Chapter 11.0 CORVALLIS TRANSPORTATION ALTERNATIVES ANALYSIS

11.10 Introduction

On August 5, 1996, the Corvallis Transportation Plan was adopted with a commitment to continue to refine the community's response to its transportation needs. The City has undertaken a general Corvallis Transportation Alternatives Analysis (TAA), to coordinate several efforts toward meeting this committment and put them in context with the work already done. These efforts include the development of a transportation demand management (TDM) plan, a transportation system management (TSM) plan, and a master plan for the Corvallis Transit System. These concepts are further discussed in Section 3.50 Transportation Alternatives Analysis. This chapter is the result of the TAA and the public involvement process that has supported it.

The TAA has been conducted with guidance and support from City staff by Kittelson & Associates, Inc. acting as consultants to the City of Corvallis. Coordination has also been maintained with Benton County planning efforts and with the Oregon Department of Transportation. Throughout the process of developing the study, understanding the results, and making recommendations, the TAA team has worked with a steering committee appointed by the Mayor of Corvallis. The committee was selected to bring thoughtful, committed reflection and leadership representative of a broad range of concerns and community interests to the project; it has been the primary source of public involvement input over the course of the study. Public open house meetings have been used to seek wider input during the initial study and in response to draft editions of this chapter.

One of the key charges to the consultants, staff, and steering committee has been to coordinate previous and ongoing work of other, related studies. A great deal of effort and community reflection has gone into Chapters 1-10 of this TSP. No attempt has been made to discard or overrule that work. The emphases are, however, recast in forms shaped by greater study of alternative transportation strategies. From this recasting, a new listing of proposed infrastructure projects emerges, as well as additional policy recommendations. This revised transportation improvement plan makes up Section 11.50 of this chapter. The key elements providing new form for the TSP are a study of potential TDM strategies and their impacts, first summarized in "The Current Status and Future Direction of TDM Planning Efforts in Corvallis" (1995) and the preparation of a Corvallis Transit Master Plan taking place concurrently with the TAA. Incorporating and coordinating with these studies has been a major component of the TAA. **Sections 11.50.20 and 11.50.30 of the revised transportation improvement plan deal specifically with TDM and Transit plans and policies.**

The method of the TAA has been to develop a set of alternative transportation strategies for the next 20 years, to model the effects of those alternatives, and from what is learned, to create a preferred alternative using elements from all alternatives as appropriate. Various evaluation criteria were devised as tools to understand the effects of each alternative. **These evaluation criteria are discussed in section 11.20.** The five alternatives identified for study are:

- "No-build",
- Roadway Build,
- Transportation System Management (TSM),
- Transportation Demand Management (TDM), and
- Transit/Land Use.

These alternatives are described in Section 11.30.

The term "alternative" may be misleading, as it can imply that one would simply evaluate which alternative is best and choose it. The intention of this analysis is somewhat different. The alternatives chosen for study are intentionally unbalanced, with each focusing narrowly on a particular strategy—Roadway Build, TSM, TDM, Transit/Land Use. The intention is to discern the potential and limits of various elements of a transportation system plan for Corvallis. Narrow focus on each strategy, separate from the others, provides a window on the type and magnitude of effects that can be expected from that strategy. **Section 11.40 summarizes the key findings of evaluating these modeled alternatives.**

The results of the alternatives analysis shape the creation of a revised transportation improvement plan. This "preferred alternative" combines elements from all of the strategies, though not to the full degrees originally modeled. It presents a realistic, forward-looking set of projects and policies that will guide Corvallis over the next 20 years toward a multi-modal and intermodal transportation system, one that provides for the needs of Corvallis' citizens, institutions, and businesses while reducing dependence on automobile travel. **The preferred alternative Revised Transportation Improvements Plan is presented in Section 11.50. The results of checking the preferred alternative against the evaluation criteria are presented in Section 11.60.**

11.20 Evaluation Criteria/Methods

Use of the Corvallis transportation demand forecasting model (EMME2) facilitated development and evaluation of many primary and secondary transportation performance measures. The model is more specifically described in Section 2.20.20 Citywide Traffic Model. In addition, a number of more qualitative evaluation criteria were also used in the analysis. Modeling of alternatives was performed with the EMME/2 travel demand forecasting program, encoding variations in the model to reflect the differences in the various alternatives. Each model run calculated a variety of system performance measures. Qualitative measures were assessed based on both the description of each alternative and the results of the modeling of each alternative. Alternatives development was shaped not only by strategy to be modeled—Roadway Build, TSM, TDM, Transit/Land Use—but also by two additional factors applied in advance. First, each strategy was modeled in a form that would meet minimum level-of-service (LOS) standards, and second, each was modeled in a form that would keep expenditures within projected financial resources. Each alternative modeled comprises a set of projects, policies, and visions.

The EMME/2 program provides powerful tools for calculating many measures of system performance. The most basic of these measures are:

- Vehicle miles traveled (VMT) and
- Vehicle hours traveled (VHT).

Other evaluation criteria can be derived from the basic trip measures. These include estimates of:

- Energy consumption
- Lane-miles of congestion
- Production of various pollutants such as carbon monoxide.

Other measures are conceptually quantifiable, but in practice best dealt with in broader strokes based in common sense, experience, and logical application of general principles. Evaluation criteria dealt with in this way include:

- Multi-modal travel time
- System safety
- Noise
- Economic impacts (other than the direct capital, operating, and maintenance costs of system improvements).

