



OPUS TRAFFICUS: THE TROUBLE WITH TRAFFIC IN SOUTHEAST KING COUNTY

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January 2022

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EXECUTIVE SUMMARY:

Rural roads in King County are **congested due to urban growth** of a kind not foreseen by the framers of the Growth Management Act. GMA was supposed to protect rural areas from suburban sprawl but over the years the rural lifestyle has been threatened by ever-growing amounts of **commuter traffic between outlying cities and the urban core**, using antiquated rural roads. (Outlying cities here refers to isolated cities – such as Black Diamond and Enumclaw - located beyond the region’s urban growth boundary and separated by some unincorporated rural space between the outlying city and that urban growth boundary.)

What went wrong on rural roads? GMA has been successful in confining most growth inside a defined urban growth boundary. That has prevented most suburban sprawl. But GMA failed to exempt outlying towns and cities in the foothills of the Cascade Mountains from the requirement that all cities take a fair share of the region’s growth. Development then came to those **historic farm towns, changing them into bedroom cities**. Those cities’ many new residents now commute to jobs in the urban core via rural county roads that were not designed to serve large volumes of traffic. Rapid traffic growth on rural roads is an adverse impact that has not been mitigated due to a lack of accountability across jurisdictional lines for these regional-scale impacts.

State highways are meant to serve city-to-city travel, but state highways are too few and far between to serve all such growth. State investment in improvements to match growth has also been far too little. The gas tax provides the majority of revenues for highways, but that venerable funding source is falling behind the needs even for maintenance let alone expansion of state routes. Wise heads are working on that problem, seeking a replacement taxing mechanism for a new century.

County roads have borne the burden of city-to-city travel instead. In fast-growing **King County, rural arterials now carry 250% more traffic than the statewide average** for rural arterials. This is unfair.

GMA unfortunately does not hold cities (and the developments therein) accountable for their impacts **outside their own boundaries**. King County has no straightforward way under GMA to obtain adequate mitigation (or compensating revenues) for the impacts of that growth on its roads. Are lawsuits the only recourse available?

For this study, **sixteen county road corridors** in Southeast King County were systematically inventoried to identify critical needs and possible responses. In some places road capacity improvements may be useful, but the most common and pervasive need is to **protect ingress and egress to adjacent properties** and to provide **safer facilities for pedestrians, bicycles, and equestrians**. The concept of designing a street to serve all users - not just traffic - is called **“complete streets”**. It is supported in state law (RCW 47.04.325) and used in many cities. In rural areas the approach should be to emphasize shoulders to provide for pedestrians and

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bicyclists (and equestrians where applicable), to preserve ingress at egress to adjacent properties, and protect the safety of all road users.

A **new approach to level of service** is suggested that accounts for all these needs, which are more important for rural roads than traffic engineering criteria measuring only the delay of through traffic. The use of traffic LOS methods in urban areas has not stopped congestion from getting much worse since GMA started. A different approach should be tried there as well.

On King County's rural roads there are **many individual driveways**. That's OK when volumes are low as expected in rural areas. But ingress/egress becomes difficult when traffic volumes rise, and safety is another concern. On all the studied sixteen roads combined, the average spacing is about 22 driveway intersections per mile, but many sections have 30 to 50 driveways per mile (e.g., at worst, only ~100 ft apart). That high frequency of existing driveways is not compatible with King County's Road Design and Construction Standards which limit the frequency of intersections on arterials to 5 to 10 intersections per mile (about 500-1000 feet between intersections) and 17 per mile on collectors. Many of the rural roads inventoried are actually viewed as collectors by the Federal Highway Administration, but King County has internally **reclassified** some collectors as minor arterials, even principal arterials, basically as a response to rising traffic volumes. That is not consistent with the original purpose of most of those roads to function more or less as the neighborhood streets of the rural area – i.e., collectors. Nor does reclassification as arterials support the preservation of rural roads for rural uses, an important aspect of maintaining rural character and rural quality of life, as called for in several planning policies of King County and Puget Sound Regional Council.

Major cities have programs for “**neighborhood traffic control**” to prevent, control, or adapt to through traffic. A similar approach to traffic control in the rural area is warranted, with emphasis on preserving the rural character first and supporting through movements only as a last resort. Examples follow.

Adding **paved shoulders for the safety of pedestrians and bicycles** is a widespread need. That is needed on about 60 miles of roadways. It will take years to complete, once funding is identified and priorities are established to identified which roads need it first, later, or last.

Preserving **safe local access to/from driveways** is needed in those corridors with the highest traffic volumes. On urban streets this usually achieved with a continuous two-way left turn lane, at great expense. That solution is clearly not compatible with the rural environment. A better solution for rural areas would be to **provide for that traffic on state highways**, and if that isn't possible then minimize future traffic increases by **restricting the amount of new development in outlying cities**. GMA calls for providing new capacity where needed, concurrent with development. Make that work across jurisdictional boundaries.

Finally, where traffic must be accommodated, corridor studies could explore **alternative design solutions** such as (just for example) a series of roundabouts at intervals along a rural corridor. That concept would eliminate the need for left turns between roundabouts, would provide

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“traffic calming” effects, and be more compatible with the rural environment. “Wide nodes and narrow roads” is the roundabout mantra.

Traditional engineering improvements are still relevant in a few specific locations. In the most heavily traveled corridors intersection improvements will be necessary to safely serve large turning movements. **Sight distance deficiencies at blind curves and hilltops** also become priority concerns when traffic is heavy.

Some physical deficiencies cannot be so easily corrected. Roads connecting the Green River Valley with the higher plateaus on both sides accomplish that large elevation change via **serpentine switchback sections**. These sharp curves are impossible for large trucks to use and they may be closed in snowy/icy conditions. It is preferable to avoid future traffic increases entirely in these corridors, by “traffic calming” methods, and not to treat them as arterials at all.

None of the traffic impacts of growth in outlying cities that fall onto rural county roads are recognized by those cities as their responsibility to mitigate. Neither does the county road budget cover such needs. But at least **half of all traffic on rural county roads** comes from and goes to cities.

A **perfect storm lies ahead** as several related factors converge on each other:

- severe traffic impacts in rural areas due to growth in outlying cities,
- no accountability for those impacts,
- no funding in sight for mitigating improvements,
- no priority for the preservation of the rural lifestyle versus urban growth.

Legislative remedies are possible. Growth throughout the rural area – whether on unincorporated land or in isolated cities - could be significantly slowed by requiring **complete mitigation of all traffic impacts on rural roads across jurisdictional lines**. More direct control over such growth could be achieved by specifying that GMA growth mandates on cities do not apply to outlying cities – only to the central urban core of the region.

Funding to remedy traffic problems in rural areas should not depend on the overburdened county road tax. **New funding methods are needed.** Potential avenues include:

- State motor vehicle fund allocation (by legislature) to rural needs
- County general fund support for active transportation (pedestrians, bicycles, equestrians) on rural roads
- A Transportation Benefit District covering rural areas and outlying cities together
- Traffic impact fees applied regionally not locally, accounting for a development’s total impact measured as vehicle-miles of travel (VMT) across jurisdictional boundaries, accounting for transit as well as roadways, and responsive to climate change concerns, and distributed to all jurisdictions consistent with the Regional Transportation Plan.

I. RURAL TRAFFIC SHOULD NOT BE LIKE URBAN TRAFFIC

Rural roads in King County are becoming congested, with traffic growth rates much higher than experienced on state highways, especially freeways. This report looks into what's gone wrong and what can be done about it, prepared by a retired transportation planner with fifty years' experience in travel forecasting, transportation planning, and growth management. The focus is on Southeast King County but similar issues are found in other rural parts of King County.

Caveat: the level of analysis is preliminary and without details. Serious work lies ahead to carry out the actions suggested.

Traffic congestion, accidents, noise and pollution are prominent concerns in every city. And every year another study cites the Seattle metropolitan area as having the nation's sixth, or seventh, or eighth most congested traffic, varying a little from year to year.



But that only applies to cities, right?

Rural living involves open space and solitude. It should go without saying that traffic in rural areas should not be congested. Rural roads everywhere are expected to have low traffic volumes giving everyone freedom to maneuver. That includes people who walk, bike, or even ride a horse. When traffic is low they can safely use the same pavement as the motorized vehicles, which is important since rural roads don't have sidewalks and rarely have shoulders.



It works that way in Amish Country.

II. HOW DID IT GET THIS WAY?

The principal cause of this mess is incomplete execution of the Growth Management Act, passed in 1990. After 30 years, we can see the shortfalls. Fixing them is not easy, but we need to try.

The Growth Management Act was supposed to preserve rural areas

Washington State is a beautiful place to live with a robust economy. But our secret is out. People in other states and other countries watch their kids grow up, leave home, and move to Washington to seek their future. Growth has been rapid since the 1970's. Urban planners back then foresaw that unconstrained sprawl would gradually expand suburbia "to the foothills of the Cascades". Back then, Bellevue was as far east from Seattle as commuters would go!

The specter of "paradise lost" motivated leaders of Washington State to pass the landmark Growth Management Act (GMA) in 1990. Key themes were to accept the inevitability of growth but manage it; to protect the environment; to confine urbanization within a firm urban growth boundary; and to improve transportation systems over time "concurrent with development". It means other things as well, but those points are most relevant here.



Has GMA worked? In most ways, yes. The urban growth boundary has largely held back the spread of low-density suburbs. Cities have grown upward not outward. Suburban cities have embraced apartments and condos and became higher-density "urban centers". Development in rural areas outside the urban growth boundary has slowed to a trickle.

But traffic? Since 1990 road congestion has gotten much worse, not better, throughout the region, throughout much of each day. The capacity of roads has not expanded rapidly enough to match the growth. Road building remains unpopular for environmental reasons, and climate change adds another layer of concerns. Building infrastructure of any kind requires funding obtained by taxation, and new taxes aren't popular with voters.

The region has invested hugely on transit, and Sound Transit now provides rail transit for at least some urban dwellers but doesn't reach everywhere - and the cost has been enormous. Complementing the Sound Transit regional system, Metro Transit runs an ever-larger system of bus routes connecting all suburban cities and Seattle neighborhoods. A new kind of city dweller is emerging who doesn't drive a car, walks to work, and takes Uber to amenities like museums, theater, fine dining. For them traffic hassles matter less. Just like New York. *Isn't that the dream of every large city?*

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Rural is different. Outside the urban growth boundary in unincorporated King County there live about 200,000 residents with different lifestyles and different needs. Half of these live in unincorporated areas that are within the urban area and merit treatment as urban residents. The other half live in truly rural areas. Under GMA most growth in the region has been confined to the urban area. That's a GMA success. But after 30 years of growth management, traffic congestion is spreading into rural areas and threatening the rural way of living. *This wasn't supposed to happen. What went wrong?*

The GMA approach to transportation rests on regulating growth so that needed road capacity is brought on line "concurrent with development". Great concept, poor execution. There is no regionally consistent way to apply this GMA rule. First, GMA responsibility was delegated to cities and counties, but without authority to address anything beyond their own boundaries. There is no "hold harmless" obligation for any jurisdiction to protect its neighbors from the consequences of its decisions. The legislature exempted the entire interstate freeway system and other "highways of statewide significance" from the "concurrency" obligations of GMA – but state highways are where the congestion is most obvious. Local jurisdictions have sometimes decided to lower their level of service standards (which the GMA allows) and accept more congestion rather than get tough with the cost of maintaining the level of service that once prevailed.

Whatever happened to the GMA goal of improving transportation "concurrently with development"?

Finally, the words in GMA are explicitly about road capacity, providing no mechanism to account for transit and highways together as a multi-modal system. So, traffic growth is not being managed "concurrent with development". Not in any city. Not in the region.

Urban traffic isn't staying on urban roads

Why is rural traffic getting worse if growth is confined to cities by GMA? The answer lies with another fault built into GMA. GMA prescribed a method that could work if the urban area had a cohesive area, close to circular in shape. GMA did not anticipate the problems that arise with isolated small cities located beyond the urban growth boundary (e.g., Black Diamond and Enumclaw). And GMA inspired the region to require all cities to plan for growth at urban densities – outlying cities as well as big central cities – though that may not be in the law itself.

An unintended consequence of that "one size fits all" assumption was that outlying cities – isolated country towns in those pristine Cascade foothills like Duvall, Carnation, Snoqualmie, North Bend, Black Diamond, Enumclaw - were not allowed to remain small but actually received a mandate to grow! They evolved from farmers' trading posts into bedroom communities for jobs in the urban core, planting suburban tracts squarely in those cherished foothills in complete opposition to the original aims of GMA. Adding insult to injury, the commuter traffic so generated now goes through the "protected" rural area between them and the urban core.

