of analyzing options and tradeoffs to help agencies prioritize expenditures within and across programs, at various steps along the way from long range planning to project implementation. The available evidence suggests, however, that few if any agencies are actually engaged in a multimodal analysis process that directly impacts decisions about specific project selection and funding. Most state DOTs report that project scoring and ranking systems are just one piece of information that is used to establish priorities. Further, trends seem to favor devolution of prioritization to district offices or regional planning organizations, making it less likely that final project funding selection will be based on direct quantitative comparison of possible alternatives. With the exception of those cases involving larger MPOs with more sophisticated processes, much of the project prioritization that occurs at lower levels of government does not involve extensive prioritization methodologies.

Long-Range Planning

Michigan’s recently-updated long-range plan applied a corridor-level approach to identify several multimodal “corridors of highest significance” based upon their importance to the State’s mobility, connectivity, and economic activity. Prioritized projects in these corridors of state, national, or international significance include highway, rail, air, and marine modal projects to improve freight and passenger flows. While there (apparently) was no explicit comparative analysis of tradeoffs between competing modal projects, the process did result in identification of multimodal capacity improvement packages as highest priority for implementation. In many of these cases, new and more flexible funding sources will need to be identified, as existing resources are too limited and/or constrained to highway projects. Final implementation decisions will involve not only Michigan DOT but numerous MPOs and Regional Planning Agencies (RPAs) to complete the programming and funding processes.

Several other states have established similar priority subsystem designations, often based on multimodal corridors of statewide or even international significance. Florida’s Strategic Intermodal System, Virginia’s Statewide Multimodal Corridors, and other examples illustrate an approach towards prioritization that attempts to help focus state resources on those parts of the multimodal system, regardless of ownership, that by definition have greater benefit to the State than other investment opportunities. When such networks are defined, it is assumed that the benefits to the state (e.g., high-capacity connectivity to all parts of the state, or efficient cross-border freight movement) are similar for all investments being considered on the strategic network, and thus prioritization can occur using a smaller set of more readily determined measures. However, the fact remains that while several states have applied some form of comparative analysis, often using subjective scoring schemes to set priorities, none appear to have developed processes or tools for conducting quantitative analysis between modes to support project-specific tradeoff decisions.
Project Programming

At the programming stage, many agencies now employ performance evaluation of some kind to set priorities, but again, evidence suggests few are actually conducting analysis across modal programs in order to select between competing alternatives that address similar policy objectives or needs. States do not report that they are flexing significant amounts of highway program dollars to other modal programs in order to optimize, for example, total costs to the highway program. This is particularly true at the state DOT level where state and Federal funding sources are relatively compartmentalized and protected. Many agencies cite the inflexibility of funding as a significant hindrance to more proactive tradeoff analysis. Much of the action involving comparison of highway vs. transit project benefits, for example, occurs at the MPO level, where there is greater likelihood of modal diversion in response to targeted investment decisions. In non-metropolitan areas it is less likely that selecting a non-highway (passenger) project will return greater benefits than a similar investment in highway capacity. Exceptions exist, of course, such as well-defined and heavily-traveled intercity passenger corridors, or freight corridors.

A number of agencies report that they do conduct comparative analysis within modes or programs to inform project selection and funding decisions. These processes often involve tools such as economic analysis, pavement and bridge management systems, and traditional trip demand models. In the majority of applications, the comparisons remain within a mode or funding program. Of the 12 public agencies present at the aforementioned FHWA workshop on tradeoff analysis, for example, none identified any specific tools or procedures in use to conduct tradeoff analysis between modes.

The Puget Sound Regional Council (PSRC, the MPO for the Seattle metropolitan area) continues to invest in development of a “least cost planning” methodology that will be multimodal in capability and apply benefit/cost analysis to system expansion projects. The process is not intended to select a specific project over another or generate a project ranking, but rather to allow classification of potential projects into more general “high, medium or low” priority based on benefits/cost and other factors. As in earlier attempts at highly-quantitative analysis of projects, such as linear programming or sufficiency analysis, a persistent challenge exists in how to represent the benefits that each potential project would provide. This is particularly true of freight system investments, where it is essential to estimate the economic value of travel delay and reliability.

