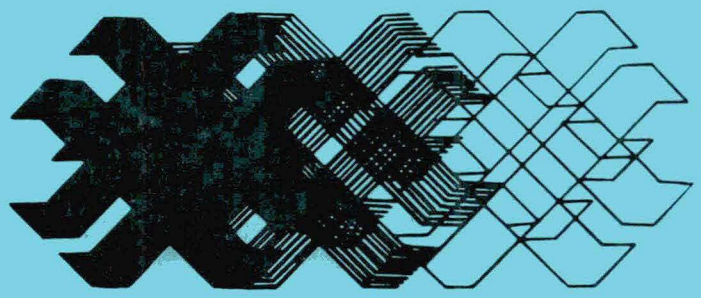
Special Report No. 6

PHASE I ANALYSIS OF WESTSIDE TRANSITWAY OPTIONS



Metropolitan Service District

November, 1979

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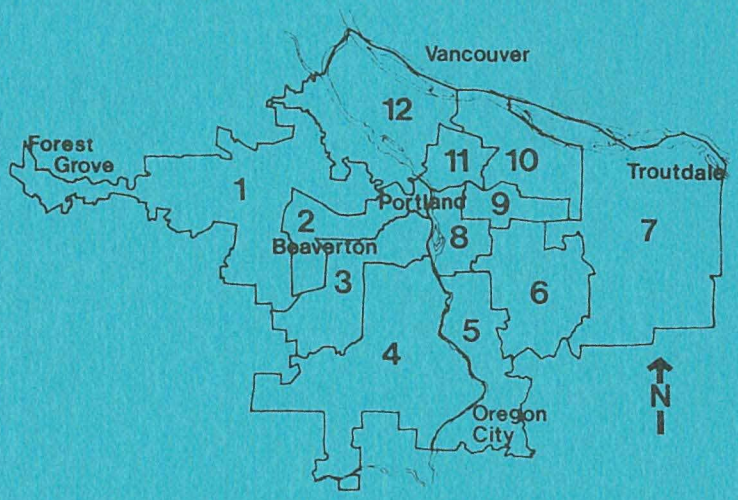

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Special Report No. 6: Phase I Analysis of Westside Transitway Options

November, 1979

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RECOMMENDATIONS

1. Amend the Regional (long-range) Transportation Plan to include a Light Rail Transit (LRT) system which connects the Portland, Hillsboro, Tigard and Beaverton areas. Pending further study, designate the Sunset Hwy. and Multnomah Blvd. as options for LRT passage through the West Hills.

2. The following implementation measures should be undertaken by a cooperative regional effort led by Metro:

   a. Immediately begin project planning activities[1] to select the initial increment of this system from the following options:

      (1) Do Nothing.

      (2) Major expansion of Westside bus service without transitway construction.

      (3) A Busway connecting the Portland Central Business District (CBD) with the west Beaverton vicinity via the Sunset Hwy. and Hwy. 217.

      (4) LRT connecting the Portland CBD with the west Beaverton vicinity via Macadam Ave. and Multnomah Blvd.

      (5) LRT connecting the Portland CBD with the West Beaverton vicinity via the Sunset Hwy. and Hwy. 217.

   b. Begin project planning activities[2] on the Tigard and/or Hillsboro extensions of the LRT system as soon as local land use plans and implementation strategies are adopted which justify the cost-effectiveness of either or both of these extensions within a 15-year time frame. Metro will immediately begin to work with the local jurisdictions to determine the land use patterns which are needed to justify these extensions.

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[1]These project planning activities are aimed at the selection of option(s) to proceed into Preliminary Engineering.

[2] Ibid.

PREFACE

This report presents the findings of Metro's Phase I evaluation of Westside Transitway Options. The analysis has been performed in conformance with UMTA Phase I Alternatives Analysis guidelines. The Phase I sketch-level evaluation of 16 options on the Westside has resulted in the recommendation of five promising alternatives to be carried forth into Phase II for more detailed evaluation:

(1) Do Nothing (base case for comparison purposes)

(2) Major expansion of Westside bus service without transitway construction.

(3) A Busway connecting the Portland Central Business District (CBD) with the West Beaverton vicinity via the Sunset Hwy. and Hwy. 217.

(4) LRT connecting the Portland CBD with the West Beaverton vicinity via Macadam Ave. and Multnomah Blvd.

(5) LRT connecting the Portland CBD with the West Beaverton vicinity via the Sunset Hwy. and Hwy. 217.

This report serves as the technical basis for the promising alternatives recommendation.

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I. BACKGROUND

A. CONTEXT OF THE REPORT

On July 26, 1979, the Metropolitan Service District Council adopted the Regional Transportation Corridor Improvement Strategy (Resolution No. 79-65) which designated the Westside Corridor as a priority corridor for major transitway investment. The strategy selected in the Westside Corridor responds to the findings of Special Report No. 4: A Systems Analysis of Major Regional Transportation Corridors in the MSD Region. These findings indicate that, based on current economic and energy assumptions, the Westside Corridor ranks sufficiently high in terms of both need and potential to merit transitway investment prioritization at this time. Sixteen different options were developed for preliminary examination which represent the full spectrum of mode and route possibilities in the Westside Corridor. This report summarizes the findings of sketch level analysis of these sixteen alternatives and makes recommendations on a set of promising alternatives to be carried forth for more detailed study within the context of federal guidelines.

