Appendix A Framework for the Transportation Mobility Strategy

Task 3 of the scope of work for developing the Transportation Mobility Strategy was to describe a framework for the strategy. ECONorthwest produced a technical memorandum (10 December 2008) that summarized its work on that topic. That memorandum built off a presentation to the ATAC (27 October 2008). The ATAC discussed and accepted that framework at its December meeting.

From December 2008 through March 2009 the consulting team did technical work consistent with the framework. In the course of doing that work, some minor aspects of the framework changed. Moreover, the Task 3 technical memorandum had more detail than was necessary for the final report. Thus, ECONorthwest chose to create a new appendix (this one) to describe the framework, rather than simply inserting the Task 3 technical memorandum. Readers wanting more detail should ask city staff for Technical memorandum: Evaluation Framework, Task 3 (10 December 2008) and the four attachments it references.

.1 HOW TRANSPORTATION FITS IN ANY CITY’S VISION OF ITS FUTURE

There are many ways that a community can define itself and try to understand and influence its future. It is typical for cities the size of Olympia to address issues of future land and infrastructure development in their Comprehensive Plans. Citizens and state laws expect the plan to describe multiple aspects of a community’s identity, its aspirations for what it wants to be like in the future, and policies and actions that it will take to get there. The Comprehensive Plan and the vision of place it provides should be the basis for a transportation plan, not the reverse. A community’s primary interest is in creating a transportation system that supports the place it wants to be, not in creating places to make certain types of transportation work best.

Figure A-1 illustrates many of the things that affect a community’s quality of life and, thus, are typically topics addressed in a community vision or Comprehensive Plan.
A community vision tries to improve Quality of Life. Such improvements require tradeoffs: funds are limited; not all objectives can be pursued at the level desired; some objectives may conflict. Note that Transportation (Access and Mobility) is but one aspect among many that a community pursues in hopes of increasing quality of life.

Thus, whether a community is planning for land use, transportation, economic development, environmental quality, natural resources, or some
other aspect of development or conservation, it is unlikely to get to an agreeable and sustainable plan unless it address all those aspects.

Further implications of this connectedness are:

- The interactions among all the systems are complicated. Even good modeling will not provide a definitive answer about a best course of action.
- There are tradeoffs: a community cannot simultaneously maximize on every desirable goal.
- Different people in a community will have different ideas about the relative importance of different objectives and outcomes.

That last point is typical of any long-run community planning project. People involved in defining and evaluating courses of action must decide the process by which they will discuss, evaluate, and choose among myriad policy options. Among the decisions is whether to decide in advance on formal criteria for evaluating policy options, and on the weight each criterion will have. That issue and others are addressed in the next section.

.2 AN EVALUATION FRAMEWORK FOR THE OLYMPIA TRANSPORTATION MOBILITY STRATEGY (TMS)

.2.1 MULTIPLE OBJECTIVES, BUT A FOCUS ON TRANSPORTATION

Consistent with Figure A-1, Olympia wants a strategy that considers (1) all modes of transportation, and (2) effects of transportation on other factors that affect quality of life. The desire to try to find a balance among multiple objectives means that the City must, of necessity, (1) evaluate across multiple criteria, and (2) use evaluation methods that facilitate an understanding and discussion of the inevitable tradeoffs among those criteria.

Figure A-1 notwithstanding, the task is to develop a transportation strategy: thus, transportation is the focus of the work plan. Figure A-2 shows that the thrust of the TMS and the evaluation is on Tasks 4, 5, and 6 (the four modes of mobility: motor vehicles, transit, bicycle, and walk), and on the cost and sources of funding (Task 7) necessary to implement the projects, policies, and programs that the TMS recommends. Those separate evaluations are technical appendices to this report (Appendices
B, C, D, and E), and the information they contain is integrated into the overall evaluation in Chapters 2, 3, and 4 of this report.

Figure A-2: Structure of the tasks in the scope of work for the evaluation

The evaluation emphasizes data interpretation, policy, and implementation, not data collection, modeling, and analysis. Ideally the City and the consultants would like high-resolution, comprehensive data for every possible measurement for every category of evaluation criteria. That ideal cannot be fully achieved under typical schedules or budgets. Criteria overlap, data are not available, and the number of variations on any measurement can get very large. Nevertheless, the consultant team kept the ideal framework in mind as it focused the measurements and methods on what was practical. Broadly, the work plan is to:

- **Present and get agreement on an evaluative framework.** That agreement was reached at the meeting of the ATAC in December 2008 (Task 3 of the scope of work).

