited the number of days travel time data were collected. A process was developed to identify roads that would be driven two to three days each in 2012. Criteria used to identify the roads for which more days driving would be done are as follows:

- Routes located in failing travel sheds.
- Routes that failed the urban or rural level of service (LOS) standard in 2010.
- Routes that were at the urban or rural LOS standard in 2010.
- Routes connected to one of the above routes.

For all other routes, travel time data was collected in one day. Routes within annexation areas that would become incorporated in 2012 were not sampled, nor included in the concurrency testing.

Five travel sheds are failing the concurrency test in 2012, compared with four in 2010. The same four travel sheds from 2010 remain out of compliance in 2012. The one new travel shed that is failing in 2012 was also failing in 2009 before passing in 2010. The travel shed that had a status change this year had routes at the compliance standard in 2010, with fluctuations in annual traffic volume contributing to the change in status. Several other travel sheds that are passing in 2012 have routes that are more congested then they were in 2010. This follows a trend from flat traffic volumes to more fluctuating traffic volume growth while the region slowly recovers from the economic downturn of recent years.

Summary of Results

Concurrency Testing Results

The 2012 transportation concurrency test results are shown on the table, Attachment C, titled *2012 Transportation Concurrency Test by Travel Shed.* Five of the twenty-five total travel sheds tested failed the test. Of the twenty travel sheds passing the concurrency test, all but two passed with more than 90 percent of the road mileage meeting concurrency LOS standards. In the Rural Area all rural mobility areas passed the 2012 concurrency test. These areas include Rural Towns (Fall City in Travel Shed 15, Snoqualmie Pass in Travel Shed 23, and Vashon in Travel Shed 1) with a LOS standard of E, and selected Rural Neighborhood Commercial Centers (Cottage Lake in Travel Shed 10, Cumberland in Travel Shed 20, Maple Valley in Travel Sheds 7 and 18, and Preston in Travel Sheds 15 and 18) with a LOS standard of D. Only Cottage Lake lies within a failing travel shed, yet the mobility area passes the concurrency test. Of the twenty-five travel sheds tested for transportation concurrency, six are all or predominantly urban, three are a mix of urban and rural, and sixteen are all or predominantly rural.

Travel sheds with more than 15 percent of total mileage failing concurrency LOS standards are identified as failing travel sheds. The failing travel sheds are indicated by crosshatching on the attached map titled *2012 Transportation Concurrency Map.* Data were collected on principal and minor arterials, and on designated state highways that function like county arterials. A summary of travel sheds failing in 2012 is shown in the table below.

Travel Sheds Failing in 2012

Travel Shed (shed #)	County Location	Percentage of Travel Shed Miles Failing	Number of Failing Travel Shed Routes	Total Travel Shed Routes
Green River Valley (5)	Southwest	32.35%	3 (*)	8
Sammamish Valley (9)	Northeast	33.27%	2 (*, **)	7
Woodinville (10)	Northeast	19.56%	5	15
Novelty Hill (11)	Northeast	22.70%	3	16
Newcastle/East Renton (12)	Southeast	24.04%	3 (**)	12

* City involvement

** State involvement

The five travel sheds in the table above are failing because of high traffic volumes and congestion at key intersections; this is shown on Attachment D, the map titled *Routes Causing Travel Shed Concurrency Failure 2012.* The following is a brief summary of the five failing travel sheds and the associated causes.

- In the Green River Valley travel shed, there are three routes (shown on the map as routes 1, 2, and 3) failing the rural LOS standard of B. One is on 83rd Avenue South (southbound) approaching South 277th Street, the second is on South 277th Street (eastbound) approaching West Valley Highway and State Route 167, and third is West Valley Highway approaching South 277th Street.

- In the Sammamish Valley travel shed, congestion at the intersection of State Route 202 and Northeast 124th Street along State Route 202 (southbound) and on Northeast 124th Street (eastbound) is causing two routes (4 and 5 on the map) to fail the rural LOS standard B.
- In the Woodinville travel shed, there are five routes failing the rural LOS standard B. Congestion at the intersection of Avondale Road Northeast and Northeast Woodinville Duvall Road is causing both roadways (routes 7 and 8 on the map) to fail the rural LOS standard B. In addition, Northeast 132nd/133rd Street (6 on the map) fails due to traffic flow at two intersections, Bear Creek Road and Avondale Road. A section of Novelty Hill Road (10 on the map) east of the urban planned developments also fails due to slow uphill traffic on a winding, steep grade with a low speed limit. Westbound on NE 124th Street/West Snoqualmie Valley Road from State Route 203 to Novelty Hill Road (9 on the map) fails due to delay at the signalized intersection of NE 124th Street at West Snoqualmie Valley Road.
- In the Novelty Hill travel shed, three routes are failing the rural LOS standard B. The section of the Novelty Hill Road route (10 on the map) east of the urban planned developments fails due to slow uphill traffic on a winding, steep grade with a low speed limit. The westbound direction on Novelty Hill Road from Redmond City Limits to near Redmond Ridge (11 on the map) is failing due to heavy traffic exacerbated by construction at 196th Avenue Northeast and delay at the 208th Avenue Northeast intersection. Also, Northeast 132nd/133rd Street (6 on the map) fails due to traffic flow at two intersections, Bear Creek Road and Avondale Road.
- In the Newcastle/East Renton travel shed, three routes are failing the rural LOS standard B. On 164th Avenue Southeast (12 on the map) southbound fails approaching the intersection at Southeast 128th Street due to traffic flow at the intersection. State Route 900 routes (13 and 14 on the map) fail in the eastbound and westbound directions approaching 164th Avenue Southeast due to the traffic flow at the intersection. The route from 164th Avenue Southeast to May Valley Road (14 on the map) fails in the eastbound direction as well due to flow approaching May Valley Road.