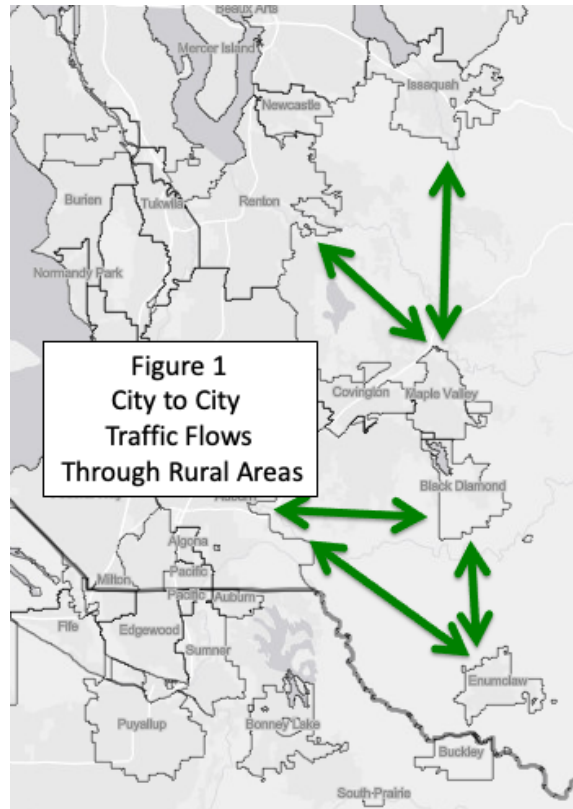
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In this report, the term “outlying cities” refers specifically to those isolated cities that are located beyond the region’s urban growth boundary and separated by some unincorporated rural space between the outlying city and that urban growth boundary. Excluded are fringe cities like Maple Valley and Issaquah at the edge of the urban area, but fully connected to it. This distinction is useful to understanding how traffic grows on rural roads outside the urban growth boundary.

But wait there’s more.

Several rural districts at the outer edge of “suburbia” chose to incorporate to gain greater local control over their own futures. Thus, were born substantial new cities: Woodinville, Sammamish, Covington, and Maple Valley among others. After incorporating, instead of remaining low density rural communities, these new cities found they were required under GMA to plan for higher densities. The smoothly cohesive urban area shape became very distorted.

Two large appendages of dense urbanism now reach outward from Seattle along I-90 to Issaquah, Snoqualmie, and North Bend, and from Kent along SR 516 to Maple Valley, as shown in Figure 1. These new bedroom communities generate intense traffic *where no commuter had gone before*.



Aside: Black Diamond annexed land northward to touch Maple Valley, and thus is not technically “isolated” to meet the working definition of an “outlying city” but the distinction is one of semantics not substance. Black Diamond’s growth has major impacts on several rural arterials.

State highways are designated to connect cities, and they are designed to move traffic far and fast. They have wide shoulders and smooth pavement.



But commuter traffic between newly born outlying cities and the urban core is not confined to the few state highways available. City to city commuters also traverse a number of rural county roads, passing through bucolic farmlands and lightly populated areas where people settled to live in relative solitude, and for whom the daily intrusion of commuter traffic is totally

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inconsistent with their expected rural ambiance. Many a rural resident nowadays can't get out of their own driveway in rush hours due to steady stream of commuter traffic passing by on their local street, now pressed into service as a commuter arterial for city-dwellers.

GMA's weaknesses degrade rural areas

Rural areas are now inundated with city-to-city commuter traffic flows because GMA was applied in a way that required all cities to accept a fair share of regionwide growth - including those distant outlying cities. But GMA did not provide strong enough mechanisms to achieve the goal of improving road capacity "concurrent with development", and left every level of government with too little direct responsibility and authority to forge a coordinated comprehensive systematic solution. It's true that GMA calls for "coordination" in many ways, but without any kind of standards and enforcement. "Coordination is satisfied by a phone call. What's needed is a requirement to mitigate impacts across jurisdictional boundaries, in place of the current practice to mitigate a development's impacts only within the jurisdiction where it is located.

Seeking a better future

Fixing this dismaying situation will take more coordination than previously attempted, new laws, new finances. And do so in a manner that carries out the next generation's mandate, to address the existential problem of climate change.

This report documents traffic conditions on sixteen rural roads in Southeast King County, and suggests a variety of actions to address their traffic problems. Some local, some global. It is hoped this information will lead to productive actions by others in years to come. Similar issues and solutions no doubt apply as well in other parts of King County, and in other counties as well. But Southeast King County is the specific area of study for this report.

III. TRAFFIC - BY THE NUMBERS

Present and future traffic volumes are high and going higher, far above expected levels for rural areas.

Traffic volumes on King County’s rural roads are far above historic norms

The average daily volume for all rural minor arterials statewide is barely 3,000. In King County the average rural minor arterial carries 250% of that statewide average. (WSDOT, Highway Performance Monitoring System, 2019). Of the sixteen roads inventoried for this report, only six carry 3,000 or less. Eight have volumes in the range of 4,000 to 7,000. Two have daily volumes over 12,000. Things are clearly different in rural King County.

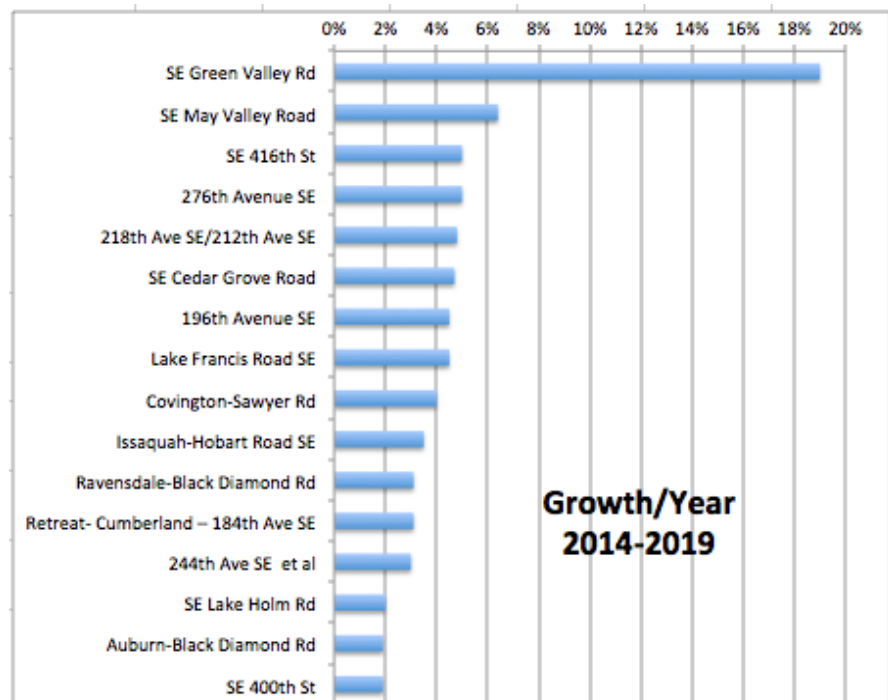
Road Volumes In King County vs. Statewide					
	Rural Roads (mostly unincorporated areas) ¹				
Federal Functional Classification ³	King Co Miles	King Co Avg Volume	King Co Rank Statewide	Statewide Average Volume	King Co vs. Statewide (Ratio)
Interstate	29	46,624	1	31,933	146%
Principal Arterial Fwy/Exprwy	16	20,955	2	8,472	247%
Principal Arterial Other	36	10,071	2	5,124	197%
Minor Arterial	74	7,409	1	3,053	243%
Major Collector	91	5,871	1	1,202	488%
Minor Collector	109	2,976	1	474	627%
Local Access	691	89	2	89	100%
Total Miles of Road	1,046				

Traffic growth rates on King County’s rural roads indicate more trouble ahead

Over the last 30 years King County’s population has grown 50%, or about 1.5% a year.

But over the last five years, traffic growth on most of the sixteen roads studied has averaged between 3% and 5% a year.

Only three roads had traffic growth as low as 2% a year.



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Two roads have five-year growth rates exceeding 6% a year. Their circumstances illustrate the emerging problem of through commute traffic using rural roads to get around congested urban locations.

May Valley Road (growth rate 6.4%/year) now receives traffic coming from I-90 via SR 900 that is destined for Issaquah Hobart Road southward all the way to Enumclaw. Commuters have discovered this route to be a feasible way to bypass Issaquah entirely and also not go out I-90 to SR18, the other “Issaquah Bypass”.

Green Valley Road (growth rate 19%/year) has seen its traffic load more than double in five years. This road is a designated King County Heritage Corridor, which identifies this beautiful farming valley as a cultural treasure to be preserved. Until recently this road only carried farm traffic. Now traffic out of Enumclaw and Buckley, even Bonney Lake, is finding its way to Auburn and the rest of the urban core through this bucolic farming district.

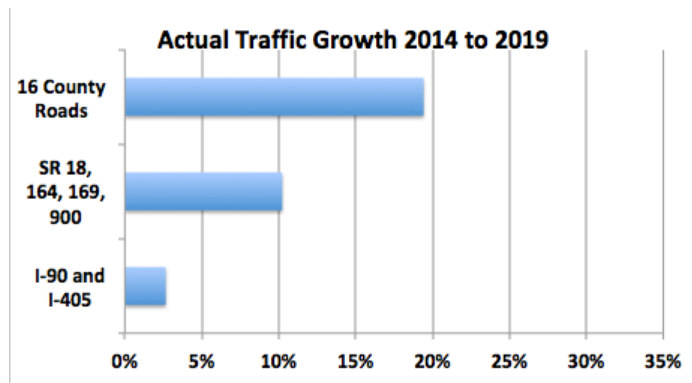


Since development in rural areas is practically non-existent almost all traffic growth on these sixteen roads is coming from those outlying cities where urban densities are required by GMA.

Traffic growth affects county roads more than state highways

Not only is traffic rising on each of the 16 rural roads considered here, but the rate of increase far surpasses the growth rate on the state highways in the area. Which in turn far surpasses the growth rate of traffic on I-90 and I-405.

The reason is simple: the freeways are so clogged that they cannot carry much more traffic. In the five-year period, freeway traffic grew just 3%, in a metro area with a blistering rate of economic expansion. Where did all the demand for freeway travel go? To substitute routes, as a spillover effect. Some to state highways, and more to local roads.



The growth on four state highways in this area averaged 10% over that five-year period but it's different between north and south. Two highways on the south side near Enumclaw (SR 164 and SR 169) both posted five percent growth. In the north near Issaquah, SR 900 and SR 18 averaged fifteen percent growth. That's how much demand there is to connect the outlying cities in the south with the jobs in northern cities like Bellevue and Redmond.

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Location in the region thus makes a difference. The issues north of Maple Valley involve north-south travel on SR 169 and Issaquah Hobart Road, while issues south of Maple Valley involve east-west travel on a variety of roads. Some issues are present concerns, about traffic safety and provisions for pedestrians and bicycles. Even horse-riders. Other issues are concerned with the additional impacts of more growth that's "baked in" to regional plans.

Regional plans say that more growth is coming

The Puget Sound Regional Council has the scoop growth forecasts as far out as 2050. Its VISION2040 land use scenario for the cities of Maple Valley, Covington, and Black Diamond calls for about 40% growth of population and jobs by 2040. (Vision 2050 extends the same growth trends another decade. This report was developed using VISION 2040 data before the 2050 data was available.) That roughly matches the countywide 2% per year growth rate too. Urban core cities have even higher growth rates. Technically those future projections are known as growth "targets" since nobody can predict perfectly what the future really holds for each city, what with real estate markets being subject to supply and demand and all that. But the county and its cities coordinate to the extent of accepting these growth targets in their own comprehensive plans.

PSRC then uses the growth targets to power its travel demand forecasting model to see what needs arise in the target year. The PSRC Regional Transportation Plan (RTP) currently spells out in detail what roads and transit and other facilities should be provided by the target year 2040. But new growth targets for VISION2050 are set, and are now being evaluated to see what that additional decade of growth means for transportation. In early 2022 the revised draft Regional Transportation Plan will be released.

The focus at PSRC is on high level facilities: freeways, mass transit, and some non-freeway arterials. The needs on lower-level roads aren't always included in the Regional Transportation Plan, although all such roads are at least accounted for in the traffic forecasting model so those forecasts are available to be considered in the comprehensive plans of local jurisdictions. In fact, King County no longer maintains an independent traffic model of its own, but refers to the PSRC regional model to justify its own Transportation Needs Report.