B. NEEDS

1. High Growth Corridor

Population: The Westside Corridor has experienced dramatic growth in population since 1960. Roughly 34 percent of the region's population growth between 1960 and 1977 has occurred in the Westside Corridor. Currently, over one-third of the region's vacant residentially zoned or planned land is found in the Corridor. Population is projected to increase by nearly 80,000 persons (+50 percent) between 1977 and 1995, making it the second greatest growth corridor in the region. The North Corridor (Clark County) will grow at a slightly greater rate but does not fall under the jurisdiction of Oregon land use law. This creates significantly lower potential in Clark County for growth management in concert with the implementation of a transitway investment.

Employment: Employment opportunities in the Corridor are expected to increase dramatically by 1995. By this time, 45,000 new jobs (+100 percent of current levels) are projected making the Westside Corridor the highest employment growth corridor in the region (the North Corridor exhibits roughly the same absolute increase).

2. Dramatic Degradation of Transportation Service Levels

Currently only 10 percent of the region's congested lane miles of roadway (roads at level-of-service "E" or "F") and vehicle hours of delay occur in the Westside Corridor. With daily travel volumes projected to grow by 50 percent in the eastern portion of the

corridor and by 100 percent in the western portion of the corridor the antiquated, mostly rural road system in Washington County will almost totally break down. The highest congestion in the region will occur in the Westside Corridor in the vicinity of Hwy. 217 (Beaverton). Traffic congestion (V/C ratio greater than 1.0 at level-of-service "E"), which currently is concentrated between Portland and Beaverton will grow westward almost as far as Hillsboro (S. W. 219th St.). Travel times from major residential sections in Washington County to key destinations throughout the region will increase by 50 percent. In overall terms, the Westside Corridor will experience rapid degradation of service levels and will exhibit the worst service levels in the region by 1995.

3. High Volumes of Regional Traffic Infiltrating Residential Neighborhoods

The worst localized traffic situation in the region currently occurs in Beaverton. Nearly all major arterials in Washington County intersect in the middle of downtown Beaverton. By 1995, this will be the vicinity which has the greatest deficiency of regional capacity and, therefore, the greatest potential for regional traffic to infiltrate neighborhoods. There is a potential that 1,400 vehicles per hour (during peak-hour) of regional trips will be on local roads passing through Beaverton. At the eastern edge of the Corridor there is a potential that 1,600 vehicles per hour of regional traffic (during peak-hour) will use local streets through Southwest Portland neighborhoods.

4. Contributes to the Photochemical Oxidant (Smog) Problem

Ozone pollution or "smog" is not a direct emission from the automobile. Rather, it results from a reaction between volatile organic compounds and nitrogen oxides in the presence of sunlight. Hydrocarbon is the key automobile pollutant that leads to ozone. Highest concentrations of ozone are found downwind from the hydrocarbon sources and later in the day than when the hydrocarbons are actually released into the atmosphere. In order to meet the ozone standard of .12 ppm, hydrocarbon emissions in the Portland area must be reduced 50 percent from the 1977 level. However, controls planned for the region are expected to result in only a 37 percent reduction by 1982 and a 42 percent reduction by 1987. As such, additional controls are necessary to reduce hydrocarbon emissions by 1987. Construction of the transitway may have a strong bearing on attainment of this standard. Evaluation of transitways has been designated as a component of the comprehensive analysis of alternative emission control strategies to be completed before June, 1980. From an ozone pollution standpoint, a transitway is most needed in those corridors that (a) produce the highest amount of hydrocarbons, and (b) are within the major air trajectories within which the hydrocarbons are converted into smog.

The Northern and Eastern Corridors are currently the greatest producers of hydrocarbon emissions and they both lie in the most sensitive air trajectory. The Westside Corridor exhibits the third

greatest hydrocarbon emission levels and lies within the second most sensitive air trajectory. As such, it would rank as the third most critical corridor in relation to regional air quality objectives.

5. Dramatic Decreases in Access to Employment Opportunities For Corridor Residents

Access to employment is determined by two factors: travel time and location of jobs. Even though jobs locate closer to the residents of a corridor, access to jobs could be diminished if travel speeds decrease faster than local employment grows. If this situation occurs then the public welfare is not benefited (in a mobility sense) by the economic development. Currently residents of Beaverton (in the Westside Corridor) have access to roughly 210,000 jobs within a 30 minute door-to-door travel time, the second highest job access level among major suburban residential areas. By 1995, the Beaverton area will experience the largest reduction in absolute employment accessibility in the region, losing access to 40 percent of the jobs Beaverton residents can currently reach. In comparison, if 1977 service levels were maintained in 1995, Beaverton residents could reach 50 percent more jobs (in 30 minutes) than they can currently. Hillsboro, at the western edge of the corridor, currently has and will continue to have the lowest-level of job accessibility in the region among major suburban residential areas.

6. Imbalance in the Westside Corridor Adds to Already Severe Conditions in the Western Circumferential and Southwestern Corridors and the Local Street System

It is clear from the paragraph above than the expected deterioration in Westside Corridor mobility over the next 15 years will dramatically reduce the range of work location choice for residents of the Corridor. As access in the Westside Corridor diminishes, Washington County residents will begin to select jobs in Washington County. Two major impacts will occur. Firstly, there will be a 10 percent increase in travel volume in the Westside Circumferential Corridor causing those facilities to break down (V/C ratio = 1.0 at level-of-service "E"). Secondly, there will be a large increase in local work trips in the Beaverton and Hillsboro areas which the local road system will not be able to accommodate. Even with decreasing trip lengths travel times will increase. One additional impact is worth noting. Beaverton and Hillsboro residents who would have worked in Portland will be forced to search out jobs in the southern portion of Washington County instead. The residents of the Southwestern Corridor who would have filled these jobs, if they were not filled by Beaverton/Hillsboro residents, will be forced to search out jobs in Portland. Overall this would add five percent more traffic to the Southwestern (I-5/99W) Corridor, making a bad situation even worse (V/C ratio = 1.1 at level-of-service "E").