A final group of evaluation criteria is significantly more subjective. These criteria serve well to identify contrasts in the alternatives and provide a framework for important decisions expressing community values as they relate to transportation planning:

- Social/neighborhood impacts
- Equity in distribution of impacts, both positive and negative
- Compatibility with other public policies
- Effects on institutions
- Acceptability to the public and to decision makers.

As indicated above, two factors were applied in the process of selecting the sets of projects and policies that comprise the various alternatives. In one set of model runs, each different strategy—Roadway Build, TSM, TDM, and Transit/Land Use—was supplemented with capacity improvements to reach a volume-to-capacity ratio corresponding to the level of service "D" called for in City policy. Another set of model runs reflected reduced sets of improvements, those that best expressed the various strategies within the constraint of projected funding available for transportation system improvements for the next 20 years.

Analysis of actual expenditures for transportation improvements over the last several years provided the basis for projections of future funding. In this initial phase of applying financial constraints, expenditures from the many sources were grouped into three sets: funding for State projects, funding for City road and pathway projects, and funding for transit. A more refined approach to matching probable funding sources to planned improvements is part of the "preferred alternative" development discussed below. Projecting past expenditures into the future yielded 20-year total funds of:

- $18 million for State projects
- $20.5 million for City projects

The 20-year projection for transit by this method would anticipate $2.6 million available; for reasons discussed below this number was not used as a financial constraint.

11.30 Description of Alternatives

The "no-build" alternative was modeled to provide base-line 2015 conditions. Each of the other alternatives described below was analyzed in two forms. In the first form, the narrow strategy is fully implemented, then supplemented with a broader range of projects to meet the City's level-of-service (LOS) standards. In the second form, the strategy is implemented as fully as possible within projected financial constraints. The travel demand forecast models used to study each alternative are based on the City's 1994 calibrated EMME/2 model. The model is designed to forecast demand by automobile users in the p.m. peak hour. Changes to other modes, e.g. increased bicycle use, are reflected in the model by reductions to the number of auto trips.

11.30.10 "No-Build"

The "no-build" alternative assumes that nothing will be done in the future to relieve congestion problems within the City. Since the City's population rises to 62,500[1] under any of the five alternatives, this alternative assumes that new roadways will be built in the areas where growth is occurring, in order to connect new development to the existing roadway system. However, this alternative also assumes that no capacity improvements will be made to existing roadways to accommodate future growth. This alternative was evaluated and considered in the same light as the other alternatives, but it also provides a baseline traffic demand forecast model for the twnety-year future on which other model scenarios can be built and against which all the other alternatives can be compared.

11.30.20 Roadway Build

The Roadway Build alternative assumes construction of all of the auto-capacity related roadway projects identified in the Chapter 10 transportation improvements plan. Improvements to the safety and convenience of roadways specifically for bicyclists and pedestrians are not part of this alternative. The travel demand forecast model for this alternative uses the baseline land use and trip generation assumptions of the "no-build" alternative while modifying the modeled street network to reflect the modifications made by the various projects, e.g. widening a highway section from two to four lanes. Such roadway expansions can be both costly and controversial.

11.30.30 Transportation System Management

The TSM alternative assumes that the maximum efficiency will be squeezed out of the existing transportation system before resorting to roadway construction projects. This alternative includes

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[1] The EMME2 traffic model used two population thresholds, 62,500 and 80,000, for evaluation purposes. The 62,500 number was taken from the City's Vision 2010 projection. Although there may be differences of opinion concerning the likely population for Corvallis in 20 years, the 62,500 number provides a suitable "point in time" for evaluation of potential traffic impacts.

relatively non-controversial actions such as improving guide signing, re-striping, and traffic signal coordination, as well as more controversial actions such as prohibiting on-street parking and instituting access management measures. The travel demand forecast model for this alternative also uses the baseline land use and trip generation assumptions of the "no-build" alternative while increasing the capacity of the modeled street network to reflect the modifications made by the various projects, e.g. signal coordination along an arterial.

11.30.40 Transportation Demand Management

The TDM alternative assumes that single-occupant vehicle use will be reduced to the greatest extent practical. This alternative includes relatively easy actions such as voluntary employer trip reduction programs, guaranteed rides home, and public pedestrian and bicycle facilities, as well as more expensive and/or controversial actions such as mandatory employer programs, on-site pedestrian and bicycle facilities (covered bicycle parking, showers, etc.), and transit signal preemption projects. The changes due to TDM measures are reflected in the travel demand forecast model by across-the-board reductions to the trip table, e.g. all of the modeled trips from home to work and back, between every pair of traffic analysis zones, were reduced by a given percentage.

11.30.50 Transit/Land Use

The Transit/Land Use alternative assumes that the Corvallis Transit System will be significantly improved and that land use patterns will change to support the transit system through increased densities adjacent to transit lines. This alternative presents the greatest departure from current patterns and trends. Targeted infill corridors and strategically chosen anchors of higher density mixed use will create a pattern of land use and transportation focused on downtown with radial arms out to the edges of Corvallis. Figure 11.1 is a composite of illustrations suggesting the character envisioned for the higher density, mixed-use areas (neighborhood centers). A substantially expanded transit system (14 buses as compared to five in 1997) will serve these radial corridors on 15-minute headways. The travel demand forecast model trip table is modified in two distinct ways to reflect this alternative. First, the pattern of land uses—where people will live and work—is matched to the pattern of corridors, anchors, and strengthened downtown. This is accomplished by creating new rates of expected trips between traffic analysis zones that fit the changed densities of housing and jobs. Second, the total trips are reduced according to how well any type of trip will be served by transit, e.g. trips between anchor nodes and downtown are reduced most while trips to and from areas farthest from transit service are not reduced at all.

