NEAR-TERM CHANGES

This section discusses the project team's initial review of how a series of short-term changes to the concurrency process would affect that process. Review of this specific set of changes was requested as part of the scope of work for this project. Each

suggested alternative is briefly described, along with the project team's opinion of how adoption of that change would affect the outcome of the concurrency process. Recommendation to adopt the change is then discussed. A recommendation for the change is based on whether the suggested change provides significant advantages over existing procedures, given the costs of adopting the change (for example, the cost of new data collection, if it were needed). If a reviewed alternative would provide advantages and can be adopted with minimal additional staff time and effort (meaning no new data collection or technical resources would be required), it is recommended for near-term adoption. If the project team review concludes that significant benefits could be gained, but additional study would be needed to determine the details of the approach, additional city resources would be needed to perform it, or significant changes in procedures would be required (meaning a significant staff training effort or public debate would be required before adoption of the procedure), the approach is recommended for further study in the remainder of the project. These issues can then be clarified and presented to the Executive Steering Committee for the project.

Switch to a Persons Per Hour Rather Than Vehicles Per Hour Approach to Capacity

This change is intended to measure the capacity to move people (or the actual efficiency of moving those people) by a combination of means, including non-motorized modes, buses, carpools, and vanpools, as well as automobile travel.

There are two basic ways to use person volumes in the concurrency process. The first is to actually use person throughput relative to available transportation facilities as a measure of facility performance. The second approach is to use person throughput as a way of weighing the relative importance of the performance of different transportation

facilities. That is, the current LOS calculation process would be followed, but rather than computing simple average v/c ratios for all intersections (or screenlines) within a city analysis "zone," the performance of each intersection/screenline would be weighted according to the person throughput associated with that location.

These two approaches are discussed separately below.

Use of Persons per Hour as a Measure of Facility Adequacy or Performance

Used by itself, person throughput is an inadequate measure of facility performance; it is only a measure of facility use. Consequently, it does not describe whether the transportation facilities being examined are adequate for the current or proposed development.

To be converted into a measure of performance, person volumes must be related to the person carrying capacity of the current (or proposed) facility. Person carrying capacity for a facility is mode specific. Thus, to use person volume as a measure of facility performance or adequacy requires a mode specific, multi-modal analysis. Adopting such a process would not be a minor change to the current process of any of the four cities.

Consequently, use of the statistic persons per hour is not a reasonable near-term alternative concurrency measure.

However, adoption of a true comparison of person throughput versus person carrying capacity by mode would resolve several of the major limitations of the current process. Thus, use of person throughput within the concurrency process will be considered as one of the alternatives for long-term revision to the concurrency calculation process.

There is one significant caveat to this approach, however, and that is that the person carrying capacity of an automobile is essentially undefined. In theory, the person carrying capacity of automobiles on roads is roughly four times the vehicular capacity of that road. However, it is unrealistic to expect a mode shift that might "fill" each car. Determining a rational "capacity" for cars is therefore problematic.

For the long-term approach, the project team proposes that car capacity be treated as being equal to vehicle capacity, and that transit capacity be independently compared with actual transit ridership. This will allow a direct evaluation of whether "spare capacity (transit or automobile) exists within a defined area.

Use of Persons per Hour for Weighting the Importance of Different Locations

This approach can be adopted easily within the current procedures of all four cities. To adopt it, each city would either need to conduct vehicle occupancy counts or assume vehicle occupancy rates. The first of these would require a considerable increase in resources spent on facility performance monitoring; the second would be far less expensive but would make the system insensitive to the effects of changes in carpool and transit usage.

Use of person throughput for weighting v/c ratios within a given analysis zone would mean that large intersections would play a more important role in the computation of the "average" v/c ratio within a given analysis zone. This would mean that the performance of larger intersections would be more important to "zonal performance" than smaller intersections (where "large" is defined in terms of person movement, so an intersection heavily used by transit would likely be a "large" intersection within a zone).