- **Build off of existing and recent studies.** Much work has been done already on transportation in Olympia, primarily by the City, Intercity Transit, and the Thurston Regional Planning Council. It would be inefficient to ignore it, and the budget and schedule could not support re-creating it. The consultant team reviewed and
summarized all that work, and commented on its implications for the Transportation Mobility Study, in a technical memorandum presented to the ATAC in December 2008 (Task 2 of the scope of work).

- **Create a baseline for comparison.** Transportation and land use will change in Olympia whether it adopts a TMS or not. A purpose of the Task 2 memorandum on existing conditions is to piece together what the current, effective transportation mobility strategy is. In other words, even though a formal TMS has not been adopted, there are policies (or not) addressing everything that it will ultimately address. If those policies remain unchanged, what is the likely future for transportation and land use in Olympia? If the ATAC believes that future should be improved, what policies should the TMS contain to move in directions likely to result in those improvements?

- **Use theory, simple techniques, and logic; be careful with complex models.** The evaluation will draw on many different quantitative and qualitative analyses into a descriptive synthesis of likely impacts. We may be talking about many impacts in relative terms, but the judgments we make about those relative impacts are informed by the existing city studies, the professional literature, and our professional experience.

### 2.2 ADDRESSING MULTIPLE OBJECTIVES USING DESCRIPTIVE METHODS RATHER THAN FORMAL WEIGHTING

Though the focus of the TMS evaluation is on transportation, it must address all modes as well as other non-transportation factors that transportation affects. The broad categories of concerns that this project must address *in concept* for the alternative transportation mobility strategies are:

- **Transportation performance**
  - By mode: motor vehicle, transit (bus for this evaluation), bicycle, and walking
  - By performance measure: e.g., safety, travel time, emissions
  - By distribution: e.g., city subareas and user groups
  - By cost and funding: primarily for construction, but also operation and maintenance where possible. The project and programs in the TMS must be paid for—whether that money is
realistically likely to be available, and where it comes from, make a difference.

- **Other concerns**

Transportation facilities and programs will have effects beyond those on transportation system performance that will affect (positively or negatively) other factors that matter to a community. Land use is the primary “other” concern. It cuts both ways: the final TMS will affect land use, and the land use policies in the comprehensive plan affect the ability of the City to achieve the objectives in the TMS.

There are two fundamental categories of methods for trying to find the optimal course of action (i.e., the best mix of policies; the best plan) when pursuing multiple criteria: (1) formal weighting, and (2) description and discussion.

A formal weighting can be done with benefit-cost analysis: all criteria are measured and monetized, and the policy option with the greatest excess of benefits over costs should be the preferred one. The dollar values are the weights. Local public policy is rarely decided that way. Somewhat less mechanical are formal processes for deriving weights (e.g., multi-attribute utility analysis), where a combination of survey questions and group exercises lead to weights for the criteria. Less formal still are more intuitive exercises in which participants just discuss relative importance and agree on weights.

At the meeting on 27 October, ECONorthwest recommended, and the ATAC approved, not doing formal weighting as part of this project. ECONorthwest provided materials to the ATAC in December 2008 describing some of the problems with formal weighting, and the reasons that most policymaking bodies, in most cases, use techniques from the second category of methods: description and discussion. That material also described why that technique almost always gets summarized as a matrix display: some type of graphic representation of how different packages of policies (alternatives) perform on different dimensions that people care about (evaluation criteria).

Any multi-criterion evaluation process must (1) move from broad goals to specific measurements, and (2) organize specific measurements so that they “nest” under the broad goals. Doing that facilitates the ability to eventually “roll up” the detailed measures into broader assessments of categories of measures.
.2.3 Evaluation Criteria, Benchmarks, Outputs, and Outcomes

In some of its previous planning and policy discussion Olympia has made a distinction between outputs and outcomes. An output is more immediate, specific, and observable than an outcome. In general, it precedes an outcome and is intermediate to that outcome. In that sense, an outcome is a higher-level assessment of community wellbeing. Outputs and outcomes are on a continuum.

At the extreme, the desired outcome of all public policy is to make the relevant constituents in a relevant geography better off. That might be achieved (in part) by providing them with a better transportation system, which might be achieved (in part) by providing better transit, which might be achieved (in part) by reducing the headways on key bus lines during AM and PM peak periods by five minutes. The most specific result (reduced headways) is the starting action: the City calls that an output, and it presumably leads to subsequent, higher-order, and less-quantifiable outcomes that the City desires.

