BEFORE THE METRO COUNCIL
AND THE
C-TRAN BOARD OF DIRECTORS

FOR THE PURPOSE OF DETERMINING THE SOUTH/NORTH LIGHT RAIL TRANSIT ALTERNATIVES TO ADVANCE INTO THE TIER II DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR FURTHER STUDY	)))))))	METRO RESOLUTION NO. 94-1989 C-TRAN RESOLUTION NO. BR-94-011 Introduced by The Planning Committee

WHEREAS, In April 1993 Metro Council and the C-TRAN Board of Directors selected the Milwaukie and I-5 North Corridors as the region's next high-capacity transit priority for study and combined them into the South/North Transit Corridor to be studied within a federal Alternatives Analysis/Draft Environmental Impact Statement; and

WHEREAS, In October 1993 the Federal Transit Administration approved the South/North application to initiate Alternative Analysis/Draft Environmental Impact Statement and the South/North Preliminary Work Plan, and issued notification of intent in the *Federal Register* to publish a South/North Environmental Impact Statement; and

WHEREAS, In December 1993 the South/North Steering Group concluded the federally prescribed Scoping Process, which included a comparative analysis of various high-capacity transit mode alternatives, by selecting the light rail transit mode and various light rail terminus and alignment alternatives to advance into Tier I for further study; and

WHEREAS, The South/North *Evaluation Methodology Report*, as adopted by the South/North Steering Group in December 1993, prescribes the South/North study organization and process for the conclusion of the Tier I study process and the selection of

the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, The role of the South/North Steering Group in the Tier I study process is to forward its final Tier I recommendation to participating jurisdictions for their consideration, that participating jurisdictions are to forward their recommendations to the C-TRAN Board of Directors and the Metro Council who are to make the final determination of the alternatives to advance into the Tier II Draft Environmental Impact Statement for further study; and

WHEREAS, The *Evaluation Methodology Report* further prescribes the criteria and measures to be used to select the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, The alternatives that were selected at the conclusion of Scoping have been developed and evaluated based on the criteria and measures from the *Evaluation Methodology Report* and documented within various technical memoranda, including the *South/North Tier I Technical Summary Report* and the *South/North Tier I Briefing Document*; and

WHEREAS, The technical methodologies, assumptions and results have been reviewed by the South/North Expert Review Panel which found, in summary, that "...the data developed is sufficient to make the decisions regarding which alternatives should be carried forward for further study;" and

WHEREAS, A comprehensive public involvement program was developed and implemented by the South/North Study that included, but was not limited to, numerous community meetings, a 60-day public comment period on the Tier I alternatives and data,

public meetings for the Steering Group to receive oral comment, and an ongoing Citizens Advisory Committee that received staff reports and presentations, provided regular public comment opportunities, and in September 1994 formed an independent Tier I recommendation that was forwarded to the Steering Group for its consideration; and

WHEREAS, In October 1994 the Steering Group considered the Citizens Advisory Committee and Project Management Group recommendations, public comment and the Tier I criteria and measures and issued its own unanimous Tier I recommendation to the participating jurisdictions, C-TRAN Board of Directors and Metro Council for their consideration; and

WHEREAS, The Steering Group's Final Tier I Recommendation identifies the LRT alternatives, described in Exhibit A, that they concluded best meet the project's goal and objectives as adopted in December 1993 by the South/North Steering Group within the *Evaluation Methodology Report*; and

WHEREAS, Clark, Clackamas and Multnomah Counties; the cities of Portland, Milwaukie, Oregon City, Gladstone and Vancouver; and the Tri-County Metropolitan Transit District have adopted recommendations for the South/North alternatives to advance into the Tier II Draft Environmental Impact Statement for further study; now therefore,

BE IT RESOLVED, That the following general approach be adopted for the continuation of the South/North Transit Corridor Study:

1. The South/North Corridor will be conducted in two study phases:

    a. Phase I will consider a light rail transit project between the Clackamas Town Center area and the 99th Street area in Clark County.

b. Phase II will consider an extension of the Phase I light rail transit project south to Oregon City and north to the 134th Street/Washington State University branch campus area.

2. These study phases will proceed as follows:

a. Preparation of the Draft Environmental Impact Statement and funding plan for the Phase I light rail transit alternative will begin immediately.

b. If light rail transit is selected as the Locally Preferred Alternative in Phase I, a Draft Environmental Impact Statement and funding strategy for the Phase II LRT extension will be prepared upon completion of the Final Environmental Impact Statement for Phase I.

3. The following alignments are the alternatives for further study within the Phase I South/North Draft Environmental Impact Statement:

a. Between the Portland and Milwaukie central business districts, the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate streets in the south, and the McLoughlin Boulevard alignment shall be developed for further study within the Draft Environmental Impact Statement. The Caruthers area crossing will be evaluated further in order for the Metro Council and the C-TRAN Board of Directors to determine whether it should also be included in the *South/North Detailed Definition of Alternatives Report* and developed further in the Draft Environmental Impact Statement. Both the Ross Island and Caruthers alternatives will be provided equal consideration through this further evaluation.

b. Within the Portland central business district, a surface light rail transit alternative on 5th and 6th Avenues shall be developed based upon several principles, for further study within the Draft Environmental Impact Statement. If at the time the Draft Environmental Impact Statement is initiated it is concluded that a 5th/6th Avenue alignment cannot be developed that addresses those principles, other alternatives will be developed for further study in the DEIS.

c. Between the Vancouver central business district and the vicinity of 99th Street, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 shall be developed for further study within the Draft Environmental Impact Statement.

4. Because further discussions and analysis should occur, the selection by the Metro Council and the C-TRAN Board of Directors of an alternative for further study within the segment between the Portland and Vancouver central business districts shall wait completion of additional technical work and evaluation.

5. The following alignments will be considered for the Phase II extensions:

a. Following completion of the *Detailed Definition of Alternatives Report*, an analysis of the I-205 alignment from the CTC terminus and the McLoughlin alignment from the Milwaukie CBD will be made to determine which alignment will advance into the Phase II DEIS. The Portland Traction Company (PTC) right-of-way will not be considered as a Phase II alignment.

b. Between the vicinity of 99th Street and the area of 134th Street/WSU Branch

Campus, the I-5 East alignment will advance into the Phase II DEIS.

And further,

BE IT RESOLVED, that Exhibit A is adopted as the *South/North Transit Corridor Tier I Final Report* that identifies in more detail the alternatives and study approach to be utilized in Tier II and the preparation of the Draft Environmental Impact Statement for the South/North Transit Corridor.

ADOPTED by the Metro Council on this 22nd day of December, 1994.

Judy Wyers

Judy Wyers, Presiding Officer
Metro Council

ADOPTED by the C-TRAN Board of Directors on this 13th day of December, 1994.

Rose F. Besserman

Rose Besserman, Chair
C-TRAN Board of Directors

LS:lmk
12-8-94
94-1989.RES

PLANNING COMMITTEE REPORT

CONSIDERATION OF RESOLUTION NO. 94-1989, FOR THE PURPOSE OF DETERMINING THE SOUTH/NORTH LIGHT RAIL TRANSIT ALTERNATIVES TO ADVANCE INTO THE TIER II DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR FURTHER STUDY

Date: December 19, 1994 Presented by: Councilor Monroe

Committee Recommendation: At the December 15 meeting, the Committee voted 5-0 to recommend Council adoption of Resolution No. 94-1989. Voting in favor: Councilors Devlin, Gates, McLain, Monroe, and Moore. Councilors Gardner, Kvistad and Washington were absent.

Committee Issues/Discussion: The staff report was presented by Andy Cotugno, Planning Director, and Leon Skiles, Transportation Planning Manager. Skiles explained that the purpose of the resolution was to adopt those route and terminus alternatives for the South/North Light Rail that will be forwarded for further study within the Tier II draft environmental impact statement (DEIS) for the proposed line. He noted that the committee had already been briefed twice on the resolution and the staff report and documents related to the Tier I alternative selection process.

Skiles noted that the principal remaining outstanding issue had been the resolution and staff report language related to the inclusion of the Caruthers Bridge crossing in the DEIS process. Proponent of this crossing had argued that the language would make it far more difficult for this crossing to be included in the DEIS process. Skiles noted that JPACT adopted an amendment to this resolution which provides that "Both the Ross Island and Caruthers alternatives will be provided equal consideration through this further evaluation." The draft Tier I Final Report also was amended to define the nature of the further study of the Caruthers crossing.

Councilor Monroe and Skiles both commented that the intent of these changes was to insure that there would be no special requirements or obstacles to including the Caruthers crossing in the DEIS process and that it would only have to meet the same conditions that were applied to the Ross Island crossing alternative.

Skiles also noted that the issue of future regional light rail priorities had been discussed at JPACT. Some had expressed concern that language should be added to the Tier I report and the resolution to clarify that extensions to the south/north line will not be given priority over other future lines or line extensions. Such language was not added, but JPACT did create a record to indicate that it was not the intent of the report or the resolution to address the issue of the priority of any future line or extension.

Public testimony focused on the Willamette crossing issue and the use of a surface or subway route in the downtown area. Bing Sheldon, representing property owners supporting the Ross Island crossing offered written data and arguments in favor of this crossing. His arguments in support included: 1) the potential amount and nature of future development near the western end of the Ross Island crossing, 2) housing development in the area in support of regional urban growth management goals which would be facilitated by access to light rail, and 3) the leveraging of private investment capital that would be aided by a light rail line. Sheldon supported the adoption of the resolution.

Jay Zidell, a major property owner near the west end of the proposed Ross Island crossing, contended that the crossing would provide the greatest ridership, support urban growth goals and promote further development in the north Macadam area. He expressed concern that the crossing decision should not pit eastside and westside interests against each other.

Roger New, representing Schnitzer Investment Corporation, spoke in favor of the Ross Island crossing. He noted that property owners in the North Macadam have already initiated efforts to develop the area and that these efforts would be enhanced by light rail. He contended that environmental concerns about a Ross Island crossing are being addressed.

Gina and Daniel Maloney testifed on behalf of the Corbett-Terwilliger-Lair Hill Neighborhood Association. They explained that, while they personally supported a Sellwood crossing, the association had adopted a resolution in support of the Ross Island crossing. The resolution also noted that environmental issues related to such a crossing must be identified and addressed. Kerry Chipman, Corbett-Terwilliger-Lair Hill Neighborhood Association, reviewed the history of the association's consideration of the crossing issue and questioned the validity of the process under which the resolution noted above had been adopted. He noted that the issue would be before the association again at its January meeting.

Jim Howe, Association of Oregon Transit Advocates (AORTA), and Stan Lewis, Downtown Community Association, expressed the need for continued study of a subway option for the downtown portion of the line. They questioned cost assumptions concerning a subway and argued that a surface route would be very disruptive to the existing transit mall and downtown businesses. Howe also argued in favor of a southern terminus in Oregon City instead of at Clackamas Town Center. He contended that ridership from an Oregon City line would be four times greater than on a Clackamas Town Center line.

All of those testifying supported adoption of the resolution.

STAFF REPORT

CONSIDERATION OF JOINT METRO RESOLUTION NO. 94-1989 AND C-TRAN RESOLUTION NO. 94-010 FOR THE PURPOSE OF DETERMINING THE SOUTH/NORTH LIGHT RAIL TRANSIT ALTERNATIVES TO ADVANCE INTO THE TIER II DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR FURTHER STUDY

Date: November 17, 1994 Presented by: Andrew Cotugno

PROPOSED ACTION

This resolution adopts the South/North Transit Corridor light rail transit (LRT) terminus and alignment alternatives that will advance into the Tier II Draft Environmental Impact Statement (DEIS) for further study.

FACTUAL BACKGROUND AND ANALYSIS

In April 1993, the Metro Council and C-TRAN Board of Directors adopted Resolutions No. 93-1784 and No. BR-93-004, respectively, that established the South/North Transit Corridor as the region's high-capacity transit (HCT) Priority Corridor to advance into Alternatives Analysis (AA) and the preparation of a DEIS. In June 1993, Metro submitted an application to the Federal Transit Administration (FTA) to advance the South/North Corridor into AA/DEIS and submitted the *South/North Preliminary Work Plan* for approval. FTA approved the application and *Preliminary Work Plan* in October 1993 and issued notification in the *Federal Register* (October 12, 1994) of its intent to publish an Environmental Impact Statement for HCT improvements within the South/North Corridor.

The *Preliminary Work Plan* established a two-tiered structure for the South/North Transit Corridor Study as follows:

- Tier I has focused on evaluating modal alternatives, alignment alternatives, design options and terminus alternatives in order to narrow the number of alternatives to be addressed in the DEIS.

- Tier II will focus on preparing a DEIS on the narrowed set of LRT alternatives and a No-Build alternative. Tier II will conclude with the selection of the *Locally Preferred Alternative.*

Tier I started in mid-1993 with the initiation of the federally-mandated Scoping Process. Based on the analysis of busways, river transit, commuter rail and light rail transit and pu input provided during Scoping, the high-capacity transit alternatives were narrowed to light

rail transit by the South/North Steering Group on December 17, 1993. Further, through Scoping, the Steering Group (as adopted on December 17, 1993 and as amended by the Steering Group in May 1994) identified:

- Four south (Clackamas County) and five north (Clark County) *Terminus Alternatives* for the LRT.

- Two or more *Alignment Alternatives* for each of five defined segments of the LRT alignment.

- Detailed *Design Options* for several of the LRT alignment alternatives.

On December 17, 1993, the South/North Steering Group also adopted the *Tier I Evaluation Methodology Report* that established the following for the South/North Transit Corridor Study:

- The goal and objectives;

- The organizational structure; and

- The criteria and measures to be used to evaluate the Tier I terminus and alignment alternatives.

After *Scoping*, staff prepared technical analyses of the terminus and alignment alternatives addressing the established criteria and measures. These analyses are documented in the *Tier I Technical Summary Report* and the *Tier I Briefing Document* (Attachment A).

The technical data, methods and assumptions for the Tier I analysis were reviewed by the South/North Expert Review Panel in July 1994. The Panel issued a letter documenting their review and comments on the technical data, methods and assumptions. In summary, the Panel wrote that, "It is the role of the Expert Panel to help assure [oversight agencies] that the assumptions, methodologies and data on which the key project decisions will be based are accurate and form a sound basis for decision-making. We believe this to be the case in this project....The Panel finds that the data developed is sufficient to make the decisions regarding which alternatives should be carried forward for further study. Overall, the project staff continue to provide top-quality, in-depth analysis of the alternatives and associated issues" (August 8, 1994).

In addition, an extensive public involvement process on the data prepared on the terminus and alignment alternatives was conducted. The public process was initiated immediately following Scoping, with a wide variety of meetings and presentations held with neighborhood organizations, businesses, various interest groups and interested citizens throughout the Corridor. These initial meetings and presentations identified the Tier I study process, the

alternatives being considered and the data or measures that would be prepared to compare and evaluate the alternatives. It also provided the public with the opportunity to voice their concerns and preferences.

In July 1994, Metro initiated a 60-day public comment period on the Tier I alternatives and data. The comment period started with four open houses held throughout the Corridor where the Tier I data was presented and the public had the opportunity to discuss the data with staff from Metro, C-TRAN and other participating jurisdictions. *Tech Facts*, a summary of the Tier I data, was distributed at the open houses and was mailed out upon request throughout the public comment period. In early September 1994, the Steering Group held four meetings to receive oral public comment on the Tier I alternatives and data where citizens were encouraged to state their preferences on the alternatives that should be selected to advance into the Tier II DEIS for further study. The public comment period ended on September 13, 1994. All written comments and a summary of the oral comments received at the public meetings are documented within the *Narrowing the Options: A Summary of Tier I Public Meetings and Comments* (September 13, 1994).

As noted above, the *Evaluation Methodology Report* established the South/North Tier I organizational structure illustrated in Appendix C of the attached *Briefing Document*. The Project Management Group (PMG) prepared a draft recommendation for terminus alternatives on August 25, 1994 and adopted its final recommendation for terminus and alignment alternatives on September 14, 1994, following the conclusion of the public comment period. The South/North Citizens Advisory Committee (CAC) adopted its recommendation on September 29, 1994. Both the PMG and CAC recommendations were forwarded to the South/North Steering Group which unanimously adopted its recommendation on October 6, 1994.

The Steering Group recommendation has been forwarded to and considered by the Study's participating jurisdictions and agencies which have each adopted resolutions recommending the terminus and alignment alternatives to advance into the Tier II DEIS for further study. Those jurisdictions and agencies that have passed recommending resolutions are: Oregon City, the City of Gladstone, the City of Milwaukie, Clackamas County, Multnomah County, the City of Portland, the City of Vancouver, Clark County and Tri-Met. Those resolutions are included in Attachment B.

The *Evaluation Methodology Report* establishes Metro Council and the C-TRAN Board of Directors with the role of making the final determination of the terminus and alignment alternatives to advance into the Tier II DEIS for further study. The Metro Council resolution is to be considered by the Transportation Policy Alternatives Committee, the Joint Policy Advisory Committee on Transportation and the Metro Planning Committee prior to consideration by the Metro Council. The Southwest Washington Regional Transportation Council and the Joint Regional Policy Committee are to consider the resolution prior to its consideration by the C-TRAN Board of Directors.

Consistent with the Steering Group's final recommendation, the resolution would adopt the *Tier I Final Report* (Exhibit A) that identifies in detail the alternatives and study approach to be utilized in Tier II and the preparation of the South/North DEIS. The general approach that the resolution would adopt is as follows:

1. The South/North Corridor will be conducted in two study phases:

    a. Phase I will consider a light rail transit project between the Clackamas Town Center area and the 99th Street area in Clark County.

    b. Phase II will consider an extension of the Phase I light rail transit project south to Oregon City and north to the 134th Street/Washington State University branch campus area.

2. These study phases will proceed as follows:

    a. Preparation of the Draft Environmental Impact Statement and funding plan for the Phase I light rail transit alternative will begin immediately.

    b. If light rail transit is selected as the Locally Preferred Alternative in Phase I, a Draft Environmental Impact Statement and funding strategy for the Phase II LRT extension will be prepared upon completion of the Final Environmental Impact Statement for Phase I.

3. The following alignments are the alternatives for further study within the South/North Draft Environmental Impact Statement:

    a. Between the Portland and Milwaukie central business districts, the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate Streets in the south, and the McLoughlin Boulevard alignment shall be developed for further study within the draft environmental impact statement. The Caruthers area crossing will be evaluated further in order for the Metro Council and C-TRAN Board of Directors to determine whether it should also be included in the *South/North Detailed Definition of Alternatives Report* and developed further in the Draft Environmental Impact Statement.

    b. Within the Portland central business district, a surface light rail transit alternative on 5th and 6th Avenues shall be developed, based upon several principles, for further study within the Draft Environmental Impact Statement. If at the time the DEIS is initiated it is concluded that a 5th/6th Avenue Surface Alignment cannot be developed that addresses those principles, other alternatives will be developed for further study within the DEIS.

c. Between the Vancouver central business district and the vicinity of 99th Street, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 shall be developed for further study within the Draft Environmental Impact Statement.

4. Because further discussions and analysis should occur, the selection by the Metro Council and the C-TRAN Board of Directors of an alternative for further study within the segment between the Portland and Vancouver central business districts shall wait completion of additional technical work and evaluation.

5. The following alignments will be considered for the Phase II extensions:

   a. Following completion of the *Detailed Definition of Alternatives Report*, an analysis of the I-205 alignment from the CTC terminus and the McLoughlin alignment from the Milwaukie CBD will be made to determine which alignment will advance into the Phase II DEIS. The Portland Traction (PTC) right-of-way will not be considered as a Phase II alignment.

   b. Between the vicinity of 99th Street and the area of 134th Street/WSU Branch Campus, the I-5 East alignment will advance into the Phase II DEIS.

The *South/North Tier I Briefing Document* (Attachment A) summarizes the criteria and measures and compares the advantages and disadvantages of each of the alternatives within each segment. Following is a summary of the Steering Group's rationale in issuing its *Tier I Final Recommendation Report*:

Two-Phased Implementation

- Ultimately, a South/North LRT line which serves Oregon City, Clackamas Town Center and the 134th Street/WSU area in Clark County would maximize the benefits of the LRT alternative.

- The amount of capital funds potentially available at this time are insufficient to construct a light rail line serving Oregon City, Clackamas Town Center, Milwaukie, Portland, Vancouver and 134th Street/WSU area.

- The phased approach maximizes the likelihood of realizing a South/North LRT project which would ultimately serve the proposed termini.

Phase I Termini

A Clackamas Town Center area to 99th Street area LRT Alternative best meets the Tier I evaluation criteria within the financial threshold as described below.

- An LRT line with termini in the vicinity of the Milwaukie CBD and 39th Street in Vancouver would barely penetrate into Clackamas or Clark Counties, providing insufficient coverage to accomplish land use or transportation objectives.

- The Clackamas Town Center area terminus alternative exhibits lower costs, greater cost-effectiveness and greater consistency with existing regional policy than the Oregon City terminus alternatives.

- The 99th Street area north terminus alternative is consistent with Growth Management Plan objectives and exhibits lower costs and greater cost-effectiveness than the 134th Street/WSU area, 179th Street and Vancouver Mall terminus alternatives.

Portland CBD to Milwaukie CBD Segment and the South Willamette River Crossing Alignment Alternative Recommendation

- The Hawthorne Bridge River Crossing alternative would exhibit substantial reliability and operations problems caused by numerous bridge openings and would not allow direct LRT access to Portland State University and South Downtown Portland.

- The Sellwood Bridge alternative would generally exhibit lower ridership, longer trip times, higher operating costs and a higher cost-effectiveness ratio and would not provide direct LRT access to several Southeast Portland neighborhoods and bus routes.

- While the Ross Island Bridge River Crossing alternative generally exhibits the same costs and transportation benefits as the Caruthers Bridge alternative, the Project Management Group's and Steering Group's recommendations to advance the Ross Island Bridge alternative into Tier II were based upon their judgment that a Ross Island crossing exhibits superior land use and development benefits.

- The Citizens Advisory Committee recommended that the Caruthers Bridge alternative be advanced into the DEIS for further study.

- There is a desire to try to serve both the North Macadam area and the Southeast Portland area with LRT, expressed both by the PMG and more strongly by the Citizens Advisory Committee.

- The McLoughlin Boulevard Alignment alternative exhibits less cost, greater ridership, higher cost-effectiveness and less environmental impact than the Portland Traction (PTC) alternative.

Portland CBD Alignment Alternative

- The 5th/6th Avenue Surface Alignment alternative is most consistent with the Downtown Plan.

- The 5th/6th Avenue Surface Alignment alternative exhibits lower capital costs and operating costs than the Subway alternative.

- Despite its lower ridership, the 5th/6th Avenue Surface Alignment alternative is more cost-effective than the Subway alternative.

Portland CBD to Vancouver CBD Alignment Alternative

The Metro Council and C-TRAN Board of Directors have yet to determine the alignment alternative(s) in this segment to advance into the DEIS for further study for the following reasons:

- While the Interstate Avenue Alignment alternative costs more than the I-5 alternative, further analysis is needed to determine if there are land use and development benefits of the Interstate alignment that outweigh its additional cost.

- Further analysis is needed to identify and evaluate modified alternatives which merge the I-5 alignment with portions of the Interstate alignment.

- Further public input is needed to determine community preferences.

Vancouver CBD to 134th/WSU Area Alignment Alternative

- The I-5 East Alignment alternative is consistent with Growth Management Plans, exhibits less cost, greater ridership and higher cost-effectiveness than the Highway 99 alternative.

- Additional information on the segment between 78th Street and 99th Street is needed to determine the location of stations and park-and-ride lots to be included in the DEIS.

EXECUTIVE OFFICER'S RECOMMENDATION

The Executive Officer recommends approval of Resolution No. 94-1989.

LS:lmk
94-1989.RES
11-15-94

Attachment A

South North

Transit Corridor Study

Briefing Document

Tier I Technical Summary Report

August 15, 1994

Metro

South North
Transit Corridor Study

Briefing Document

Tier I Technical Summary Report

August 15, 1994

Table of Contents

I. Introduction

Metro and C-TRAN, in cooperation with twelve state and local jurisdictions and agencies, are studying the South/North Transit Corridor to determine whether proposed light rail transit (LRT) improvements within the Corridor should be designed and constructed.

The South/North Transit Corridor Study was initiated in July 1993 following the region's decision in April 1993 to designate the South/North Corridor as the region's priority corridor within which to conduct the next Alternatives Analysis following the Westside Corridor to Hillsboro.

Because of the size of the South/North Corridor and the complexity of the issues involved, the South/North Alternatives Analysis was divided into two phases, or "tiers."

Tier I

The purpose of Tier I is to define the high capacity transit (HCT) alternative to be studied further within Tier II. Tier I will be used to: 1) select a preferred HCT mode; 2) to determine how far south and how far north within the Corridor to study further; and, 3) to reduce the number of HCT alignment alternatives throughout the corridor to one or two.

At the beginning of Tier I, the Region conducted a "Scoping" process where a wide range of alternative HCT modes (LRT, busway, river transit and commuter rail) were evaluated. Through the analysis prepared within Scoping, the Region determined that only LRT warranted further study within Tier I, in effect determining that the HCT mode that would advance into Tier II would be LRT. Therefore, within Tier I, the only alignment alternatives that have been developed and analyzed are LRT alternatives.

Tier II

The purpose of Tier II will be to evaluate the LRT alternative selected within Tier I and to compare it to a No-Build Alternative and an expansion of the bus system termed the Transportation Systems Management (TSM) Alternative. The performance, costs and impacts of these three alternatives will be documented within a draft environmental impact statement (DEIS) which will be used by the Region in selecting a locally preferred alternative. If the selected alternative is the LRT Alternative then the Corridor would advance toward final design and construction.

Narrowing LRT Alternatives: The Choice at Hand

The South/North Study is currently concluding Tier I. The purpose of this document is to summarize the data and information that have been prepared on the various LRT alternatives being studied within Tier I in order to allow the community and decision-makers to come to an informed determination on which alternatives should advance to Tier II for further study

The Tier I alternatives and this document have been structured to facilitate the understanding of the trade-offs (the benefits and the costs, the advantages and disadvantages) of the various LRT alternatives being considered. Again, because of the size and complexity of the Corridor, the choices have been divided into several groups (described in Section III of this report) where the differences between the alternatives can be isolated and better understood. By selecting the best LRT alternative within each group the region will define the optimum LRT alternative to advance into Tier II.

Other choices concerning the LRT alternatives also face the region but are not addressed within this document nor by the process at this time. They are at a finer level of detail and are called "design options," such as the placement of LRT tracks in the center or on the left or right side of a street. Design options exist for each of the alternatives being evaluated. Many design options have been evaluated within Scoping and Tier I. Throughout Tier I, design options have been screened out or have been developed to solve problems or to take advantage of opportunities. Design options associated with the alternatives selected to advance into Tier II will be further refined and screened before work is initiated on the DEIS. This screening will be conducted by the Steering Group and Project Management Group in consultation with the public and the Citizens Advisory Committee

Following is a description of the transportation problems within the Corridor and the goal and objectives of the South/North Study that were used to help define and evaluate the LRT Alternatives being considered.

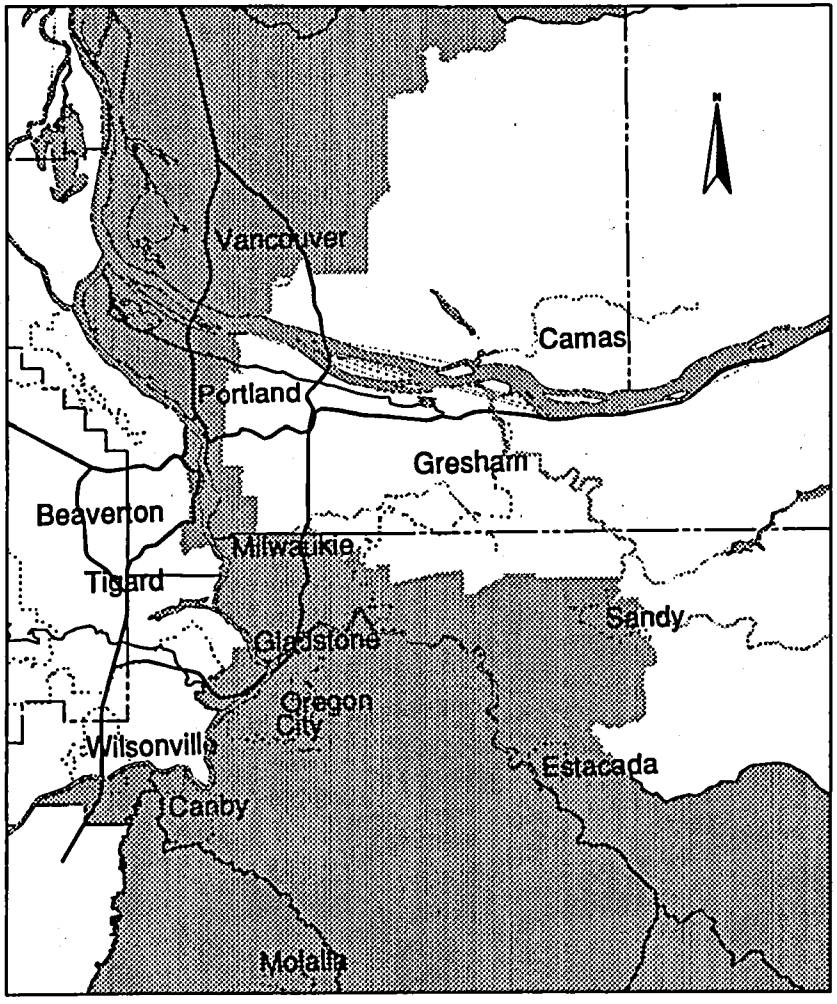


Figure 1 South/North Corridor

II. Purpose and Need

The purpose of the following two pages is to set a context for the South/North Transit Corridor Study: What area does the Study cover? Why are we studying the South/North Corridor? What purpose will the alternatives being studied serve? How will we evaluate the alternatives?

The South/North Corridor

Figure 1 illustrates the South/North Corridor. It is the travel shed extending north from the Oregon City area in Clackamas County, through downtown Portland and into Clark County beyond Vancouver. The Corridor is defined in this way because it captures the trips that could benefit from the major transit improvements being evaluated, either on LRT exclusively or fed through a system of connecting bus routes or park-and-ride lots.

Key activity centers within the Corridor help to define the points that LRT alternatives should connect to. The first three in the table below are common in all of the alternatives being studied, but the remaining centers present choices and trade-offs between the alternatives in the South and the North.

Major Activity Centers Within the Corridor

Common	South	North
Downtown Portland Downtown Milwaukie Downtown Vancouver Jantzen Beach	Clackamas Town Center Oregon City	I-5 & 134th Vancouver Mall

The Corridor also includes other important centers such as the Central Eastside Industrial Area, OMSI, Portland State University, Johns Landing, Interstate Avenue and Portland Community College. The proposed LRT improvements could serve over twenty Portland neighborhoods, depending upon the alternatives selected.

In all, the South/North Corridor covers almost half of the metropolitan region. It is characterized by high employment and residential growth with the potential for worsening travel conditions. Population and employment growth in Clark and Clackamas Counties is projected be 32% to 48% over the next twenty years, exceeding the overall Regional growth rates.

Transportation Problems and Opportunities

The problems and opportunities that exist within the South/North Corridor set a context for defining and evaluating the transit alternatives.

- **Traffic Problems.** Traffic in the South/North Corridor is exceeding the capacity of many of the roads and intersections within highway system. For example, most of McLoughlin Boulevard is currently highly congested with a level of service of E or F (A is best, F is worst). In the North, traffic across the Columbia River has almost doubled since the opening of the I-205 Bridge with projections for continued growth well into the future, causing demand to exceed capacity during the key commute periods.

- **Transit Problems.** As the highway network becomes congested the bus network, which shares the road with cars and trucks, experiences longer travel times and high levels of unreliability. Deterioration in speed and reliability of buses increases operating costs, deters ridership and costs transit riders thousands of person hours a day through longer bus trips.

- **Regional Plans.** For almost twenty years the Region has shaped its land use and transportation plans based upon the expectation that high capacity transit (HCT) would be provided within the South/North Corridor. Those plans have sized the road network, defined the comprehensive land use plans and implemented a bus network that would be served by and enhance an HCT facility.

- **New State Regulations.** Both Oregon and Washington jurisdictions face tougher state regulations affecting transportation and land use planning. Oregon now requires that the Region plan for a 20% reduction in the per capita vehicle miles traveled and a 10% reduction in the per capita number of parking spaces. In Washington, the Clark County area is required to adopt a commute trip reduction ordinance that would result in a 35% drop in trips to major employers by 1999.

- **Economic Health.** There is growing concern that reduced accessibility within the South/North Corridor may reduce its ability to attract and retain industrial and commercial development in the Corridor. This trend adds to the concern in Clark County regarding the relative loss of per capita income compared to the Region. Further, concurrency requirements within Washington may limit new developments if the transportation system is inadequate to handle new demand.

- **Air Quality.** The Region is currently "marginal" for ozone and "moderate" for carbon monoxide. Transit expansion is a key element of the Region's proposed Air Quality Maintenance Plan and could save new industry $2 million a year in air quality clean-up costs.

Goal and Objectives

To implement a major transit expansion program in the South/North Corridor which supports bi-state land use goals, optimizes the transportation system, is environmentally sensitive, reflects community values and is fiscally responsive.

1. Provide high quality transit service.
2. Ensure effective transit system operations.
3. Maximize the ability of the transit system to accommodate future growth in travel demand.
4. Minimize traffic congestion and traffic infiltration through neighborhoods.
5. Promote desired land use patterns and development.
6. Provide for a fiscally stable and financially efficient transit system.
7. Maximize the efficiency and environmental sensitivity of the engineering design of the proposed project.

Alternatives were developed that address the problems and opportunities within the Corridor and they are described in the following section of this report. The study's objectives provide a framework for evaluating the alternatives. Each alternative's ability to meet the study objectives was measured. Their performance is described in Sections V-X and summarized in a table format in Appendix A.

III. Tier I LRT Alternatives

The Tier I LRT Alternatives have been divided into six groups in order to isolate and better understand the choices to be made.

A. Study Terminus Alternatives

Study Terminus Alternatives will be used to define how far South and North to study within Tier II. Because of the time and costs associated with the Tier II analysis, it is important that the Region only study improvements that could potentially be funded and that provide adequate benefits in relationship to their costs. A set of Study Terminus Alternatives have been defined for the South and the North. They have been analyzed and are evaluated in sections V and VI separately so that decisions regarding the ultimate termini can be made independently of each other.

While selecting Study Termini short of the furthest points would not remove the furthest points from the Regional Transportation Plan's HCT Corridors, it could remove them from the list of Ten-Year Priorities.

Also, it is important to note that the determination of a Study Terminus in Tier I is different than the minimum operable segment analysis and selection of a locally preferred alternative that will occur in Tier II. The Study Terminus choice will be just that, how far North and South to *study* in Tier II. The Region may choose to, or the Federal Transit Administration may require us to, evaluate even shorter segments before the selection of the locally preferred alternative following the completion of the draft environmental impact statement. This analysis could also include the possible phasing of improvements with an opening of one segment followed a year or two later by the opening of another segment.

Finally, selection of a Study Terminus will not necessarily define the precise street or location of the terminus. Instead, it is intended to define the general vicinity of the terminus for study in Tier II. Design considerations such as station and park-and-ride lot locations, costs and traffic and environmental impacts may require that a terminus studied in Tier II to be several blocks from its designation as the Study Terminus at the conclusion of Tier I.

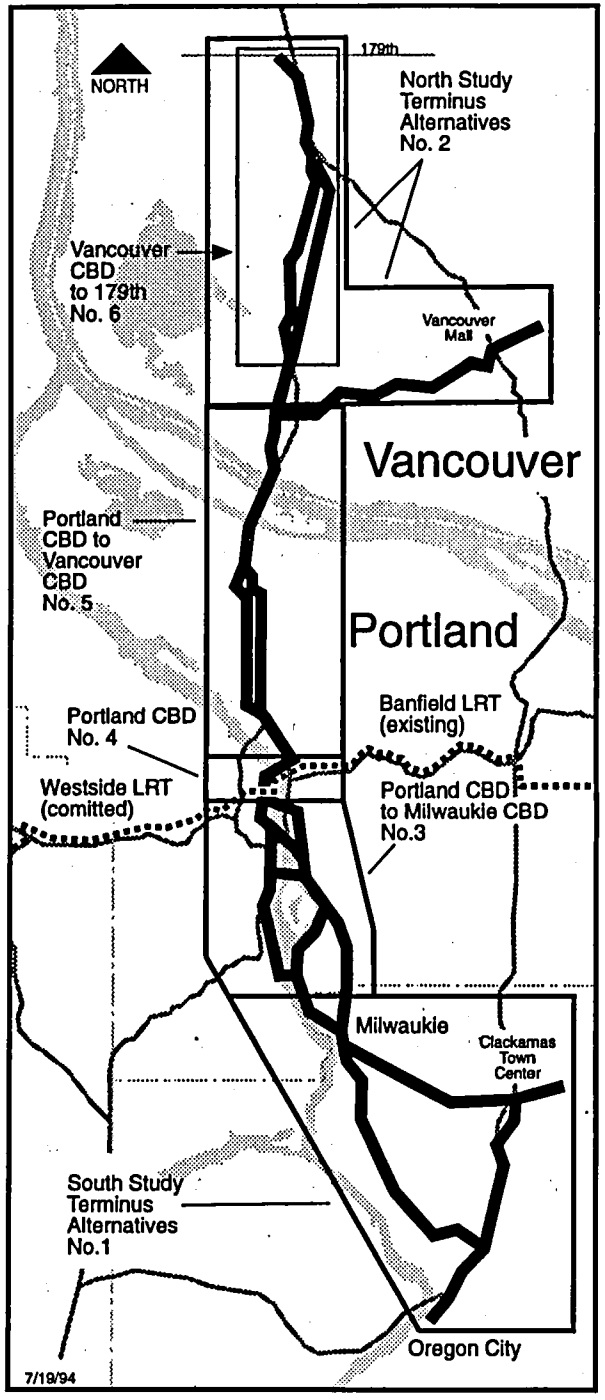


Figure 2 Tier I Groups of Alternatives

1. **South Study Terminus Alternatives**
   - **Milwaukie CBD.** This alternative would extend LRT from downtown Portland, across the Willamette River to south or east of the Milwaukie CBD.
   - **Clackamas Town Center.** This alternative would extend LRT from downtown Milwaukie to the Clackamas Town Center and possibly across I-205 to a park-and-ride in the vicinity of Sunnyside Road.
   - **Oregon City via McLoughlin Boulevard.** This alternative would extend LRT south from Milwaukie along McLoughlin Boulevard, through Gladstone and into the old town area of Oregon City.
   - **Oregon City via I-205 and Clackamas Town Center.** This alternative would extend LRT through the Clackamas Town Center, along I-205, through Gladstone and into the old town area of Oregon City.

2. **North Study Terminus Alternatives**
   - **Vancouver CBD.** This alternative would extend LRT from downtown Portland, across the Steel Bridge and across the Columbia River, through downtown Vancouver to 39th Street.
   - **88th Street.** This alternative would extend LRT from 39th Street, parallel to I-5, to 88th Street.
   - **134th Street.** This alternative would extend LRT from 88th Street, parallel to I-5, to 134th Street near the future WSU branch campus.
   - **179th Street.** This alternative would extend LRT from 134th Street, parallel to I-5, to 179th Street near the Clark County Fairgrounds.
   - **Vancouver Mall.** This alternative would extend LRT east from the Vancouver CBD, parallel to SR-500, to the Vancouver Mall and possibly across I-205 to a park-and-ride lot in Orchards.

B. LRT Alignment Alternatives

Alignment alternatives are the major choices of where LRT improvements should be studied further within Tier II. As opposed to design options described in Section I, alignment alternatives are separated by several blocks or miles. Generally, the differences in alignments are great enough to cause significant differences in costs and ridership. There are four geographic areas within the Corridor that have Alignment Alternatives being evaluated:

3. **Portland CBD to Milwaukie CBD**

   a. **Willamette River Crossings:**
   - **Hawthorne Bridge.** This alternative could use the existing Hawthorne Bridge which would be retrofitted for LRT.
   - **Caruthers Bridge.** This alternative would use a new span under the Marquam Bridge from South Waterfront District to south of OMSI.
   - **Ross Island Bridge.** This alternative would use a new span just south of the existing Ross Island Bridge.
   - **Sellwood Bridge.** This alternative would provide service to Johns Landing and would use a new span north of the Sellwood Bridge.

   b. **Eastbank Alignments**
   - **McLoughlin Blvd.** This alternative would use McLoughlin Blvd. between the three northern river crossings and Sellwood.
   - **PTC Alignment.** This alternative would use the Portland Traction Company alignment next to the Willamette River between the three northern river crossings and Sellwood.

4. **Portland Central Business District**
   - **Surface.** This alternative would be on the surface streets of 5th and 6th Avenues on the Transit Mall between the Steel Bridge and connections to the South Willamette River crossings.
   - **Subway.** This alternative would be below ground from Union Station to connections to the South Willamette River crossings. A subway could be under 4th, 5th, 6th or Broadway Avenues but could not be connected to a Hawthorne Bridge crossing.

5. **Portland CBD to Vancouver CBD**
   - **Interstate Avenue.** This alternative would be within the Interstate Avenue right-of-way between the Kaiser medical facility and Kenton.
   - **I-5.** This alternative would be on the ridge above and parallel to I-5, generally within or adjacent to the Minnesota Avenue right-of-way between Kaiser medical facility and the Kenton neighborhood.

6. **Vancouver CBD to 179th Street**
   - **Highway 99.** This alternative would be in the median of Highway 99 between the Main Street/I-5 interchange and 179th Street.
   - **I-5.** This alternative would be directly adjacent to I-5 between Main Street/I-5 interchange and 179th Street.

IV. A Few Notes About the Numbers

Following is a description of how many of the measures within this report were developed:

- **Comparing the Alternatives.** Most important in using the comparative measures within this report is understanding the alternatives and how they have been developed for the purpose of this analysis. Within the grouping of alternatives (e.g. South Study Terminus Alternatives, Portland CBD to Vancouver CBD Alignment Alternatives, etc.) the alternatives have been held constant outside the segment in question. For example, when developing, modeling and comparing South Study Terminus Alternatives, changes were only made within the segment from Milwaukie to Oregon City. Each of the South Study Terminus Alternatives are the same north of Milwaukie: McLoughlin Boulevard, across the Hawthorne Bridge, through downtown Portland using the surface alignment on the Transit Mall, north on Interstate Avenue, through the Vancouver CBD and along I-5 to 179th Street. When evaluating the North Study Terminus Alternatives, the alignments south of Vancouver are similarly held constant terminating in the south in Oregon City via I-205.

  This method of analysis was employed to ensure consistency among the alternatives within a given segment or group. It also guarantees that the changes in the data can be attributed to the changes made to the alternatives within the segment in question. Finally, it allowed the number of alternatives developed and analyzed to be kept to a minimum, saving time and money.

  There are three important implications that lead from this way of analyzing the alternatives:

  1) The differences between the alternatives in ridership and costs are real and are tied directly to the variations in the alternatives;

  2) Much of the data from one set of alternatives should not be compared with an alternative from another set; and

  3) There are numerous combinations of projects that can be created by mixing and matching the alternatives within each of the segments. All of those combinations have not been presented or costed within this report. However, a matrix of the possible southern and northern terminus combinations is provided in Appendix B. By using add-ons or deductions for each of the alignment alternatives, one can develop a cost estimate for any of the possible combinations.

- **Ridership.** The light rail ridership forecasts are based upon changes in the LRT and bus networks within the Corridor. The forecasts are for the year 2015 and are based on existing land use plans and allocations developed by Metro and local jurisdictions.

- **1994 Capital Costs.** Capital cost estimates for the alternatives have been developed in 1994 dollars by calculating the quantities in sixteen cost categories from conceptual plans for each segment of alignment. Costs include right-of-way , related roadway reconstruction, structures, various trackway treatments, system costs (e.g. signals system), light rail vehicles and maintenance facilities. The cost estimates also include engineering, administration and a contingency allowance to reflect the level of design detail available. The unit rates used to develop these estimates include historic data and recent Westside LRT data, where available.

- **Year of Expenditure (YOE) Costs.** Because costs generally inflate over time and it would take approximately ten years to finish the planning, engineering and construction of the LRT alternatives, the projected inflated costs of the alternatives have been provided. First, the YOE costs depend upon the assumed inflation rate (6.2%) and the construction schedule (developed consistent with the Westside Project with construction completed by 2003 to 2005 depending upon the alternative). In general, the 1994 costs increase by about 60% to develop the year of expenditure costs. Second, additional items beyond design and construction costs have been added to the factored 1994 capital costs to provide a more accurate prediction of the actual funds that will be needed to complete the alternate projects. Those additional items include a reserve for yet-to-be determined design options, bonding issuance costs, interim borrowing costs and funds for a capital reserve account (CAPRA).

- **Operating and Maintenance (O&M) Costs.** O&M costs within this report are the costs of operating the LRT alternative. The difference in bus O&M costs between the alternative with the highest bus operating costs and the other alternatives is subtracted from the LRT operating costs. The result is the *effective* LRT operating costs used in calculating the cost effectiveness

estimate for the alternatives.

- **Cost Effectiveness.** Cost effectiveness analysis provides a means of comparing the benefits of each alternative with its costs. The Tier I cost effectiveness analysis focuses on two different costs: 1) Effective Operating Costs; and 2) Total Annualized Costs. Effective Operating Costs are the year 2015 operations and maintenance costs of the LRT minus the bus O&M costs saved by the subject LRT alternative from the highest bus O&M costs among the comparable alternatives. Total Annualized Costs includes annualized LRT capital costs plus the year 2015 Effective Operating Costs (in 1994 dollars). Annualized capital costs are based on the estimated LRT capital costs in 1994 dollars and assume a seven-percent discount rate and a 40-year economic life. The higher the cost effectiveness ratio, the less cost effective the alternative.

- **Environmental Analysis.** The estimates of environmental impacts (e.g. noise and vibrations, displacements, etc.) are based upon sketch-level analysis. While the data is accurate in comparing the alternatives, the actual environmental impacts may change as designs are refined, as more detailed analyses are done and as mitigation measures are developed and incorporated into the design. Tier II, with the preparation of the Draft Environmental Impact Statement, will provide a very high level of detail on a much wider array of potential impacts.

Technical Summary Report

The *Briefing Document* is in essence an executive summary of the *South/North Tier I Technical Summary Report,* which can be referred to for more detailed information.

Appendix A

At the end of this report in Appendix A are tables for each of the six sets of alternatives that present all of the criteria and measures for each of the alternatives. The tables within the body of the report summarize the ridership, cost and cost effectiveness for the alternatives included within the larger tables. Within the text of this report measures are referred to that are either within the summary table adjacent to the text or within the full tables included within Appendix A.

Glossary of Terms

Terminus: A terminus is the furthest north or south light rail station.

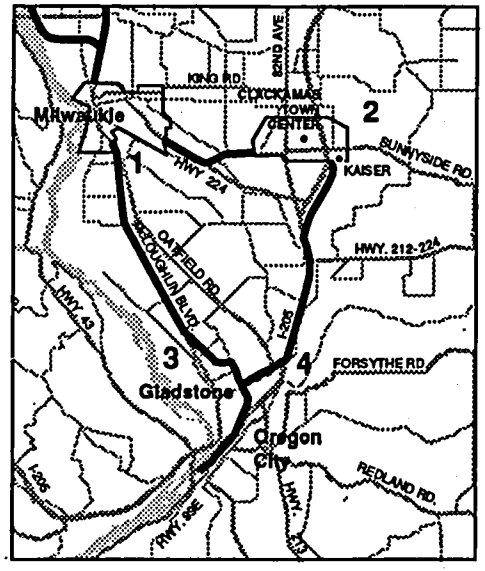
LRT Ridership: Light rail ridership includes any transit trip that would use light rail for a portion of that trip within the South/North Corridor

Total Transit Ridership: Total transit ridership is the total number of bus, light rail and combined bus and light rail trips taken within the corridor. They are one-way trips and a trip that involves a transfer is counted as one trip.

Total Transit Travel Time. Total Transit Travel Time is the combined time it would take to walk to a bus stop or station, wait for the bus or light rail vehicle, travel within the vehicle, and walk to the destination. Travel times used within this report are for the peak rush hour in the peak direction (traveling away from downtown in the evening).

Cutline. A cutline is an imaginary line drawn across one or more highways where the total number of cars or passengers crossing that line are added together. By comparing the highway or transit capacity across that line to the cars or passengers that would cross that line under any given alternative, a volume to capacity ratio can be calculated giving an indication of congestion at that location.

V. South Study Terminus Alternatives



The above map illustrates the four terminus alternatives for the South that could be selected to advance into Tier II. The selection of a Study Terminus will define the southern limits of the Tier II analysis. Within those limits, shorter segments may be studied for either phasing opportunities or as required by the federal government to determine the minimum operable segment.

1. Milwaukie Terminus

Advantages:

- The least costly of the four alternative southern termini, with a capital cost savings in $YOE of $457 to $1,015 million compared with a terminus at Clackamas Town Center (CTC) or Oregon City.
- The least costly of the alternatives to operate, with annual savings in $1994 of approximately $70,000 (CTC) to $2.7 million (Oregon City via I-205).
- The most cost effective southern terminus alternative.
- Total transit travel time between Milwaukie and Portland CBDs would be less than auto travel times during the peak hour.

Disadvantages:

- Lowest LRT and total transit (LRT + bus) ridership, with 2,500 to 5,850 fewer LRT trips and 600 to 2,150 fewer total transit trips.
- Would provide only limited LRT service into Clackamas County and to major activity centers within the County.
- Limited park-and-ride lot opportunities with the highest park-and-ride demand would result in higher capital costs and/or lower ridership estimates with greater traffic impacts than are currently estimated.

Portland CBD to:	Milwaukie CBD	CTC/Sunnyside	Oregon City via McLoughlin	Oregon City via I-205
Year of Expenditure Cost (millions)	$674	$1,131	$1,272	$1,689
LRT Weekday Ridership from 179th to:	56,900	59,400	61,900	62,750
Total Corridor Transit Weekday Ridership	129,200	129,800	131,750	131,350
Effective LRT Annual Operating Cost (millions) from 179th to:	$12.87	$12.94	$13.35	$15.58
Cost Effectiveness Ratio	6.72	7.48	7.50	8.40
Additional park-and-ride capacity may be required to accommodate forecast demand at the estimated cost (YOE millions) of:	$28	$13	$20	$6

- Would leave many of the transportation problems within the segment unaddressed, with slower total transit travel times for Oregon City and Clackamas Town Center to the Portland CBD than for the same trip using an automobile. In addition, volume to capacity ratios (congestion) at several cutlines would be highest among all the alternatives.