Two of the route failures are on state highways (State Route 202 and State Route 900), and two of the key intersections (Northeast 124th Street at State Route 202 and 83rd Avenue South at South 277th Street) are located within city limits (Redmond and Auburn, respectively) or involve the cities on one or more legs of the intersection. Consequently, these situations require coordination between King County and the other jurisdictions to complete projects that could bring a failing route into compliance. The Washington State Department of Transportation and cities of Auburn, and Redmond have LOS standards and concurrency processes different than King County, which complicates the coordination effort.

Also noteworthy is that four of the five failing travel sheds are in predominantly rural areas. The routes that fail in rural travel sheds are failing the rural LOS standard B. Several of the rural roads with failing routes connect two urban areas. For example, State Route 202 connects the cities of Woodinville and Redmond. This roadway carries urban commuter traffic through an area designated primarily as rural. South 277th Street runs across the Green River Valley and acts as an urban connector through preserved farmlands that are islands of rural designation in the urban area.

Travel Sheds Changes from 2010 to 2012

Four travel sheds failed the transportation concurrency test in 2010, and five travel sheds fail in 2012. The following table identifies the changes in travel shed failing mileage.

Travel Shed Changes

Travel Shed (shed #)	2010 Status	2012 Status	2010 Percentage of Travel Shed Miles Failing	2012 Percentage of Travel Shed Miles Failing
Vashon (1)	Pass	Pass	4.79%	11.52%
Green River Valley (5)	Fail	Fail	22.62%	32.35%
Soos Creek (7)	Pass	Pass	2.15%	8.81%
Woodinville (10)	Fail	Fail	18.18%	19.56%
Novelty Hill (11)	Fail	Fail	20.18%	22.70%
Newcastle/East Renton (12)	Pass	Fail	2.48%	24.04%
Union Hill/202 (14)	Pass	Pass	7.63%	9.31%
Duvall (16)	Pass	Pass	0%	11.61%
Snoqualmie Valley (17)	Pass	Pass	0%	2.69%
Tiger Mountain (18)	Pass	Pass	4.92%	9.90%
Klahanie/Eastgate (25)	Pass	Pass	6.75%	0%

The one travel shed that passed in 2010 but is now failing in 2012 is Newcastle/East Renton (12). The Newcastle/East Renton travel shed was passing in 2010 with only 2.48 percent of the road mileage not meeting standards, but in 2012 24.04 percent is failing. Increased traffic volume and congestion near the intersection of State Route 900 and 164th Avenue Southeast was enough to result in a change from LOS B in 2010 to a LOS D (on the west approach to 164th) and LOS E (on the east approach to 164th) with the corresponding change in travel shed status in 2012. Also contributing to the high failing percentage in this shed is the change on 164th Avenue Southeast.

Of the remaining 10 travel sheds in the *Travel Shed Changes* table, all but one experienced an increase in percentage of travel shed miles failing the transportation concurrency standard. That one travel shed is Klahanie/Eastgate (25) where the South Bellevue (Eastgate) annexation to Bellevue eliminated the only failing route in that travel shed. This one travel shed and Newcastle/East Renton (12) were the only travel sheds where annexations eliminated failing road mileage. However, in Newcastle/East Renton (12) other routes failed the LOS standard causing the failing percentage to increase, and the travel shed to fail the concurrency test. The remaining travel sheds experienced an increase in failing mileage from 2010 to 2012 due to routes changing from passing to failing the rural standard LOS B.

Trends in Travel Time

An analysis of the concurrency and LOS changes between 2010 and 2012 indicates they are related to transportation trends throughout the Seattle Metropolitan region. A combination of factors, from the economic downturn to high gas prices, seems to be altering commuting habits and affecting traffic volumes and travel times on the roadways. During 2008 and early 2009, the Washington State Department of Transportation studied travel time on area freeways and found travel times during commute hours were down on a majority of routes ("Economic Downturn

Reduces Travel Demand in the Central Puget Sound," by the Washington State Transportation Center, April 2009, http://tinyurl.com/ntw29k). This mirrored a national trend identified by the 2009 Urban Mobility Report published by the Texas Transportation Institute ("Economic Factors Tap the Brakes on Traffic Congestion," July 2009, http://mobility.tamu.edu/ums/media_information/press_release.stm).

King County's 2011 and 2012 traffic count data generally confirms the continued effects of the economic downturn, but with slightly increased traffic. In March and April 2010, the same months the TCM program collected travel time data, the Road Services Division's (RSD) Traffic Engineering Section collected traffic counts in eight key locations on arterials throughout King County for which travel time data were also collected. From 2008 to 2009, there was a major reduction in traffic on all measured routes. From 2009 to 2010, half of the counts increased and half decreased, with the total volume for all eight count locations remaining virtually unchanged. While the 2011 and 2012 counts showed further increases in volume, the volume has not reached levels attained prior to 2009.

Identification of Needed Transportation Improvements

A component of the TCM program is the identification of potential transportation improvements needed to bring failing travel sheds back into compliance, with an emphasis on the road corridor routes, or segments, that cause the travel sheds to fail. The failing travel sheds and their failing routes are illustrated in the map, Attachment D, titled *Routes Causing Travel Shed Concurrency Failure 2012*. Also Attachment E is a *Project List for Achieving Concurrency Compliance in Failing Travel Sheds Summary Table*, which identifies the problem locations, possible road improvements to solve the problems, preliminary estimated costs, and priorities.

Several of the potential road improvements to address transportation concurrency failures within the unincorporated area cannot be implemented by King County because they are on a state highway or within cities; this information will be communicated by the RSD to these jurisdictions. In addition, most of the state, city or county projects are unfunded at this time. Having a rural LOS standard of B in areas carrying urban level traffic may make infeasible the scale of improvements required for compliance with the King County LOS standard. More information on how needed improvements were identified is contained in Attachment F, the Technical Appendix.