The effect of such a change would be entirely dependent on the relative condition of large and small intersections within the zone. If the larger intersections operated better, or were more easily expanded, such an approach would have the effect of allowing more development to occur. If larger intersections were more difficult to expand (they might already have been expanded as much as possible to meet the larger demands placed on them), this might result in less ability to accept growth.

When viewed in the larger context of concurrency, emphasizing larger facilities would be likely to have only a modest effect on overall concurrency calculations. It would basically provide a modest "tweak" to the current system that could be used in some cases to influence the results produced. From a theoretical perspective, it would shift the emphasis within an analysis zone toward movements that served the most people.

It would not improve the analysis of specific facilities, nor would it provide particularly useful insight into a city's facility performance.

This approach is not recommended for further study. It would further complicate the concurrency process without providing a significantly better outcome than is currently available. It would not resolve any of the limitations in the current concurrency process.

Switch to a Travel Time Approach

The v/c approach to estimating level-of-service has a number of limitations. Among these limitations are that v/c is at best a mediocre surrogate for level-of-service as perceived by the traveling public and that under congested conditions use of actually measured volumes underestimates the "true" level of service. (Not included in this list

are those larger limitations of the current concurrency process noted elsewhere in this report.)

As a result of the limitations in the v/c process, there is a growing sense among transportation professionals that the best statistic for gauging facility performance is travel time. This measure is easy for the public to understand, relates directly to the traveling experience, and can be compared transparently across modes.

The first disadvantage to the use of travel time is the fact that no data collection procedure currently exists to collect and report actual travel times. (Although the four-step modeling program can predict travel times with no changes to the current process.) Thus, a new data collection program would be needed if actual travel times were to be used for model validation, or for project development review. In addition, travel times are route and trip dependent, which means that specific "trips" would need to be defined for data collection and review. (This step would be similar to the designation of "critical intersections" or "screenlines" in the current process.)

A second disadvantage is that the analytical requirements for converting specific project improvements into travel time are not well defined, and those parts that are defined require more effort than the current v/c process. While the four-step modeling process allows for direct calculation of route-specific travel times, application of a four-step model would require more work than simply estimating trips to be generated and adding those trips to existing measured volumes at nearby intersections.

The next disadvantage of using travel times as the primary concurrency review statistic is that its adoption would require revision to the entire concurrency standards process. (This would be a significant, but certainly not overwhelming, effort.) As

mentioned above, within each zone a city would need to adopt specific routes/segments for which travel times would be collected/estimated. Standards would then have to be adopted for each of these routes, just as v/c standards had to be adopted for intersections.

The good news is that such a process would allow a public review of expected transportation system performance. This would allow a city such as Issaquah to select new performance standards that might permit development where development was not currently allowed.

For any city, the selection of a new performance standard is not without significant risk of increasing public distrust in the planning and public decision making process. Consequently, it is important when selecting a new performance measure, such as travel times, to be able to clearly describe to the public why a new measure is better than the existing measure, how the measure serves the public good, and why it gives a more accurate reflection of the presence or absence of "adequate transportation facilities." (Bellevue has already experienced the communication difficulties loss of public trust entails as a result of changing from a one hour standard to a two hour standard.)

If a travel time approach is adopted, it most be remembered that simply shifting from a v/c approach to a travel time approach would not fix the structural problems the project team has found with the current concurrency process. The most significant of these problems include the inability to accurately account for non-automobile based travel modes, the insensitivity of the current forecasting process to adopted TDM measures, and the lack of measurement of the effects of regional impacts. (Note that while the use of travel time measurements would allow direct comparison of transit to

SOV performance, no process or standards exist to direct how this comparison would take place. That is, since transit travel times are typically slower than SOV travel times, a shift to transit use could conceivably make average person travel times increase, thus making concurrency less likely. Thus, even though use of travel time would make multi-modal comparisons possible, considerable work would be needed to make this technique operational.)

This proposal merits consideration of further review, but at first glance it does not appear that it would, by itself, resolve many of the primary issues identified earlier in this report.

