



King County

Annual Report

Transportation Concurrency Management Program

2013 Annual Update

October 2013

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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 (GMA), 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 transportation concurrency.

The current *2012 Transportation Concurrency Map*, effective February 2013, was based on travel time data collected in the spring 2012. The 2013 Transportation Concurrency Update includes a new *2013 Transportation Concurrency Map* (see Attachment A) that is based on 2012 data as well as selective travel time sampling in the spring 2013. The 2013 map incorporates a proposed change in the 2013 testing procedures that involves separate testing of the Urban and Rural areas. In addition, future updates will be conducted on a biennial basis, or more frequently as circumstances change or as required by the King County Council.

Changes and Findings

The 2013 update used a small sampling (8 routes or 11% of total) of travel time data from monitored corridors taken during the spring, and for roads not sampled in 2013, used data collected in 2012. The 2012 travel time data was a complete sampling of all principal and minor arterial corridors in unincorporated King County and selected state highways during spring 2012. In 2013, due to budget and staffing 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 one to two days each. Criteria used to identify the roads were as follows:

- Routes located in failing travel sheds.
- Routes that failed the urban or rural level of service (LOS) standard in 2012.

The travel time data collected in 2013 showed a mix of corridors that experienced slower travel speeds and corresponding LOS, corridors that improved LOS, and corridors that did not change. This follows a trend over the years from flat traffic volumes to more fluctuating traffic volume growth while the region slowly recovers from the economic downturn of recent years.

Five travel sheds have areas failing the concurrency test in 2013, the same number as in 2012. In 2012 the difference is the entire area of these five travel sheds failed. In 2013 three of the five have Urban Area that now passes the new concurrency test based on the change in testing procedures, while the Rural Area of the same travel sheds fail. The testing change was to further the intent of the GMA and the King County Comprehensive Plan to encourage development in unincorporated urban areas contiguous to incorporated areas. By having separate tests for both Urban and Rural areas, the County intends both areas to pass the concurrency test based on each area standard and not allow the Rural Area LOS B standard to preclude development within the Urban Area if roadways meet the LOS E urban standard.

Timing of future map updates will be done in coordination with the King County Department of Transportation's biennial budget process instead of an annual update. Past concurrency updates have been tied to the previous budget process, which was completed on an annual cycle. A transportation concurrency change to a biennial cycle will be consistent with the current budget process, as well as with the two-year cycle of the Transportation Needs Report (TNR), an attachment to the King County Comprehensive Plan. Projects needed to address concurrency issues should be in the TNR before moving to the Capital Improvement Program in the budget process for implementation.

As before, the King County Council is empowered to authorize an update to the concurrency map as needed outside of the regular schedule. Should circumstances change with regard to traffic conditions based on completed capital improvements and travel time analysis results, the King County Department of Transportation may propose updates to the concurrency map to be considered by the King County Council outside of the biennial update process.

Summary of Results

Concurrency Testing Results

The 2013 transportation concurrency test results are shown on the table, Attachment B, titled *2013 Transportation Concurrency Test by Travel Shed*. Separate tests were done for Urban and Rural areas within the same travel shed. Road mileage within the Urban Area was tested against LOS E as the standard and road mileage within the Rural Area against LOS B. In past years the road mileage tested, whether Urban or Rural, was combined to test the entire travel shed. This testing procedure resulted in the Urban Area of four travel sheds failing because of road mileage failing the more stringent rural standard. The testing procedure for the Bear Creek Urban Planned Development (UPD) area was not changed because that area is not contiguous to incorporated area. This is consistent with King County Comprehensive Plan policy in Chapter 2 Urban Communities.¹

Five of the twenty-five total travel sheds tested have areas failing the transportation concurrency test. In all five travel sheds the Rural Area fails the test. Four of the five travel sheds have Urban Area within the travel shed. Of the four, three have Urban Area that passes the concurrency test for Urban Area. The fourth contains the Urban Area of the Bear Creek UPD area (Redmond Ridge, Trilogy at Redmond Ridge and Redmond Ridge East), which does not pass the concurrency test. Of the twenty travel sheds with areas passing the test, all have passing Urban and Rural areas, and all but two areas (both rural) pass with more than 90 percent of the road mileage meeting concurrency LOS standards.