The continuum of outputs to outcomes is related to the continuum of specific measurements to goals, described above. The broad goal (desired outcome) might be “better quality of life for Olympia citizens;” the intermediate goal might be “better transportation access and mobility;” and a specific measurement (output) might be “change in headways on key bus lines during AM and PM peak periods.”

Whatever the City cares about (whether described as goals, outputs, or outcomes) are ultimately the criteria by which it should evaluate the options it has for transportation strategies and actions. The broad categories of goals can serve as categories of evaluation criteria under which measures can be nested. Every evaluation project has specific measurements that nest under broader categories of evaluation criteria. The concepts of evaluation criteria and benchmarks overlap. Benchmarks are often defined as performance measurements—since one is measuring performance on a dimension one cares about, these measurements are simultaneously evaluation criteria.

A problem with benchmarks relates to the City’s distinction between outputs and outcomes: namely, that the link between any specific benchmark (an output) and a desired outcome may not be inevitable, and that there may be unintended consequences. Consider the following example.
Assume (a big assumption) that one had an accurate measurement of changes in vehicle-miles traveled (VMT). If that measurement shows VMT is reduced is that good or bad? Many people would say that is good. In making that judgment, they are implicitly assuming that either (1) people can still get anywhere they want to (or need to) in about the same amount of time, or (2) even if they cannot, the system is now operating in a way that better reflects real costs, so the reduction in VMT is efficient. Many transportation economists, however, would argue that if VMT is reduced as a result of an increase in travel costs, in most settings the economic impact (everything else being equal) is negative because there is a loss in user benefits. But there is an important type of exception. If the reduction in travel reduces a non-user cost (e.g., air pollution) and the benefit of those reductions exceeds the loss in user welfare, then reduction in travel may be beneficial on balance. Elimination of congestion externalities is a similar case. The point remains, however, that without tying changes in VMT to all the other issues it affects (some in ways that are good; others in ways that are bad), there is no basis for interpreting the benchmark called “change in VMT” as good or bad.

As part of its work on Task 2 of this project (evaluating existing planning documents), the consultant team looked for benchmarks / measurements that were either explicit or implied. Our Task 2 technical memorandum summarized the results and grouped benchmarks we found under the broad categories described above (i.e., transportation performance, by mode; and non-transportation impacts—land use).

.3 CONTEXT FOR THE EVALUATION: CURRENT OPERATION, PRINCIPLES, PROBLEMS, AND TRADEOFFS FOR URBAN SURFACE TRANSPORTATION

Olympia’s Transportation Mobility Strategy should aspire for change, but the assessment of the amount of change to expect should be grounded in an understanding of current realities for urban transportation. How does transportation occur now in urban areas, what is possible in the future, and how hard will it be to make those possibilities a reality?

The reality is that in urban, metropolitan areas, person-trips greater than a few hundred meters are made primarily by automobile. In all but perhaps a dozen of the biggest, densest metropolitan areas in the U.S., over 90% of all person-trips are made by automobile. Even if a community wants to lower that percentage, it must start by understanding why it is that high and acknowledging that the tremendous amount of investment
in streets, motorized vehicles, and real estate development has created travel patterns that cannot change quickly without substantial pain. Said another way, the current transportation system provides substantial benefits: directly to travelers, and indirectly to households and businesses who enjoy job opportunity, diverse products, less expensive products, and greater productivity. For intra-urban freight, the percentage is even higher: almost all freight moves by motorized vehicles on streets.

Moreover, the streets carrying all these trips are getting more congested. That congestion leads people of all types (legislators, business owners, and workers; Republicans and Democrats) to support the construction of new street capacity to reduce congestion. But funding has proved inadequate to do proper maintenance of existing capacity, much less build all the new capacity various advocates would like.

That is a difficult environment in which to introduce policies that benefit other users of streets: bus riders, bike riders, and pedestrians. Improving their travel often means either (1) reducing the functionality of the street system for cars and trucks, or (2) shifting money to from improvements that would benefit users of cars and trucks to ones that would benefit users of transit, bikes, sidewalks, and trails.

Many members of the ATAC for this project have a strong interest in shifting focus of Olympia’s transportation policy and funding more toward modes other than the automobile. Among the arguments in support of such a shift are:

- Providing streets for automobiles has become increasingly problematic in urban areas:
  - Urban growth leads to congestion even if more streets (capacity) could be added.
  - The obvious and easy streets have been built. Expansions and new streets are increasingly expensive because of increased costs of material, labor, right-of-way, and mitigation.
  - There is a tradeoff between increasing travel speeds for cars and making streets safe for other travel modes and conducive to other economic and social activities. Arterials designed to get traffic through a city are incompatible with other uses of the street (walking, socializing) and with the creation of attractive urban places that would increase density and trips by alternative modes of travel. Different designs could make these streets safer for travelers of all modes, and would lead to
beneficial changes in surrounding land uses as they are oriented to a different palate of transportation options.