- Limited ability to respond to or shape development within the most rapidly growing areas of the segment.

- Would not provide LRT service to CTC or Oregon City.

2. Clackamas Town Center Terminus

Advantages:

- The lowest cost (both capital and O&M) and the most cost effective of the alternatives that extend into the urban area of Clackamas County.

- Would provide LRT access to Clackamas Town Center area, a high growth rate area and high intensity use area in Clackamas County.

- Total transit travel times between Clackamas Town Center and the Portland CBD would be one minute faster than the automobile travel times.

- The lowest (same as Oregon City via McLoughlin Boulevard) operating cost per trip of the alternatives.

Disadvantages:

- Higher cost (both capital and O&M) than the Milwaukie Terminus.

- Lower LRT and total transit ridership than either extension to Oregon City.

- McLoughlin park-and-ride demand must be accommodated with a lot near or north of the Milwaukie CBD which may result in more local traffic impacts within the downtown Milwaukie area.

- Would not provide LRT service to Oregon City, the county seat.

3. Oregon City via McLoughlin Boulevard Terminus

Advantages:

- Highest total transit and second highest LRT ridership of the South terminus alternatives.

- Total transit travel times between Oregon City and downtown Portland would be two minutes faster than the auto travel times.

- Would provide direct LRT service to the County seat.

- The lowest (same as CTC) operating cost per trip of the alternatives.

- Some opportunities for redevelopment on McLoughlin Boulevard.

Disadvantages:

- Second highest capital cost southern terminus alternative, almost $600 million more costly than the Milwaukie Terminus and $140 million more than the CTC Terminus, and second highest O&M costs.

- The second highest cost effectiveness ratio.

- Park-and-ride demand from east of Milwaukie must be accommodated with a lot near or north of the Milwaukie CBD which may result in more local traffic impacts within the downtown Milwaukie area.

- Traffic impacts on McLoughlin Boulevard would include left turns being restricted to intersections and impacts during construction.

- Limited opportunities for new development.

- Would not provide LRT service to CTC.

4. Oregon City via I-205 Terminus

Advantages:

- Would have the highest LRT ridership and second highest total transit ridership of the southern terminus alternatives.

- Would provide LRT access to the CTC area, the highest growth rate and highest planned density use area of the County, and to Oregon City, the County seat.

Disadvantages:

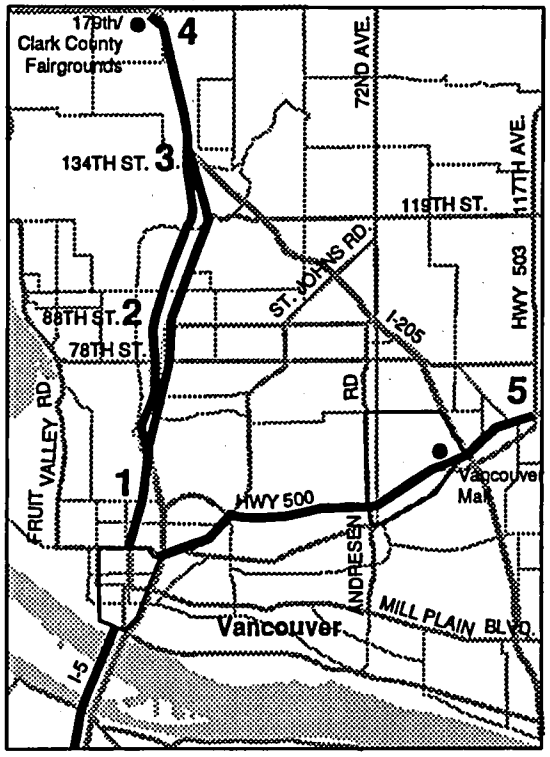
- Highest cost alternative, with over $1 billion more capital costs than the Milwaukie Terminus and $2.7 million more annually in additional O&M costs.

- Least cost effective of the South Terminus Alternatives, with the highest annualized cost per LRT rider and the highest LRT operating costs per rider.

- Total transit times would remain longer for trips between Oregon City and downtown Portland than for trips taken using an automobile.

- Limited station opportunities between Clackamas Town Center and Gladstone.

VI. North Study Terminus Alternatives



The above map illustrates the five alternative terminus points for the North that could be selected to advance into Tier II. The selection of a Study Terminus will define the northern limits of the Tier II analysis. Within those limits shorter segments may be studied for either phasing opportunities or as required by the federal government to evaluate shorter segments.

1. Vancouver CBD/39th Street Terminus

Advantages:

- The least costly of the four alternative northern termini, with a capital cost savings in $YOE of $224 (88th Street) to $495 (179th Street) million.
- The least costly of the alternatives to operate ($530,000 to $2.3 million less annually).
- The most cost effective northern terminus alternative.
- Total transit travel time between Vancouver and Portland CBDs would be less than auto travel times during the peak hour.

Disadvantages:

- Lowest LRT and total transit (LRT + bus) ridership, with 1,550 to 2,750 fewer LRT trips and 700 to 1,350 fewer total transit trips.
- Would provide only limited LRT service into Clark County and to major activity centers within the county.
- Limited park-and-ride lot opportunities with the high park-and-ride demand would result in higher capital costs and/or lower ridership estimates with greater traffic impacts than currently estimated.
- Would leave many of the transportation problems within the Clark County segment unaddressed, with slower total transit travel times for north Clark County and Vancouver Mall.
- LRT would not extend far enough into Clark County to assist in the management of growth within Clark County.

2. 88th Street Terminus

Advantages:

- The lowest cost (both capital and O&M) and the most cost effective of the alternatives that extend well into Clark County. Total transit ridership is only slightly lower than the further termini but at a substantially lower cost.
- Would provide LRT access into the north I-5 corridor area, designated within the growth management plan as a high growth area with intense development pasterns.
- Would provide higher transit reliability for patrons than the Vancouver CBD Alternative and the same reliability as the further extensions at a much lower cost (based on the percent of passenger miles within protected ROW).
- The lowest (same as Vancouver CBD) operating cost per trip.
- Total transit travel time from Portland CBD to Vancouver CBD and 88th Street would be less than or similar to auto travel times during the peak hour.

Disadvantages:

- Higher cost (both capital and O&M than the Vancouver CBD Terminus.
- Lower LRT ridership than extensions north and to Vancouver Mall.

From Portland CBD to:	Vancouver CBD	88th	134th	179th	Van Mall/Orchards
Year of Expenditure Cost (millions)	$1,199	$1,423	$1,563	$1,694	$1,660
LRT Weekday Ridership from Oregon City to:	60,050	61,600	62,200	62,800	62,450
Total Weekday Corridor Transit Ridership	130,000	131,150	131,300	131,350	130,700
Effective LRT Operating Cost (millions) Oregon City to:	$15.27	$15.80	$16.47	$17.55	$17.60
Cost Effectiveness Ratio	7.65	7.98	8.23	8.48	8.47
Additional park-and-ride capacity may be required to accommodate demand at a cost (millions $YOE) of up to:	$45	$30	$23	$4	$6

- SR-500 park-and-ride demand would need to be accommodated with a lot near or north of the Vancouver CBD which may result in more local traffic impacts near central Vancouver.

3. 134th Street Terminus

Advantages:

- Second highest total transit ridership of the North terminus alternatives.
- Would provide LRT access to the 134th Street area with possible shuttle access to WSU Campus. This area has been designated as a major growth and activity center. Would forward growth management planning goals.

Disadvantages:

- Third highest capital cost of the northern terminus alternatives, $364 million more costly than the Vancouver CBD Terminus and $140 million more than the 88th Street Terminus.
- SR-500 park-and-ride demand would need to be accommodated with a lot near or north of the Vancouver CBD which may result in more local traffic impacts near central Vancouver.
- Total transit travel times would remain longer than the auto travel times for trips from 134th Street, 179th Street and Vancouver Mall to Portland CBD.

4. 179th Street Terminus

Advantages:

- Would have the highest LRT ridership and highest total transit ridership of the northern terminus alternatives.
- Would provide direct LRT access to the 134th Street area with possible shuttle service to the WSU Branch Campus area.

Disadvantages:

- Highest capital cost alternative, over $495 million more than the Vancouver CBD Terminus and $2.28 million more in O&M costs.
- Total transit travel times would remain longer than the auto travel times from 134th Street, 179th Street and Vancouver Mall to downtown Portland.
- Least cost effective of the North Terminus Alternatives.
- Terminus at 179th Street is very close to the interim growth boundary and could result in pressure to extend the boundary. If the boundary is not expanded it could lead to underutilization of the transit system.

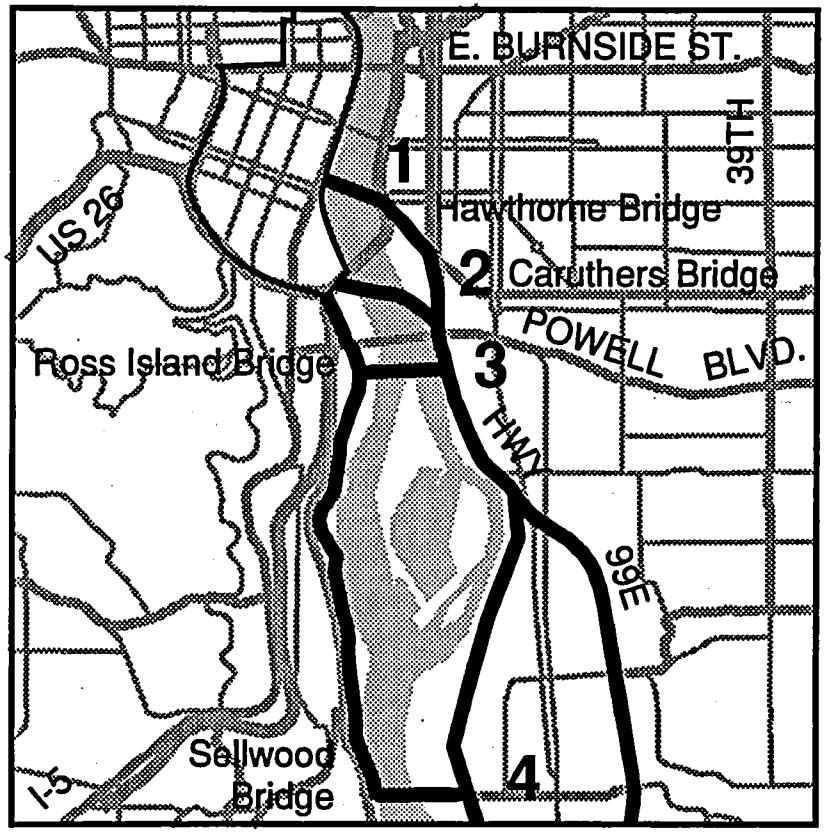
4. Vancouver Mall/Orchards Terminus

Advantages:

- Would have the second highest LRT ridership of the northern termini.
- Would provide LRT access to the Vancouver Mall area, a high growth rate and high intensity use area within Clark County.

Disadvantages:

- Highest LRT operating costs per rider.
- Total transit travel times would remain longer than auto travel times from Vancouver Mall, 134th Street and 179th Street to downtown Portland.
- I-5 park-and-ride demand would need to be accommodated with a lot near the Vancouver CBD which may result in local traffic impacts near central Vancouver.



The above map illustrates the alignment alternatives between the Portland CBD and downtown Milwaukie that could be selected to advance into Tier II for further study. Within this segment there are two different sets of alternatives being compared. First are the alternate locations for a crossing of the Willamette River south of the Portland CBD.

Second, for the Hawthorne, Caruthers and Ross Island Bridge Crossing alternatives, two Eastbank routes south are being compared: either the Portland Traction Company rail right-of-way or an alignment adjacent to McLoughlin Boulevard.

Note that the capital cost estimates include both the cost of the bridge and the alignment from the Portland CBD to the Milwaukie CBD. This is done to be able to account for the full costs of using a particular crossing location. A lower cost bridge may require a higher cost alignment in order to reach that location.

A. South Willamette River Crossings

1. Hawthorne Bridge Alternative

Advantages:

- The least costly of the four alternatives with a cost savings in $YOE of $59 to $65 million.
- Would provide the best LRT access to the Central Eastside and OMSI.
- May provide better opportunity for SE bus connections to LRT.
- Would provide LRT access to inner SE neighborhoods (Brooklyn and Moreland).

Disadvantages:

- Would provide the least LRT access to the southern portions of the Portland Central City including PSU, and no access to the North Macadam area and to the South Waterfront District.
- Frequent bridge openings for river traffic would cause LRT reliability problems, decrease LRT ridership and increase operating expenses by approximately $500,000 per year (included within the ridership and O&M cost estimates). Because of the bridge's age, direct bridge operating costs would be higher.
- Difficult to bring the existing Hawthorne Bridge up to seismic and operational standards and a new span would increase costs and would significantly impact the Portland CBD.
- Total transit ridership would be lower than the Caruthers Bridge.

Portland CBD to Milwaukie via:	Hawthorne Bridge	Caruthers Bridge	Ross Island Bridge	Sellwood Bridge
Year of Expenditure Cost (millions)	$674	$739	$733	$739
LRT Weekday Ridership 179th to Oregon City	61,400	62,800	62,300	61,400
Total Corridor Transit Weekday Ridership	131,350	132,200	131,400	130,750
Effective LRT Operating Cost (millions) Oregon City to 179th	$18.43	$17.93	$17.93	$19.12
Cost Effectiveness Ratio	8.72	8.64	8.70	8.90

- Impacts of bridge reconstruction on the Willamette River ecosystem. Using the McLoughlin alignment on the eastside south to Sellwood would displace approximately 50 structures and could adversely impact historic structures. Use of the PTC alignment could have significant impacts upon the adjacent wildlife habitat and natural environment. (See *Disadvantages* for the McLoughlin and PTC alignments).

2. Caruthers Bridge

Advantages:
- Highest total transit and LRT ridership.
- Would provide LRT access to the South Central City area including PSU, Riverplace and the South Waterfront Development.
- Would provide LRT access to OMSI, inner SE neighborhoods (Brooklyn and Moreland).
- The lowest (same as Ross Island Bridge) operating cost per trip and the lowest cost effectiveness ratio.

Disadvantages:
- Highest cost (similar to Sellwood) Willamette River crossing ($65 million more than the Hawthorne Bridge).
- Severe design constraints due to the close proximity of the Marquam Bridge may increase costs.
- Known and possibly unknown hazardous material sites.
- Impacts of bridge construction to the Willamette River ecosystem.
- Using the McLoughlin alignment on the eastside south to Sellwood would displace approximately 40 structures and could adversely impact historic structures. Use of the PTC alignment could have significant impacts upon the adjacent wildlife habitat and natural environment. (See *Disadvantages* below for the McLoughlin and PTC alignments).
- Possible impact on design of future development in South Waterfront Development.

3. Ross Island Bridge

Advantages:
- Second highest total transit ridership.
- Would provide LRT access to the north Macadam redevelopment area and the South Central City area including PSU, Riverplace and the South Waterfront Development.
- Would provide LRT access to inner SE neighborhoods (Brooklyn and Moreland).
- Low operating costs, moderate operating cost per trip, capital costs and cost effectiveness ratio, and lowest capital costs of the fixed span alternatives.
- May provide the opportunity to use a portion of the Shoreline right-of-way.

Disadvantages:

- Capital costs would be $59 million more than Hawthorne Bridge.
- Impacts of bridge construction to the Willamette River ecosystem.
- Using the McLoughlin alignment on the eastside south to Sellwood would displace approximately 60 structures and could adversely impact historic structures. Use of the PTC alignment could have significant impacts upon the adjacent wildlife habitat and natural environment. (See *Disadvantages* for the McLoughlin and PTC alignments).
- Possible impact on design of future development in South Waterfront and North Macadam Development areas.
- Would not provide direct LRT service to OMSI.

4. Sellwood Bridge

Advantages:

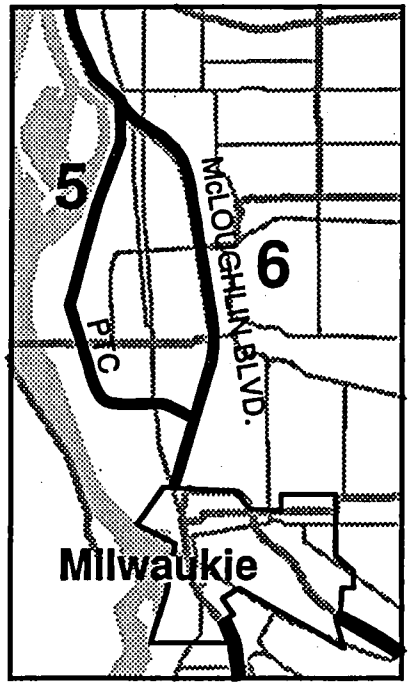
- Would provide LRT access to the North Macadam redevelopment area, the South Central City area including PSU, Riverplace, the South Waterfront Development and Johns Landing.
- May provide the opportunity to reduce total transportation costs and impacts by combining highway and transit river crossing.
- May provide the opportunity to use a portion of the Shoreline right-of-way.

Disadvantages:

1. Highest cost (similar to Caruthers Bridge) Willamette river crossing alternative ($65 million more than Hawthorne and similar to Ross Island).
- Lowest LRT ridership and total transit ridership.
- Highest operating costs, highest operating costs per rider and highest cost effectiveness ratio.
- Local neighborhood and social impacts (e.g. noise and vibration) in the Johns Landing area.
- Impacts due to bridge construction to the Willamette River ecosystem.
- Slowest travel times between Clackamas County and downtown Portland (approximately 5 minutes slower).
- Would not provide LRT access to Brooklyn and Moreland neighborhoods or OMSI.

B. Eastbank Alignments

The map below illustrates the Portland Traction Company Alignment Alternative and the McLoughlin Boulevard Alignment Alternative. The costs within the following analysis assume a Hawthorne Bridge crossing but the cost differential would apply to either the Hawthorne, Caruthers or Ross Island crossing.



5. Portland Traction Company Alignment

Advantages:

- Would have fewer residential displacements and fewer construction impacts on local neighborhoods and businesses.

Disadvantages:

- Higher O&M and higher capital costs than the McLoughlin Boulevard Alignment Alternative.
- Lower ridership due to longer travel times, fewer transfer opportunities and less access to eastside neighborhoods.
- Higher LRT operating costs per ride and highest cost effectiveness ratio.
- Possible significant environmental impacts due to the alignment's proximity to wildlife habitat which could lead to higher costs in order to avoid, minimize or mitigate impacts.
- Because of the restrictions placed on much of the land adjacent to the alignment it would have relatively little ability to shape and support transit supportive land use patterns and urban redevelopment.
- Would relocate active freight rail service and approximately 20 commercial or industrial structures.

6. McLoughlin Boulevard Alignment

Advantages:

- Would have higher LRT and higher total transit ridership than the PTC Alignment Alternative due to shorter travel times and better access to eastside neighborhoods.
- Would have lower capital and O&M costs due in part to the shorter alignment length.
- Exhibits the lowest operating cost per rider and the lowest cost effectiveness ratio.
- Would provide the best opportunity to support and shape transit supportive and more intense urban development.
- Would have fewer significant environmental impacts, especially on wildlife habitat and the natural environment.

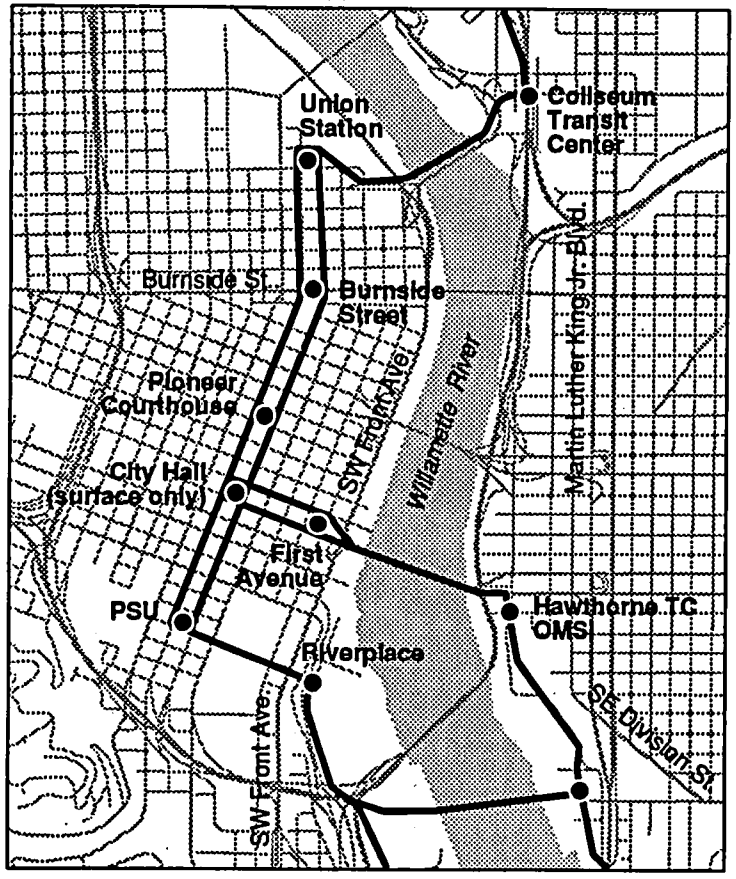
Disadvantages:

- Would displace approximately 50 residences/businesses along McLoughlin with potential impact on historical and cultural resources.

North River Crossings to Milwaukie Via:	PTC	McLoughlin
Year of Expenditure Cost (millions)	$695	$674
LRT Weekday Ridership from Oregon City to 179th	58,250	62,750
Total Corridor Weekday Transit Ridership	131,050	131,350
Effective LRT Operating Cost (millions) from Oregon City to 179th	$18.76	$18.19
Cost Effectiveness Ratio	9.26	8.52

Note: Costs assume a Hawthorne Bridge crossing, but the cost differential between alternatives would generally hold constant for the Ross Island or Caruthers bridge crossings as well.

VIII. Portland CBD Alignment Alternatives



The above map illustrates the alignment alternatives within the Portland Central Business District (CBD) from the Steel Bridge in the north to Riverplace in the south. Within this segment there are two different sets of alternatives being compared.

First is the Surface Alternative which would use the existing Transit Mall on 5th and 6th Avenues. Several options for the Surface Alternative have been developed and will be refined before Tier II is initiated.

Second is the Subway Alternative that could be built under one of four north/south streets: 4th, 5th, 6th, or Broadway Avenues. The subway would be built using tunnel boring and cut and cover techniques. For this analysis a dual tube subway (see Subway Cross-Section on page 17) under Broadway Avenue (and 5th Avenue for additional cost analysis) has been assumed. If a subway is selected for further study within Tier II then further refinement of the subway options would be made prior to initiating the DEIS.

If a subway is selected for further study, the surface alignment will also advance into the DEIS, because of the high costs associated with a subway and the need to have intermediate cost alternatives within a DEIS.

Downtown Portland via:	Surface	Subway
Year of Expenditure Cost (millions)	$288 -$309	$551 - $584
LRT Weekday Ridership from Oregon City to 179th	61,400	64,900
Total Corridor Transit Weekday Ridership	130,750	132,850
Effective LRT Operating Cost (millions) from Oregon City to 179th	$19.12	$20.91
Cost Effectiveness Ratio	8.90	9.07

1. Surface Alignment Alternative

Advantages:

- The least costly of the alternatives to build and operate, with a capital cost savings in $YOE of approximately $263 to $275 million and O&M cost savings in $1994 of $1.8 million.
- Would have adequate operational capacity to accommodate additional South/North Corridor demand beyond the forecast year of 2015.
- Would have lower operating costs per rider and would be the most cost effective Portland CBD alternative.
- Would provide more visible and direct access from LRT to bus connections and to adjacent retail, commercial and residential properties.

Disadvantages:

- Would have lower LRT and total transit ridership.
- Spatial constraints on the Transit Mall will require some trade-offs between capacity for buses, LRT, pedestrian movements and general purpose auto access.
- Travel time through downtown Portland is approximately four minutes slower than with the subway alternative.
- Construction activities on the Transit Mall would affect bus and auto operations and pedestrian movements.

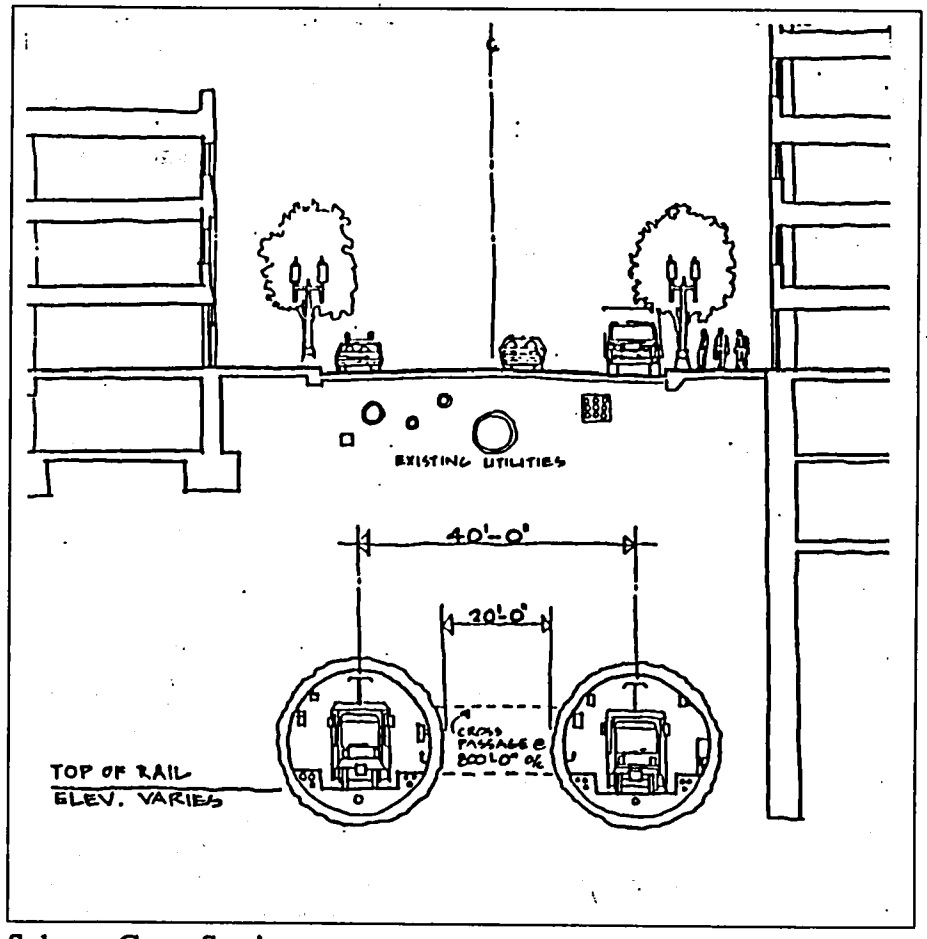
2. Subway Alignment Alternative

Advantages:

- Highest total transit and LRT ridership due to faster travel times (by four minutes) through downtown Portland.
- Would minimize changes to Transit Mall auto, pedestrian and bus travel patterns and existing auto capacity on the Mall could be maintained.
- Ultimate capacity would exceed the surface alignment.

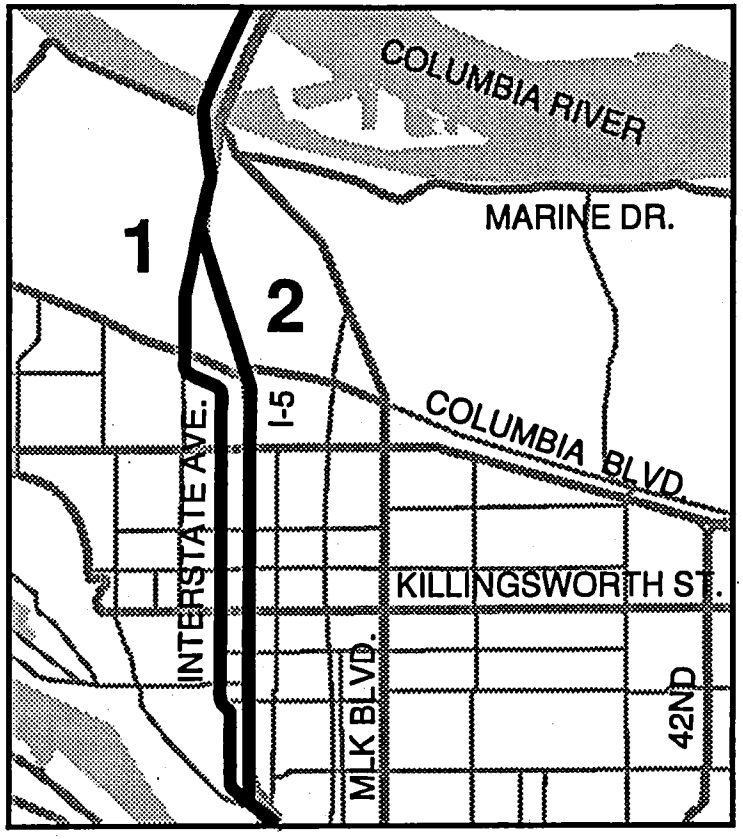
Disadvantages:

- Highest capital and O&M costs with approximately $263 to $275 million ($YOE) in additional capital costs and $1.8 million ($1994) in additional annual operating costs.
- Would have the highest operating cost per rider and the highest cost effectiveness ratio of the Portland CBD Alternatives.
- Traffic, displacements and other impacts during construction associated with the subway portals and stations would be significant.
- Would have a lower visibility and less direct access to bus connections and to adjacent retail, commercial and residential properties adjacent to the alignment.
- Total transportation costs and constructions impacts may be higher than projected due to the planned Transit Mall reconstruction that would not be incurred with the Surface alignment alternative.



Subway Cross-Section

IX. Portland CBD to Vancouver CBD Alignment Alternatives



The above map illustrates the alignment alternatives between the Portland CBD in the south and the Vancouver CBD in the North. Within this segment there are two different sets of alternatives being compared. Appendix D includes cross-section drawings of the two alternatives.

First is the Interstate Avenue Alternative that would use an alignment generally within the center of Interstate Avenue. Several options for the Interstate Avenue Alternative have been developed for this analysis. First is a two-lane option that would use two general purpose lanes from Interstate Avenue to accommodate LRT, leaving two lanes, one in each direction. Second, the four-lane option would expand the Interstate Avenue right-of-way to accommodate both LRT within a median strip and four lanes of general purpose auto traffic, two in each direction. A third option, a two-lane configuration with four-lane expansion at the key intersections has also been developed and costed. In general, its costs fall between the less expensive two-lane option and the higher cost four-lane option and are used below for comparison with the I-5 Alternative. It would also reduce impacts (e.g. displacement) associated with the four-lane option while generally providing adequate roadway capacity for auto use.

Second is the I-5 Alternative that would be located just west of the existing I-5 freeway, up at the level of the neighborhood generally within or adjacent to the Minnesota Avenue right-of-way and generally separated from the neighborhood with noise walls. Pedestrian access improvements across I-5 would be included within the I-5 Alignment Alternative. There are no significant design options for the I-5 Alignment Alternative assumed within this analysis. However, design options could be developed for the I-5 Alternative which would provide direct LRT service to the Kenton business and neighborhood areas.

1. Interstate Avenue Alignment Alternative

Advantages:

- Would have higher LRT visibility and provide more direct LRT access to retail, commercial and residential properties on Interstate Avenue and within the Kenton area.
- Would provide good (and similar to the I-5 alignment) access to the planned mixed use and higher density housing between Interstate Avenue and I-5 designated within the Albina Community Plan.
- Would provide more direct LRT access to the residential areas west of Interstate Avenue.

Disadvantages:

- Would have lower LRT (1,400 fewer) and lower total transit ridership (1,450 fewer) than the I-5 Alignment Alternative.
- Would be more costly to construct (by $114 million in $YOE) and more costly to operate (by about $120,000 a year in 1994 dollars).
- LRT travel time in this segment would be two minutes slower than the I-5 Alignment due to a longer alignment and a lower maximum operating speed.

- Would have higher operating costs per rider and a higher cost effectiveness ratio than the I-5 Alignment Alternative.

- Would require approximately 40 residential/business displacements for a two-lane option and up to 120 residential/business displacements for the four-lane option. The combined two-lane/four-lane would require approximately 65 residential/commercial displacements.

- Potential noise impacts on Interstate Avenue would be more difficult to mitigate due to the difficulty of constructing noise walls within the median strip, where LRT would be located.

- Traffic impacts on Interstate Avenue would include left turns being restricted to intersections and the removal of parking near intersections.

- Construction impacts on local traffic using Interstate Avenue would be significant and construction impacts through the middle of the established neighborhoods would be more significant than with the I-5 Alternative which is on the edge of the neighborhoods.

2. I-5 Alignment Alternative

Advantages:

- Higher total transit (by 1,450 daily) and higher LRT (by 1,400 daily) ridership than the Interstate Alignment Alternative. Increased transit ridership would be generated both within Clark County and within north Portland.

- Lower capital costs (by $114 million in $YOE) and lower annual O&M costs (by $120,000 annually in $1994).

- Would have lower operating costs per rider and a lower cost effectiveness ratio than the Interstate Avenue Alternative.

- LRT travel times would be two minutes quicker through this segment because of the higher maximum LRT operating speeds between stations and the shorter alignment length.

- Would provide better access to the PCC campus on N.E. Killingsworth and neighborhoods east of I-5.

- Would provide good (and similar to the Interstate Avenue alignment) access to the planned mixed use and higher density housing between Interstate Avenue and I-5 designated within the Albina Community Plan.

- Noise impacts caused by LRT could be more easily mitigated through noise walls west of the proposed LRT alignment. Those noise walls could have the added benefit of reducing existing freeway-generated noise to some of the neighborhoods west of the I-5 freeway.

From Portland CBD to Vancouver CBD via:	Interstate Avenue 2-Lane/4-Lane	I-5
Year of Expenditure Cost (millions)	$1,199	$1,085
LRT Weekday Ridership from Oregon City to 179th	64,000	65,400
Total Weekday Corridor Transit Ridership	131,350	132,800
Effective LRT Operating Cost (millions) from Oregon City to 179th	$18.14	$18.02
Cost Effectiveness Ratio	8.36	7.94

Disadvantages:

- Would provide less LRT visibility and access to the properties along Interstate Avenue.

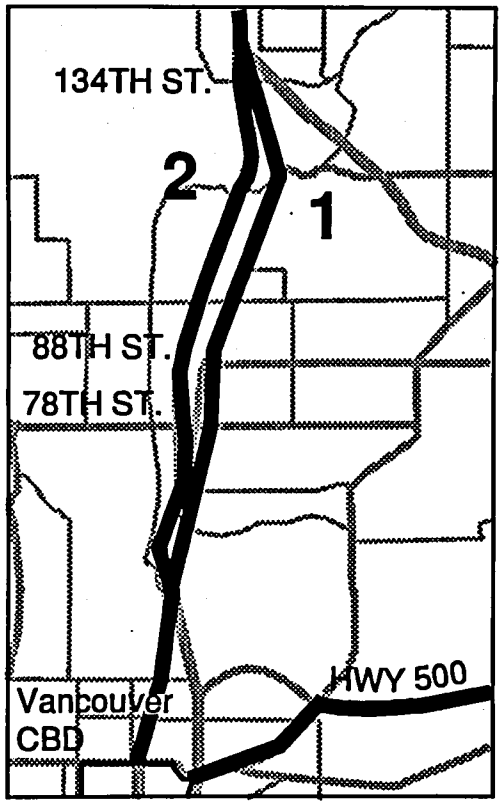
- The current design of the I-5 Alternative would provide only limited LRT access to the Kenton neighborhood and no LRT access to the Kenton business district.

- Would provide less LRT visibility and access to the neighborhoods west of Interstate Avenue.

- Physical constraints may make it more difficult to provide station sites and layouts that maximize development potential around the LRT station areas.

- Would require approximately 70, mostly residential, displacements.

X. Vancouver CBD to 179th Alignment Alternatives



The map to the left illustrates the alignment alternatives between the Vancouver CBD in the south and 179th Street in the north. Within this segment there are two different alternatives being compared. Both alternatives would use the same alignment south of the Main Street/I-5 interchange. The 88th Street, 134th Street and 179th Street North Study Terminus Alternatives are affected by these Alignment Alternatives.

First, the Highway 99 Alternative would use an alignment generally within the center of Highway 99.

Second, the I-5 Alternative would be located just west or east of the existing I-5 freeway.

1. Highway 99 Alignment Alternative

Advantages:

- Would have higher LRT visibility and provide more direct LRT access to retail, commercial and residential properties along Highway 99. Both alternatives would support the proposed transit overlay district (TOD) for this portion of the corridor.

Disadvantages:

- Would have lower LRT (1,150 fewer) and lower total transit ridership (1,250 fewer).
- Would be more costly to construct (by $79 million $YOE to 88th Street and by $167 million $YOE to 134th or 179th Streets) and more costly to operate by about $110,000 a year in 1994 dollars.
- Travel time through this segment would be three minutes slower than with the I-5 Alignment.
- Would have the highest operating costs per rider and the highest cost effectiveness ratio of the two north Clark County alignment alternatives.
- Would require approximately 106 displacements, most of which would be commercial displacements.
- Traffic impacts on Highway 99 would include left turns being restricted to intersections and capacity reductions at intersections that are currently nearing capacity and significant traffic impacts would be caused by construction.

From Vancouver CBD to 134th via:	Highway 99	I-5	
		West	East
Year of Expenditure Cost (millions)	$531	$379	$364
LRT Weekday Ridership from Oregon City to 179th	61,600	62,750	62,750
Total Corridor Weekday Transit Ridership	130,100	131,350	131,350
Effective LRT Operating Cost (millions) from Oregon City to 179th	$18.31	$18.20	$18.20
Cost Effectiveness Ratio	9.05	8.56	8.52

2. I-5 Alignment Alternative

Advantages:

- Higher LRT ridership (by 1,150 daily) and higher total transit ridership (by 1,250 daily).

- Lower capital costs (by $79 million $YOE to 88th Street and by $167 million $YOE to 134th or 179th Streets) and lower annual operating costs (by $110,000 annually).

- Would have lower operating costs per rider and a lower cost effectiveness ratio.

- LRT travel times would be three minutes quicker through this segment because of the higher maximum LRT operating speeds between stations and the shorter alignment length.

- Noise impacts would be less and mitigation of noise impacts would be easier to design and implement.

- Would provide greater LRT visibility and would provide more direct LRT access to residential area west of I-5. Both alternatives would support the proposed transit overlay district (TOD) for this portion of the corridor.

Disadvantages:

- Would cause a variety of local traffic impacts due to park-and-ride lot access.

- Less direct LRT access to the properties along Highway 99.

- Would require approximately 80 residential/commercial displacements.

Appendix A

Summary Tables

Summary of Measurement Criteria
South Study Terminus Alternatives

Criteria	Measure	Milwaukie	Clackamas TC	OC via McLoughlin	OC via I-205
Transit Service	Peak hour accessibility				
Ease of Access	Households within 45 minutes by transit to:				
	Milwaukie	101,890	103,370	103,720	102,710
	Clackamas Town Center	116,820	105,920	108,520	101,930
	Oregon City	60,370	57,460	56,610	54,380
	Employment within 45 minutes by transit to:				
	Milwaukie	381,350	384,780	380,290	383,250
	Clackamas Town Center	260,300	321,640	199,410	310,920
	Oregon City	85,710	80,770	166,270	96,630
Transferability	Mode of Access (south of Portland CBD)				
	Walk on	30%	34%	40%	35%
	Transfer	24%	25%	21%	26%
	Park-and-ride	46%	41%	39%	39%
Travel Time	Total Travel Time, PM Peak Hour (in minutes)				
	Transit from Portland CBD to Milwaukie (auto = 27)	26	26	26	26
	Transit from Portland CBD to Clackamas TC (auto = 37)	43	36	45	36
	Transit from Portland CBD to Oregon City (auto = 47)	64	64	45	53
Reliability	Miles of Reserved or Separate ROW; W of Hawthorne Bridge	5.3	10.7	12.6	17.5
	% of Corridor Passenger-miles on Reserved ROW	28.8%	32.1%	35.0%	35.0%
Ridership	Weekday Corridor Transit Trips	129,200	129,800	131,750	131,350
	Weekday S/N LRT Trips	56,900	59,400	61,900	62,750
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:				
Highway Use	Milwaukie, S of Monroe (Hwy 224, Lake, McL.)	1.24	1.14	1.10	1.14
	S of Sunnyside (I-205, 82nd)	0.91	0.91	0.92	0.92
	N of Roethe (McL., Oatfield, River)	0.84	0.79	0.83	0.80
	S of Arlington (I-205, McL.)	1.12	1.09	1.09	1.09
	At Boundary (Corbett, Macadam)	1.01	1.01	1.02	1.04
Traffic Issues		P&R volumes in Milwaukie	At grade crossings	At grade crossings Left turn restrictions	At grade crossings

Criteria	Measure	Milwaukie	Clackamas TC	OC via McLoughlin	OC via I-205
Fiscal Efficiency	Capital Cost (1994 $); Pioneer Square south	$424.0	$711.5	$800.1	$1,062.0
Cost	Capital Cost (YOE $); Pioneer Square south	$674.2	$1,131.2	$1,272.1	$1,688.6
(in millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$12.87	$15.60	$16.59	$18.20
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.00	$2.66	$3.24	$2.62
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.69	$0.66	$0.66	$0.76
	Cost Effectiveness Ratio	6.72	7.48	7.50	8.40
Promote Desired Land Use	Major Activity Centers Served	Milwaukie CBD	Milwaukie CBD, Clackamas TC	Milwaukie CBD, Oregon City CBD	Milwaukie CBD, Clackamas TC, Oregon City CBD
Support Major Activity Centers					
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes	yes	yes

Notes:

All data is for year 2015, unless otherwise noted.
Data assumes LRT from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
Bus O&M savings represents cost reduction from highest bus cost alternative.
Additional Park-and-Ride capacity may be required to accomodate anticipated demand at a cost of up to the following amounts for the corresponding terminus alternative: Milwaukie CBD $28.3 million; Clackamas TC $13 million; OC via McLoughlin $20.3 million; OC via I-205 $6 million.

Summary of Measurement Criteria
North Study Terminus Alternatives

Criteria	Measure	39th St.	88th St.	134th St.	179th St.	Van Mall
Transit Service	Peak Hour Accessibility					
Ease of Access	Households within 45 minutes by transit to:					
	Vancouver CBD	138,440	137,840	138,100	137,020	142,040
	134th St.	57,280	56,180	87,200	87,110	89,210
	Vancouver Mall	97,210	96,670	99,390	99,390	108,000
	Employment within 45 minutes by transit to:					
	Vancouver CBD	307,690	307,020	306,970	295,800	308,220
	134th St.	68,400	66,280	121,900	119,190	108,430
	Vancouver Mall	120,080	120,280	119,500	119,500	139,910
Transferability	Mode of Access (North of Coliseum TC)					
	Walk on	27%	31%	31%	33%	32%
	Transfer	49%	43%	46%	45%	45%
	Park-and-ride	24%	22%	23%	22%	23%
Travel Time	Total Travel Time, PM Peak Hour (in minutes)					
	Transit from Portland CBD to Vancouver CBD (auto = 40)	38	38	38	38	38
	Transit from Portland CBD to 88th St. (auto = 45)	53	46	46	46	55
	Transit from Portland CBD to 134th St. (auto = 48)	59	59	51	51	54
	Transit from Portland CBD to 179th St. (auto = 52)	74	75	63	55	68
	Transit from Portland CBD to Van Mall (auto = 44)	60	60	60	60	52
Reliability	Miles of Reserved or Separate ROW; north of Coliseum TC	9.1	11.9	14.2	16.3	15.1
	% of Corridor Passenger-miles on Reserved ROW	35.1%	37.7%	37.6%	38.0%	37.7%
Ridership	Weekday Corridor Transit Trips	130,000	131,150	131,300	131,350	130,700
	Weekday S/N LRT Trips	60,050	61,600	62,200	62,800	62,450
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:					
Highway Use	N of Mill Plain (I-5, Main, Broadway, Ft. Van.)	0.54	0.54	0.54	0.54	0.54
	N of 39th (15th, Main, I-5)	0.84	0.78	0.78	0.79	0.84
	S of 78th (Hwy 99, Hazel Dell Ave., I-205)	0.69	0.62	0.63	0.63	0.67
	W of Andreson (18th, 40th, 4th Plain, SR 500)	0.74	0.73	0.73	0.67	0.72
	I-5 Bridge	1.31	1.30	1.30	1.31	1.30
	W of I-205 (4th Plain, 63rd, Burton, SR 500)	0.89	0.89	0.88	0.88	0.87
	I-205 Bridge	0.94	0.94	0.94	0.94	0.94
Traffic Issues		P&R volumes in Vancouver	Main St.	Main St.	Main St.	At grade Xings P&R volumes

Criteria	Measure	39th St.	88th St.	134th St.	179th St.	Van Mall
Fiscal Efficiency	Capital Cost (1994 $); Pioneer Square north	$753.9	$895.2	$982.9	$1,065.1	$1,044.0
Cost	Capital Cost (YOE $) Pioneer Square north	$1,198.7	$1,423.4	$1,562.8	$1,693.6	$1,659.9
(in millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$15.27	$16.21	$17.33	$18.20	$17.96
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.00	$0.41	$0.86	$0.65	$0.36
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.78	$0.78	$0.81	$0.85	$0.86
	Cost Effectiveness Ratio	7.65	7.98	8.23	8.48	8.47
Promote Desired Land Use	Major Activity Centers Served	Vancouver CBD	Vancouver CBD	Vancouver CBD, Salmon Creek/ WSU	Vancouver CBD, Salmon Creek/ WSU	Vancouver CBD, Vancouver Mall
Support Major Activity Centers						
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes	yes	May encourage expansion	yes

Notes:

All data is for year 2015, unless otherwise noted.
Data assumes LRT from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
Bus O&M savings represents cost reduction from highest bus cost alternative.
Additional Park-and-Ride capacity may be required to meet anticipated demand at a cost of up to the following amounts for the corresponding terminus alternative: Vancouver CBD/39th Street $44.9 million; 88th Street $29.6 million; 134th Street $23.3 million; 179th Street $4 million; Van Mall/Orchards $5.4 million.

Summary of Measurement Criteria
Portland CBD to Milwaukie CBD South River Crossing Alternatives

Criteria	Measure	Hawthorne	Caruthers	Ross Island	Sellwood
Transit Service	Peak Hour Accessibility				
Ease of Access	Households within 45 minutes by transit to:				
	OMSI	160,400	167,950	169,300	168,200
	John's Landing	97,700	97,920	99,330	124,950
	Milwaukie	102,710	106,760	102,440	82,410
	Employment within 45 minutes by transit to:				
	OMSI	538,450	534,100	495,540	487,550
	John's Landing	353,570	350,990	350,070	449,110
	Milwaukie	385,150	393,090	389,130	348,490
Transferability	Mode of Access				
	Walk on	36.4%	35.8%	35.2%	34.1%
	Transfer	28.8%	28.1%	28.7%	32.2%
	Park-and-ride	34.8%	36.2%	36.1%	33.8%
Travel Time	Total Travel Time, PM Peak Hour (in minutes)				
	Transit from Portland CBD to Milwaukie (auto = 27)	27	27	27	32
	Transit from Portland CBD to Clackamas TC (auto = 37)	36	36	36	41
	Transit from Portland CBD to Oregon City (auto = 46)	53	53	53	58
Reliability	Miles of Reserved or Separated ROW	34.8	34.5	34.7	35.3
	% of Corridor Passenger-miles on Reserved ROW	36.7%	35.1%	32.0%	32.1%
Ridership	Weekday Corridor Transit Trips	131,350	132,200	131,400	130,750
	Weekday S/N LRT Trips	61,800	62,800	62,300	61,400
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:				
Highway Use	River Crossings (Fremont - Ross Island)	1.07	1.07	1.06	1.07
	River Crossings (Sellwood Bridge)	1.23	1.23	1.23	1.23
	N of Prescott (Denver, I-5, Interstate, MLK, Vancouver)	0.76	0.76	0.76	0.76
	At Boundary (Macadam, Corbett)	1.04	1.03	1.02	1.03
Traffic Issues		Bridge lanes Main/Madison Sts.	Harrison St. Moody St.	Harrison St. Moody St.	Moody St. At grade Xings

Criteria	Measure	Hawthorne	Caruthers	Ross Island	Sellwood
Fiscal Efficiency	Capital Cost (1994 $) Pioneer Square to Milwaukie	$424	$465	$461	$465
Cost	Capital Cost (YOE $) Pioneer Square to Milwaukie	$674	$739	$733	$739
(in millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$18.70	$18.17	$18.19	$19.12
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.27	$0.24	$0.26	$0.0
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.87	$0.87	$0.88	$0.95
	Cost Effectiveness Ratio	8.72	8.64	8.70	8.90
Promote Desired Land Use *Support Major Activity Centers*	Major Activity Centers Served	CEIC, OMSI SE Neighborhoods, Milwaukie CBD	PSU, Riverplace, OMSI, SE Portland Neighborhoods, Milwaukie CBD	PSU, Riverplace N Macadam, SE Neighborhoods, Milwaukie CBD	PSU, Riverplace N Macadam, John's Landing Milwaukie CBD
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes	yes	yes
Environmental Sensitivity	Possible Displacements	47, commercial and residential	41, commercial and residential	64, mostly commercial/industrial	27, mostly commercial/industrial
	Noise Impact Areas				Moody St., John's Landing, Sellwood
	Ecosystem Impacts	Willamette Xing	Willamette Xing	Willamette Xing	Willamette Xing
	Historical and Cultural Impacts	Existing bridge, Brooklyn Nh.	Brooklyn Nh.	Existing bridge, Brooklyn Nh.	Existing bridge, Sellwood Nh.

Notes:

All data is for year 2015, unless otherwise noted.
Data assumes LRT from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
Bus O&M savings represents cost reduction from highest bus cost alternative.
Displacement data based on preliminary design without specific efforts to mitigate possible impacts.