If there is an average of 40% more trip generation in the outlying cities by 2040, and even greater growth in the urban core, what does that suggest about traffic growth between outlying cities and the urban core? At least 40% traffic growth in the aggregate, right? And nearly all of it in cars. High-capacity transit won't be seen in rural areas any time soon.

The PSRC regional traffic forecasting model provides a forecast volume in 2040 for every arterial road in the region as background information for the bigger questions about freeways and mass transit systems. But there's a problem. Most of the roads studied for this report carried more traffic in 2019, as measured by counts, than the PSRC traffic model forecasts for 2040. This is not to criticize the model but to point out how actual growth patterns can differ

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from the planning assumptions used by the traffic model. The traffic counts are telling us that the real estate marketplace is marching to a different tune than the planners are planning for. The real estate market is hot not only in Seattle and in the suburban cities, but also in the outlying cities where the regional plan allegedly wants to minimize new growth.

Developers respond to marketplace demand, and the demand is strong for cheaper housing, which is always located further out from the urban core. Since GMA requires cities to embrace high-density housing (i.e., apartments and condos), the outlying cities have dutifully zoned areas for that purpose, and ... Surprise! Outlying cities have become hotbeds of development. And that's where traffic growth on rural arterials comes from.

The outlying cities are growing at a pace much faster than the regional plan foresaw. Growth targets are just targets, not firm limits. There is no legal method to prevent cities from exceeding their growth targets. Worse yet for traffic, nothing holds outlying cities accountable for the impacts of the commuter traffic they generate on the rural roads outside their jurisdiction. Black Diamond in particular is pushing the limits of such development.

[Traffic projections to 2040 for King County's rural roads are frightening](#)

If development trends continue their blistering pace for another 20 years, the trend of traffic growth will likely be a 20-year continuation of the fast 2014-2019 traffic rate. That trend projection applied to all roads leads to very frightening future volumes. This report takes a more conservative approach. Less frightening volumes are used here, taken as the average of the (lower) PSRC forecast for 2040 and the (higher) linear continuation of past trends.

The results are still rather dramatic. Figure 2 compares past, present, and future traffic volumes for all sixteen roads. The information in Figure 2 can be summarized by grouping roads by increments of roughly 5,000 daily vehicles.

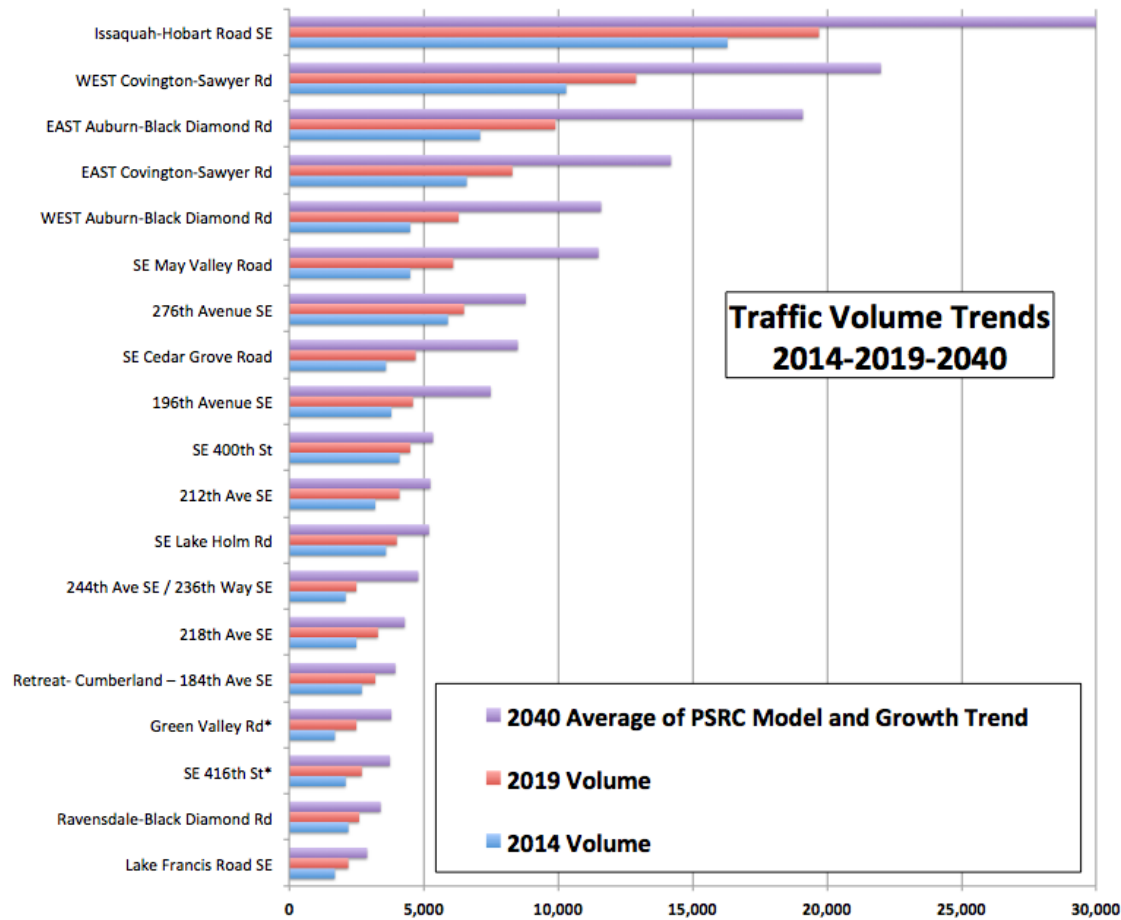
At the top of the chart are three roads with future volumes of between 19,000 and 30,000 daily vehicles or more.

These roads are:

- Issaquah Hobart Road (SR 18 to Issaquah city limits)
- Covington Sawyer Road (from Thomas Road westward to Covington city limits)
- Auburn Black Diamond Road (from Black Diamond to Kent city limits as Kent Black Diamond Road)



Figure 2. Traffic Volume Trends 2014-2019-2040



Will Additional Lanes Be Needed?

Existing Issaquah Hobart Road carries 19,000 daily trips and has extreme congestion. The high 5-year growth rate of the recent past implies that demand will continue to grow. But a two-lane road cannot serve much more than the existing load of 19,000 daily trips. Figure 2 implies that more lanes will be needed. The Regional Transportation Plan has another answer: SR 18 over Tiger Mountain will be upgraded to a four-lane freeway within the next six years. That may take up all the future growth that the existing two-lane Issaquah Hobart Road cannot. The RTP also anticipates 2040 volumes on Issaquah Hobart Road about the same as at present.

Future improvements on Issaquah Hobart Road, if any, should first render the existing traffic more compatible with adjacent land uses, meaning better service to pedestrians and bicycles and support for local access. If this road remains highly congested after SR 18 is widened, that is when further actions would need to be considered. The main choices would be:

- Add through lanes and/or a median left turn lane, and/or a series of roundabouts, or
- Provide significantly more transit service in rural areas to reduce traffic growth, or
- Reduce the amount of development in the outlying areas south of Hobart/Ravensdale.
- No Action. As a two-lane road it acts as a “gate” protecting all of Issaquah.

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Two Lane Roads with High Loads

The next two roads in Figure 2 show high growth forecasts that will put them into the same status as existing Issaquah Hobart Road.

- Covington Sawyer Road (WEST of Thomas Road to Covington)
- Auburn Black Diamond Road (EAST of Thomas Road to Black Diamond)

Mitigation of traffic growth on these roads will require the same types of improvements or land use regulation in their areas as was described for Issaquah Hobart Road in its areas.

Two-Lane Roads with Moderate Loads

Next in Figure 2 are six roads projected to carry 6,000 to 14,000 vehicles a day in 2040. That range of volumes can be handled by a two-lane road provided there are safety and local access improvements. Congestion and noise and other conflicts with the adjacent rural area will be moderate at the low end of this volume range and severe at the high end – almost as much as existing Issaquah Hobart Road. These roads are:

- Covington Sawyer Road (EAST of Thomas Road to 216th Ave SE)
- Auburn Black Diamond Road (WEST of Thomas Road to SR 18)
- May Valley Road (Coal Creek Parkway to Issaquah Hobart Road)
- 276th Avenue SE (Ravensdale to Hobart)
- Cedar Grove Road (SR 169 to Issaquah Hobart Road)
- 196th Avenue SE (SR 169 to Covington city limits)

Roads with Physical Design Constraints

There are physical challenges along several of these roads: sharp turns, uneven topography, steep side slopes, and other geometric challenges. It makes some sense to reduce future demand rather than invest in costly road construction in those challenging areas. That means – to be perfectly blunt - reducing the growth allowed in outlying cities to match the level of road improvements that can be assured “concurrent with development”. Trouble is, there’s no way to make that happen under current law.

The universal need for improving these roads - regardless of the amount of growth - is to adapt the road to the adjacent rural environment – i.e., provide safely for pedestrians and bicyclists, control speeds, and support local access turns. At the high end of the volume range, larger intersection improvements become additional needs.

Roads On the Bubble

At the bottom of the chart in Figure 3 are ten roads with future volumes of from 3,000 to 5,000 daily vehicles. These rural roads are “on the bubble”- where traditional rural road design will be pushed to the limit. Future traffic volumes are bearable as far as ingress/egress is concerned. Safety for pedestrians and bicyclists is another matter. Improvements will be needed for safety – chiefly paved shoulders for pedestrians and bicyclists, and speed controls.

IV. TRAFFIC – A GEOGRAPHIC VIEW

Travel patterns in southeast King County can be summarized in two geographical groups: north-south movements and east-west movements.

North-south traffic funnels through Issaquah

The poster child for all rural roads affected by growth is the Issaquah Hobart Road. This route carries the high traffic volume of a major urban arterial. King County has crowned it in its Comprehensive Plan as a “Rural Regional Arterial”. There are three other such roads in the KCCP, all in northeast King County. Their common purpose is to transport commuters from city to city through rural areas.

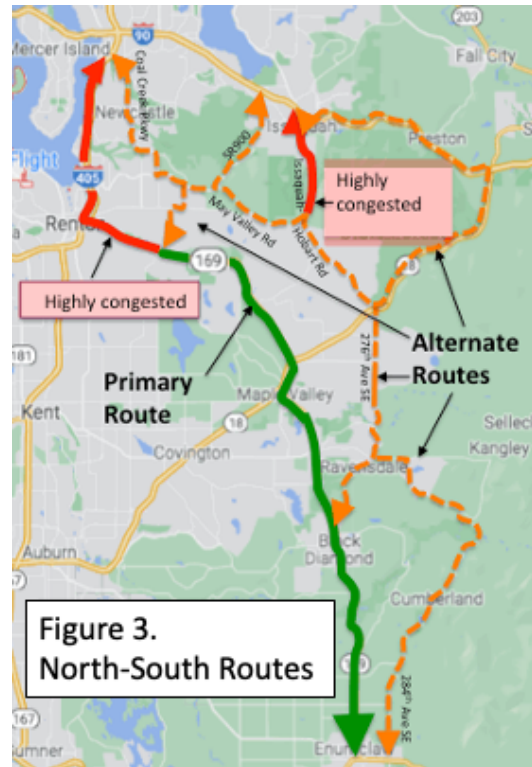
Almost none of the traffic on Issaquah Hobart Road bears any relation to the 7-mile-long agricultural valley it runs through from Issaquah to SR 18. Nor to the rural Hobart area immediately south of SR 18. **Nor for that matter to the city of Issaquah.** This road is simply a funnel through which traffic out of Maple Valley, Black Diamond, and Enumclaw flows to reach I-90 after plowing through Issaquah. These commuters use I-90 to reach their real destinations in the large cities of Bellevue and Redmond, even Seattle.

Figure 3 shows how the funnel that is Issaquah Hobart Road is fed by traffic from four other rural county roads from the south:

- May Valley Road – traffic from NE Renton
- 276th Avenue SE - traffic from Maple Valley and the next two roads listed
- Black Diamond Ravensdale Road – traffic from Black Diamond
- An easterly route through Cumberland –traffic from Enumclaw

North-south traffic is long distance traffic

The traffic flow on 276th Avenue SE through Hobart comes mostly from areas south of Ravensdale. Just how little of that traffic is local was demonstrated in 2019 when King County temporarily closed the Landsburg Bridge for repairs. That bridge on 276th Avenue across the Cedar River is the only link between Ravensdale and Hobart. During the closure, traffic through Hobart on 276th Avenue SE plummeted to just **one-fourth** its normal volume.



Nobody foresaw the consequences to the region of closing down a commuter corridor.