C. OBJECTIVES

Based upon these findings, the Westside Transitway Corridor Study will attempt to meet the following objectives:

a. Promote efficient land use patterns in the high growth areas in Washington County.

b. Improve transportation service levels in the region's future highest congestion, highest delay, highest operating cost Corridor.

c. Minimize the high volume of regional traffic infiltrating residential neighborhoods in eastern Washington County, Beaverton and Southwest Portland.

d. Reduce regional hydrocarbon emission levels to meet federal photochemical oxidant (smog) standards.

e. Maintain reasonable levels of employment opportunities for residents of the Corridor which is projected to experience the region's most dramatic decline in job access.

f. Increase transit use to balance the entire Westside transportation system to improve travel conditions on Washington County's local street system, the Hwy. 217/Hall Blvd. Corridor, and the I-5/99W Corridor as well as the Westside Corridor.

g. Conserve fossil fuels.

h. Promote transit operating efficiencies.

D. TRANSITWAY ALTERNATIVES

Because of the natural constraints presented by the West Hills, only three practical routes are available to provide a connection between downtown Portland and Beaverton:

- Sunset Hwy.
- Beaverton-Hillsdale Hwy.
- Multnomah Blvd.

The range of practical service options for each of these route alternatives is described in detail in Special Report No. 5: Westside Transitway Options in terms of (a) preliminary facility alignments, (b) potential station locations, and (c) major bus route modifications associated with the transitway proposal. In total, 16 options were examined for the Westside:

a. Do Nothing -- no improvements (Figure 1)

b. Bus Service Expansion, no transitway construction (Figure 2)

c. Beaverton-Hillsdale Reversible Bus Lane (Figure 3)

d. Beaverton-Hillsdale Two-Way Bus Lane (Figure 4)

e. Beaverton-Hillsdale LRT (Figure 5)

f. Sunset Bus Lane (Figure 6)

g. Sunset Busway (Figure 7)

h. Sunset LRT to Tigard and Hillsboro (Figure 8)

i. Sunset LRT to Tigard (Figure 9)

j. Sunset LRT to Hillsboro (Figure 10)

k. Sunset LRT to Beaverton (Figure 11)

l. Multnomah Bus Lane (Figure 12)

m. Multnomah LRT to Tigard and Hillsboro (Figure 13)

n. Multnomah LRT to Tigard (Figure 14)

o. Multnomah LRT to Hillsboro (Figure 15)

p. Multnomah LRT to Beaverton (Figure 16)

E. EVALUATION METHODOLOGY

1. Overview

The analysis in this report evaluates each option within one of two broad categories: (1) Fatal Flaw Analysis; (2) Cost-Effectiveness Analysis. The Fatal Flaw Analysis results when serious feasibility concerns ranging from operations to community impact occur. The option is determined to be infeasible and is, therefore, eliminated from further consideration. The Cost-Effectiveness Analysis evaluates each option in terms of (a) transit ridership; (b) highway service levels; (c) access to opportunities; (d) environmental quality; (e) costs and efficiency; (f) land use; (g) right-of-way impacts and (h) system flexibility.

2. 1995 Transit Use

1995 transit ridership was estimated by the models described in Technical Memorandum No. 28: Sketch Planning Patronage Estimation. The results are shown for peak-hour (peak direction) and daily (two-way) trips between various communities in the Westside Corridor (Figure 1). Transit ridership at selected points in the network is illustrated. Also documented are the peak-hour travel times between the Westside communities by transit.