Corridor- and Project-Level Analysis

More states and MPOs are now conducting corridor-level planning from a multimodal perspective, and some report that they are attempting multimodal tradeoff decisions at the corridor level. Some of this occurs as part of required environmental analysis processes, where comparative analysis of project alternatives is common. Yet actual linkage between tradeoff analysis results and project selection is still indirect; strategic or long-range plans are more apt to
show evidence of tradeoff analysis than actual Statewide Transportation Improvement Program (STIP) projects.

At this level of analysis, regional travel demand models are most commonly used to conduct analysis of highway and transit alternatives, and a growing number of states are adding benefit/cost analysis procedures to these models, as well as regional economic impact models. California recently implemented a process for prioritizing a long list of multimodal projects to be funded from a general obligation bond program. The “California Strategic Growth Plan” was promulgated to reduce congestion, enhance safety, and accommodate future economic growth in the state. While funding totals for different modal categories were established through a political process, selection of projects within modal categories was based on benefit/cost analysis modeling and other performance factors. The initial roster of selected projects included highway capacity expansion, marine port improvements, goods movement infrastructure, intercity rail, high-occupancy vehicle (HOV), bicycle and pedestrian improvements. As observed in many other instances, further refinement to the project list has been conducted based on a number of factors in addition to the economic analysis, such as geographic allocation and project readiness.

In summary, although there is continued political and professional interest in pursuing multimodal tradeoffs, the actual practice is taking hold very slowly, for a number of reasons discussed further below. As such, there are no clear models to follow that come from the transportation sector, and any significant movement in this direction would require ODOT to take a position of leadership rather than adopt existing practices. Expectations for change in the near term should thus be modest. On the other hand, ODOT is clearly a leader among states in terms of its investment in and refinement of the types of analytical tools, processes, and staff resources that would be required to more fully implement a multimodal tradeoff process. ODOT’s past experience and current capabilities are discussed further below, in Section 4.1.

3.4 WHAT ARE THE REASONS FOR LIMITED APPLICATION TO DATE?

A number of reasons for the limited progress on tradeoff analysis have been identified through implementation efforts, research projects, and workshops such as the one sponsored by the FHWA. These reasons can be grouped into a few categories.

Constraints on Flexible Funding

 Agencies frequently cite inflexibility in Federal, state and even local funding programs as a disincentive. Formula-based funding, geographic equity considerations, and other constraints limit the amount of money that DOTs or MPOs are able to flex, and thus lends to the perception that there is limited
reason to conduct a data-intensive process to determine the best expenditure. State DOTs, MPOs and transit operators all comment that the partitioning of most funds into “highway” and “transit” categories limits the potential effectiveness of tradeoff analysis. The FHWA notes that as more funds are devoted to rehabilitation and preservation of existing infrastructure, the ability to make tradeoffs may be even further limited.

There are exceptions to this general condition. For example, Florida has been able to develop a flexible state transportation fund that can be used to make investments in any modal project that is within the defined Strategic Intermodal System. The Florida DOT (FDOT) notes that this same flexibility is needed at the regional and local levels in Florida to fully implement their policy objectives for multimodal planning.

At the regional level there is less concern over flexibility of funding, particularly for larger MPOs that have developed substantial funding capacity for public transit system expansion. In these cases there is probably less demand to consider flexing limited highway modernization funds to public transit projects.

Technical or Resource Constraints

Most states report that they do not have suitable data, tools, or methods for conducting an “apples to apples” comparison between two different modal projects. It is still the case in most locations that the highway system is far better represented in regional or statewide models than any other mode. This in turn impacts the applicability of many “post processor” type models which rely on a regional travel demand model to generate estimates of other benefits and costs, including environmental externalities, energy consumption, or economic impact. If transit or freight networks are not well-represented in the regional model, it is difficult to conduct a fair comparison between these modes and the highway system.