Summary of Measurement Criteria
Portland CBD to Milwaukie CBD Eastbank Alignment Alternatives

Criteria	Measure	PTC	McLoughlin
Transit Service	Peak Hour Accessibility		
Ease of Access	Households within 45 minutes by transit to:		
	OMSI	153,290	159,700
	Milwaukie	88,420	102,710
	Clackamas Town Center	92,760	101,930
	Oregon City CBD	52,020	54,380
	Employment within 45 minutes by transit to:		
	OMSI	531,860	538,450
	Milwaukie	368,720	383,250
	Clackamas Town Center	292,500	310,920
	Oregon City CBD	90,810	96,630
Transferability	Mode of Access; Milwaukie to OMSI		
	Walk on	36%	42%
	Transfer	27%	26%
	Park-and-ride	38%	32%
Travel Time	Total Travel Time, PM Peak Hour (in minutes)		
	Transit from Portland CBD to Milwaukie (auto = 27)	28	27
	Transit from Portland CBD to Clackamas TC (auto = 37)	38	36
	Transit from Portland CBD to Oregon City (auto = 46)	55	53
Reliability	Miles of Reserved or Separate ROW	7.1	6.2
	% of Corridor Passenger-miles on Reserved ROW	28.9%	35.0%
Ridership	Weekday Corridor Transit Trips	131,050	131,350
	Weekday S/N LRT Trips	58,250	62,750
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:		
Highway Use	River Crossings (Fremont - Ross Island)	1.07	1.07
	River Crossings (Sellwood Bridge)	1.24	1.23
	Milwaukie, S of Monroe (Hwy 224, Lake, McL)	1.14	1.14
	N of Roethe (McL., Oatfield, River)	0.79	0.80
Traffic Issues		New freight spur across McLoughlin	Signal coordination on McLoughlin, close some local access to McLoughlin

Criteria	Measure	PTC	McLoughlin
Fiscal Efficiency	Capital Cost (1994 $); Pioneer Square to Milwaukie	$437.20	$424.0
Cost	Capital Cost (YOE $); Pioneer Square to Milwaukie	$695.20	$674.20
(in millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$18.76	$18.20
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.00	$0.01
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.98	$0.88
	Cost Effectiveness Ratio	9.26	8.52
Promote Desired Land Use	Major Activity Centers Served	Milwaukie CBD	SE Neighborhoods, Milwaukie CBD
Support Major Activity Centers			
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes
Environmental Sensitivity	Possible Displacements (Residential/Commercial)	20+ commercial/indust.	50+, commercial and residential
		Existing freight line	
	Noise Impacts	Greater risks due to lower existing noise	
	Ecosystem Impacts	Wetlands & wildlife habitat	
	Historical and Cultural Impacts		Greater risk due to more displacements

Notes:

All data is for year 2015, unless otherwise noted.
Data assumes LRT from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
Bus O&M savings represents cost reduction from highest bus cost alternative.
Displacement data based on preliminary design without specific efforts to mitigate possible impacts.

Summary of Measurement Criteria
Portland CBD Alignment Alternatives

Criteria	Measure	Surface	Subway
Transit Service	Peak Hour Accessibility		
Ease of Access	Households within 45 minutes by transit to:		
	Vancouver CBD	114,750	143,710
	Portland CBD	219,150	234,580
	Milwaukie CBD	82,410	103,630
	Employment within 45 minutes by transit to:		
	Vancouver CBD	306,970	344,300
	Portland CBD	579,600	598,400
	Milwaukie CBD	348,490	382,970
Travel Time	Total Travel Time, PM Peak Hour (in minutes)		
	Transit from Portland CBD to Milwaukie (auto = 27)	32	28
	Transit from Portland CBD to Vancouver CBD (auto = 39)	38	36
Reliability	Miles of Reserved or Separate ROW	35.3	35.2
	% of Corridor Passenger-miles on Reserved ROW	25.3%	23.7%
Ridership	Weekday Corridor Transit Trips	130,750	132,850
	Weekday S/N LRT Trips	61,400	64,900
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:		
Highway Use	River Crossings (Fremont - Ross Island)	1.07	1.07
	River Crossings (Sellwood Bridge)	1.27	1.27
	N of Prescott (Denver, I-5, Interstate, MLK Blvd., Vancouver)	0.76	0.76
	At Boundary (Macadam, Corbett)	1.04	1.03
Traffic Issues		At grade crossings	Portal Impacts

Criteria	Measure	Surface	Subway
Fiscal Efficiency	Capital Cost (1994 $); South Waterfront to Union Station	$180.8 - $194.4	$353.2 - $367.3
Cost	Capital Cost (YOE $); South Waterfront to Union Station	$287.5 - $309.1	$551.0 - $584.0
(In millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$19.12	$20.93
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.00	$0.02
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.95	$0.98
	Total Annualized LRT Cost per Rider	$8.90	$9.07
Promote Desired Land Use	Major Activity Centers Served	Portland CBD	Portland CBD
Support Major Activity Centers			
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes
Environmental Sensitivity	Possible Displacements (Residential/Commercial)	Potential at mall connections	Potential at portals.
	Noise Impacts	Possible vibrations	Potential at portals.
	Ecosystem Impacts	No significant impacts	No significant impacts
	Historical and Cultural Impacts	Potential impacts	Potential at portals

Notes:

All data is for year 2015, unless otherwise noted.
Data assumes LRT from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
Bus O&M savings represents cost reduction from highest bus cost alternative.

Summary of Measurement Criteria
Portland CBD to Vancouver CBD Alignment Alternatives

Criteria	Measure	Interstate Ave.	I-5
Transit Service	Peak Hour Accessibility		
Ease of Access	Households within 45 minutes by transit to:		
	Swan Island	126,840	131,810
	Kenton	178,050	184,810
	Hayden Island	163,300	170,270
	Vancouver CBD	138,650	150,000
	Employment within 45 minutes by transit to:		
	Swan Island	369,490	377,770
	Kenton	450,430	472,540
	Hayden Island	402,300	408,530
	Vancouver CBD	310,400	337,200
Transferability	Mode of Access		
	Walk on	60%	61%
	Transfer	40%	39%
	Park-and-ride	0%	0%
Travel Time	Total Travel Time, PM Peak Hour (in minutes)		
	Transit from Portland CBD to Swan Island (auto = 17)	29	28
	Transit from Portland CBD to Kenton (auto = 20)	26	24
	Transit from Portland CBD to Hayden Island (auto = 28)	33	31
	Transit from Portland CBD to Vancouver CBD (auto = 40)	38	36
Reliability	Miles of Reserved or Separated ROW	4.0	3.9
	% of Corridor Passenger-miles on Reserved ROW	38.0%	40.4%
Ridership	Weekday Corridor Transit Trips	131,350	132,800
	Weekday S/N LRT Trips	64,000	65,400
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:		
Highway Use	Columbia River Crossing (I-5 Bridge)	1.31	1.30
	N of Columbia (I-5, Interstate, MLK Blvd.)	0.70	0.69
	N of Prescott (Denver, I-5, Interstate, MLK Blvd., Vancouver)	0.76	0.76
	River Crossings (Fremont - Ross Island)	1.07	1.07
Local Traffic		At grade crossings Changes street design Removes some parking	Ramp Impacts Removes some parking

Criteria	Measure	Interstate Ave.	I-5
Fiscal Efficiency	Capital Cost (1994 $)	$753.9	$682.2
Cost	Capital Cost (YOE $)	$1,198.7	$1,084.7
(in millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$18.20	$18.02
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.06	$0.00
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.86	$0.84
	Cost Effectiveness Ratio	8.36	7.94
Promote Desired Land Use	Major Activity Centers Served	Coliseum, N/NE Neighborhoods, Vancouver CBD	Coliseum, N/NE Neighborhoods, Vancouver CBD
Support Major Activity Centers			
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes
Environmental Sensitivity	Possible Displacements (Residential/Commercial)	65+, mostly commercial	65+, almost all residential
	Noise Impacts	More difficult to mitigate	Replace existing and new noise wall
	Ecosystem Impacts	Columbia Slough and River Xing	Columbia Slough and River Xing
	Historical and Cultural Impacts	Slightly higher risk of impacts	

Notes:

All data is for year 2015, unless otherwise noted.
Data represents build out from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
Bus O&M savings represents cost reduction from highest bus cost alternative.
Displacement data based on preliminary design without specific efforts to mitigate possible impacts.
Note capital costs and cost effectiveness for Interstate Avenue are for the two-lane/four-lane hybrid option.

Summary of Measurement Criteria
39th to 179th Street Alignment Alternatives

Criteria	Measure	Highway 99	I-5
Transit Service	Peak Hour Accessibility		
Ease of Access	Households within 45 minutes by transit to:		
	Vancouver CBD	136,040	137,020
	134th St.	80,240	87,110
	Vancouver Mall	97,010	99,390
	Employment within 45 minutes by transit to:		
	Vancouver CBD	304,760	295,800
	134th St.	103,560	119,190
	Vancouver Mall	117,290	119,500
Transferability	Mode of Access; Vancouver CBD to 179th St.		
	Walk on	23%	23%
	Transfer	45%	45%
	Park-and-ride	32%	32%
Travel Time	Total Travel Time, PM Peak Hour (in minutes)		
	Transit from Portland CBD to Vancouver CBD (auto = 39)	38	38
	Transit from Portland CBD to 88th St. (auto = 44)	48	46
	Transit from Portland CBD to 134th St. (auto = 48)	54	51
	Transit from Portland CBD to 179th St. (auto = 52)	58	55
	Transit from Portland CBD to Vancouver Mall (auto = 44)	60	60
Reliability	Miles of Reserved or Separate ROW	34.8	34.7
	% of Corridor Passenger-miles on Reserved ROW	37.7%	38.0%
Ridership	Weekday Corridor Transit Trips	130,100	131,350
	Weekday S/N LRT Trips	61,600	62,750
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:		
Highway Use	Between Mill & 4th Plain (I-5, Main, Broadway, Ft. Van.)	0.54	0.54
	N of 39th (15th, Main, I-5)	0.79	0.79
	S of 78th (Hwy 99, Hazel Dell Ave., I-205)	0.63	0.63
	St. Johns/Andreson (18th, 40th, 4th Plain, SR 500)	0.72	0.72
Traffic Issues		Restricted left turns	

Criteria	Measure	Highway 99	I-5
Fiscal Efficiency	Capital Cost (1994 $); 39th to 134th	$334	$229
Cost	Capital Cost (YOE $); 39th to 134th	$531	$364
(in millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$18.59	$18.20
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.28	$0.00
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.91	$0.88
	Cost Effectiveness Ratio	9.05	8.52
Promote Desired Land Use	Major Activity Centers Served	Vancouver CBD, Salmon Creek/WSU	Vancouver CBD, Salmon Creek/WSU
Support Major Activity Centers			
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes
Environmental Sensitivity	Possible Displacements (Residential/Commercial)	100+, mostly commercial	80+, commercial and residential
	Noise Impacts	More difficult to mitigate	Can mitigate with noise walls
	Ecosystem Impacts	Salmon Creek Xing	Salmon Creek Xing
	Historical and Cultural Impacts	No difference	

Notes:

All data is for year 2015, unless otherwise noted.
Data assumes LRT from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
I-5 data assumes an east of I-5 alignment.
Bus O&M savings represents cost reduction from highest bus cost alternative.
Displacement data based on preliminary design without specific efforts to mitigate possible impacts.

Appendix B

Summary of Year of Expenditure Capital Costs

South/North Corridor Year of Expenditure Costs

I. Termini Alternative Costs
($Millions in Year of Expenditure)

By using the following table the various costs of the Tier I alternatives can be calculated. Select the cell that corresponds to the particular South and North Termini and then adjust that cost up or down according to the *Adjustment* provided.

Note: These termini costs are based on the Order of Magnitude (OOM) cost estimate ($1994) of the generic representative alignment factored to year of expenditure through proto-typical construction schedules.

Terminus Alternatives	39th St	88th St	134th St	179th St	Vancouver Mall
Milwaukie CBD	$2,108	$2,333	$2,472	$2,603	$2,569
Clackamas Town Center	$2,565	$2,790	$2,929	$3,060	$3,026
Oregon City via McLoughlin	$2,706	$2,930	$3,070	$3,201	$3,167
Oregon City via I-205	$3,122	$3,347	$3,486	$3,617	$3,584

II. Adjustments for Alignment Alternatives (YOE $millions)

Add (if a positive number) or subtract (if a negative number) these factors to any of the terminus alternatives above to determine year of expenditure capital cost of any combination of terminus and alignment alternatives. Costs are in millions of year of expenditure dollars.

1. South Willamette River Crossings

Hawthorne	*$ 0*
Caruthers	*$65*
Ross Island	*$59*
Sellwood	*$64*

2. Eastbank Alternatives

McLoughlin	*$ 0*
PTC	*$21*

3. CBD Alternatives

Surface	*$ 0*
Subway	*$275*

4. Portland CBD - Vancouver

I-5	*-$114*
Interstate Avenue	*$ 0*

5. Vancouver - 179th Alternatives

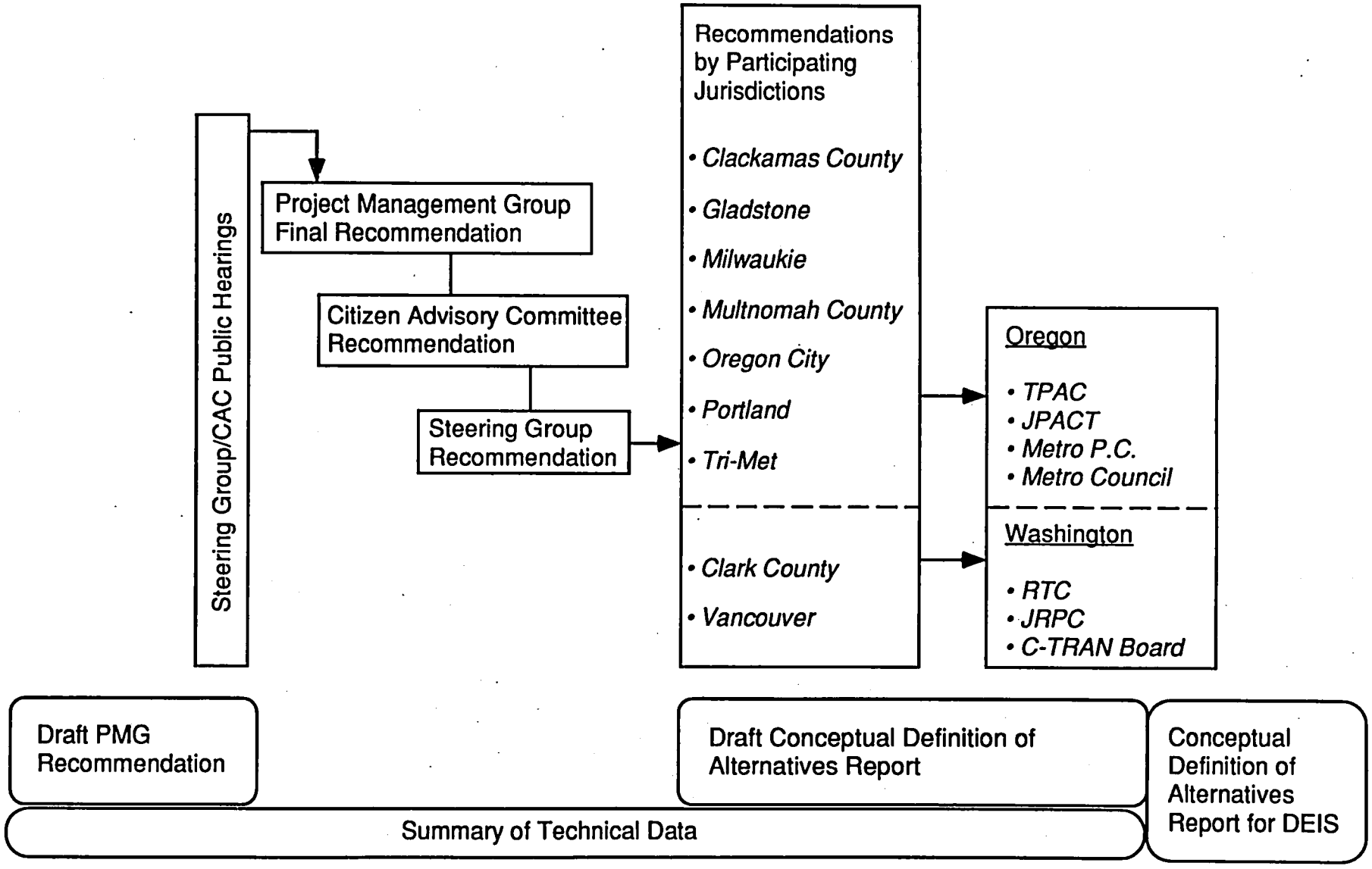
I-5 (east)	*$ 0*
I-5 (west)	*$15*
Highway 99	*$167*

Note: YOE costs reflect a final design and construction schedule, adjustments for inflation, reserve for yet-to-be determined design options, bonding issuance costs, interim borrowing costs and CAPRA.

Appendix C

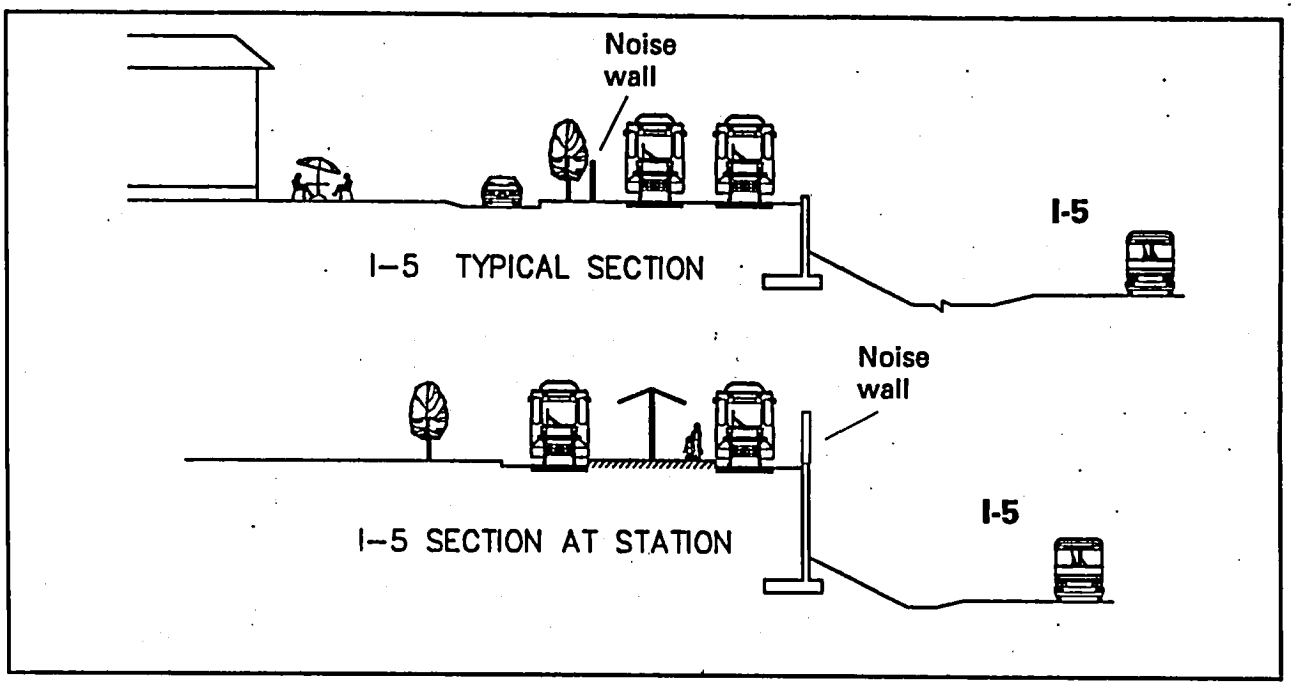
Tier I Process

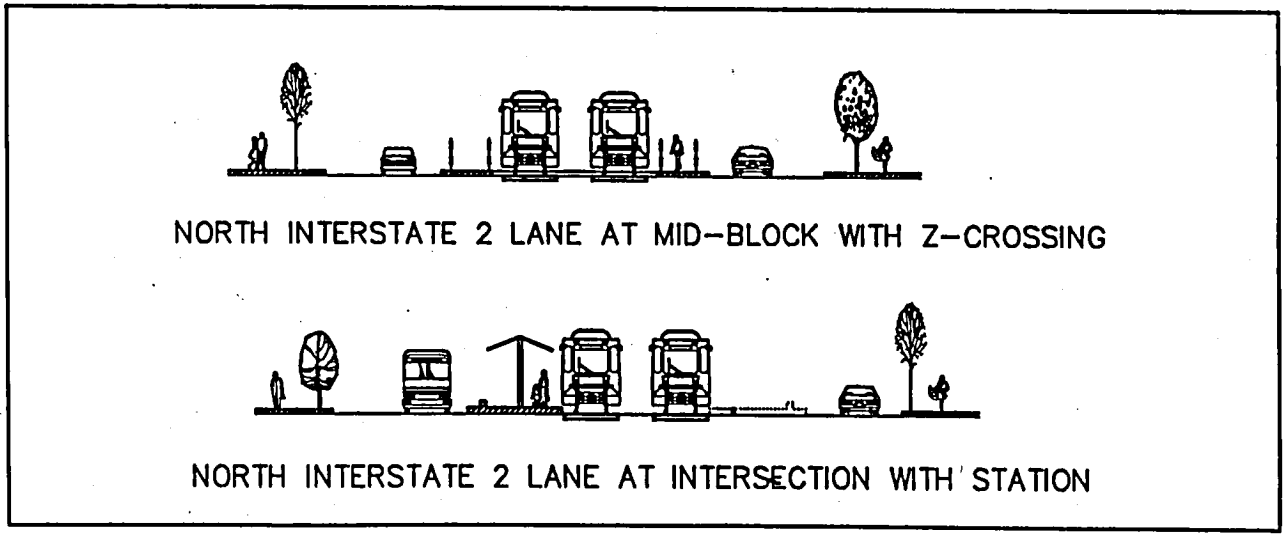
Tier I Decision Process



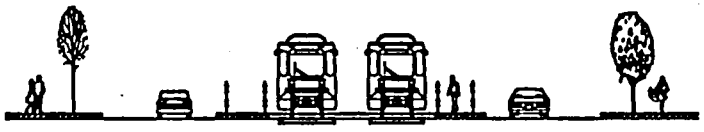
Appendix D

Sample Cross-Section Drawings

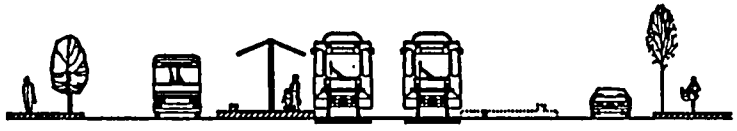




NORTH PORTLAND ALIGNMENT ALTERNATIVES
TYPICAL CROSS SECTIONS



SOUTH MCLOUGHLIN 4 LANE AT MID–BLOCK WITH Z–CROSSING



SOUTH MCLOUGHLIN 4 LANE AT INTERSECTION WITH STATION

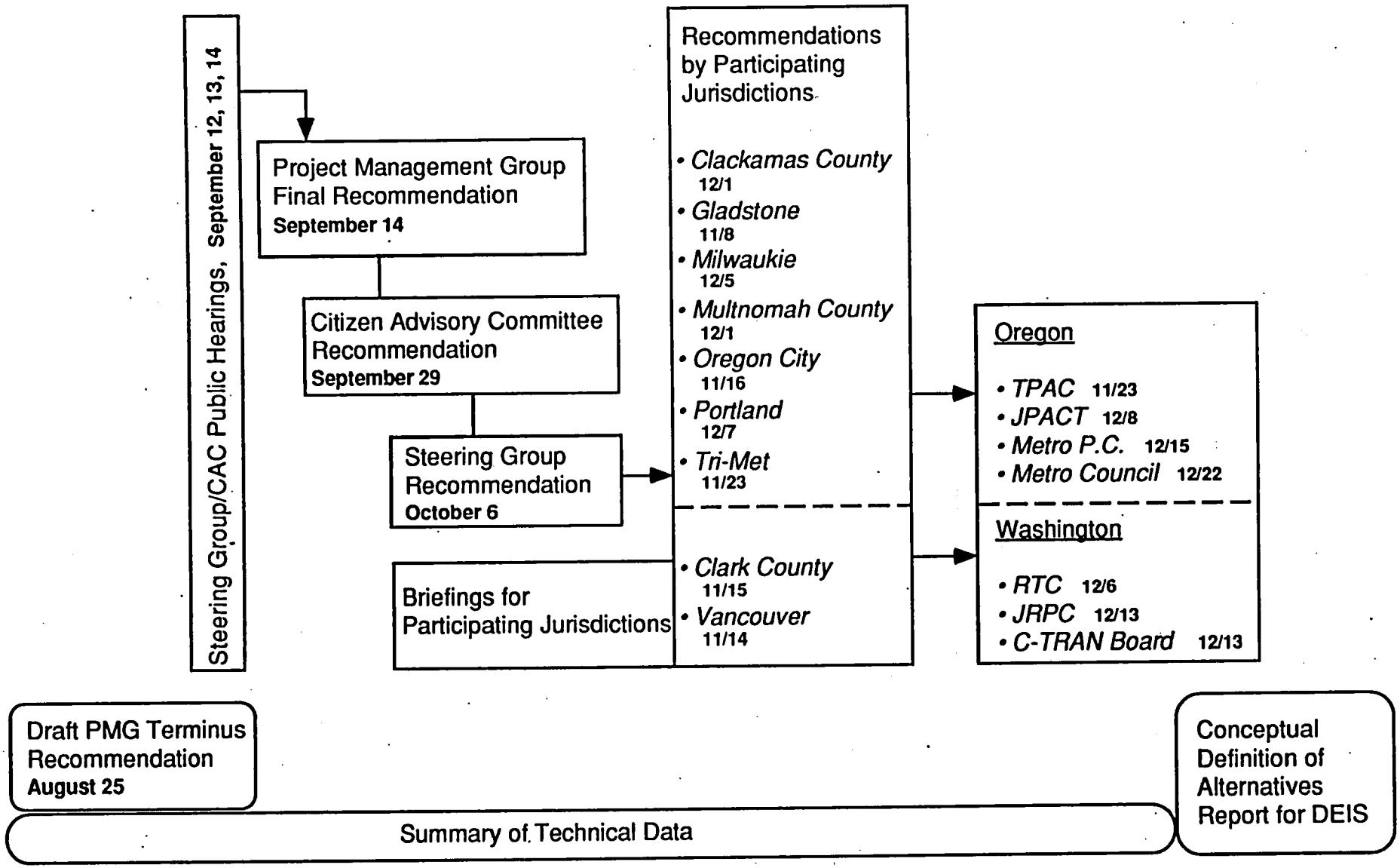
SOUTH MCLOUGHLIN ALIGNMENT ALTERNATIVES
TYPICAL CROSS SECTIONS

Attachment B

RESOLUTIONS OF SOUTH/NORTH PARTICIPATING JURISDICTIONS

- Clackamas County
- City of Gladstone
- City of Milwaukie
- Multnomah County
- Oregon City
- City of Portland
- Tri-Met
- Clark County
- City of Vancouver

Tier I Alternative Selection Process



RESOLUTION NO. 730

RECOMMENDATION OF THE CITY OF GLADSTONE IN SUPPORT OF THE SOUTH/NORTH STEERING GROUP TIER I FINAL RECOMMENDATION REPORT DESCRIBING THE LIGHT RAIL ALTERNATIVES TO ADVANCE INTO THE TIER II DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR FURTHER STUDY.

WHEREAS, in April 1993 Metro Council and the C-TRAN Board of Directors selected the Milwaukie and I-5 North Corridors as the region's next high capacity transit priority for study and combined them into the South/North Corridor to be studied with a federal Alternatives Analysis/Draft Environmental Impact Statement; and

WHEREAS, in October 1993 the Federal Transit Administration approved the South/North application to initiate Alternative Analysis/Draft Environmental Impact Statement and the South/North Preliminary Work Plan, and issued notification of intent in the Federal Register to publish a South/North Draft Environmental Impact Statement; and

WHEREAS, in December 1993 the South/North Steering Group concluded the federally prescribed Scoping Process, which included a comparative analysis of various high capacity transit mode alternatives, by selecting the light rail transit and various light rail terminus and alignment alternatives to advance into Tier I for further study; and

WHEREAS, the South/North Evaluation Methodology Report, as adopted by the South/North Steering Group in December 1993, prescribes the South/North study organization and process for the conclusion of the Tier I study process and the selection of the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the role of the South/North Steering Group in the Tier I study process is to forward its final Tier I recommendation to participating jurisdictions for their consideration, that participating jurisdictions are to forward their recommendations to the C-TRAN Board of Directors and the Metro Council who are to make the final determination of the alternatives to advance into the Tier II Draft Environmental Impact Statement for further study; and

WHEREAS, the Evaluation Methodology Report, further prescribes the criteria and measures to be used to select the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the alternatives that were selected at the conclusion of Scoping have been developed and the criteria and measures from the Evaluation Methodology Report have been developed and documented within various technical memoranda, including the South/North Tier I Technical Summary Report and the South/North Tier I Briefing Document; and

WHEREAS, the technical methodologies, assumptions and results have been reviewed by the South/North Expert Review Panel which found, in summary, that, "The Panel finds that the data developed is sufficient to make the decisions regarding which alternatives should be carried forward for further study;" and

WHEREAS, a comprehensive involvement program was developed and implemented by the South/North Study that included but was not limited to a variety of community meetings, a 60-day public comment period on the Tier I alternatives and data, meetings for the Steering Group to receive oral public comment, and an on-going Citizens Advisory Committee that received staff reports and presentations, provided regular public comment opportunities, and in

September 1994 formed an independent Tier I recommendation that was forwarded to the Steering Group for its consideration; and

WHEREAS, in October 1994 the Steering Group considered the Citizens Advisory Committee and Project Management Group recommendations, public comment and the Tier I criteria and measures and issued its own unanimous Tier I recommendation to the participating jurisdictions, C-TRAN Board of Directors and Metro Council for their consideration; and

WHEREAS, the Steering Group's Final Tier I Recommendation identified the LRT alternatives that they concluded best meet the project's goal and objectives as adopted in December 1993 by the South/North Steering Group within the Evaluation Methodology Report,

NOW, THEREFORE, BE IT RESOLVED THAT THE COMMON COUNCIL OF THE CITY OF GLADSTONE recommends to the Metro Council and the C-TRAN Board of Directors the following approach to continuation of the South/North Transit Corridor Study:

1. *To pursue the South/North Corridor in two study phases:*

   a. *Phase I would consider a Light Rail Transit project between the Clackamas Town Center area (CTC) and the 99th Street area in Clark County.*

   b. *Phase II would consider an extension of the Phase I LRT Project south through Gladstone to Oregon City and north to the 134th Street/WSU area.*

2. *These study phases would proceed as follows:*

   a. *Preparation of the Draft Environmental Impact Statement (DEIS) and funding plan for the Phase I LRT alternative would begin immediately.*

   b. *If LRT is selected as the Locally Preferred Alternative in Phase I, a DEIS and funding strategy for the Phase II LRT extension would be prepared upon completion of the Final Environmental Impact Statement (FEIS) for Phase I.*

3. *The following alignments are alternatives for further study within the Draft Environmental Impact Statement:*

   a. *Between the Portland and Milwaukie CBDs, that the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate Streets in the south, and the McLoughlin Boulevard alignment shall be developed for further study within the DEIS. The Caruthers area crossing will be evaluated further in order to determine whether it should also be included in the Detailed Definition of Alternatives Report and developed further in the DEIS.*

   b. *Within the Portland CBD that a Surface LRT Alternative on 5th and 6th Avenues shall be developed based upon several principles for further study within the DEIS.*

   c. *Between the Vancouver CBD and the 134th/Washington State University branch campus area for both the Phase I and Phase II termini, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 shall be developed for further study within the DEIS;*

4. *Because it has found that further discussions and analysis should occur, a recommendation for the segment between the Portland and Vancouver CBDs shall wait completion of additional technical work and evaluation.*

BE IT FURTHER RESOLVED, THAT THE COMMON COUNCIL OF THE CITY OF GLADSTONE recommends that the C-TRAN Board of Directors and Metro Council adopt the South/North Steering Group Tier I Final Recommendation Report describing the light rail terminus and alignment alternatives to advance into the Tier II Draft Environmental Impact Statement for further study.

This Resolution adopted by the Gladstone City Council and approved by the Mayor this 8th *day of* November, *1994.*

Attest:

Wade Byers

Wade Byers, Mayor

Verna Howell, CMC, City Recorder

11/14/94

RESOLUTION NO. M-2930

A RESOLUTION recommending that the C-TRAN Board of Directors and Metro Council adopt the Tier I Final Recommendation Report which describes the light rail terminal and alignment alternatives and recommends that the process advance to the Tier II, Draft Environmental Impact Statement stage.

WHEREAS, in April 1993 Metro Council and the C-TRAN Board of Directors selected the Milwaukie and I-5 North Corridors as the region's next high capacity transit priority for study and combined them into the South/North Corridor to be studied within a federal Alternatives Analysis/Draft Environmental Impact Statement; and

WHEREAS, in October 1993 the Federal Transit Administration approved the South/North application to initiate Alternative Analysis/Draft Environmental Impact Statement and the South/North Preliminary Work Plan, and issued notification of intent in the *Federal Register* to publish a South/North Draft Environmental Impact Statement; and

WHEREAS, in December 1993 the South/North Steering Group concluded the federally prescribed Scoping Process, which included a comparative analysis of various high capacity transit mode alternatives, by selecting the light rail transit and various light rail terminus and alignment alternatives to advance into Tier I for further study; and

WHEREAS, the South/North *Evaluation Methodology Report*, as adopted by the South/North Steering Group in December 1993, prescribes the South/North study organization and process for the conclusion of the Tier I study process and the selection of the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the role of the South/North Steering Group in the Tier I study process is to forward its final Tier I recommendation to participating jurisdictions for their consideration, that participating jurisdictions are to forward their recommendations to the C-

TRAN Board of Directors and the Metro Council who are to make the final determination of the alternatives to advance into the Tier II Draft Environmental Impact Statement for further study; and

WHEREAS, the *Evaluation Methodology Report,* further prescribes the criteria and measures to be used to select the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the alternatives that were selected at the conclusion of Scoping have been developed and the criteria and measures from the *Evaluation Methodology Report* have been developed and documented within various technical memoranda, including the *South/North Tier I Technical Summary Report* and the *South/North Tier I Briefing Document*; and

WHEREAS, the technical methodologies, assumptions and results have been reviewed by the South/North Expert Review Panel which found, in summary, that, " The Panel finds that the data developed is sufficient to make the decisions regarding which alternatives should be carried forward for further study;" and

WHEREAS, a comprehensive public involvement program was developed and implemented by the South/North Study that included but was not limited to a variety of community meetings, a 60-day public comment period on the Tier I alternatives and data, meetings for the Steering Group to receive oral public comment, and an on-going Citizens Advisory Committee that received staff reports and presentations, provided regular public comment opportunities, and in September 1994 formed an independent Tier I recommendation that was forwarded to the Steering Group for its consideration; and

WHEREAS, in October 1994 the Steering Group considered the Citizens Advisory Committee and Project Management Group recommendations, public comment and the Tier I criteria and measures and issued its own unanimous Tier I recommendation to the participating jurisdictions, C-TRAN Board of Directors and Metro Council for their consideration; and

WHEREAS, the Steering Group's Final Tier I Recommendation identifies the LRT alternatives that they concluded best meet the project's goal and objectives as adopted in December 1993 by the South/North Steering Group within the *Evaluation Methodology Report*; and

WHEREAS, on November 7, 1994 the Vancouver City Council adopted the Vancouver Urban Area Comprehensive Plan which strongly emphasizes alternative modes of transportation, including light rail transit,

NOW THEREFORE,

BE IT RESOLVED BY THE CITY OF VANCOUVER:

Section 1. That the City of Vancouver recommends to the Metro Council and the C-TRAN Board of Directors the following approach to continuation of the South/North Transit Corridor Study:

1. To pursue the South/North Corridor in two study phases:
   a. Phase I would consider a Light Rail Transit project between the Clackamas Town Center area (CTC) and the 99th Street area in Clark County.
   b. Phase II would consider an extension of the Phase I LRT Project south to Oregon City and north to the 134th Street/WSU area.
2. These study phases would proceed as follows:
   a. Preparation of the Draft Environmental Impact Statement (DEIS) and funding plan for the Phase I LRT alternative would begin immediately.
   b. If LRT is selected as the Locally Preferred Alternative in Phase I, a DEIS and funding strategy for the Phase II LRT extension would be prepared upon completion of the Final Environmental Impact Statement (FEIS) for Phase I.

3. The following alignments are alternatives for further study within the Draft Environmental Impact Statement:

   a. Between the Portland and Milwaukie CBDs, that the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate streets in the south, and the McLoughlin Boulevard alignment shall be developed for further study within the DEIS. The Caruthers area crossing will be evaluated further in order to determine whether it should also be included in the *Detailed Definition of Alternatives Report* and developed further in the DEIS.

   b. Within the Portland CBD that a Surface LRT Alternative on 5th and 6th Avenues shall be developed based upon several principles for further study within the DEIS.

   c. Between the Vancouver CBD and the 134th/Washington State University branch campus area for both the Phase I and Phase II termini, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 shall be developed for further study within the DEIS.

4. Because it has found that further discussions and analysis should occur, a recommendation for the segment between the Portland and Vancouver CBDs shall wait completion of additional technical work and evaluation.

and further, BE IT RESOLVED BY THE CITY OF VANCOUVER:

Section 2. That the City of Vancouver recommends that the C-TRAN Board of Directors and Metro Council adopt the South/North Steering Group *Tier I Final Recommendation Report* describing the light rail terminus and alignment alternatives to advance into the Tier II Draft Environmental Impact Statement for further study.

ADOPTED at regular session of the Council of the City of Vancouver, at

_____ day of _____, 1994.

Bruce E. Hagensen, Mayor

Attest:

_____

H. K. Shorthill, City Clerk

Approved as to form:

_____

Ted H. Gathe, City Attorney

H:\COUNCIL\RCTRAN.118

CLARK COUNTY, WASHINGTON

RESOLUTION NO. 1994-11-31

RECOMMENDATION OF THE BOARD OF COUNTY COMMISSIONERS OF CLARK COUNTY IN SUPPORT OF THE SOUTH/NORTH STEERING GROUP TIER I FINAL RECOMMENDATION REPORT DESCRIBING THE LIGHT RAIL ALTERNATIVES TO ADVANCE INTO THE TIER II DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR FURTHER STUDY.

WHEREAS, in the April 1993 Metro Council and the C-TRAN Board of Directors selected the Milwaukie and I-5 North Corridors as the region's next high capacity transit priority for study. These corridors were identified as the South/North Corridor for further study within the federal Alternatives Analysis/Draft Environmental Impact Statement. In October 1993, the Federal Transit Administration approved the South/North application to initiate the Alternative Analysis/Draft Environmental Impact Statement and a South/North Preliminary Work Plan. In addition, the Federal Transit Administration issued a notification of intent in the *Federal Register* to publish a South/North Draft Environmental Impact Statement.

In December 1993, the South/North Steering Group concluded the federally prescribed Scoping Process, which included a comparative analysis of various high capacity transit mode alternatives. Based on this analysis, the light rail transit and various light rail terminus and alignment alternatives were advanced into the Tier I phase for further study. In addition, the South/North Steering Group adopted the *South/North Evaluation Methodology Report* prescribing the South/North study organization and process for the conclusion of the Tier I study process and selection of the alternatives to advance into Tier II and the Draft Environmental Impact Statement. From the completed work of Tier I, the South/North Steering Group developed a set of recommendations for consideration from participating jurisdictions. These jurisdictions will forward their recommendations on to the C-TRAN Board of Directors and the Metro Council who will make the final determination of the alternatives to advance into the Tier II Draft Environmental Impact Statement. The *Evaluation Methodology Report* describes the criteria and measures to be used to select the alternatives into Tier II and the Draft Environmental Impact Statement.

The alternatives that were selected at the conclusion of Scoping have been developed and the criteria and measures from the *Evaluation Methodology Report* have been developed and documented within various technical memorandum, including the *South/North Tier I Technical Summary Report* and the *South/North Tier I Briefing Document.*

These recommendations of the Steering Group were developed with input from the South/North Expert Review Panel, Citizen Advisory Committee, and the general public. A comprehensive public involvement program was developed which yielded many opportunities for citizens to participate through community meetings, and a 60-day comment period on Tier I alternatives and data. In addition, the Citizen Advisory Committee in September 1994 formed an independent Tier I recommendation that was forwarded to the Steering Group for its consideration.

In October 1994 the Steering Group considered the Citizen Advisory Committee and Project Management Group recommendations, public comment and the Tier I criteria and measures

and issued its own unanimous Tier I recommendation to the participating jurisdictions, C-TRAN Board of Directors and Metro Council for their consideration. In addition, the Growth Management planning process supports these recommendations throughout the Clark County region. Moreover, the Steering Group's Final Tier I Recommendation identifies the Light Rail Transit alternatives that they concluded best meeting the project's goal and objectives as adopted in December 1993 by the South/North Steering Group within the *Evaluation Methodology Report.*

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Figure 1 illustrates the Tier I terminus and alignment alternatives that will advance into the Tier II Draft Environmental Impact Statement (DEIS) for further study.

Following is a summary of the South/North study approach adopted by the Metro Council and C-TRAN Board of Directors:

- The South/North Corridor Project will be pursued in two study phases:

  [a] Phase I will consider a Light Rail Transit project between the Clackamas Town Center area and the 99th Street area in Clark County.

  [b] Phase II will consider an extension of the Phase I Light Rail Transit Project south to Oregon City and north to the 134th Street/Washington State University area.

- The study phases will be implemented as follows:

  [a] Preparation of the Draft Environmental Impact Statement (DEIS) and funding plan for the Phase I LRT alternative will begin immediately.

  [b] If LRT is selected as the Locally Preferred Alternative in Phase I, a DEIS and funding strategy for the Phase II LRT extension will be prepared upon completion of the Final Environmental Impact Statement (FEIS) for Phase I.

- The following alignment alternatives will be studied further within the Phase I Draft Environmental Impact Statement:

  [a] Between the Portland and Milwaukie Central Business Districts, the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate streets in the south, and the McLoughlin Boulevard alignment will be developed for further study within the DEIS. The Caruthers area crossing will be evaluated further in order for the C-TRAN Board of Directors and Metro Council to determine whether it should also be included in the *Detailed Definition of Alternatives Report* and developed further in the DEIS. Both the Ross Island and Caruthers alternatives will be provided equal consideration through this further evaluation.

  [b] Within the Portland CBD a Surface LRT Alternative on 5th and 6th Avenues will be developed based upon several principles for further study within the DEIS. If at the time the DEIS is initiated it is concluded that a 5th/6th Avenue surface alignment cannot be developed that addresses those principles, other alternatives will be developed for further study in the DEIS.

[c] Between the Vancouver CBD and the vicinity of 99th Street, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 will be developed for further study within the DEIS.

- Because further discussions and analysis should occur, the selection by the Metro Council and the C-TRAN Board of Directors of an alternative for further study for the segment between the Portland and Vancouver central business districts shall wait completion of additional technical work and evaluation.

- The following alignments will be considered for the Phase II extensions:

  a. Following completion of the *Detailed Definition of Alternatives Report*, an analysis of the I-205 alignment from the CTC terminus and the McLoughlin alignment from the Milwaukie CBD will be made to determine which alignment will advance into the Phase II DEIS. The Portland Traction (PTC) right-of-way will not be considered as a Phase II alignment.

  b. Between the vicinity of 99th Street and the area of 134th Street/WSU Branch Campus, the I-5 East alignment will advance into the Phase II DEIS.

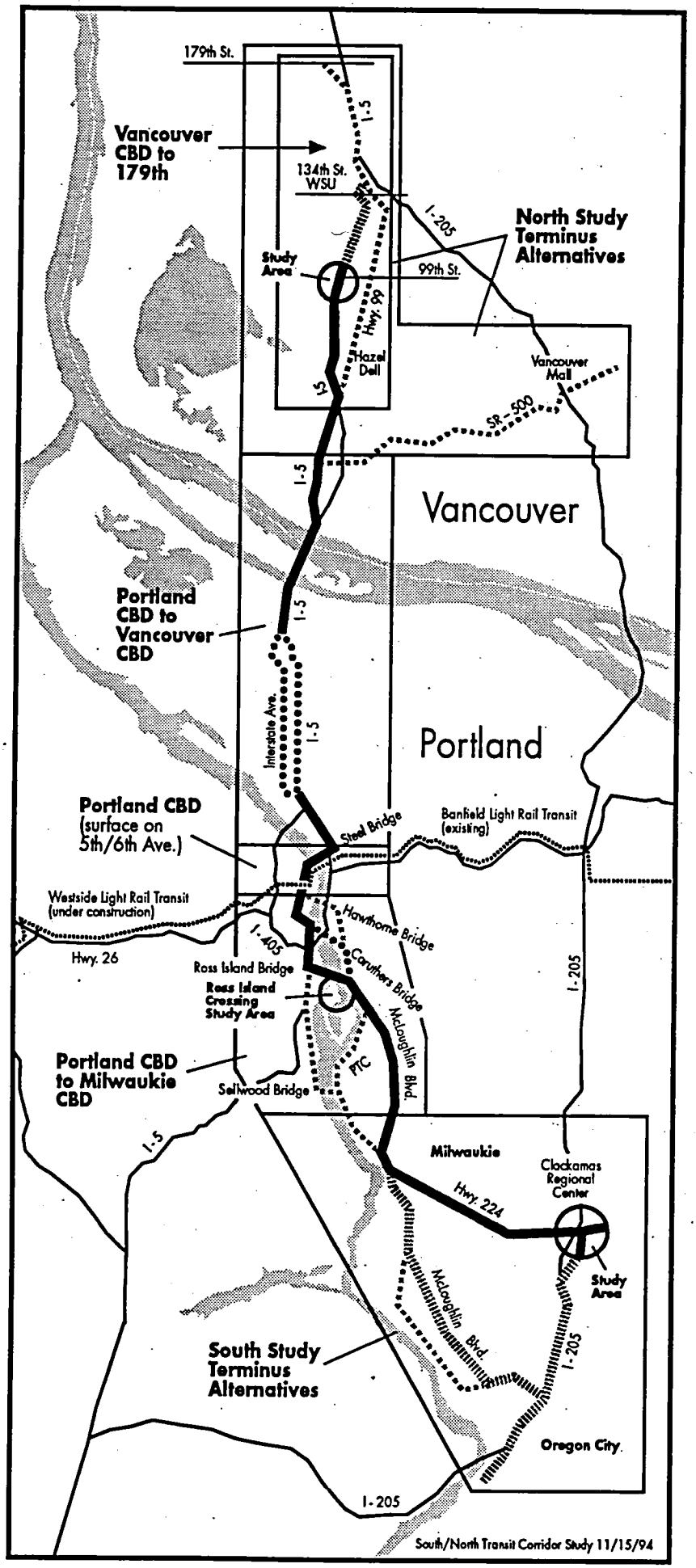
- The Phase I LRT alignment alternative between Clackamas Town Center and 99th Street area is estimated to:

  [a] Serve almost 20 million trips per year,

  [b] Help manage growth and reduce air pollution, traffic and vehicle-miles-of-travel; and

  [c] Cost approximately $2.85 billion in inflated (year-of-expenditure) dollars.

South North
Transit Corridor Study



Metro Council
C-TRAN Board of Directors

South/North Terminus and Alignment Alternatives Approved for Further Study

- ━━━ To be studied within the Tier II DEIS
- ••••••••• Pending further Tier I analysis and public comment
- ▪▪▪▪▪▪▪▪▪▪ To be studied later in Phase II
- ····· Removed from further study

Figure 1

INTRODUCTION

1.1 Purpose

This *South/North Tier I Final Report* identifies (1) the South/North Light Rail Transit (LRT) terminus and alignment alternatives to be advanced into the Tier II Draft Environmental Impact Statement (DEIS) and (2) policies and actions related to other aspects of the South/North Transit Corridor Study. As the alignment alternatives are narrowed, more detailed "Design Options" will remain under study and will be addressed in the *Detailed Definition of Alternatives Report.*

The C-TRAN Board of Directors and Metro Council adopted this report at their regular meetings in December 1994. Adoption of the *Tier I Final Report* concludes a public selection process that was initiated in August 1994 with the preparation of draft terminus alternative recommendations by the South/North Project Management Group (PMG). On September 14, 1994, following conclusion of the Tier I public comment period, the PMG adopted its final Tier I terminus and alignment recommendations. After receiving the PMG final recommendation the South/North Citizens Advisory Committee (CAC) adopted its Tier I final recommendation on September 29, 1994. Both the PMG and CAC final recommendations were forwarded to the South/North Steering Group which adopted its final recommendation on October 6, 1994. Next, the participating jurisdictions and agencies reviewed the Steering Group recommendation and adopted independent recommendations in November and early December 1994. Those recommendations were forwarded to the C-TRAN Board of Directors and Metro Council for final adoption of this *Tier I Final Report* that delineates the LRT alternatives to advance into the Tier II DEIS for further study. Remaining alignment alternative choices described below will be made through a similar process.

1.2 Background

Because of its size and complexity, the South/North Transit Corridor Study and Draft Environmental Impact Statement (DEIS) process is being undertaken in two steps called "Tiers":

- Tier I focused on evaluating modal alternatives (busways, river transit, commuter and light rail), alignment alternatives, design options and terminus alternatives in order to narrow the number of alternatives to be addressed in the DEIS.

- Tier II will focus on preparing a DEIS on the narrowed set of LRT alternatives and a No-Build alternative. Tier II will conclude with the selection of the Locally Preferred Alternative.

Tier I started in mid-1993 with the initiation of the federally-mandated Scoping Process. The Federal Transit Administration's intent to publish an environmental impact statement for the South/North Transit Corridor was issued in the *Federal Register* on October 12, 1993. Based on analyses and public input provided during Scoping, the high capacity transit alternatives were narrowed to one mode -- light rail transit. Scoping (as amended by the Steering Group in May 1994) also identified:

- Four south (Clackamas County) and five north (Clark County) *Terminus Alternatives* for the LRT.

- Two or more *Alignment Alternatives* for each of five defined segments of the LRT alignment.

- Detailed *Design Options* for several of the LRT alignment alternatives.

After Scoping, staff prepared technical analyses of the terminus and alignment alternatives. These analyses are documented in the *Tier I Technical Summary Report* and the *Tier I Briefing Document*. In addition, an extensive public involvement process on the alternatives and options was conducted. These data and public input serve as the basis for this draft recommendation.

This *Tier I Final Report:*

- Defines a two-phase study approach for pursuing the proposed project.

- Identifies the Terminus and Alignment Alternatives which will be advanced into the Tier II Draft Environmental Impact Statement (DEIS).

- Identifies strategies regarding how to proceed with yet-to-be decided issues and/or refinements associated with the recommended alternatives.