The Trouble with Traffic in Rural King County



Meanwhile, traffic on SR 169 through Maple Valley got slammed. Traffic, like water, will not be denied. It will find a way to go from A to B. The surprising congestion in Maple Valley made the TV news on day one. It seems nobody in authority had foreseen the consequences to the region of closing down a commuter corridor.

That episode can be interpreted another way too, taking the reverse approach. If SR 169 through Maple Valley was the route of choice for those city-to-city commuters when deprived of 276th Avenue, and if 276th Avenue through Ravensdale and Hobart is a rural road serving a rural community, then the question is:

Why hasn't SR 169 been upgraded "concurrent with development" to provide an urban corridor sufficient for the urban growth that GMA enabled?

The practical answer is "maybe someday, but improvements are costly and the legislative process is unpredictable since the legislature must balance all needs statewide against the limited funds available, and local governments have no ability to force developments to pay for mitigation on state highways, and bla bla bla." The legal answer is that SR 169 is one of those "highways of statewide significance" that is exempt from concurrency. The legislature said in effect: local jurisdictions must plan for growth as regards their roads, but leave state highways to us."

But the problem remains. Traffic on SR 169 through Maple Valley and on to Renton is growing faster than corresponding capacity is being provided. To be fair to WSDOT, some widening has taken place in the past two years. It's just too little too late.

North-south traffic wants to use SR 169

An eagle flying overhead would see this commute pattern on Issaquah Hobart Road from a still larger perspective. If the commuter trip from Enumclaw or Black Diamond is going to Bellevue, why is it using that path through Issaquah at all? Why isn't it using the straightest, most direct route: via SR 169 to Renton and then I-405 to Bellevue? After all that's what state highways are supposed to do: connect cities and provide for commerce.

That's the "primary route" shown in Figure 1, and that direct path via state highways is what people actually do use in light traffic - such as at midnight and on Sunday morning. But in rush hours I-405 from Renton to Bellevue is among the most congested freeway sections in the whole region. It remains so despite more lanes being added in the past decade, and more lanes planned for some future decade (but so far unfunded). Heavy trucks account for a fair amount of the congestion on freeways, too. Some are calling for separate truck lanes or truck facilities, which benefits both trucks and cars. But that price tag is, well, astronomical.

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The outcome is that commuters making that trip seek out alternative paths. Google Maps knows about this congestion too, and advises the travel time in rush hours from Enumclaw to Bellevue is a highly uncertain 1-2 hours, whereas at midnight it's only 45 minutes.

And now Issaquah Hobart Road is just as congested in peak hours as I-405 and SR 169, so much so that some trips that might prefer to use Issaquah Hobart Road find still other alternative paths from I-90 southward to avoid going through Issaquah and Issaquah Hobart Road.

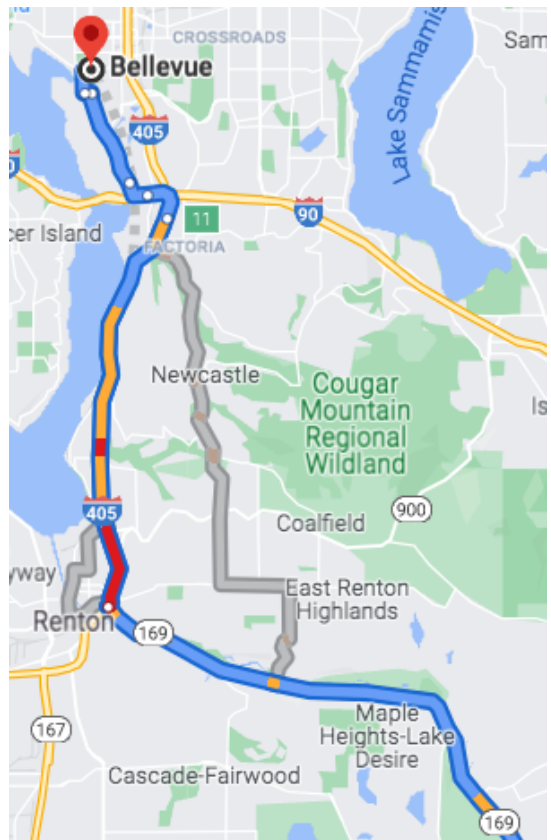
One path around congested downtown Issaquah is via SR 900 and May Valley Road, reconnecting with Issaquah Hobart Road several miles south of Issaquah. Even though May Valley Road is narrow, curvy, and the area it serves is entirely rural.

Another path follows I-90 toward North Bend then takes SR 18 over Tiger Mountain to cross paths with – you guessed it – Issaquah Hobart Road en route to Maple Valley. The Tiger Mountain route is fraught with congestion and safety problems, especially in winter. The good news is that the I-90 / SR 18 interchange will get a radical makeover within a couple more years to relieve the long backups there, and the route over Tiger Mountain is slated for expansion to a fully separate four-lane freeway, within six years. When completed, those improvements will siphon off some of the overload from Issaquah Hobart Road. Remember that eagle flying overhead? He/she must think it passing strange that humans would go from Maple Valley to Bellevue via Tiger Mountain and I90, rather than the direct route via SR 169 to I405. Oh to be able to fly like a bird! So much easier.

By the year 2040 though, more regional growth will have occurred. Traffic forecasts by the Puget Sound Regional Council see SR 18 carrying a lot more traffic thanks to that 4-lane widening over Tiger Mountain. That's the benefit of adding those lanes over Tiger Mountain. That is what will keep demand on Issaquah Hobart Road at about the same amount of traffic in 2040 as at present still abysmally congested but perhaps not needing the 4-lane widening that some have called for. Folks in Issaquah will appreciate that.

Shortcuts through neighborhoods

Some of the traffic that would ideally use I-405 out of Bellevue south to Renton instead turns off in Factoria to follow Coal Creek Parkway through Newcastle and East Renton Highlands to find 156th Avenue SE. This old county road is now Renton's joy to manage. It snakes down the bluff via a winding section of roadway through a residential area to cross the Cedar River, just before connecting with SR 169 as 154th Place SE. Turning volumes to/from SR 169 at 154th Place SE are a sight to behold, for a road that looks like it is just serving a neighborhood. Google Maps knows that route too.



Another bypass option to avoid congestion in Maple Valley is 196th Avenue SE located to the west of SR 169. It is not shown in Figure 1, to avoid clutter.

196th Avenue SE leads from Covington northward, joining SR 169 just before the big curve where SR 169 swings from northward to westward. 196th Avenue SE is a classic two-lane rural road serving active farms and



some rural residential areas at very low densities measured in acres per house not houses per acre. Residents along this corridor are alarmed about the speed of through traffic and the safety issues arising from inadequate sight distance for ingress and egress near blind curves and steep hill-climb sections.

Volumes on 196th are low by urban standards, but increasing. There is no development activity within the corridor itself.

East-west traffic issues reflect congestion on SR 164 and SR 516

East-west travel issues dominate in the south half of the region, from Maple Valley southward. The growing desire is for east-west travel from Black Diamond and Enumclaw in the east to Kent, Auburn, and beyond in the west.

Only two state routes exist to provide for all these movements: SR 516 from Kent to Maple Valley, and SR 164 from Auburn to Enumclaw. Filling the void between these two routes are

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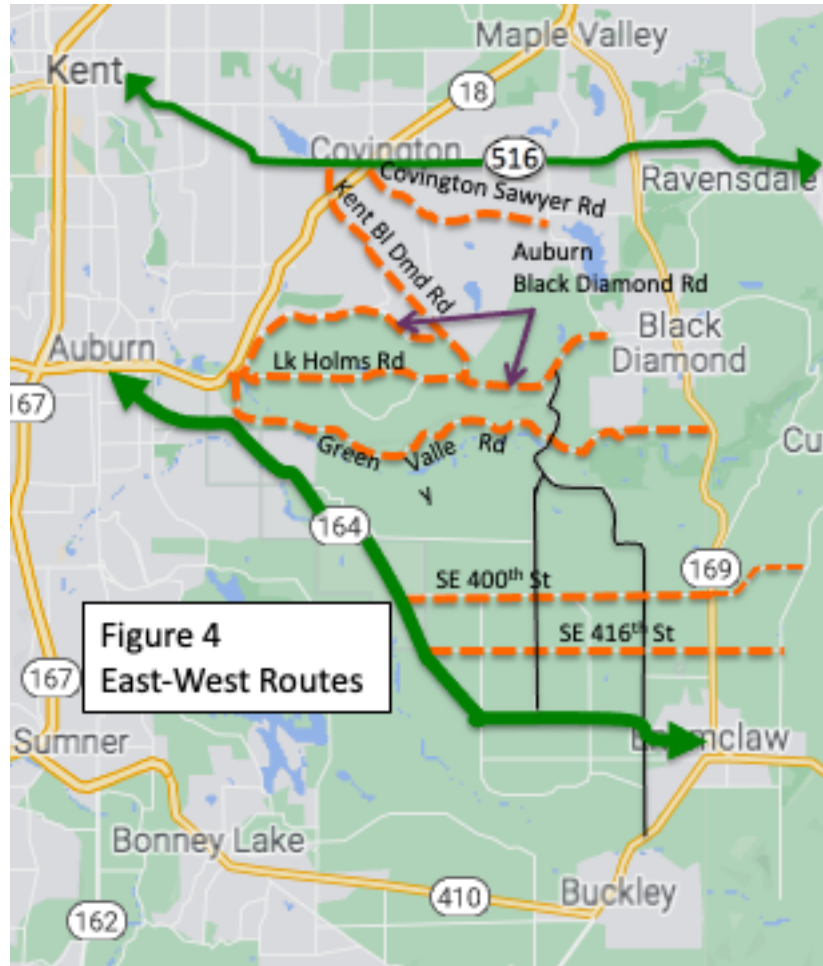
several county roads which are receiving the majority of increases in east-west traffic. These routes are depicted in Figure 4.

Topography is a limiting factor in this area due to the steep walls framing the valleys of the Green River and the White River.

Traffic volumes on these roads do not yet rise to the extreme level found on Issaquah Hobart Road, but the rate of growth in recent years is more alarming. These old rural roads were not built to carry large volumes of through traffic. Each road has sections with sharp curves and hill-hugging contours with limited sight distance in too many places. There are too many driveways and intersections where turning conflicts are already a problem. Pedestrians and bicyclists use these roads at their peril due to the general absence of paved shoulders or other facilities for such users.

Two of these roads were highlighted in a previous section because their future volumes approach the limits of capacity for two lane roads. Both are highly impacted by growth in Black Diamond with no provision being made for mitigation of those impacts. **Auburn Black Diamond Road** takes the brunt of traffic out of Black Diamond into Auburn at SR18 and into Kent at SR516. **Covington Sawyer Road** links the north end of Black Diamond with SR 516 at Covington. Residents along those two roads take a dim view of the toll traffic growth is taking on their quality of life.

Green Valley Road is the poster child of a purely rural road through a farming district. Until recently it was serving only a miniscule volume of local traffic including tractors and hay trucks. Traffic has now more than doubled as it has been discovered by commuters going to Auburn and beyond from outlying Enumclaw and Buckley - even Bonney Lake!



V. TRAFFIC – A PERFORMANCE VIEW

The same types of problem situations show up repeatedly on many country roads. These are:

- driveways and intersections
- sight distance
- speeding and speed limits
- serpentine hill-climb sections
- “active transportation”

Problems at driveways and intersections

Anywhere that vehicles turn on/off an arterial is a point of conflict with through traffic. When traffic volumes are low, this is not a concern. As volume rises, the number of reliable gaps in traffic shrinks until the point is reached when ingress/egress is practically impossible during peak hours at least. Like on Issaquah Hobart Road. Making left turns off the arterial delays all traffic behind the vehicle stopped and waiting for a safe gap in oncoming traffic. Impatient drivers may use the shoulder to get around the stopped vehicle. This is a setup for traffic accidents and road rage.

But the level of service standard used by engineers to rate a road is mainly concerned with the speed and volume of throughput, not the feasibility and safety of turning movements. A different measure is needed to account for the degree of conflict between through traffic and local access.

To provide some factual information about driveways, a count was taken of the number of driveways per mile along each of the 16 rural roads. Frequent driveways mean more ingress/egress activity, and that local activity is adversely affected by increasing volumes of through traffic.

Most of the rural roads inventoried here have large numbers of driveways serving homes, farms, and the occasional small business. The counts of driveways here include as well all intersections with named streets for simplicity and because those are very few out in the country. Whether it's a driveway or an intersection, it's still a conflict point.