Resource constraints within an agency are often cited as the main reason they are not able to obtain good data or develop suitable tools for this purpose; most agencies simply do not have the financial or technical resources required to develop reliable data sets for alternative modes. Although the situation is slowly improving, it is still difficult for public agencies to obtain detailed information about freight network capacity, utilization, cost, etc., particularly for the privately-owned portions of the system, thus impeding effective comparisons between freight modes. A few states and metropolitan areas have invested in truck models or multimodal freight models, and as these models become more tested and replicable, it will be easier to generate the kind of benefit and cost data that would be required to conduct a fair comparison across modes.

Another technical constraint cited by several agencies is the difficulty in identifying mode-neutral measures and criteria for comparing across modes. The measures that can be generated with reasonable levels of resources are often determined by the available travel models and other legacy data systems,
making it prohibitively time- or resource consuming to generate new, mode-neutral measures. Some agencies have suggested moving towards a smaller set of measures that can effectively be computed for all modes, and thus spreading data collection and analysis costs broadly across more modes rather than deeply into a large number of measures for just highway and urban transit.

On a related subject, agencies note the need for a framework (i.e., a prescribed methodology or approach) for analysis that provides a common denominator for comparing projects, and that is not too data intensive, costly, or time-consuming to acquire. A research project sponsored by the National Cooperative Highway Research Program (NCHRP) developed a prototypical framework for conducting tradeoff analysis, but case study applications of that framework demonstrated that the real obstacle to more widespread adoption lies in generating the appropriate performance data for different modal projects or programs that result from different levels of investment.2

Transportation planning agencies have spent considerable resources to develop ever-more detailed highway and transit demand modeling systems which are able to generate such output data. Most states also have pavement and bridge management systems that will estimate the benefits resulting from incremental investment in those programs. The Highway Economic Requirements System (HERS), developed by the FHWA, gives states a fairly easy way to prioritize highway modernization investments based on benefits/cost analysis. Thus for the state highway system and urban highway and transit systems there is relatively widespread ability to estimate and compare the benefits of projects within the modes that are represented. There has not yet been a corresponding investment in freight or non-motorized analysis models, and these areas of special model development are just taking hold in the profession. Intercity or statewide models, though gaining in number, are still far less common than urban or regional models, and are rarely multimodal. As such, bringing freight rail, marine, air, and non-motorized modal options into the comparative analysis is quite difficult and not likely to result in a true "apples to apples" comparison. At some point agencies will need to make a larger investment in these other modal analysis systems if multimodal tradeoff decisions are to be informed by sound quantitative analysis based on good data and tested models.

**Institutional and Jurisdictional Issues**

Not surprisingly, in addition to the funding and technical issues, agencies report that the way they are structured and governed has also made it more difficult to actually make tradeoff decisions. This is particularly true if multiple agencies need to be involved in the decision, and where funding will be spent on a project that is outside of the normally accepted range of expenditures for a given funding source or program. "Turf issues and local politics" may prevent projects from being selected according to objective criteria, as expressed by one of the participants in the FHWA tradeoffs workshop. As a result, governing bodies often make final allocation decisions based on a wide array of criteria and
considerations other than the specific transportation, economic, or environmental benefits reported by comparative alternative analysis.

State DOTs note that MPOs and other regional or local agencies make many of the decisions regarding non-highway modal investments, particularly projects within urban areas that might be most appropriate substitutes for highway capacity projects.

Even within a single large agency such as a state DOT with responsibility for a variety of programs there may be resistance to conduct budgeting according to cross-program or cross-modal criteria. A redirection of traditional highway and bridge funding to other modes may be seen as a “take away” by both agency personnel and the traveling public if they are not aware of, or do not agree with, the optimized-benefits approach to funding.

Finally, translating the results of quantitative tradeoff analysis for decision-makers is cited by numerous agencies as an important area for further improvement for multimodal tradeoff analysis and decisions to become more feasible in their environment. There is a need for improved understanding of the core concepts on the part of decision-makers, and agency staffs need greater understanding of the applicable methods and tools as well as of the shortfalls of current approaches.