In addition to the *Tier I Final Report*, two other reports will be prepared before work starts on the DEIS:

- The *Conceptual Definition of Alternatives Report* will be based upon the actions of the C-TRAN Board of Directors and Metro Council and will provide a general description of the LRT alignment, termini and other project elements for information purposes, primarily for the Federal Transit Administration (FTA). It will also provide a general description of the No-Build alternative.

- The *Detailed Definition of Alternatives Report* will specify the proposed LRT alignment, design, park-and-ride lot locations, station locations, maintenance facility and other project elements in detail and will serve as the basis for the DEIS. It will also provide a detailed description of the No-Build alternative.

Those elements of the LRT alternative that are not addressed in the *Tier I Final Report* will be addressed in these reports.

1.3 Public Involvement

The adoption of the *Tier I Final Report* by Metro Council and the C-TRAN Board of Directors follows a lengthy period and numerous opportunities for public review of the Tier I technical

information and public comment on the Tier I alternatives. The public comment period began in July 1994 with notification of the availability of the draft *Tier I Technical Summary Report,* the draft *Briefing Document* and the draft *Tech Facts.* The public was also invited to attend four public open houses to review the Tier I alternatives and technical information and to discuss the information and alternatives with project staff and participating agency representatives. In July and August 1994, meetings with individual neighborhood and business associations were held throughout the Corridor by study staff and participating jurisdictions.

In August 1994, the *Briefing Document* and *Tech Facts* were revised to reflect new or corrected information and the public was asked to attend four meetings to allow the Steering Group to receive public comment on the Tier I technical information. Oral and written comments were received at the four meetings and additional written comments were received during the comment period which ran through September 13, 1994. Those oral and written comments have been compiled and summarized in a report titled *Narrowing the Options: Summary of Tier I Public Meetings and Comments.* A supplement to the *Summary of Public Meetings and Comments* has been issued documenting the public meetings held and comments received between the close of the public comment period and the adoption of the *Tier I Final Report.*

1.4 Organization of the *Tier I Final Report*

This report is divided into four chapters:

- **Chapter 1: Introduction** defines the purpose and background of the report.
- **Chapter 2: South/North Alternatives Adopted for Further Study** defining the Phase I and Phase II terminus alternatives and alignment alternatives that will be advanced for further study..
- **Chapter 3 : Rationale for Selection of Terminus Alternatives for Further Study** documents the reasons for the Steering Group's recommendations regarding the Phase I and Phase II terminus alternatives.
- **Chapter 4: Rationale for Selection of Alignment Alternatives for Further Study** documents the reasons for the Steering Group's recommendations regarding the alignment alternatives.

ALTERNATIVES SELECTED FOR FURTHER STUDY

2.1 Project Phasing

1. The South/North Project will be pursued in two study phases:

   [a] Phase I will consider the light rail transit alternative, described below, which Metro Council and the C-TRAN Board of Directors have found best meets the evaluation criteria established for Tier I and is also constrained by current estimates of potential funding. Work on the Draft Environmental Impact Statement for the Phase I alternative will begin immediately.

   [b] Phase II will consider a future extension of the South/North LRT to the potential end-points in Clackamas and Clark Counties, if LRT is selected as the locally preferred alternative in Phase I. The DEIS and funding plan for the Phase II LRT extension will be prepared upon completion of the Final EIS for Phase I.

2. In compliance with FTA requirements, Minimum Operable Segment(s) will be identified in each DEIS. Construction of a Phase may occur in Minimum Operable Segment(s) to accommodate funding schedules and/or availability.

2.2 South Terminus

2.2.1 Phase I South Terminus

1. The *Clackamas Town Center* area will be the Phase I South Terminus of the S/N LRT Alternative studied in the Draft Environmental Impact Statement (DEIS).

2. The specific location of the Phase I terminus within the Clackamas Town Center area and the associated alignment, station locations and park-and-ride location within the area need further analysis. Accordingly, staff shall:

   [a] Establish a special study area in the Clackamas Town Center area which extends east to Sunnyside and south to Highway 224.

   [b] Evaluate specific "eastward-oriented" (e.g. heading toward Kaiser Hospital) and "southward-oriented" (e.g. heading toward Oregon City) Phase I terminus and alignment options within the Town Center study area.

   [c] Ensure that appropriate park-and-ride access and capacity be provided with the Phase I terminus.

[d] Recommend a refined Phase I terminus and alignment within the Clackamas Town Center area in the *Detailed Definition of Alternatives Report.*

3. Clackamas County shall be asked to review revised land use plans for the Clackamas Town Center area to ensure a more pedestrian and transit friendly land use pattern which supports the Town Center area's designation as a Regional Center in the draft 2040 Plan and as the Phase I South Terminus of the South/North LRT alternative.

2.2.2 Phase II South Terminus

1. Metro will consider the incorporation of policies in the Regional Transportation Plan (RTP) and Regional Framework Plan which call for a Phase II extension of the South/North LRT Alternative to *Oregon City.*

2. In conjunction with the analysis described in Section 2.2.1.2(b), staff will evaluate the I-205 alignment from the CTC area terminus and McLoughlin Boulevard alignment from the Milwaukie CBD for the Phase II extension to Oregon City and establish a preferred Phase II alignment for consideration by Metro Council for inclusion in the RTP and Regional Framework Plan. Work on selecting a preferred Phase II alignment will begin upon completion of the Phase I *Detailed Definition of Alternatives Report.* The Portland Traction (PTC) right-of-way will not be considered as a Phase II alignment.

3. Local jurisdictions along the proposed Phase II alignment shall be asked to consider revisions to their land use plans which encourage transit supportive land uses along the Phase II alignment. Such revisions, if adopted, will be outlined in the Phase II DEIS as "committed actions" and could greatly facilitate Federal Transit Administration (FTA) approval of a Phase II extension. Such actions, if adopted, will also be reflected in the Phase II land-use analysis and ridership forecasts.

4. The Cove development currently being pursued by Oregon City through its urban renewal plan is regionally significant in terms of (i) the alignment choice and future feasibility of the Phase II LRT extension to Oregon City and (ii) regional objectives encouraging Transit Oriented Districts (TODs). Accordingly, Metro and Oregon City shall pursue the following course of action:

   [a] The alignment and policies regarding the Phase II extension of the South/ North LRT being prepared by Metro and the site plan and land uses for the Cove development being prepared by Oregon City should be integrated.

   [b] The site plan for the Cove development should preserve right-of-way for the Phase II extension of South/North LRT.

[c] Plans for feeder bus service for the Phase I LRT alternative should provide service to the Cove development in a manner which supports a transit supportive land use pattern during the interim period.

[d] Based on the resulting RTP and Regional Framework Plan, funding for improvements which are needed to support a transit oriented development within the Cove area and/or are needed to preserve the right-of-way for the proposed Phase II LRT extension through the Cove development shall be a priority for the allocation of regional TOD or other appropriate funds.

5. If LRT is extended along I-205 to Oregon City and if a development proposal and plan for the 80-acre Seventh-Day Adventist (SDA) property in Gladstone is prepared and moves toward implementation, an approach similar to that described above in Section 2.2.2(4) for the Cove development shall be undertaken for the SDA property by Metro, the City of Gladstone and Clackamas County.

6. Tri-Met shall be asked to plan for high-quality feeder bus service between Oregon City and the Phase I LRT transit centers to help develop transit and land use patterns which facilitate a future Phase II extension of the South/North LRT.

2.3 North Terminus

2.3.1 Phase I North Terminus

1. The *99th Street* area is the Phase I North Terminus for the South/North LRT Alternative that will be studied further in the DEIS.

2. The specific station and park-and-ride lot locations within the 78th Street to the 99th Street area need further analysis to determine how best to accommodate park-and-ride demand. Accordingly, staff shall:

   [a] Establish a special study area between 78th Street and 99th Street area.

   [b] Evaluate park-and-ride lot opportunities and the land use and transportation impacts associated between 78th Street and the 99th Street area.

   [c] Recommend a refined station and park-and-ride lot locations within the special study area in the *Detailed Definition of Alternatives Report.*

2.3.2 Phase II North Terminus

1. Metro and RTC shall be asked to consider incorporating policies in their respective Regional Transportation Plans (RTPs) and Clark County and the City of Vancouver shall be asked to

incorporate policies in their Growth Management Plans that call for a proposed Phase II extension of the South/North LRT Alternative to the *134th Street/WSU area.*

2. Clark County, RTC, the City of Vancouver and C-TRAN staff shall be asked to review land use plans for the proposed Phase II LRT terminus area to ensure transit supportive land use patterns are integrated with the proposed Phase II terminus and alignment alternatives. The resulting actions, if adopted, will be outlined in the Phase II DEIS as "committed actions" and could greatly facilitate FTA approval of a Phase II extension. Such actions, if adopted, would also be reflected in the Phase II land-use analysis and ridership forecasts.

3. The planned activity center and Washington State University (WSU) campus development in the vicinity of 134th Street and I-5 are critical to the future feasibility of the Phase II LRT extension to the 134th Street/WSU area. Accordingly, Clark County, RTC, the City of Vancouver and C-TRAN staff shall work with WSU officials and other developers in the area to ensure transit supportive land uses are developed in and around the proposed Phase II LRT terminus area and that required right-of-way is preserved.

4. C-TRAN shall be asked to plan for provision of high-quality feeder bus service between the 134th Street/WSU area (in particular, the WSU campus) and the 99th Street area (the Phase I north terminus) to help develop transit and land use patterns which facilitate a future Phase II extension of the South/North LRT.

2.4 Portland CBD to Milwaukie/South Willamette River Crossing Alignment Alternative

1. The *Ross Island Bridge Crossing Alternative* and *McLoughlin Boulevard Alignment Alternative* are the LRT alignment alternatives in the segment from the Portland CBD to Milwaukie/South Willamette River Crossing that will be studied further within the Tier II of the DEIS.

2. The Caruthers area crossing will be evaluated further in order to allow the C-TRAN Board of Directors and Metro Council to determine whether it should also be included in the *Detailed Definition of Alternatives Report* and developed further in the DEIS.

   [a] Determine the costs, travel demand and local and regional land use and development benefits of linking the Caruthers Crossing with the Brooklyn Yards alignment.

   [b] Refine the ridership potential of the OMSI Station to fully reflect current plans and policies regarding the Portland General Electric "Station L" redevelopment site, the Central Eastside Industrial Area and OMSI. Determine whether local redevelopment opportunities are feasible and provide assurances necessary to meet local and regional land use and development objectives.

[c] Evaluate Caruthers Bridge designs to see if they could provide adequate access to both the North Macadam Redevelopment Area and the OMSI area.

[d] Evaluate alternate bridge designs, alignment options and station locations for a Caruthers area crossing and recommend a refined bridge, alignment and station location design for inclusion within the *Detailed Definition of Alternatives Report* if a Caruthers area crossing is selected for advancement into the DEIS.

3. The location of the Ross Island area river crossing, bridgeheads and stations in this segment will receive further analysis to determine how to serve as much of the North Macadam redevelopment area and S.E. residential areas as possible. Further, if a Caruthers area crossing is selected to advance into the DEIS then its design will be refined and included within the *Detailed Definition of Alternatives Report.* Accordingly, staff shall:

   [a] Establish special study areas on the east and west banks of the Willamette River which are generally bounded by the Ross Island Bridge and S.W. Gibbs Street in the north and Bancroft Street and Holgate Boulevard in the south.

   [b] Evaluate alternative bridge locations, alignment options and station locations(s) within these study areas which provide for optimal light rail coverage to S.E. Portland neighborhoods and the North Macadam Area.

   [c] Recommend a refined location for the Ross Island area LRT bridge, associated alignment and stations in the *Detailed Definition of Alternatives Report* based on an assessment of development opportunities, costs, environmental considerations and engineering constraints.

   [d] Refine the ridership potential of westbank stations to fully reflect current plans and policies for the North Macadam Redevelopment Area. Determine whether local redevelopment opportunities are feasible and provide assurances necessary to meet local and regional land use and development objectives.

4. Both the Ross Island and Caruthers Alternatives will be provided equal consideration through this further evaluation. Accordingly, staff shall:

   [a] Provide a local selection process identical to the process that led to the adoption of this report to consider this further analysis and to determine whether to advance the Caruthers Crossing Alternative into the Tier II DEIS.

   [b] Work with interested parties to develop and evaluate the design options described above.

   [c] Continue to undertake planning and engineering work for the LRT alignment alternatives that allows for an Eastside transit connection.

2.5 Portland CBD Alignment Alternative

1. The Surface LRT Alternative on 5th and 6th Avenues within the Portland CBD will be developed in detail for further study within the Tier II DEIS.

2. Because of the critical function that the Portland CBD segment plays in the South/North Corridor, the study of the 5th/6th Avenue Surface Alignment is based upon the following principles:

   [a] To accommodate bus, light rail, general purpose automobile and pedestrian travel on the 5th/6th Avenue Transit Mall.

   [b] To develop for further evaluation Surface LRT Transit Mall design options that accommodate those modes of travel using both a three-lane and a four-lane configuration. The designs will address sidewalk widths, street trees and other amenities which are critical to a pedestrian friendly environment.

   [c] To retain automobile access on essential blocks that directly serve the Hilton Hotel, parking garages that enter and/or exit onto the Transit Mall and other important locations as determined through a collaborative process with interested downtown parties.

   [d] To establish the light rail station locations that will optimize both light rail access and automobile access on the Transit Mall. In general, those locations will be (1) near the PSU campus; (2) near City Hall; (3) near Pioneer Square; (4) south of Burnside; and (5) one or two stations to serve the Old Town, Union Station and north River District areas.

   [e] To work with the Downtown Portland community in developing the Surface LRT Transit Mall options for further study and in selecting the locally preferred alternative.

   [f] To develop the refined surface alternative(s) that address these principles for inclusion in the adoption of the *Detailed Definition of Alternatives Report*, and that if at that time it is concluded that a 5th/6th Avenue Surface Alignment cannot be developed that addresses those principles, other alternatives would be developed for further study within the Draft Environmental Impact Statement.

2.6 Portland CBD to Vancouver CBD Alignment Alternative

1. While the existing technical data and public comments have been valuable in understanding tradeoffs between the Interstate Avenue and I-5 alignments, additional information and discussions are needed to produce a clear basis for a determination of the preferred LRT alignment between the Portland and Vancouver CBDs. Therefore project staff shall:

   [a] Conclude discussions on the relative land use impacts of the alignment alternatives and their ability to meet community objectives; and,

[b] Conclude more detailed analysis of traffic and pedestrian movement impacts of the alignment alternatives.

2. Further, modified alternatives which merge the I-5 alignment with portions of the Interstate Avenue alignment north of Skidmore Street shall be undertaken to determine if a modified I-5 alignment can achieve the land use and neighborhood benefits associated with the Interstate alignment at a lower cost. Therefore, project staff shall:

   [a] Establish a special study area bounded by Skidmore Street and the Columbia Slough.

   [b] Identify and evaluate modified I-5 alignment alternatives which (i) merge segments of the I-5 alignment with segments of the Interstate Avenue alignment within the special study area and/or (ii) more centrally serve the Kenton neighborhood.

   [c] Address issues regarding the location of the Columbia Slough crossing.

3. Finally, the Metro Council and the C-TRAN Board of Directors intend to determine the preferred alignment between the Portland and Vancouver CBDs by the time the *Detailed Definition of Alternatives Report* is finalized using the following: (i) existing technical information and public comment; (ii) new technical information and discussions described in section 2.6.2 (a) and (b); and, (iii) the analysis of modified alignment alternatives described in section 2.6.3.

2.7 Vancouver CBD to 134th Street/WSU Area Alignment Alternative

1. The *I-5 East Alignment Alternative* is the alignment alternative in the segment from Vancouver CBD to the vicinity of 99th Street that will be studied further in the Tier II DEIS.

2. The *I-5 East Alignment Alternative* is the alignment between the vicinity of 99th Street and 134th Street/WSU area that will be proposed for inclusion in the RTP and Growth Management Plan policies regarding the Phase II extension of the South/North LRT.

3. Prior to finalizing the *Detailed Definition of Alternatives Report*, project staff will conduct a study of station areas in the Hazel Dell area to determine the best east/west cross-street locations for stations, pedestrian connections and park-and-ride lots and to determine the best location for those stations between I-5 and Highway 99. Following conclusion of the DEIS based upon those station locations, further study and refinement of the station locations may be required to meet transportation, transit service and development/redevelopment objectives.

2.8 Design Options

1. Within the alignment alternatives recommended above, the following more detailed "Design Options" remain under study and will be addressed in the *Detailed Definition of Alternatives Report*:

   [a] The alignment through the Vancouver CBD.

   [b] The Columbia River Crossing (high bridge, lift span bridge or tunnel).

   [c] The alignment between the Steel Bridge, Emanuel Hospital and the Kaiser Medical Center.

   [d] The alignment through Milwaukie.

   [e] The alignment between Milwaukie and the Clackamas Town Center.

   [f] The locations of park-and-ride lots, transit centers, stations and maintenance facilities.

   [g] Downtown Portland alignment details.

   [h] Other design options as required.

RATIONALE FOR TERMINUS ALTERNATIVES SELECTED FOR FURTHER STUDY

The following conclusions and supporting information summarize the basis for Metro Council's and the C-TRAN Board of Director's selection of the South/North LRT terminus alternatives:

3.1 Rationale for the Two-Phase Implementation

- *Ultimately, a South/North LRT line which serves Oregon City, Clackamas Town Center and the 134th Street/WSU area in Clark County would maximize the benefits of the LRT alternative.*

  The eastern portion of urban Clackamas County provides a unique opportunity to develop transit-oriented land uses in support of LRT. Within this area, there are three major development nodes -- Milwaukie, Oregon City and the Clackamas Town Center vicinity (CTC). At the beginning of Tier I, the "terminus issue" was framed as selecting one of these three nodes as the "South Terminus" of the S/N LRT.

  Based on the analyses and public comment received during Tier I, it became evident that the desired end-result is to provide light rail service to Milwaukie, CTC and Oregon City. Such a system would maximize the ridership and land use benefits of the light rail line.

  A similar but slightly different situation exists in Clark County. As Tier I began, the issue was whether the South/North line should terminate along I-5 or in the vicinity of the Vancouver Mall. However, staff found that transit travel patterns in the Vancouver Mall area are oriented more towards transit service in the I-205 corridor than towards a South/North LRT line. As a result, the issue of choosing a north terminus for the South/North LRT alternative focused on selecting between the terminus alternatives in the I-5 corridor.

  The higher costs associated with a 179th Street terminus outweigh its added benefits. As a result, the 179th Street terminus can not be justified as the Phase II terminus. Instead, 134th Street/WSU area is recommended. The combination of (i) the Growth Management Plan establishing the 134th Street area as an activity center and (ii) Washington State University developing a campus in this area, establishes 134th Street/WSU area as a major LRT opportunity.

- *The amount of capital funds potentially available at this time are insufficient to construct a light rail line serving Oregon City, Clackamas Town Center, Milwaukie, Portland, Vancouver and 134th Street/WSU area.*

  The estimated maximum amount of capital funds available for a first phase of construction is $2.85 billion. This estimate assumes that 50% of the cost would be funded by a federal LRT construction grant. Based on recent LRT federal funding trends, a maximum federal

contribution of about $1.4 billion can potentially be achieved over two federal authorization cycles. It also appears that about $1.4 billion is a practical limit on the amount of LRT capital funds which can be locally assembled.

Based on Tier I engineering and costing studies, the least expensive options for a LRT line between Oregon City, the CTC area and 134th Street/WSU area would cost approximately $3.55 billion in inflated dollars -- $700 million more than that which is achievable in Phase I.

- *The phased approach maximizes the likelihood of realizing a South/North LRT project which would ultimately serve the proposed termini.*

  The basic criteria for securing FTA approval for federal funds are: (i) evidence that sufficient development exists to support the project, (ii) cost-effectiveness and (iii) evidence that sufficient funds are committed to build the project. A project between 134th Street/WSU area and Oregon City would currently perform poorly with respect to the first two criteria. More importantly, it would not be possible to demonstrate sufficient committed funds. As a result, if the proposed LRT alternative project and extensions were pursued now, it would put the entire project in jeopardy.

  The phased approach avoids these problems. A Phase I project between the 99th Street area and the CTC area would exhibit better levels of existing development and cost-effectiveness than a longer project. Furthermore, the proposed funding plan, if successfully implemented, would demonstrate the level of commitment sought by FTA. And finally, a phased approach would allow for adoption of land-use plans and implementing ordinances, which are more transit-supportive and would therefore exhibit higher ridership and better cost-effectiveness.

3.2 Rationale for Phase I Termini

A Clackamas Town Center area to 99th Street area LRT Alternative best meets the Tier I evaluation criteria within the financial threshold as described below.

- *An LRT line with termini in the vicinity of the Milwaukie CBD and 39th Street in Vancouver would barely penetrate into Clackamas or Clark Counties, providing insufficient coverage to accomplish land use or transportation objectives.*

  To best achieve the land use and transportation objectives established for the project, the South/North LRT alternative should serve regional and intra-county trips in both Clark and Clackamas counties. The Milwaukie CBD and 39th Street terminus alternatives do not accommodate intra-county trips. Furthermore, there are significant opportunities for encouraging transit-oriented land uses not far beyond these termini. These transit-oriented land use opportunities are worthy of consideration within the DEIS process. The Milwaukie CBD to 39th Street terminus does not provide the occasion to consider such land use opportunities.

- *The Clackamas Town Center area terminus alternative exhibits lower costs, greater cost-effectiveness and greater consistency with existing regional policy than the Oregon City terminus alternatives.*

  The CTC area terminus alternative is approximately $140 - $560 million (in Year of Expenditure (YOE) dollars) less expensive to construct than an Oregon City terminus alternative. In addition, the CTC area terminus alternative is estimated to cost $1 - $2.6 million per year less to operate than an Oregon City terminus. As a result, the Tier I measure of cost-effectiveness for the CTC area terminus is 1% - 12% better than that for an Oregon City terminus.

  Metro's Regional Transportation Plan (RTP) has identified a light rail line to CTC as the region's next LRT priority after the Hillsboro extension. The transportation and land use benefits associated with Oregon City are not sufficient to modify this long-standing policy.

- *The 99th Street area north terminus alternative is consistent with Growth Management Plan objectives and exhibits lower costs and greater cost-effectiveness than the 134th Street/WSU area, 179th Street and Vancouver Mall terminus alternatives.*

  Both the 99th Street area terminus and the 134th Street/WSU area terminus are consistent with and would support the proposed Growth Management Plan objectives for Clark County, the City of Vancouver, C-TRAN, RTC and WSDOT.

  The 99th Street area terminus is approximately $105 million (in YOE dollars) less expensive to construct and $0.9 million per year less expensive to operate than the 134th Street/WSU area terminus. As a result, the Tier I measure of cost-effectiveness for the 99th Street terminus is 2% better than that for the 134th Street/WSU area terminus.

  The 99th Street area terminus is approximately $202 million (in YOE dollars) less expensive to construct than the Vancouver Mall terminus alternative (which includes the Orchards extension). In addition, the 99th Street area terminus alternative is estimated to cost $1.6 million per year less to operate than a Vancouver Mall terminus. As a result, the Tier I measure of cost-effectiveness for the 99th Street area terminus is 5% better than that for a Vancouver Mall terminus.

  The 99th Street area terminus is approximately $236 million (in YOE dollars) less expensive to construct and $1.8 million per year less to expensive to operate than the 179th Street terminus. As a result, the Tier I measure of cost-effectiveness for the 99th Street area terminus is 5% better than that for the 179th Street terminus.

3.3 Rationale for the Recommended Implementation Strategy

- *Questions remain as to whether the Phase I south terminus should head eastward (e.g. toward Kaiser Hospital) or southward (e.g. toward Oregon City).*

While it is determined that Oregon City be the Phase II terminus, there is not yet a preferred Phase II alignment alternative. Two options exist: one would extend from the Phase I terminus in the CTC area to Oregon City via I-205 and one would extend from the Milwaukie CBD to Oregon City via McLoughlin Boulevard (creating a two-branch system in Clackamas County). The PTC alignment in this segment, south of Milwaukie and west of McLoughlin Boulevard, would no longer be considered. The determination of the preferred alignment to Oregon City will effect both the location and orientation of the Phase I terminus within the CTC area. The proposed action plan prescribes a process for making these determinations.

- *Questions remain as how best to accommodate park-and-ride demands in the vicinity of the 99th Street area.*

  Because of the availability of a major interchange at I-5 and 99th Street and other travel demand and land use patterns and opportunities, the area of 99th Street has been identified as the proposed Phase I Northern Terminus. However, the 99th Street area may not provide the best opportunity to accommodate park-and-ride demand. As a result, further analysis will be conducted to determine the best placement of stations and park-and-ride lots between 78th Street and the 99th Street vicinity.

- *Local and regional government commitments towards densification and transit-oriented land use patterns along the proposed Phase II alignment could facilitate federal funding for the Phase II extension.*

  Section 3010 of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) establishes the criteria to be used by the Secretary of Transportation in making recommendations on LRT capital (Section 3) grants. Therein, the Secretary is required to "identify and consider transit supportive existing land use policies and future patterns and ... the degree to which the project ... promotes economic development" in allocating Section 3 funds. Because the existing development levels in the Oregon City and 134th Street areas are not as high as in areas surrounding competing projects in other regions, the strongest case for a Phase II extension may hinge on the densification and transit-oriented land use commitments called for in the proposed action plan.

RATIONALE FOR ALIGNMENT ALTERNATIVES SELECTED FOR FURTHER STUDY

The following conclusions and supporting information summarize the basis for Metro Council's and the C-TRAN Board of Director's selection of the South/North LRT alignment alternatives.

4.1 Portland CBD to Milwaukie/South Willamette River Crossing Alignment Alternative

4.1.1 Rationale for Alignment Recommendation

The *Ross Island Bridge Crossing* and *McLoughlin Boulevard Alignment Alternative* are the alignment alternatives that will be studied further within the Tier II DEIS and the *Caruthers Area Crossing* will receive further study within Tier I to determine whether it should also be advanced into the Tier II DEIS for the following reasons:

- *The Hawthorne Bridge River Crossing Alternative would exhibit substantial reliability and operations problems caused by numerous bridge openings and would not allow direct LRT access to Portland State University and South Downtown Portland.*

  The frequency of openings associated with the Hawthorne Bridge is considered to be a significant disadvantage of this alternative. A bridge opening during the peak-hour would likely disrupt the train schedule for the entire peak-period. Effective travel times would increase and reliability would suffer. As a result, ridership would decline, operating costs would increase and the cost-effectiveness of the alternative would deteriorate over time. Further, an alignment using the Hawthorne Bridge would increase the distance between and LRT station and PSU, a major transit attraction, by approximately 7 blocks. In addition, other activity points in South Downtown Portland would not receive direct LRT access.

- *The Sellwood Bridge alternative would generally exhibit lower ridership, longer trip times, higher operating costs and a higher cost-effectiveness ratio and would not provide direct LRT access to several S.E. Portland neighborhoods and bus routes.*

  The additional length of the Sellwood Bridge alternative would increase transit travel times between the Portland CBD and locations within Clackamas County by up to five minutes more than other alternatives. In addition, the Sellwood Bridge alternative would have the lowest projected total transit ridership (189,800 to 474,000 per year fewer), the lowest LRT ridership (131,000 to 460,000 per year fewer) and the highest operating costs ($690,000 to $1,190,000 per year more), resulting in the highest cost effectiveness ratio of the South Willamette River crossing alternatives. Finally, the Sellwood Bridge alternative would not provide direct LRT access to several S.E. Portland neighborhoods and bus routes that would have LRT access with other river crossing alternatives.

- *While the Ross Island Bridge River Crossing Alternative generally exhibits the same costs and transportation benefits as the Caruthers Bridge alternative, the Project Management Group's and the Steering Group's recommendations to advance the Ross Island Bridge alternative into Tier II were based upon their judgement that a Ross Island crossing exhibits superior land use and development benefits.*

  The Ross Island Bridge alternative would be approximately $6 million (in inflated dollars) less expensive to construct and serve 160,000 less LRT riders per year than the Caruthers Bridge alternative. In combination, these cost and ridership factors are not considered decisive. The choice between these two alignment alternatives is effected by determining which are the most important areas to be served by light rail: (1) OMSI and its surrounding area available for Eastside development and redevelopment or (2) the North Macadam Development and Redevelopment Area. Because of its amount of vacant developable and redevelopable land, its proximity to downtown, its ability to support housing and the role that redevelopment of urban land can play in maintaining a compact urban area, the land use benefits of direct LRT access to the North Macadam Area were determined by the PMG to be greater than in the OMSI area. The Steering Group concurred with the PMG on the importance of serving the North Macadam Redevelopment Area and on the importance of serving established Southeast Portland neighborhoods and recommended that the Ross Island Bridge Alignment be forwarded into Tier II for further study within the DEIS.

- *The Citizens Advisory Committee recommended that the Caruthers Bridge alternative be advanced into the DEIS for further study.*

  The Citizens Advisory Committee recommended that the Caruthers Bridge alternative be advanced into the DEIS for further study generally because it felt that the Caruthers Bridge alternative would provide better service to OMSI, the surrounding redevelopment area and the established S.E. Portland neighborhoods in that area. The Steering Group concurred that the Caruthers Bridge alternative warrants further study and recommended that prior to the adoption of the *Detailed Definition of Alternatives Report* there be a determination of whether the differences between the Ross Island Bridge and the Caruthers Bridge alternatives warrants inclusion of the Caruthers Bridge alternative within the Tier II DEIS.

- *There is a desire to try to serve both the North Macadam area and the southeast Portland area with LRT, expressed both by the PMG and more strongly by the Citizens Advisory Committee.*

  The Tier I analysis assumed that the new LRT bridge would be located south of and adjacent to the existing Ross Island Bridge. A Ross Island crossing close to the existing Ross Island Bridge would provide the highest level of LRT access to the northern parcels of the redevelopable land with less direct access to parcels further south in the district. A crossing further south and closer to Bancroft Street would provide more centralized access to the redevelopable land. On the eastside there is also a desire to provide LRT station access to eastside residential and development areas. A crossing near the existing Ross Island Bridge may provide the best opportunity for a potential station to serve that area, while a crossing

further South may be limited to station access near Holgate Boulevard. As a result of these trade-offs, the recommended action plan proposes further analysis of the location of the river crossing, bridgehead and stations in the North Macadam Area on the westbank and north of Holgate on the eastbank to determine the best opportunities for serving established neighborhoods and development opportunities on both sides of the river.

- *The McLoughlin Boulevard alignment alternative exhibits less cost, greater ridership, higher cost effectiveness and less environmental impact than the Portland Traction (PTC) alternative.*

  Within this segment, the McLoughlin Boulevard alignment alternative is approximately $21 million (in inflated dollars) less expensive to construct and $560,000 per year less expensive to operate than the PTC alternative. (In addition, the McLoughlin alternative serves almost 1.5 million annual LRT riders more than the PTC alternative. As a result, the Tier I measure of cost-effectiveness for the McLoughlin alignment is 7% better than that for the PTC alternative. Furthermore, the PTC alignment would traverse Oaks Bottom--a very sensitive wetlands and wildlife area.

4.1.2 Rationale for the Recommended Implementation Strategy

- *Questions remain as to the precise location of the bridge crossing.*

  Further research is needed on three key issues before the bridge location(s) to be brought into the DEIS can be finalized. First, more research is needed on the site plans for development in the areas. Second, the environmental impacts of the bridge crossing on the river eco-system and wildlife habitat and visual resources need to be better understood. Third, the opportunities and constraints for station locations and the effect that those locations would have in optimizing LRT access to established residential areas and connections to local transit service.

4.2 Portland CBD Alignment Alternative

4.2.1 Rationale for Alignment Recommendation

The *5th/6th Avenue Surface Alignment Alternative* is the alignment alternative in this segment that will be developed further for study within the Tier II DEIS for the following reasons:

- *The 5th/6th Avenue Surface Alignment Alternative is most consistent with the Downtown Plan*

  The Downtown Plan calls for the region's highest density commercial uses along the 5th/6th Avenue spine. Alignment alternatives, whether they be surface or subway, employing other streets places transit further away from these densities and, as a result, fail to maximize the

quality of the service. The Downtown Plan also calls for an active pedestrian environment at street level. This is the basic policy implicit in many aspects of the development requirements for downtown -- for example, the requirement for first-floor retail in parking garages. A surface alignment best provides for such a pedestrian environment.

- *The 5th/6th Avenue Surface Alignment Alternative exhibits lower capital costs and operating costs than the Subway alternative.*

  The 5th/6th Avenue Surface Alignment would be $242 - $296 million (in inflated dollars) less expensive to construct and $1.8 million per year less expensive to operate than the Subway Alternative.

- *Despite its lower ridership, the 5th/6th Avenue Surface Alignment Alternative is more cost-effective than the Subway alternative.*

  Overall weekday corridor ridership would be 2,100 greater with the Subway Alternative. Nonetheless, these ridership benefits are outstripped by the higher capital and operating costs of the Subway Alternative. As a result, the 5th/6th Avenue Surface Alignment Alternative is more cost-effective.

4.2.2 Rationale for the Recommended Implementation Strategy

- *Additional information on the Surface Alignment is needed to determine the design options to be evaluated in the DEIS.*

  Recently, concept plans for the *Surface Alignment Alternative* were circulated for preliminary comment. These plans include two design options which would accommodate LRT, bus, auto and pedestrian circulation on the Transit Mall. One design option would have a three-lane configuration and may require the platooning of certain buses while the other would have a four-lane configuration and may require narrowing some sidewalks.

  Other design options are also being looked at and developed both for the central mall south of Burnside and for the mall north of Burnside. Further analysis and discussion with the public, businesses and various agencies need to be conducted before these designs can be finalized. This additional work will refine station locations (within the general locations specified in the recommendation) and the location of auto circulation and access (hotel and parking garage accesses will be retained, the location of other auto lanes depends on the refined designs). Because of the sensitivity and complexity of these issues, special efforts will be made to involve the downtown Portland community.

4.3 Portland CBD to Vancouver CBD Alignment Alternative

The Metro Council and C-TRAN Board of Directors have yet to determine the alignment alternative(s) in this segment to advance into the DEIS for further study for the following reasons:

- *While the Interstate Avenue alignment alternative costs more than the I-5 alternative, further analysis is needed to determine if there are land use and development benefits of the Interstate alignment that outweigh its additional cost.*

  The I-5 alignment alternative in this segment is approximately $114 million (in inflated dollars) less expensive to construct, $120,000 per year less expensive to operate and serves 460,000 more LRT riders per year than the Interstate Avenue alternative. However, the relative land use and development benefits are of critical importance and therefore merit additional consideration before a draft recommendation is proposed.

- *Further analysis is needed to identify and evaluate modified alternatives which merge the I-5 alignment with portions of the Interstate alignment.*

  In Tier I, it was assumed that the I-5 alignment would parallel the freeway. As a result, the I-5 alignment would serve the Kenton neighborhood with a station location on the fringe of the neighborhood. There is a desire to determine if the I-5 alignment can be merged with the Interstate alignment at a location between Skidmore Street and Columbia Boulevard to achieve the benefits associated with the Interstate alignment at a reduced cost -- in particular more centrally located service within Kenton.

- *Further public input is needed to determine community preferences.*

4.4 Vancouver CBD to 134th/WSU Area Alignment Alternative

4.4.1 Rationale for Alignment Alternative

The I-5 East Alignment Alternative is the alignment alternative in this segment that will be advanced into the DEIS for further study for the following reason:

- *The I-5 East Alignment Alternative is consistent with Growth Management Plans, exhibits less cost, greater ridership and higher cost effectiveness than the Highway 99 alternative.*

  The I-5 East Alignment Alternative is consistent with the Growth Management Plans for the Hazell Dell area prepared by Clark County, the City of Vancouver, C-TRAN, RTC and WSDOT. The LRT running alignment between stations is best located next to I-5 because it will avoid the traffic pattern disruption and local impacts associated with the Highway 99 alignment. However, the optimal locations for stations, pedestrian connections and park-and-ride lots between Highway 99 and east of I-5 need to be studied further within the 99th Street

area special study to maximize the transportation and land use benefits in the proximity of Highway 99.

In addition, the I-5 alignment alternative is approximately $167 million (in inflated dollars) less expensive to construct between 39th and 134th Streets than the Highway 99 alternative. In addition, the I-5 alignment alternative is estimated to cost $190,000 per year less to operate than the Highway 99 alternative. Furthermore, the I-5 alternative serves 400,000 annual LRT riders more than the Highway 99 alternative. As a result, the Tier I measure of cost-effectiveness for the I-5 alignment is 11% better than that for the Highway 99 alternative.

4.4.2 Rationale for the Recommended Implementation Strategy

- *Additional information on the segment between 78th Street and 99th Street is needed to determine the location of stations and park-and-ride lots to be included in the DEIS.*

The design studies and technical analyses conducted in Tier I included an alternative terminus in the vicinity of 88th Street. In adopting the *Tier I Final Report* it was determined that the area of 99th Street would be a more appropriate location for the terminus given its proximity to a major arterial and interchange with I-5. This determination creates additional opportunities for stations and park-and-rides which were not considered to date in Tier I. One of the objectives of the 99th Street area special study is to determine more precisely where within the vicinity of 99th Street the terminus station should be located.

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South North
Transit Corridor Study

EXHIBIT A

DRAFT

Tier I Final Recommendation Report

Metro Council

C-TRAN Board of Directors

December 8, 1994

METRO

Tier I Final Recommendation Report

South/North Corridor
Alternatives Analysis

December 8, 1994

Metro Council
C-TRAN Board of Directors

The preparation of this report was financed in part by the U.S. Department of Transportation, Federal Transit Administration and by the Washington State Department of Transportation. The opinions, findings and conclusions expressed in this report are not necessarily those of either the Federal Transit Administration or the Washington Department of Transportation

South North
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Tier I Final Recommendation Report

Metro Council

C-TRAN Board of Directors

November 23, 1994

METRO

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Figure 1 illustrates the Tier I terminus and alignment alternatives that will advance into the Tier II Draft Environmental Impact Statement (DEIS) for further study.

Following is a summary of the South/North study approach adopted by the Metro Council and C-TRAN Board of Directors:

- The South/North Corridor Project will be pursued in two study phases:

  [a] Phase I will consider a Light Rail Transit project between the Clackamas Town Center area and the 99th Street area in Clark County.

  [b] Phase II will consider an extension of the Phase I Light Rail Transit Project south to Oregon City and north to the 134th Street/Washington State University area.

- The study phases will be implemented as follows:

  [a] Preparation of the Draft Environmental Impact Statement (DEIS) and funding plan for the Phase I LRT alternative will begin immediately.

  [b] If LRT is selected as the Locally Preferred Alternative in Phase I, a DEIS and funding strategy for the Phase II LRT extension will be prepared upon completion of the Final Environmental Impact Statement (FEIS) for Phase I.

- The following alignment alternatives will be studied further within the Phase I Draft Environmental Impact Statement:

  [a] Between the Portland and Milwaukie Central Business Districts, the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate streets in the south, and the McLoughlin Boulevard alignment will be developed for further study within the DEIS. The Caruthers area crossing will be evaluated further in order for the C-TRAN Board of Directors and Metro Council to determine whether it should also be included in the *Detailed Definition of Alternatives Report* and developed further in the DEIS.

  [b] Within the Portland CBD a Surface LRT Alternative on 5th and 6th Avenues will be developed based upon several principles for further study within the DEIS. If at the

time the DEIS is initiated it is concluded that a 5th/6th Avenue surface alignment cannot be developed that addresses those principles, other alternatives will be developed for further study in the DEIS.

[c] Between the Vancouver CBD and the vicinity of 99th Street, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 will be developed for further study within the DEIS.

- Because further discussions and analysis should occur, the selection by the Metro Council and the C-TRAN Board of Directors of an alternative for further study for the segment between the Portland and Vancouver central business districts shall wait completion of additional technical work and evaluation.

- The following alignments will be considered for the Phase II extensions:

  a. Following completion of the *Detailed Definition of Alternatives Report*, an analysis of the I-205 alignment from the CTC terminus and the McLoughlin alignment from the Milwaukie CBD will be made to determine which alignment will advance into the Phase II DEIS. The Portland Traction (PTC) right-of-way will not be considered as a Phase II alignment.

  b. Between the vicinity of 99th Street and the area of 134th Street/WSU Branch Campus, the I-5 East alignment will advance into the Phase II DEIS.

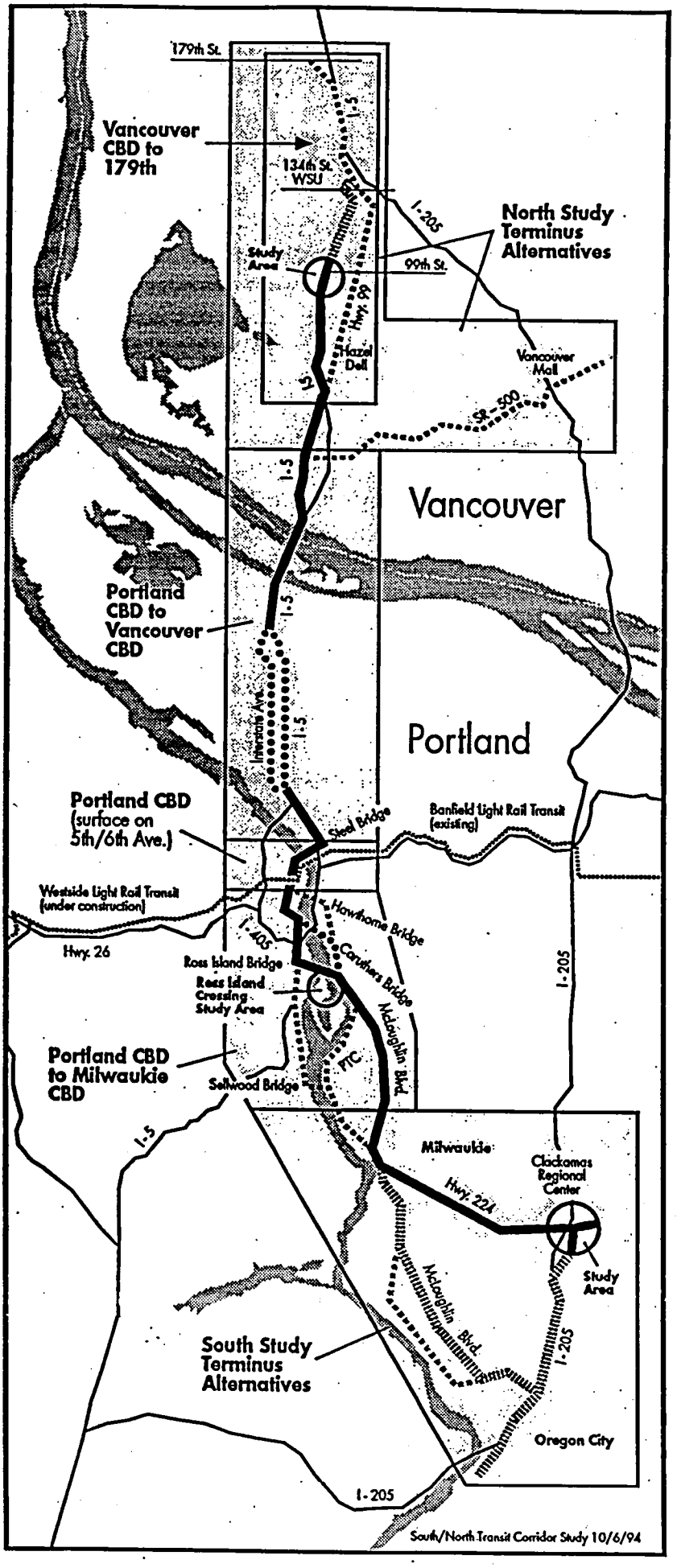
- The Phase I LRT alignment alternative between Clackamas Town Center and 99th Street area is estimated to:

  [a] Serve almost 20 million trips per year,

  [b] Help manage growth and reduce air pollution, traffic and vehicle-miles-of-travel; and

  [c] Cost approximately $2.85 billion in inflated (year-of-expenditure) dollars.

South North
Transit Corridor Study



Steering Group Final Recommendation

- Recommended for immediate DEIS Analysis
- Recommendation pending further Tier I analysis and public comment
- Recommended to be studied later in Phase II
- Recommended to be removed from further study

Figure 1

INTRODUCTION

1.1 Purpose

This *South/North Tier I Final Report* identifies (1) the South/North Light Rail Transit (LRT) terminus and alignment alternatives to be advanced into the Tier II Draft Environmental Impact Statement (DEIS) and (2) policies and actions related to other aspects of the South/North Transit Corridor Study. As the alignment alternatives are narrowed, more detailed "Design Options" will remain under study and will be addressed in the *Detailed Definition of Alternatives Report.*

The C-TRAN Board of Directors and Metro Council adopted this report at their regular meetings in December 1994. Adoption of the *Tier I Final Report* concludes a public selection process that was initiated in August 1994 with the preparation of draft terminus alternative recommendations by the South/North Project Management Group (PMG). On September 14, 1994, following conclusion of the Tier I public comment period, the PMG adopted its final Tier I terminus and alignment recommendations. After receiving the PMG final recommendation the South/North Citizens Advisory Committee (CAC) adopted its Tier I final recommendation on September 29, 1994. Both the PMG and CAC final recommendations were forwarded to the South/North Steering Group which adopted its final recommendation on October 6, 1994. Next, the participating jurisdictions and agencies reviewed the Steering Group recommendation and adopted independent recommendations in November and early December 1994. Those recommendations were forwarded to the C-TRAN Board of Directors and Metro Council for final adoption of this *Tier I Final Report* that delineates the LRT alternatives to advance into the Tier II DEIS for further study. Remaining alignment alternative choices described below will be made through a similar process.

1.2 Background

Because of its size and complexity, the South/North Transit Corridor Study and Draft Environmental Impact Statement (DEIS) process is being undertaken in two steps called "Tiers":

- Tier I focused on evaluating modal alternatives (busways, river transit, commuter and light rail), alignment alternatives, design options and terminus alternatives in order to narrow the number of alternatives to be addressed in the DEIS.

- Tier II will focus on preparing a DEIS on the narrowed set of LRT alternatives and a No-Build alternative. Tier II will conclude with the selection of the Locally Preferred Alternative.

Tier I started in mid-1993 with the initiation of the federally-mandated Scoping Process. The Federal Transit Administration's intent to publish an environmental impact statement for the South/North Transit Corridor was issued in the *Federal Register* on October 12, 1993. Based on analyses and public input provided during Scoping, the high capacity transit alternatives were narrowed to one mode -- light rail transit. Scoping (as amended by the Steering Group in May 1994) also identified:

- Four south (Clackamas County) and five north (Clark County) *Terminus Alternatives* for the LRT.

- Two or more *Alignment Alternatives* for each of five defined segments of the LRT alignment.

- Detailed *Design Options* for several of the LRT alignment alternatives.

After Scoping, staff prepared technical analyses of the terminus and alignment alternatives. These analyses are documented in the *Tier I Technical Summary Report* and the *Tier I Briefing Document.* In addition, an extensive public involvement process on the alternatives and options was conducted. These data and public input serve as the basis for this draft recommendation.

This *Tier I Final Report:*

- Defines a two-phase study approach for pursuing the proposed project.

- Identifies the Terminus and Alignment Alternatives which will be advanced into the Tier II Draft Environmental Impact Statement (DEIS).

- Identifies strategies regarding how to proceed with yet-to-be decided issues and/or refinements associated with the recommended alternatives.

In addition to the *Tier I Final Report*, two other reports will be prepared before work starts on the DEIS:

- The *Conceptual Definition of Alternatives Report* will be based upon the actions of the C-TRAN Board of Directors and Metro Council and will provide a general description of the LRT alignment, termini and other project elements for information purposes, primarily for the Federal Transit Administration (FTA). It will also provide a general description of the No-Build alternative.

- The *Detailed Definition of Alternatives Report* will specify the proposed LRT alignment, design, park-and-ride lot locations, station locations, maintenance facility and other project elements in detail and will serve as the basis for the DEIS. It will also provide a detailed description of the No-Build alternative.

Those elements of the LRT alternative that are not addressed in the *Tier I Final Report* will be addressed in these reports.

1.3 Public Involvement

The adoption of the *Tier I Final Report* by Metro Council and the C-TRAN Board of Directors follows a lengthy period and numerous opportunities for public review of the Tier I technical

information and public comment on the Tier I alternatives. The public comment period began in July 1994 with notification of the availability of the draft *Tier I Technical Summary Report*, the draft *Briefing Document* and the draft *Tech Facts*. The public was also invited to attend four public open houses to review the Tier I alternatives and technical information and to discuss the information and alternatives with project staff and participating agency representatives. In July and August 1994, meetings with individual neighborhood and business associations were held throughout the Corridor by study staff and participating jurisdictions.

In August 1994, the *Briefing Document* and *Tech Facts* were revised to reflect new or corrected information and the public was asked to attend four meetings to allow the Steering Group to receive public comment on the Tier I technical information. Oral and written comments were received at the four meetings and additional written comments were received during the comment period which ran through September 13, 1994. Those oral and written comments have been compiled and summarized in a report titled *Narrowing the Options: Summary of Tier I Public Meetings and Comments*. A supplement to the *Summary of Public Meetings and Comments* has been issued documenting the public meetings held and comments received between the close of the public comment period and the adoption of the *Tier I Final Report*.

1.4 Organization of the *Tier I Final Report*

This report is divided into four chapters:

- **Chapter 1: Introduction** defines the purpose and background of the report.
- **Chapter 2: South/North Alternatives Adopted for Further Study** defining the Phase I and Phase II terminus alternatives and alignment alternatives that will be advanced for further study..
- **Chapter 3 : Rationale for Selection of Terminus Alternatives for Further Study** documents the reasons for the Steering Group's recommendations regarding the Phase I and Phase II terminus alternatives.
- **Chapter 4: Rationale for Selection of Alignment Alternatives for Further Study** documents the reasons for the Steering Group's recommendations regarding the alignment alternatives.

ALTERNATIVES SELECTED FOR FURTHER STUDY

2.1 Project Phasing

1. The South/North Project will be pursued in two study phases:

   [a] Phase I will consider the light rail transit alternative, described below, which Metro Council and the C-TRAN Board of Directors have found best meets the evaluation criteria established for Tier I and is also constrained by current estimates of potential funding. Work on the Draft Environmental Impact Statement for the Phase I alternative will begin immediately.

   [b] Phase II will consider a future extension of the South/North LRT to the potential end-points in Clackamas and Clark Counties, if LRT is selected as the locally preferred alternative in Phase I. The DEIS and funding plan for the Phase II LRT extension will be prepared upon completion of the Final EIS for Phase I.

2. In compliance with FTA requirements, Minimum Operable Segment(s) will be identified in each DEIS. Construction of a Phase may occur in Minimum Operable Segment(s) to accommodate funding schedules and/or availability.