In the Rural Area, all rural mobility areas passed the 2013 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

¹ Policy U-106 of the 2012 King County Comprehensive Plan states that, "Most population and employment growth should locate in the contiguous Urban Growth Area in western King County, especially in cities and their Potential Annexation Areas. Cities in the rural area should accommodate growth in accordance with adopted growth targets."

lies within a failing Rural Area of the 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 unincorporated urban designated land use, five are a mix of urban and rural, and fourteen are all or predominantly rural designated land use.

Travel shed areas with more than 15 percent of total mileage failing concurrency LOS standards are identified as failing travel sheds areas. The failing travel sheds areas are indicated by crosshatching on the attached map titled *2013 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 with failing areas in 2013 is shown in the table below.

Travel Shed Areas Failing in 2013

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	Rural 78.14%	3 (*)	8
Sammamish Valley (9)	Northeast	Rural 51.12%	2 (*, **)	7
Woodinville (10)	Northeast	Rural 18.18%	4	15
Novelty Hill (11)	Northeast	Urban 28.97% Rural 45.16%	4*	16
Newcastle/East Renton (12)	Southeast	Rural 26.99%	3 (**)	12

* City involvement

** State involvement

The five travel shed areas in the table above are failing because of high traffic volumes and congestion at key intersections; this is shown on Attachment C, the map titled *Routes Causing Travel Shed Concurrency Failure 2013*. The following is a brief summary of the five travel sheds with failing areas 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 SR-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 four 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 Bear Creek UPD area also fails due to slow uphill traffic on a winding, steep grade with a low speed limit.

- In the Novelty Hill travel shed, four routes are failing the rural LOS standard B. Northeast 132nd/133rd Street (6 on the map) fails due to traffic flow at two intersections, Bear Creek Road and Avondale Road. Avondale Road northbound and southbound (9 on the map) between NE 116th Street and NE 132nd Street is failing due to congestion at the intersections. The section of Novelty Hill Road route (10 on the map) east of the Bear Creek UPD area fails due to slow uphill traffic on a winding, steep grade with a low speed limit. The eastbound 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 NE and delay at the 208th Avenue NE intersection.
- In the Newcastle/East Renton travel shed, three routes are failing the rural LOS standard B. On 164th Avenue SE (12 on the map) southbound and northbound fails due to traffic congestion at the intersections with SE 128th Street and SR-900. State Route 900 (13 and 14 on the map) fail in the eastbound and westbound directions due to the heavy traffic flow approaching the intersection with 164th Avenue SE.

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 travel sheds with failing areas have a mix of Urban and Rural Areas. The routes that fail in these 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. Novelty Hill Road connects the Bear Creek UPD area with Redmond, as well as Duvall. These roadways carry urban commuter traffic through areas 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 2012 to 2013

While the same five travel sheds have failing areas in 2013 as they did in 2012, there are changes in other travel sheds. The following table identifies the changes in travel shed failing mileage.

Travel Shed Changes

Travel Shed (shed #)	2012 Status	2013 Status	2012 Percentage of Travel Shed Miles Failing	2013 Percentage of Travel Shed Miles Failing
Woodinville (10)	Fail	Fail	19.56%	18.18%
Novelty Hill (11)	Fail	Fail	22.70%	28.97%
Union Hill/202 (14)	Pass	Pass	9.31%	7.05%
Duvall (16)	Pass	Pass	11.61%	0%
Snoqualmie Valley (17)	Pass	Pass	2.69%	0%

Four of the five travel sheds in the *Travel Shed Changes* table were affected by NE 124th Street/West Snoqualmie Valley Road route that went from LOS C in 2012 to LOS B in 2013. The westbound travel time was faster than that sampled in 2012 enabling the route to meet the LOS B rural standard. The one travel shed that experienced an increase in the percentage of failing travel shed miles was Novelty Hill (11). The 2013 sampling resulted in one route that is failing the rural LOS standard that was not failing in 2012. That route is Avondale Road between NE 116th Street and NE 132nd Street.