4.0 Current and Potential Future Applicability to ODOT

Feasibility and practicality of selecting capacity projects based upon tradeoffs between competing modal alternatives projects depends on a host of factors and conditions. As a result of a long-standing commitment to a rigorous and highly cooperative planning process, ODOT has in place some of the institutional and technical “culture” and capacity to provide a good foundation for tradeoff analysis. As noted in the several examples below, ODOT has already invested in a number of analytical tools and processes which allow a certain degree of multimodal comparison and tradeoff analysis to take place. Although a number of the limitations cited in the sections above still apply, ODOT is closer to being able to implement multimodal tradeoffs than most DOTs in the United States.

4.1 Oregon Experience and Capabilities

At ODOT, multimodal analysis takes place within a number of programs and processes, including long range planning, policy analysis, development of the STIP, and in special funding programs such as Connect Oregon.
Long-Range Planning and Policy Analyses

ODOT has developed and applied a number of tools and procedures used to conduct analysis of alternative projects and scenarios for long range planning. Significant investment has gone into development of its flagship statewide, multimodal passenger model that has been used in a variety of planning and policy analysis applications, including the 2006 Oregon Transportation Plan (OTP). By integrating transportation, land use, and economic models, ODOT created an analysis system that is currently capable of supporting tradeoff analysis between passenger modes over a portion of the state's highway network. The OTP development effort considered alternative scenarios that differed primarily in their relative emphasis on highway capacity expansion vs. an operations-intensive approach that included major investment in the I-5 passenger rail corridor. The diversion of auto passenger trips to rail was included in the aggregate comparison of costs and benefits of the scenarios, but the analysis did not explicitly compare the two projects (i.e., highway widening vs. rail systems and operations upgrade) to one another. Nor did it consider the potential impact of rail system improvements in diverting freight trips from truck to rail, as at that time the model did not include freight trips. The analysis conducted for the OTP was further limited by the relatively coarse region-level capabilities of the model at the time, which were suitable for statewide long range planning but would have proven problematic if a project-specific comparison were undertaken.

Another ODOT innovation involved the linking of the Highway Economic Requirement System (HERS) with the statewide travel model to facilitate economic analysis of alternative scenarios in the 1999 Oregon Highway Plan. This joining of tools allowed the combined benefits of the segment-level analysis of economic effectiveness that HERS provides, with the system interactions that the statewide model provides. This was the first such planning application of HERS in the country, and was the forerunner to the newer HERS-ST, developed by FHWA and distributed to state DOTs to provide the same type of planning analyses capabilities applied by ODOT in the OHP. ODOT is now working to link HERS with a metropolitan-level travel demand model in the Rogue Valley metropolitan area.

Improvements to the ODOT statewide travel model are nearly continuous, and future generations of the model will have substantially more multimodal analysis capabilities on both freight and passenger modes. The ability to compare alternative modes of freight movement is obviously a necessary component of tradeoff analysis when considering the benefits of public investment in highway capacity vs. improvements to freight rail lines serving similar markets.

Multimodal Performance Measures

ODOT has conducted innovative research in the area of model-based measures for comparing alternative travel models. This research influenced the selection
and computation of performance measures used in development of the current
OTP, and improved the ability of the plan to test scenarios against the broader
range of policies that currently guide Oregon transportation planning at the state
and regional level. These included measures that address changes to cost of
travel, economic vitality at the region and state level, equitable distribution of
impacts and benefits, travel safety, i.e., beyond the more traditional measures of
system utilization and capacity. Measures of these type of policies are important
determinants of how well and how efficiently a transportation system delivers
multi-modal services, and are thus an important component of multimodal
tradeoff analysis. An important aspect of this research was the interest in
identifying cost-effective approaches, meaning that data collection and analysis
costs must be reasonable, and capable of being generated with existing analytical
tools not only for existing conditions, but for projected future conditions. Cost
and/or difficulty of data collection and analysis is an oft-cited obstacle to
quantitative performance-based analysis, and is a significant issue at ODOT as
well.