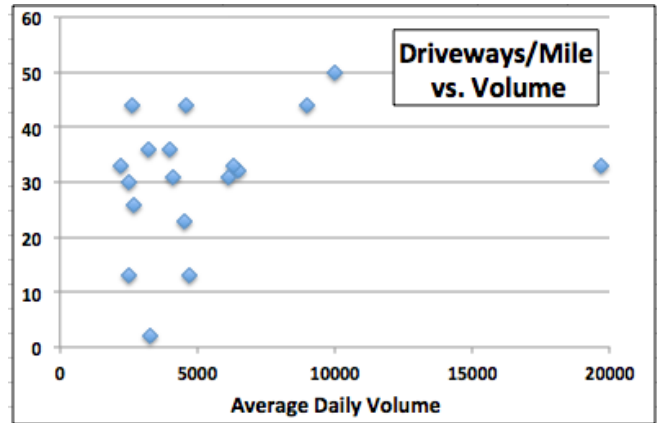
The overall average frequency of such conflict points works out to 22 per mile, but most segments have more and some segments have up to 50 conflict points per mile. Three routes



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stand out for having both high driveway counts and high traffic volumes (10,000 and up) in their core sections, indicating high conflict and potential for accidents. These are:

- Issaquah Hobart Rd (33 driveways/mile)
- Covington Sawyer Rd (50 driveways/mile)
- Ravensdale Black Diamond Rd (44 driveways/mile)



Three additional routes present a moderate level of concern with current volumes between 5,000 and 10,000 daily vehicles and 30+ driveways per mile.

- May Valley Rd
- 276th Avenue SE
- Auburn Black Diamond Rd

Ten routes have current volumes below 5,000 daily vehicles which minimizes concern for now, but most of them have high driveway frequencies. As volumes rise in the future, most of these routes will rise to a higher level of concern too.

For comparison, conflict points on comparison sections of state highways 164, 169, and 516 average only 17 per mile. The state strives to limit access points on its routes and thus maintain the priority of through traffic.

This inventory of actual driveway frequency is a useful way to compare as-built land use to idealized land use found in road design standards. King County's road design standards specify only 10 intersections per mile on Minor Arterials, which indicates that every one of these rural roads has far too many intersections (including driveways) to perform satisfactorily as a Minor Arterial. Safety issues are sure to follow.

Problems with speeding and speed limits

The relationship between speed and injuries is well established. Speed kills. The severity of injuries to pedestrians and bicyclists rises significantly when vehicle speeds rise above 30 mph. But it is not easy to control speeds out in the country where prevailing speeds on most routes are over 40 mph, and scofflaws going 50-60 mph are not uncommon.

On many of our sixteen rural routes, speed limits are either 35 mph or 40 mph. But several routes have 45 mph posted limits on at least part of their length, and one section has a 50-mph speed limit.

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Those higher speed limits were presumably set by engineers after studying the pattern of actual speeds. Engineering practice is to set the speed limit so the violation rate by scofflaws is about 15%. Setting the speed limit lower than that leads to far more drivers being in violation, and requires a lot more police enforcement. That's often done in cities where "neighborhood traffic control" is a priority and speed limits are set low to discourage through traffic and to protect children in the neighborhood. County policy on speeds has been to support through traffic and therefore leans toward higher speed limits. Why not change the policy to prioritize safety, not speed? The Washington Traffic Safety Commission has a Target Zero Plan to eliminate all traffic fatalities, through education, enforcement, and engineering. The Federal Highway Administration has a strategic plan called Safer Roads for a Safer Future.

Why not emphasize safety more than speed?

Problems with sight distance

Older rural roads were built to lower design speeds than apply nowadays. That is why country roads tend to hug the terrain with more blind curves and blind hillcrests. That was cheaper than smoothing out vertical and horizontal curves, as is typical of state highways. Sight distance in such places is inadequate today as speeds and volumes have risen, sometimes dramatically.



Twelve of the sixteen roads surveyed have locations where horizontal curves noticeably restrict sight distance. Nine of the roads have locations where hillcrests similarly inhibit sight distance.

Sight distance issues do not always produce high accident experience, but they are always a safety factor that can be improved by design changes or by reducing speeds.



Most obviously affected is the safety of pedestrians and bicyclists on the edge of the roadway at locations where there is no suitably wide shoulder for them to avoid sharing the pavement with passing cars. Also, car drivers cannot see far enough ahead to know if it is safe to cross the centerline to pass, or they are obliged to follow slowly behind the ped/biker until adequate sight distance is achieved. This issue gets worse as traffic grows.

County road standards relate necessary sight distance to prevailing speed, rising from 390 feet at 35 mph to 555 feet at 50 mph. Thus, speed policy and speed control interact with road design and with regulation of access at new developments. All can play a part in improving

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safety overall for ingress/egress at local intersections and driveways – i.e., supporting preservation of rural living.

Problems at serpentine hill-climb sections

Going westerly from Black Diamond, three of the routes surveyed follow serpentine paths to descend from a high plateau to the floor of the Green River valley. Sharp turns are posted with advisory speed limits of 15 or 20 mph. Locals tell of trucks getting stuck attempting these sharp turns. Conditions of snow and ice are difficult to manage here as well. These roads can serve the rural areas they traverse adequately at relatively low volumes, but the serpentine hill-climb sections were not built to serve as regional arterials to handle high volumes.



Lake Holm Road is one such route. Others with similar constraints are Green Valley Road and Covington Sawyer Road. In a north-south direction, 212th Ave SE has similar issues. Hill-climbs are also found on Auburn Black Diamond Road and 218th Avenue SE but their curves are better engineered for speed.

As traffic volumes rise due to population growth in the outlying cities, these serpentine hill climbing sections will have greater problems and become significant bottlenecks at relatively moderate volumes compared to other arterials. Most alarming are the much greater traffic increases that would follow from Black Diamond’s growth plan that far exceeds regional targets. That city’s plans were announced over a decade ago but a comprehensive analysis of traffic impacts has never been completed.

Problems for “active transportation”

What used to be known as non-motorized travel is now described in transportation circles as “active transportation” since it refers to the *activity* of travel on foot or by bicycle. In rural areas that can include horseback riding.

Pedestrian activity along roads is low in rural areas, but anybody may need to walk sometime, perhaps carrying an empty gas can. And more people would choose to walk if there weren’t so many #%\$#@ cars. Some joggers brave the traffic and wear reflective clothing. Pedestrians are most common near local activity centers such as parks, playgrounds, watering holes (both the indoor kind and on rivers), and local markets. The point is, roadside safety for people on foot is not a design choice. It’s a risk factor that should not be ignored.



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Bicyclists commute to work on rural roads (may their numbers increase!), and urban bicycle clubs choose rural roads for long tours. Issaquah Hobart Road on a Saturday is a great place to view 50 bicycles in a row, trailed by a dozen cars waiting for a chance to pass. Maple Valley just hosted an Ironman competition including a bicycle segment on public roads.



In olden times, everyone shared in the use of rural roads – walking, horseback riding, buggy riding, and so forth. Then came cars. At the low traffic volumes originally prevailing, cars could share the road with people on two feet or four feet, or two wheels. Only in recent decades has car traffic reached the high volumes that leave all other users feeling unsafe. The most common upgrade in rural areas is to provide adequate shoulders, or sometimes a separate path or trail.

King county road design standards call for paved shoulders at least four feet wide on rural



arterials and neighborhood collectors. That works pretty well for pedestrians and bicycles. But bicyclists say that paved shoulders are not swept clear of debris very often and flat tires are the result, so they prefer to ride in the street anyway. That's a question to address in the road maintenance budget. The county's road design standards also call for consideration of equestrian needs alongside the road, or for crossing the

road, where activity exists in designated equestrian communities.

So, the sixteen rural roads were checked for paved shoulder width over 57 miles of length. It turns out that 59% of the road mileage checked has less than two feet of shoulder. That's not enough "elbow room" for anyone on foot or bicycle to feel safely separated from traffic whizzing by at 40+ mph. But the county only applies the 4-foot+ standard to new road construction and road reconstruction projects, when and if they occur. There is no priority within limited budgets to retrofit all roads with



adequate paved shoulders anytime soon.

Only two of the sixteen routes have paved shoulder widths of 4+ feet over their entire lengths.

Route Miles with Paved Shoulders <2 ft		
Route	Miles	% of Total Route
196 th Avenue SE	5.1	100%
276 th Avenue SE	6.4	100%
SE Green Valley Rd	9.1	86%
SE May Valley Road	5.4	83%
Issaquah-Hobart Road SE	5.4	83%
244 th Ave SE et al	5.8	82%
212 th Ave SE	3.65	68%
SE Lake Holm Rd	2.9	66%
SE Cedar Grove Road	2.3	66%
Lake Francis Road SE	2	57%
Covington-Sawyer Rd	1.3	38%
Retreat- Cumberland – 184 th Ave SE	6	34%
Ravensdale-Black Diamond Rd	0.8	24%
SE 400 th St	0.9	12%
Auburn-Black Diamond Rd	0	0%
218 th Ave SE	0	0%
Totals, all routes	57.1	59%

VI. TRAFFIC – A POLICY VIEW

The traffic problems rural residents now experience didn't just arise by accident. They emerged as a result of disjointed policies separately devised at different levels, with unfortunately predictable consequences.

Functional classification as related to land use

Engineers classify roads according to the role they play in a region's network, and this has important consequences for how land adjacent to the road is developed and used:

- **Principal Arterials** are the backbone of the system serving high volumes of long-distance travel with little or no local access.
- **Minor Arterials** also serve through traffic but with more tolerance for local access.
- **Collector Arterials** provide for a balance of local access and through movements.
- **Local Roads and Streets** serve only local access.

Ideally, the arterial network consists of many collectors, a few minor arterials, and very few principal arterials. Most centerline miles of road are local; i.e., unclassified. Note also that collectors are arterials, as distinct from local roads.

Functional classification influences road design standards, speed limits, intersection spacing, and private driveway access. Level of service standards (i.e., how much congestion is OK) also vary with classification, meaning that more congestion is acceptable on Principal Arterials and less on Collectors. And as previously noted, there is no attention in handbooks to the level of service standard for local access.

The Federal Highway Administration uses a standardized classification scheme for all roads nationwide, which is followed by state highway departments (e.g., WSDOT) and regional planning agencies (e.g., PSRC). Local governments sometimes adopt different classifications for their internal purposes. King County does. That's not illegal - just not relevant when applying for federal grants. The Golden Rule applies: *those who have the gold make the rules.*

In King County there are many differences between how the same rural roads are classified by the federal government, and by King County. Of the 16 rural roads inventoried for this report, only four roads have the same classification at both agencies.

<u>Classification</u>	<u>Federal Highways</u>	<u>King County</u>
Principal Arterial	1	4
Minor Arterial	10	10
Collector Arterial	5	2

Some traffic problems in rural King County can be traced to taking roads built as collectors and reclassifying them as minor arterials, even principal arterials, in order to favor through traffic, *but without reconstructing the roads to actually function well at the higher classifications, nor*

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attempting to close any of the too-frequent driveways that violate the standard. But speed limits may get adjusted upward based on the higher classification.

As a consequence, rural residents have difficulty getting out of their own driveways in rush hours due to the rising volume of through traffic on roads that were originally collectors but which the county now views as minor or even principal arterials. The county's policy and practice is to support through traffic over local access. Countywide planning policy TP2 declares it and functional classifications implement it.

Whatever happened to the GMA goal of preserving rural areas? Traffic between cities should be served by state highways. The volumes carried by county roads should remain low.

Road design standards in relation to functional classification

Road design standards express the balance of priorities between through movements and local ingress and egress. The King County standard allows only 5 intersections per mile on Principal Arterials, 10 per mile on Minor Arterials, and 17 per mile on Collector Arterials.

A private driveway is an intersection for this purpose, since each driveway presents another potential conflict point.

B. Spacing between adjacent intersecting roads/streets, whether crossing or T-connecting, shall be as follows:	
When highest classification involved is:	Minimum centerline offset shall be:
Principal arterial	1,000 feet
Minor arterial	500 feet
Collector arterial	300 feet
Neighborhood collector	150 feet
Any lesser street classification	100 feet

When the classification of a road is changed, especially upward, that has significant consequences for adjacent land development that may not be consistent with current land uses, the zoning code and future land use plans.

Revising current King County functional classifications in keeping with the adjacent rural land uses, such as reverting to the federal functional classifications, would be a step toward road designs that support the rural area.