Trends in Travel Time

An analysis of the concurrency and LOS changes between 2010 and 2013 indicates they mirror 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. The worst periods of traffic congestion peaked in 2005. 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). This mirrored a national trend identified by the 2009 Urban Mobility Report published by the Texas A & M Transportation Institute (“Economic Factors Tap the Brakes on Traffic Congestion,” July 2009).

The most recent study in 2012 by the Texas A & M Transportation Institute (December 2012) shows that congestion has increased slightly, but is still below the peak that was in 2005. Traffic has increased in some areas, plateaued in others, and the congestion can vary or be unreliable from day to day. This appears to be the case in unincorporated King County. Travel times collected show a variety of results with some areas getting slightly worse (SR-900 and Avondale Road/Novelty Hill Road). Congestion on roads in the Novelty Hill and East Renton areas appears to be directly related to the growth of housing and employment in areas that those corridors serve. The study also indicates traffic will get worse as the economy improves, even though a recent Federal Highway Administration study (August 2013) reports people are driving less. Annual per person vehicle miles traveled have gone down 5 to 10% between 2005 and 2011 in Washington State.

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 traffic counts increased and half decreased, with the total volume for all eight count locations remaining virtually unchanged. While the 2011 and 2012 traffic counts showed further increases in volume, the volume has not reached levels attained prior to 2009. The traffic count program on unincorporated area roads will not be available in the foreseeable future because of budgeting cuts.

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

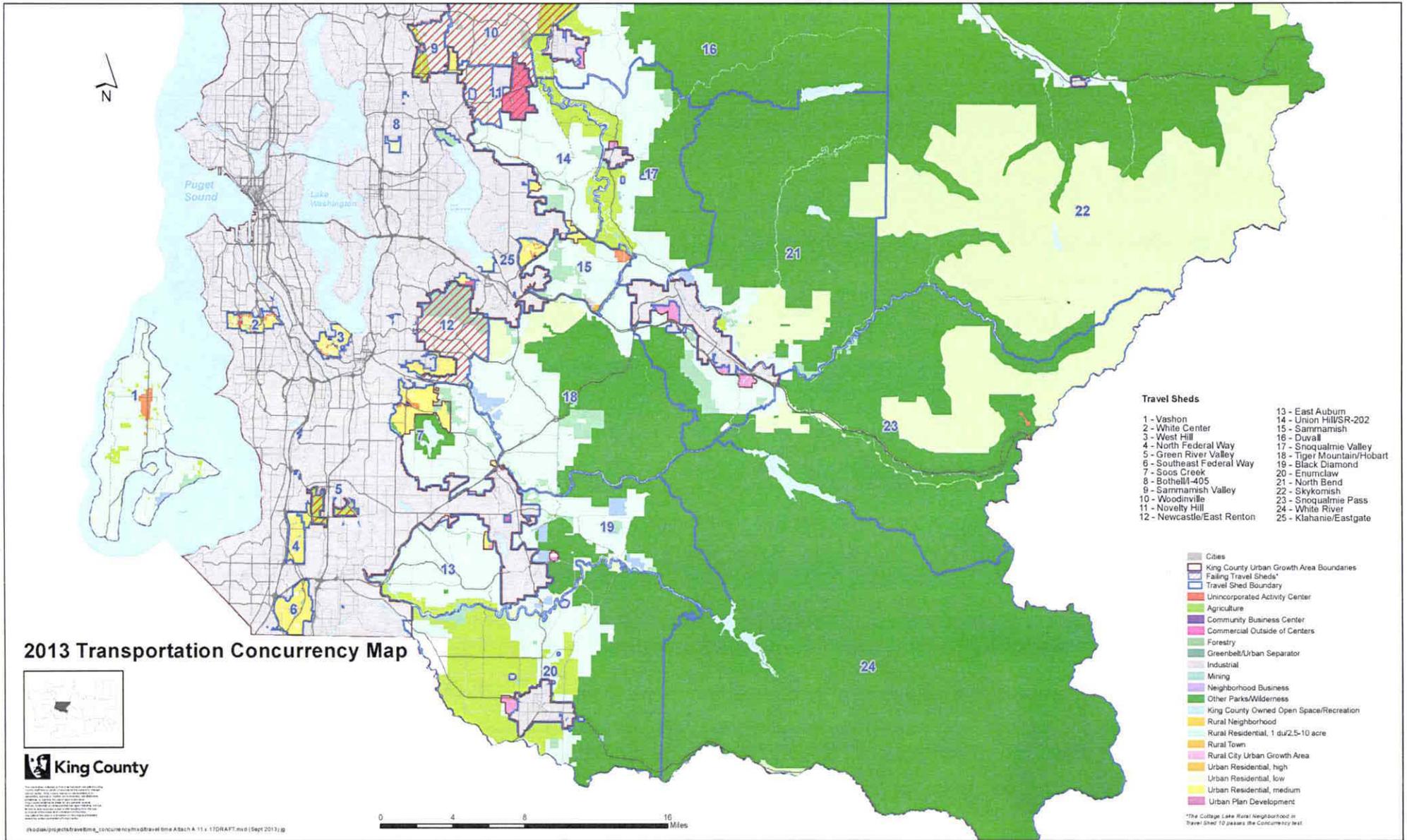
routes are illustrated in the map, Attachment C, titled *Routes Causing Travel Shed Concurrency Failure 2013*. Also Attachment D is a *Project List for Achieving Concurrency Compliance in Failing Travel Sheds Summary Table*, which identifies the problem locations, possible road improvements that may 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 RSD to these jurisdictions. In addition, most of the projects—whether state, city, or county—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 E, the *Technical Appendix*.