2.2 South Terminus

2.2.1 Phase I South Terminus

1. The *Clackamas Town Center* area will be the Phase I South Terminus of the S/N LRT Alternative studied in the Draft Environmental Impact Statement (DEIS).

2. The specific location of the Phase I terminus within the Clackamas Town Center area and the associated alignment, station locations and park-and-ride location within the area need further analysis. Accordingly, staff shall:

   [a] Establish a special study area in the Clackamas Town Center area which extends east to Sunnyside and south to Highway 224.

   [b] Evaluate specific "eastward-oriented" (e.g. heading toward Kaiser Hospital) and "southward-oriented" (e.g. heading toward Oregon City) Phase I terminus and alignment options within the Town Center study area.

   [c] Ensure that appropriate park-and-ride access and capacity be provided with the Phase I terminus.

[d] Recommend a refined Phase I terminus and alignment within the Clackamas Town Center area in the *Detailed Definition of Alternatives Report.*

3. Clackamas County shall be asked to review revised land use plans for the Clackamas Town Center area to ensure a more pedestrian and transit friendly land use pattern which supports the Town Center area's designation as a Regional Center in the draft 2040 Plan and as the Phase I South Terminus of the South/North LRT alternative.

2.2.2 Phase II South Terminus

1. Metro will consider the incorporation of policies in the Regional Transportation Plan (RTP) and Regional Framework Plan which call for a Phase II extension of the South/North LRT Alternative to *Oregon City.*

2. In conjunction with the analysis described in Section 2.2.1.2(b), staff will evaluate alignment alternatives for the Phase II extension to Oregon City and establish a preferred Phase II alignment for consideration by Metro Council for inclusion in the RTP and Regional Framework Plan. Work on selecting a preferred Phase II alignment will begin upon completion of the Phase I *Detailed Definition of Alternatives Report.* The Portland Traction (PTC) right-of-way will not be considered as a Phase II alignment.

3. Local jurisdictions along the proposed Phase II alignment shall be asked to consider revisions to their land use plans which encourage transit supportive land uses along the Phase II alignment. Such revisions, if adopted, will be outlined in the Phase II DEIS as "committed actions" and could greatly facilitate Federal Transit Administration (FTA) approval of a Phase II extension. Such actions, if adopted, will also be reflected in the Phase II land-use analysis and ridership forecasts.

4. The Cove development currently being pursued by Oregon City through its urban renewal plan is regionally significant in terms of (i) the alignment choice and future feasibility of the Phase II LRT extension to Oregon City and (ii) regional objectives encouraging Transit Oriented Districts (TODs). Accordingly, Metro and Oregon City shall pursue the following course of action:

   [a] The alignment and policies regarding the Phase II extension of the South/ North LRT being prepared by Metro and the site plan and land uses for the Cove development being prepared by Oregon City should be integrated.

   [b] The site plan for the Cove development should preserve right-of-way for the Phase II extension of South/North LRT.

   [c] Plans for feeder bus service for the Phase I LRT alternative should provide service to the Cove development in a manner which supports a transit supportive land use pattern during the interim period.

[d] Based on the resulting RTP and Regional Framework Plan, funding for improvements which are needed to support a transit oriented development within the Cove area and/or are needed to preserve the right-of-way for the proposed Phase II LRT extension through the Cove development shall be a priority for the allocation of regional TOD or other appropriate funds.

5. If LRT is extended along I-205 to Oregon City and if a development proposal and plan for the 80-acre Seventh-Day Adventist (SDA) property in Gladstone is prepared and moves toward implementation, an approach similar to that described above in Section 2.2.2(4) for the Cove development shall be undertaken for the SDA property by Metro, the City of Gladstone and Clackamas County.

6. Tri-Met shall be asked to plan for high-quality feeder bus service between Oregon City and the Phase I LRT transit centers to help develop transit and land use patterns which facilitate a future Phase II extension of the South/North LRT.

2.3 North Terminus

2.3.1 Phase I North Terminus

1. The *99th Street* area is the Phase I North Terminus for the South/North LRT Alternative that will be studied further in the DEIS.

2. The specific station and park-and-ride lot locations within the 78th Street to the 99th Street area need further analysis to determine how best to accommodate park-and-ride demand. Accordingly, staff shall:

   [a] Establish a special study area between 78th Street and 99th Street area.

   [b] Evaluate park-and-ride lot opportunities and the land use and transportation impacts associated between 78th Street and the 99th Street area.

   [c] Recommend a refined station and park-and-ride lot locations within the special study area in the *Detailed Definition of Alternatives Report.*

2.3.2 Phase II North Terminus

1. Metro and RTC shall be asked to consider incorporating policies in their respective Regional Transportation Plans (RTPs) and Clark County and the City of Vancouver shall be asked to incorporate policies in their Growth Management Plans that call for a proposed Phase II extension of the South/North LRT Alternative to the *134th Street/WSU area.*

2. Clark County, RTC, the City of Vancouver and C-TRAN staff shall be asked to review land use plans for the proposed Phase II LRT terminus area to ensure transit supportive land use patterns are integrated with the proposed Phase II terminus and alignment alternatives. The resulting actions, if adopted, will be outlined in the Phase II DEIS as "committed actions" and could greatly facilitate FTA approval of a Phase II extension. Such actions, if adopted, would also be reflected in the Phase II land-use analysis and ridership forecasts.

3. The planned activity center and Washington State University (WSU) campus development in the vicinity of 134th Street and I-5 are critical to the future feasibility of the Phase II LRT extension to the 134th Street/WSU area. Accordingly, Clark County, RTC, the City of Vancouver and C-TRAN staff shall work with WSU officials and other developers in the area to ensure transit supportive land uses are developed in and around the proposed Phase II LRT terminus area and that required right-of-way is preserved.

4. C-TRAN shall be asked to plan for provision of high-quality feeder bus service between the 134th Street/WSU area (in particular, the WSU campus) and the 99th Street area (the Phase I north terminus) to help develop transit and land use patterns which facilitate a future Phase II extension of the South/North LRT.

2.4 Portland CBD to Milwaukie/South Willamette River Crossing Alignment Alternative

1. The *Ross Island Bridge Crossing Alternative* and *McLoughlin Boulevard Alignment Alternative* are the LRT alignment alternatives in the segment from the Portland CBD to Milwaukie/South Willamette River Crossing that will be studied further within the Tier II of the DEIS.

2. The Caruthers area crossing will be evaluated further in order to allow the C-TRAN Board of Directors and Metro Council to determine whether it should also be included in the *Detailed Definition of Alternatives Report* and developed further in the DEIS.

3. The location of the Ross Island area river crossing, bridgeheads and stations in this segment will receive further analysis to determine how to serve as much of the North Macadam redevelopment area and S.E. residential areas as possible. Further, if a Caruthers area crossing is selected to advance into the DEIS then its design will be refined and included within the *Detailed Definition of Alternatives Report.* Accordingly, staff shall:

   [a] Establish special study areas on the east and west banks of the Willamette River which are generally bounded by the Ross Island Bridge and S.W. Gibbs Street in the north and Bancroft Street and Holgate Boulevard in the south.

   [b] Evaluate alternate bridge locations, alignment options and station location(s) within these study areas which provide for optimal light rail coverage to S.E. Portland neighborhoods and the North Macadam Area.

[c] Recommend a refined location for the Ross Island area LRT bridge, associated alignment and stations in the *Detailed Definition of Alternatives Report* based on an assessment of development opportunities, costs, environmental considerations and engineering constraints.

[d] Evaluate alternate bridge designs, alignment options and station locations for a Caruthers area crossing and recommend a refined bridge, alignment and station location design for inclusion within the *Detailed Definition of Alternatives Report* if a Caruthers area crossing is selected for advancement into the DEIS.

[e] Work with interested parties to develop and evaluate the design options described above.

[f] Continue to undertake planning and engineering work for the LRT alignment alternatives that allows for an Eastside transit connection.

2.5 Portland CBD Alignment Alternative

1. The Surface LRT Alternative on 5th and 6th Avenues within the Portland CBD will be developed in detail for further study within the Tier II DEIS.

2. Because of the critical function that the Portland CBD segment plays in the South/North Corridor, the study of the 5th/6th Avenue Surface Alignment is based upon the following principles:

   [a] To accommodate bus, light rail, general purpose automobile and pedestrian travel on the 5th/6th Avenue Transit Mall.

   [b] To develop for further evaluation Surface LRT Transit Mall design options that accommodate those modes of travel using both a three-lane and a four-lane configuration. The designs will address sidewalk widths, street trees and other amenities which are critical to a pedestrian friendly environment.

   [c] To retain automobile access on essential blocks that directly serve the Hilton Hotel, parking garages that enter and/or exit onto the Transit Mall and other important locations as determined through a collaborative process with interested downtown parties.

   [d] To establish the light rail station locations that will optimize both light rail access and automobile access on the Transit Mall. In general, those locations will be (1) near the PSU campus; (2) near City Hall; (3) near Pioneer Square; (4) south of Burnside; and (5) one or two stations to serve the Old Town, Union Station and north River District areas.

   [e] To work with the Downtown Portland community in developing the Surface LRT Transit Mall options for further study and in selecting the locally preferred alternative.

[f] To develop the refined surface alternative(s) that address these principles for inclusion in the adoption of the *Detailed Definition of Alternatives Report*, and that if at that time it is concluded that a 5th/6th Avenue Surface Alignment cannot be developed that addresses those principles, other alternatives would be developed for further study within the Draft Environmental Impact Statement.

2.6 Portland CBD to Vancouver CBD Alignment Alternative

1. While the existing technical data and public comments have been valuable in understanding tradeoffs between the Interstate Avenue and I-5 alignments, additional information and discussions are needed to produce a clear basis for a determination of the preferred LRT alignment between the Portland and Vancouver CBDs. Therefore project staff shall:

   [a] Conclude discussions on the relative land use impacts of the alignment alternatives and their ability to meet community objectives; and,

   [b] Conclude more detailed analysis of traffic and pedestrian movement impacts of the alignment alternatives.

2. Further, modified alternatives which merge the I-5 alignment with portions of the Interstate Avenue alignment north of Skidmore Street shall be undertaken to determine if a modified I-5 alignment can achieve the land use and neighborhood benefits associated with the Interstate alignment at a lower cost. Therefore, project staff shall:

   [a] Establish a special study area bounded by Skidmore Street and the Columbia Slough.

   [b] Identify and evaluate modified I-5 alignment alternatives which (i) merge segments of the I-5 alignment with segments of the Interstate Avenue alignment within the special study area and/or (ii) more centrally serve the Kenton neighborhood.

   [c] Address issues regarding the location of the Columbia Slough crossing.

3. Finally, the Metro Council and the C-TRAN Board of Directors intend to determine the preferred alignment between the Portland and Vancouver CBDs by the time the *Detailed Definition of Alternatives Report* is finalized using the following: (i) existing technical information and public comment; (ii) new technical information and discussions described in section 2.6.2 (a) and (b); and, (iii) the analysis of modified alignment alternatives described in section 2.6.3.

2.7 Vancouver CBD to 134th Street/WSU Area Alignment Alternative

1. The *I-5 East Alignment Alternative* is the alignment alternative in the segment from Vancouver CBD to the vicinity of 99th Street that will be studied further in the Tier II DEIS.

2. The *I-5 East Alignment Alternative* is the alignment between the vicinity of 99th Street and 134th Street/WSU area that will be proposed for inclusion in the RTP and Growth Management Plan policies regarding the Phase II extension of the South/North LRT.

3. Prior to finalizing the *Detailed Definition of Alternatives Report*, project staff will conduct a study of station areas in the Hazel Dell area to determine the best east/west cross-street locations for stations, pedestrian connections and park-and-ride lots and to determine the best location for those stations between I-5 and Highway 99. Following conclusion of the DEIS based upon those station locations, further study and refinement of the station locations may be required to meet transportation, transit service and development/redevelopment objectives.

2.8 Design Options

1. Within the alignment alternatives recommended above, the following more detailed "Design Options" remain under study and will be addressed in the *Detailed Definition of Alternatives Report*:

   [a] The alignment through the Vancouver CBD.

   [b] The Columbia River Crossing (high bridge, lift span bridge or tunnel).

   [c] The alignment between the Steel Bridge, Emanuel Hospital and the Kaiser Medical Center.

   [d] The alignment through Milwaukie.

   [e] The alignment between Milwaukie and the Clackamas Town Center.

   [f] The locations of park-and-ride lots, transit centers, stations and maintenance facilities.

   [g] Downtown Portland alignment details.

   [h] Other design options as required.

RATIONALE FOR TERMINUS ALTERNATIVES SELECTED FOR FURTHER STUDY

The following conclusions and supporting information summarize the basis for Metro Council's and the C-TRAN Board of Director's selection of the South/North LRT terminus alternatives:

3.1 Rationale for the Two-Phase Implementation

- *Ultimately, a South/North LRT line which serves Oregon City, Clackamas Town Center and the 134th Street/WSU area in Clark County would maximize the benefits of the LRT alternative.*

  The eastern portion of urban Clackamas County provides a unique opportunity to develop transit-oriented land uses in support of LRT. Within this area, there are three major development nodes -- Milwaukie, Oregon City and the Clackamas Town Center vicinity (CTC). At the beginning of Tier I, the "terminus issue" was framed as selecting one of these three nodes as the "South Terminus" of the S/N LRT.

  Based on the analyses and public comment received during Tier I, it became evident that the desired end-result is to provide light rail service to Milwaukie, CTC and Oregon City. Such a system would maximize the ridership and land use benefits of the light rail line.

  A similar but slightly different situation exists in Clark County. As Tier I began, the issue was whether the South/North line should terminate along I-5 or in the vicinity of the Vancouver Mall. However, staff found that transit travel patterns in the Vancouver Mall area are oriented more towards transit service in the I-205 corridor than towards a South/North LRT line. As a result, the issue of choosing a north terminus for the South/North LRT alternative focused on selecting between the terminus alternatives in the I-5 corridor.

  The higher costs associated with a 179th Street terminus outweigh its added benefits. As a result, the 179th Street terminus can not be justified as the Phase II terminus. Instead, 134th Street/WSU area is recommended. The combination of (i) the Growth Management Plan establishing the 134th Street area as an activity center and (ii) Washington State University developing a campus in this area, establishes 134th Street/WSU area as a major LRT opportunity.

- *The amount of capital funds potentially available at this time are insufficient to construct a light rail line serving Oregon City, Clackamas Town Center, Milwaukie, Portland, Vancouver and 134th Street/WSU area.*

  The estimated maximum amount of capital funds available for a first phase of construction is $2.85 billion. This estimate assumes that 50% of the cost would be funded by a federal LRT construction grant. Based on recent LRT federal funding trends, a maximum federal

contribution of about $1.4 billion can potentially be achieved over two federal authorization cycles. It also appears that about $1.4 billion is a practical limit on the amount of LRT capital funds which can be locally assembled.

Based on Tier I engineering and costing studies, the least expensive options for a LRT line between Oregon City, the CTC area and 134th Street/WSU area would cost approximately $3.55 billion in inflated dollars -- $700 million more than that which is achievable in Phase I.

- *The phased approach maximizes the likelihood of realizing a South/North LRT project which would ultimately serve the proposed termini.*

  The basic criteria for securing FTA approval for federal funds are: (i) evidence that sufficient development exists to support the project, (ii) cost-effectiveness and (iii) evidence that sufficient funds are committed to build the project. A project between 134th Street/WSU area and Oregon City would currently perform poorly with respect to the first two criteria. More importantly, it would not be possible to demonstrate sufficient committed funds. As a result, if the proposed LRT alternative project and extensions were pursued now, it would put the entire project in jeopardy.

  The phased approach avoids these problems. A Phase I project between the 99th Street area and the CTC area would exhibit better levels of existing development and cost-effectiveness than a longer project. Furthermore, the proposed funding plan, if successfully implemented, would demonstrate the level of commitment sought by FTA. And finally, a phased approach would allow for adoption of land-use plans and implementing ordinances, which are more transit-supportive and would therefore exhibit higher ridership and better cost-effectiveness.

3.2 Rationale for Phase I Termini

A Clackamas Town Center area to 99th Street area LRT Alternative best meets the Tier I evaluation criteria within the financial threshold as described below.

- *An LRT line with termini in the vicinity of the Milwaukie CBD and 39th Street in Vancouver would barely penetrate into Clackamas or Clark Counties, providing insufficient coverage to accomplish land use or transportation objectives.*

  To best achieve the land use and transportation objectives established for the project, the South/North LRT alternative should serve regional and intra-county trips in both Clark and Clackamas counties. The Milwaukie CBD and 39th Street terminus alternatives do not accommodate intra-county trips. Furthermore, there are significant opportunities for encouraging transit-oriented land uses not far beyond these termini. These transit-oriented land use opportunities are worthy of consideration within the DEIS process. The Milwaukie CBD to 39th Street terminus does not provide the occasion to consider such land use opportunities.

- *The Clackamas Town Center area terminus alternative exhibits lower costs, greater cost-effectiveness and greater consistency with existing regional policy than the Oregon City terminus alternatives.*

  The CTC area terminus alternative is approximately $140 - $560 million (in Year of Expenditure (YOE) dollars) less expensive to construct than an Oregon City terminus alternative. In addition, the CTC area terminus alternative is estimated to cost $1 - $2.6 million per year less to operate than an Oregon City terminus. As a result, the Tier I measure of cost-effectiveness for the CTC area terminus is 1% - 12% better than that for an Oregon City terminus.

  Metro's Regional Transportation Plan (RTP) has identified a light rail line to CTC as the region's next LRT priority after the Hillsboro extension. The transportation and land use benefits associated with Oregon City are not sufficient to modify this long-standing policy.

- *The 99th Street area north terminus alternative is consistent with Growth Management Plan objectives and exhibits lower costs and greater cost-effectiveness than the 134th Street/WSU area, 179th Street and Vancouver Mall terminus alternatives.*

  Both the 99th Street area terminus and the 134th Street/WSU area terminus are consistent with and would support the proposed Growth Management Plan objectives for Clark County, the City of Vancouver, C-TRAN, RTC and WSDOT.

  The 99th Street area terminus is approximately $105 million (in YOE dollars) less expensive to construct and $0.9 million per year less expensive to operate than the 134th Street/WSU area terminus. As a result, the Tier I measure of cost-effectiveness for the 99th Street terminus is 2% better than that for the 134th Street/WSU area terminus.

  The 99th Street area terminus is approximately $202 million (in YOE dollars) less expensive to construct than the Vancouver Mall terminus alternative (which includes the Orchards extension). In addition, the 99th Street area terminus alternative is estimated to cost $1.6 million per year less to operate than a Vancouver Mall terminus. As a result, the Tier I measure of cost-effectiveness for the 99th Street area terminus is 5% better than that for a Vancouver Mall terminus.

  The 99th Street area terminus is approximately $236 million (in YOE dollars) less expensive to construct and $1.8 million per year less to expensive to operate than the 179th Street terminus. As a result, the Tier I measure of cost-effectiveness for the 99th Street area terminus is 5% better than that for the 179th Street terminus.

3.3 Rationale for the Recommended Implementation Strategy

- *Questions remain as to whether the Phase I south terminus should head eastward (e.g. toward Kaiser Hospital) or southward (e.g. toward Oregon City).*

While it is determined that Oregon City be the Phase II terminus, there is not yet a preferred Phase II alignment alternative. Two options exist: one would extend from the Phase I terminus in the CTC area to Oregon City via I-205 and one would extend from the Milwaukie CBD to Oregon City via McLoughlin Boulevard (creating a two-branch system in Clackamas County). The PTC alignment in this segment, south of Milwaukie and west of McLoughlin Boulevard, would no longer be considered. The determination of the preferred alignment to Oregon City will effect both the location and orientation of the Phase I terminus within the CTC area. The proposed action plan prescribes a process for making these determinations.

- *Questions remain as how best to accommodate park-and-ride demands in the vicinity of the 99th Street area.*

  Because of the availability of a major interchange at I-5 and 99th Street and other travel demand and land use patterns and opportunities, the area of 99th Street has been identified as the proposed Phase I Northern Terminus. However, the 99th Street area may not provide the best opportunity to accommodate park-and-ride demand. As a result, further analysis will be conducted to determine the best placement of stations and park-and-ride lots between 78th Street and the 99th Street vicinity.

- *Local and regional government commitments towards densification and transit-oriented land use patterns along the proposed Phase II alignment could facilitate federal funding for the Phase II extension.*

  Section 3010 of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) establishes the criteria to be used by the Secretary of Transportation in making recommendations on LRT capital (Section 3) grants. Therein, the Secretary is required to "identify and consider transit supportive existing land use policies and future patterns and ... the degree to which the project ... promotes economic development" in allocating Section 3 funds. Because the existing development levels in the Oregon City and 134th Street areas are not as high as in areas surrounding competing projects in other regions, the strongest case for a Phase II extension may hinge on the densification and transit-oriented land use commitments called for in the proposed action plan.

RATIONALE FOR ALIGNMENT ALTERNATIVES SELECTED FOR FURTHER STUDY

The following conclusions and supporting information summarize the basis for Metro Council's and the C-TRAN Board of Director's selection of the South/North LRT alignment alternatives.

4.1 Portland CBD to Milwaukie/South Willamette River Crossing Alignment Alternative

4.1.1 Rationale for Alignment Recommendation

The *Ross Island Bridge Crossing* and *McLoughlin Boulevard Alignment Alternative* are the alignment alternatives that will be studied further within the Tier II DEIS and the *Caruthers Area Crossing* will receive further study within Tier I to determine whether it should also be advanced into the Tier II DEIS for the following reasons:

- *The Hawthorne Bridge River Crossing Alternative would exhibit substantial reliability and operations problems caused by numerous bridge openings and would not allow direct LRT access to Portland State University and South Downtown Portland.*

  The frequency of openings associated with the Hawthorne Bridge is considered to be a significant disadvantage of this alternative. A bridge opening during the peak-hour would likely disrupt the train schedule for the entire peak-period. Effective travel times would increase and reliability would suffer. As a result, ridership would decline, operating costs would increase and the cost-effectiveness of the alternative would deteriorate over time. Further, an alignment using the Hawthorne Bridge would increase the distance between and LRT station and PSU, a major transit attraction, by approximately 7 blocks. In addition, other activity points in South Downtown Portland would not receive direct LRT access.

- *The Sellwood Bridge alternative would generally exhibit lower ridership, longer trip times, higher operating costs and a higher cost-effectiveness ratio and would not provide direct LRT access to several S.E. Portland neighborhoods and bus routes.*

  The additional length of the Sellwood Bridge alternative would increase transit travel times between the Portland CBD and locations within Clackamas County by up to five minutes more than other alternatives. In addition, the Sellwood Bridge alternative would have the lowest projected total transit ridership (189,800 to 474,000 per year fewer), the lowest LRT ridership (131,000 to 460,000 per year fewer) and the highest operating costs ($690,000 to $1,190,000 per year more), resulting in the highest cost effectiveness ratio of the South Willamette River crossing alternatives. Finally, the Sellwood Bridge alternative would not provide direct LRT access to several S.E. Portland neighborhoods and bus routes that would have LRT access with other river crossing alternatives.

- *While the Ross Island Bridge River Crossing Alternative generally exhibits the same costs and transportation benefits as the Caruthers Bridge alternative, the Project Management Group's and the Steering Group's recommendations to advance the Ross Island Bridge alternative into Tier II were based upon their judgement that a Ross Island crossing exhibits superior land use and development benefits.*

  The Ross Island Bridge alternative would be approximately $6 million (in inflated dollars) less expensive to construct and serve 160,000 less LRT riders per year than the Caruthers Bridge alternative. In combination, these cost and ridership factors are not considered decisive. The choice between these two alignment alternatives is effected by determining which are the most important areas to be served by light rail: (1) OMSI and its surrounding area available for Eastside development and redevelopment or (2) the North Macadam Development and Redevelopment Area. Because of its amount of vacant developable and redevelopable land, its proximity to downtown, its ability to support housing and the role that redevelopment of urban land can play in maintaining a compact urban area, the land use benefits of direct LRT access to the North Macadam Area were determined by the PMG to be greater than in the OMSI area. The Steering Group concurred with the PMG on the importance of serving the North Macadam Redevelopment Area and on the importance of serving established Southeast Portland neighborhoods and recommended that the Ross Island Bridge Alignment be forwarded into Tier II for further study within the DEIS.

- *The Citizens Advisory Committee recommended that the Caruthers Bridge alternative be advanced into the DEIS for further study.*

  The Citizens Advisory Committee recommended that the Caruthers Bridge alternative be advanced into the DEIS for further study generally because it felt that the Caruthers Bridge alternative would provide better service to OMSI, the surrounding redevelopment area and the established S.E. Portland neighborhoods in that area. The Steering Group concurred that the Caruthers Bridge alternative warrants further study and recommended that prior to the adoption of the *Detailed Definition of Alternatives Report* there be a determination of whether the differences between the Ross Island Bridge and the Caruthers Bridge alternatives warrants inclusion of the Caruthers Bridge alternative within the Tier II DEIS.

- *There is a desire to try to serve both the North Macadam area and the southeast Portland area with LRT, expressed both by the PMG and more strongly by the Citizens Advisory Committee.*

  The Tier I analysis assumed that the new LRT bridge would be located south of and adjacent to the existing Ross Island Bridge. A Ross Island crossing close to the existing Ross Island Bridge would provide the highest level of LRT access to the northern parcels of the redevelopable land with less direct access to parcels further south in the district. A crossing further south and closer to Bancroft Street would provide more centralized access to the redevelopable land. On the eastside there is also a desire to provide LRT station access to eastside residential and development areas. A crossing near the existing Ross Island Bridge may provide the best opportunity for a potential station to serve that area, while a crossing

further South may be limited to station access near Holgate Boulevard. As a result of these trade-offs, the recommended action plan proposes further analysis of the location of the river crossing, bridgehead and stations in the North Macadam Area on the westbank and north of Holgate on the eastbank to determine the best opportunities for serving established neighborhoods and development opportunities on both sides of the river.

- *The McLoughlin Boulevard alignment alternative exhibits less cost, greater ridership, higher cost effectiveness and less environmental impact than the Portland Traction (PTC) alternative.*

Within this segment, the McLoughlin Boulevard alignment alternative is approximately $21 million (in inflated dollars) less expensive to construct and $560,000 per year less expensive to operate than the PTC alternative. (In addition, the McLoughlin alternative serves almost 1.5 million annual LRT riders more than the PTC alternative. As a result, the Tier I measure of cost-effectiveness for the McLoughlin alignment is 7% better than that for the PTC alternative. Furthermore, the PTC alignment would traverse Oaks Bottom--a very sensitive wetlands and wildlife area.

4.1.2 Rationale for the Recommended Implementation Strategy

- *Questions remain as to the precise location of the bridge crossing.*

Further research is needed on three key issues before the bridge location(s) to be brought into the DEIS can be finalized. First, more research is needed on the site plans for development in the areas. Second, the environmental impacts of the bridge crossing on the river eco-system and wildlife habitat and visual resources need to be better understood. Third, the opportunities and constraints for station locations and the effect that those locations would have in optimizing LRT access to established residential areas and connections to local transit service.

4.2 Portland CBD Alignment Alternative

4.2.1 Rationale for Alignment Recommendation

The *5th/6th Avenue Surface Alignment Alternative* is the alignment alternative in this segment that will be developed further for study within the Tier II DEIS for the following reasons:

- *The 5th/6th Avenue Surface Alignment Alternative is most consistent with the Downtown Plan*

The Downtown Plan calls for the region's highest density commercial uses along the 5th/6th Avenue spine. Alignment alternatives, whether they be surface or subway, employing other streets places transit further away from these densities and, as a result, fail to maximize the

quality of the service. The Downtown Plan also calls for an active pedestrian environment at street level. This is the basic policy implicit in many aspects of the development requirements for downtown -- for example, the requirement for first-floor retail in parking garages. A surface alignment best provides for such a pedestrian environment.

- *The 5th/6th Avenue Surface Alignment Alternative exhibits lower capital costs and operating costs than the Subway alternative.*

  The 5th/6th Avenue Surface Alignment would be $242 - $296 million (in inflated dollars) less expensive to construct and $1.8 million per year less expensive to operate than the Subway Alternative.

- *Despite its lower ridership, the 5th/6th Avenue Surface Alignment Alternative is more cost-effective than the Subway alternative.*

  Overall weekday corridor ridership would be 2,100 greater with the Subway Alternative. Nonetheless, these ridership benefits are outstripped by the higher capital and operating costs of the Subway Alternative. As a result, the 5th/6th Avenue Surface Alignment Alternative is more cost-effective.

4.2.2 Rationale for the Recommended Implementation Strategy

- *Additional information on the Surface Alignment is needed to determine the design options to be evaluated in the DEIS.*

  Recently, concept plans for the *Surface Alignment Alternative* were circulated for preliminary comment. These plans include two design options which would accommodate LRT, bus, auto and pedestrian circulation on the Transit Mall. One design option would have a three-lane configuration and may require the platooning of certain buses while the other would have a four-lane configuration and may require narrowing some sidewalks.

  Other design options are also being looked at and developed both for the central mall south of Burnside and for the mall north of Burnside. Further analysis and discussion with the public, businesses and various agencies need to be conducted before these designs can be finalized. This additional work will refine station locations (within the general locations specified in the recommendation) and the location of auto circulation and access (hotel and parking garage accesses will be retained, the location of other auto lanes depends on the refined designs). Because of the sensitivity and complexity of these issues, special efforts will be made to involve the downtown Portland community.

4.3 Portland CBD to Vancouver CBD Alignment Alternative

The Metro Council and C-TRAN Board of Directors have yet to determine the alignment alternative(s) in this segment to advance into the DEIS for further study for the following reasons:

- *While the Interstate Avenue alignment alternative costs more than the I-5 alternative, further analysis is needed to determine if there are land use and development benefits of the Interstate alignment that outweigh its additional cost.*

  The I-5 alignment alternative in this segment is approximately $114 million (in inflated dollars) less expensive to construct, $120,000 per year less expensive to operate and serves 460,000 more LRT riders per year than the Interstate Avenue alternative. However, the relative land use and development benefits are of critical importance and therefore merit additional consideration before a draft recommendation is proposed.

- *Further analysis is needed to identify and evaluate modified alternatives which merge the I-5 alignment with portions of the Interstate alignment.*

  In Tier I, it was assumed that the I-5 alignment would parallel the freeway. As a result, the I-5 alignment would serve the Kenton neighborhood with a station location on the fringe of the neighborhood. There is a desire to determine if the I-5 alignment can be merged with the Interstate alignment at a location between Skidmore Street and Columbia Boulevard to achieve the benefits associated with the Interstate alignment at a reduced cost -- in particular more centrally located service within Kenton.

- *Further public input is needed to determine community preferences.*

4.4 Vancouver CBD to 134th/WSU Area Alignment Alternative

4.4.1 Rationale for Alignment Alternative

The I-5 East Alignment Alternative is the alignment alternative in this segment that will be advanced into the DEIS for further study for the following reason:

- *The I-5 East Alignment Alternative is consistent with Growth Management Plans, exhibits less cost, greater ridership and higher cost effectiveness than the Highway 99 alternative.*

  The I-5 East Alignment Alternative is consistent with the Growth Management Plans for the Hazell Dell area prepared by Clark County, the City of Vancouver, C-TRAN, RTC and WSDOT. The LRT running alignment between stations is best located next to I-5 because it will avoid the traffic pattern disruption and local impacts associated with the Highway 99 alignment. However, the optimal locations for stations, pedestrian connections and park-and-ride lots between Highway 99 and east of I-5 need to be studied further within the 99th Street

area special study to maximize the transportation and land use benefits in the proximity of Highway 99.

In addition, the I-5 alignment alternative is approximately $167 million (in inflated dollars) less expensive to construct between 39th and 134th Streets than the Highway 99 alternative. In addition, the I-5 alignment alternative is estimated to cost $190,000 per year less to operate than the Highway 99 alternative. Furthermore, the I-5 alternative serves 400,000 annual LRT riders more than the Highway 99 alternative. As a result, the Tier I measure of cost-effectiveness for the I-5 alignment is 11% better than that for the Highway 99 alternative.

4.4.2 Rationale for the Recommended Implementation Strategy

- *Additional information on the segment between 78th Street and 99th Street is needed to determine the location of stations and park-and-ride lots to be included in the DEIS.*

The design studies and technical analyses conducted in Tier I included an alternative terminus in the vicinity of 88th Street. In adopting the *Tier I Final Report* it was determined that the area of 99th Street would be a more appropriate location for the terminus given its proximity to a major arterial and interchange with I-5. This determination creates additional opportunities for stations and park-and-rides which were not considered to date in Tier I. One of the objectives of the 99th Street area special study is to determine more precisely where within the vicinity of 99th Street the terminus station should be located.

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PLANNING COMMITTEE REPORT

CONSIDERATION OF RESOLUTION NO. 94-1989, FOR THE PURPOSE OF DETERMINING THE SOUTH/NORTH LIGHT RAIL TRANSIT ALTERNATIVES TO ADVANCE INTO THE TIER II DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR FURTHER STUDY

Date: December 19, 1994 Presented by: Councilor Monroe

Committee Recommendation: At the December 15 meeting, the Committee voted 5-0 to recommend Council adoption of Resolution No. 94-1989. Voting in favor: Councilors Devlin, Gates, McLain, Monroe, and Moore. Councilors Gardner, Kvistad and Washington were absent.

Committee Issues/Discussion: The staff report was presented by Andy Cotugno, Planning Director, and Leon Skiles, Transportation Planning Manager. Skiles explained that the purpose of the resolution was to adopt those route and terminus alternatives for the South/North Light Rail that will be forwarded for further study within the Tier II draft environmental impact statement (DEIS) for the proposed line. He noted that the committee had already been briefed twice on the resolution and the staff report and documents related to the Tier I alternative selection process.

Skiles noted that the principal remaining outstanding issue had been the resolution and staff report language related to the inclusion of the Caruthers Bridge crossing in the DEIS process. Proponent of this crossing had argued that the language would make it far more difficult for this crossing to be included in the DEIS process. Skiles noted that JPACT adopted an amendment to this resolution which provides that "Both the Ross Island and Caruthers alternatives will be provided equal consideration through this further evaluation." The draft Tier I Final Report also was amended to define the nature of the further study of the Caruthers crossing.

Councilor Monroe and Skiles both commented that the intent of these changes was to insure that there would be no special requirements or obstacles to including the Caruthers crossing in the DEIS process and that it would only have to meet the same conditions that were applied to the Ross Island crossing alternative.

Skiles also noted that the issue of future regional light rail priorities had been discussed at JPACT. Some had expressed concern that language should be added to the Tier I report and the resolution to clarify that extensions to the south/north line will not be given priority over other future lines or line extensions. Such language was not added, but JPACT did create a record to indicate that it was not the intent of the report or the resolution to address the issue of the priority of any future line or extension.

Public testimony focused on the Willamette crossing issue and the use of a surface or subway route in the downtown area. Bing Sheldon, representing property owners supporting the Ross Island crossing offered written data and arguments in favor of this crossing. His arguments in support included: 1) the potential amount and nature of future development near the western end of the Ross Island crossing, 2) housing development in the area in support of regional urban growth management goals which would be facilitated by access to light rail, and 3) the leveraging of private investment capital that would be aided by a light rail line. Sheldon supported the adoption of the resolution.

Jay Zidell, a major property owner near the west end of the proposed Ross Island crossing, contended that the crossing would provide the greatest ridership, support urban growth goals and promote further development in the north Macadam area. He expressed concern that the crossing decision should not pit eastside and westside interests against each other.

Roger New, representing Schnitzer Investment Corporation, spoke in favor of the Ross Island crossing. He noted that property owners in the North Macadam have already initiated efforts to develop the area and that these efforts would be enhanced by light rail. He contended that environmental concerns about a Ross Island crossing are being addressed.

Gina and Daniel Maloney testifed on behalf of the Corbett-Terwilliger-Lair Hill Neighborhood Association. They explained that, while they personally supported a Sellwood crossing, the association had adopted a resolution in support of the Ross Island crossing. The resolution also noted that environmental issues related to such a crossing must be identified and addressed. Kerry Chipman, Corbett-Terwilliger-Lair Hill Neighborhood Association, reviewed the history of the association's consideration of the crossing issue and questioned the validity of the process under which the resolution noted above had been adopted. He noted that the issue would be before the association again at its January meeting.

Jim Howe, Association of Oregon Transit Advocates (AORTA), and Stan Lewis, Downtown Community Association, expressed the need for continued study of a subway option for the downtown portion of the line. They questioned cost assumptions concerning a subway and argued that a surface route would be very disruptive to the existing transit mall and downtown businesses. Howe also argued in favor of a southern terminus in Oregon City instead of at Clackamas Town Center. He contended that ridership from an Oregon City line would be four times greater than on a Clackamas Town Center line.

All of those testifying supported adoption of the resolution.

BEFORE THE METRO COUNCIL
AND THE
C-TRAN BOARD OF DIRECTORS

FOR THE PURPOSE OF DETERMINING THE SOUTH/NORTH LIGHT RAIL TRANSIT ALTERNATIVES TO ADVANCE INTO THE TIER II DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR FURTHER STUDY	)))))))	METRO RESOLUTION NO. 94-1989 C-TRAN RESOLUTION NO. BR-94-011 Introduced by The Planning Committee

WHEREAS, In April 1993 Metro Council and the C-TRAN Board of Directors selected the Milwaukie and I-5 North Corridors as the region's next high-capacity transit priority for study and combined them into the South/North Transit Corridor to be studied within a federal Alternatives Analysis/Draft Environmental Impact Statement; and

WHEREAS, In October 1993 the Federal Transit Administration approved the South/North application to initiate Alternative Analysis/Draft Environmental Impact Statement and the South/North Preliminary Work Plan, and issued notification of intent in the *Federal Register* to publish a South/North Environmental Impact Statement; and

WHEREAS, In December 1993 the South/North Steering Group concluded the federally prescribed Scoping Process, which included a comparative analysis of various high-capacity transit mode alternatives, by selecting the light rail transit mode and various light rail terminus and alignment alternatives to advance into Tier I for further study; and

WHEREAS, The South/North *Evaluation Methodology Report*, as adopted by the South/North Steering Group in December 1993, prescribes the South/North study organization and process for the conclusion of the Tier I study process and the selection of

the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, The role of the South/North Steering Group in the Tier I study process is to forward its final Tier I recommendation to participating jurisdictions for their consideration, that participating jurisdictions are to forward their recommendations to the C-TRAN Board of Directors and the Metro Council who are to make the final determination of the alternatives to advance into the Tier II Draft Environmental Impact Statement for further study; and

WHEREAS, The *Evaluation Methodology Report* further prescribes the criteria and measures to be used to select the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, The alternatives that were selected at the conclusion of Scoping have been developed and evaluated based on the criteria and measures from the *Evaluation Methodology Report* and documented within various technical memoranda, including the *South/North Tier I Technical Summary Report* and the *South/North Tier I Briefing Document*; and

WHEREAS, The technical methodologies, assumptions and results have been reviewed by the South/North Expert Review Panel which found, in summary, that "...the data developed is sufficient to make the decisions regarding which alternatives should be carried forward for further study;" and

WHEREAS, A comprehensive public involvement program was developed and implemented by the South/North Study that included, but was not limited to, numerous community meetings, a 60-day public comment period on the Tier I alternatives and data,

public meetings for the Steering Group to receive oral comment, and an ongoing Citizens Advisory Committee that received staff reports and presentations, provided regular public comment opportunities, and in September 1994 formed an independent Tier I recommendation that was forwarded to the Steering Group for its consideration; and

WHEREAS, In October 1994 the Steering Group considered the Citizens Advisory Committee and Project Management Group recommendations, public comment and the Tier I criteria and measures and issued its own unanimous Tier I recommendation to the participating jurisdictions, C-TRAN Board of Directors and Metro Council for their consideration; and

WHEREAS, The Steering Group's Final Tier I Recommendation identifies the LRT alternatives, described in Exhibit A, that they concluded best meet the project's goal and objectives as adopted in December 1993 by the South/North Steering Group within the *Evaluation Methodology Report*; and

WHEREAS, Clark, Clackamas and Multnomah Counties; the cities of Portland, Milwaukie, Oregon City, Gladstone and Vancouver; and the Tri-County Metropolitan Transit District have adopted recommendations for the South/North alternatives to advance into the Tier II Draft Environmental Impact Statement for further study; now therefore,

BE IT RESOLVED, That the following general approach be adopted for the continuation of the South/North Transit Corridor Study:

1. The South/North Corridor will be conducted in two study phases:

    a. Phase I will consider a light rail transit project between the Clackamas Town Center area and the 99th Street area in Clark County.

b. Phase II will consider an extension of the Phase I light rail transit project south to Oregon City and north to the 134th Street/Washington State University branch campus area.

2. These study phases will proceed as follows:

a. Preparation of the Draft Environmental Impact Statement and funding plan for the Phase I light rail transit alternative will begin immediately.

b. If light rail transit is selected as the Locally Preferred Alternative in Phase I, a Draft Environmental Impact Statement and funding strategy for the Phase II LRT extension will be prepared upon completion of the Final Environmental Impact Statement for Phase I.

3. The following alignments are the alternatives for further study within the Phase I South/North Draft Environmental Impact Statement:

a. Between the Portland and Milwaukie central business districts, the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate streets in the south, and the McLoughlin Boulevard alignment shall be developed for further study within the Draft Environmental Impact Statement. The Caruthers area crossing will be evaluated further in order for the Metro Council and the C-TRAN Board of Directors to determine whether it should also be included in the *South/North Detailed Definition of Alternatives Report* and developed further in the Draft Environmental Impact Statement. Both the Ross Island and Caruthers alternatives will be provided equal consideration through this further evaluation.

b. Within the Portland central business district, a surface light rail transit alternative on 5th and 6th Avenues shall be developed based upon several principles, for further study within the Draft Environmental Impact Statement. If at the time the Draft Environmental Impact Statement is initiated it is concluded that a 5th/6th Avenue alignment cannot be developed that addresses those principles, other alternatives will be developed for further study in the DEIS.

c. Between the Vancouver central business district and the vicinity of 99th Street, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 shall be developed for further study within the Draft Environmental Impact Statement.

4. Because further discussions and analysis should occur, the selection by the Metro Council and the C-TRAN Board of Directors of an alternative for further study within the segment between the Portland and Vancouver central business districts shall wait completion of additional technical work and evaluation.

5. The following alignments will be considered for the Phase II extensions:

a. Following completion of the *Detailed Definition of Alternatives Report*, an analysis of the I-205 alignment from the CTC terminus and the McLoughlin alignment from the Milwaukie CBD will be made to determine which alignment will advance into the Phase II DEIS. The Portland Traction Company (PTC) right-of-way will not be considered as a Phase II alignment.

b. Between the vicinity of 99th Street and the area of 134th Street/WSU Branch

Campus, the I-5 East alignment will advance into the Phase II DEIS.

And further,

BE IT RESOLVED, that Exhibit A is adopted as the *South/North Transit Corridor Tier I Final Report* that identifies in more detail the alternatives and study approach to be utilized in Tier II and the preparation of the Draft Environmental Impact Statement for the South/North Transit Corridor.

ADOPTED by the Metro Council on this _____ day of _____, 1994.

_____
Judy Wyers, Presiding Officer
Metro Council

ADOPTED by the C-TRAN Board of Directors on this _____ day of _____, 1994.

_____
Rose Besserman, Chair
C-TRAN Board of Directors

LS:lmk
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94-1989.RES

Attachment A

South North
Transit Corridor Study

Briefing Document
Tier I Technical Summary Report

August 15, 1994

Metro

South North
Transit Corridor Study

Briefing Document

Tier I Technical Summary Report

August 15, 1994

Table of Contents

I. Introduction

Metro and C-TRAN, in cooperation with twelve state and local jurisdictions and agencies, are studying the South/North Transit Corridor to determine whether proposed light rail transit (LRT) improvements within the Corridor should be designed and constructed.

The South/North Transit Corridor Study was initiated in July 1993 following the region's decision in April 1993 to designate the South/North Corridor as the region's priority corridor within which to conduct the next Alternatives Analysis following the Westside Corridor to Hillsboro.

Because of the size of the South/North Corridor and the complexity of the issues involved, the South/North Alternatives Analysis was divided into two phases, or "tiers."

Tier I

The purpose of Tier I is to define the high capacity transit (HCT) alternative to be studied further within Tier II. Tier I will be used to: 1) select a preferred HCT mode; 2) to determine how far south and how far north within the Corridor to study further; and, 3) to reduce the number of HCT alignment alternatives throughout the corridor to one or two.

At the beginning of Tier I, the Region conducted a "Scoping" process where a wide range of alternative HCT modes (LRT, busway, river transit and commuter rail) were evaluated. Through the analysis prepared within Scoping, the Region determined that only LRT warranted further study within Tier I, in effect determining that the HCT mode that would advance into Tier II would be LRT. Therefore, within Tier I, the only alignment alternatives that have been developed and analyzed are LRT alternatives.

Tier II

The purpose of Tier II will be to evaluate the LRT alternative selected within Tier I and to compare it to a No-Build Alternative and an expansion of the bus system termed the Transportation Systems Management (TSM) Alternative. The performance, costs and impacts of these three alternatives will be documented within a draft environmental impact statement (DEIS) which will be used by the Region in selecting a locally preferred alternative. If the selected alternative is the LRT Alternative then the Corridor would advance toward final design and construction.

Narrowing LRT Alternatives: The Choice at Hand

The South/North Study is currently concluding Tier I. The purpose of this document is to summarize the data and information that have been prepared on the various LRT alternatives being studied within Tier I in order to allow the community and decision-makers to come to an informed determination on which alternatives should advance to Tier II for further study

The Tier I alternatives and this document have been structured to facilitate the understanding of the trade-offs (the benefits and the costs, the advantages and disadvantages) of the various LRT alternatives being considered. Again, because of the size and complexity of the Corridor, the choices have been divided into several groups (described in Section III of this report) where the differences between the alternatives can be isolated and better understood. By selecting the best LRT alternative within each group the region will define the optimum LRT alternative to advance into Tier II.

Other choices concerning the LRT alternatives also face the region but are not addressed within this document nor by the process at this time. They are at a finer level of detail and are called "design options," such as the placement of LRT tracks in the center or on the left or right side of a street. Design options exist for each of the alternatives being evaluated. Many design options have been evaluated within Scoping and Tier I. Throughout Tier I, design options have been screened out or have been developed to solve problems or to take advantage of opportunities. Design options associated with the alternatives selected to advance into Tier II will be further refined and screened before work is initiated on the DEIS. This screening will be conducted by the Steering Group and Project Management Group in consultation with the public and the Citizens Advisory Committee

Following is a description of the transportation problems within the Corridor and the goal and objectives of the South/North Study that were used to help define and evaluate the LRT Alternatives being considered.

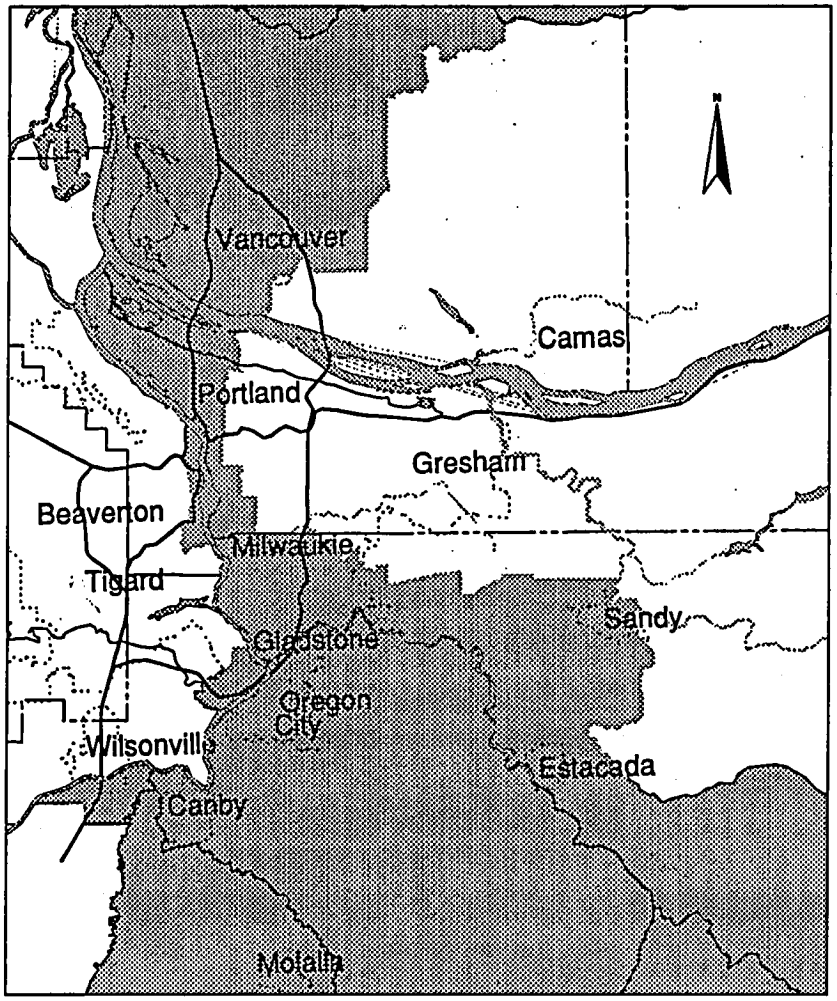


Figure 1 South/North Corridor

II. Purpose and Need

The purpose of the following two pages is to set a context for the South/North Transit Corridor Study: What area does the Study cover? Why are we studying the South/North Corridor? What purpose will the alternatives being studied serve? How will we evaluate the alternatives?

The South/North Corridor

Figure 1 illustrates the South/North Corridor. It is the travel shed extending north from the Oregon City area in Clackamas County, through downtown Portland and into Clark County beyond Vancouver. The Corridor is defined in this way because it captures the trips that could benefit from the major transit improvements being evaluated, either on LRT exclusively or fed through a system of connecting bus routes or park-and-ride lots.

Key activity centers within the Corridor help to define the points that LRT alternatives should connect to. The first three in the table below are common in all of the alternatives being studied, but the remaining centers present choices and trade-offs between the alternatives in the South and the North.

Major Activity Centers Within the Corridor

Common	South	North
Downtown Portland Downtown Milwaukie Downtown Vancouver Jantzen Beach	Clackamas Town Center Oregon City	I-5 & 134th Vancouver Mall

The Corridor also includes other important centers such as the Central Eastside Industrial Area, OMSI, Portland State University, Johns Landing, Interstate Avenue and Portland Community College. The proposed LRT improvements could serve over twenty Portland neighborhoods, depending upon the alternatives selected.