Connect Oregon

In 2005 the Oregon Legislature authorized $100 million for Oregon’s Multimodal
Transportation Fund to invest in air, rail, marine, and transit infrastructure. This
first authorization, referred to as ConnectOregon I, resulted in selection and
funding of approximately 41 projects. The 2007 Oregon Legislature approved a
second authorization of $100 million for the program. Project activities that are
eligible for funding from the State Highway Trust Fund or that require or rely
upon continuing subsidies from the Oregon Department of Transportation are
not eligible for ConnectOregon funding. Although the ConnectOregon program is
specifically for non-highway projects, the criteria for evaluation and
prioritization of applicant projects are of particular interest to the concept of
multimodal tradeoffs. The project evaluation criteria are relatively mode-neutral,
and could be adapted to permit comparison of both highway and non-highway
projects in terms of their contribution to program objectives including reduced
transportation costs for businesses, improved access to jobs and labor pools, and
enhanced critical connections to improve multimodal system utilization and
efficiency. While there is nothing inherently flawed with the current
ConnectOregon evaluation methodology, it does not support a point-by-point
comparison between projects that would be necessary to make tough tradeoff
decisions. It would be necessary to generate more quantitative measures in most
of the evaluation categories and to define a more specific analysis methodology
or framework. Claims of economic benefits to the state, or of reduced
transportation costs to users, for example, could be quantified for highway and
public transit modes using data and tools now available to ODOT. Economic
models are available that can estimate job creation, wage rate increases, etc., that
are used to make a more objective and fair comparison of potential economic
development contribution of different projects, again limited generally to
highway and public transit. Travel models can more accurately estimate changes
in travel costs resulting from network improvements, and would provide a more
even basis for comparison of alternative projects. The current limiting factors
seem to be the lack of suitable data and analytical tools for freight modes other
than highway, and for passenger modes other than highway and surface public
transit.

**Programming**

The ODOT STIP development process, while extensive and highly collaborative,
primarily serves to allocate resources within funding categories, rather than to
identify which of multiple alternative projects might deliver the greatest total
benefit in a given situation. There is some flexing of Federal Surface
Transportation Program (STP) funds to transit projects, and Oregon has
previously secured approval to spend Congestion Mitigation and Air Quality
(CMAQ) Program funds on operation of additional passenger rail service
between Eugene and Portland. The majority of capital expansion funds
including public transit are allocated by modal category, however, and the
Federal STP funded projects selected by Transportation Management Areas
(MPOs over 200,000 in population) are incorporated without change into the
STIP, indicating that there is no existing process in place to apply a multimodal
assessment of benefits to determine whether the programmed projects reflect the
optimum expenditure with regards to system policies and objectives.

**4.2 Future Potential Application at ODOT**

Our comments below on the potential applicability of multimodal tradeoffs at
ODOT are based in part on several assumptions we have derived from a variety
of ODOT sources. These assumptions should be discussed and tested, and
future considerations or strategies modified as necessary to best reflect ODOT’s
objectives.

It appears that the greatest current interest at ODOT is in the potential tradeoffs
between investments in highway capacity improvements and modal alternatives
including commuter rail, intercity rail or bus, and freight rail. Further, the
current interest is primarily in “supply side” strategies, e.g., capacity investments
to induce changes in mode choice decisions for both passenger and freight trips,
rather than “demand side management” techniques which might involve
government policies such as differential pricing, zoning, etc. Motivating this
interest is the desire to achieve a better mix of user mobility, general public
benefits, lower system costs, the best use of limited resources, and economic
stimulus through transportation investments. As discussed further in Section 4.3
below, capacity expansion on the right modal system in the right location is more
likely to attract trips away from less economically efficient modes, and it is this
sort of shift that is likely to generate the greatest economic benefit to users and
the public at large.
As suggested by the numerous comments offered by the FHWA workshop participants, a number of current conditions would need to be addressed to both facilitate the technical process of tradeoff analysis, as well as to bring the resulting information to bear on current planning, programming and funding decision processes so as to make a measurable difference:

- Improve ability of ODOT and other partners to quantify modal diversion, economic benefits, and other impacts of capacity projects in other than highway and urban transit modes. This reflects an expansion of the already industry-leading planning analysis that ODOT and METRO have demonstrated over the past decade.