Remove Selected Intersections[3] from the LOS Calculation if Capacity Increases Result in Negative Neighborhood Impacts

This proposal addresses limitations in the concurrency process where current (or forecast) levels of traffic volume are not acceptable, but increases in roadway capacity are unwanted by the local community. This combination of events prohibits further development in the area not because capacity improvements are not possible, but because political constraints prevent any undertaking of those improvements. (Note that these political constraints might not be "bad," that is, the city may agree with local residents and property owners that capacity improvements are not appropriate for that facility.) Removing intersections that fell under these constraints from the concurrency process would allow development to proceed. It would allow a development to proceed when "adequate" facilities did not exist to serve it, removing the constraint on development to under-served areas that concurrency is designed to provide. With no constraint on facility

performance remaining, development that significantly exceeded "acceptable" levels could not be restrained.

> Simply removing the intersection from the concurrency analysis eliminates the congestion check which concurrency was intended to provide. Thus, this approach appears counter to the goals of concurrency, and will not be further analyzed in this study.

The key in this situation would be not to "remove" the facility from concurrency calculations but to either restate the allowable congestion (i.e., raise the allowable amount of congestion to one that was acceptable), or raise the standard when specific pre-conditions had been met.

Kirkland has already adopted this type of arrangement in its approach to zonal LOS standards. Specific intersections can exceed the adopted LOS standard, as long as they are not TOO FAR above that standard, but only if the zonal average remains acceptable. In fact, all four city's have also adopted an "exemption" process, where a limited number of intersections (or roadway segments) are allowed to exceed the v/c standard without "tripping" the concurrency standard. Simply increasing the number of allowable exemptions by one intersection would have the same positive (pro development) effect as removing the intersection from the analysis. Unlike removing the intersection, however, this approach still acknowledges that congestion is being allowed to grow, which is an important public disclosure, given the intent of concurrency.

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[3] Note that "roadway segment" can be used interchangeably with "intersection" in this discussion, in that "congested roadway segments" could also be removed from the concurrency process if widening those roadways resulted in unacceptable, negative, neighborhood impacts.

A different twist to this same basic concept would be to allow an intersection to exceed the base LOS standard as long as transit service (or transit use) exceeded some set level. Such an approach would mean allowing additional development to occur where sufficient transit service (or use) existed to serve that development, and the availability of a "high" level of transit service would provide sufficient transportation access despite the congested roadway conditions. These more detailed, multi-modal approaches are not short-term improvements to the current concurrency process and are therefore included in the longer term solutions that will be studied in more depth as this project continues.

Lower LOS Standards (Allow More Congestion) for Motor Vehicles

This approach would simply allow development to occur without requiring the widening and upgrading of congested intersections and roadway segments. Where such an approach is politically acceptable, this would be reasonable. It would be inexpensive and easy, as long as the political will existed to do it.

No changes in the current concurrency process would be required to implement this alternative.

There are two primary drawbacks to this approach. The first is that such an approach might not be politically acceptable. Certainly in cities such as Issaquah and parts of Redmond and Bellevue, adjusting LOS standards to allow more congestion would not be accepted mildly by vocal segments of the population. The reason that concurrency was adopted at all was that transportation infrastructure was not being expanded quickly enough to serve new development, and the public resented the failure of the transportation system to move cars more freely. The project team's opinion is that,

in many cases, the currently adopted standards would be difficult to lower without mitigation.

The second drawback to this approach is that it would eliminate the ability to use concurrency as a way of generating additional funds for transportation system improvements. While concurrency is, in theory, not about fund generation, it often does serve that purpose in heavily congested areas (because not enough other sources of transportation improvement funds are available). However, if development with no transportation system expansion were politically preferable to no development, then this approach would be acceptable.