In all, the South/North Corridor covers almost half of the metropolitan region. It is characterized by high employment and residential growth with the potential for worsening travel conditions. Population and employment growth in Clark and Clackamas Counties is projected be 32% to 48% over the next twenty years, exceeding the overall Regional growth rates.

Transportation Problems and Opportunities

The problems and opportunities that exist within the South/North Corridor set a context for defining and evaluating the transit alternatives.

- **Traffic Problems.** Traffic in the South/North Corridor is exceeding the capacity of many of the roads and intersections within highway system. For example, most of McLoughlin Boulevard is currently highly congested with a level of service of E or F (A is best, F is worst). In the North, traffic across the Columbia River has almost doubled since the opening of the I-205 Bridge with projections for continued growth well into the future, causing demand to exceed capacity during the key commute periods.

- **Transit Problems.** As the highway network becomes congested the bus network, which shares the road with cars and trucks, experiences longer travel times and high levels of unreliability. Deterioration in speed and reliability of buses increases operating costs, deters ridership and costs transit riders thousands of person hours a day through longer bus trips.

- **Regional Plans.** For almost twenty years the Region has shaped its land use and transportation plans based upon the expectation that high capacity transit (HCT) would be provided within the South/North Corridor. Those plans have sized the road network, defined the comprehensive land use plans and implemented a bus network that would be served by and enhance an HCT facility.

- **New State Regulations.** Both Oregon and Washington jurisdictions face tougher state regulations affecting transportation and land use planning. Oregon now requires that the Region plan for a 20% reduction in the per capita vehicle miles traveled and a 10% reduction in the per capita number of parking spaces. In Washington, the Clark County area is required to adopt a commute trip reduction ordinance that would result in a 35% drop in trips to major employers by 1999.

- **Economic Health.** There is growing concern that reduced accessibility within the South/North Corridor may reduce its ability to attract and retain industrial and commercial development in the Corridor. This trend adds to the concern in Clark County regarding the relative loss of per capita income compared to the Region. Further, concurrency requirements within Washington may limit new developments if the transportation system is inadequate to handle new demand.

- **Air Quality.** The Region is currently "marginal" for ozone and "moderate" for carbon monoxide. Transit expansion is a key element of the Region's proposed Air Quality Maintenance Plan and could save new industry $2 million a year in air quality clean-up costs.

Goal and Objectives

To implement a major transit expansion program in the South/North Corridor which supports bi-state land use goals, optimizes the transportation system, is environmentally sensitive, reflects community values and is fiscally responsive.

1. Provide high quality transit service.

2. Ensure effective transit system operations.

3. Maximize the ability of the transit system to accommodate future growth in travel demand.

4. Minimize traffic congestion and traffic infiltration through neighborhoods.

5. Promote desired land use patterns and development.

6. Provide for a fiscally stable and financially efficient transit system.

7. Maximize the efficiency and environmental sensitivity of the engineering design of the proposed project.

Alternatives were developed that address the problems and opportunities within the Corridor and they are described in the following section of this report. The study's objectives provide a framework for evaluating the alternatives. Each alternative's ability to meet the study objectives was measured. Their performance is described in Sections V-X and summarized in a table format in Appendix A.

III. Tier I LRT Alternatives

The Tier I LRT Alternatives have been divided into six groups in order to isolate and better understand the choices to be made.

A. Study Terminus Alternatives

Study Terminus Alternatives will be used to define how far South and North to study within Tier II. Because of the time and costs associated with the Tier II analysis, it is important that the Region only study improvements that could potentially be funded and that provide adequate benefits in relationship to their costs. A set of Study Terminus Alternatives have been defined for the South and the North. They have been analyzed and are evaluated in sections V and VI separately so that decisions regarding the ultimate termini can be made independently of each other.

While selecting Study Termini short of the furthest points would not remove the furthest points from the Regional Transportation Plan's HCT Corridors, it could remove them from the list of Ten-Year Priorities.

Also, it is important to note that the determination of a Study Terminus in Tier I is different than the minimum operable segment analysis and selection of a locally preferred alternative that will occur in Tier II. The Study Terminus choice will be just that, how far North and South to *study* in Tier II. The Region may choose to, or the Federal Transit Administration may require us to, evaluate even shorter segments before the selection of the locally preferred alternative following the completion of the draft environmental impact statement. This analysis could also include the possible phasing of improvements with an opening of one segment followed a year or two later by the opening of another segment.

Finally, selection of a Study Terminus will not necessarily define the precise street or location of the terminus. Instead, it is intended to define the general vicinity of the terminus for study in Tier II. Design considerations such as station and park-and-ride lot locations, costs and traffic and environmental impacts may require that a terminus studied in Tier II to be several blocks from its designation as the Study Terminus at the conclusion of Tier I.

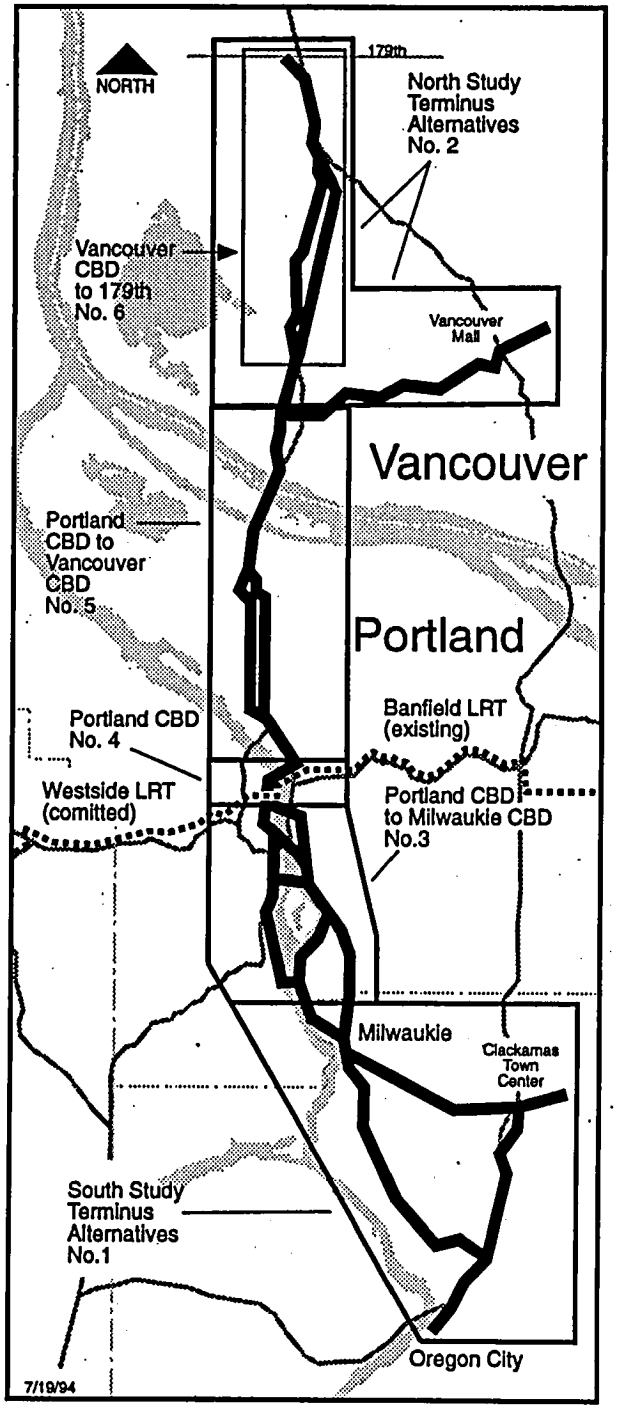


Figure 2 Tier I Groups of Alternatives

1. **South Study Terminus Alternatives**
   - **Milwaukie CBD.** This alternative would extend LRT from downtown Portland, across the Willamette River to south or east of the Milwaukie CBD.
   - **Clackamas Town Center.** This alternative would extend LRT from downtown Milwaukie to the Clackamas Town Center and possibly across I-205 to a park-and-ride in the vicinity of Sunnyside Road.
   - **Oregon City via McLoughlin Boulevard.** This alternative would extend LRT south from Milwaukie along McLoughlin Boulevard, through Gladstone and into the old town area of Oregon City.
   - **Oregon City via I-205 and Clackamas Town Center.** This alternative would extend LRT through the Clackamas Town Center, along I-205, through Gladstone and into the old town area of Oregon City.

2. **North Study Terminus Alternatives**
   - **Vancouver CBD.** This alternative would extend LRT from downtown Portland, across the Steel Bridge and across the Columbia River, through downtown Vancouver to 39th Street.
   - **88th Street.** This alternative would extend LRT from 39th Street, parallel to I-5, to 88th Street.
   - **134th Street.** This alternative would extend LRT from 88th Street, parallel to I-5, to 134th Street near the future WSU branch campus.
   - **179th Street.** This alternative would extend LRT from 134th Street, parallel to I-5, to 179th Street near the Clark County Fairgrounds.
   - **Vancouver Mall.** This alternative would extend LRT east from the Vancouver CBD, parallel to SR-500, to the Vancouver Mall and possibly across I-205 to a park-and-ride lot in Orchards.

B. LRT Alignment Alternatives

Alignment alternatives are the major choices of where LRT improvements should be studied further within Tier II. As opposed to design options described in Section I, alignment alternatives are separated by several blocks or miles. Generally, the differences in alignments are great enough to cause significant differences in costs and ridership. There are four geographic areas within the Corridor that have Alignment Alternatives being evaluated:

3. **Portland CBD to Milwaukie CBD**

   a. **Willamette River Crossings:**
   - **Hawthorne Bridge.** This alternative could use the existing Hawthorne Bridge which would be retrofitted for LRT.
   - **Caruthers Bridge.** This alternative would use a new span under the Marquam Bridge from South Waterfront District to south of OMSI.
   - **Ross Island Bridge.** This alternative would use a new span just south of the existing Ross Island Bridge.
   - **Sellwood Bridge.** This alternative would provide service to Johns Landing and would use a new span north of the Sellwood Bridge.

   b. **Eastbank Alignments**
   - **McLoughlin Blvd.** This alternative would use McLoughlin Blvd. between the three northern river crossings and Sellwood.
   - **PTC Alignment.** This alternative would use the Portland Traction Company alignment next to the Willamette River between the three northern river crossings and Sellwood.

4. **Portland Central Business District**
   - **Surface.** This alternative would be on the surface streets of 5th and 6th Avenues on the Transit Mall between the Steel Bridge and connections to the South Willamette River crossings.
   - **Subway.** This alternative would be below ground from Union Station to connections to the South Willamette River crossings. A subway could be under 4th, 5th, 6th or Broadway Avenues but could not be connected to a Hawthorne Bridge crossing.

5. **Portland CBD to Vancouver CBD**
   - **Interstate Avenue.** This alternative would be within the Interstate Avenue right-of-way between the Kaiser medical facility and Kenton.
   - **I-5.** This alternative would be on the ridge above and parallel to I-5, generally within or adjacent to the Minnesota Avenue right-of-way between Kaiser medical facility and the Kenton neighborhood.

6. **Vancouver CBD to 179th Street**
   - **Highway 99.** This alternative would be in the median of Highway 99 between the Main Street/I-5 interchange and 179th Street.
   - **I-5.** This alternative would be directly adjacent to I-5 between Main Street/I-5 interchange and 179th Street.

IV. A Few Notes About the Numbers

Following is a description of how many of the measures within this report were developed:

- **Comparing the Alternatives.** Most important in using the comparative measures within this report is understanding the alternatives and how they have been developed for the purpose of this analysis. Within the grouping of alternatives (e.g. South Study Terminus Alternatives, Portland CBD to Vancouver CBD Alignment Alternatives, etc.) the alternatives have been held constant outside the segment in question. For example, when developing, modeling and comparing South Study Terminus Alternatives, changes were only made within the segment from Milwaukie to Oregon City. Each of the South Study Terminus Alternatives are the same north of Milwaukie: McLoughlin Boulevard, across the Hawthorne Bridge, through downtown Portland using the surface alignment on the Transit Mall, north on Interstate Avenue, through the Vancouver CBD and along I-5 to 179th Street. When evaluating the North Study Terminus Alternatives, the alignments south of Vancouver are similarly held constant terminating in the south in Oregon City via I-205.

  This method of analysis was employed to ensure consistency among the alternatives within a given segment or group. It also guarantees that the changes in the data can be attributed to the changes made to the alternatives within the segment in question. Finally, it allowed the number of alternatives developed and analyzed to be kept to a minimum, saving time and money.

  There are three important implications that lead from this way of analyzing the alternatives:

  1) The differences between the alternatives in ridership and costs are real and are tied directly to the variations in the alternatives;

  2) Much of the data from one set of alternatives should not be compared with an alternative from another set; and

  3) There are numerous combinations of projects that can be created by mixing and matching the alternatives within each of the segments. All of those combinations have not been presented or costed within this report. However, a matrix of the possible southern and northern terminus combinations is provided in Appendix B. By using add-ons or deductions for each of the alignment alternatives, one can develop a cost estimate for any of the possible combinations.

- **Ridership.** The light rail ridership forecasts are based upon changes in the LRT and bus networks within the Corridor. The forecasts are for the year 2015 and are based on existing land use plans and allocations developed by Metro and local jurisdictions.

- **1994 Capital Costs.** Capital cost estimates for the alternatives have been developed in 1994 dollars by calculating the quantities in sixteen cost categories from conceptual plans for each segment of alignment. Costs include right-of-way , related roadway reconstruction, structures, various trackway treatments, system costs (e.g. signals system), light rail vehicles and maintenance facilities. The cost estimates also include engineering, administration and a contingency allowance to reflect the level of design detail available. The unit rates used to develop these estimates include historic data and recent Westside LRT data, where available.

- **Year of Expenditure (YOE) Costs.** Because costs generally inflate over time and it would take approximately ten years to finish the planning, engineering and construction of the LRT alternatives, the projected inflated costs of the alternatives have been provided. First, the YOE costs depend upon the assumed inflation rate (6.2%) and the construction schedule (developed consistent with the Westside Project with construction completed by 2003 to 2005 depending upon the alternative). In general, the 1994 costs increase by about 60% to develop the year of expenditure costs. Second, additional items beyond design and construction costs have been added to the factored 1994 capital costs to provide a more accurate prediction of the actual funds that will be needed to complete the alternate projects. Those additional items include a reserve for yet-to-be determined design options, bonding issuance costs, interim borrowing costs and funds for a capital reserve account (CAPRA).

- **Operating and Maintenance (O&M) Costs.** O&M costs within this report are the costs of operating the LRT alternative. The difference in bus O&M costs between the alternative with the highest bus operating costs and the other alternatives is subtracted from the LRT operating costs. The result is the *effective* LRT operating costs used in calculating the cost effectiveness

estimate for the alternatives.

- **Cost Effectiveness.** Cost effectiveness analysis provides a means of comparing the benefits of each alternative with its costs. The Tier I cost effectiveness analysis focuses on two different costs: 1) Effective Operating Costs; and 2) Total Annualized Costs. Effective Operating Costs are the year 2015 operations and maintenance costs of the LRT minus the bus O&M costs saved by the subject LRT alternative from the highest bus O&M costs among the comparable alternatives. Total Annualized Costs includes annualized LRT capital costs plus the year 2015 Effective Operating Costs (in 1994 dollars). Annualized capital costs are based on the estimated LRT capital costs in 1994 dollars and assume a seven-percent discount rate and a 40-year economic life. The higher the cost effectiveness ratio, the less cost effective the alternative.

- **Environmental Analysis.** The estimates of environmental impacts (e.g. noise and vibrations, displacements, etc.) are based upon sketch-level analysis. While the data is accurate in comparing the alternatives, the actual environmental impacts may change as designs are refined, as more detailed analyses are done and as mitigation measures are developed and incorporated into the design. Tier II, with the preparation of the Draft Environmental Impact Statement, will provide a very high level of detail on a much wider array of potential impacts.

Technical Summary Report

The *Briefing Document* is in essence an executive summary of the *South/North Tier I Technical Summary Report*, which can be referred to for more detailed information.

Appendix A

At the end of this report in Appendix A are tables for each of the six sets of alternatives that present all of the criteria and measures for each of the alternatives. The tables within the body of the report summarize the ridership, cost and cost effectiveness for the alternatives included within the larger tables. Within the text of this report measures are referred to that are either within the summary table adjacent to the text or within the full tables included within Appendix A.

Glossary of Terms

Terminus: A terminus is the furthest north or south light rail station.

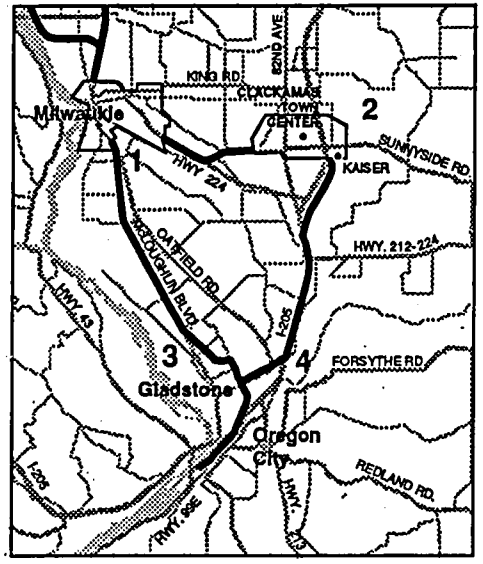
LRT Ridership: Light rail ridership includes any transit trip that would use light rail for a portion of that trip within the South/North Corridor

Total Transit Ridership: Total transit ridership is the total number of bus, light rail and combined bus and light rail trips taken within the corridor. They are one-way trips and a trip that involves a transfer is counted as one trip.

Total Transit Travel Time. Total Transit Travel Time is the combined time it would take to walk to a bus stop or station, wait for the bus or light rail vehicle, travel within the vehicle, and walk to the destination. Travel times used within this report are for the peak rush hour in the peak direction (traveling away from downtown in the evening).

Cutline. A cutline is an imaginary line drawn across one or more highways where the total number of cars or passengers crossing that line are added together. By comparing the highway or transit capacity across that line to the cars or passengers that would cross that line under any given alternative, a volume to capacity ratio can be calculated giving an indication of congestion at that location.

V. South Study Terminus Alternatives



The above map illustrates the four terminus alternatives for the South that could be selected to advance into Tier II. The selection of a Study Terminus will define the southern limits of the Tier II analysis. Within those limits, shorter segments may be studied for either phasing opportunities or as required by the federal government to determine the minimum operable segment.

1. Milwaukie Terminus

Advantages:

- The least costly of the four alternative southern termini, with a capital cost savings in $YOE of $457 to $1,015 million compared with a terminus at Clackamas Town Center (CTC) or Oregon City.
- The least costly of the alternatives to operate, with annual savings in $1994 of approximately $70,000 (CTC) to $2.7 million (Oregon City via I-205).
- The most cost effective southern terminus alternative.
- Total transit travel time between Milwaukie and Portland CBDs would be less than auto travel times during the peak hour.

Disadvantages:

- Lowest LRT and total transit (LRT + bus) ridership, with 2,500 to 5,850 fewer LRT trips and 600 to 2,150 fewer total transit trips.
- Would provide only limited LRT service into Clackamas County and to major activity centers within the County.
- Limited park-and-ride lot opportunities with the highest park-and-ride demand would result in higher capital costs and/or lower ridership estimates with greater traffic impacts than are currently estimated.

Portland CBD to:	Milwaukie CBD	CTC/Sunnyside	Oregon City via McLoughlin	Oregon City via I-205
Year of Expenditure Cost (millions)	$674	$1,131	$1,272	$1,689
LRT Weekday Ridership from 179th to:	56,900	59,400	61,900	62,750
Total Corridor Transit Weekday Ridership	129,200	129,800	131,750	131,350
Effective LRT Annual Operating Cost (millions) from 179th to:	$12.87	$12.94	$13.35	$15.58
Cost Effectiveness Ratio	6.72	7.48	7.50	8.40
Additional park-and-ride capacity may be required to accommodate forecast demand at the estimated cost (YOE millions) of:	$28	$13	$20	$6

- Would leave many of the transportation problems within the segment unaddressed, with slower total transit travel times for Oregon City and Clackamas Town Center to the Portland CBD than for the same trip using an automobile. In addition, volume to capacity ratios (congestion) at several cutlines would be highest among all the alternatives.

- Limited ability to respond to or shape development within the most rapidly growing areas of the segment.

- Would not provide LRT service to CTC or Oregon City.

2. Clackamas Town Center Terminus

Advantages:

- The lowest cost (both capital and O&M) and the most cost effective of the alternatives that extend into the urban area of Clackamas County.

- Would provide LRT access to Clackamas Town Center area, a high growth rate area and high intensity use area in Clackamas County.

- Total transit travel times between Clackamas Town Center and the Portland CBD would be one minute faster than the automobile travel times.

- The lowest (same as Oregon City via McLoughlin Boulevard) operating cost per trip of the alternatives.

Disadvantages:

- Higher cost (both capital and O&M) than the Milwaukie Terminus.

- Lower LRT and total transit ridership than either extension to Oregon City.

- McLoughlin park-and-ride demand must be accommodated with a lot near or north of the Milwaukie CBD which may result in more local traffic impacts within the downtown Milwaukie area.

- Would not provide LRT service to Oregon City, the county seat.

3. Oregon City via McLoughlin Boulevard Terminus

Advantages:

- Highest total transit and second highest LRT ridership of the South terminus alternatives.

- Total transit travel times between Oregon City and downtown Portland would be two minutes faster than the auto travel times.

- Would provide direct LRT service to the County seat.

- The lowest (same as CTC) operating cost per trip of the alternatives.

- Some opportunities for redevelopment on McLoughlin Boulevard.

Disadvantages:

- Second highest capital cost southern terminus alternative, almost $600 million more costly than the Milwaukie Terminus and $140 million more than the CTC Terminus, and second highest O&M costs.

- The second highest cost effectiveness ratio.

- Park-and-ride demand from east of Milwaukie must be accommodated with a lot near or north of the Milwaukie CBD which may result in more local traffic impacts within the downtown Milwaukie area.

- Traffic impacts on McLoughlin Boulevard would include left turns being restricted to intersections and impacts during construction.

- Limited opportunities for new development.

- Would not provide LRT service to CTC.

4. Oregon City via I-205 Terminus

Advantages:

- Would have the highest LRT ridership and second highest total transit ridership of the southern terminus alternatives.

- Would provide LRT access to the CTC area, the highest growth rate and highest planned density use area of the County, and to Oregon City, the County seat.

Disadvantages:

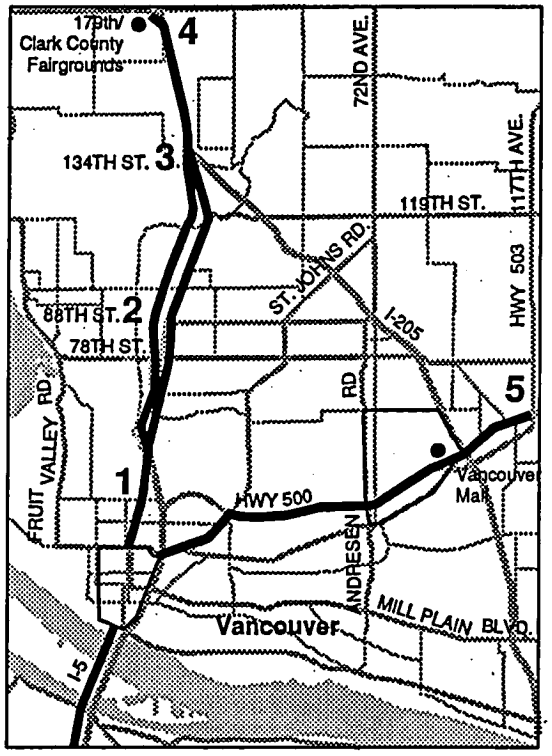
- Highest cost alternative, with over $1 billion more capital costs than the Milwaukie Terminus and $2.7 million more annually in additional O&M costs.

- Least cost effective of the South Terminus Alternatives, with the highest annualized cost per LRT rider and the highest LRT operating costs per rider.

- Total transit times would remain longer for trips between Oregon City and downtown Portland than for trips taken using an automobile.

- Limited station opportunities between Clackamas Town Center and Gladstone.

VI. North Study Terminus Alternatives



The above map illustrates the five alternative terminus points for the North that could be selected to advance into Tier II. The selection of a Study Terminus will define the northern limits of the Tier II analysis. Within those limits shorter segments may be studied for either phasing opportunities or as required by the federal government to evaluate shorter segments.

1. Vancouver CBD/39th Street Terminus

Advantages:

- The least costly of the four alternative northern termini, with a capital cost savings in $YOE of $224 (88th Street) to $495 (179th Street) million.
- The least costly of the alternatives to operate ($530,000 to $2.3 million less annually).
- The most cost effective northern terminus alternative.
- Total transit travel time between Vancouver and Portland CBDs would be less than auto travel times during the peak hour.

Disadvantages:

- Lowest LRT and total transit (LRT + bus) ridership, with 1,550 to 2,750 fewer LRT trips and 700 to 1,350 fewer total transit trips.
- Would provide only limited LRT service into Clark County and to major activity centers within the county.
- Limited park-and-ride lot opportunities with the high park-and-ride demand would result in higher capital costs and/or lower ridership estimates with greater traffic impacts than currently estimated.
- Would leave many of the transportation problems within the Clark County segment unaddressed, with slower total transit travel times for north Clark County and Vancouver Mall.
- LRT would not extend far enough into Clark County to assist in the management of growth within Clark County.

2. 88th Street Terminus

Advantages:

- The lowest cost (both capital and O&M) and the most cost effective of the alternatives that extend well into Clark County. Total transit ridership is only slightly lower than the further termini but at a substantially lower cost.
- Would provide LRT access into the north I-5 corridor area, designated within the growth management plan as a high growth area with intense development pasterns.
- Would provide higher transit reliability for patrons than the Vancouver CBD Alternative and the same reliability as the further extensions at a much lower cost (based on the percent of passenger miles within protected ROW).
- The lowest (same as Vancouver CBD) operating cost per trip.
- Total transit travel time from Portland CBD to Vancouver CBD and 88th Street would be less than or similar to auto travel times during the peak hour.

Disadvantages:

- Higher cost (both capital and O&M than the Vancouver CBD Terminus.
- Lower LRT ridership than extensions north and to Vancouver Mall.

From Portland CBD to:	Vancouver CBD	88th	134th	179th	Van Mall/Orchards
Year of Expenditure Cost (millions)	$1,199	$1,423	$1,563	$1,694	$1,660
LRT Weekday Ridership from Oregon City to:	60,050	61,600	62,200	62,800	62,450
Total Weekday Corridor Transit Ridership	130,000	131,150	131,300	131,350	130,700
Effective LRT Operating Cost (millions) Oregon City to:	$15.27	$15.80	$16.47	$17.55	$17.60
Cost Effectiveness Ratio	7.65	7.98	8.23	8.48	8.47
Additional park-and-ride capacity may be required to accommodate demand at a cost (millions $YOE) of up to:	$45	$30	$23	$4	$6

- SR-500 park-and-ride demand would need to be accommodated with a lot near or north of the Vancouver CBD which may result in more local traffic impacts near central Vancouver.

3. 134th Street Terminus

Advantages:

- Second highest total transit ridership of the North terminus alternatives.
- Would provide LRT access to the 134th Street area with possible shuttle access to WSU Campus. This area has been designated as a major growth and activity center. Would forward growth management planning goals.

Disadvantages:

- Third highest capital cost of the northern terminus alternatives, $364 million more costly than the Vancouver CBD Terminus and $140 million more than the 88th Street Terminus.
- SR-500 park-and-ride demand would need to be accommodated with a lot near or north of the Vancouver CBD which may result in more local traffic impacts near central Vancouver.
- Total transit travel times would remain longer than the auto travel times for trips from 134th Street, 179th Street and Vancouver Mall to Portland CBD.

4. 179th Street Terminus

Advantages:

- Would have the highest LRT ridership and highest total transit ridership of the northern terminus alternatives.
- Would provide direct LRT access to the 134th Street area with possible shuttle service to the WSU Branch Campus area.

Disadvantages:

- Highest capital cost alternative, over $495 million more than the Vancouver CBD Terminus and $2.28 million more in O&M costs.
- Total transit travel times would remain longer than the auto travel times from 134th Street, 179th Street and Vancouver Mall to downtown Portland.
- Least cost effective of the North Terminus Alternatives.
- Terminus at 179th Street is very close to the interim growth boundary and could result in pressure to extend the boundary. If the boundary is not expanded it could lead to underutilization of the transit system.

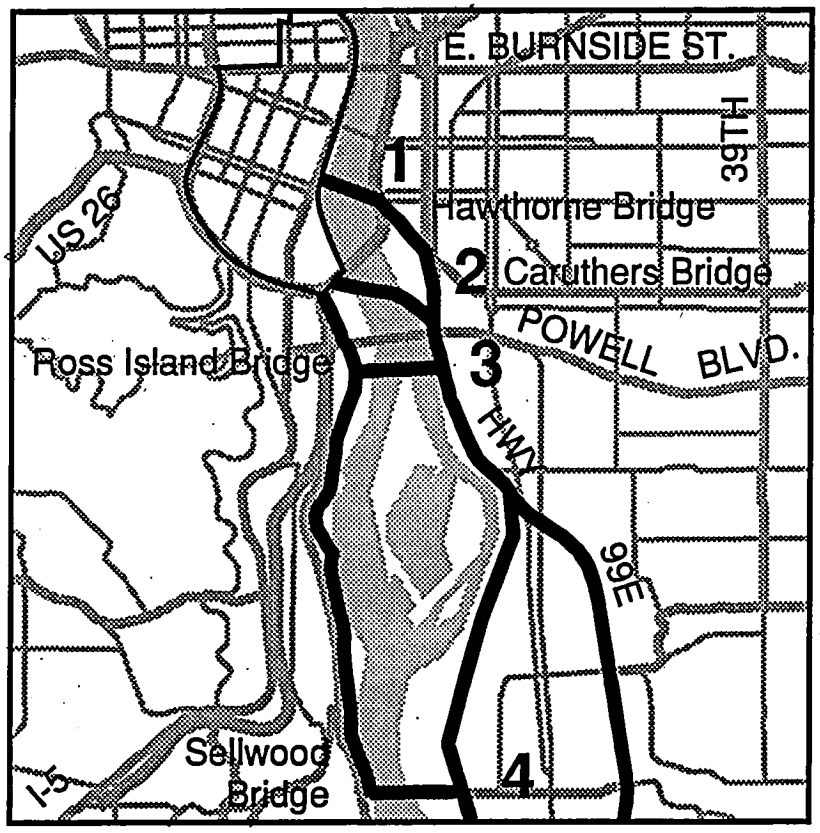
4. Vancouver Mall/Orchards Terminus

Advantages:

- Would have the second highest LRT ridership of the northern termini.
- Would provide LRT access to the Vancouver Mall area, a high growth rate and high intensity use area within Clark County.

Disadvantages:

- Highest LRT operating costs per rider.
- Total transit travel times would remain longer than auto travel times from Vancouver Mall, 134th Street and 179th Street to downtown Portland.
- I-5 park-and-ride demand would need to be accommodated with a lot near the Vancouver CBD which may result in local traffic impacts near central Vancouver.



The above map illustrates the alignment alternatives between the Portland CBD and downtown Milwaukie that could be selected to advance into Tier II for further study. Within this segment there are two different sets of alternatives being compared. First are the alternate locations for a crossing of the Willamette River south of the Portland CBD.

Second, for the Hawthorne, Caruthers and Ross Island Bridge Crossing alternatives, two Eastbank routes south are being compared: either the Portland Traction Company rail right-of-way or an alignment adjacent to McLoughlin Boulevard.

Note that the capital cost estimates include both the cost of the bridge and the alignment from the Portland CBD to the Milwaukie CBD. This is done to be able to account for the full costs of using a particular crossing location. A lower cost bridge may require a higher cost alignment in order to reach that location.

A. South Willamette River Crossings

1. Hawthorne Bridge Alternative

Advantages:

- The least costly of the four alternatives with a cost savings in $YOE of $59 to $65 million.
- Would provide the best LRT access to the Central Eastside and OMSI.
- May provide better opportunity for SE bus connections to LRT.
- Would provide LRT access to inner SE neighborhoods (Brooklyn and Moreland).

Disadvantages:

- Would provide the least LRT access to the southern portions of the Portland Central City including PSU, and no access to the North Macadam area and to the South Waterfront District.
- Frequent bridge openings for river traffic would cause LRT reliability problems, decrease LRT ridership and increase operating expenses by approximately $500,000 per year (included within the ridership and O&M cost estimates). Because of the bridge's age, direct bridge operating costs would be higher.
- Difficult to bring the existing Hawthorne Bridge up to seismic and operational standards and a new span would increase costs and would significantly impact the Portland CBD.
- Total transit ridership would be lower than the Caruthers Bridge.

Portland CBD to Milwaukie via:	Hawthorne Bridge	Caruthers Bridge	Ross Island Bridge	Sellwood Bridge
Year of Expenditure Cost (millions)	$674	$739	$733	$739
LRT Weekday Ridership 179th to Oregon City	61,400	62,800	62,300	61,400
Total Corridor Transit Weekday Ridership	131,350	132,200	131,400	130,750
Effective LRT Operating Cost (millions) Oregon City to 179th	$18.43	$17.93	$17.93	$19.12
Cost Effectiveness Ratio	8.72	8.64	8.70	8.90

- Impacts of bridge reconstruction on the Willamette River ecosystem. Using the McLoughlin alignment on the eastside south to Sellwood would displace approximately 50 structures and could adversely impact historic structures. Use of the PTC alignment could have significant impacts upon the adjacent wildlife habitat and natural environment. (See *Disadvantages* for the McLoughlin and PTC alignments).

2. Caruthers Bridge

Advantages:

- Highest total transit and LRT ridership.
- Would provide LRT access to the South Central City area including PSU, Riverplace and the South Waterfront Development.
- Would provide LRT access to OMSI, inner SE neighborhoods (Brooklyn and Moreland).
- The lowest (same as Ross Island Bridge) operating cost per trip and the lowest cost effectiveness ratio.

Disadvantages:

- Highest cost (similar to Sellwood) Willamette River crossing ($65 million more than the Hawthorne Bridge).
- Severe design constraints due to the close proximity of the Marquam Bridge may increase costs.
- Known and possibly unknown hazardous material sites.
- Impacts of bridge construction to the Willamette River ecosystem.
- Using the McLoughlin alignment on the eastside south to Sellwood would displace approximately 40 structures and could adversely impact historic structures. Use of the PTC alignment could have significant impacts upon the adjacent wildlife habitat and natural environment. (See *Disadvantages* below for the McLoughlin and PTC alignments).
- Possible impact on design of future development in South Waterfront Development.

3. Ross Island Bridge

Advantages:

- Second highest total transit ridership.
- Would provide LRT access to the north Macadam redevelopment area and the South Central City area including PSU, Riverplace and the South Waterfront Development.
- Would provide LRT access to inner SE neighborhoods (Brooklyn and Moreland).
- Low operating costs, moderate operating cost per trip, capital costs and cost effectiveness ratio, and lowest capital costs of the fixed span alternatives.
- May provide the opportunity to use a portion of the Shoreline right-of-way.

Disadvantages:

- Capital costs would be $59 million more than Hawthorne Bridge.
- Impacts of bridge construction to the Willamette River ecosystem.
- Using the McLoughlin alignment on the eastside south to Sellwood would displace approximately 60 structures and could adversely impact historic structures. Use of the PTC alignment could have significant impacts upon the adjacent wildlife habitat and natural environment. (See *Disadvantages* for the McLoughlin and PTC alignments).
- Possible impact on design of future development in South Waterfront and North Macadam Development areas.
- Would not provide direct LRT service to OMSI.

4. Sellwood Bridge

Advantages:

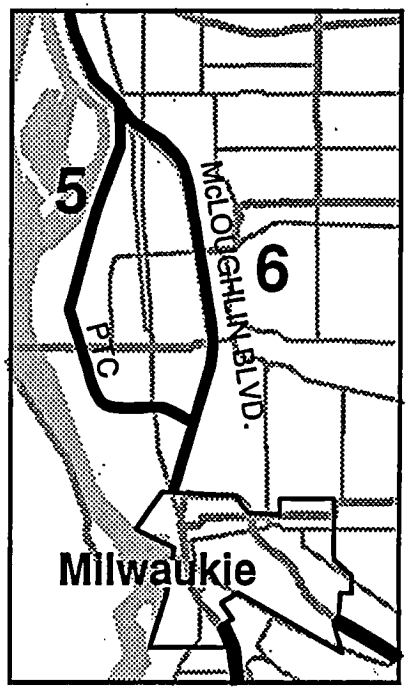
- Would provide LRT access to the North Macadam redevelopment area, the South Central City area including PSU, Riverplace, the South Waterfront Development and Johns Landing.
- May provide the opportunity to reduce total transportation costs and impacts by combining highway and transit river crossing.
- May provide the opportunity to use a portion of the Shoreline right-of-way.

Disadvantages:

1. Highest cost (similar to Caruthers Bridge) Willamette river crossing alternative ($65 million more than Hawthorne and similar to Ross Island).
- Lowest LRT ridership and total transit ridership.
- Highest operating costs, highest operating costs per rider and highest cost effectiveness ratio.
- Local neighborhood and social impacts (e.g. noise and vibration) in the Johns Landing area.
- Impacts due to bridge construction to the Willamette River ecosystem.
- Slowest travel times between Clackamas County and downtown Portland (approximately 5 minutes slower).
- Would not provide LRT access to Brooklyn and Moreland neighborhoods or OMSI.

B. Eastbank Alignments

The map below illustrates the Portland Traction Company Alignment Alternative and the McLoughlin Boulevard Alignment Alternative. The costs within the following analysis assume a Hawthorne Bridge crossing but the cost differential would apply to either the Hawthorne, Caruthers or Ross Island crossing.



5. Portland Traction Company Alignment

Advantages:

- Would have fewer residential displacements and fewer construction impacts on local neighborhoods and businesses.

Disadvantages:

- Higher O&M and higher capital costs than the McLoughlin Boulevard Alignment Alternative.
- Lower ridership due to longer travel times, fewer transfer opportunities and less access to eastside neighborhoods.
- Higher LRT operating costs per ride and highest cost effectiveness ratio.
- Possible significant environmental impacts due to the alignment's proximity to wildlife habitat which could lead to higher costs in order to avoid, minimize or mitigate impacts.
- Because of the restrictions placed on much of the land adjacent to the alignment it would have relatively little ability to shape and support transit supportive land use patterns and urban redevelopment.
- Would relocate active freight rail service and approximately 20 commercial or industrial structures.

6. McLoughlin Boulevard Alignment

Advantages:

- Would have higher LRT and higher total transit ridership than the PTC Alignment Alternative due to shorter travel times and better access to eastside neighborhoods.
- Would have lower capital and O&M costs due in part to the shorter alignment length.
- Exhibits the lowest operating cost per rider and the lowest cost effectiveness ratio.
- Would provide the best opportunity to support and shape transit supportive and more intense urban development.
- Would have fewer significant environmental impacts, especially on wildlife habitat and the natural environment.

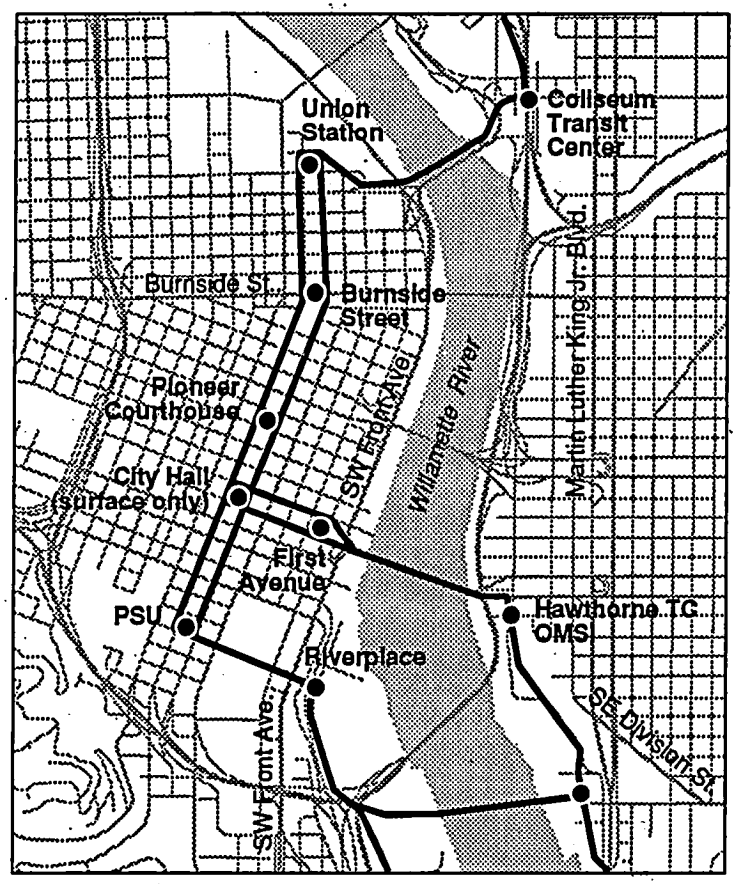
Disadvantages:

- Would displace approximately 50 residences/businesses along McLoughlin with potential impact on historical and cultural resources.

North River Crossings to Milwaukie Via:	PTC	McLoughlin
Year of Expenditure Cost (millions)	$695	$674
LRT Weekday Ridership from Oregon City to 179th	58,250	62,750
Total Corridor Weekday Transit Ridership	131,050	131,350
Effective LRT Operating Cost (millions) from Oregon City to 179th	$18.76	$18.19
Cost Effectiveness Ratio	9.26	8.52

Note: Costs assume a Hawthorne Bridge crossing, but the cost differential between alternatives would generally hold constant for the Ross Island or Caruthers bridge crossings as well.

VIII. Portland CBD Alignment Alternatives



The above map illustrates the alignment alternatives within the Portland Central Business District (CBD) from the Steel Bridge in the north to Riverplace in the south. Within this segment there are two different sets of alternatives being compared.

First is the Surface Alternative which would use the existing Transit Mall on 5th and 6th Avenues. Several options for the Surface Alternative have been developed and will be refined before Tier II is initiated.

Second is the Subway Alternative that could be built under one of four north/south streets: 4th, 5th, 6th, or Broadway Avenues. The subway would be built using tunnel boring and cut and cover techniques. For this analysis a dual tube subway (see Subway Cross-Section on page 17) under Broadway Avenue (and 5th Avenue for additional cost analysis) has been assumed. If a subway is selected for further study within Tier II then further refinement of the subway options would be made prior to initiating the DEIS.

If a subway is selected for further study, the surface alignment will also advance into the DEIS, because of the high costs associated with a subway and the need to have intermediate cost alternatives within a DEIS.

Downtown Portland via:	Surface	Subway
Year of Expenditure Cost (millions)	$288 -$309	$551 - $584
LRT Weekday Ridership from Oregon City to 179th	61,400	64,900
Total Corridor Transit Weekday Ridership	130,750	132,850
Effective LRT Operating Cost (millions) from Oregon City to 179th	$19.12	$20.91
Cost Effectiveness Ratio	8.90	9.07

1. Surface Alignment Alternative

Advantages:

- The least costly of the alternatives to build and operate, with a capital cost savings in $YOE of approximately $263 to $275 million and O&M cost savings in $1994 of $1.8 million.
- Would have adequate operational capacity to accommodate additional South/North Corridor demand beyond the forecast year of 2015.
- Would have lower operating costs per rider and would be the most cost effective Portland CBD alternative.
- Would provide more visible and direct access from LRT to bus connections and to adjacent retail, commercial and residential properties.

Disadvantages:

- Would have lower LRT and total transit ridership.
- Spatial constraints on the Transit Mall will require some trade-offs between capacity for buses, LRT, pedestrian movements and general purpose auto access.
- Travel time through downtown Portland is approximately four minutes slower than with the subway alternative.
- Construction activities on the Transit Mall would affect bus and auto operations and pedestrian movements.

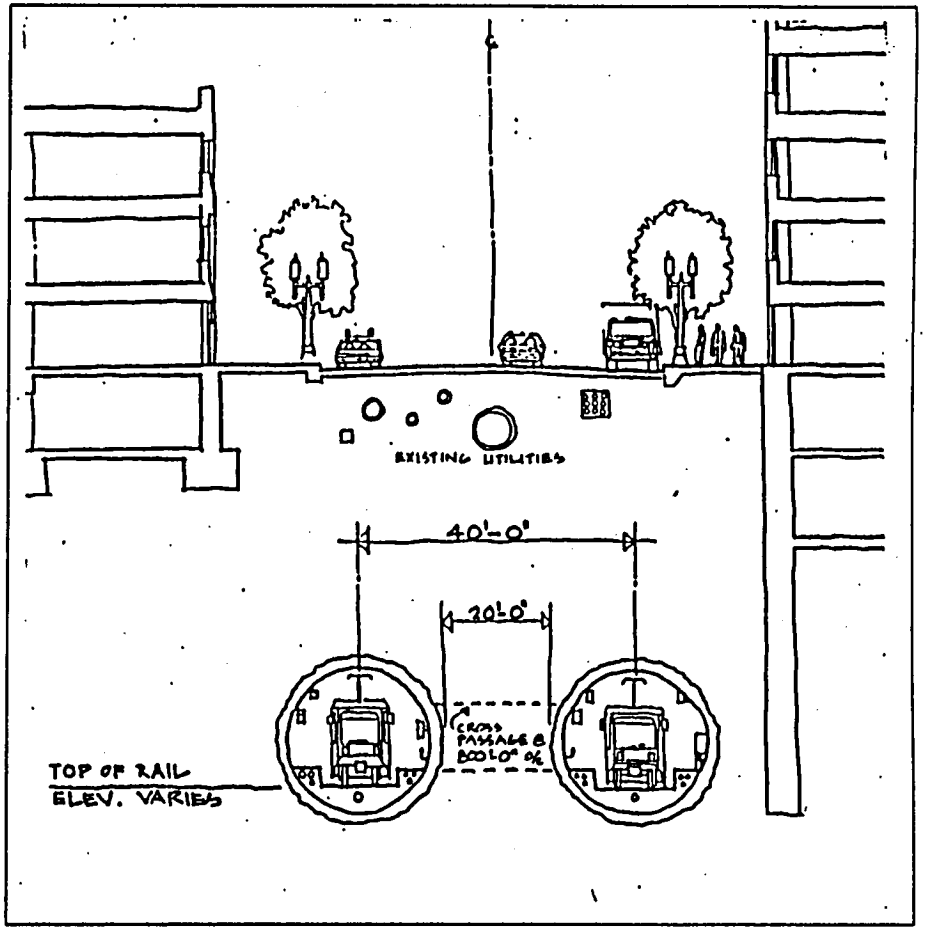
2. Subway Alignment Alternative

Advantages:

- Highest total transit and LRT ridership due to faster travel times (by four minutes) through downtown Portland.
- Would minimize changes to Transit Mall auto, pedestrian and bus travel patterns and existing auto capacity on the Mall could be maintained.
- Ultimate capacity would exceed the surface alignment.

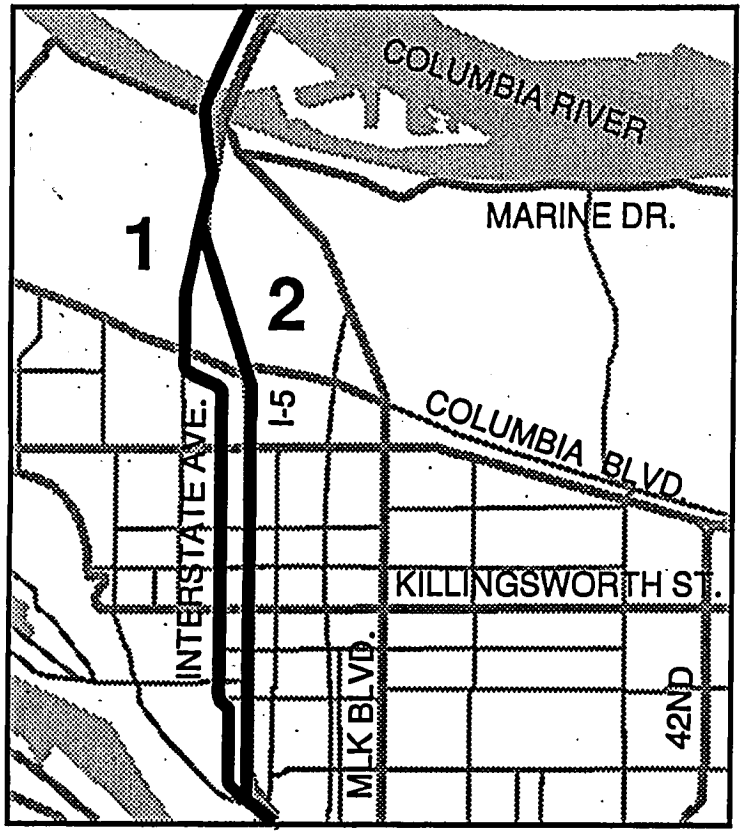
Disadvantages:

- Highest capital and O&M costs with approximately $263 to $275 million ($YOE) in additional capital costs and $1.8 million ($1994) in additional annual operating costs.
- Would have the highest operating cost per rider and the highest cost effectiveness ratio of the Portland CBD Alternatives.
- Traffic, displacements and other impacts during construction associated with the subway portals and stations would be significant.
- Would have a lower visibility and less direct access to bus connections and to adjacent retail, commercial and residential properties adjacent to the alignment.
- Total transportation costs and constructions impacts may be higher than projected due to the planned Transit Mall reconstruction that would not be incurred with the Surface alignment alternative.



Subway Cross-Section

IX. Portland CBD to Vancouver CBD Alignment Alternatives



The above map illustrates the alignment alternatives between the Portland CBD in the south and the Vancouver CBD in the North. Within this segment there are two different sets of alternatives being compared. Appendix D includes cross-section drawings of the two alternatives.

First is the Interstate Avenue Alternative that would use an alignment generally within the center of Interstate Avenue. Several options for the Interstate Avenue Alternative have been developed for this analysis. First is a two-lane option that would use two general purpose lanes from Interstate Avenue to accommodate LRT, leaving two lanes, one in each direction. Second, the four-lane option would expand the Interstate Avenue right-of-way to accommodate both LRT within a median strip and four lanes of general purpose auto traffic, two in each direction. A third option, a two-lane configuration with four-lane expansion at the key intersections has also been developed and costed. In general, its costs fall between the less expensive two-lane option and the higher cost four-lane option and are used below for comparison with the I-5 Alternative. It would also reduce impacts (e.g. displacement) associated with the four-lane option while generally providing adequate roadway capacity for auto use.