- Explore the full range of flexibility of existing and potential future sources of transportation funds, including appropriate funding partnerships, for use on a wide range of modal capital projects.

- Push for creation of new and sustainable funding sources that will have fewer constraints across modal programs.

- Continue to take part in collaborative planning and programming activities with key partners within Oregon, including MPOs, Port of Portland, marine and rail operators, etc.

- Similarly, continue to support multistate infrastructure planning, programming and funding efforts such as the Columbia River crossing project.

Implementation of several initiatives in the OTP should help ensure that current and future activities reflect the directions that need to be taken for multimodal tradeoffs to be feasible. Some specific activities that should be noted include:

- Developing tools to evaluate transportation investment benefits should include integration of other modes to the greatest extent possible, for example, integrating truck and freight rail models with highway and public transit models, to improve ability to examine investment tradeoffs.

- Developing a system for maximizing Federal funding for transportation improvements across jurisdictions and modes is an important undertaking requiring extensive cooperation across government, business, community, and special interest groups.

- Pursuing additional funds for programs like Connect Oregon for multimodal investments is critical; evaluation criteria could be revisited to ensure that the program identifies and funds the most effective non-highway capacity projects that will improve the likelihood of modal optimization and system integration, as well as meeting the other program criteria of reduced cost, improved access, and economic benefit.

- Several activities to help implement strategic investments in capacity relate directly to the ability to implement tradeoff decisions, including non-dedicated funding sources, improved regional models, and identification of
specific methods and criteria to identify the tradeoffs in costs, benefits, and impacts of different modal alternatives for capacity expansion.

4.3 **SUITABILITY OF PROJECTS FOR TRADEOFF**

Aside from the practicality of the technical analysis and political decision-making processes, there are other criteria that would determine the feasibility of multimodal tradeoff analysis and selection, and which also tend to suggest what kinds of candidate projects are more suitable for this kind of analysis and decision-making. For example:

- Where are trip-makers (including freight shippers, for the purposes of this discussion) most sensitive to supply-side factors, such as availability of a modal alternative, capacity and reliability of the alternatives, and price of the alternative? Multiple studies have shown, for example, that auto commuters are relatively insensitive to the price of public transportation in certain (and common) situations, such as where the sunk cost of auto ownership is not a factor, where destination-end parking is free or paid for by an employer, etc. Drivers are more likely to be lured from autos where transit system availability (route coverage and frequency) is significant, where travel time is at least competitive with auto travel, and where transit system reliability is predictably better than that of auto travel. Given the typical access times at the start and end of a transit trip, auto drivers may also be more likely to shift modes for longer distance trips, other things being equal. Thus, suitable tradeoff situations for auto commuters are more likely to exist in situations where highway congestion contributes to excess delay and poor reliability, and where parking is at a premium. These same situations will generate not only the greatest potential user benefits but public benefits as well, as reductions in vehicular pollutant emissions and energy consumption are likely to be more meaningful. The ability to continue to deliver a suitably-skilled labor pool to a congested urban employment market may sustain greater economic activity and productivity than would otherwise be possible, with broad benefits to the public at large.

- Freight shippers, though highly sensitive to price and travel time reliability, are quite often bound to certain modes by location of terminals and distribution points. Oregon, however, has several situations where privately-owned rail lines are vitally important to the transportation of goods for certain industries such as forest products. In situations where public investment can create, sustain, or improve rail access between, for example, production points and Class I rail lines or major distribution terminals, there will be direct benefits to the shippers through lower transport costs, and indirect benefits to highway users through the reduction or avoidance of heavy trucks on state highways. Taxpayers at large may benefit from reduced maintenance and rehabilitation costs for roadways and bridges which offset the capital cost of the rail line improvement. In cases where
commuter trains share track with freight trains, there can be additional user benefits from mainline trackage or switching facilities, in the form of improved travel time for rail passengers. These types of situation also create opportunities to leverage funds from other sources such as Federal programs or specific Federal earmarks.