- The long-term trend toward increasing vehicle-miles traveled per person has begun to change and will continue to do so because of increasing fuel prices, actions that will be taken to reduce greenhouse gas emissions, the increasing per unit cost of adding vehicle capacity to the road system, and (for these reasons and others) increases in the real price of travel.

- Reducing the amount of automobile travel is likely to improve:
  - Environmental quality, including air quality, reduction of greenhouse gases, and mitigation of climate change.
  - Health, because some people will get more exercise from biking and walking.
  - Sense of community, because people will have more opportunity to interact
  - Energy security, because less fuel will be used than otherwise would have, and less imported fuel will be required.

- More transportation planning and investment should be directed at non-automobile modes of travel—transit, bicycling, and walking—and at cost effective maintenance of the facilities in the existing transportation system.

  In the short run, the shift toward more attention for alternative modes is more about quality of place, environmental quality, safety, and fairness (giving travelers on all modes a safe and efficient transportation system) than it is about congestion relief for a metropolitan transportation system: motorized vehicles are going to continue to carry the large majority of the load by any measure of usage for a while.

  That can change over time. In the interim, however, the challenge for a mobility strategy in an urban area is to find a balance of policy and investment that moves in a preferred direction without penalizing travel in motorized vehicles (which make up the large majority of trips) too much or too quickly.

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1 Clearly the relationships are complicated and the future is uncertain. What is listed here are potential benefits, not net benefits. The presumption is that there would be net benefits (i.e., that the benefits listed would outweigh the costs (e.g., of greater travel time), but analysis and modeling to support that presumption is beyond the scope of this study.
Other urban areas in the U.S. have addressed the challenge using the concept of complete streets. Streets are for everyone, not just motorized vehicles, and they serve purposes other than access and mobility. Thus, streets should be planned with all those functions in mind: they should be complete. The American Planning Association calls the concept a paradigm shift. Bicycle and pedestrian advocacy groups support it as a way to give some serious attention to their travel modes at the level of transportation system planning (which has been almost exclusively about motorized trips) instead of having to struggle project by project for “concessions” to their modes. The specific tools that might be used to develop and implement a complete-streets program are not complex:

- Coordinated planning for all aspects of the transportation system with a focus on access and mobility for people and goods rather than vehicles.
- More serious attention to broader array of impacts associated with transportation projects. On the transportation side, for example, that means more attention paid to estimating changes in safety (and the value of those changes) for all modes. On the non-transportation side (indirect impacts), for example, that means more attention paid to “external” effects of transportation improvements on emissions and greenhouse gases, the health benefits of exercise (biking and walking), and placemaking.
- Measures of level of service or quality of service for non-motorized travel modes. Some communities have gone as far as to require an equal level of service for all modes on some or all streets.
- A new overlay of street typology that defines a street not just by its “functional class” (which is based on its mission and ability to move automobiles), but also by the land uses it serves and which are adjacent.

Travel by transit shares characteristics with travel by car and truck (motorized) and with travel by bike and foot (it is an alternative to car, the dominant mode of person-trips, and it is more likely to be linked to bike and walking trips). Any policy of complete streets must include transit as well.

The assessment of the consultant team is that incorporating the idea of complete streets into the discussion of transportation system planning is the right idea, but that communities and interest groups should have realistic expectations about what change is possible, which means in large part what change is efficient and fair. Like all issues of public policy and
investment, people will have different and strongly held opinions. In most cases change will not occur in leaps but in increments. Some clarification:

- **It will be easier to agree on the direction of change than on the destination of change.** It will be easier to agree that more attention and budget should be given to alternative modes than to agree that alternative modes should have X% of the transportation budget. Our experience gives us confidence to predict that if the debate about budget turns into a technical one about making estimates of the full costs and benefits of each mode, there will be no clear answer and the policy direction will still be one that the City Council will have to make based on extensive but, ultimately, inconclusive information. In those situations, the typical (and practical) policy response is “Let’s move a little bit in this direction and see how it goes.”