Revised Transportation Concurrency Travel Shed Boundaries Map

King County Code (KCC) 14.70.230.B references a map adopted by the King County Council that identifies the boundaries of each of the 25 travel sheds used for transportation concurrency testing within unincorporated King County. The current *Transportation Concurrency Travel Shed Boundaries* map was adopted by the King County Council in January 2012. The transportation concurrency test for King County cannot include any roadways within incorporated areas. To be consistent with testing procedures, the boundaries map is being updated to reflect conditions through 2012.

Several annexations affecting King County principal and minor arterials have occurred in 2011 and 2012, or will occur in 2012:

Annexations

Annexation Area	City Annexing	Effective Date of Annexation	Travel Shed Affected
South Bellevue	Bellevue	June/August 2012	Klahanie/Eastgate (25)
Enumclaw	Enumclaw	2011/2012	Enumclaw (20)
South Bothell	Bothell	December 2012	Bothell/I-405 (8)

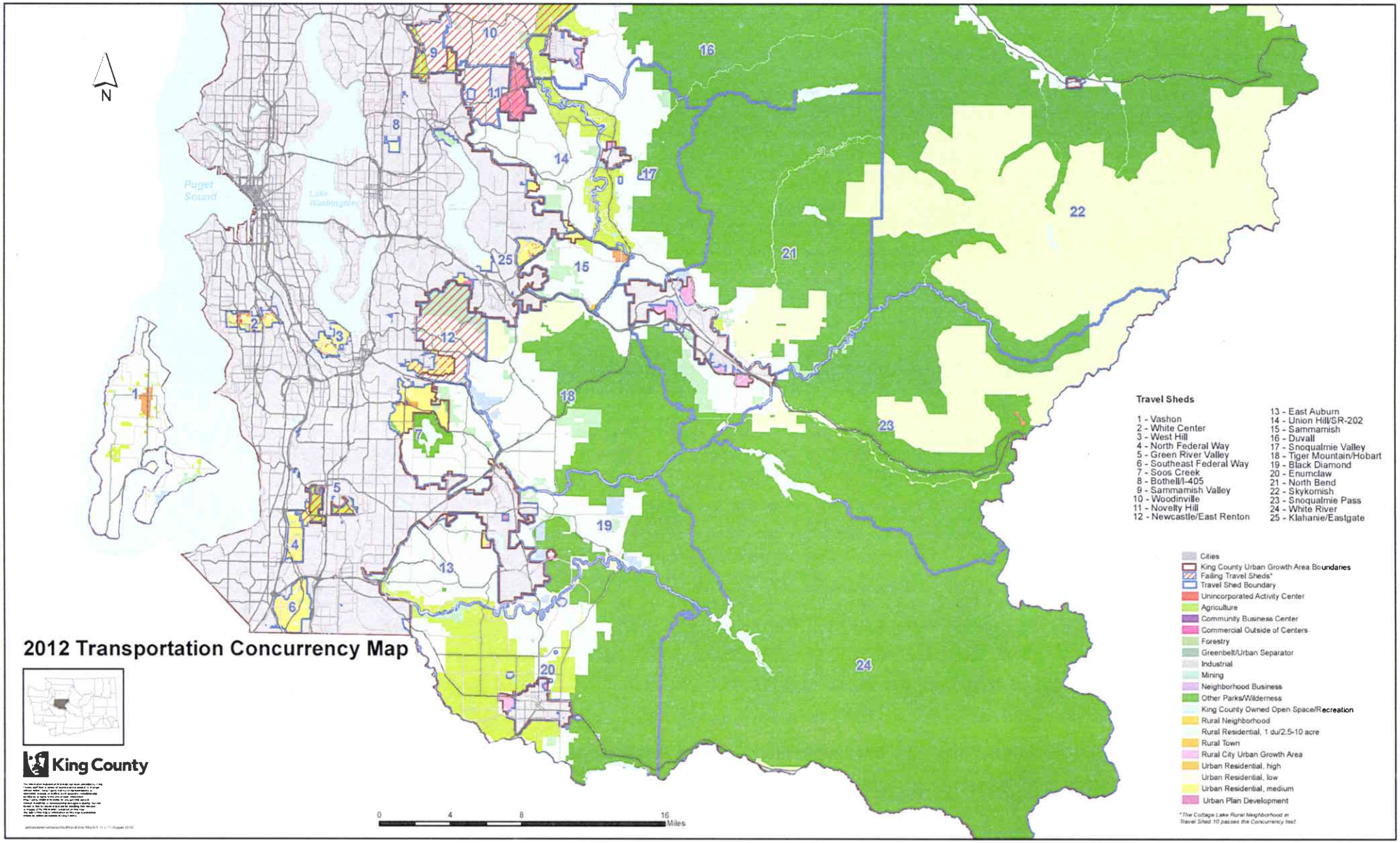
Several smaller annexations have also occurred in travel sheds throughout King County. The South Bothell annexation essentially eliminates most of Travel Shed 8. The remaining parcels consist of several small properties west of Redmond and Bridal Trails State Park. All boundary changes related to these annexations are reflected in the revised *Transportation Concurrency Travel Shed Boundaries* map proposed for adoption. (See *Attachment B - Transportation Concurrency Travel Shed Boundaries*)

Looking Ahead: 2013 Update

Through the end of 2012 and in 2013, the RSD staff will focus on reviewing the TCM program for efficiencies and compliance with the direction of the Strategic Plan for Road Services. This work will also tie into the policy direction of the King County Comprehensive Plan 2012 Update. During the fall and winter, staff will develop ideas for revising the TCM program and present these concepts to Transportation Concurrency Expert Review Panel for consideration and feedback from this stakeholder group.

An important aspect of this work is to be consistent with the transformation of the RSD to a predominantly rural agency with heavy reliance on asset management. As part of this effort, staff will be reviewing other agency programs that might be similar to the direction of the RSD. Staff will review the King County level of service standards, consider revising travel sheds, and consider the possible integration of the TCM program with the King County Mitigation Payment System in order to realize efficiencies in both programs.