Expand the Definition of "State Route" to Include Intersections Feeding State Routes That Are Not Controlled by the Local Jurisdiction

Because the state specifically removed state routes from the concurrency process, congestion on those facilities may not be factored into development concurrency decisions. The net effect is that approved development tends to create unmitigated increases in volume on state routes. This in turn creates congestion on routes that intersect (or parallel) those facilities. One particularly difficult location, from a concurrency standpoint, is where a city arterial connects to a congested freeway. When the local jurisdiction does not control these intersections, there is little opportunity to provide congestion relief to the arterial. The arterial congestion then causes a concurrency failure that limits the city's ability to permit additional development even in localities specified in its comp plan vision.

This proposal would essentially extend the current practice of removing state facilities from the concurrency process to include these specific intersections, even though they are not technically part of a state route.

The primary advantage of this idea is that it would further diminish the impacts of regional facility congestion on a local jurisdiction's ability to control its own development. The suggested change follows the basic line of thinking at the legislative level that resulted in removal of the state routes from the concurrency process. This line of reasoning can be summarized by the following example, "We shouldn't deny growth in Bellevue because I-405 is congested." This line of reasoning makes sense at the legislative level because the "fixes" for many of these concurrency failures are very expensive and thus significantly limit development under the concurrency legislation.

Extending "state route" designation to non-state route arterial intersections would allow increases in development without providing for "congestion" control related to that growth. This would be a good idea if the goal of the change were simply to permit additional development, regardless of congestion. It would be a bad idea if the city wished to uphold the intent of the concurrency process. Simply removing this class of transportation facilities from the concurrency calculation would not help "solve" the problem of inadequate transportation facilities for a given level of development. It would give a city more flexibility in "getting around" the concurrency legislation.

> While exempting routes of state significance from concurrency requirements has been problematic, removing more arterials and intersections from concurrency requirements will not advance the balance of development and mobility intended by state policy and law.

This approach would certainly be one way of "surmounting" a specific type of problem, but it would not provide the cities with a tool that was very useful for managing

their development patterns, given the existing, planned, and desired transportation system.

Remove Arterial Roadways that Serve Primarily Regional Trips from the Concurrency Determination

As noted above, state routes were specifically exempted from concurrency determination, and congestion related to a lack of capacity on those routes is a major problem in applying concurrency at the local level. The problem is that travelers divert from congested state routes onto locally controlled arterials that serve as alternative routes for these regional trips. Increases in these regional trips, with trip ends outside of the local jurisdiction, cause increases in local congestion without generating the funds needed to mitigate the volume increases. A roadway that primarily serves these types of trips becomes a "drag" on local concurrency and local control because it will continue to degrade in level-of-service, and the cost of improvements (which must be done to meet concurrency requirements) must be met by the local jurisdiction and/or local development.

Removing arterials that primarily serve regional trips from concurrency calculations would "solve" this dilemma, at least in the same manner that the current state route exemption "solves" the problem. The disadvantage of such an approach is that it essentially would allow development without regard to the availability of adequate transportation infrastructure. Thus, while "solving" one specific problem, it would likely generate or exacerbate several others. (For example, increased congestion on local roads caused by worsening conditions on regional by-pass routes would result in other concurrency failures as traffic attempted to by-pass the by-pass facilities.)

The project team does not recommend adoption of this idea. Such an approach would simply eliminate the concept of concurrency, without replacing it with a more functional system. In addition, given the fact that standards have already been adopted that include these roadways, it is likely to be viewed as a "give away to developers" by significant segments of the population, and is likely to generate considerable distrust towards future city actions.

This approach would simply treat a symptom, not address the issues that concurrency was meant to address, nor would it provide a mechanism to help fund the transportation system improvements that non-concurrent development requires.

Change the Duration of the Concurrency Standard

The City of Bellevue changed from a 1-hour volume standard to a 2-hour volume standard in 1998. Bellevue also adopted a peak hour factor of 1.00, instead of the 0.95 that was previously used.