11.40 Summary of Alternatives Evaluation

The following discussion summarizes key findings from the evaluation of the various alternatives. The discussion begins with specific criteria where clear distinctions appear and where the evaluation of the criteria are strongly connected to the community's vision and values. This is followed by more general descriptions of the strengths and weaknesses found in each alternative.

In all of the alternatives, the great majority of capacity related problems and the largest most expensive single projects are concentrated on state and federal highways. **In relatively few areas**

directly within the City's control will the choice of one strategy over another mean the difference between acceptable and unacceptable LOS performance. Overall system performance and impacts do vary significantly among the alternatives.

10.40.10 Quantitative Impacts

The most basic quantitative measure of transportation system performance is **vehicle miles traveled** (VMT). VMT can be affected in two principal ways: changes to the number of trips and changes to trip length. The number of trips is controlled by the trip table, but the length of trips cannot be determined until the model is run. Trips are assigned to the fastest route available—if congestion slows the most direct route, trips will be assigned to longer but faster routes.

The VMT results for the study alternatives are instructive. In all cases, VMT closely tracks the changes to the trip table, but shows little change due to congestion re-routing. The alternatives that reduce total automobile trips show the greatest reduction in VMT, essentially equal to the percent reduction in trips:

- 9.8% reduction in VMT for Transit/Land Use
- 4.6% reduction in VMT for TDM.

By contrast, merely reducing congestion from the "no-build" base level did little to reduce VMT:

- 0.1% reduction in VMT for Roadway Build
- 0.3% reduction in VMT for TSM.

In contrast, **vehicle hours traveled** (VHT) shows effects of both trip reduction and of congestion reduction. The largest reductions in VHT over the "no-build" alternative are again seen in the Transit/Land Use alternative (16.7%, this and following percents are for the financially constrained models), and the TDM alternative (10.9%). But the Roadway Build and TSM scenarios, each with a strong emphasis on keeping cars moving, do show significant reductions over the "no-build" alternative (Roadway Build 7.2%, TSM 4.3%).

Effects on **air pollution** correlate closely with VHT. Effects on **energy consumption** fall between those of VMT and VHT. In all these measures, under realistic financially-constrained modeling, the order of alternatives remains constant. The greatest benefits in these quantitative measures are seen with the Transit/Land Use alternative, followed in decreasing order by TDM, Roadway Build, and TSM.

The main potential **land use impacts** are on density and location patterns (suburbanization). The theory here is straightforward. To the extent that the City and State improve automobile access on arterials that feed into the downtown, development at the edge of the urban area is encouraged. In general, development patterns at the fringe tend to be less dense. That theory certainly applies to residential development. But for office and some retail development, improved transportation simultaneously has a contradictory effect: it allows businesses that want central locations (e.g., professional services in a large downtown) to concentrate in those locations.

Taking “no-build” as the base case, all of the other scenarios are going to facilitate more suburban development. Even in the “no-build” scenario, given its assumptions, there will still be substantial suburban development—it will slow down sooner, however, as the arterials serving it begin to fail. Except for Transit/Land Use, the alternatives differ primarily in the timing of the impacts and, at the margin, the amount. The Land Use/Transit alternative has the potential of doing more to affect land use. The direction of the effect is clear (toward more density downtown and along the radial transit corridors), but the magnitude of the effects may be small and depend on the extent to which the City forces development to occur where market forces are not driving it now. If fully implemented, then more development will occur in the Neighborhood Focus areas and along transit lines in the Land Use/Transit alternative than in the other alternatives.

10.40.20 Qualitative Impacts

Social/Neighborhood Impacts can be difficult to define and measure. Typical transportation environmental impact statements focus on disruptions to *neighborhood cohesion*. That disruption is typically a function of the amount of direct change that a transportation improvement will cause (e.g., by acquiring and demolishing houses in established neighborhoods for right-of-way; by creating large highways that create barriers to non-motor travel that used to occur in neighborhoods), or the indirect change, primarily via changes in land use, that might follow the improvement (e.g., a by-pass causes a deterioration of a by-passed neighborhood). But none of the strategies in the Corvallis Transportation Alternatives Analysis is of a type or scale that causes obvious changes in this variable. There are no major freeways or by-passes, and no new routes or alignments through existing neighborhoods. Thus, as a first approximation, there are no differences among the strategies in the system-wide magnitude of neighborhood impacts.

Differences in the kinds and distribution of impacts do exist. The TDM alternative, because of its emphasis on walking and bike connections, has potential for increasing interactions among residents within neighborhoods. The Transit/Land Use alternative has the potential for creating even stronger senses of neighborhood community in very focussed areas. But not all people consider higher density, mixed-use, pedestrian and transit oriented neighborhoods desirable. Also, if the advantages to central neighborhoods come by severely limiting highway improvement in less central areas, then those less central neighborhoods will suffer.

10.40.30 Distribution of Impacts

Distribution of Impacts refers to whether the benefits and costs of the scenario are perceived to be equitably (fairly) distributed. A distributional criterion is needed because any given scenario may generate net benefits in the aggregate but may not benefit everyone equally, and, more important, may cause some groups to be worse off. Though many special groups could be defined (for example, based on ethnicity, age, handicaps), the key sub-categories for transportation relevant in Corvallis are probably (1) auto trip makers compared to other trip makers; (2) low-income households compared to households with higher incomes, and (3) one area of the City compared to other areas.