The effects of annexations will change how concurrency is applied. Annexations can affect the road mileage tested by reducing total mileage or eliminating congested road segments within a travel shed. In 2013, staff will monitor the annexations that become effective and that have the potential to become effective over the next biennium. A partial travel time data gathering based on prioritizing the importance of corridors is planned for spring 2013 for the next TCM program update.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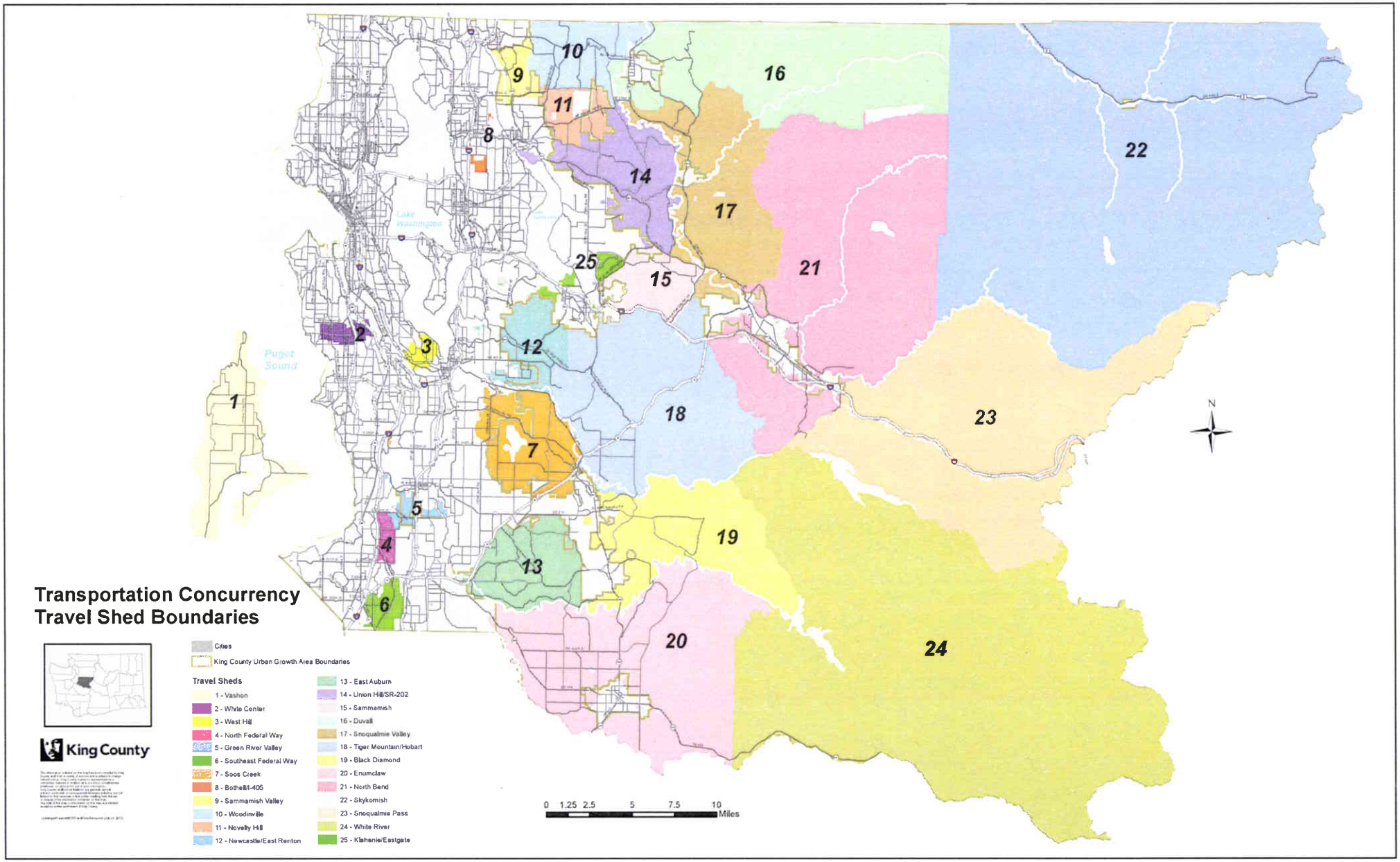
Puget Sound
Lake Washington
Travel Sheds
1 - Vashon
2 - White Center
3 - West Hill
4 - North Federal Way
5 - Green River Valley
6 - Southeast Federal Way
7 - Soos Creek
8 - Bothell/I-405
9 - Sammamish Valley
10 - Woodinville
11 - Novelty Hill
12 - Newcastle/East Renton
13 - East Auburn
14 - Union Hill/SR-202
15 - Sammamish
16 - Duvall
17 - Snoqualmie Valley
18 - Tiger Mountain/Hobart
19 - Black Diamond
20 - Enumclaw
21 - North Bend
22 - Skykomish
23 - Snoqualmie Pass
24 - White River
25 - Klahanie/Eastgate
Cities
King County Urban Growth Area Boundaries
Failing Travel Sheds*
Travel Shed Boundary
Unincorporated Activity Center
Agriculture
Community Business Center
Commercial Outside of Centers
Forestry
Greenbelt/Urban Separator
Industrial
Mining
Neighborhood Business
Other Parks/Wilderness
King County Owned Open Space/Recreation
Rural Neighborhood
Rural Residential, 1 du/2.5-10 acre
Rural Town
Rural City Urban Growth Area
Urban Residential, high
Urban Residential, low
Urban Residential, medium
Urban Plan Development
* The Cottage Lake Rural Neighborhood in Travel Shed 10 passes the Concurrency test
0 4 8 16 Miles
2012 Transportation Concurrency Map
King County