Looking Ahead: 2014 Update

Through the end of 2013 and in 2014, RSD staff will focus on reviewing the TCM program in a comprehensive manner in preparation for proposing significant, transformational changes to be considered for adoption as part of the King County Comprehensive Plan 2016 Update. 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 shed boundaries, 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 goal is to establish a modernized, effective TCM program in the context of diminished resources at RSD and numerous recent annexations of urban area into cities, leaving mostly rural area under King County jurisdiction. A new TCM program will be aligned with the direction of the adopted Strategic Plan for Road Services and a new asset management system under development. A proposal to update the TCM program will address multiple issues, including how best to incorporate State Routes into the program, the appropriate level of service standard for Rural Regional Corridors, and whether to adjust or eliminate travel time testing as a means to evaluate concurrency. RSD will ask the Transportation Concurrency Expert Review Panel for ideas and feedback during the process to develop a proposal to comprehensively update the TCM program.



2013 Transportation Concurrency Map



King County

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 0 4 8 16 Miles

- Travel Sheds**
- | | |
|----------------------------|----------------------------|
| 1 - Vashon | 13 - East Auburn |
| 2 - White Center | 14 - Union Hill/SR-202 |
| 3 - West Hill | 15 - Sammamish |
| 4 - North Federal Way | 16 - Duvall |
| 5 - Green River Valley | 17 - Snoqualmie Valley |
| 6 - Southeast Federal Way | 18 - Tiger Mountain/Hobart |
| 7 - Soos Creek | 19 - Black Diamond |
| 8 - Bothell-405 | 20 - Enumclaw |
| 9 - Sammamish Valley | 21 - North Bend |
| 10 - Woodinville | 22 - Skykomish |
| 11 - Novelly Hill | 23 - Snoqualmie Pass |
| 12 - Newcastle/East Renton | 24 - White River |
| | 25 - Klakam/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