By design, auto trip makers are favored in the Roadway Build and TSM alternatives and non-auto trip makers are favored in the TDM and Transit/Land Use scenarios. But even in the TDM and Transit/Land Use alternatives, those who still use automobiles gain benefits from the overall

reduction of vehicle trips. The auto-oriented alternatives do not offer a similar, substantial benefit to non-auto trips. TDM and Transit/Land Use scenarios, therefore, offer greater equity among travel modes.

Comparing impacts to low and high income households is difficult. A central distinction is that higher income households in general have greater freedom of choice in transportation than lower income households. Better paid, better educated individuals are more likely to have flexible schedules; they can afford housing either close to or distant from work; they can choose to have multiple cars, good bicycles and rain gear, and a transit pass if they so desire. Poorer people cannot choose their housing in relation to their jobs. They may have to live and work in areas that require commuting by car. Or they may be unable to afford a car for each working family member and have to use transit or bike or walk. Because lower income families have fewer resources to adapt their lives to a limited transportation system, they will be best served by alternatives that support the broadest range of transportation choices.

10.40.40 Comparison of Alternatives

In general, all of the alternatives include improvements broadly covering all areas of the City. The most notable geographic distribution impacts come with the Transit/Land Use alternative. In this alternative, some areas of the City retain their existing character, while other areas experience significant infill and development of mixed commercial/denser residential uses. The transit plan also calls for greatly improved service to downtown, the radial corridors, and the anchor nodes developed at the ends of the corridors. It achieves this at the expense of reducing or eliminating fixed route transit service to some other areas of the City.

The **No Build** alternative serves as a baseline for comparing alternatives under projected conditions in 2015. Any of the alternative strategies will provide better transportation performance.

The **Roadway Build** alternative:

- Most clearly serves the needs of automobile users
- Is most compatible with a continuation of development patterns that have substantially shaped Corvallis up to now—single family dwelling subdivisions and separate, auto-access oriented commercial and employment zones
- Allows individual trips to pollute less, but supports more and longer trips
- Does not promote expanded transportation choices
- Costs more to achieve the same levels of mobility.

TSM provides similar effects to, though to a lesser extent than, Roadway Build.

- Are least expensive
- Are no more effective, often less effective, than the other alternatives
- Provide low-cost immediate gains in roadway capacity in some corridors
- Require long-term policy implementation to achieve the full potential of access management.

The **TDM** alternative:

- Reduces auto trips, though not dramatically
- Provides greatest facilities for bicycle use
- Minimizes impacts of growth on neighborhoods by limiting increases in traffic without major land use changes
- Indicates a community commitment to reducing dependence on the automobile
- Requires substantial, ongoing investment by employers and City
- Results in greater total travel time when all trips by all modes are considered together, due to greater use of slower modes, e.g. walking.

Transit/Land Use presents the strongest departure from current conditions and practices. The Transit/Land Use alternative:

- Produces the greatest reductions in automobile use
- Goes farthest toward creating a pedestrian oriented city
- Provides the greatest range of transportation choices, primarily for those willing and able to live in areas of somewhat greater density than typical subdivisions
- Requires acceptance of significant land use changes, principally creation of areas of greater density and mixed use both within the existing city limits and in areas yet to be annexed
- Requires the City to be more prescriptive, possibly requiring uses that would not match market demand (e.g. more people may desire low-density subdivision homes than this plan will accommodate)
- Is most focused on preservation and development of downtown Corvallis
- Requires consistent, committed policy and planning over the long-term
- Presumes greater funding than other alternatives, to support ongoing operations of expanded transit service.

11.50 Revised Transportation Improvement Plan

The revised transportation improvement plan presented below is the result of an effort to combine the most effective and realistic elements of all the alternatives into a well balanced plan for Corvallis' transportation system for the next 20 years. The most pressing capacity related needs are met with a combination of road construction, TSM measures, and trip reduction. Overall trip reduction is achieved by a commitment to strong, voluntary TDM measures and the concepts of the Transit/Land Use alternative. The plan does not, however, assume the same pace of land use change as envisioned in the Transit/Land Use alternative. Elements of the plan that overlap with County and State jurisdictions have been modified in some instances to maintain a high degree of coordination.

The infrastructure projects presented in section 11.50.10 are road and pathway improvements—changes to the physical transportation network. These are primarily projects described in Chapter 10. The main additions are the various TSM projects. Infrastructure projects include roadway improvement for automobiles as well as projects to provide safer, more direct bicycle and pedestrian connections. Projects not included in the revised plan are listed at the end of

the infrastructure section. The pedestrian and bicycle infrastructure improvements are an essential part of the overall Travel Demand Management strategy of the Revised Plan. Section 11.50.20 presents the TDM policy and support measures that complete the TDM strategy. The transit plan element is discussed in Section 11.50.30. Finally, Section 11.50.40 presents the Land Use policy needed to assure that this plan reaches its transportation goals.

11.50.10 Infrastructure Projects

Most of the infrastructure projects indicated below are described in Chapter 10. They are grouped somewhat differently here as capacity driven projects, TDM support projects (including fixed transit facilities), development associated projects, State projects, and TSM measures. These groupings are not hard and fast; many projects have a variety of positive impacts for various travel modes. Within each category, the priority groupings established in Chapter 10 have substantially guided selection of projects. The letter-number designators in parentheses in the bullet lists below indicate the Chapter 10 project designation where applicable. Table 11.1 presents the full list of projects. The project numbers in this table serve as a key to Figure 11.2 indicating the locations of projects. (Not included in the lists below, but still part of the revised transportation improvement plan, is project A9: miscellaneous airport improvements, $204,000.)