GMA in relation to functional classifications

The logic of road design standards implies that lower classed roads should carry lower traffic volumes in order to accommodate local turns, and higher classed roads should provide less support for local turns because they are intended to carry higher traffic volumes. But GMA only specified using level of service, not functional classification, as the basis for maintaining adequacy of roads "concurrent with development". And traffic engineers evaluate level of service without regard for classification because the potential throughput of any lane anywhere is almost a constant of physics. Thus, for LOS purposes traffic engineers will give lower classified roads almost the same capacity as higher classified roads. This completely disregards the original intent of the road engineers' classification scheme which associates lower classifications with lower permissible traffic volumes. A better approach to LOS for rural roads would be to consider the volume limits below which easy ingress/egress is assured. That

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should lead to threshold volume somewhere between 5,000 and 10,000 vehicles/day (more research is needed).

Many of the county roads evaluated for this report originated as farm-to-market roads serving agricultural needs. As such, traffic volumes were low and frequent driveways were not a problem. Now, as those roads are increasingly used for city-to-city travel, driveway frequency looms as a major cause of conflict between the adjacent land uses and the through traffic users of the road. This issue is largely overlooked in traditional traffic engineering and thus the intent of GMA to protect rural areas has been disregarded.

Shooting regional growth targets over the moon

There's a rotten egg in the GMA methodology: the growth targets are not binding on the cities. Most cities have accepted their growth targets, some in protest, some with glee. But Black Diamond is breaking the mold with a "moonshot". More than ten years ago, tiny Black Diamond entered into development agreements with two Master Planned Developments (MPD's) that would add 6,100 new homes and 1.1 million square feet of commercial space. About three times their regionally approved growth target used by PSRC, and ten times their former population. That city is proceeding as if it need not adhere to the region's growth targets at all. It's even amending its comprehensive plan to add more developments beyond those original MPD's. The traffic impacts beyond that city will blow the PSRC traffic forecasts right over the moon.

But this is not rocket science. Any engineering handbook will establish that the traffic generated by 6100 homes assuming a mix of single-family houses, multi-unit condominiums, and low-rise apartments is approximately 50,000 daily trips (+/-). Some of that will stay in Black Diamond but most will go elsewhere. To accommodate (say) 40,000 trips/day on one road in one place would require FOUR TO SIX NEW LANES of arterial roads. Sadly, there is no plan anyplace to provide any such lanes. So, the existing road network will take the burden, and become overwhelmed. These are the available routes between Black Diamond and the urban core to the north and west:

- Black Diamond Ravensdale Road to 276th Avenue SE to Issaquah Hobart Road and SR18
- SR 169 to Renton through Maple Valley
- 216th Avenue SE to Kent Kangley Road (SR 516)
- Covington Sawyer Road to Kent Kangley Road (SR 516)
- Auburn Black Diamond Road (east end) to Kent Black Diamond Road to Kent Kangley Road (SR 516)
- Auburn Black Diamond Road (west end) to SR 18
- 218th Avenue SE to Green Valley Road to SR 18

The amount of new growth planned by Black Diamond will bring all of these roads to a crawl, long before the full buildout status is reached. This ain't over folks. Keep an eye on it.

VII. TECHNICAL SOLUTIONS

For most traffic problems there are potential solutions; i.e., feasible countermeasures. These are discussed next similar to the previous discussion of problem categories, plus more.

- Driveways and intersections
- Speeding problems
- Sight distance problems
- Serpentine hill-climb sections
- Active transportation
- High traffic volumes
- Too much growth
- Roads that work for everybody

Should not problems inflicted on rural areas by developments in nearby cities be viewed as impacts of growth? With the cost of improvements allocated to developments as mitigation in fair proportions?

The trouble with achieving those solutions usually boils down to cost; i.e., who pays?

Solutions at driveways and intersections

Traffic level of service (LOS) standards are based primarily on delay. Ordinarily this refers to delay of the vehicles entering an intersection. In the case of vehicles on the road delay is represented by average speed. The logic of delay also applies to ingress and egress movements at driveways and minor intersections, but the focus is on individual vehicles rather than the average for groups of vehicles. The “group” is instead the sum of all the individual driveways along a route.

The severity of delay at driveways is related to the volume of through traffic. Accident experience also tends to rise with higher volumes. Exactly where the break points should fall for LOS A, B, C, D, E, F need not be decided here. Using the simple measure of daily volumes, the following rough guide is a start.

- Below about 5,000 daily vehicles, ingress/egress movements are not significantly delayed.
- Around 10,000 daily vehicles, ingress/egress movements are noticeably delayed.
- At 15,000 daily vehicles and higher, ingress/egress is nearly impossible.

That impossible condition clearly exists for access movements on Issaquah Hobart Road, and some other rural roads aren't far behind. But to construct improvements costs money, especially over a long length of roadway.

Defining a level of service policy is part science, part economics, and part politics. Where local access turns are concerned, a policy could be formulated that finds it intolerable in rural areas for ingress and egress to suffer such delays that the rural lifestyle cannot be maintained. The ideal might be to preserve volumes below 5,000 as much as possible and the daily volume level of 10,000 could indicate when corrective measures should be taken.

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The first consideration would therefore be to control traffic volumes entering a corridor to keep traffic below the level where the entire corridor needs a costly upgrade. When volumes are unavoidably higher physical improvements can take various forms, best determined in a detailed study with emphasis on traffic calming and active community participation throughout the process.

A two-way left turn lane is the usual choice in urban corridors with frequent driveways. That physical expansion would not be compatible with a rural area, but it depicts a starting point to discuss options better suited to the rural environment.

Roundabouts at spaced intervals along a route are a possible solution. Instead of widening the whole roadway over a long distance with a two-way left turn lane, just widen a few intersections. A roundabout every mile or so provides everyone an option to make a right turn instead, go to the next roundabout, and use the roundabout for a U-turn to end up going the right direction. To prohibit left-turn movements entirely also add a raised median C-curb.

Mini-roundabouts are gaining increasing support as a design option suitable for “traffic calming” in rural areas. Mini-roundabouts use a smaller diameter to fit within the existing intersection space. They have a low profile that is mountable so trucks can make turns. Being smaller, they cost much less to construct than larger roundabouts. But the smaller size means they aren’t suitable where entering speeds are high. Placing a mini roundabout at each local street intersection throughout a corridor can work to limit the speed between intersections, while the beginning and ending roundabouts of the corridor may need to be larger to regulate the higher speeds entering from outside the corridor.

Solutions for speeding problems

A policy expressing preference for local access safety over efficiency of through movements could support lower speed limits and more speed enforcement.

Some routes have a variety of speeds posted from one end to the other. This is confusing to local residents. A more nuanced speed study might support a uniform speed over a longer distance, such as changing a mixture of 40 and 45 mph segments to a uniform 40 mph. The isolated segment of 276th Avenue SE that is posted at 50 mph seems particularly open to re-assessment in view of recent accident history and citizen complaints.

A rural collector should arguably have a lower speed than a minor arterial to give preferential support to local access. The current classification scheme of King County in the southeast county area consists of numerous principal arterials and minor arterials and too few collectors, whereas the protection of rural residents is better served by restoring collector classifications to some roads and enforcing lower speed limits. On that basis, speed limits might reasonably be lowered 5 mph on many roads.

Solutions for sight distance problems

Almost every one of the sixteen rural roads inventoried here has one or more blind spot locations, whether caused by a horizontal curve or a vertical curve. Solutions will vary depending on the details of each specific situation. An engineering review of each specific situation is needed to choose from available options, such as the following. Reconstruction options are obviously more costly than maintenance options.

- Set speed limits lower and enforce them with extra police emphasis at the location.
- Remove brush and other roadside obstacles and maintain that clearer condition.
- Remove some adjacent sloping hillside that blocks sight lines and install a retaining wall.
- Straighten a curve by reconstruction.
- Round off a hillcrest by reconstruction.

Solutions for serpentine hill-climb sections

A snaking hill-climbing section generally cannot be fixed without major reconstruction, if at all. The original design used sharp switchback curves to cope with difficult topography, and there may be no feasible alternative at reasonable cost. Therefore, the best strategy at such locations is to prevent high traffic volumes from using the road in the first place. That involves both a carrot and a stick.

The “carrot” is to provide better travel alternatives elsewhere. That may mean adding capacity to a nearby state highway or other arterial deemed preferable to serve future growth, instead of the road with the difficult serpentine section. It may also mean reconsidering land development in areas that contribute new demand for the difficult serpentine section, or imposing conditions on such development to avoid traffic growth on that road.

The “stick” is to limit the use of the road in question by traffic calming techniques including the following:

- Post “no through traffic” signs at key locations.
- Set lower speed limits through the corridor.
- Install mini-roundabouts at each end of the corridor to forcibly regulate speeds
- Install a “choker” section at each end of the corridor, forcing all traffic to come to a stop before crossing a one-way section. This technique is reasonable only in low-volume situations.

Solutions for active transportation

Providing for active transportation in cities generally means sidewalks and bicycle lanes. In rural areas the idea remains the same but the methods change, meaning in most cases to provide a paved shoulder of suitable width. Current road design standards actually call for at least four feet of paved shoulders, which is minimally adequate for pedestrians and bicycles.

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Most of the sixteen arterial routes studied for this report are deficient per that standard, but funds for improvement are lacking. It matters for vehicular safety as well. Where the shoulder is too narrow, drivers will swerve across the centerline to make room for a pedestrian or bicyclist on the narrow shoulder.



With whatever funding is available for this purpose, it makes sense to first address high priority locations where the needs are most obvious:

- Blind curves and blind hilltop locations - where vehicles can't see far enough to pass a bicycle and neither bicycles nor pedestrians can get off the paved road because there's no usable shoulder.
- Road sections where there's local pedestrian activity like around neighborhood stores, schools, ballparks and other recreation.
- Popular routes where bicycle clubs flock on weekends and experience considerable friction with traffic.

The eventual goal: every arterial has at least four-foot shoulders, preferably more. Paved or unpaved is a design choice that depends on the local situation.

Solutions for high traffic volumes

Where traffic volumes on county arterials are deemed unacceptably high the choices are limited. First apply all the traffic calming techniques previously discussed to make the arterial traffic as compatible with the adjacent environment as possible. Then address the "excess demand" problem as follows:

- Increase the capacity of state highways between outlying cities and the urban core, primarily to give an advantage to commuter transit service in those corridors.
- Provide high-speed commuter transit service between outlying cities and the urban core.
- Reduce land development in outlying cities unless/until state highways are suitably upgraded.

Solutions for too much growth

The worst disruption of the rural environment, and the most-costly remedial road reconstruction, can be avoided by reducing growth in outlying cities. This calls for revising GMA at the legislative level to provide the region with the tools it needs:

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- the ability to set lower growth targets for outlying cities compared to urban core cities.
- the ability to enforce growth targets, and impose controls on a city that approves growth in excess of what the region is prepared to accept.
- the ability to account for all impacts of development across jurisdictional boundaries and considering the longer trip length and lower transit use arising in outlying cities – such as a regional “system hookup charge” based on the vehicle-miles of travel generated by a development.

These changes are supportable as well as part of a broader climate change strategy, since they lead to fewer trips by fuel-burning automobiles and shorten the average length of such trips.

Solutions that make roads work for everybody

Setting priorities and designing road improvements to better fit the rural environment is helped considerably by establishing a “complete streets” approach for level of service on rural roads. It’s not so much about inventing a new standard as recovering the standard that prevailed in the early days of the automobile era and still works in most rural counties where traffic volumes remain low:

everybody should be able to use the road – not just cars, trucks, buses, but also pedestrians and bicycles and equestrians.

There are websites devoted to the “complete streets” philosophy. A Washington State law was enacted in 2010 encouraging local jurisdictions to adopt complete streets ordinances. Many cities have done so. Applying the same to county roads is also possible. It just requires adding consideration of “active transportation” and “ingress/egress” to the methodology for level of service alongside or in place of the conventional focus on speed.

King County Road Standards do address the topic in a way by specifying that when nonmotorized facilities are required, certain design standards apply. But that leaves unspecified the decision of when a shoulder or sidewalk or separate multipurpose path is required. And where do we find a “standard” to follow for the timing of road improvements? GMA. Paraphrasing for brevity, the essence of RCW36.70A.170 is:

Cities and counties required to plan under GMA must have a transportation plan which meets the level of service standard in a specified future year. And where development approval is concerned, that level of service standard must be satisfied “concurrent with the development”.

That same section of GMA also calls for a “pedestrian and bicycle component” in the transportation plan, but there are no specific standards. It’s just a matter of meeting “community lifestyles” – i.e., it’s political.