Attachment B
 2013 Transportation Concurrency Test by Travel Shed
 October 2013

Travel Shed	Rural and Urban Mileage	Travel Shed Area Failing Mileage	Percent Travel Shed Area Failing Standards	Travel Shed Area Concurrency Test (85% Compliance)*
1--Vashon	Rural 26.12	3.01	11.52%	PASS
	Urban 0.00	0.00	0.00%	PASS
2--White Center	Rural 0.00	0.00	0.00%	PASS
	Urban 7.28	0.25	3.43%	PASS
3--West Hill	Rural 0.00	0.00	0.00%	PASS
	Urban 4.46	0.00	0.00%	PASS
4--North Federal Way	Rural 0.00	0.00	0.00%	PASS
	Urban 5.54	0.00	0.00%	PASS
5--Green River Valley	Rural 1.83	1.43	78.14%	FAIL
	Urban 2.59	0.00	0.00%	PASS
6--SE Federal Way	Rural 0.00	0.00	0.00%	PASS
	Urban 5.94	0.00	0.00%	PASS
7--Soos Creek	Rural 18.24	2.45	13.43%	PASS
	Urban 9.56	0.00	0.00%	PASS
8--Bothell/I-405	Rural 0.00	0.00	0.00%	PASS
	Urban 0.00	0.00	0.00%	PASS
9--Sammamish Valley	Rural 3.56	1.82	51.12%	FAIL
	Urban 1.91	0.00	0.00%	PASS
10--Woodinville	Rural 20.30	3.69	18.18%	FAIL
	Urban 0.00	0.00	0.00%	PASS
11--Novelty Hill**	Rural 9.41	4.25	45.16%	FAIL
	Urban and Rural 14.67	4.25	28.97%	FAIL
12--Newcastle/East Renton	Rural 11.82	3.19	26.99%	FAIL
	Urban 1.45	0.00	0.00%	PASS
13--East Auburn	Rural 21.95	0.00	0.00%	PASS
	Urban 0.67	0.00	0.00%	PASS
14--Union Hill/SR-202	Rural 32.42	2.34	7.22%	PASS
	Urban 0.77	0.00	0.00%	PASS
15--Sammamish	Rural 7.10	0.00	0.00%	PASS
	Urban 3.09	0.00	0.00%	PASS
16--Duvall	Rural 8.36	0.00	0.00%	PASS
	Urban 0.25	0.00	0.00%	PASS
17--Snoqualmie Valley	Rural 19.10	0.00	0.00%	PASS
	Urban 0.61	0.00	0.00%	PASS
18--Tiger Mtn/Hobart	Rural 31.10	3.08	9.90%	PASS
	Urban 0.00	0.00	0.00%	PASS
19--Black Diamond	Rural 13.77	0.00	0.00%	PASS
	Urban 0.27	0.00	0.00%	PASS
20--Enumclaw	Rural 40.98	0.00	0.00%	PASS
	Urban 3.15	0.00	0.00%	PASS
21--North Bend	Rural 2.11	0.00	0.00%	PASS
	Urban 1.03	0.00	0.00%	PASS