- **For reasons similar to the ones given in the previous point,** this report does not recommend specific targets for changes in mode-split. We recognize that the City has existing policies addressing mode split: the City’s de-facto transportation plan includes mode-split targets. One can infer from those targets that the City wants to move in the direction of a higher percentage of total trips by alternative modes of transportation. A concern, however, is that (1) movement toward those mode-shift targets will depend more on the pricing and cost of motorized transportation and on land use policies than on investments in bike lanes and sidewalks, and that therefore (2) there is a risk that any increases in investment in bike and walking modes—done for the legitimate purposes of safety, livability, and equity—may show little or no change in mode share. Failure to meet aggressive targets may be used as evidence that a shift in investment toward alternative modes is not producing desired results and that the investment strategy should be changed.

- **Consistent with the previous point,** it is too much to expect this Transportation Mobility Strategy to deliver a means of comprehensively evaluating all transportation projects and programs against a common metric across all modes so the “best” ones can be selected. It is more realistic to expect that Olympia might be able to eliminate some of the least beneficial of its potential improvements for motorized travel, and identify and build some of the best of its projects for alternative modes. If that happens, and the results are judged by citizens as good, then more can happen.

- **Don’t get lost in the rhetoric or the measurement.** The idea that level of service (LOS) or quality of service (QOS) could be
measured for each travel mode on a common scale is appealing, but it is technically challenging if not inherently flawed. It implies some normative judgments that are beyond technical evaluation. For example, some communities have said, as a policy statement, that (1) they will have LOS measures for all modes of travel, and (2) every street must be designed or redesigned to have the same LOS for all modes. That policy is likely to give up a lot of efficiency for what some people believe is more equity. What if, for example, on a given arterial, 2% of total zone-to-zone person trips are made by transit, 1% by bike, 1% by walking, and 96% by cars and trucks. Assume LOS for bike is evaluated as F, and for motorized travel is evaluated as C. Assume further that getting bike LOS from F to D would drop motorized LOS to D. There are lots of complicated issues here (e.g., What about safety: are crashes reduced or increased? Even if increased, is the severity reduced?), but our point is that there is a possibility that a lot of people are now worse off (people traveling in motorized vehicles who now have a lower level of transportation service) so that a few people can be better off (bike riders). If that policy is then applied on all streets throughout the urban area, the transfer of benefits from the many to the few will be substantial.

That kind of issue is difficult to discuss. Even stating here, without taking a side on whether the tradeoff is one worth making, is likely to create controversy. That, however, is the point: those are the kinds of issues a community will have to deal with and compromise on if it is going to get to agreement on a mobility strategy.

Finally, we note a point we think important and strongly supported by the professional literature. It is common for people to assume that if better alternative modes are available, more people will use them. And that is true, other things being equal. But traffic planners and economists have well developed theory and substantial empirical documentation of a phenomenon referred to as *triple convergence*. As better alternatives to motorized travel are made available, some travelers decide that trips by alternative modes are a better value, and they swap an auto trip for one by an alternative mode. If many drivers do that, they may reduce auto trips enough that the level of service for autos on the street improves. Travelers are savvy consumers: most “purchase” trips five to ten times a day. If they see that a certain route now has less congestion and better travel times, they converge on that route in three ways: by route (that route instead of an alternative), by mode (the car, instead of alternatives), and by time of day (peak periods rather than off-peak period).
The result is that the investment in alternative modes, by itself, does not make motorized travel less congested. It may change in a small way who is making the auto trips; in theory, it encourages people who before were not making those auto trips to now make them (though the effect may be small).

The best way to avoid this consequence is to get the pricing right on the auto trips. ECONorthwest has done extensive work on “congestion pricing.” The theory is well developed and accepted; large metropolitan areas that have implemented it (Singapore, London) have demonstrated empirical effects consistent with the theory. The technology for doing the pricing is available, but it will take another 10 to 20 years before it is commonly implemented.

In the meantime, it is difficult for independent and relatively small metropolitan areas (e.g., Olympia) to implement a congestion pricing program. We understand that, are not naively proposing that the City try to implement such a program. Rather, we are saying that whatever programs it does adopt should be based on an understanding of what happens to travel choices and patterns when peak-period congestion is not explicitly priced by route and time of day. In other words, if trips were priced to deal with external effects on travel time and the environment, what would travelers do? Obviously, they would travel less on routes, by modes, and at times that were priced... but how much less? If they were, hypothetically, charged the full amount of their external costs as a congestion fee but still found it beneficial to travel almost as much by car, then one must question the assumption that getting people out of their cars and into alternative modes is the efficient thing to do.

We do not come to a conclusion here on the proper mix of travel or investment across modes that should be in the Transportation Mobility Strategy for the City of Olympia. The purpose of this section was more limited: it tries to set a context for the kinds of policies debates that are discussed more in Chapter 3.