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What level of service standard does GMA require? ***Whatever the jurisdiction specifies in their transportation plan.*** Most cities and counties simply use traffic engineering methodology for level of service. That only addresses vehicular speed and delay. But can a level of service standard incorporate pedestrians and bicycles? Can the protection of ingress/egress be added? Sure. What constitutes adequacy is a policy question, not an engineering decision. But the jurisdiction has to define it in the comprehensive plan because there's no handbook that considers this situation.

A few Washington cities have actually done so. They have written custom level of service standards reflecting the "complete streets" idea, along these lines:

- The full amount of road capacity per traffic engineering methods can only be used if the roadway meets full urban design standards – including sidewalks
- Without sidewalks, much lower volumes are allowable.
- Acceptable volumes rise in proportion to the completion of sidewalks.
- Shoulders can substitute for sidewalks
- Other design deficiencies such as narrow lanes, curves, topography, and sight distance issues can be accounted for as well

Of course, in rural areas, shoulders would be the standard not sidewalks. It's not a new concept at all. Calgary, Alberta did this back in the 1980's. They assigned each road an "environmental capacity" that was much lower than its physical (typical engineering) capacity, if it lacked adequate facilities for pedestrians, bicycles, and local access.

So how do you put numbers on a concept like "complete streets" for purposes of level of service? Looking at traffic from the perspective of rural residents some breakpoints can be suggested, at least for 2-lane roads. Under 1,000 vehicles a day traffic is easy to live with. In peak hours that's about 2 cars a minute. Most city neighborhood streets meet that. So do most rural collectors in the state. Up to 3,000 vehicles a day, pedestrians feel OK using the street but must be alert. Life goes on. At around 5,000 vehicles a day, quality of life for adjacent residents is measurably diminished. Noise is a bother. Kids are kept away from the street. Joint use of streets no longer feels safe, but traffic still flows nicely. This social aspect of traffic on streets was researched decades ago (Appleyard, Liveable Streets, 1981)!

As traffic rises toward 10,000 vehicles a day, traffic is slowed much more by local turn movements, and everybody's frustration rises. Nobody wants to walk alongside the road without a good wide shoulder. Bicyclists co-exist with traffic but with misgivings. Through traffic still has more room to grow.

The practical limit to daily capacity used to be about 15,000 vehicles a day, back when peak demand filled just one hour each evening and each morning. The severe lack of new road capacity throughout King County for several decades has trained everybody to be flexible and

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shift their schedules so that peak demand is stretched fairly evenly across 3-4 peak hours each morning and each evening. That has led to a higher daily limit of about 20,000 vehicles a day. Hello, Issaquah Hobart Road.

Stretching a single peak hour to become a peak period three to four hours long is called “peak-spreading”. This has taken place gradually since the 1980’s and is a key part of “travel demand management” in regional plans. Translation: 6-8 hours of congestion every day is a good thing, because we are making more efficient use of pavement. Pavement bad, congestion good. That is considered “wise use of resources” in urban areas. *But rural areas?*

Most of the sixteen roads inventoried have daily volumes far above the statewide average for rural Minor Arterials, and that affects the quality of life for rural residents. Doesn’t it make sense to have a rural level of service standard that calls a road deficient if volumes are higher than is safe and comfortable for pedestrians and bicycles, and higher than is tolerable for turning movements at driveways? If such a level of service standard were applied in the rural area, the transportation plan could then identify improvements that create “complete streets”.

Solutions for transit

Metro Transit operates bus routes between rural cities and the urban core, but coverage is limited and service is infrequent. Existing routes are limited to state highway corridors:

- SR 164 between Enumclaw and the Auburn Transit Center
- SR 169 from Black Diamond to Renton Transit Center
- SR 516 from Maple Valley to Kent Transit Center.

Given the incentive to use transit to meet climate change goals, an expanded transit program in this area might include some/all of the following:

- More frequent service on existing bus routes to transit centers
- Extend the existing service on SR 169 to originate in Enumclaw
- Additional bus routes on several of the sixteen arterials reviewed in this report
- Additional express bus routes to directly connect outlying cities with urban employment centers in north King County, such as Bellevue-Redmond, rather than link them to a transit center in south King County.
- More routes within outlying cities for intra-city circulation
- Bus lanes or other transit-supportive improvements on state highways to enable buses to bypass congested traffic

A Southeast King County Commuter Rail Feasibility Study was performed in 2010 by WSDOT for the legislature. That study found that using the BNSF Stampede Pass rail line from Auburn to Maple Valley would be much too costly and suggested instead an express bus along SR 18 between Auburn and Maple Valley. After SR18 is widened to full freeway status over Tiger Mountain, an express bus route could also go from Maple Valley to Issaquah via SR18 and I-90.

VIII FINANCING SOLUTIONS

It's one thing to identify needed improvements, and another to finance those improvements. No need to mince words here. To finance is to tax. And tax policy is always a difficult topic. Some general observations follow to begin the discussion.

County Road Tax

County road programs in this state historically are funded by the county road tax levied on property in unincorporated areas but not in cities. Cities receive funds directly from the state via a different tax. The county road fund has dwindled in recent decades due mainly to massive annexations that shrank the tax base but left the county responsible for too many rural road-miles to maintain. This systemic finance problem for King County Roads means that current roads and bridges cannot be maintained properly let alone construct anything new for future needs. This tax formula begs for an overhaul. It is unfair to tax rural property owners to provide road improvements that support urban traffic through the taxpayer's area rather than to support the taxpayer's needs. There must be a better way. Solutions most likely will be arranged at the state level, and benefit all counties statewide.

State Assistance to Counties

A portion of the statewide gas tax goes to a popular program called the County Road Administration Board (CRAB) to help rural counties build up their arterials. A similar program aimed at urban needs is the Transportation Improvement Board (TIB). With modifications, both programs could become the vehicles to provide state assistance for a new category of improvements to rural roads that serve urban-generated travel.

Those popular grant programs have focused on adding or reconstructing lanes for cars. The issue is to create eligibility for shoulder widening for pedestrians and bicycles, traffic improvements like intersection controls, turn lanes, and correcting sight distance problems, and other roadside improvements. Safety is the key principle of engineering that relates all those types of rural road improvements. A relatively small shift in tax allocation priorities increase should suffice to cover such needs. Adding shoulders in rural areas is "dirt cheap" compared to rebuilding freeway bridges across large rivers.

The Traffic Safety Commission is also concerned with protecting pedestrians and bicyclists from deadly collisions, but focused more on education and policy projects than construction projects. Their Target Zero Plan aims to reduce traffic fatalities to zero, statewide. They could provide valuable support for legislation and policy campaigns.

County general fund

County general government taxes are paid at the same rate by all property in cities and in rural areas, to fund various regional services operated by the county. Things like libraries, parks, elections, courts and jails. General fund revenues historically aren't allocated to roads because the county road tax was presumed to be sufficient, but that has not been the case for a

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long time. Might there be some equitable allocation from the general fund to the roads program, to reimburse the rural road program for impacts of urban commuters?

Active transportation improvements

King County Parks has an extensive plan for paths and trails throughout the county to enable pedestrians and bicyclists and equestrians to enjoy their recreation totally separate from motor vehicles on roads. This is popular but also expensive. It seems that the users of this expensive park system are mostly urban dwellers and the location of the trails is mostly in rural areas. If there is a fairness argument for shifting some general funds to the rural road account for active transportation, might that come from the total amount now limited to trails through parks? It could then be targeted to provide paved shoulders where pedestrian and bicycle needs are greatest. This is not meant to take sides over a popular program, but to be equitable about distributing benefits where most needed.

Transportation Benefit District (TBD)

A TBD can be established by a vote of the people within the specified TBD boundaries to finance a defined set of transportation projects from a property tax levied within that district. A TBD could therefore be created that includes an outlying city and the rural roads that city uses to send commuter traffic to the urban core. The road project list could be designed to include some projects benefitting rural residents as well as some projects to benefit the city resident commuters. A TBD might also fund special commuter bus routes beyond what Metro Transit is able to provide. A TBD could also be used as documentation for a city to impose impact mitigation fees on its new developments to benefit the rural roads used by that development, by carefully segregating needs required with existing conditions versus additional needs required with new growth.

Transportation Impact Fees

Impact fees are authorized by the Growth Management Act to give cities and counties a tool to charge new developments for their proportionate share of new facilities needed for development. King County had a Mitigation Payment System for road improvements for many years, but abandoned it recently because there is now very little new development in its own unincorporated areas. The developments that now cause impacts on rural roads are located in outlying cities, and the county cannot levy an impact fee on such developments. To overcome that weakness state law must change.

Regional uniformity. To eliminate disparities across jurisdictional boundaries, GMA impact fees should be re-crafted to operate on a systematic regional basis administered by the regional planning agency (e.g., Puget Sound Regional Council). A regional system would eliminate the disparities of the existing system whereby each city and county does its own program (or no program) limited to what's within their own borders.

Hookup Charge Simplicity. A regional impact fee system can be formulated the same way a utility system calculates the "hookup charge" for new users of its system, based simply on

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vehicle-miles-of-travel (VMT) added to the region's road system. Each development would pay the average cost to add the equivalent VMT of new capacity to the system. This approach offers powerful simplifications. There is no need for detailed traffic studies to discern which roads are used by which development in which amounts – the VMT of the development will use some road somewhere, and all roads are in the regional plan. So just figure out the average cost per VMT to serve new trips. The source data for the average cost per VMT is already available in the set of projects listed in the Regional Transportation Plan (RTP).

Based on location in the region. This approach will support more compact development and less sprawl too, because the impact of development in outlying cities measured in VMT will be greater than in the urban core due to the longer trip lengths from the region's edge.

Regional administration. Every development anywhere in the region would pay its fee into a regional fund. The regional agency would allocate funds to projects by local governments from this source, the same way it now administers federal and state grants to those governments. But the eligible projects would be whatever is in the Regional Transportation Plan. Details of the program would account for transit and nonmotorized projects as well as roads. A portion of the total funds would be assigned to local jurisdictions for their local projects which are beneath the level of the regional plan but account for a portion of total VMT generated by new developments. It is logical to enable such a process in state law because every metropolitan region has similar needs and has a similar regional agency already in place.

Concurrency cancelled. A companion change in state law would be to abolish the current definition of concurrency. It simply has not worked as a tool to require improvements to be made "concurrent with development". Isn't congestion much worse now than in 1990, just about everywhere? If concurrency hasn't been effective after 30 years why continue trying?

Instead create the regional impact fee system to collect enough money to assure the needed road improvements are accomplished over time. That satisfies the concurrency goal at the very top of the system, rather than tinker around the bottom. With an effective regional impact fee there is simply no need to continue employing armies of consultants and lawyers to argue the microscopic details of traffic level of service at each and every intersection, for each and every development. It's enough to do the traffic capacity and level of service analysis once and only once, at the level of the regional plan. That creates a complete list of road and transit projects adequate to serve the present and future needs of the region. Local governments are then free to build the growth-driven improvements so long as they are consistent with the regional vision. And developers are free to develop so long as they pay their hookup charge. It really can be that simple.

A failure to communicate? But what if any city decides to approve development in excess of their assigned target? Then more VMT will be generated. That will lead to more VMT-based impact fees into the regional fund from that city. But that city would not receive any additional

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project approvals or project financing related to the “excess” development, unless they are able to successfully petition PSRC to amend its plan to account for the “excess” development. The additional impacts could, however, raise the priority of improvements BEYOND THE CITY. The added funds could go to those projects. Won’t that conversation be fun to listen to?

State Environmental Policy Act (SEPA)

The SEPA review process provides a basis for jurisdictions to seek mitigation for traffic impacts on its roads generated in another jurisdiction, if it can show that the jurisdiction failed to consider and mitigate external impacts. But this legal process operates case by case and is slow and costly to apply. It is a method of last resort if mitigation is still needed after all of the above options are accounted for.

Steps forward

A few of the ideas offered herein are “low hanging fruit” – obvious in benefits, low in cost, easy to do. But not much can be expected before the end of 2022 within the existing county budget. Going forward, use 2022 to develop a more refined list of further actions to be accomplished over several years. Prioritize things to be accomplished in 5 years, 10 years, 20 years. Establish funding for the first increment in the next biennial budget, for 2023-2024.

The King County Roads Division is looking to improve its financial position via a levy lid lift which takes voter approval. So, take a look at incorporating some of these ideas into the package of road projects that levy lid lift would authorize. That should increase voter interest.

Finally, seek action in the 2023 legislative session to address the higher-level issues accounted for by state-level actions, whether for changed procedures or shifting finances.