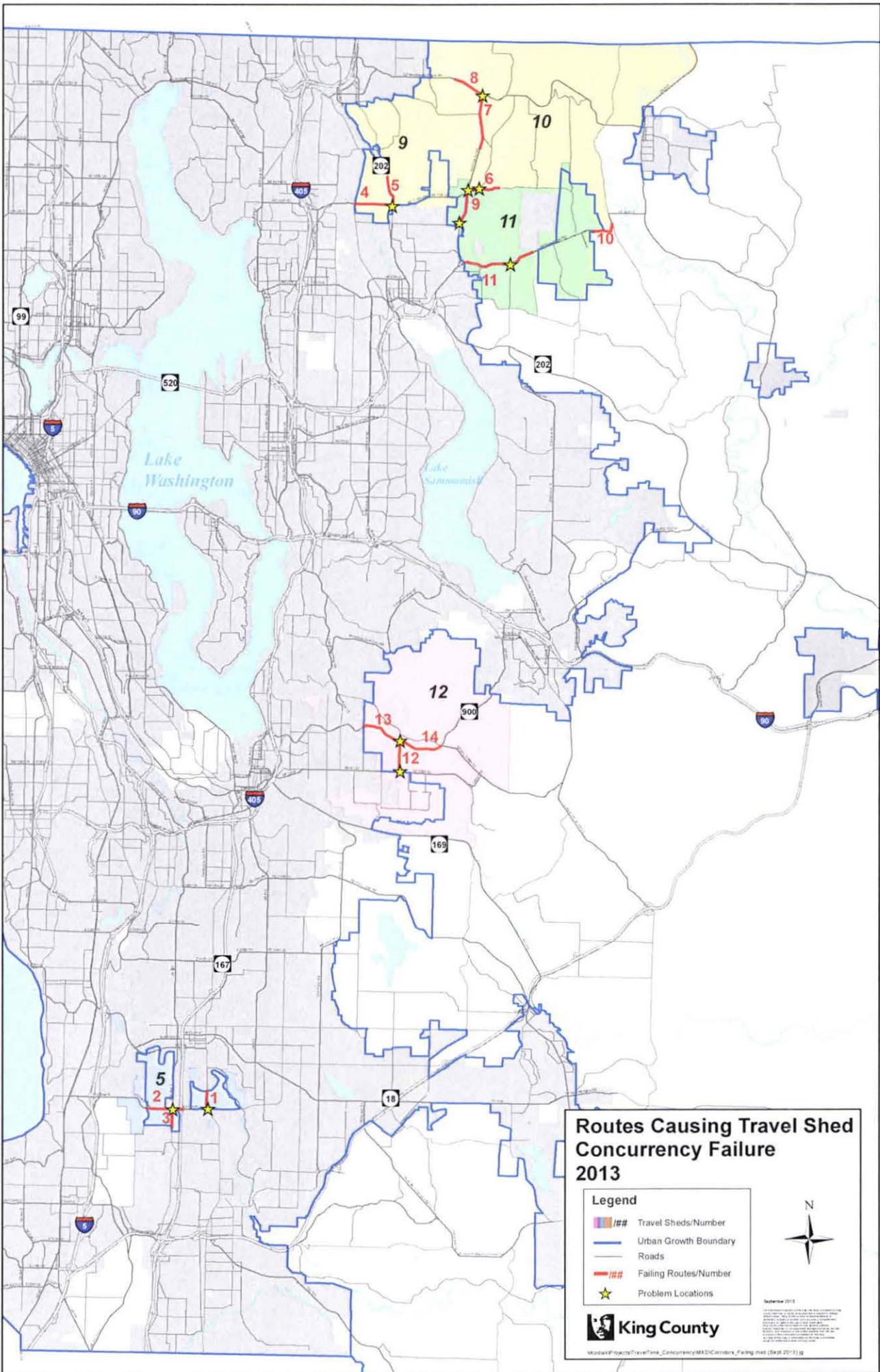
Attachment B
2013 Transportation Concurrency Test by Travel Shed
 October 2013

Travel Shed	Rural and Urban Mileage	Travel Shed Area Failing Mileage	Percent Travel Shed Area Failing Standards	Travel Shed Area Concurrency Test (85% Compliance)*
22--Skykomish	Rural 0.00	0.00	0.00%	PASS
	Urban 0.00	0.00	0.00%	PASS
23--Snoqualmie Pass	Rural 0.00	0.00	0.00%	PASS
	Urban 0.00	0.00	0.00%	PASS
24--White River	Rural 0.00	0.00	0.00%	PASS
	Urban 0.00	0.00	0.00%	PASS
25--Klahanie/Eastgate	Rural 0.00	0.00	0.00%	PASS
	Urban 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 the rural and urban areas of a travel shed and dividing by the total miles of sampled roads in the rural and urban areas of the travel shed, respectively. If the result is greater than 15%, the area 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 evaluated based on the travel time test results in the rural areas compared to the level of service standards for these sub-areas (E for Rural Towns and D for Rural Neighborhood Commercial Centers). These sub-areas all pass concurrency testing.

** Excludes mileage and 2012/2013 data on 196th Avenue NE due to construction that is part of the Novelty Hill Road CIP project. Urban road miles in the Urban Planned Developments were tested with the total urban and rural travel shed mileage.