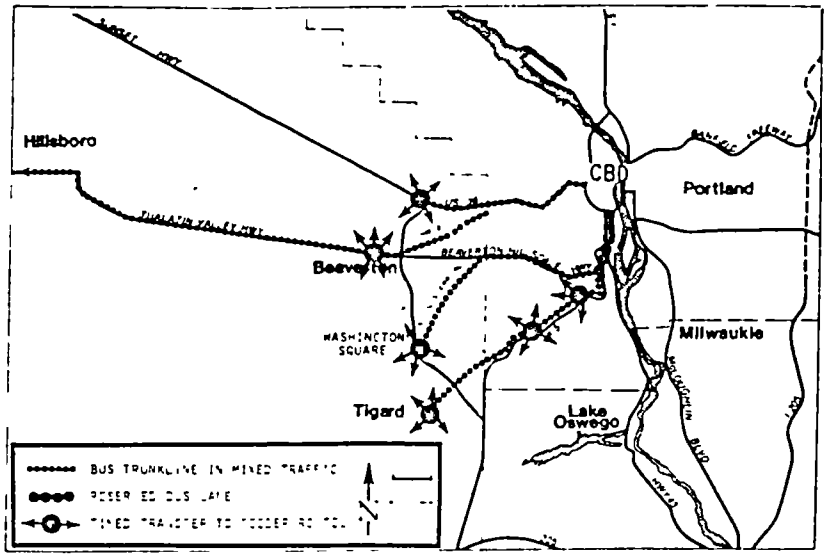

FIGURE 1 · THE DO NOTHING OPTION

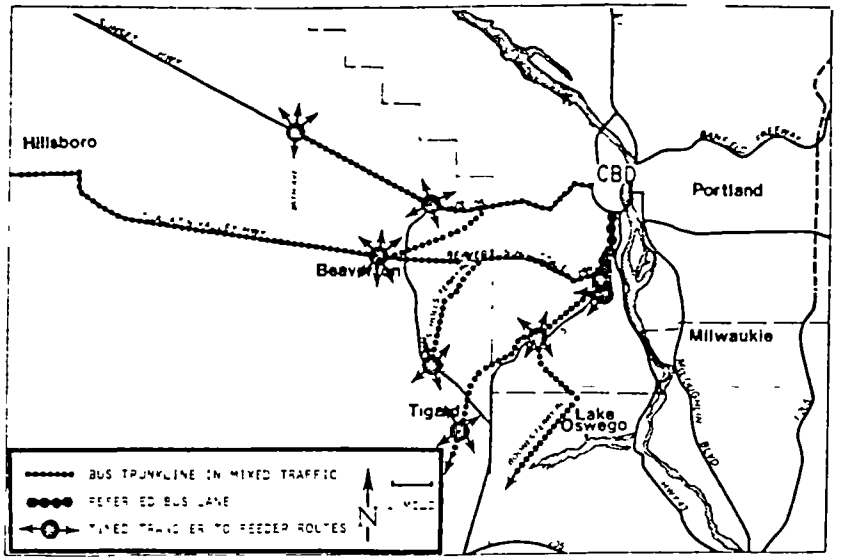

FIGURE 2 : THE BUS SERVICE EXPANSION OPTION

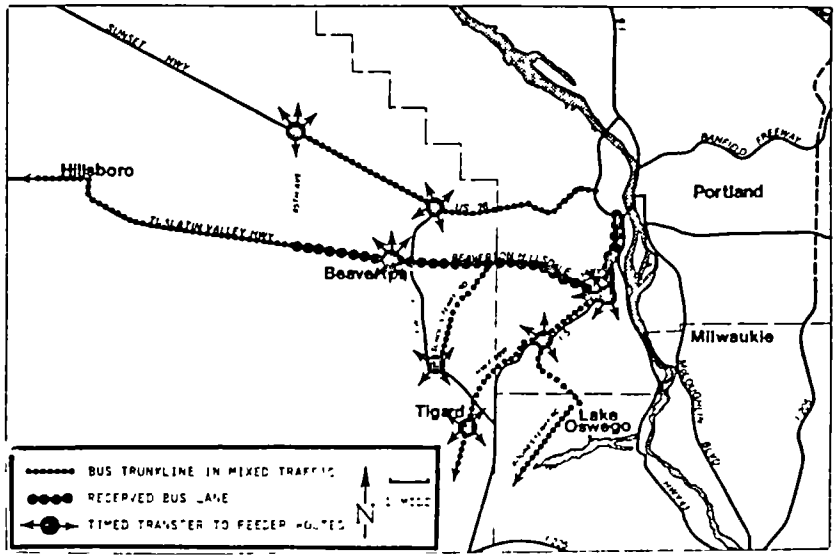

FIGURE 3 : BEAVERTON-HILLSDALE REVERSIBLE BUS LANE OPTION

SEE SPECIAL REPORT NO.5, MEDIUM TRANSITWAY OPTIONS, SECTION II-C, FOR FURTHER DESCRIPTION

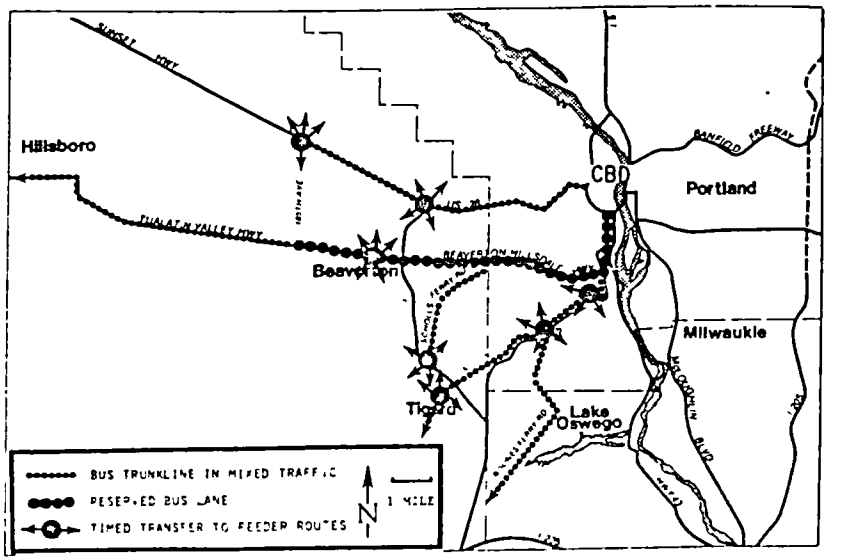

FIGURE 4 THE BEAVERTON- HILLSDALE TWO-WAY BUSLANE OPTION

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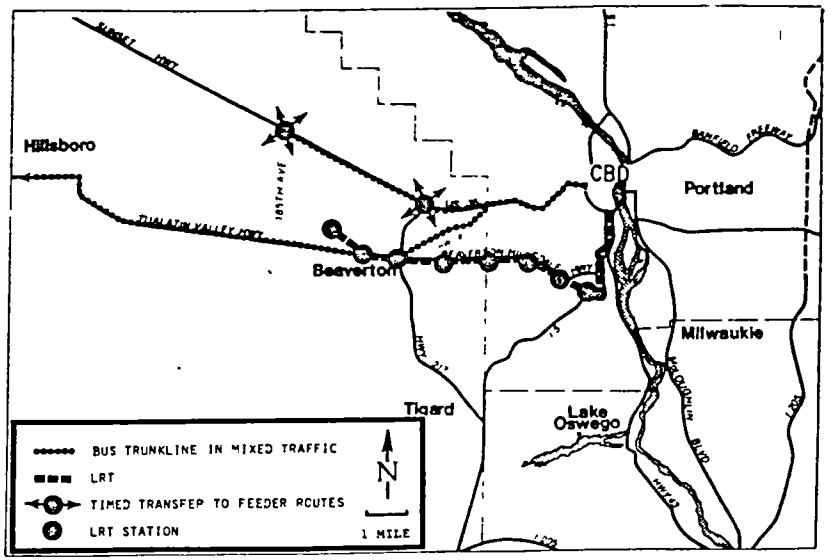