Transportation Concurrency
Travel Shed Boundaries
King County
Cities
King County Urban Growth Area Boundaries
Travel Sheds
1 - Vashon
2 - White Center
3 - West Hill
4 - North Federal Way
5 - Green River Valley
6 - Southeast Federal Way
7 - Soos Creek
8 - Bothell/I-405
9 - Sammamish Valley
10 - Woodinville
11 - Novelty Hill
12 - Newcastle/East Renton
13 - East Auburn
14 - Union Hill/SR-202
15 - Sammamish
16 - Duvall
17 - Snoqualmie Valley
18 - Tiger Mountain/Hobart
19 - Black Diamond
20 - Enumclaw
21 - North Bend
22 - Skykomish
23 - Snoqualmie Pass
24 - White River
25 - Klahanie/Eastgate
Lake Washington
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0 1.25 2.5 5 7.5 10
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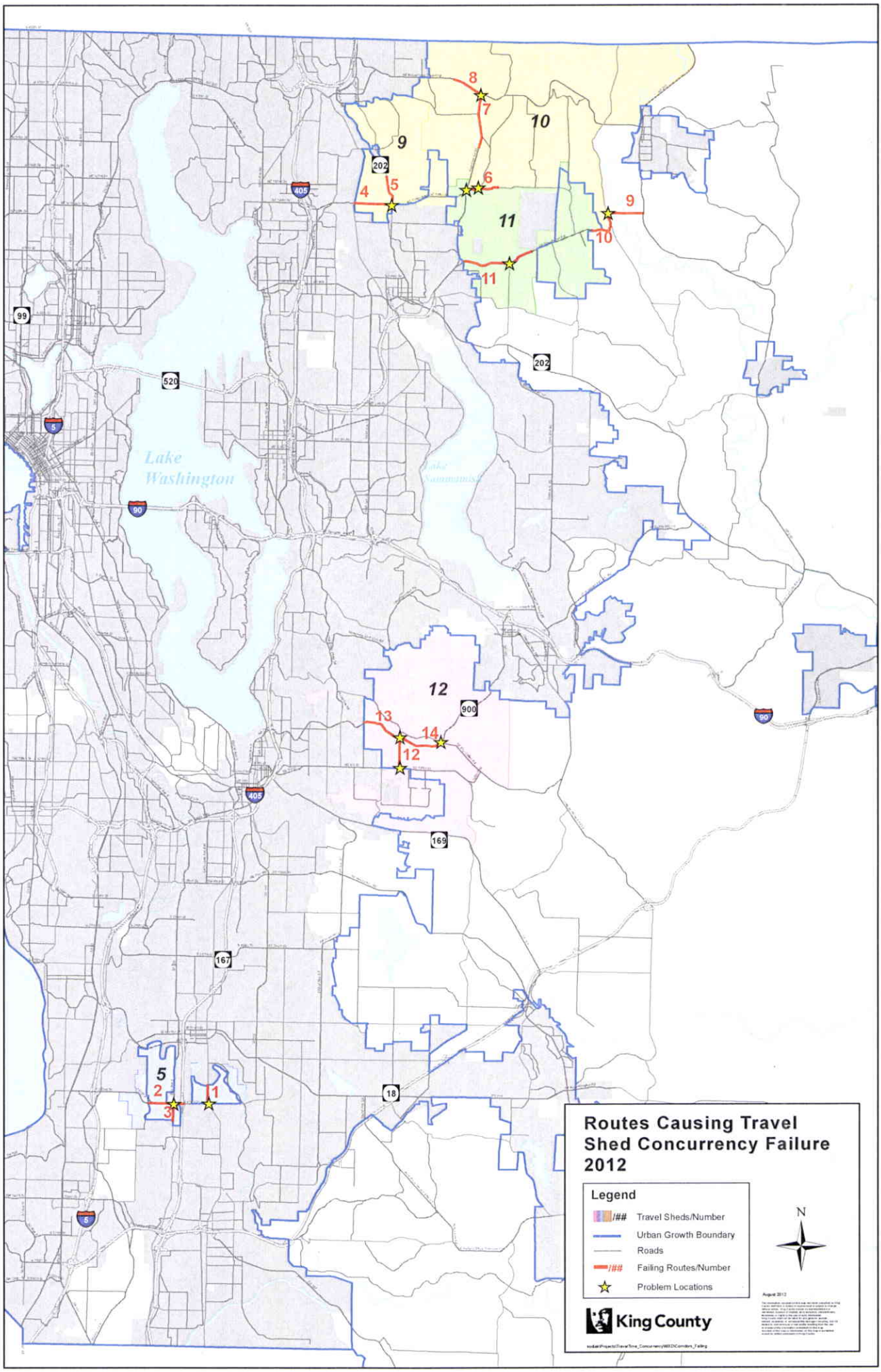
Attachment C
2012 Transportation Concurrency Test by Travel Shed
August 2012

Travel Shed	Geographic Identifier	Total Travel Shed Mileage	Travel Shed Total Failed Mileage	Percent Travel Shed Failing Standards	Travel Shed Concurrency Test (85% Compliance)*
1	Vashon	26.12	3.01	11.52%	PASS
2	White Center	7.28	0.25	3.43%	PASS
3	West Hill	4.46	0.00	0.00%	PASS
4	North Federal Way	5.54	0.00	0.00%	PASS
5	Green River Valley	4.42	1.43	32.35%	FAIL
6	SE Federal Way	5.94	0.00	0.00%	PASS
7	Soos Creek	27.80	2.45	8.81%	PASS
8	Bothell/I-405	0.00	0.00	0.00%	PASS
9	Sammamish Valley	5.47	1.82	33.27%	FAIL
10	Woodinville	20.30	3.97	19.56%	FAIL
11	Novelty Hill**	14.67	3.33	22.70%	FAIL
12	Newcastle/East Renton	13.27	3.19	24.04%	FAIL
13	East Auburn	22.62	0.00	0.00%	PASS
14	Union Hill/SR-202	33.19	3.09	9.31%	PASS
15	Sammamish	10.19	0.00	0.00%	PASS
16	Duvall	8.61	1.00	11.61%	PASS
17	Snoqualmie Valley	19.71	0.53	2.69%	PASS
18	Tiger Mtn/Hobart	31.10	3.08	9.90%	PASS
19	Black Diamond	14.04	0.00	0.00%	PASS
20	Enumclaw	44.13	0.00	0.00%	PASS
21	North Bend	3.14	0.00	0.00%	PASS
22	Skykomish	0.00	0.00	0.00%	PASS
23	Snoqualmie Pass	0.00	0.00	0.00%	PASS
24	White River	0.00	0.00	0.00%	PASS
25	Klahanie/Eastgate	2.11	0.00	0.00%	PASS