The **capacity driven** City projects in the plan are primarily intersection improvements. Much of the funding for these projects will come from System Development Charges (SDC) and to a lesser extent the City Street Fund. Projects A7, A8, A10, and A17 are included in the current CIP listing, as is the Highway 20-34/Technology Loop intersection traffic signal. The improvements to 53rd Street assume the lower-cost alternative—an at-grade gated railroad crossing and a signalized 53rd Street/Reservoir Road intersection relocated somewhat further north of the railroad. These projects are primarily warranted by automobile capacity and safety needs. The new signals will also provide significant improvements to safety for pedestrians and bicyclists. (Estimated costs are given in thousands of dollars.)

Project	**($ in 1,000s)**
• (CIP, A7) Highway 99W/Circle intersection improvements	$500
• (CIP, A8) Harrison Boulevard improvements, 29th to 36th[2]	$750
• (CIP, A10) Walnut Boulevard extension	$1,750
• (CIP, A17) Walnut/Witham Hill traffic signal	$152
• (CIP, not in Chp. 10)Hwy 20-34/Technology Loop traffic signal	$142
• (B4) 53rd Street improvements, Philomath Blvd. to Harrison	$3,000
• (B7) 9th/Grant traffic signal	$127
• (C3) Circle/9th intersection improvements	$280
• (C5) Hwy. 99W/9th/Conifer intersection improvement study	$25

[2] This is the capacity-related portion of the Harrison Corridor Strategy adopted by Council on May 19, 1998.

Many projects are needed to support a strong **TDM** program. Encouraging non-auto travel depends on the availability of safe and convenient alternatives. SDC charges cannot, as a rule, be used for these projects. Most will depend on state and federal grants with 20 to 50 percent matching funds coming from the City.

Project	**($ in 1,000s)**
• (A1) Kings Boulevard improvements, Monroe to Buchanan	$2,256
• (CIP, A2) Circle Boulevard path, Witham Hill to Harrison	$495
• (CIP, A3) Riverfront multi-use path widening	$200
• (A4) Downtown intermodal mall	$141[3]
• (A5) Transit bus stop facilities	$150
• (CIP, A11) Neighborhood traffic management	$250
• (CIP, A12) Bicycle parking improvements	$80
• (A13) 14th/15th St. bike lanes	$60
• (CIP, A14) Brooklane Drive improvements	$2,610
• (CIP, B1) 35th Street improvements, Philomath Blvd. to Orchard	$2,380
• (B2) 14th Street bike lanes	$1
• (B8) Grant bike lanes	$3
• (B9) Garfield bike lanes	$5
• (B11/12) Alexander, Park, or Goodnight bike lanes	$270
• (B13) Madison bike lanes	$5
• (B14) Downtown east/west bikeway	$5
• (C13) Circle-Conifer path	$950
• (C6) Crystal Lake-Willamette Park path	$950
• (C8) Marys/Willamette River path	$390

Many projects will be required and substantially funded by **development**. These projects will bring collector streets up to City standards, providing safer automobile operation as well as sidewalks and bikelanes. Based on development projects approved or under consideration in Spring, 1998, the first four projects in the list below are considered the most likely to be constructed in the near term (5-10 years). The additional projects are listed because any of these could be triggered over the next 20 years depending on where and when development actually occurs.

Project	**($ in 1,000s)**
• (A18) West Hills Road improvements, Western to 53rd	$1,900
• (B3) West Hills improvements, 53rd to Reservoir	$1,300
• (B5) Country Club Drive improvements	$2,900
• (B10) Crystal Lake improvements	$440
• (B6) Ponderosa improvements -- to city standards	$1,250
• (F1) 53rd Street improvements, Philomath Blvd. to Nash	$2,300
• (F2) Reservoir Road improvements	$2,240
• (F3) Airport Avenue-Rivergreen collector	$3,500
• (F4) Goodnight improvements	$250

[3] The scope and funding for this project is subject to change based on the availability of federal funds.

Projects on **State Highways** are the responsibility of ODOT working in coordination with local jurisdictions. Projects to be funded by the State are decided on a state-wide basis, but considerable weight is given to regional priorities. Corvallis' needs are primarily received by ODOT as part of the recommendations of the Cascades West Council of Governments. The projects listed here recognize the current CWCOG priorities, while expanding on some areas of particular importance to the adequate functioning of Corvallis' transportation system.

Project	**($ in 1,000s)**
• (S3) N. Highway 99W widening (RR overcrossing to Walnut)	$3,500
• (S2) Van Buren Bridge replacement	$5,000
• (FS4) Bypass/Highway 34 interchange	$2,000
• (S1,FS2) Philomath Blvd. widening, Highway 99W to Philomath	$13,600
• (FS1) U.S. 20 widening, Circle to Albany (modified in coordination with Benton County TSP as follows)	

The US 20 corridor between Corvallis and Albany remains a difficult issue. A refinement study is needed to propose section-by-section modifications. US 20 can be divided into the following sections (and probable cross section):

- Harrison to Water Works Avenue (3-lane)
- Water Works Avenue to Circle Boulevard (2-lane with left-turn pocket and acceleration lane)
- Circle Boulevard to Asbahr Lane (5-lane)
- Asbahr Lane to Scenic Drive (4-lane with left turn pockets)
- Scenic Drive to the Willamette River (4- and 5-lane with coordinated signals)

TSM measures are directed at both low-cost immediate capacity increases and longer term maintenance of facility operations. The following projects are newly added as part of the alternatives analysis and are not described in Chapter 10.