FIGURE 5 : THE BEAVERTON-HILLSDALE LRT OPTION

SEE SPECIAL REPORT NO.5: WESTSIDE TRANSITWAY OPTIONS, SECTION II-E, FOR FURTHER DESCRIPTION

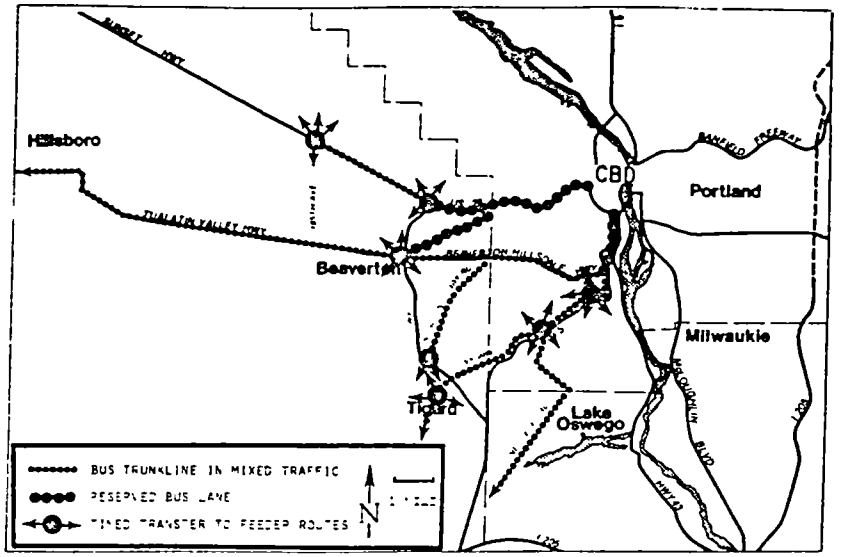

FIGURE 6 THE SUNSET BUSLANE OPTION

SEE SPECIAL REPORT NO.5, WESTSIDE TRANSITWAY OPTIONS, SECTION III-C, FOR FURTHER DESCRIPTION

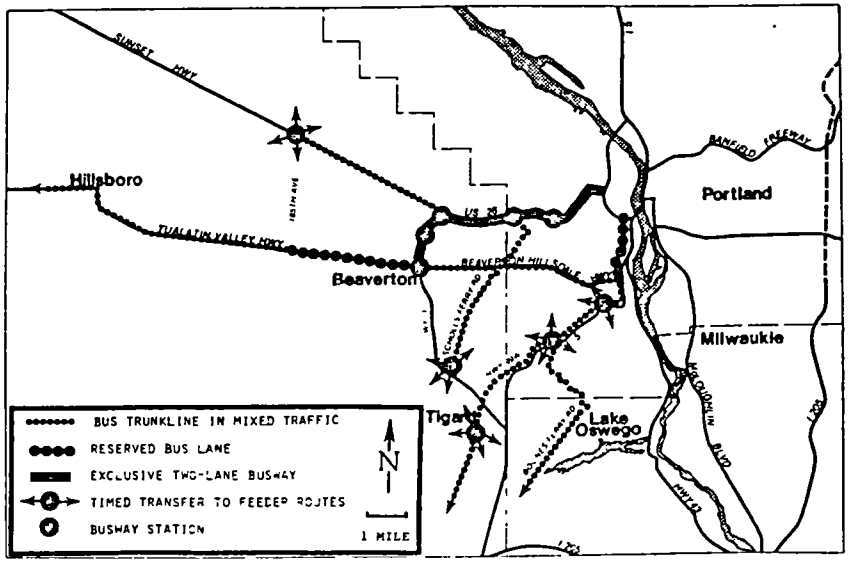

FIGURE 7 : THE SUNSET BUSWAY OPTION

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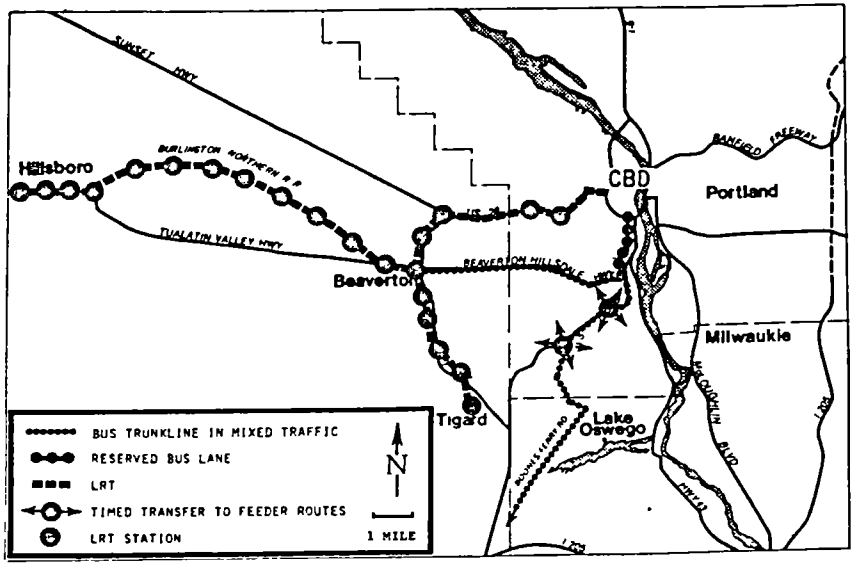