Attachment D
Project List for Achieving Concurrency Compliance in Failing Travel Sheds
Summary Table
 October 2013

Route Number	Corridor	Corridor Route	2013 LOS	LOS Standard	Failing Direction	% of Shed Mileage	% of Shed Mileage Failing	Problem/Location	Solution/Project	Cost Estimates \$ (million)	Ease of Implementation (1) Easiest 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 Gm Riv Bridge) major widening 0.9 mi; add 1 WB & 2 EB three lanes; final config. 5 lanes, 3 EB / 2 WB lanes.	\$6.5 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 D
Project List for Achieving Concurrency Compliance in Failing Travel Sheds
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Route Number	Corridor	Corridor Route	2013 LOS	LOS Standard	Failing Direction	% of Shed Mileage	% of Shed Mileage Failing	Problem/Location	Solution/Project	Cost Estimates \$ (million)	Ease of Implementation (1) Easiest to (3) Most Difficult
Travel Shed 10 - Woodinville							18.18				
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	\$12.2 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	\$10.6 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
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							28.97				
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	\$12.2 County Unfunded	3
9	Avondale Rd	NE 116th St to NE 132nd St	C	B	NB/SB	6.27		Intersection delay northbound and southbound	None	None	N/A
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	King County feasibility study in 2007 recommended that roadway improvements to rebuild road to meet standards not be done due to costs, environmental constraints and increased traffic volume	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)	\$11.1 County Unfunded intersection	3

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Route Number	Corridor	Corridor Route	2013 LOS	LOS Standard	Failing Direction	% of Shed Mileage	% of Shed Mileage Failing	Problem/Location	Solution/Project	Cost Estimates \$ (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/D	B	SB/NB	6.41		Intersection delay southbound at SE 128th St and northbound at SR-900; delay caused by east/west traffic on SE 128th St and on SR-900	Signal modification and operational improvements; ITS project on 164th Ave SE and intersection channelization on 164th Ave SE at SR-900; Mitigation Payment System project	\$4.4 County Unfunded	3
13	SR-900	Renton City Limits to 164th Ave SE	C	B	EB	8.44		Intersection delay eastbound at 164th Ave SE; delay caused by heavy through traffic and turns at intersection	Improve westbound and eastbound left turn lanes/signal timing at 164th Ave SE	\$4.1 WSDOT Unfunded	3
14	SR-900	164th Ave SE to SE May Valley Rd	F	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 E

TECHNICAL APPENDIX

Annual Report Transportation Concurrency Management Program 2013 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 Global Positioning System (GPS) devices designed for collecting detailed vehicle travel data. The GPS 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 GPS unit 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 2013 limited the number of days (one to two) travel time data was collected on roadway corridors. A process was developed to identify the number of days roads would be sampled in 2013. Criteria used to identify on which roads 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.

All routes used for transportation concurrency testing would have travel time data collected at least one day, with higher priority routes receiving up to two days.

Travel time data was collected on principal and minor arterials and certain state highways. For sampled routes, four to eight data runs per day were collected on routes in each corridor over a one- to two-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. 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 the month of May. Data was only collected on Tuesdays, Wednesdays, and Thursdays, when the most representative weekday traffic conditions occur during the peak evening commuting period (the highest estimated two-hour volume is between 4:00 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, 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 GPS 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 and failing 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. Since the inception in 2008 of an all travel time data collection and testing process, a travel shed was 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. Starting in 2013 Road Services staff is recommending separating Urban and Rural Area testing within a travel shed.

Under the new process, travel sheds containing both Rural and Urban designated land keep separate the Urban and Rural Area road mileage for testing purposes. The passing and failing segment lengths of urban roads (LOS standard E) are used to identify if the Urban Area portion of that travel shed passes the concurrency test. Similarly the passing and failing segment lengths of rural roads (LOS standard B) are used to identify if the Rural Area portion passes the concurrency test. The one exception to this testing procedure is for the Bear Creek Urban Planned Developments (UPD) area in Novelty Hill Travel Shed 11. The old testing procedure is still applied to the Urban Area and this travel shed, because the Urban Area is not contiguous to the incorporated UGA area.

The designated Rural Mobility Areas, consisting of Rural Towns and Rural Neighborhood Commercial Centers, are tested separately from the Urban and Rural Area test for the travel shed 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 Rural Area of 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 with areas out of compliance in 2013 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 D, *Summary Table Project List for Achieving Concurrency Compliance in Failing Travel Sheds*.

Bringing a failing travel area 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 area 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 may be new projects. Any new projects will need to be added to the TNR as appropriate, and to the CIP for implementation. Several of the projects will require involvement by the state and/or by cities, as some failing segments are on state routes and locations that involve cities.

Cost estimates in 2013 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 area 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.