- Improve downtown signing to/from Harrison and Van Buren Boulevard bridges and Hwy 20.
- Increase arterial capacity through signal coordination (signal coordination increases the number of vehicle that will receive a green light at each signal, one after another. Signal coordination plans can be programmed to respond to changes in traffic over the course of the day, such as reversal of the major traffic flow from morning peak times to afternoon-evening peak hours)
  - -Walnut Boulevard (Witham Hill Drive to Highway 99W)
  - -Kings Boulevard (Walnut to Van Buren)
  - -Harrison (Kings to 29th)
  - -9th Street (Van Buren to Conifer)
  - -Circle Boulevard (Kings to Hwy 99W)
  - -Highway 99W (Conifer to Circle Boulevard)
  - -Highway 20/34 (53rd Street to 15th Street)
- Kings Boulevard (Grant to Circle) remove parking to add a two-way left-turn lane
- South 3rd Street Access Management

A South Corvallis Area study was completed in December, 1997. The plan recommends moving toward greater access control and service to pedestrians on South 3rd Street. South 3rd Street is State Highway 99W. ODOT standards and policies should govern the process of implementing access management strategies over time as adjacent properties are redeveloped, concurrent with major street modifications, or to mitigate identified safety or capacity deficiencies. In addition, ODOT policy should guide the timing of possible conversion of the current two-way left-turn lane into a non-traversable median with left-turn pockets. However, the City should seek to construct three or four pedestrian-refuge islands in the sections between signals. These should be placed and designed to minimize disruption to existing access while providing a high degree of safety for pedestrians and motorists alike. The South Corvallis Area study, when complete, will provide more specific direction and recommendations for South 3rd Street treatments.

- NW 9th Street Access Management

NW 9th Street is a City arterial in an area already well developed, but with some undeveloped areas and many sites that may be subject to redevelopment over the next 20 years. Based on direction from the Steering Committee, the City should establish an access management plan for NW 9th Street and adopt implementing ordinances. The ordinances should lead to driveway consolidation over time with redevelopment of adjoining properties. An appropriate standard would be a minimum 150-foot spacing between private driveways and between driveways and any public street except where a driveway can be made to line up with a public street across 9th Street. Conditional driveway permits should recognize the eventual possibility of medial access control, limiting all or most non-public intersections to right-in/right-out movements. The progress of driveway consolidation, operating level of service, and accident history should be monitored to determine if a full non-traversable median is warranted.

In addition, to meet the need for safer pedestrian and bicycle access to businesses along NW 9th Street, four or five pedestrian refuge islands should be constructed between signals along 9th Street between Buchanan Avenue and Walnut Boulevard. These should be placed and designed to minimize disruption to existing access while providing a high degree of safety for pedestrians and motorists alike.

- Harrison Corridor Plan

Increasing traffic on Harrison Bouevard between 29th Street and 53rd Street/Walnut Boulevard has caused quantitative and qualitative impacts to those who travel through and live in the area. These impacts primarily effect people on Harrison Boulevard and in the areas that extend north and south of Harrison Boulevard approximately five blocks. To address these impacts, the City Council initiated the Harrison Corridor Study in February 1996. A Task Force appointed by the Mayor worked in cooperation with the Community Development and Public Works Departments to develop a detailed Harrison Corridor Plan. After public meetings within the corridor, followed by meetings with the Bicycle and Pedestrian Advisory Commission, and Cititens Advisory Commission on Transit, the Urban Services Committee, and City Council, the Council adopted the plan on May 19, 1997. Only part of the funding has been identified for the plan, which identifies capacity-related modifications on Harrison Boulevard between 29th and 36th Streets, and traffic calming and related modifications for specific locations within the study area. Funding for the latter modifications has

not been identified. The plan will need to be intigrated into the Capital Improvement Program as warrant studies and neighborhood concerns indicate consideration is important.

Projects not included in the Revised Plan were left off primarily to keep financial costs within a reasonable range based on expected funding sources. In addition, project A19, 3rd/4th Downtown Bikelanes, was judged to have too great a negative impact if not coupled to a comprehensive downtown parking program. The connection of the riverfront path to the Van Buren bridge was considered redundant; it will be part of the bridge replacement, which is a State priority project. The extension of the Circle Boulevard multi-use path beyond Harrison Boulevard to connect through to Campus Way would provide a valuable link in the bicycle/pedestrian system, but it would be entirely on Oregon State University land—further negotiations with OSU will be needed before it could be included in the plan.

Project selection within financial constraints was based on:

- The priority level given in Chapter 10
- Continuity of modifications—did a given modification form a link in a larger set of modifications
- Absolute cost—many relatively low-cost projects, such as restriping for bike lanes, were easier to include than single very costly projects
- Projected funding sources—not all funding sources can be applied to all projects; a first pass attempt to assign realistic funding sources helped shape the final project list.

Funding estimates are just that: estimates. All of the projects identified in Chapter 10.0 Transportation Improvement Plan but not included in this refinement are considered desireable. If additional funding is available, these projects would be appropriate additions to Corvallis' transportation system.