* The transportation concurrency test consists of taking the sampled miles of roads failing the level of service standard in a travel shed and dividing by the total miles of sampled roads in that travel shed. If the result is greater than 15%, the travel shed fails the concurrency test. Designated Rural Towns (Fall City - Travel Shed 15, Snoqualmie Pass - Travel Shed 23, Vashon - Travel Shed 1) and Rural Neighborhood Commercial Centers (Cottage Lake - Travel Shed 10, Cumberland - Travel Shed 20, Maple Valley - Travel Sheds 7 and 8, Preston - Travel Sheds 15 and 18) all pass concurrency testing.

** Excludes mileage and 2012 data on 196th Avenue NE due to construction that is part of the Novelty Hill Road CIP project.


Lake Washington
Lake Sammamish
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520
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90
405
202
900
169
167
18
Routes Causing Travel Shed Concurrency Failure 2012
Legend
/## Travel Sheds/Number
Urban Growth Boundary
Roads
/## Failing Routes/Number
Problem Locations
N
King County
August 2012

Attachment E
Project List for Achieving Concurrency Compliance in Failing Travel Sheds
Summary Table
August 2012

Route Number	Corridor	Corridor Route	2012 LOS	LOS Standard	Failing Direction	% of Shed Mileage	% of Shed Mileage Failing	Problem/Location	Solution/Project	Cost Estimate $ (million)	Ease of Implementation (1) Easy to (3) Most Difficult
Travel Shed 5 - Green River Valley							32.35				
1	83rd Ave S (Central)	Green River Bridge to S 277th St	D	B	SB	11.31		Intersection delay southbound movements to S 277th St; Delay caused by heavy eastbound traffic from 83rd Ave SE / Auburn Way N to SR-167	S 277th St (Auburn Way N to Grn Riv Bridge) major widing 0.9 mi; add 1 WB & 2 EB three lanes; final config. 5 lanes, 3 EB / 2 WB lanes.	$4.65 City of Auburn Unfunded	3
2	S 272nd/277th St	Lake Fenwick Rd to SR-167 East off ramp	C	B	EB	11.31		Intersection delay eastbound @ West Valley Highway and @ SR-167 ramp intersections; delay caused by heavy through traffic	ITS; signal modification to coordinate signals in corridor; KC CIP Project number 300108 scheduled for 2012; coordination with WSDOT and Auburn	$1.0 County Funded (2012)	1
3	West Valley Highway	S 277th St to Auburn City Limits	C	B	NB	9.73		Intersection delay northbound @ S 277th St; delay caused by heavy east/west through traffic on S 277th St	Same as Project 2 above	See Project 2 above	1
Travel Shed 9 - Sammamish Valley							33.27				
4	NE 124th St	Willows Rd to SR-202	C	B	EB	18.46		Intersection delay eastbound @ SR-202 caused by heavy volume and competing movements	City project to widen SR-202 in planning stage as part of Red-Wood Corridor project	City of Redmond unfunded corridor improvement	3
5	SR-202	NE 124th St to NE 136th St	D	B	SB	14.81		Intersection delay southbound @ NE 124th St caused by heavy volume	Same as Project 4 above	See Project 4 above	3

Attachment E
Project List for Achieving Concurrency Compliance in Failing Travel Sheds
Summary Table
August 2012

Travel Shed 10 - Woodinville							19.56				
6	NE 133rd St	Avondale Rd to 202nd Ave NE	C	B	WB	4.43		Volume and intersection delay westbound @ Bear Creek Rd and @ Avondale Road	Widen and rechannelize intersection at Avondale Rd; realign intersection at Bear Creek Rd to make major movement east/west and Bear Creek Rd at 90 degrees to NE 133rd; old KC CIP Project number 101088 (NE 128th/NE 132nd St); Mitigation Payment System project	$12.6 County Unfunded	3
7	Avondale Rd	Woodinville-Duvall Rd to NE 146th Way	C	B	NB	7.39		Intersection delay northbound @ Woodinville Duvall Rd caused by heavy traffic	Former CIP project full intersection improvement with turn channel improvements on all legs; Woodinville-Duvall Rd ITS Phase II signal interconnect and coordination; Mitigation Payment System project	$10.3 County Unfunded	3
8	Woodinville-Duvall Rd	182nd Ave NE to Avondale Rd	D	B	EB	4.34		Intersection delay eastbound @ Avondale Rd caused by heavy traffic	Same as Project 7 above	See Project 7 above	3
9	NE 124th St/West Snoqualmie Valley Rd	SR-202 to NE Novelty Hill Rd	C	B	EB	1.38		Intersection delay westbound on NE 124th St @ West Snoqualmie Valley Rd	Widen and rechannelize intersection NB on West Snoqualmie Valley Rd; improve intersection to enhance major northbound to westbound movement; old KC CIP Project number 201101 (intersection project); Mitigation Payment System project.	$5.0 County Unfunded	3
10	Novelty Hill Rd	234th Ave NE to West Snoqualmie Valley Rd	C	B	WB	2.02		Slow traffic both eastbound and westbound on the steep, winding, low speed limit road	Rebuild road to meet standards and connect at NE 124th St	N/A County Unfunded	3
Travel Shed 11 - Novelty Hill							22.70				
6	NE 133rd St	Avondale Rd to 202nd Ave NE	C	B	WB	6.14		Volume and intersection delay westbound @ Bear Creek Rd and @ Avondale Rd	Widen and rechannelize intersection at Avondale Rd; realign intersection at Bear Creek Rd to make major movement east/west and Bear Creek Rd at 90 degrees to NE 133rd; old KC CIP Project number 101088 (NE 128th/NE 132nd St); Mitigation Payment System project	$11.8 County Unfinded	3
10	Novelty Hill Rd	234th Ave NE to West Snoqualmie Valley Rd	C	B	WB	2.93		Slow traffic both eastbound and westbound on the steep, winding, low speed limit road	Rebuild road to meet standards and connect at NE 124th St	N/A County Unfunded	3
11	Novelty Hill Rd	Redmond City Limits to 218th Ave NE	D	B	EB	13.63		Delay eastbound from heavy volume and turn movements at 208th Ave NE; effected by construction (CIP project number 100992) at 196th Ave NE	Roundabout at 208th Ave NE intersection; ultimate Novelty Hill Rd CIP project or as separate intersection project; roundabout at 196th Ave NE under construction (CIP project number 100992)	$10.8 County Unfunded intersection	3