This peak period duration (and/or peak hour factor), or an even longer standard, could be applied by all jurisdictions. In most locations, computing an "average hourly volume" over a 2-hour peak period would result in a lower traffic volume than if such a volume were measured for only 1 hour. The lower volume would result in a lower v/c ratio and would consequently result in a "better" computed level-of-service. Similarly, using a peak hour factor of 1.0 instead of 0.95 would lower the computed v/c.

Combined, these adjustments would "artificially" reduce the v/c ratio computed for a given intersection (assuming that the current v/c ratio using 1-hour volumes and a 0.95 PHF are considered to be "truth"). In reality, neither of these adjustments would

change the performance of the intersection; they would simply change how that performance was reported.

The lower value reported with a 2-hour period and 1.0 PHF simply reflects the "average" condition at that intersection over the entire 2-hour period, rather than the condition found during the highest volume 15-minute period during the highest volume hour of the day. The 2-hour approach is essentially a measure of "average peak period," while the 1-hour approach is a "worst case" condition during the peak period. Both conditions occur. The question is simply which one is the better measure of intersection performance for use in managing infrastructure investment?

Answering this question requires stepping back to how level-of-service standards are set. If LOS standards are adopted as if they represent the "worst" condition of the day but are then computed with an average peak period volume, the analysis results will produce an artificially low measure of congestion. On the other hand, if the standards are adopted with the understanding that the "average 2-hour condition" is being measured (and that at the worst of times during that 2-hour period conditions are likely to be worse than reported), then increasing the duration of the time period measured is certainly acceptable.

In a congested metropolitan area, it makes considerable sense to use a longer period and set standards based on the "peak period." This acknowledges the reality of urban congestion, particularly in zones with heavy employment, and accepts the facts that congestion does exist, that peak spreading is acceptable, and that roadway geometry should not be altered to meet the highest level of peak demand. However, while this may be "correct" from an "urbanist" point of view, it may not be politically acceptable or

appropriate for zones that are primarily residential. The "correct" answer to this question is political, not technical.

At the same time, many local anti-growth activists will see such a change as simply a mechanism to permit unmitigated growth. This has the effect of creating distrust of the city's motives. This group of citizens is likely to view these types of changes as simply a "way around" previously adopted standards.

No technical improvement would result from this suggestion. It would not resolve any of the limitations noted earlier in this paper. It would simply allow more development, given the current transportation infrastructure. This same result could be obtained by adopting a different level-of-service standard

Switch to an Average Total Delay Approach

The current Highway Capacity Manual includes procedures for estimating approach delay at intersections on the basis of input volumes, geometric intersection detail, and intersection timing information. Total intersection delay can then be used to look up the resulting level of service for the intersection. This technique could be used in place of the current v/c procedures for estimating level of service.

The advantage of such an approach is that it would describe intersection performance in terms of a traveler's time, rather than in terms of roadway characteristics. In theory, this would allow the comparison of travel improvements across modes and allow more effective consideration of non-automobile based travel. The description of intersection performance in terms of "time delayed" would probably also be easier for the public to understand than the more abstract v/c ratio.

Additionally, it would be possible to compute delay for the "less important" movements at each intersection and to incorporate this delay into the reporting process. (The current process ignores all "non-critical" movements.) This would allow improvements to these "non-critical" movements to be reflected in the concurrency computations. However, inclusion of data on those movements would decrease the importance of the most congested movements.

On the downside, as with adopting travel time in place of v/c, simply changing the statistic used to compute concurrency would not result in a significantly better concurrency process. To address the issues identified earlier would require a more structural change to the concurrency process, such as collection and use of transit ridership and transit performance information. However, inclusion of transit trips and performance in the level-of-service computation is not possible in the near term for the majority of the cities in this study. Without these additional capabilities, no significant change in the concurrency process outcome will occur. That is, all of the significant limitations noted above will remain, and therefore, this approach is not worth pursuing. Addition of non-automobile modal performance is considered a "longer term" change and is therefore addressed in the following section.