FIGURE 8 : THE SUNSET LRT TO TIGARD AND HILLSBORO OPTION

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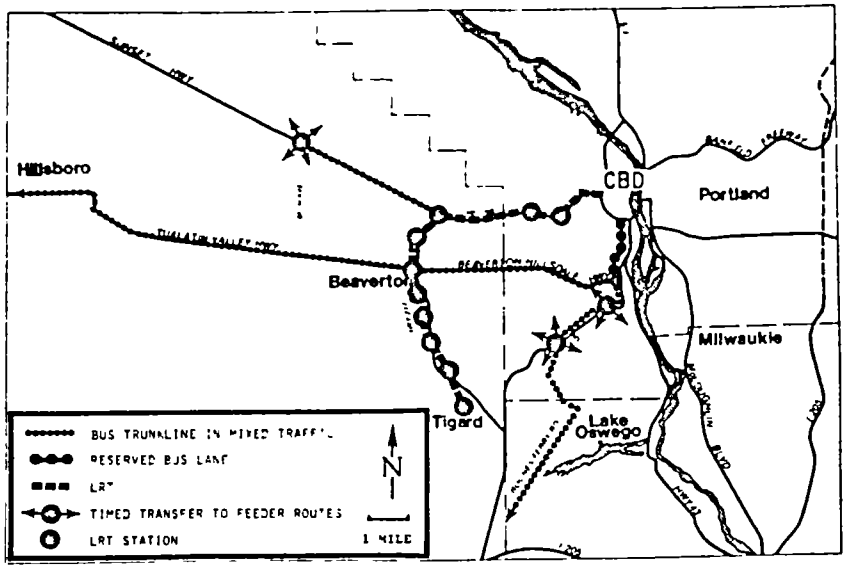

FIGURE 9 : THE SUNSET LRT TO TIGARD OPTION

SEE SPECIAL REPORT NO.5, WESTSIDE TRANSITWAY OPTIONS, SECTION III-G, FOR FURTHER DESCRIPTION.