Attachment E
Project List for Achieving Concurrency Compliance in Failing Travel Sheds
Summary Table
August 2012

Route Number	Corridor	Corridor Route	2012 LOS	LOS Standard	Failing Direction	% of Shed Mileage	% of Shed Mileage Failing	Problem/Location	Solution/Project	Cost Estimate $ (million)	Ease of Implementation (1 Easiest to 3 Most Difficult)
Travel Shed 12 - Newcastle/East Renton							24.04				
12	164th Ave SE	SR-900 to SE 128th St	C	B	SB	6.41		Intersection delay southbound at SE 128th St; delay caused by east/west traffic on SE 128th St	Signal modification and operational improvements; ITS project on 164th Ave SE and intersection channelization on SE 128th St; Mitigation Payment System project	$4.3 County Unfunded	2
13	SR-900	Renton City Limits to 164th Ave SE	D	B	EB	8.44		Intersection delay eastbound at 164th Ave SE; delay caused by heavy through traffic and turns at intersection	Add westbound and eastbound left turn lanes at 164th Ave SE	$4.0 WSDOT Unfunded	3
14	SR-900	164th Ave SE to SE May Valley Rd	E	B	NB	9.19		Intersection delay westbound at 164th Ave SE; delay caused by heavy through traffic at intersection	Same as Project 13 above	See Project 13 above	3

Attachment F

TECHNICAL APPENDIX

Annual Report
Transportation Concurrency Management Program
2012 Annual Update

I. Travel Time Data Collection Methodology

The Transportation Concurrency Management (TCM) Program collects travel time data each year to update the Transportation Concurrency map. In 2009, the concurrency process became more automated when the Road Services Division (RSD) acquired eight GeoLoggers, which are Global Positioning System (GPS) devices designed for collecting detailed vehicle travel data. The GeoLogger units allow for accurate and intensive data collection using half the manpower needed for previous survey efforts in 2008. The data logger automatically records second-by-second time, geographic position, speed data, etc. The automated nature of the device also increases safety by allowing the driver of the data collection vehicle to be more attentive to road conditions. Companion software imports the data collected by the GeoLogger and processes it. The data is then displayed graphically through Geographical Information System software covering the King County road network.

Due to resource constraints, the TCM program for 2012 limited the number of days (one to three) travel time data was collected on roadway corridors. A process was developed to identify the number of days roads would be sampled in 2012. Criteria used to identify the roads receiving the most days during which travel time data would be collected are as follows:

- Routes in failing travel sheds
- Routes that failed the urban or rural level of service (LOS) standard in previous update.
- Routes that were at the urban or rural LOS standard in previous update.
- Routes connected to one of the above routes.

All routes used for transportation concurrency testing would have travel time data collected at least one day, with higher priority routes receiving up to three days. Routes within annexation areas that would become incorporated in 2011 and 2012 were not sampled, nor included in the concurrency testing.

Travel time data was collected on principal and minor arterials and certain state highways. For sampled routes, three to ten data runs per day were collected on routes in each corridor over a one-day to three-day period, depending on corridor length and congestion. A single run consists of a round-trip drive through the corridor in one direction, and returning in the opposite direction to the starting point. Each corridor route was prioritized to determine how many days and runs should be completed. Prioritization was established based on several factors, including the perceived congestion level of the corridor based on the previous update data collection. For contiguous and short corridors, data was collected from multiple corridors by the same driver in a given evening. Data collection was halted or the data dismissed if an accident or emergency

obstructed traffic flow in a corridor. Corridors were scheduled based on avoiding abnormal traffic conditions caused by construction, road closures, or other identified events.

Travel time data was collected by driving each route and timing how long it took to move from one end of the corridor to the other, noting intermediate points in between. According to the Federal Highway Administration (Travel Time Data Collection Handbook), the spring season is the time of year providing the most representative driving conditions, so the data collection program was run during March, April, and early May. Data was only collected on Tuesdays, Wednesdays, and Thursdays, when the most representative weekly traffic conditions occur during the peak evening commuting period (the highest estimated two-hour volume is between 4 p.m. and 6:00 p.m.). No data was gathered during school spring breaks, holiday periods, and construction and traffic events to avoid obtaining data during atypical commuting days.

II. Data Processing and Analysis

Once the data was collected, it was downloaded and processed by TravTime software used by the RSD. The software reads the GPS data and calculates information (number of runs, distance, average travel speed, travel time, etc.) for each corridor route, including the LOS using Highway Capacity Manual methodology, which is the industry standard. Prior to 2009 processing of the data was accomplished manually using spreadsheets. Use of TravTime software has greatly increased the efficiency of this exercise, with much faster results that are less susceptible to human error. All route lengths are measured from the GPS points and matched to the road network in the King County Geographical Information System. TravTime compares the calculated speed with the travel speed LOS for roads by functional classification, as identified in the *Road Levels of Service* table in the next section. Using the LOS for each roadway, the RSD staff then proceeded to concurrency testing for the travel sheds.