Second is the I-5 Alternative that would be located just west of the existing I-5 freeway, up at the level of the neighborhood generally within or adjacent to the Minnesota Avenue right-of-way and generally separated from the neighborhood with noise walls. Pedestrian access improvements across I-5 would be included within the I-5 Alignment Alternative. There are no significant design options for the I-5 Alignment Alternative assumed within this analysis. However, design options could be developed for the I-5 Alternative which would provide direct LRT service to the Kenton business and neighborhood areas.

1. Interstate Avenue Alignment Alternative

Advantages:

- Would have higher LRT visibility and provide more direct LRT access to retail, commercial and residential properties on Interstate Avenue and within the Kenton area.
- Would provide good (and similar to the I-5 alignment) access to the planned mixed use and higher density housing between Interstate Avenue and I-5 designated within the Albina Community Plan.
- Would provide more direct LRT access to the residential areas west of Interstate Avenue.

Disadvantages:

- Would have lower LRT (1,400 fewer) and lower total transit ridership (1,450 fewer) than the I-5 Alignment Alternative.
- Would be more costly to construct (by $114 million in $YOE) and more costly to operate (by about $120,000 a year in 1994 dollars).
- LRT travel time in this segment would be two minutes slower than the I-5 Alignment due to a longer alignment and a lower maximum operating speed.

- Would have higher operating costs per rider and a higher cost effectiveness ratio than the I-5 Alignment Alternative.

- Would require approximately 40 residential/business displacements for a two-lane option and up to 120 residential/business displacements for the four-lane option. The combined two-lane/four-lane would require approximately 65 residential/commercial displacements.

- Potential noise impacts on Interstate Avenue would be more difficult to mitigate due to the difficulty of constructing noise walls within the median strip, where LRT would be located.

- Traffic impacts on Interstate Avenue would include left turns being restricted to intersections and the removal of parking near intersections.

- Construction impacts on local traffic using Interstate Avenue would be significant and construction impacts through the middle of the established neighborhoods would be more significant than with the I-5 Alternative which is on the edge of the neighborhoods.

2. I-5 Alignment Alternative

Advantages:

- Higher total transit (by 1,450 daily) and higher LRT (by 1,400 daily) ridership than the Interstate Alignment Alternative. Increased transit ridership would be generated both within Clark County and within north Portland.

- Lower capital costs (by $114 million in $YOE) and lower annual O&M costs (by $120,000 annually in $1994).

- Would have lower operating costs per rider and a lower cost effectiveness ratio than the Interstate Avenue Alternative.

- LRT travel times would be two minutes quicker through this segment because of the higher maximum LRT operating speeds between stations and the shorter alignment length.

- Would provide better access to the PCC campus on N.E. Killingsworth and neighborhoods east of I-5.

- Would provide good (and similar to the Interstate Avenue alignment) access to the planned mixed use and higher density housing between Interstate Avenue and I-5 designated within the Albina Community Plan.

From Portland CBD to Vancouver CBD via:	Interstate Avenue 2-Lane/4-Lane	I-5
Year of Expenditure Cost (millions)	$1,199	$1,085
LRT Weekday Ridership from Oregon City to 179th	64,000	65,400
Total Weekday Corridor Transit Ridership	131,350	132,800
Effective LRT Operating Cost (millions) from Oregon City to 179th	$18.14	$18.02
Cost Effectiveness Ratio	8.36	7.94

- Noise impacts caused by LRT could be more easily mitigated through noise walls west of the proposed LRT alignment. Those noise walls could have the added benefit of reducing existing freeway-generated noise to some of the neighborhoods west of the I-5 freeway.

Disadvantages:

- Would provide less LRT visibility and access to the properties along Interstate Avenue.

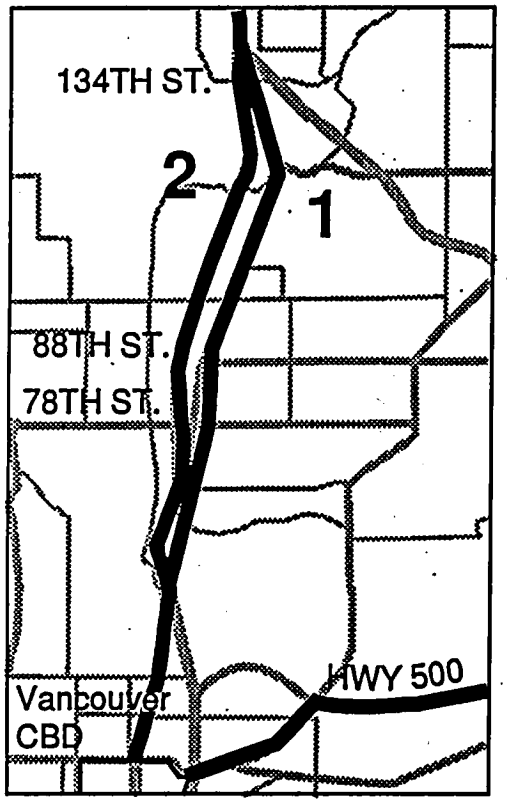
- The current design of the I-5 Alternative would provide only limited LRT access to the Kenton neighborhood and no LRT access to the Kenton business district.

- Would provide less LRT visibility and access to the neighborhoods west of Interstate Avenue.

- Physical constraints may make it more difficult to provide station sites and layouts that maximize development potential around the LRT station areas.

- Would require approximately 70, mostly residential, displacements.

X. Vancouver CBD to 179th Alignment Alternatives



The map to the left illustrates the alignment alternatives between the Vancouver CBD in the south and 179th Street in the north. Within this segment there are two different alternatives being compared. Both alternatives would use the same alignment south of the Main Street/I-5 interchange. The 88th Street, 134th Street and 179th Street North Study Terminus Alternatives are affected by these Alignment Alternatives.

First, the Highway 99 Alternative would use an alignment generally within the center of Highway 99.

Second, the I-5 Alternative would be located just west or east of the existing I-5 freeway.

1. Highway 99 Alignment Alternative

Advantages:

- Would have higher LRT visibility and provide more direct LRT access to retail, commercial and residential properties along Highway 99. Both alternatives would support the proposed transit overlay district (TOD) for this portion of the corridor.

Disadvantages:

- Would have lower LRT (1,150 fewer) and lower total transit ridership (1,250 fewer).
- Would be more costly to construct (by $79 million $YOE to 88th Street and by $167 million $YOE to 134th or 179th Streets) and more costly to operate by about $110,000 a year in 1994 dollars.
- Travel time through this segment would be three minutes slower than with the I-5 Alignment.
- Would have the highest operating costs per rider and the highest cost effectiveness ratio of the two north Clark County alignment alternatives.
- Would require approximately 106 displacements, most of which would be commercial displacements.
- Traffic impacts on Highway 99 would include left turns being restricted to intersections and capacity reductions at intersections that are currently nearing capacity and significant traffic impacts would be caused by construction.

From Vancouver CBD to 134th via:	Highway 99	I-5	
		West	East
Year of Expenditure Cost (millions)	$531	$379	$364
LRT Weekday Ridership from Oregon City to 179th	61,600	62,750	62,750
Total Corridor Weekday Transit Ridership	130,100	131,350	131,350
Effective LRT Operating Cost (millions) from Oregon City to 179th	$18.31	$18.20	$18.20
Cost Effectiveness Ratio	9.05	8.56	8.52

2. I-5 Alignment Alternative

Advantages:

- Higher LRT ridership (by 1,150 daily) and higher total transit ridership (by 1,250 daily).
- Lower capital costs (by $79 million $YOE to 88th Street and by $167 million $YOE to 134th or 179th Streets) and lower annual operating costs (by $110,000 annually).
- Would have lower operating costs per rider and a lower cost effectiveness ratio.
- LRT travel times would be three minutes quicker through this segment because of the higher maximum LRT operating speeds between stations and the shorter alignment length.
- Noise impacts would be less and mitigation of noise impacts would be easier to design and implement.
- Would provide greater LRT visibility and would provide more direct LRT access to residential area west of I-5. Both alternatives would support the proposed transit overlay district (TOD) for this portion of the corridor.

Disadvantages:

- Would cause a variety of local traffic impacts due to park-and-ride lot access.
- Less direct LRT access to the properties along Highway 99.
- Would require approximately 80 residential/commercial displacements.

Appendix A

Summary Tables

Summary of Measurement Criteria
South Study Terminus Alternatives

Criteria	Measure	Milwaukie	Clackamas TC	OC via McLoughlin	OC via I-205
Transit Service	Peak hour accessibility				
Ease of Access	Households within 45 minutes by transit to:				
	Milwaukie	101,890	103,370	103,720	102,710
	Clackamas Town Center	116,820	105,920	108,520	101,930
	Oregon City	60,370	57,460	56,610	54,380
	Employment within 45 minutes by transit to:				
	Milwaukie	381,350	384,780	380,290	383,250
	Clackamas Town Center	260,300	321,640	199,410	310,920
	Oregon City	85,710	80,770	166,270	96,630
Transferability	Mode of Access (south of Portland CBD)				
	Walk on	30%	34%	40%	35%
	Transfer	24%	25%	21%	26%
	Park-and-ride	46%	41%	39%	39%
Travel Time	Total Travel Time, PM Peak Hour (in minutes)				
	Transit from Portland CBD to Milwaukie (auto = 27)	26	26	26	26
	Transit from Portland CBD to Clackamas TC (auto = 37)	43	36	45	36
	Transit from Portland CBD to Oregon City (auto = 47)	64	64	45	53
Reliability	Miles of Reserved or Separate ROW; W of Hawthorne Bridge	5.3	10.7	12.6	17.5
	% of Corridor Passenger-miles on Reserved ROW	28.8%	32.1%	35.0%	35.0%
Ridership	Weekday Corridor Transit Trips	129,200	129,800	131,750	131,350
	Weekday S/N LRT Trips	56,900	59,400	61,900	62,750
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:				
Highway Use	Milwaukie, S of Monroe (Hwy 224, Lake, McL.)	1.24	1.14	1.10	1.14
	S of Sunnyside (I-205, 82nd)	0.91	0.91	0.92	0.92
	N of Roethe (McL., Oatfield, River)	0.84	0.79	0.83	0.80
	S of Arlington (I-205, McL.)	1.12	1.09	1.09	1.09
	At Boundary (Corbett, Macadam)	1.01	1.01	1.02	1.04
Traffic Issues		P&R volumes in Milwaukie	At grade crossings	At grade crossings Left turn restrictions	At grade crossings

Criteria	Measure	Milwaukie	Clackamas TC	OC via McLoughlin	OC via I-205
Fiscal Efficiency	Capital Cost (1994 $); Pioneer Square south	$424.0	$711.5	$800.1	$1,062.0
Cost	Capital Cost (YOE $); Pioneer Square south	$674.2	$1,131.2	$1,272.1	$1,688.6
(In millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$12.87	$15.60	$16.59	$18.20
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.00	$2.66	$3.24	$2.62
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.69	$0.66	$0.66	$0.76
	Cost Effectiveness Ratio	6.72	7.48	7.50	8.40
Promote Desired Land Use	Major Activity Centers Served	Milwaukie CBD	Milwaukie CBD, Clackamas TC	Milwaukie CBD, Oregon City CBD	Milwaukie CBD, Clackamas TC, Oregon City CBD
Support Major Activity Centers					
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes	yes	yes

Notes:

All data is for year 2015, unless otherwise noted.
Data assumes LRT from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
Bus O&M savings represents cost reduction from highest bus cost alternative.
Additional Park-and-Ride capacity may be required to accomodate anticipated demand at a cost of up to the following amounts for the corresponding terminus alternative: Milwaukie CBD $28.3 million; Clackamas TC $13 million; OC via McLoughlin $20.3 million; OC via I-205 $6 million.

Summary of Measurement Criteria
North Study Terminus Alternatives

Criteria	Measure	39th St.	88th St.	134th St.	179th St.	Van Mall
Transit Service	Peak Hour Accessibility					
Ease of Access	Households within 45 minutes by transit to:					
	Vancouver CBD	138,440	137,840	138,100	137,020	142,040
	134th St.	57,280	56,180	87,200	87,110	89,210
	Vancouver Mall	97,210	96,670	99,390	99,390	108,000
	Employment within 45 minutes by transit to:					
	Vancouver CBD	307,690	307,020	306,970	295,800	308,220
	134th St.	68,400	66,280	121,900	119,190	108,430
	Vancouver Mall	120,080	120,280	119,500	119,500	139,910
Transferability	Mode of Access (North of Coliseum TC)					
	Walk on	27%	31%	31%	33%	32%
	Transfer	49%	43%	46%	45%	45%
	Park-and-ride	24%	22%	23%	22%	23%
Travel Time	Total Travel Time, PM Peak Hour (in minutes)					
	Transit from Portland CBD to Vancouver CBD (auto = 40)	38	38	38	38	38
	Transit from Portland CBD to 88th St. (auto = 45)	53	46	46	46	55
	Transit from Portland CBD to 134th St. (auto = 48)	59	59	51	51	54
	Transit from Portland CBD to 179th St. (auto = 52)	74	75	63	55	68
	Transit from Portland CBD to Van Mall (auto = 44)	60	60	60	60	52
Reliability	Miles of Reserved or Separate ROW; north of Coliseum TC	9.1	11.9	14.2	16.3	15.1
	% of Corridor Passenger-miles on Reserved ROW	35.1%	37.7%	37.6%	38.0%	37.7%
Ridership	Weekday Corridor Transit Trips	130,000	131,150	131,300	131,350	130,700
	Weekday S/N LRT Trips	60,050	61,600	62,200	62,800	62,450
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:					
Highway Use	N of Mill Plain (I-5, Main, Broadway, Ft. Van.)	0.54	0.54	0.54	0.54	0.54
	N of 39th (15th, Main, I-5)	0.84	0.78	0.78	0.79	0.84
	S of 78th (Hwy 99, Hazel Dell Ave., I-205)	0.69	0.62	0.63	0.63	0.67
	W of Andreson (18th, 40th, 4th Plain, SR 500)	0.74	0.73	0.73	0.67	0.72
	I-5 Bridge	1.31	1.30	1.30	1.31	1.30
	W of I-205 (4th Plain, 63rd, Burton, SR 500)	0.89	0.89	0.88	0.88	0.87
	I-205 Bridge	0.94	0.94	0.94	0.94	0.94
Traffic Issues		P&R volumes in Vancouver	Main St.	Main St.	Main St.	At grade Xings P&R volumes

Criteria	Measure	39th St.	88th St.	134th St.	179th St.	Van Mall
Fiscal Efficiency	Capital Cost (1994 $); Pioneer Square north	$753.9	$895.2	$982.9	$1,065.1	$1,044.0
Cost	Capital Cost (YOE $) Pioneer Square north	$1,198.7	$1,423.4	$1,562.8	$1,693.6	$1,659.9
(in millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$15.27	$16.21	$17.33	$18.20	$17.96
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.00	$0.41	$0.86	$0.65	$0.36
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.78	$0.78	$0.81	$0.85	$0.86
	Cost Effectiveness Ratio	7.65	7.98	8.23	8.48	8.47
Promote Desired Land Use	Major Activity Centers Served	Vancouver CBD	Vancouver CBD	Vancouver CBD, Salmon Creek/ WSU	Vancouver CBD, Salmon Creek/ WSU	Vancouver CBD, Vancouver Mall
Support Major Activity Centers						
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes	yes	May encourage expansion	yes

Notes:

All data is for year 2015, unless otherwise noted.
Data assumes LRT from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
Bus O&M savings represents cost reduction from highest bus cost alternative.
Additional Park-and-Ride capacity may be required to meet anticipated demand at a cost of up to the following amounts for the corresponding terminus alternative: Vancouver CBD/39th Street $44.9 million; 88th Street $29.6 million; 134th Street $23.3 million; 179th Street $4 million; Van Mall/Orchards $5.4 million.

Summary of Measurement Criteria
Portland CBD to Milwaukie CBD South River Crossing Alternatives

Criteria	Measure	Hawthorne	Caruthers	Ross Island	Sellwood
Transit Service	Peak Hour Accessibility				
Ease of Access	Households within 45 minutes by transit to:				
	OMSI	160,400	167,950	169,300	168,200
	John's Landing	97,700	97,920	99,330	124,950
	Milwaukie	102,710	106,760	102,440	82,410
	Employment within 45 minutes by transit to:				
	OMSI	538,450	534,100	495,540	487,550
	John's Landing	353,570	350,990	350,070	449,110
	Milwaukie	385,150	393,090	389,130	348,490
Transferability	Mode of Access				
	Walk on	36.4%	35.8%	35.2%	34.1%
	Transfer	28.8%	28.1%	28.7%	32.2%
	Park-and-ride	34.8%	36.2%	36.1%	33.8%
Travel Time	Total Travel Time, PM Peak Hour (in minutes)				
	Transit from Portland CBD to Milwaukie (auto = 27)	27	27	27	32
	Transit from Portland CBD to Clackamas TC (auto = 37)	36	36	36	41
	Transit from Portland CBD to Oregon City (auto = 46)	53	53	53	58
Reliability	Miles of Reserved or Separated ROW	34.8	34.5	34.7	35.3
	% of Corridor Passenger-miles on Reserved ROW	36.7%	35.1%	32.0%	32.1%
Ridership	Weekday Corridor Transit Trips	131,350	132,200	131,400	130,750
	Weekday S/N LRT Trips	61,800	62,800	62,300	61,400
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:				
Highway Use	River Crossings (Fremont - Ross Island)	1.07	1.07	1.06	1.07
	River Crossings (Sellwood Bridge)	1.23	1.23	1.23	1.23
	N of Prescott (Denver, I-5, Interstate, MLK, Vancouver)	0.76	0.76	0.76	0.76
	At Boundary (Macadam, Corbett)	1.04	1.03	1.02	1.03
Traffic Issues		Bridge lanes Main/Madison Sts.	Harrison St. Moody St.	Harrison St. Moody St.	Moody St. At grade Xings

Criteria	Measure	Hawthorne	Caruthers	Ross Island	Sellwood
Fiscal Efficiency	Capital Cost (1994 $) Pioneer Square to Milwaukie	$424	$465	$461	$465
Cost	Capital Cost (YOE $) Pioneer Square to Milwaukie	$674	$739	$733	$739
(in millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$18.70	$18.17	$18.19	$19.12
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.27	$0.24	$0.26	$0.0
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.87	$0.87	$0.88	$0.95
	Cost Effectiveness Ratio	8.72	8.64	8.70	8.90
Promote Desired Land Use	Major Activity Centers Served	CEIC, OMSI SE Neighborhoods, Milwaukie CBD	PSU, Riverplace, OMSI, SE Portland Neighborhoods, Milwaukie CBD	PSU, Riverplace N Macadam, SE Neighborhoods, Milwaukie CBD	PSU, Riverplace N Macadam, John's Landing Milwaukie CBD
Support Major Activity Centers					
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes	yes	yes
Environmental Sensitivity	Possible Displacements	47, commercial and residential	41, commercial and residential	64, mostly commercial/industrial	27, mostly commercial/industrial
	Noise Impact Areas				Moody St., John's Landing, Sellwood
	Ecosystem Impacts	Willamette Xing	Willamette Xing	Willamette Xing	Willamette Xing
	Historical and Cultural Impacts	Existing bridge, Brooklyn Nh.	Brooklyn Nh.	Existing bridge, Brooklyn Nh.	Existing bridge, Sellwood Nh.

Notes:

All data is for year 2015, unless otherwise noted.
Data assumes LRT from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
Bus O&M savings represents cost reduction from highest bus cost alternative.
Displacement data based on preliminary design without specific efforts to mitigate possible impacts.

Summary of Measurement Criteria
Portland CBD to Milwaukie CBD Eastbank Alignment Alternatives

Criteria	Measure	PTC	McLoughlin
Transit Service	Peak Hour Accessibility		
Ease of Access	Households within 45 minutes by transit to:		
	OMSI	153,290	159,700
	Milwaukie	88,420	102,710
	Clackamas Town Center	92,760	101,930
	Oregon City CBD	52,020	54,380
	Employment within 45 minutes by transit to:		
	OMSI	531,860	538,450
	Milwaukie	368,720	383,250
	Clackamas Town Center	292,500	310,920
	Oregon City CBD	90,810	96,630
Transferability	Mode of Access; Milwaukie to OMSI		
	Walk on	36%	42%
	Transfer	27%	26%
	Park-and-ride	38%	32%
Travel Time	Total Travel Time, PM Peak Hour (in minutes)		
	Transit from Portland CBD to Milwaukie (auto = 27)	28	27
	Transit from Portland CBD to Clackamas TC (auto = 37)	38	36
	Transit from Portland CBD to Oregon City (auto = 46)	55	53
Reliability	Miles of Reserved or Separate ROW	7.1	6.2
	% of Corridor Passenger-miles on Reserved ROW	28.9%	35.0%
Ridership	Weekday Corridor Transit Trips	131,050	131,350
	Weekday S/N LRT Trips	58,250	62,750
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:		
Highway Use	River Crossings (Fremont - Ross Island)	1.07	1.07
	River Crossings (Sellwood Bridge)	1.24	1.23
	Milwaukie, S of Monroe (Hwy 224, Lake, McL)	1.14	1.14
	N of Roethe (McL., Oatfield, River)	0.79	0.80
Traffic Issues		New freight spur across McLoughlin	Signal coordination on McLoughlin, close some local access to McLoughlin

Criteria	Measure	PTC	McLoughlin
Fiscal Efficiency	Capital Cost (1994 $); Pioneer Square to Milwaukie	$437.20	$424.0
Cost	Capital Cost (YOE $); Pioneer Square to Milwaukie	$695.20	$674.20
(in millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$18.76	$18.20
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.00	$0.01
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.98	$0.88
	Cost Effectiveness Ratio	9.26	8.52
Promote Desired Land Use	Major Activity Centers Served	Milwaukie CBD	SE Neighborhoods, Milwaukie CBD
Support Major Activity Centers			
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes
Environmental Sensitivity	Possible Displacements (Residential/Commercial)	20+ commercial/indust. Existing freight line	50+, commercial and residential
	Noise Impacts	Greater risks due to lower existing noise	
	Ecosystem Impacts	Wetlands & wildlife habitat	
	Historical and Cultural Impacts		Greater risk due to more displacements

Notes:

All data is for year 2015, unless otherwise noted.
Data assumes LRT from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
Bus O&M savings represents cost reduction from highest bus cost alternative.
Displacement data based on preliminary design without specific efforts to mitigate possible impacts.

Summary of Measurement Criteria
Portland CBD Alignment Alternatives

Criteria	Measure	Surface	Subway
Transit Service	Peak Hour Accessibility		
Ease of Access	Households within 45 minutes by transit to:		
	Vancouver CBD	114,750	143,710
	Portland CBD	219,150	234,580
	Milwaukie CBD	82,410	103,630
	Employment within 45 minutes by transit to:		
	Vancouver CBD	306,970	344,300
	Portland CBD	579,600	598,400
	Milwaukie CBD	348,490	382,970
Travel Time	Total Travel Time, PM Peak Hour (in minutes)		
	Transit from Portland CBD to Milwaukie (auto = 27)	32	28
	Transit from Portland CBD to Vancouver CBD (auto = 39)	38	36
Reliability	Miles of Reserved or Separate ROW	35.3	35.2
	% of Corridor Passenger-miles on Reserved ROW	25.3%	23.7%
Ridership	Weekday Corridor Transit Trips	130,750	132,850
	Weekday S/N LRT Trips	61,400	64,900
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:		
Highway Use	River Crossings (Fremont - Ross Island)	1.07	1.07
	River Crossings (Sellwood Bridge)	1.27	1.27
	N of Prescott (Denver, I-5, Interstate, MLK Blvd., Vancouver)	0.76	0.76
	At Boundary (Macadam, Corbett)	1.04	1.03
Traffic Issues		At grade crossings	Portal impacts

Criteria	Measure	Surface	Subway
Fiscal Efficiency	Capital Cost (1994 $); South Waterfront to Union Station	$180.8 - $194.4	$353.2 - $367.3
Cost	Capital Cost (YOE $); South Waterfront to Union Station	$287.5 - $309.1	$551.0 - $584.0
(in millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$19.12	$20.93
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.00	$0.02
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.95	$0.98
	Total Annualized LRT Cost per Rider	$8.90	$9.07
Promote Desired Land Use	Major Activity Centers Served	Portland CBD	Portland CBD
Support Major Activity Centers			
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes
Environmental Sensitivity	Possible Displacements (Residential/Commercial)	Potential at mall connections	Potential at portals.
	Noise Impacts	Possible vibrations	Potential at portals.
	Ecosystem Impacts	No significant impacts	No significant impacts
	Historical and Cultural Impacts	Potential impacts	Potential at portals

Notes:

All data is for year 2015, unless otherwise noted.
Data assumes LRT from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
Bus O&M savings represents cost reduction from highest bus cost alternative.

Summary of Measurement Criteria
Portland CBD to Vancouver CBD Alignment Alternatives

Criteria	Measure	Interstate Ave.	I-5
Transit Service	Peak Hour Accessibility		
Ease of Access	Households within 45 minutes by transit to:		
	Swan Island	126,840	131,810
	Kenton	178,050	184,810
	Hayden Island	163,300	170,270
	Vancouver CBD	138,650	150,000
	Employment within 45 minutes by transit to:		
	Swan Island	369,490	377,770
	Kenton	450,430	472,540
	Hayden Island	402,300	408,530
	Vancouver CBD	310,400	337,200
Transferability	Mode of Access		
	Walk on	60%	61%
	Transfer	40%	39%
	Park-and-ride	0%	0%
Travel Time	Total Travel Time, PM Peak Hour (in minutes)		
	Transit from Portland CBD to Swan Island (auto = 17)	29	28
	Transit from Portland CBD to Kenton (auto = 20)	26	24
	Transit from Portland CBD to Hayden Island (auto = 28)	33	31
	Transit from Portland CBD to Vancouver CBD (auto = 40)	38	36
Reliability	Miles of Reserved or Separated ROW	4.0	3.9
	% of Corridor Passenger-miles on Reserved ROW	38.0%	40.4%
Ridership	Weekday Corridor Transit Trips	131,350	132,800
	Weekday S/N LRT Trips	64,000	65,400
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:		
Highway Use	Columbia River Crossing (I-5 Bridge)	1.31	1.30
	N of Columbia (I-5, Interstate, MLK Blvd.)	0.70	0.69
	N of Prescott (Denver, I-5, Interstate, MLK Blvd., Vancouver)	0.76	0.76
	River Crossings (Fremont - Ross Island)	1.07	1.07
Local Traffic		At grade crossings Changes street design Removes some parking	Ramp impacts Removes some parking

Criteria	Measure	Interstate Ave.	I-5
Fiscal Efficiency	Capital Cost (1994 $)	$753.9	$682.2
Cost	Capital Cost (YOE $)	$1,198.7	$1,084.7
(in millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$18.20	$18.02
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.06	$0.00
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.86	$0.84
	Cost Effectiveness Ratio	8.36	7.94
Promote Desired Land Use	Major Activity Centers Served	Coliseum, N/NE Neighborhoods, Vancouver CBD	Coliseum, N/NE Neighborhoods, Vancouver CBD
Support Major Activity Centers			
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes
Environmental Sensitivity	Possible Displacements (Residential/Commercial)	65+, mostly commercial	65+, almost all residential
	Noise Impacts	More difficult to mitigate	Replace existing and new noise wall
	Ecosystem Impacts	Columbia Slough and River Xing	Columbia Slough and River Xing
	Historical and Cultural Impacts	Slightly higher risk of impacts	

Notes:

All data is for year 2015, unless otherwise noted.
Data represents build out from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
Bus O&M savings represents cost reduction from highest bus cost alternative.
Displacement data based on preliminary design without specific efforts to mitigate possible impacts.
Note capital costs and cost effectiveness for Interstate Avenue are for the two-lane/four-lane hybrid option.

Summary of Measurement Criteria
39th to 179th Street Alignment Alternatives

Criteria	Measure	Highway 99	I-5
Transit Service	Peak Hour Accessibility		
Ease of Access	Households within 45 minutes by transit to:		
	Vancouver CBD	136,040	137,020
	134th St.	80,240	87,110
	Vancouver Mall	97,010	99,390
	Employment within 45 minutes by transit to:		
	Vancouver CBD	304,760	295,800
	134th St.	103,560	119,190
	Vancouver Mall	117,290	119,500
Transferability	Mode of Access; Vancouver CBD to 179th St.		
	Walk on	23%	23%
	Transfer	45%	45%
	Park-and-ride	32%	32%
Travel Time	Total Travel Time, PM Peak Hour (in minutes)		
	Transit from Portland CBD to Vancouver CBD (auto = 39)	38	38
	Transit from Portland CBD to 88th St. (auto = 44)	48	46
	Transit from Portland CBD to 134th St. (auto = 48)	54	51
	Transit from Portland CBD to 179th St. (auto = 52)	58	55
	Transit from Portland CBD to Vancouver Mall (auto = 44)	60	60
Reliability	Miles of Reserved or Separate ROW	34.8	34.7
	% of Corridor Passenger-miles on Reserved ROW	37.7%	38.0%
Ridership	Weekday Corridor Transit Trips	130,100	131,350
	Weekday S/N LRT Trips	61,600	62,750
Traffic	PM Peak Hour, Peak Direction V/C Ratio at:		
Highway Use	Between Mill & 4th Plain (I-5, Main, Broadway, Ft. Van.)	0.54	0.54
	N of 39th (15th, Main, I-5)	0.79	0.79
	S of 78th (Hwy 99, Hazel Dell Ave., I-205)	0.63	0.63
	St. Johns/Andreson (18th, 40th, 4th Plain, SR 500)	0.72	0.72
Traffic Issues		Restricted left turns	

Criteria	Measure	Highway 99	I-5
Fiscal Efficiency	Capital Cost (1994 $); 39th to 134th	$334	$229
Cost	Capital Cost (YOE $); 39th to 134th	$531	$364
(in millions of $)	Annual LRT Operating and Maintenance Cost (1994 $)	$18.59	$18.20
	Annual Bus Operating and Maintenance Savings (1994 $)	$0.28	$0.00
Cost Effectiveness	Effective LRT Operating Cost per Rider	$0.91	$0.88
	Cost Effectiveness Ratio	9.05	8.52
Promote Desired Land Use	Major Activity Centers Served	Vancouver CBD, Salmon Creek/WSU	Vancouver CBD, Salmon Creek/WSU
Support Major Activity Centers			
Support Bi-State Policies	Maintain Urban Growth Boundaries	yes	yes
Environmental Sensitivity	Possible Displacements (Residential/Commercial)	100+, mostly commercial	80+, commercial and residential
	Noise Impacts	More difficult to mitigate	Can mitigate with noise walls
	Ecosystem Impacts	Salmon Creek Xing	Salmon Creek Xing
	Historical and Cultural Impacts	No difference	

Notes:

All data is for year 2015, unless otherwise noted.
Data assumes LRT from Oregon City via I-205 to 179th St. in Clark County, unless otherwise noted.
Costs are in millions of $.
I-5 data assumes an east of I-5 alignment.
Bus O&M savings represents cost reduction from highest bus cost alternative.
Displacement data based on preliminary design without specific efforts to mitigate possible impacts.

Appendix B

Summary of Year of Expenditure Capital Costs

South/North Corridor Year of Expenditure Costs

I. Termini Alternative Costs
($Millions in Year of Expenditure)

By using the following table the various costs of the Tier I alternatives can be calculated. Select the cell that corresponds to the particular South and North Termini and then adjust that cost up or down according to the *Adjustment* provided.

Note: These termini costs are based on the Order of Magnitude (OOM) cost estimate ($1994) of the generic representative alignment factored to year of expenditure through proto-typical construction schedules.

Terminus Alternatives	39th St	88th St	134th St	179th St	Vancouver Mall
Milwaukie CBD	$2,108	$2,333	$2,472	$2,603	$2,569
Clackamas Town Center	$2,565	$2,790	$2,929	$3,060	$3,026
Oregon City via McLoughlin	$2,706	$2,930	$3,070	$3,201	$3,167
Oregon City via I-205	$3,122	$3,347	$3,486	$3,617	$3,584

II. Adjustments for Alignment Alternatives (YOE $millions)

Add (if a positive number) or subtract (if a negative number) these factors to any of the terminus alternatives above to determine year of expenditure capital cost of any combination of terminus and alignment alternatives. Costs are in millions of year of expenditure dollars.

1. *South Willamette River Crossings*

Hawthorne	*$ 0*
Caruthers	*$65*
Ross Island	*$59*
Sellwood	*$64*

2. *Eastbank Alternatives*

McLoughlin	*$ 0*
PTC	*$21*

3. *CBD Alternatives*

Surface	*$ 0*
Subway	*$275*

4. *Portland CBD - Vancouver*

I-5	*-$114*
Interstate Avenue	*$ 0*

5. *Vancouver - 179th Alternatives*

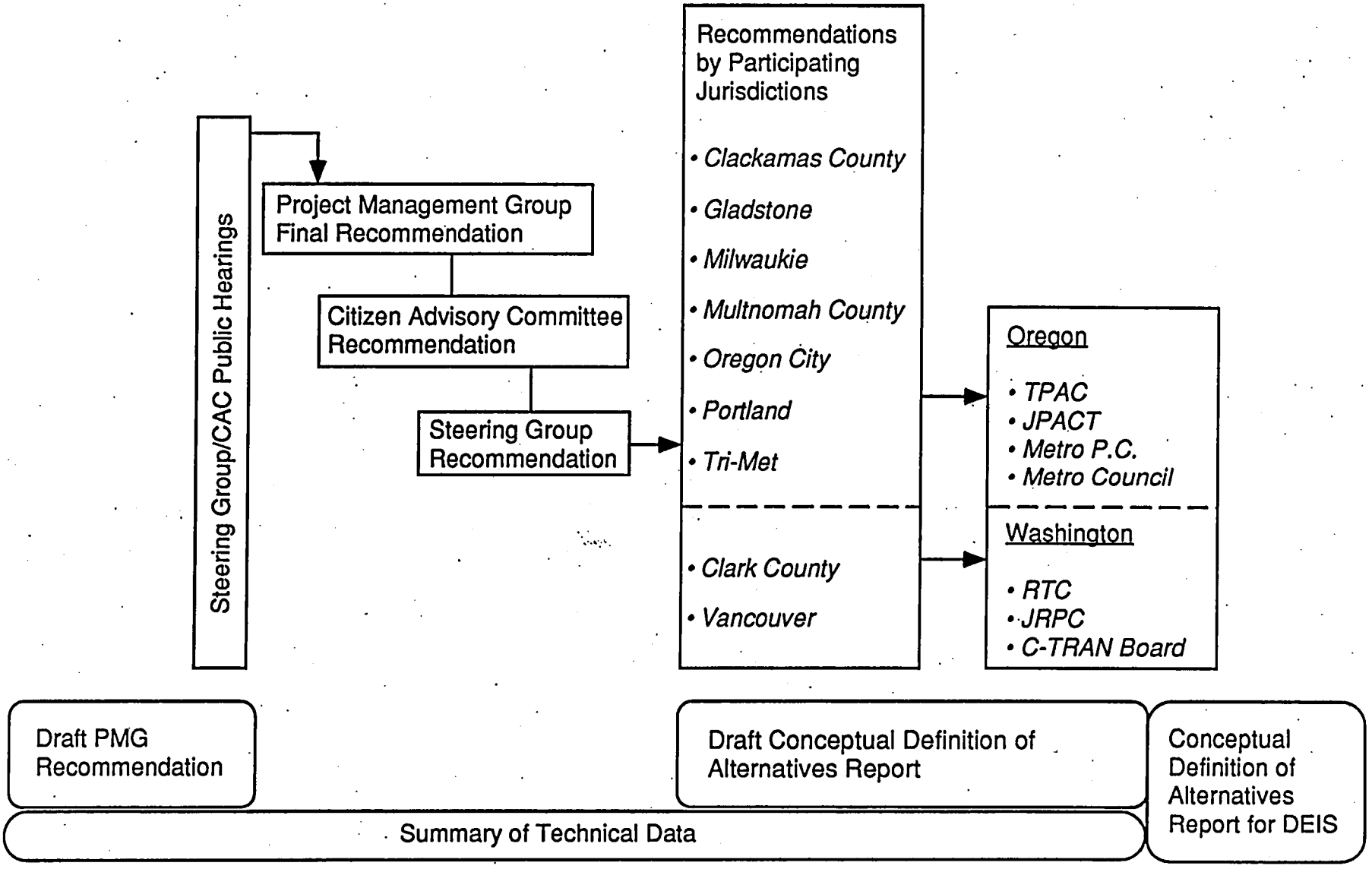
I-5 (east)	*$ 0*
I-5 (west)	*$15*
Highway 99	*$167*

Note: YOE costs reflect a final design and construction schedule, adjustments for inflation, reserve for yet-to-be determined design options, bonding issuance costs, interim borrowing costs and CAPRA.

Appendix C

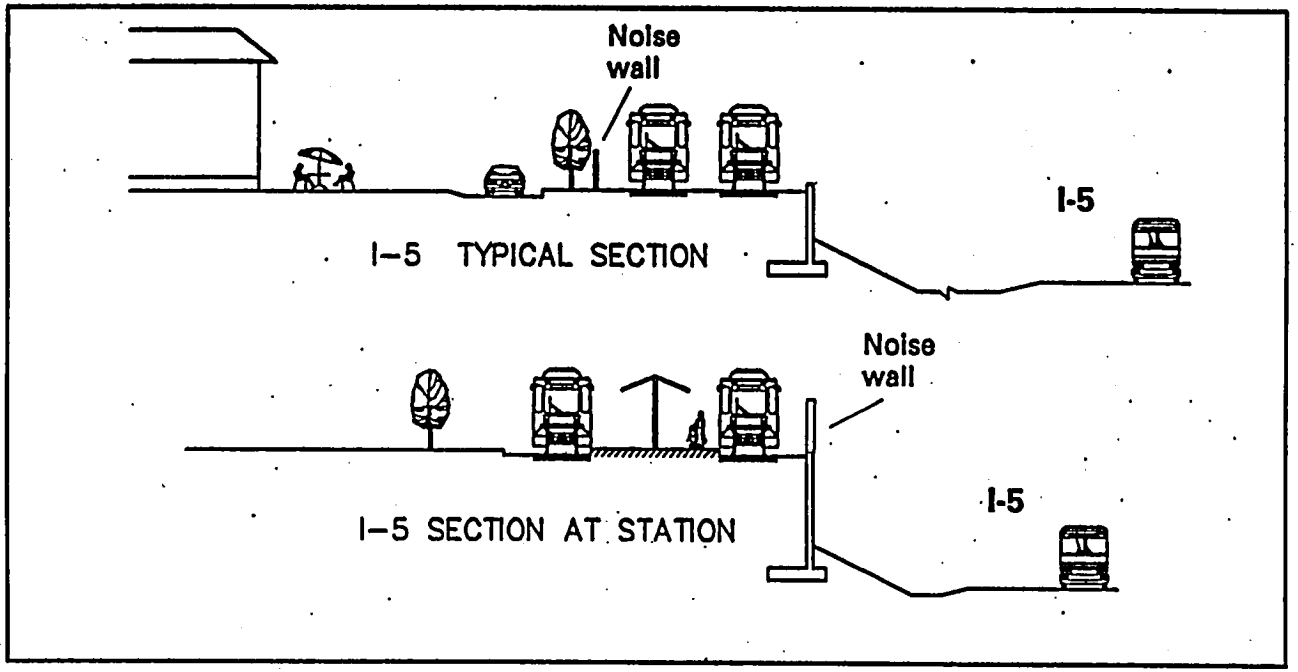
Tier I Process

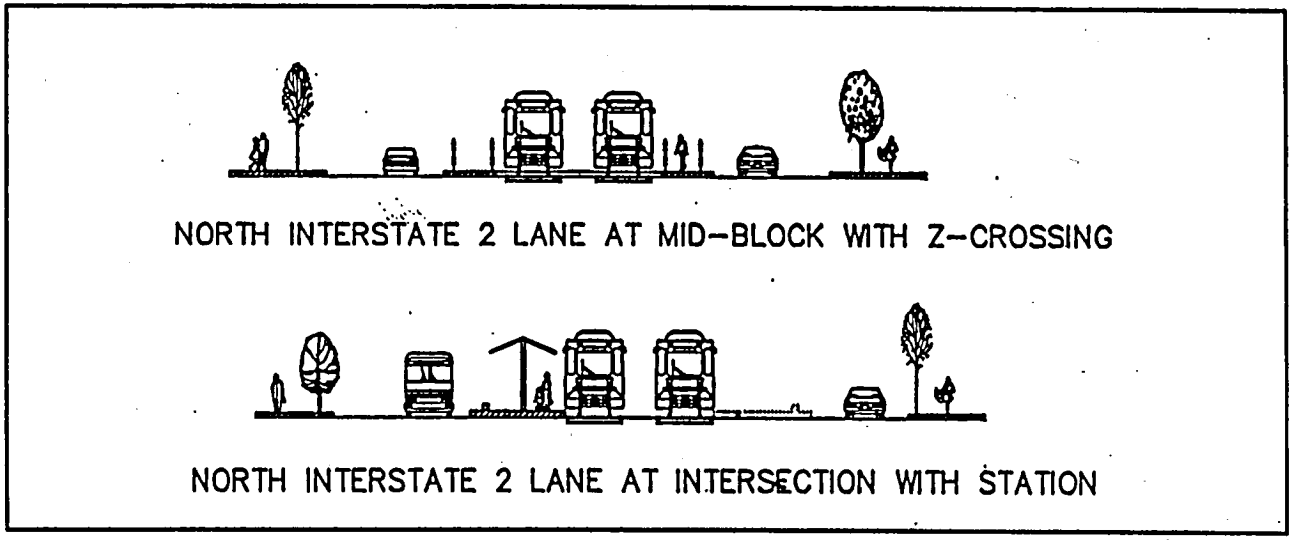
Tier I Decision Process



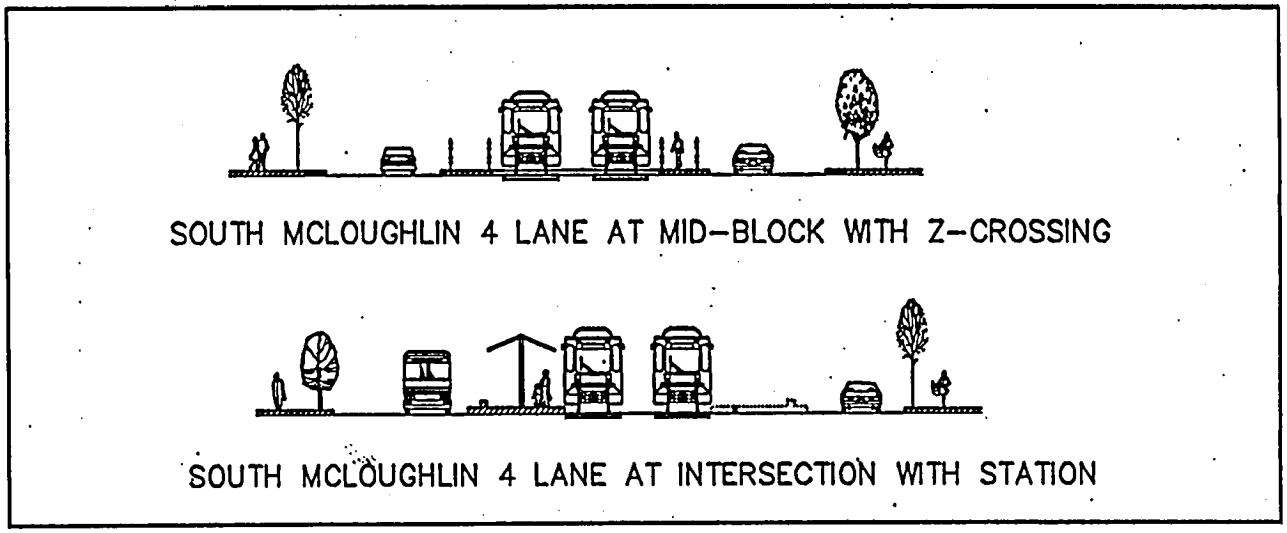
Appendix D

Sample Cross-Section Drawings





NORTH PORTLAND ALIGNMENT ALTERNATIVES
TYPICAL CROSS SECTIONS



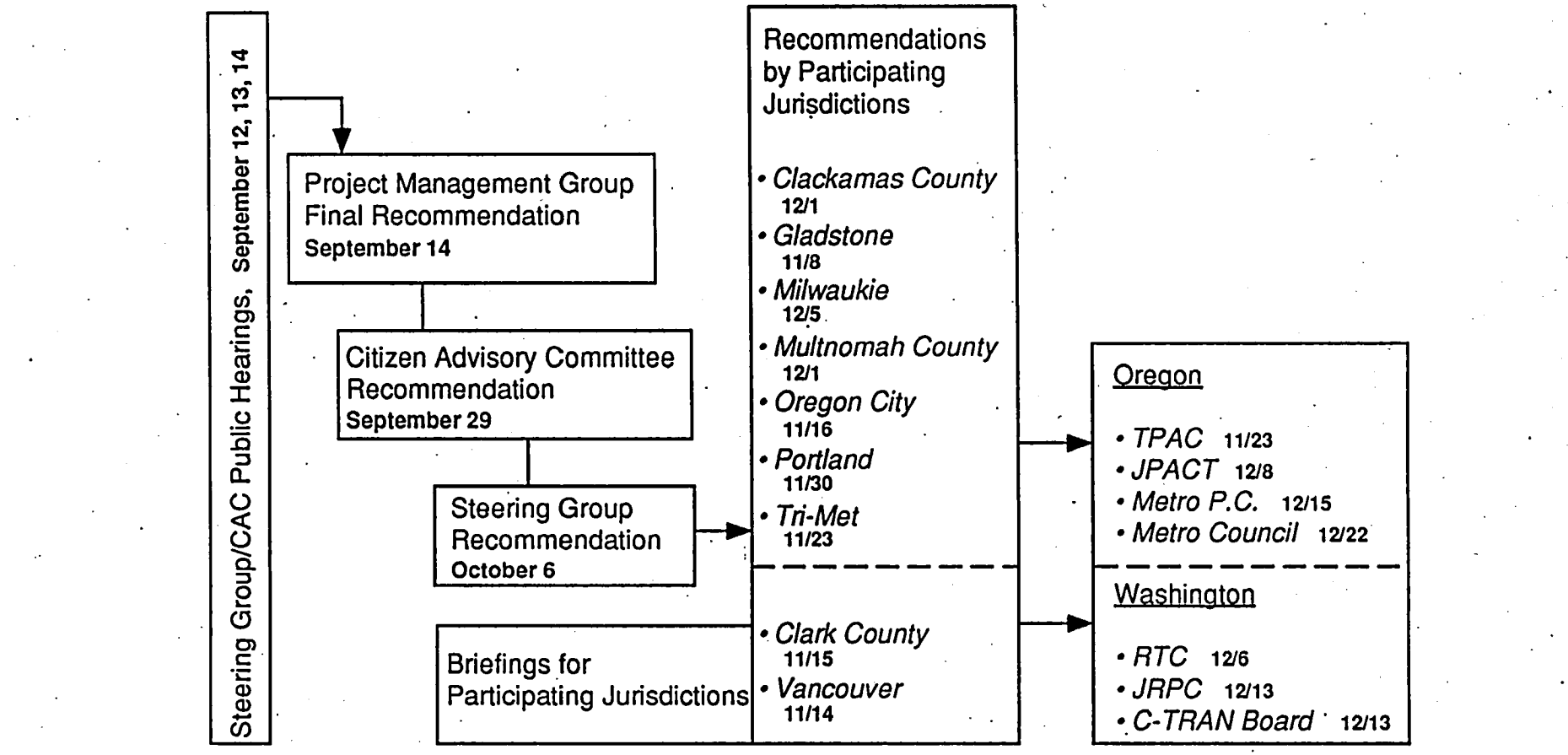
SOUTH MCLOUGHLIN ALIGNMENT ALTERNATIVES
TYPICAL CROSS SECTIONS

Attachment B

RESOLUTIONS OF SOUTH/NORTH PARTICIPATING JURISDICTIONS

- Clackamas County
- City of Gladstone
- City of Milwaukie
- Multnomah County
- Oregon City
- City of Portland
- Tri-Met
- Clark County
- City of Vancouver

Tier I Alternative Selection Process



BEFORE THE BOARD OF COUNTY COMMISSIONERS

OF CLACKAMAS COUNTY, STATE OF OREGON

FILED
DEC 9 - 1994
JOHN F. KAUFFMAN, County Clerk
By [signature] Deputy

: the Matter of Supporting
.e South/North Tier 1 Final
commendation Report describing
ght Rail Alternatives to Advance
.to the Tier II Draft Environmental
ıpact Statement for further study.

BOARD ORDER NO.: 94-1297

WHEREAS, in April 1993 Metro Council and the TRAN Board of Directors selected the Milwaukie and I-5 North Corridors as .e region's next high capacity transit priority for study and combined them .to the South/North Corridor to be studied within a federal Alternatives alysis/Draft Environmental Impact Statement, and

WHEREAS, in October 1993 the Federal Transit ministration approved the South/North application to initiate Alternative alysis/Draft Environmental Impact Statement and the South/North eliminary Work Plan, and issued notification of intent in the Federal gister to publish a South/North Draft Environmental Impact Statement; and

WHEREAS, in December 1993 the South/North eering Group concluded the federally prescribed Scoping Process, which cluded a comparative analysis of various high capacity transit mode .ternatives, by selecting the light rail transit and various light rail rminus and alignment alternatives to advance into Tier I for further udy; and

WHEREAS, the South/North Evaluation thodology Report, as adopted by the South/North Steering Group in December 93, prescribes the South/North study organization and process for the nclusion of the Tier I study process and the selection of the alternatives advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the role of the South/North Steering oup in the tier I study process is to forward its final Tier I commendation to participating jurisdictions for their consideration, that rticipating jurisdictions are to forward their recommendations to the C-AN Board of Directors and the Metro Council who are to make the final termination of the alternatives to advance into the Tier II Draft vironmental Impact Statement for further study; and.

WHEREAS, the Evaluation Methodology Report, rther prescribes the criteria and measures to be used to select the ternatives to advance into Tier II and the Draft Environmental Impact atement; and

WHEREAS, the alternatives that were selected the conclusion of Scoping have been developed and the criteria and asures from the Evaluation Methodology Report have been developed and cumented within various technical memoranda, including the South/North er I Technical Summary Report and the South/North Tier I Briefing cument; and

BEFORE THE BOARD OF COUNTY COMMISSIONERS
OF CLACKAMAS COUNTY, STATE OF OREGON

In the Matter of Supporting the South/North Tier 1 Final Recommendation Report describing Light Rail Alternatives to Advance into the Tier II Draft Environmental Impact Statement for further study.