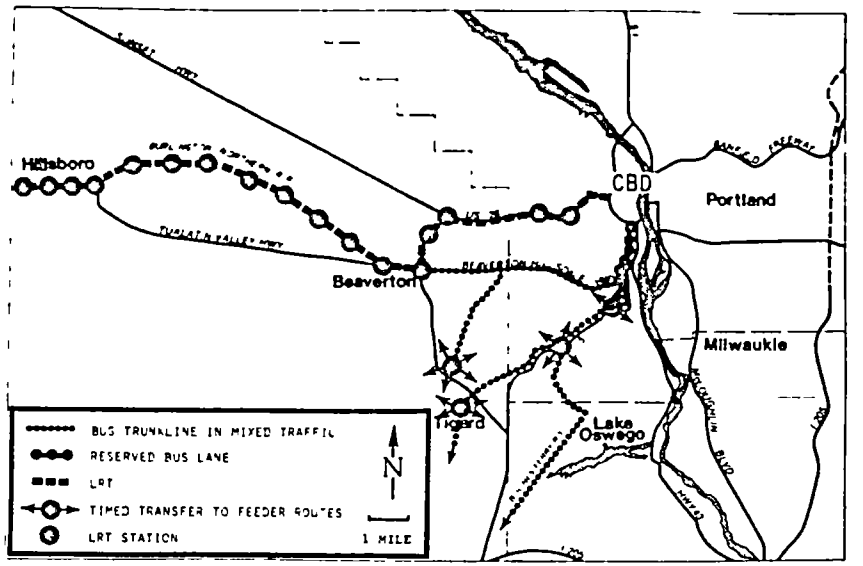

FIGURE 10 : THE SUNSET LRT TO HILLSBORO OPTION

SEE SPECIAL REPORT NO.5, WESTSIDE TRANSITWAY OPTIONS, SECTION III-F, FOR FURTHER DESCRIPTION

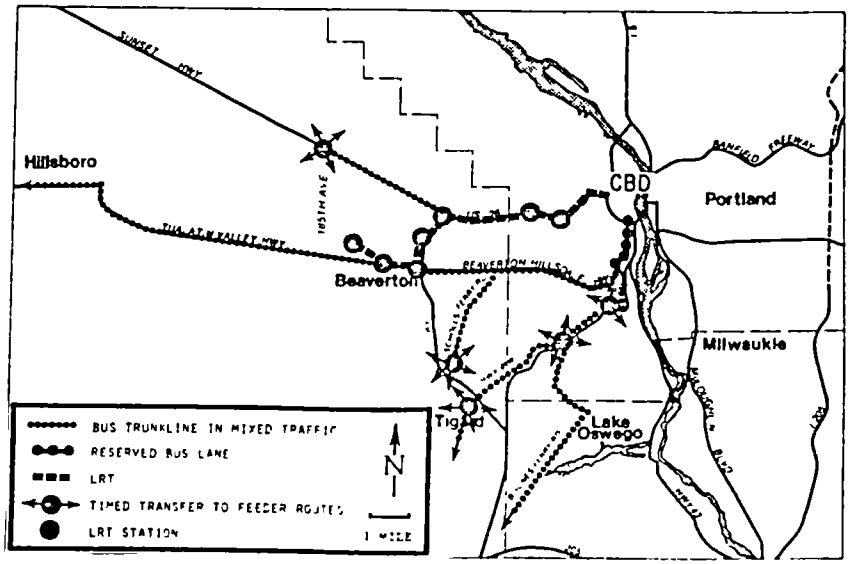

FIGURE 11 : THE SUNSET LRT TO BEAVERTON OPTION

SEE SPECIAL REPORT NO.5 WESTSIDE TRANSITWAY OPTIONS, SECTION III-F, FOR FURTHER DESCRIPTION

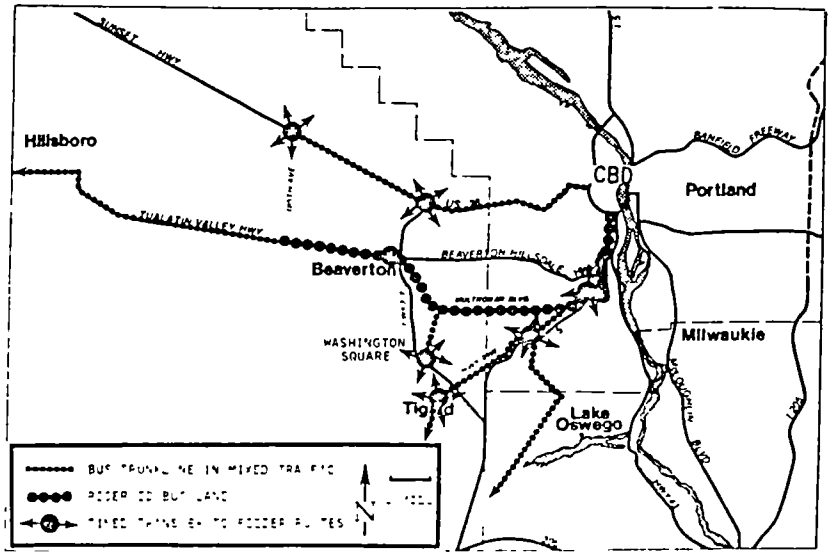

FIGURE 12 THE MULTNOMAH BUSLANE OPTION

SEE SPECIAL REPORT NO.5, WESTSIDE TRANSITWAY OPTIONS, SECTION III-C, FOR FURTHER DESCRIPTION

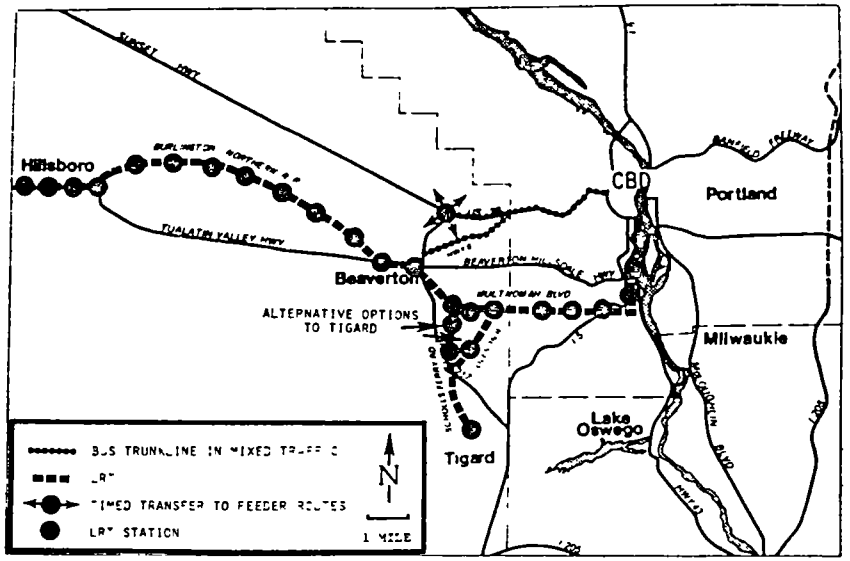

FIGURE 13 : THE MULTNOMAH LRT TO TIGARD AND HILLSBORO OPTION

SEE SPECIAL REPORT NO.5, WESTSIDE TRANSITWAY OPTIONS, SECTION IV-G, FOR FURTHER DESCRIPTION

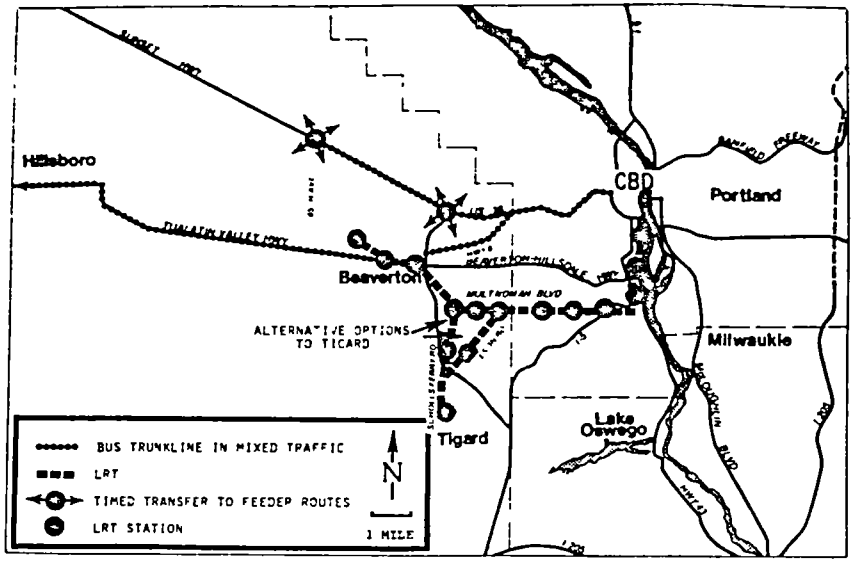

FIGURE 14 : THE MULTNOMAH LRT TO TIGARD OPTION

SEE SPECIAL REPORT NO.5, WESTSIDE TRANSITWAY OPTIONS, SECTION IV-F, FOR FURTHER DESCRIPTION

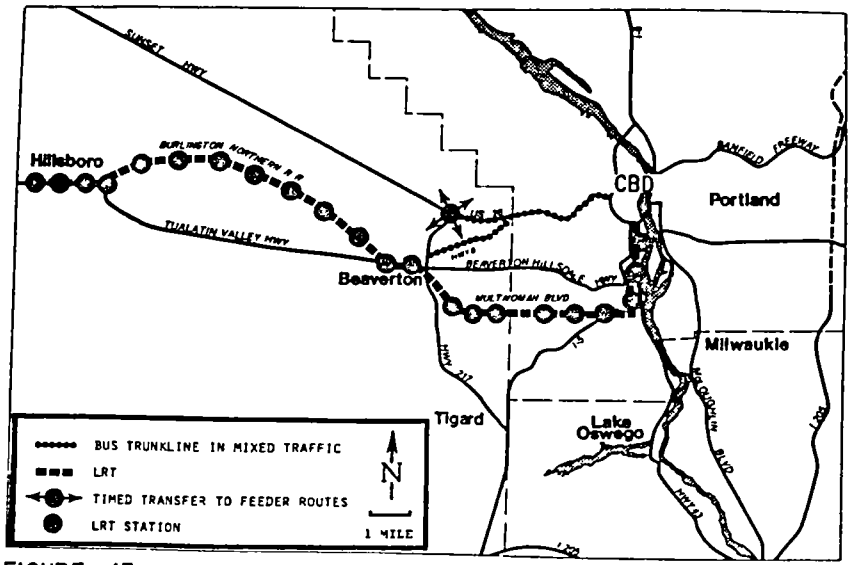

FIGURE 15 : THE MULTNOMAH LRT TO HILLSBORO OPTION

SEE SPECIAL REPORT NO.5: WESTSIDE TRANSITWAY OPTIONS, SECTION IV-E, FOR FURTHER DESCRIPTION

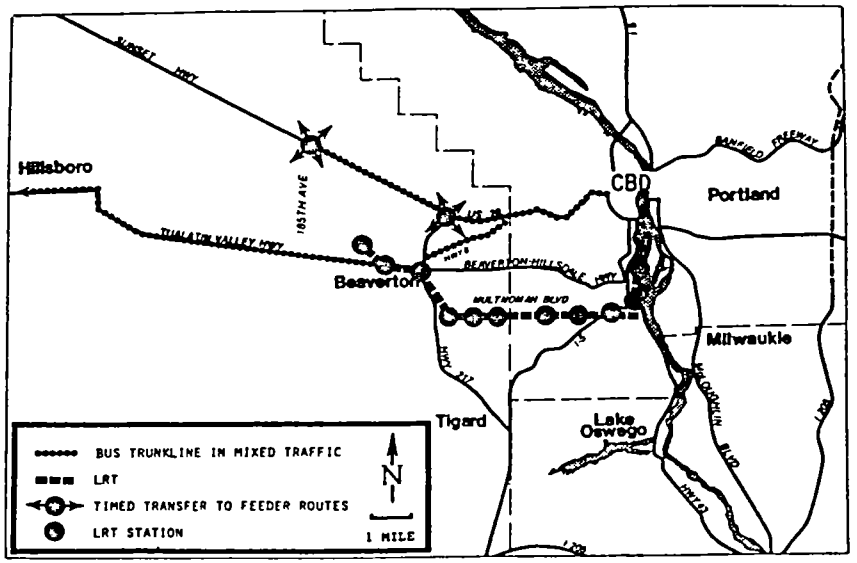

FIGURE 16 : THE MULTNOMAH LRT TO BEAVERTON OPTION

SEE SPECIAL REPORT NO.5, WESTSIDE TRANSITWAY OPTIONS, SECTION IV-D, FOR FURTHER DESCRIPTION

3. 1995 Highway Service Levels

1995 auto trips were assigned to the highway network using a 5-iteration application of the UROAD capacity restraint model described in Technical Memorandum No. 28. 1995 highway volumes at selected points in the highway network are illustrated.