The City Projects found in Chapter 10, but not included, were:

Project	**($ in 1,000s)**
• (C2) Buchanan/9th intersection modifications	$300
• (C4) Bike/ped railroad crossings	$530
• (C9) Witham Hill Dr. -- widen for bikelanes	$580
• (C10) Goodnight-Avery path	$450
• (C11) North riverfront path extension	$400
• (A15) 26th/Philomath Blvd bike crossing	$1,000
• (A16) Circle Blvd path extension -- Harrison to Campus Way	$495
• (C7) Porter Park path $250	
• (C1) Riverfront multi-use path to the Van Buren bridge	$187
• (A19) 3rd/4th downtown bike lanes	$1
• (A6) S 3rd/Adams traffic signal (already completed)	$136

In addition, the revised plan does not anticipate the building of the north Hwy 20/34 bypass in the next 20 years, nor are the modifications to Hwy 20 to Albany as extensive.

11.50.20 Transportation Demand Management

Transportation demand management will reduce overall automobile trip production in Corvallis through a combination of City efforts and voluntary employer-based TDM measures. The revised transportation improvement plan TDM strategy calls for the substantial additions to the pedestrian and bicycle facilities as listed above. In addition, it calls on the City to provide support staff for education, promotion, and coordination of TDM measures. Employers are encouraged to voluntarily create or improve TDM programs. The revised plan calls for policies requiring new commercial, industrial, and institutional construction to meet some standards for TDM support.

The report "City of Corvallis TDM Planning Background Study of TDM Strategies, Costs, and Potential Effectiveness"(Parametrix, April 1995) provides information on 23 individual TDM strategies: a basic definition, experience to date, effectiveness, costs, and implementation issues. Effective application of these strategies requires support structures and services and also the creation of an expectation that single occupancy automobile trip making must be reduced. Both the City and employers have important roles in both these aspects.

This plan envisions the City providing TDM education, monitoring, and expanded support for alternate travel modes. The City will strongly encourage employers to undertake new or expand existing workplace TDM programs. City mandates requiring employer based programs were considered, but rejected. City policy will require some alternative mode accessibility standards as conditions for building permits by new employers and for significant expansion or change of an employment center.

The following actions may be appropriate for the **City** in support of an aggressive, voluntary TDM program for all citizens, businesses, and institutions.

- Continue to develop excellent bicycle, pedestrian, and transit facilities and services
- Education targeted at the general public, employers/employees, schools/parents
- Set goals for workplace trip reductions and seek employer/employee cooperation in assessing success in meeting those goals
- Partner with businesses to compile employee surveys and suggest strategies
- Offer support materials and services tailored to employer/ee needs, e.g. administer a guaranteed ride home program.
- Offer incentives: fee waivers, civic recognition, variances.
- Offer disincentives: additional fees, additional requirements for those not meeting TDM goals.
- Reduced parking maximums and minimums

Many specific actions can be taken by **businesses and institutions** to reduce single occupant vehicle trips. These include:

- Monetary incentives (transportation allowances, transit pass subsidies, rideshare subsidies.)
- Alternative work schedules (flexible work hours, compressed work week)
- Secure, covered bicycle parking

- Street connections for bicyclists and pedestrians
- Lockers and showers
- Guaranteed ride home
- Carpool matching programs
- Preferential carpool parking
- Vanpools
- On-site services (e.g. ATM, childcare, cafeteria or restaurant, exercise facilities, dry cleaner)
- Telecommuting

All of these are proposed as voluntary measures. In addition, employers will be encouraged to work with the City to survey current employee transportation options and preferences, to set goals for reducing peak hour single occupant vehicle trips, and to monitor the effectiveness of TDM measures undertaken.

The decision not to recommend mandatory employer programs was based on evaluation of both the gains and costs of mandatory programs when compared to voluntary programs. Some employers in Corvallis are already providing some or all of the above mentioned TDM incentives on a voluntary basis. They have found that TDM measures make sound business sense in their situations. Requiring TDM measures from all employers above a certain size is an option worthy of consideration, but many of the potentially most useful TDM strategies depend on actions beyond the control of the individual employers. High quality transit service, and safe, convenient pedestrian and bicycle routes are essential to the success of TDM programs. The results of the Parametrix study, combined with the Alternatives Analysis modeling, indicate that most of the gains that would be achieved with mandatory employer-based TDM can be reached with the aggressive TDM supportive measures of this Revised Transportation Improvements Plan. Mandatory TDM programs would reduce annual vehicle miles traveled less than one percent over the reductions from the voluntary program presented here. The marginal increases in TDM effectiveness gained by mandatory programs would be bought at substantial cost in administration and the political capital necessary to impose further government regulation.

11.50.30 Transit

The Corvallis Transit Master Plan presents the refined transit element of the Corvallis Transportation Plan. It proposes an increase in transit service beyond just maintaining the current per-capita level as Corvallis continues to grow. Corvallis currently provides substantially less transit service than many cities of similar size and character. In addition, research indicates that transit demand increases faster than population in growing urban areas. The transportation system improvements plan presented here follows the lines of Transit Master Plan “High Scenario” but anticipates a somewhat slower pace of land use change and transit increases. The “high scenario” presented in the Transit Master Plan calls for 14 buses providing service every 15 minutes on radial corridors connecting Corvallis downtown with anchor nodes of mixed use development. It represents significant changes to land-use, concentrating much of Corvallis’ increase in employment and housing downtown, at the nodes, and along the corridors. More traditional, much lower density, subdivisions are less well served, or not served at all, by transit. The transit system assumed in this chapter will only reach a fleet of 12 buses over the next 20 years and will be serving a less well defined system of corridors.