As the two examples show, the better candidate situations for tradeoff analysis involve some common elements, including these:

- Current and future users of one modal system (generally it will be the highway system in these discussions) who are sensitive to availability, capacity, reliability, and (to a lesser extent for auto commuters) the price of a competing alternative mode. These are the conditions which usually will exist in some significant combination before any substantial mode change can be effected through a public investment in alternative modes.

- Well-defined corridors that serve well-defined user markets. This makes it easier to capture all the factors, including cost, that go in to a mode choice decision, such as the relative importance of travel time vs. reliability vs. trip cost. When analysts are able to define the markets that would be served by a capacity improvement they are far better able to place a value on these factors, and thus better able to estimate the likely impact on user decisions. With that in hand, we can then make a better estimate of likely modal diversion, resulting congestion levels, safety improvement, impacts to pavement, pollutant emissions, and so on down the line of all the subsequent considerations that add up to determine which of the modal alternatives delivers the best combination of user and public benefits, economic impacts, etc.

- Application of public-sector transportation funds to improve a privately-owned facility, such as a marine terminal or freight rail line, should result in clear benefits not just to the businesses who use those facilities, but to the traveling public and general public at large. Thus, improvements should be seen in areas such as reduced congestion from truck freight, improved highway safety also related to reduced heavy truck volumes, reduced roadway and bridge structure impacts, net reduced diesel emissions, etc. It is worth considering the real source of “private” funds that are being leveraged in a public-private partnership; in some cases these matching dollars may in fact be public funds from other sources. While it is desirable to leverage state transportation dollars with whatever other sources can be tapped, it is worth noting whether private entities are actually contributing substantially to a jointly-funded project, or are serving as a conduit for other public monies.
5.0 Conclusions

While this paper does not attempt to resolve the question of how best to actually conduct analysis of multimodal tradeoffs and make decisions accordingly, we have attempted to summarize the current state of the practice, provide thoughts on the rationale and potential benefits, give some examples of attempts that have been made to base funding decisions on objective analysis of multimodal project benefits, and enumerate several obstacles and considerations that have been repeatedly cited by agencies who have been consulted on this subject.

At present, we are not aware of any state DOTs that are applying a comprehensive multimodal tradeoff process to make project selection or funding decisions. Many DOTs and MPOs do, however, bring information about broad project benefits to the decision table, for example, economic development, transportation safety, energy consumption or pollutant emissions. What remains lacking from the picture is a methodical approach to assembling data and performance information that allows decision makers to make an "apples to apples" comparison of the costs and benefits of two or more projects on different modal systems. As we have noted, a clear contributing factor in most cases is the simple lack of comparably detailed data sets or analytical tools for most of the non-highway modes and for freight transport. Other constraints exist as well, as we have documented, including constraints on use of funding, and an overall dearth of funds for capacity expansion projects in any mode.

The Oregon DOT is farther along than most DOTs of which we are aware in its ability to generate quantitative data that could support comparative analysis of one project against another in terms of total benefits, or the degree to which specific transportation objectives as well as more broad societal policies are served. Investments in the Oregon statewide model, HERS-Oregon, other similar tools and in highly competent staff are the reasons.

At the same time, Oregon has successfully applied collaborative decision-making processes to programs such as the STIP and ConnectOregon that utilize stakeholder groups to make multimodal investment decisions based on both qualitative and limited quantitative information. This culture of broad-based input to important decisions is likely an important precursor to a more quantitative tradeoff analysis process. We say this because we believe it is unlikely that a pure quantitative comparison or ranking method will ever replace the complex decision processes that characterize most public transportation investments. Rather it is likely that ODOT could be successful in achieving even more informed and efficient decisions by introducing more objective, higher-quality multimodal tradeoff comparisons to the process. This would over time result in optimization or maximization of return on investment of transportation dollars.
A. Endnotes