Finally, delay is only accurately measured when the effects of signal timing are accurately reflected. Signal timing is not incorporated into the four-step modeling process and is often not tracked well by the planning sections of most cities. Consequently, it is likely that delay computations output from the four-step planning process will be "rational" at best and most likely no better than the current v/c computations.

This approach is not recommended. It would provide few real benefits and would increase the time and resources required to perform the analysis.

POTENTIAL LONG-TERM SOLUTIONS

As a result of the work done to date on this effort, the project team believes that "fixing[4]" the concurrency process followed by the four cities in order to address the issues identified in the second section of this report requires some substantial changes to

- what types of measures are included in the concurrency standards,
- how the cities work together (and with other agencies in the region),
- how funds are generated, controlled, and spent for regional transportation improvements, and
- the types of transportation system improvements cities (and their residents) are willing to accept as a consequence of continued growth.

Not all of these types of changes must be adopted. However to fulfill the intent of this study, the project team believes that we need to explore this typology of changes in order to adequately describe their potential application to the participating cities, as well as to understand the advantages each might convey and the costs each implies.

The project team recommends pursuing the following six areas of study in order to adequately define and describe realistic proposals for addressing the major limitations in the current process.

- **A System of Regional Concurrency.** Our study and PSRC's concurrency assessment project confirm that local concurrency powers cannot and do not manage regionally generated traffic. Could a regional concurrency system be

employed? What would it look like and how might it work? Who would manage it? Would loss of local control and complexity cause more problems than would be solved? How would you provide accountability? Measure success?

- **Results-based Concurrency Measures.** Presently, the four eastside cities use one LOS metric, the volume of automobiles at key points in roadways relative to estimated roadway capacity. But PSRC's survey identifies two examples where local governments have set different outcome-based measures for future transportation. Can the kinds of performance standards for reducing VMT in Snohomish County and increasing the transit share of trips in Renton make concurrency work better in the eastside cities? Could adoption of a program similar to the University of Washington's U-Pass (which limits vehicle trips bound to/from a defined geographic zone) within a defined geographic area function successfully when multiple land owners and hundreds of tenants and residents fall within that zone?
- **Investing in TDM, HOV, and Non Motorized Modes.** Auto capacity LOS measures invariably result in road widening solutions. The GMA legislation itself also leans towards immediate capital improvements because it uses the term "adequate public *facilities*" and imposes a six year time frame for implementing improvements paid for by impact fees on new development. What measures could induce more multi-modal and non-structural approaches to concurrency investments, consistent with the intent of federal TEA-21 transportation policy?

[4] Note that not all participants in this project feel that the current system needs to be "fixed."

- **Incorporation of Other Modal Performance Measures Within the Concurrency Standards.** Where the desired increase in transportation system capacity needed to serve desired growth is not roadway based, how can the four cities' define those system improvements in such a way that they can be incorporated into the transportation concurrency standards? How can performance against those standards be cost effectively monitored, and how can the effects of proposed development on the use of those non-roadway facilities be accurately predicted?
- **A Long Term TDM/Transit Fund.** There are two arguments against using impact fees (and other publicly controlled transportation funds generated from new development) for anything other than adding lanes or widening intersections. The first is that impact fees must be spent within six years, hence on-going car trip reduction methods would be impossible to sustain. The second is that transit operations are not permanent and would disappear after a six year period as well. We plan to examine the efficacy of creating *transit and TDM operating accounts,* a type of perpetuating fund which could yield an annuity for transit service and/or TDM efforts. If this kind of mechanism appears promising, we would want to understand if it is enabled under current state law, and if not, what changes would be necessary.
- **Local/Regional Transit Cooperation.** As we have seen, a strength and limitation of transportation concurrency is that it is locally defined and administered. Should an eastside city decide locally to enhance transit service to achieve concurrency in a given corridor, it would remain powerless to implement

such service, because transit operating authority falls within King County's jurisdiction. What legal, structural, or inter-jurisdictional arrangements would remedy the existing disconnect between concurrency at the city level and transit planning and operations at the county level?