In any transit plan, tradeoffs are required among number of buses, geographical coverage, and headways (how frequently buses run on a given route). Experience teaches that cutting headways in half from 30 minutes to 15 minutes more than doubles ridership. Concentrating service in a few corridors allows closer headways without as many buses. Maintaining full geographic coverage for large areas of low-density subdivisions requires either more buses or less frequent service. Adding more buses is clearly desirable from a service perspective, but bus fleets are expensive. The capital cost for a bus is approximately $250,000; expected service life is 12 years. The operating and maintenance costs are approximately $130,000 per year per bus. Total twenty-year costs for the transit system as modeled are $3.0 million in capital costs and $22.6 million operating and maintenance. **It is a fundamental premise of the Transit Master Planning effort that significantly increased funding for transit in Corvallis can and will be found.**

The analysis of alternatives considered the full land use and transit changes envisioned in the "high transit" scenario. In modeling the need for and effectiveness of the various elements of the Revised Transportation Improvements Plan, a somewhat more conservative approach was taken. The nominal case assumes that land use patterns will be moving in the direction envisioned, but at a slower pace. The Transit Master Plan assumes five well developed radial corridors as well as greater residential and employment densities downtown. The revised transportation improvement plan assumes the same structure as a goal, but accepts that not all of the five corridors will be as well developed, and more areas may have developed at lower densities on the fringes of the urban area. This will reduce the effectiveness of the bus fleet (through some combination of fewer people having nearby bus routes and/or decreased frequency of bus service). In addition, the bus fleet assumed only increases to a total of 12 buses, gradually added over the next 20 years. These assumptions represent a middle ground, between the "low" and "high" scenarios in the Transit Master Plan. A sensitivity analysis of the impact of these assumptions suggests that the measures of transportation system effectiveness do improve with increased transit service along denser corridors, and that matching the transit service level to the level of land use changes provides best results. The Revised Transportation Improvements Plan, therefore, accepts somewhat less effective transportation as the trade-off for lower social and political costs than would be required with the high scenario. It recommends a steady growth in the bus fleet, matched to development of denser corridors, downtown, and nodes. With 12 buses, and allowing for the need for limited service to some less favorably located development, the transit service will provide 15 minute headways to the two or three most developed corridors and less frequent service to other developing corridors. It is recognized that corridor-based routing may pose problems for some to take advantage of transit service. To address these issues, service routes designed to fill such gaps should be evaluated and implemented as appropriate**.**

The Benton County Transportation System Plan is currently in process. It recognizes the need for inter-city connections and sattelite park-and-ride lots. The Cascades West Council of Governments has also called for study of inter-city transit routes across the valley. Corvallis needs to be an active player in planning for and supporting such inter-city links. Current State plans for higher-speed rail service in the valley will not directly serve Corvallis, but will stop in Albany. A coordinated-schedule shuttle to and from Corvallis should be considered as part of the rail service.

11.50.40 Land Use

Land use patterns that support the vision of Corvallis as a compact, less auto-dependent city are an essential component of the Revised Transportation Improvement Plan. The Transit Master Plan indicates strategies and goals for guiding future development in a way that will support efficient transit use. The same strategies and goals also support pedestrian and bicycle use. An analysis of the sensitivity of the model to a variety of assumptions indicated that changes to land use patterns have the greatest overall influence on vehicle miles traveled.

Land use policies needed as part of the revised plan include:

- maintaining the Urban Growth Boundary
- encouraging future transit-dependent development—including dense housing, secondary schools, retail, medical facilities, and government facilities serving the public—to locate along the corridors identified in the Transit Master Plan
- providing increased transit service in coordination with increasing development along the corridors
- requiring pedestrian/transit oriented commercial and institutional development (e.g. buildings close to sidewalk with auto parking in back).

11.60 Conclusion - Plan Effectiveness

The revised transportation improvement plan will guide Corvallis toward a more balanced and efficient transportation system over the next 20 years. The plan combines element of the various alternatives to provide better overall performance than any individual alternative strategy. The reduction in VHT over the "no-build" baseline is 19 percent, better than any of the individual alternatives. The reduction to VMT over the "no-build" is 6.9 percent, also better than the TDM alternative level, though not as great as the level of the full Transit/Land Use alternative. These two measures again show the lessons of the alternatives analysis. Both capacity improvement and trip reduction measures can reduce VHT. Taken together, even at levels lower than in the pure strategies, they produce greater reductions in VHT than are possible separately. VMT depends most directly on reductions to the number of trips and their length. Combining strong TDM measures with increased Transit and moderate Land Use changes provides excellent VMT reduction in a framework of reasonable impacts.

Some roadway sections will still experience moderate peak hour congestion over the next 20 years. These are largely on State facilities, though parts of Monroe Avenue near campus and Kings Boulevard in the area of Buchanan may also continue to present problems. The plan recognizes that, even if it were entirely desirable to Corvallis, sufficient funds will likely not exist at the State level to solve all problems by roadway construction.

The Revised Transportation Improvements Plan is based in the values expressed through extensive public input. It emphasizes a commitment to reducing automobile dependence. It does so at levels of economic and social cost acceptable to the community. Much of the strength of the Transit/Land Use and TDM alternatives is maintained, while the social impacts are moderated. Continuing efficient use of automobiles is provided for, while minimizing road construction and widening

projects. The moderate, mixed-strategy plan presented will tend toward moderate impacts. Suburbanization will continue, but at substantially lower levels than with any alternative other than aggressive Transit/Land Use. Neighborhoods will change similarly, with more infill and mixed-use on transit corridors, but at a slower pace than envisioned in the full Transit/Land Use alternative. The plan moves Corvallis toward a greater range of realistic transportation choices, while not placing all the burden on those who choose to, or must, use automobiles.