An important element of the travel time data collection is documentation and quality control for travel time procedures. All phases of the data collection process include review by the concurrency staff team to ensure accurate data gathering procedures. Documentation includes GeoLogger data files, field notes from data collection, and summary tables of this data for each corridor. Following are some of the quality control checks performed for the 2012 TCM program:

- Check of the field note forms submitted by each driver.
- Review of corridors and routes, distances, and functional classifications.
- Review of speeds and LOS standards.
- Review of shared corridors (the arterial forms the boundary between two travel sheds), rural vs. urban arterials, and incorporated portions of corridors.
- Check of travel shed mileage.
- Check of recently annexed areas, as well as elections in pending potential annexation areas.

III. Standards Used for Concurrency Testing – Levels of Service

The LOS standards adopted in the King County Comprehensive Plan are used to appropriately encourage growth in the urban area and to determine if future growth can be accommodated on

the transportation facilities. Levels of service on roadways range from LOS standard A for free flow to LOS standard F for heavily congested traffic. The LOS for different arterial classifications and state highways is identified by travel speed in the following table from the King County Code.

There is a different LOS standard for urban areas (LOS standard E) than for rural areas (LOS standard B). In addition, mobility areas established in the rural areas have their own LOS standard. Rural Towns (Fall City, Vashon, and Snoqualmie Pass) have a LOS standard of E, and selected Rural Neighborhood Commercial Centers (Cumberland, Cottage Lake, Maple Valley, Preston) have a LOS standard of D. These LOS standards have remained the same since 2008 and can only be changed during a major comprehensive plan update, which occurs every four years. The next plan update will be in 2016.

ROAD LEVELS OF SERVICE				
Road Classification:	I (State Routes)	II (Principal Arterials)	III (Minor Arterials)	IV (Collector Arterials)
LEVEL OF SERVICE	AVERAGE TRAVEL SPEED (MILES PER HOUR)			
A	>42	>35	>30	>25
B	>34 – 42	>28 – 35	>24 – 30	>19 – 25
C	>27 – 34	>22 – 28	>18 – 24	>13 – 19
D	>21 – 27	>17 – 22	>14 – 18	>9 – 13
E	>16 – 21	>13 – 17	>10 – 14	>7 – 9
F	<=16	<=13	<=10	<=7

From King County Code 14.70.220.B.2

IV. Concurrency Testing Methodology

The transportation concurrency testing process compares the monitored road miles passing the King County LOS standards with the total monitored road miles in a travel shed. The LOS for travel speed on various arterial classifications and state highways is identified by the King County Code and shown in the *Road Levels of Service* table above. A travel shed is deemed to be concurrent if at least 85 percent of the roadway miles meet the urban and rural LOS standards. If less than 85 percent of the roadway miles pass the LOS standards, the travel shed fails the concurrency test.

Within a travel shed that contains both rural and urban designated land, the passing segment lengths of urban roads (LOS standard E) are added to the passing segment lengths of rural roads (LOS standard B) for a passing mileage total in the entire travel shed. This mileage is then compared to the individual travel shed total mileage, and the percentage pass/fail is determined. The designated rural mobility areas, consisting of Rural Towns and Rural Neighborhood Commercial Centers, are tested separately from the travel shed test in which they are located. The separate test uses road miles within the entire travel shed, but this test is based on a LOS standard E for Rural Towns and LOS standard D for selected Rural Neighborhood Commercial Centers. The result can create a situation where a rural travel shed may fail the rural concurrency test standard of LOS B, but the mobility area with a lower standard of LOS D or E will pass the

test. An example of this is the Woodinville travel shed that fails the concurrency test, while the Cottage Lake Rural Neighborhood Commercial Center located in the travel shed passes the test.

V. Bringing Travel Sheds Back into Compliance

The five travel sheds out of compliance in 2012 had a total of 14 road routes or segments that failed concurrency LOS standards. A RSD staff team reviewed the travel time data and field notes for reasons the corridors appeared to be failing. The main congestion areas identified were primarily choke points at major intersections causing delay and slowing vehicle speeds. These causes are due in part to lack of turn channelization, heavy volume, and signal timing. Specific solutions were identified by the team to address needs in each corridor. Each solution was then reviewed and costs were estimated. These projects were then prioritized based on their feasibility and effectiveness in bringing the corridor travel shed back into compliance. The project information is presented in Attachment E, *Summary Table Project List for Achieving Concurrency Compliance in Failing Travel Sheds.*

Bringing a failing travel shed back into compliance depends on the total travel shed compliance percentage and the number and length of the routes out of compliance in each travel shed. If failing routes are affected by the same intersection or improvement, just making that one improvement can bring both routes back into compliance. For example, the intersection at Woodinville-Duvall Road and Avondale Road is causing the Woodinville-Duvall Road and the Avondale Road approach routes to be out of compliance. Making that one improvement could bring the failing corridor routes back into compliance for the travel shed to pass concurrency.

The road projects identified include a variety of intersection treatments and Intelligent Transportation System signal interconnections. Some projects are already identified in the adopted Transportation Needs Report (TNR) 2012 and the 2012 Capital Improvement Program (CIP), while others are entirely new projects. The new projects will need to be added to the TNR as appropriate, and to the CIP for implementation. Several of the new projects will require involvement by the state or by cities, as some failing segments are on state routes and locations that involve cities.

Cost estimates in 2012 dollars were made, and known costs from other jurisdictions were used for each of the new projects identified in the *Summary Table Project List for Achieving Concurrency Compliance in Failing Travel Sheds.* The projects were then prioritized based on cost and feasibility. Projects were given a priority of one (projects perceived easiest to implement) to three (projects perceived most difficult to implement). Identified projects will undergo further review to determine how to move them through the implementation process based in part on the determined priority. Not every road segment will have to be brought back into compliance for a travel shed to pass concurrency. And some routes may never be able to be improved to comply with the Rural Area standard LOS B because of the heavy urban level of traffic using the road. Strategies will be developed to identify a timeline for implementing the projects, including combinations of multiple projects and coordination with other jurisdictions.