BOARD ORDER NO.:94-1297

WHEREAS, the technical methodologies, ssumptions and results have been reviewed by the South/North Expert Review anel which found, in summary, that, "The Panel finds that the data eveloped is sufficient to make the decisions regarding which alternatives ıould be carried forward for further study," and

WHEREAS, a comprehensive public involvement rogram was developed and implemented by the South/North Study that included ıt was not limited to a variety of community meetings, a 60-day public ɔmment period on the Tier I alternatives and data, meetings for the teering Group to receive oral public comment, and an ongoing Citizens dvisory Committee that received staff reports and presentations, provided egular public comment opportunities, and in September 1994 formed an ıdependent Tier I recommendation that was forwarded to the Steering Group ɔr its consideration; and

WHEREAS, in October 1994 the Steering Group ɔnsidered the Citizens Advisory Committee and Project Management Group ecommendations, public comment and the Tier I criteria and measures and ssued its own unanimous Tier I recommendation to the participating ırisdictions, C-TRAN Board of Directors and Metro Council for their ɔnsideration; and

WHEREAS, the Steering Group's Final Tier I ecommendation identifies the LRT alternatives that they concluded best meet ıe project's goal and objectives as adopted in December 1993 by the ɔuth/North Steering Group within the Evaluation Methodology Report; now ıerefore,

BE IT RESOLVED, that the Clackamas County ɔard of Commissioners recommends to the Metro Council and the C-TRAN Board f Directors the following approach to continuation of the South/North ransit Corridor Study:

1. To pursue the South/North Corridor in two study phases:

   a. Phase I would consider a Light Rail Transit project between the Clackamas Town Center area (CTC) and the 99th Street area in Clark County.

   b. Phase II would consider an extension of the Phase I LRT Project south to Oregon City and north to the 134th Street/WSU area.

In the Matter of Supporting the South/North Tier 1 Final Recommendation Report describing Light Rail Alternatives to Advance into the Tier II Draft Environmental Impact Statement for further study.

These study phases would proceed as follows:

a. Preparation of the Draft Environmental Impact Statement (DEIS) and funding plan for the Phase I LRT alternative would begin immediately.

b. If LRT is selected as the Locally Preferred Alternative in Phase I, a DEIS and funding strategy for the Phase II LRT extension would be prepared upon completion of the Final Environmental Impact Statement (FEIS) for Phase I.

The following alignments are alternatives for further study within the Draft Environmental Impact Statement:

a. Between the Portland and Milwaukie CBDs, that the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate streets in the south, and the McLoughlin Boulevard alignment shall be developed for further study within the DEIS. The Caruthers area crossing will be evaluated further in order to determine whether it should also be included in the Detailed Definition of Alternatives Report and developed further in the DEIS.

b. Within the Portland CBD that a Surface LRT Alternative on 5th and 6th Avenues shall be developed based upon several principles for further study within the DEIS.

c. Between the Vancouver CBD and the 134th/Washington State University branch campus area for both the Phase I and Phase II termini, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 shall be developed for further study within the DEIS.

Because it has found that further discussions and analysis should occur, a recommendation for the segment between the Portland and Vancouver CBDs shall wait completion of additional technical work and evaluation.

and further,

BEFORE THE BOARD OF COUNTY COMMISSIONERS
OF CLACKAMAS COUNTY, STATE OF OREGON

In the Matter of Supporting the South/North Tier 1 Final Recommendation Report describing Light Rail Alternatives to Advance into the Tier II Draft Environmental Impact Statement for further study.

BOARD ORDER NO.: 94-1297

BE IT RESOLVED, that the Clackamas County Board of Commissioners recommends that the Metro Council and the C-TRAN Board of Directors adopt the South/North Steering Group Tier I Final Recommendation Report describing the light rail terminus and alignment alternatives to advance into the Tier II Draft Environmental Impact Statement for further study.

DATED this 1st day of December, 1994

BOARD OF COUNTY COMMISSIONERS

Ed Lindquist, Chairperson

Judie Hammerstad, Commissioner

Darlene Hooley, Commissioner

cc/rs/1115:jb

239 - 767

RESOLUTION NO. 730

RECOMMENDATION OF THE CITY OF GLADSTONE IN SUPPORT OF THE SOUTH/NORTH STEERING GROUP TIER I FINAL RECOMMENDATION REPORT DESCRIBING THE LIGHT RAIL ALTERNATIVES TO ADVANCE INTO THE TIER II DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR FURTHER STUDY.

WHEREAS, in April 1993 Metro Council and the C-TRAN Board of Directors selected the Milwaukie and I-5 North Corridors as the region's next high capacity transit priority for study and combined them into the South/North Corridor to be studied with a federal Alternatives Analysis/Draft Environmental Impact Statement; and

WHEREAS, in October 1993 the Federal Transit Administration approved the South/North application to initiate Alternative Analysis/Draft Environmental Impact Statement and the South/North Preliminary Work Plan, and issued notification of intent in the Federal Register to publish a South/North Draft Environmental Impact Statement; and

WHEREAS, in December 1993 the South/North Steering Group concluded the federally prescribed Scoping Process, which included a comparative analysis of various high capacity transit mode alternatives, by selecting the light rail transit and various light rail terminus and alignment alternatives to advance into Tier I for further study; and

WHEREAS, the South/North Evaluation Methodology Report, as adopted by the South/North Steering Group in December 1993, prescribes the South/North study organization and process for the conclusion of the Tier I study process and the selection of the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the role of the South/North Steering Group in the Tier I study process is to forward its final Tier I recommendation to participating jurisdictions for their consideration, that participating jurisdictions are to forward their recommendations to the C-TRAN Board of Directors and the Metro Council who are to make the final determination of the alternatives to advance into the Tier II Draft Environmental Impact Statement for further study; and

WHEREAS, the Evaluation Methodology Report, further prescribes the criteria and measures to be used to select the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the alternatives that were selected at the conclusion of Scoping have been developed and the criteria and measures from the Evaluation Methodology Report have been developed and documented within various technical memoranda, including the South/North Tier I Technical Summary Report and the South/North Tier I Briefing Document; and

WHEREAS, the technical methodologies, assumptions and results have been reviewed by the South/North Expert Review Panel which found, in summary, that, "The Panel finds that the data developed is sufficient to make the decisions regarding which alternatives should be carried forward for further study;" and

WHEREAS, a comprehensive involvement program was developed and implemented by the South/North Study that included but was not limited to a variety of community meetings, a 60-day public comment period on the Tier I alternatives and data, meetings for the Steering Group to receive oral public comment, and an on-going Citizens Advisory Committee that received staff reports and presentations, provided regular public comment opportunities, and in

September 1994 formed an independent Tier I recommendation that was forwarded to the Steering Group for its consideration; and

WHEREAS, in October 1994 the Steering Group considered the Citizens Advisory Committee and Project Management Group recommendations, public comment and the Tier I criteria and measures and issued its own unanimous Tier I recommendation to the participating jurisdictions, C-TRAN Board of Directors and Metro Council for their consideration; and

WHEREAS, the Steering Group's Final Tier I Recommendation identified the LRT alternatives that they concluded best meet the project's goal and objectives as adopted in December 1993 by the South/North Steering Group within the Evaluation Methodology Report,

NOW, THEREFORE, BE IT RESOLVED THAT THE COMMON COUNCIL OF THE CITY OF GLADSTONE recommends to the Metro Council and the C-TRAN Board of Directors the following approach to continuation of the South/North Transit Corridor Study:

1. *To pursue the South/North Corridor in two study phases:*

   a. *Phase I would consider a Light Rail Transit project between the Clackamas Town Center area (CTC) and the 99th Street area in Clark County.*

   b. *Phase II would consider an extension of the Phase I LRT Project south through Gladstone to Oregon City and north to the 134th Street/WSU area.*

2. *These study phases would proceed as follows:*

   a. *Preparation of the Draft Environmental Impact Statement (DEIS) and funding plan for the Phase I LRT alternative would begin immediately.*

   b. *If LRT is selected as the Locally Preferred Alternative in Phase I, a DEIS and funding strategy for the Phase II LRT extension would be prepared upon completion of the Final Environmental Impact Statement (FEIS) for Phase I.*

3. *The following alignments are alternatives for further study within the Draft Environmental Impact Statement:*

   a. *Between the Portland and Milwaukie CBDs, that the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate Streets in the south, and the McLoughlin Boulevard alignment shall be developed for further study within the DEIS. The Caruthers area crossing will be evaluated further in order to determine whether it should also be included in the Detailed Definition of Alternatives Report and developed further in the DEIS.*

   b. *Within the Portland CBD that a Surface LRT Alternative on 5th and 6th Avenues shall be developed based upon several principles for further study within the DEIS.*

   c. *Between the Vancouver CBD and the 134th/Washington State University branch campus area for both the Phase I and Phase II termini, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 shall be developed for further study within the DEIS;*

4. *Because it has found that further discussions and analysis should occur, a recommendation for the segment between the Portland and Vancouver CBDs shall wait completion of additional technical work and evaluation.*

BE IT FURTHER RESOLVED, THAT THE COMMON COUNCIL OF THE CITY OF GLADSTONE recommends that the C-TRAN Board of Directors and Metro Council adopt the South/North Steering Group Tier I Final Recommendation Report describing the light rail terminus and alignment alternatives to advance into the Tier II Draft Environmental Impact Statement for further study.

This Resolution adopted by the Gladstone City Council and approved by the Mayor this _____ day of _____, 1994.

Attest:

Wade Byers

Wade Byers, Mayor

Verna Howell

Verna Howell, CMC, City Recorder

RESOLUTION NO. 51-1994

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILWAUKIE, OREGON, IN SUPPORT OF THE SOUTH/NORTH STEERING GROUP TIER I FINAL RECOMMENDATION REPORT DESCRIBING THE LIGHT RAIL ALTERNATIVES TO ADVANCE INTO THE TIER II DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR FURTHER STUDY.

WHEREAS, in April, 1993, Metro Council and the C-TRAN Board of Directors selected the Milwaukie and I-5 North Corridors as the region's next high capacity transit priority for study and combined them into the South/North Corridor to be studied with a federal Alternatives Analysis/Draft Environmental Impact Statement; and

WHEREAS, in October, 1993, the Federal Transit Administration approved the South/North application to initiate Alternative Analysis/Draft Environmental Impact Statement and the South/North Preliminary Work Plan, and issued notification of intent in the Federal Register to publish a South/North Draft Environmental Impact Statement; and

WHEREAS, in December, 1993, the South/North Steering Group concluded the federally prescribed Scoping Process, which included a comparative analysis of various high capacity transit mode alternatives, by selecting the light rail transit and various light rail terminus and alignment alternatives to advance into Tier I for further study; and

WHEREAS, the South/North Evaluation Methodology Report, as adopted by the South/North Steering Group in December, 1993, prescribes the South/North study organization and process for the conclusion of the Tier I study process and the selection of the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the role of the South/North Steering Group in the Tier I study process is to forward its final Tier I recommendation to participating jurisdictions for their consideration, that participating jurisdictions are to forward their recommendations to the C-TRAN Board of Directors and the Metro Council who are to make the final determination of the alternatives to advance into the Tier II Draft Environmental Impact Statement for further study; and

WHEREAS, the Evaluation Methodology Report further prescribes the criteria and measures to be used to select the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the alternatives that were selected at the conclusion of scoping have been developed and the criteria and measures from the Evaluation Methodology Report have been developed and documented within the various technical memoranda, including the South/North Tier I Technical Summary Report and the South/North Tier I Briefing Document; and

WHEREAS, the technical methodologies, assumptions and results have been reviewed by the South/North Expert Review Panel which found, in summary, that " ....the data developed is sufficient to make the decisions regarding which alternatives should be carried forward for further study;" and

WHEREAS, a comprehensive involvement program was developed and implemented by the South/North Study that included but was not limited to a variety of community meetings, a 60-day public comment period on the Tier I alternatives and data, meetings for the Steering Group to receive oral public comment, and an on-going Citizens Advisory Committee that received staff reports and presentations, provided regular public comment opportunities, and in September 1994 formed an independent Tier I recommendation that was forwarded to the Steering Group for its consideration; and

WHEREAS, in October 1994 the Steering Group considered the Citizens Advisory Committee and Project Management Group recommendations, public comment and the Tier I criteria and measures and issued its own unanimous Tier I recommendation to the participating jurisdictions, C-TRAN Board of Directors and Metro Council for their consideration; and

WHEREAS, the Steering Group's Final Tier I Recommendation identified the LRT alternatives that they concluded best meet the project's goal and objectives as adopted in December, 1993, by the South/North Steering Group within the Evaluation Methodology Report,

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MILWAUKIE:

Section 1. That the Metro Council and the C-TRAN Board of Directors adopt the following approach to continuation of the South/North Transit Corridor Study:

A. To pursue the South/North Corridor in two phases:

1. Phase I would consider a Light Rail Transit project between the Clackamas Town Center area (CTC) and the 99th Street area in Clark County.

2. Phase II would consider an extension of the Phase I LRT Project south to Oregon City via I-205 or McLoughlin Blvd. and north to the 134th Street/WSU area.

B. These study phases would proceed as follows:

1. Preparation of the Draft Environmental Impact Statement (DEIS) and funding plan for the Phase I LRT alternative would begin immediately.

2. If LRT is selected as the Locally Preferred Alternative in Phase I, a DEIS and funding strategy for the Phase II LRT extension would be prepared upon completion of the Final Environmental Impact Statement (FEIS) for Phase I.

C. The following alignments are alternatives for further study within the Draft Environmental Impact Statement:

1. Between the Portland and Milwaukie CBDs, that the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate Streets in the south, and the McLoughlin Boulevard alignment shall be developed for further study within the DEIS. The Caruthers area crossing will be evaluated further in order to determine whether it should also be included in the Detailed Definition of Alternatives Report and developed further in the DEIS.

2. Within the Portland CBD that a surface LRT Alternative on 5th and 6th Avenues shall be developed based upon several principles for further study within the DEIS. If at the time the Draft Environmental Impact Statement is initiated it is concluded that a 5th/6th Avenue alignment cannot be developed that addresses those principles, other alternatives will be studied for further study in the DEIS.

3. Between the Vancouver CBD and the 134th/Washington State University branch campus area for both the Phase I and Phase II termini, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 shall be developed for further study within the DEIS;

D. Because it has been found that further discussions and analysis should occur, a recommendation for the segment between the Portland and Vancouver CBDs shall wait for completion of additional technical work and evaluation.

E. The following alignments will be considered for the Phase II extensions:

1. Following completion of the Detailed Definition of Alternatives Report, an analysis of the I-205 alignment from the CTC terminus and the McLoughlin alignment from the Milwaukie CBD to Oregon City will be made to determine which alignment will advance into the Phase II DEIS. The Portland Traction Company (PTC) right-of-way will not be considered as a Phase II alignment.

2. Between the vicinity of 99th Street and the area of 134th Street/WSU Branch Campus, the I-5 East alignment will advance into the Phase II DEIS.

Section 2. That the C-TRAN Board of Directors and Metro Council adopt the South/North Steering Group Tier I Final Recommendation Report describing the light rail terminus and alignment alternatives to advance into the Tier II Draft Environmental Impact Statement for further study.

Introduced and adopted by the City Council on December 6, 1994.

Craig J. Lomnicki

Craig Lomnicki, Mayor

ATTEST:

Pat DuVal

Pat DuVal, City Recorder

Approved as to form:

O'Donnell Ramis Crew Corrigan & Bachrach

BEFORE THE BOARD OF COUNTY COMMISSIONERS
FOR MULTNOMAH COUNTY, OREGON

Recommendation in support of the South/North Steering Group Tier I Final Recommendation Report describing the Light Rail Alternatives to advance into Tier II Draft Environmental Impact Statement for further study.	)))))	RESOLUTION 94-231

WHEREAS, in April 1993 Metro Council and the C-Tran Board of Directors selected the Milwaukie and I-5 North Corridors as the region's next high capacity transit priority for study, and combined them into the South/North Corridor to be studied within a federal Alternatives Analysis/Draft Environmental Impact Statement; and

WHEREAS, in October 1993 the Federal Transit Administration approved the South/North Preliminary Work Plan, and issued notification of intent in the *Federal Register* to publish a South/North Draft Environmental Impact Statement (DEIS); and

WHEREAS, in December 1993 the South/North Steering Group including Multnomah County representation, concluded the federally prescribed Scoping Process, which included a comparative analysis of various high capacity transit mode alternatives, by selecting the light rail transit and various light rail terminus and alignment alternatives into Tier I for further study; and

WHEREAS, the South/North *Evaluation Methodology Report*, as adopted by the South/North Steering Group in December 1993, prescribes the South/North Study organization and process for the conclusion of the Tier I study process, and the selection of the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the role of the South/North Steering Group in the Tier I study process is to forward its final Tier I recommendation to Multnomah County and the other participating jurisdictions for their consideration, so that the County and other participating jurisdictions may forward their recommendations to the C-Tran Board of Directors and the Metro Council who are to make the final determination of the alternatives to advance into the Tier II Draft Environmental Impact Statement for further study; and

WHEREAS, the *Evaluation Methodology Report* further prescribes the criteria and measures to be used to select the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the alternatives that were selected at the conclusion of the Scoping Process have been developed, and the criteria and measures from the *Evaluation Methodology Report* have been developed and documented within various technical memoranda, including the *South/North Tier I Technical Summary Report* and the *South/North Tier I Briefing Document*; and

WHEREAS, the technical methodologies, assumptions, and results have been reviewed by the South/North Expert Review Panel which found, in summary, that "The Panel finds that the data developed is sufficient to make the decisions regarding which alternatives should be carried forward for further study," and

WHEREAS, a comprehensive public involvement program was developed and implemented by the South/North Study that included but was not limited to a variety of community meetings, a 60-day public comment period on the Tier I alternatives and data, meetings for the Steering Group to receive oral public comment, and an ongoing Citizens Advisory Committee including representation from Multnomah County, that received staff reports and presentations, provided regular public comment opportunities, and in September 1994, formed an independent Tier I recommendation that was forwarded to the Steering Group for its consideration; and

WHEREAS, in October 1994 the Steering Group considered Citizens Advisory Committee and Project Management Group recommendations, public comment, and the Tier I criteria and measures and issued its own unanimous Tier I recommendation to the participating jurisdictions, C-Tran Board of Directors, and Metro Council for their consideration; and

WHEREAS, the Steering Group's Final Tier I Recommendation identifies LRT alternatives that they concluded best meet the project's goal and objectives as adopted in December 1993 by the South/North Steering Group within the *Evaluation Methodology Report*;

NOW, THEREFORE, BE IT RESOLVED that the Multnomah County Board of Commissioners recommends to the Metro Council and the C-Tran Board of Directors the following approach to continuation of the South/North Transit Corridor Study:

1. To pursue the South/North Corridor in two study phases:

   A. Phase I would consider a Light Rail Transit project between the Clackamas Town Center (CTC) area and the 99th Street area in Clark County.

   B. Phase II would consider an extension of the Phase I LRT project south to Oregon City and north to the 134th Street/WSU area.

2. These study phases would proceed as follows:

   A. Preparation of the Draft Environmental Impact Statement (DEIS) and funding plan for Phase I LRT alternative would begin immediately.

   B. If LRT is selected as the Locally Preferred Alternative in Phase I, a DEIS and funding strategy for the Phase II LRT extension would be prepared upon completion of the Final Environmental Impact Statement (FEIS) for Phase I.

3. The following alignments are alternatives for further study within the Draft Environmental Impact Statement:

   A. Between the Portland and Milwaukie CBDs, that the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate Streets in the south, and the McLoughlin Blvd. alignment shall be developed for further study within the DEIS. The Caruthers area crossing will be evaluated further to determine whether it should also be included in the *Detailed Definition of Alternatives Report* and developed further in the DEIS.

B. Within the Portland CBD, a Surface LRT Alternative on 5th and 6th Avenues shall be developed based upon several principles for further study within the DEIS.

C. Between the Vancouver CBD and the 134th Street/Washington State University branch campus area for both Phase I and Phase II termini, the I-5 east Alignment Alternative with station areas between I-5 and Highway 99 shall be developed for further study within the DEIS.

4. Because it has been found that further discussions and analysis should occur, a recommendation for the segment between the Portland and Vancouver CBDs shall be made following completion of additional technical work and evaluation;

And further,

BE IT RESOLVED, that Multnomah County Board of Commissioners recommends that the C-Tran Board of Directors and Metro Council adopt the South/North Steering Group *Tier I Final Recommendation Report* describing the light rail terminus and alignment alternatives to advance into the Tier II Draft Environmental Impact Statement for further study.

DATED this 1st day of December, 1994.

BOARD OF COUNTY COMMISSIONERS
FOR MULTNOMAH COUNTY, OREGON

Beverly Stein, Chair

REVIEWED:

LAURENCE KRESSEL, COUNTY COUNSEL
FOR MULTNOMAH COUNTY, OREGON

By _____
Assistant County Counsel

EPCK0870.RES

RESOLUTION NO. 94-56

A RESOLUTION EXPRESSING CITY COMMISSION SUPPORT OF TIER 1, SOUTH/NORTH LIGHT RAIL RECOMMENDATIONS

WHEREAS, on October 19, 1994, the Oregon City Urban Renewal Agency met in work session to review and comment on the final Tier 1 Final Recommendations adopted by the South/North Steering Committee; and

WHEREAS, on October 26, 1994, the Oregon City Commission met in work session to review and comment on the final Tier 1 Final Recommendations; and

WHEREAS, the Oregon City Commission believes that the South/North Light Rail (LRT) line is an essential element in addressing long range transportation needs in Oregon City, Clackamas County and the Region; and

WHEREAS, the Oregon City Commission believes that the South/North LRT project will reduce the dependency on the automobile, will provide better service to existing and future transit users, will support the End of the Oregon Trail Center and mixed-use development at Clackamette Cove, and will enhance revitalization efforts now underway in downtown Oregon City; and

WHEREAS, the Oregon City Commission is committed to a strong regional partnership which the Commission feels is necessary in order to advance future light rail projects in all parts of the Metro area.

Now, therefore,

BE IT RESOLVED that the City Commission of Oregon City, Oregon, supports of the Tier 1 Final Recommendations adopted by the South/North Steering Committee on October 6, 1994, which call for an ultimate Phase II South Terminus of the LRT Alternative in Oregon City; and

That the City Commission supports the Tier 1 Final Recommendations which identify the Clackamas Town Center as the Phase I South Terminus of the S/NLRT Alternative; and

That the City Commission commits the City to actively participate in all Phase I and II activities outlined in the Tier 1 Final Recommendations, and in coordination and advocacy activities involving Clackamas County and the cities in the County; and

That the Oregon City Commission recommends a "yes" vote on Measure No. 26-13, which will authorize Tri-Met to issue general obligation bonds to match federal funds to build the South/North LRT line.

BE IT FURTHER RESOLVED that the Oregon City Commission will request a joint meeting or meetings with the Clackamas County Commission to discuss and obtain County Commission support for several actions which will strengthen the prospects for extending LRT to Oregon City, and to formulate a joint City-County resolution in support of the project; and

That copies of the resolution be forwarded to the Clackamas County Commission.

Adopted, signed and approved this 2nd day of November, 1994.

Mayor

Commissioner

Commissioner

Commissioner

Commissioner

Comprising the City Commission
of Oregon City, Oregon

RESOLUTION NO. 94-56

RESOLUTION NO. 35339

SUPPORT THE SOUTH/NORTH STEERING GROUP TIER I FINAL RECOMMENDATION REPORT DESCRIBING THE LIGHT RAIL ALTERNATIVES TO ADVANCE INTO THE TIER II DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR FURTHER STUDY

WHEREAS, in April 1993 Metro Council and the C-TRAN Board of Directors selected the Milwaukie and I-5 North Corridors as the region's next high capacity transit priority for study and combined them into the South/North Corridor to be studied within a federal Alternatives Analysis/Draft Environmental Impact Statement; and

WHEREAS, in October 1993 the Federal Transit Administration approved the South/North application to initiate Alternative Analysis/Draft Environmental Impact Statement and the South/North Preliminary Work Plan, and issued notification of intent in the *Federal Register* to publish a South/North Draft Environmental Impact Statement; and

WHEREAS, in December 1993 the South/North Steering Group concluded the federally prescribed Scoping Process, which included a comparative analysis of various high capacity transit mode alternatives by selecting the light rail transit and various light rail terminus and alignment alternatives to advance into Tier I for further study; and

WHEREAS, the South/North *Evaluation Methodology Report*, as adopted by the South/North Steering Group in December 1993, prescribes the South/North study organization and process for the conclusion of the Tier I study process and selection of the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the role of the South/North Steering Group in the Tier I study process is to forward its final Tier I recommendation to participating jurisdictions for their consideration, that participating jurisdictions are to forward their recommendations to the C-TRAM Board of Directors and Metro Council who are to make the final determination of the alternatives to advance into the Tier II Draft Environmental Impact Statement for further study; and

WHEREAS, the *Evaluation Methodology Report*, further prescribes the criteria and measures to be used to select the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the alternatives that were selected at the conclusion of Scoping have been developed and the criteria and measures from the *Evaluation Methodology Report* have been developed and documented within various technical memoranda, including the *South/North Tier I Technical Summary Report* and the *South/North Tier I Briefing Document*, and

WHEREAS, the technical methodologies, assumptions and results have been reviewed by the South/North Expert Review Panel which found, in summary, the "The Panel finds that the data developed is sufficient to make the decisions regarding which alternatives should be carried forward for further study," and

WHEREAS, a comprehensive public involvement program was developed and implemented by the south/north study that included but was not limited to a variety of community meetings, a 60-day public comment period on the Tier I alternatives and data, meeting for the Steering Group to receive oral public comment, and an on-going Citizens Advisory Committee that received staff reports and presentations, provided regular public

comment opportunities, and in September 1994 formed an independent Tier I recommendation that was forwarded to the Steering Group for its consideration; and

WHEREAS, in October 1994 the Steering Group considered the Citizens Advisory Committee and Project Management Group recommendations, public comment and the Tier I criteria and measures and issued its own unanimous Tier I recommendation to the participating jurisdictions, C-TRAN Board of Directors and Metro Council for their consideration; and

WHEREAS, the Steering Group's Final Tier I Recommendation identifies the LRT alternatives that they concluded best meet the project's goal and objectives as adopted in December 1993 by the South/North Steering Group within the *Evaluation Methodology Report*; now therefore,

BE IT RESOLVED, that the Portland City Council recommends to the Metro Council the following approach to continuation of the South/North Transit Corridor Study:

1. To pursue the South/North Corridor in two study phases:

    a. Phase I would consider a light Rail Transit project between the Clackamas Town Center area (CTC) and the 99th Street area in Clark County.

    b. Phase II would consider an extension of the Phase I LRT Project south to Oregon City and north to the 134th Street/WSU area.

2. These study phases would proceed as follows:

    a. Preparation of the Draft Environmental Impact Statement (DEIS) and funding plan for the Phase I LRT alternative would begin immediately.

    b. If LRT is selected as the Locally Preferred Alternative in Phase I, a DEIS and funding strategy for the Phase II LRT extension would be prepared upon completion of the Final Environmental Impact Statement (FEIS) for Phase I.

3. The following alignments are alternatives for further study within the Draft Environmental Impact Statement:

    a. Between the Portland and Milwaukie CBDs, that the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate streets in the south, and the McLoughlin Boulevard alignment shall be developed for further study within the DEIS. The Caruthers area crossing will be evaluated further in order to determine whether it should also be included in the *Detailed Definition of Alternatives Report* and developed further in the DEIS.

    b. Within the Portland CBD that a Surface LRT Alternative on 5th and 6th Avenues shall be developed based upon several principles, for further study within the DEIS. If at that time it is not concluded that a 5th/6th Avenue Surface Alignment can be developed that addresses the principles identified in the Tier I Final Recommendation, other alternatives would be developed for further study within the DEIS.

c. Between the Vancouver CBD and the 134th/Washington State University branch campus area for both the Phase I and Phase II termini, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 shall be developed for further study within the DEIS:

4. Because it has found that further discussions and analysis should occur, a recommendation for the segment between the Portland and Vancouver CBDs shall wait completion of additional technical work and evluation; and further

BE IT RESOLVED, that the Portland City Council recommends that the C-TRAN Board of Directors and Metro Council adopt the South/North Steering Group *Tier I Final Recommendation Report* describing the light rail terminus and alignment alternatives to advance into the Tier II Draft Environmental Impact Statement for further study.

Adopted by the Council: NOV 30 1994
Commissioner Blumenauer
Barrow Emerson
Nov. 20, 1994

BARBARA CLARK
Auditor of the City of Portland
By: [redacted] Deputy
Britta Olson

RESOLUTION 94-11-91

RESOLUTION OF THE TRI-COUNTY METROPOLITAN TRANSPORTATION DISTRICT (TRI-MET) BOARD OF DIRECTORS IN SUPPORT OF THE SOUTH/NORTH STEERING GROUP TIER I FINAL RECOMMENDATION REPORT.

WHEREAS, in April 1993 Metro Council and the C-TRAN Board of Directors selected the Milwaukie and I-5 North Corridors as the region's next high capacity transit priority for study and combined them into the South/North Corridor to be studied within a federal Alternatives Analysis/Draft Environmental Impact Statement; and

WHEREAS, in October 1993 the Federal Transit Administration approved the South/North application to initiate Alternative Analysis/Draft Environmental Impact Statement and the South/North Preliminary Work Plan, and issued notification of intent in the *Federal Register* to publish a South/North Draft Environmental Impact Statement; and

WHEREAS, in December 1993 the South/North Steering Group concluded the federally prescribed Scoping Process, which included a comparative analysis of various high capacity transit mode alternatives, by selecting the light rail transit and various light rail terminus and alignment alternatives to advance into Tier I for further study; and

WHEREAS, the South/North *Evaluation Methodology Report*, as adopted by the South/North Steering Group in December 1993, prescribes the South/North study organization and process for the conclusion of the Tier I study process and the selection of the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the role of the South/North Steering Group in the Tier I study process is to forward its final Tier I recommendation to participating jurisdictions for their consideration, that participating jurisdictions are to forward their recommendations to the C-TRAN Board of Directors and the Metro Council who are to make the final determination of the alternatives to advance into the Tier II Draft Environmental Impact Statement for further study; and

WHEREAS, the *Evaluation Methodology Report*, further prescribes the criteria and measures to be used to select the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the alternatives that were selected at the conclusion of Scoping have been developed and the criteria and measures from the *Evaluation Methodology Report* have been developed and documented within various technical memoranda, including the *South/North Tier I Technical Summary Report* and the *South/North Tier I Briefing Document*; and

WHEREAS, the technical methodologies, assumptions and results have been reviewed by the South/North Expert Review Panel which found, in summary, that, " The Panel finds that the data developed is sufficient to make the decisions regarding which alternatives should be carried forward for further study;" and

WHEREAS, a comprehensive public involvement program was developed and implemented by the South/North Study that included but was not limited to a variety of community meetings, a 60-day public comment period on the Tier I alternatives and data, meetings for the Steering Group to receive oral public comment, and an on-going Citizens Advisory Committee that received staff reports and presentations, provided regular public comment opportunities, and in September 1994 formed an independent Tier I recommendation that was forwarded to the Steering Group for its consideration; and

WHEREAS, in October 1994 the Steering Group considered the Citizens Advisory Committee and Project Management Group recommendations, public comment and the Tier I criteria and measures and issued its own unanimous Tier I recommendation to the participating jurisdictions, C-TRAN Board of Directors and Metro Council for their consideration; and

WHEREAS, the Steering Group's Final Tier I Recommendation identifies the LRT alternatives that they concluded best meet the project's goal and objectives as adopted in December 1993 by the South/North Steering Group within the *Evaluation Methodology Report*;

NOW, THEREFORE, BE IT RESOLVED:

1. That the Tri-Met Board of Directors recommends to the Metro Council and the C-TRAN Board of Directors the following approach to continue the South/North Transit Corridor Study:

   A. Pursue the South/North Corridor in two study phases:

      1.) Phase I would consider a Light Rail Transit project between the Clackamas Town Center area (CTC) and the 99th Street area in Clark County.

      2.) Phase II would consider an extension of the Phase I LRT Project south to Oregon City and north to the 134th Street/WSU area.

B. These study phases would proceed as follows:

1.) Preparation of the Draft Environmental Impact Statement (DEIS) and funding plan for the Phase I LRT alternative would begin immediately.

2.) If LRT is selected as the Locally Preferred Alternative in Phase I, a DEIS and funding strategy for the Phase II LRT extension would be prepared upon completion of the Final Environmental Impact Statement (FEIS) for Phase I.

C. The following alignments are alternatives for further study within the Draft Environmental Impact Statement:

1.) Between the Portland and Milwaukie CBDs, that the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate streets in the south, and the McLoughlin Boulevard alignment shall be developed for further study within the DEIS. The Caruthers area crossing will be evaluated further to determine whether it also should be included in the *Detailed Definition of Alternatives Report* and developed further in the DEIS.

2.) Within the Portland CBD that a Surface LRT Alternative on 5th and 6th Avenues shall be developed based upon several principles for further study within the DEIS.

3.) Between the Vancouver CBD and the 134th/Washington State University branch campus area for both the Phase I and Phase II termini, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 shall be developed for further study within the DEIS.

D. Because it has found that further discussions and analysis should occur, a recommendation for the segment between the Portland and Vancouver CBDs should wait completion of additional technical work and evaluation.

2. That the Tri-Met Board of Directors recommends that the C-TRAN Board of Directors and Metro Council adopt the South/North Steering Group Tier I Final Recommendation Report describing the light rail terminus and alignment alternatives to advance into the Tier II Draft Environmental Impact Statement for further study.

Dated: November 30, 1994

Presiding Officer

Attest:

Recording Secretary

Approved as to Legal Sufficiency:

Legal Department

TRI-COUNTY
METROPOLITAN
TRANSPORTATION
DISTRICT
OF OREGON

TRI-MET

4012 S.E. 17TH AVENUE
PORTLAND, OREGON 97202
(503) 238-RIDE

December 1, 1994

Councillor Rod Monroe, Chair
Joint Policy Advisory Committee on Transportation
Metro Regional Center
600 NE Grand Avenue
Portland, Oregon 97232-2736

Dear Councillor Monroe:

The enclosed resolution adopted by the Tri-Met Board on November 30, 1994, supports the recommendations of the S/N Steering Committee in its Alignment Alternatives Report dated October 6, 1994.

Our Board appreciates the effort and leadership you and the Steering Committee have contributed in advancing the S/N project thus far.

Two recommendations in your report, referenced in our resolution, need special comment:

1. On the Willamette River crossing south of downtown, we expect that both the Ross Island options and the Caruthers option will be given equal consideration during the next phase of study scheduled to be completed in April.

2. On the downtown alignment we expect a detailed and comprehensive analysis of the 5th and 6th Avenue surface alignment to be completed by April. If the analysis is unable to demonstrate that the 5th and 6th Avenue surface alignment is capable of handling future service levels anticipated over the next 30 years we would then expect that other options (including tunnel) would be introduced into the process.

Our support of the attached resolution is conditioned upon the above stated expectations. We request that project staff report findings on these two alignment options to our Board prior to commencement of the DEIS phase of the project in April, 1995.

Sincerely,

William D. Robertson/dsmith

William D. Robertson, Jr.
President, Board of Directors

CLARK COUNTY, WASHINGTON

RESOLUTION NO. 1994-11-31

RECOMMENDATION OF THE BOARD OF COUNTY COMMISSIONERS OF CLARK COUNTY IN SUPPORT OF THE SOUTH/NORTH STEERING GROUP TIER I FINAL RECOMMENDATION REPORT DESCRIBING THE LIGHT RAIL ALTERNATIVES TO ADVANCE INTO THE TIER II DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR FURTHER STUDY.

WHEREAS, in the April 1993 Metro Council and the C-TRAN Board of Directors selected the Milwaukie and I-5 North Corridors as the region's next high capacity transit priority for study. These corridors were identified as the South/North Corridor for further study within the federal Alternatives Analysis/Draft Environmental Impact Statement. In October 1993, the Federal Transit Administration approved the South/North application to initiate the Alternative Analysis/Draft Environmental Impact Statement and a South/North Preliminary Work Plan. In addition, the Federal Transit Administration issued a notification of intent in the *Federal Register* to publish a South/North Draft Environmental Impact Statement.

In December 1993, the South/North Steering Group concluded the federally prescribed Scoping Process, which included a comparative analysis of various high capacity transit mode alternatives. Based on this analysis, the light rail transit and various light rail terminus and alignment alternatives were advanced into the Tier I phase for further study. In addition, the South/North Steering Group adopted the *South/North Evaluation Methodology Report* prescribing the South/North study organization and process for the conclusion of the Tier I study process and selection of the alternatives to advance into Tier II and the Draft Environmental Impact Statement. From the completed work of Tier I, the South/North Steering Group developed a set of recommendations for consideration from participating jurisdictions. These jurisdictions will forward their recommendations on to the C-TRAN Board of Directors and the Metro Council who will make the final determination of the alternatives to advance into the Tier II Draft Environmental Impact Statement. The *Evaluation Methodology Report* describes the criteria and measures to be used to select the alternatives into Tier II and the Draft Environmental Impact Statement.

The alternatives that were selected at the conclusion of Scoping have been developed and the criteria and measures from the *Evaluation Methodology Report* have been developed and documented within various technical memorandum, including the *South/North Tier I Technical Summary Report* and the *South/North Tier I Briefing Document.*

These recommendations of the Steering Group were developed with input from the South/North Expert Review Panel, Citizen Advisory Committee, and the general public. A comprehensive public involvement program was developed which yielded many opportunities for citizens to participate through community meetings, and a 60-day comment period on Tier I alternatives and data. In addition, the Citizen Advisory Committee in September 1994 formed an independent Tier I recommendation that was forwarded to the Steering Group for its consideration.

In October 1994 the Steering Group considered the Citizen Advisory Committee and Project Management Group recommendations, public comment and the Tier I criteria and measures

and issued its own unanimous Tier I recommendation to the participating jurisdictions, C-TRAN Board of Directors and Metro Council for their consideration. In addition, the Growth Management planning process supports these recommendations throughout the Clark County region. Moreover, the Steering Group's Final Tier I Recommendation identifies the Light Rail Transit alternatives that they concluded best meeting the project's goal and objectives as adopted in December 1993 by the South/North Steering Group within the *Evaluation Methodology Report*.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF CLARK COUNTY, STATE OF WASHINGTON, recommends to the Metro Council and the C-TRAN Board of Directors the following approach to continuation of the South/North Transit Corridor Study:

1. To pursue the South/North Corridor in two study phases:

   a. Phase I would consider a Light Rail Transit (LRT) Project between the Clackamas Town Center area (CTC) and the 99th Street area in Clark County.

   b. Phase II would consider an extension of the Phase I LRT south to Oregon City and north to the 134th Street/WSU area.

2. These study phases would proceed as follows:

   a. Preparation of the Draft Environmental Impact Statement (DEIS) and funding plan for the Phase I LRT alternative would begin immediately.

   b. IF LRT is selected as the Locally Preferred Alternative in Phase I, a DEIS and funding strategy for the Phase II LRT extension would be prepared upon completion of the Final Environmental Impact Statement (FEIS) for Phase I.

3. The following alignments are alternatives for further study within the Draft Environmental Impact Statement:

   a. Between the Portland and Milwaukie CBDs, the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate streets in the south, and the McLoughlin Boulevard alignment shall be developed for further study within the DEIS. The Caruthers area crossing will be evaluated further in order to determine whether it should also be included in the *Detailed Definition of Alternatives Report* and developed further in the DEIS.

   b. Within the Portland CBD that a Surface LRT Alternative on 5th and 6th Avenues shall be developed based upon several principles for further study within DEIS.

   c. Between the Vancouver CBD and the 134th/Washington State University branch campus area for both the Phase I and Phase II termini, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 shall be developed for further study within the DEIS.

4. Because it has been found that further discussions and analysis should occur, a recommendation for the segment between the Portland and Vancouver CBDs shall wait completion of additional technical work and evaluation.

FURTHER BE IT RESOLVED, that the Board of County Commissioners of Clark County recommends that the C-TRAN Board of Directors and Metro Council adopt the South/North Steering Group *Tier I Final Recommendations Report* describing the light rail terminus and alignment alternatives to advance into the Tier II Draft Environmental Impact Statement for further study.

ADOPTED by the Board of County Commissioners of Clark County, Washington, at a regular open public meeting thereof, this 15th day of November 1994.

ATTEST:

By _____
Clerk to the Board

Approved as to Form Only
ARTHUR D. CURTIS
Prosecuting Attorney

By _____
Richard S. Lowry, Chief Civil Deputy
Prosecuting Attorney

BOARD OF COUNTY COMMISSIONERS
FOR CLARK COUNTY, WASHINGTON

By _____
JOHN C. MAGNANO, Chair of the Board

By _____
BUSSE NUTLEY, Commissioner

By _____
DAVID W. STURDEVANT, Commissioner

STAFF REPORT

DEPARTMENT/DIVISION:	Public Works/Transportation
DATE:	November 2, 1994
SPECIFIC REQUEST:	Board Approval of the Attached Resolution for South/North Transit Corridor Study Tier I Final Recommendations
CHECK ONE:	[X] Consent [ ] Worksession [ ] Public Hearing

BACKGROUND: Because of the size and complexity, the Alternative Analysis and Draft Environmental Impact Statement for the South/North Transit Corridor Study are being undertaken in two steps (Tier I and II). Work for Tier I has been completed through a collaborative effort by staff from affected jurisdictions in the Clark County region and Oregon. On the basis of this work, the Regional Steering Group for this study has brought forward a set of recommendations for approval by local jurisdictions, and final adoption by the C-TRAN Board and Metro. Tier II will focus on preparing a Draft Environmental Impact Statement on a narrowed set of Light Rail Transit alternatives, a No-Build alternative and a Transportation Systems Management alternative. Tier II will conclude with the selection of the Locally Preferred Alternative.

Tier I included the examination of four major issues in order to narrow the number of alternatives to be addressed in the Draft Environmental Impact Statement. These issues included the evaluation of 1) modal alternatives (busways, river transit, commuter and light rail), 2) alignment alternatives, 3) terminus alternatives and 4) design options. The following summary details the recommendations directly impacting the Clark County region.

- The examination of the modal alternatives of Tier I started about one year ago with the initiation of the federally-mandated *Scoping* process. Based on analyses and public input provided during *Scoping*, the high capacity transit alternatives were narrowed to one mode – light rail transit.

- With regard to the analysis of terminus alternatives, the Steering Group has recommended that the South/North Project be pursued in two phases. Phase I would consider a project which best meets the evaluation criteria established for Tier I and is also constrained by current estimates of potential funding. Work on the Draft Environmental Impact Statement for a Phase I alternative would begin immediately. Phase II would consider a future extension of the South/North Light Transit Rail to endpoints farther into Clark County, if Light Rail Transit is the locally preferred alternative. Based on these premises, the Steering Group has recommended that the 99th Street area serve as the Phase I terminus while the 134th Street/WSU area is recommended as the Phase II terminus. A phased approach allows any Phase II projects to be included in the Regional Transportation Plans and Growth Management Policies of local jurisdictions.

- The examination of the alignment alternatives has led the Steering Group to recommend the I-5 East alignment alternative for the segment from the Vancouver Central Business District to the vicinity of 99th Street for Phase I. The I-5 East Alignment Alternative is also the recommended alignment between 99th Street and the 134th Street/WSU area for Phase II.

- Finally, within the alignment alternatives recommended above, the following more detailed "Design Options" will remain under study and will be addressed in the *Detailed Definition of Alternatives Report* (which will serve as a basis for the Draft Environmental Impact Statement):

a) The alignment through the Vancouver Central Business District

b) The Columbia River Crossing (high bridge, lift span, or tunnel).

c) The locations of park-and-ride lots, transit centers, stations and maintenance facilities.

d) Other design options as required.

The timing of local jurisdiction's approval and the C-TRAN/Metro adoption of these recommendations is directly related to the funding opportunities available for this project. It is essential that the C-TRAN Board and Metro adopt these recommendations by the end of this year. Approval of these recommendations by local jurisdictions will assist in expediting this process in a timely manner.

ACTION REQUESTED\BUDGET IMPLICATIONS: It is requested that the Board of County Commissioners approve, by signature, the attached resolution. The attached resolution does not have direct budget implications to the County at this time.

DISTRIBUTION: Return an approved copy of this Staff Report and the resolution to the Department of Public Works/Transportation Division.

Paul S. Haines, County Engineer

APPROVED: 11-15-94 SR 460-94
CLARK COUNTY, WASHINGTON
BOARD OF COMMISSIONERS

Ron S. Bergman, Director of Public Works

PSH:RSB:mw

Attachments: Tier I Final Recommendation Report
South/North Resolution

11/14/94

RESOLUTION NO. M-2930

A RESOLUTION recommending that the C-TRAN Board of Directors and Metro Council adopt the Tier I Final Recommendation Report which describes the light rail terminal and alignment alternatives and recommends that the process advance to the Tier II, Draft Environmental Impact Statement stage.

WHEREAS, in April 1993 Metro Council and the C-TRAN Board of Directors selected the Milwaukie and I-5 North Corridors as the region's next high capacity transit priority for study and combined them into the South/North Corridor to be studied within a federal Alternatives Analysis/Draft Environmental Impact Statement; and

WHEREAS, in October 1993 the Federal Transit Administration approved the South/North application to initiate Alternative Analysis/Draft Environmental Impact Statement and the South/North Preliminary Work Plan, and issued notification of intent in the *Federal Register* to publish a South/North Draft Environmental Impact Statement; and

WHEREAS, in December 1993 the South/North Steering Group concluded the federally prescribed Scoping Process, which included a comparative analysis of various high capacity transit mode alternatives, by selecting the light rail transit and various light rail terminus and alignment alternatives to advance into Tier I for further study; and

WHEREAS, the South/North *Evaluation Methodology Report*, as adopted by the South/North Steering Group in December 1993, prescribes the South/North study organization and process for the conclusion of the Tier I study process and the selection of the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the role of the South/North Steering Group in the Tier I study process is to forward its final Tier I recommendation to participating jurisdictions for their consideration, that participating jurisdictions are to forward their recommendations to the C-

TRAN Board of Directors and the Metro Council who are to make the final determination of the alternatives to advance into the Tier II Draft Environmental Impact Statement for further study; and

WHEREAS, the *Evaluation Methodology Report,* further prescribes the criteria and measures to be used to select the alternatives to advance into Tier II and the Draft Environmental Impact Statement; and

WHEREAS, the alternatives that were selected at the conclusion of Scoping have been developed and the criteria and measures from the *Evaluation Methodology Report* have been developed and documented within various technical memoranda, including the *South/North Tier I Technical Summary Report* and the *South/North Tier I Briefing Document*; and

WHEREAS, the technical methodologies, assumptions and results have been reviewed by the South/North Expert Review Panel which found, in summary, that, " The Panel finds that the data developed is sufficient to make the decisions regarding which alternatives should be carried forward for further study;" and

WHEREAS, a comprehensive public involvement program was developed and implemented by the South/North Study that included but was not limited to a variety of community meetings, a 60-day public comment period on the Tier I alternatives and data, meetings for the Steering Group to receive oral public comment, and an on-going Citizens Advisory Committee that received staff reports and presentations, provided regular public comment opportunities, and in September 1994 formed an independent Tier I recommendation that was forwarded to the Steering Group for its consideration; and

WHEREAS, in October 1994 the Steering Group considered the Citizens Advisory Committee and Project Management Group recommendations, public comment and the Tier I criteria and measures and issued its own unanimous Tier I recommendation to the participating jurisdictions, C-TRAN Board of Directors and Metro Council for their consideration; and

WHEREAS, the Steering Group's Final Tier I Recommendation identifies the LRT alternatives that they concluded best meet the project's goal and objectives as adopted in December 1993 by the South/North Steering Group within the *Evaluation Methodology Report*; and

WHEREAS, on November 7, 1994 the Vancouver City Council adopted the Vancouver Urban Area Comprehensive Plan which strongly emphasizes alternative modes of transportation, including light rail transit,

NOW THEREFORE,

BE IT RESOLVED BY THE CITY OF VANCOUVER:

Section 1. That the City of Vancouver recommends to the Metro Council and the C-TRAN Board of Directors the following approach to continuation of the South/North Transit Corridor Study:

1. To pursue the South/North Corridor in two study phases:
   a. Phase I would consider a Light Rail Transit project between the Clackamas Town Center area (CTC) and the 99th Street area in Clark County.
   b. Phase II would consider an extension of the Phase I LRT Project south to Oregon City and north to the 134th Street/WSU area.
2. These study phases would proceed as follows:
   a. Preparation of the Draft Environmental Impact Statement (DEIS) and funding plan for the Phase I LRT alternative would begin immediately.
   b. If LRT is selected as the Locally Preferred Alternative in Phase I, a DEIS and funding strategy for the Phase II LRT extension would be prepared upon completion of the Final Environmental Impact Statement (FEIS) for Phase I.

3. The following alignments are alternatives for further study within the Draft Environmental Impact Statement:

   a. Between the Portland and Milwaukie CBDs, that the Ross Island Bridge Crossing, generally between the Ross Island Bridge in the north and Bancroft and Holgate streets in the south, and the McLoughlin Boulevard alignment shall be developed for further study within the DEIS. The Caruthers area crossing will be evaluated further in order to determine whether it should also be included in the *Detailed Definition of Alternatives Report* and developed further in the DEIS.

   b. Within the Portland CBD that a Surface LRT Alternative on 5th and 6th Avenues shall be developed based upon several principles for further study within the DEIS.

   c. Between the Vancouver CBD and the 134th/Washington State University branch campus area for both the Phase I and Phase II termini, the I-5 East Alignment Alternative with station areas between I-5 and Highway 99 shall be developed for further study within the DEIS.

4. Because it has found that further discussions and analysis should occur, a recommendation for the segment between the Portland and Vancouver CBDs shall wait completion of additional technical work and evaluation.

and further, BE IT RESOLVED BY THE CITY OF VANCOUVER:

Section 2. That the City of Vancouver recommends that the C-TRAN Board of Directors and Metro Council adopt the South/North Steering Group *Tier I Final Recommendation Report* describing the light rail terminus and alignment alternatives to advance into the Tier II Draft Environmental Impact Statement for further study.

ADOPTED at regular session of the Council of the City of Vancouver, at 14th day of November, 1994.

Bruce E. Hagensen, Mayor

Attest:

H. K. Shorthill, City Clerk

Approved as to form:

Ted H. Gathe, City Attorney

H:\COUNCIL\RCTRAN.118