Attachments:

Data tables for 16 rural roads

Field reports for 16 rural road roads (separate document)

Summary slide show (separate file)

SUMMARY TABLES

The Trouble with Traffic in Rural King County

EMERGENT TRANSPORTATION CORRIDORS IN SOUTHEAST KING COUNTY								
A summary of known facts and community perceptions about transportation conditions								
East-West Routes (sorted north to south)								
ETC Corridor	SE May Valley Road	SE Cedar Grove Road	Covington-Sawyer Rd	Auburn-Black Diamond Rd	SE Lake Holm Rd	SE Green Valley Rd	SE 400 th St	SE 416 th St
Limits	Coal Creek Pkwy to Iss-Hobart Rd	SR 169 to Iss-Hobart Rd	Covington to Black Diamond	SR 18 to Black Diamond	Aub-BI Dmd Rd to Aub-BI Dmd	SR 18 to SR 169	SR 164 to 284 th Ave SE	196 th Ave SE to SR 169
Federal Arterial Class	Minor	Minor	Minor	Minor	NA	NA	Minor	NA
King Co Arterial Class (2019)	Principal	Minor	Minor	Principal	Minor	Collector	Principal	Minor w/o SR 169 Collector e/o SR 169
Driveways & Int'ns Per Mile	25	10	32	19	25	12	16	22
Predominant Land Uses	Farms, Rural Residential	Landfill, Rural residential	Mostly rural residential, some suburban tracts	Mostly rural residential, some suburban tracts	Farms	K.C. designated "Heritage" farming district	Farms	Farms
Length (mi.)	7.4	4.5	3.4	8.7	4.4	10.6	7.6	6.5
2014 Volume	4,500	3,600	10,300 w/o Thomas Rd	4,500	3,600	1,700	4,100	2,100
2019 Volume	6,100	4,700	12,900 w/o Thomas Rd	6,300	4,000	2,500	4,500	2,700
Growth / Year	6.4%	4.7%	4.0%	1.9%	2.0%	19%	1.9%	5.0%
2040 Forecast (hybrid*)	11,500	8,500	22,000 w/o Thomas Rd	5,900	4,900	1,700		
Through Traffic	Growing	Growing	Excessive	Excessive	Excessive	Rapidly growing	Growing	Growing
Congestion	At Iss-Hobart Rd	At each end	Throughout	Turn problems at intersections	No	No	No	No
Blind Curves	Several	No	Serpentine hill climb west end	Several	Serpentine hill climb west end	Serpentine hill climb near east end	No	No
Blind Hill Crests	No	No	No	Yes	Yes	No	Several	Several
Shoulder Description	<2 ft (most)	6 ft west, 2 ft east	2 ft west, 6 ft east	2-4 ft west, 6 ft east	most <2 ft but 2-4 ft mid section	0-2 ft mostly; 4-6 ft at activity areas	4-6 ft w/o SR 169 0-4 ft e/o SR 169	0 mostly 2ft for 1 mile
% Shoulders <2 ft	83%	66%	38%	0%	66%	86%	12%	100%
Speed Limit (mph)	25/30 w/o SR900 35 e/o SR 900	40	35	40 w/o Thomas Rd 45 e/o Thomas Rd	40	35 in valley floor 40 near SR 169	45	45
Speeding Issues	Yes	Yes	Congestion inhibits speeding	Yes	No	Throughout valley section	Yes	Yes
Bicycle Use	Popular route	Some	Some	Some	No?	Popular route	Popular route	Some
Pedestrian Use	Some	Low	At east end	At 2 activity centers	No?	At 3 activity centers	Popular route	Minimal
Equestrian Area	Yes	No	No	West half	Yes	Yes	Yes	Yes
Vehicle Safety	Sharp curves v. speed	Better geometry than most roads	Blind locations, speed	Blind locations, turn movements	blind locations	Sharp curves vs. speed	Turn movements vs. speed	Turn movements vs. speed
Ped-Bike Safety	Negligible shoulders	Negligible shoulders east	Negligible shoulders west	Negligible shoulders west	Negligible shoulders	Negligible shoulders	Negligible shoulders east	Negligible shoulders
Other	Used as bypass around Issaquah congestion	Trucks to/from Landfill	Railroad crossing west end	links to Kent Black Diamond Rd nw/o Thomas Rd	Hillclimb is severely limiting	Hillclimb is severely limiting	-	Provides bypass around Enumclaw
Segment Dividing Point	SR 900	na	218th Ave SE	Thomas Rd	151st Way SE	Hillclimb section	SR 169	SR 169
Area Council	Four Creeks	Four Creeks	SCAR	SCAR	GRVLH	GRVLH	EPCA	EPCA

* hybrid 2040 forecast = average of 2014-2019 trend projection and PSRC 2040 model (post-processed)

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EMERGENT TRANSPORTATION CORRIDORS IN SOUTHEAST KING COUNTY								
A summary of known facts and community perceptions about transportation conditions								
North-South Routes (sorted west to east)								
ETC Corridor	196 th Avenue SE	218 th Ave SE/212 th Ave SE	244 th Ave SE et al	Lake Francis Road SE	Issaquah-Hobart Road SE	276 th Avenue SE	Ravensdale-Black Diamond Rd	Retreat-Cumberland – 184 th Ave SE
Limits	SR 169 to SE 240 th St	Aub – Bl Dmd Rd to SR 164	212 th Ave SE to SR 410	Cedar Grove Road to SR18/244 th Ave	Issaquah to SR 18	SR 18 to Kent Kangley Rd	Kent Kangley Rd to SR 169	Kent Kangley Rd to SR 410 Enumclaw
Federal Class	NA	NA	NA n/o SR164 Minor s/o SR164	NA	Principal	NA	NA	NA
King Co Class	Minor	Minor	Collector north Minor south	Collector	Principal	Minor	Minor	Minor
Driveways Per Mile	30	2 north xx south	14 north 30 south	3 north 33 south	34 north 16 south	31 north 12 south	44 in Ravensdale 2 s/o Ravensdale	28 in Ravensdale 36 in Cumberland 8 in Enumclaw
Predominant Land Uses	Farms	Farms	Farms north Suburban south	Quarries north rural residential south	Rural residential north, farms south	Farms and rural residential	Historic Ravensdale village; resource extraction sites	Farms, rural residential
Length (mi.)	5.1	1.4	9	5.9	6.5	6.4	3.3	17.4
2014 Volume	3800 north	2,500 north 3,200 south	2,300	1,700	16,300	5,900	2,200	2,700
2019 Volume	4,600 north 2,600 south	3,300 north 4,100 south	2,500	2,200	19,700	6,500	2,600	3,200
Growth / Year	3.5% north 4.5% south	4.8% north 4.5% south	3.0%	4.5%	3.5%	5.0%	3.1%	3.1%
2040 Forecast (VISION2040)	4,000	2,600 north 3,300 south		1,900	19,500	7,000	2,800	3,950
Through Traffic	Growing	Growing	Growing	Growing	Extreme	Excessive	Growing	Growing
Congestion	No	No	No	No	Severe	None	None	None
Blind Curves	At Sweeney Rd	At SE 368th Way	At SE 368th Way and southward to 244th Ave	Several	Btw Cedar Grove Road and SR 18	None	Several; also 2 right-angle turns at RR XNG	Several
Blind Hill Crests	At 195th Place	At SE 368th Way	At SE 368th Way	Several	None	Several	None	None
Shoulder Description	0-2 ft mostly	2-8 ft north mostly 0-2 ft south	<2 ft n/o 416th St 4-8 ft s/o 416th	mostly 0-2 ft	mostly 0-2 ft	0-2 ft	2-4 ft In Ravensdale 0-2 ft southward	2-4 ft except none on narrow bridges; 8 ft on Kent Kangley
% Shoulders <2 ft	100%	0%	82%	57%	83%	100%	24%	100%
Speed Limit (mph)	40	45 n/o SE 400th 35 s/o SE 400th	45 SE 416th St to SR 164; 35 north and south	35	40, 45	40, 50	35 In Ravensdale 45 southward	45
Speeding Issues	Yes	Some north xx south	Long straightaways	Some concerns	Some concerns	Substantial	Some	Vehicles vs. pedestrians in villages; vs. bicycles everywhere
Bicycle Use	Some	Uncertain	Would be popular if safer	Minimal	Popular route despite traffic	Popular route	Some	Popular route despite speeding traffic
Pedestrian Use	Near school bus stops	At Grn Rvr Bridge At Westwood E.S.	Near schools s/o SR 164	Minimal	Heavy near Poo Poo Pt Trailhead, Fox Hollow Farm	Near stores in Hobart, Ravensdale	In historic Ravensdale village	In historic Ravensdale, Cumberland villages
Equestrian Area	Yes	Yes	North of SR 164	Some	No	No	No	Trailheads near Ravensdale
Vehicle Safety	Speed vs. turn movements	Turns at 3 major intersections	Turns at key intersections	Truck conflicts, many curves	Turn movements at driveways; shoulder parking	Turn movements at driveways; shoulder parking	Railroad Crossing	Turns, especially at Ravensdale "Y"
Ped-Bike Safety	Negligible shoulders	Negligible shoulders	Negligible shoulders north	Negligible shoulders, many curves	Negligible shoulders, heavy traffic	Negligible shoulders, traffic	Need walkable shoulders in Ravensdale and at Black Diamond end	Need walkable shoulders in Ravensdale, Cumberland
Other	Very rural ambiance threatened by though traffic	Very rural ambiance threatened by though traffic	Geometry issues at SE 368th Way / 212th Ave Intn	North end trucks and deteriorated roadway	Some I-H-R demand diverts to SR 18 or SR900 + May Valley Rd	Links Issaquah Hobart Road to Enumclaw, Black Diamond	Truck traffic, rough surfaces near resource extraction businesses	Passing on shoulders; heavy truck traffic
Segment Dividing Point	Sweeney Rd	Green Valley Road	varies as noted	SE 184th St	May Valley Road	SE 231 St Street (yellow submarine)	Railroad Crossing	Kent Kangley
Area Council	GMVUAC	GRVLH / EPCA	EPCA	GMVUAC	Four Creeks	GMVUAC	GMVUAC	EPCA / GMVUAC

* hybrid 2040 forecast = average of 2014-2019 trend projection and PSRC 2040 model (post-processed)

The Trouble with Traffic in Rural King County

EMERGENT TRANSPORTATION CORRIDORS IN SOUTHEAST KING COUNTY

A summary of known facts and community perceptions about transportation conditions

ETC Corridor	Comparison Routes					
	SR 164	SR 169 North of Maple Valley	SR 169 of South Maple Valley	SR 516 (Kent Kangley Road)	Petrovitsky Road	SR 18 Tiger Mountain Segment
Limits	SE 368th St to 244th Ave SE	196th Ave SE to SE 216th St	SE 280th St to SE Summit Drive	202 Ave SE to 216th Ave SE	156th Ave SE to 196th Ave SE	Issaquah Hobart Rd to I-90
Federal Class	Minor	Principal	Principal	Minor	Minor	Principal
King Co Class	Principal	Principal	Principal	Principal	Principal	Principal
Driveways Per Mile	18	17	9	17	17	0
Predominant Land Uses	Farms	Rural residential	Open space (natural area)	Suburban residential	Suburban residential	forest
Length (mi.)	-	-	-	-	-	-
2014 Volume	17,000 west end	22,000 north end	11,000 north end	20,000	8,700	24,000
2019 Volume (WSDOT 2020)	12,000 west end	22,000 north end	12,000 north end	19,000	9,700	23,000
Growth / Year	0.0%	0.0%	2.0%	0.0%	5.0%	na
2040 Forecast (VISION2040)*	21,000	25,000	13,000	23,000	18,000	33,400
Through Traffic	Predominant	Predominant	Predominant	Predominant	Predominant	Total
Congestion	No	High	No	Substantial	Moderate	Substantial
Blind Curves	None	None	None	None	None	None
Blind Hill Crests	None	None	None	None	None	None
Shoulder Description	4-6 ft	0-4 ft +Adjacent Trail	8 ft	4-6 ft	4-6 ft	8 ft
% Shoulders < 2ft	None	None	None	None	None?	None
Speed Limit	50	50	50	40	40,45,50	
Speeding Issues	?	?	?	?	?	
Bicycle Use	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Pedestrian Use	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Equestrian Area	No	No	No	No	No	No
Vehicle Safety	??	??	??	??	??	??
Ped-Bike Safety	good shoulders	good shoulders	good shoulders	good shoulders	good shoulders	good shoulders
Other						
Segment Dividing Point						
Area Council	EPCA	GMVUAC	GMVUAC	GMVUAC	GMVUAC	GMVUAC

*PSRC 2040 model volume, not post processed or hybridized.