Four cutlines were established in the Westside Corridor to present a better picture of corridor volumes in relation to corridor capacities. P.M. peak-hour, peak-direction traffic volumes were compared to the amount of capacity available at each cutline. The reduction in capacity deficiency of each option is reported. The following cutlines and facilities at each cutline were used:

Cutline Location	Facilities	Capacity[1]
SW 219th	TV Highway	2,300
	Baseline Road	550
	Cornell Road	700
	Sunset Highway	3,900
	Total	7,450
Murray Blvd	Farmington Road	530
	TV Highway	2,300
	Walker Road	850
	Sunset Highway	3,900
	Cornell Road	550
	Total	8,130
Hwy 217	Hall Boulevard	850
	Denney Road	850
	Allen Boulevard	1,800
	Beaverton-Hillsdale Hwy	1,800
	Canyon Road	1,800
	Walker Road	850
	Sunset Highway	3,900
	Total	11,850
Multnomah County Line	Taylors Ferry Road	800
	Multnomah Boulevard	800
	Vermont	800
	Beaverton-Hillsdale Hwy	2,300
	Sunset Highway	5,000
	Burnside	550
	Total	10,250

[1]Capacity has been defined at level-of-service "E." An "E" level-of-service is one characterized by an unstable flow of traffic, with average speeds between 30 and 35 mph. Short periods of stop-and-go traffic are experienced.

4. 1995 Access to Opportunities

Two types of accessibility were examined:

a. The number of jobs (based on the employment forecasts documented in Technical Memorandum No. 29: Westside Transitway Land Use Assumptions) within 30 minutes (by either transit or highway -- whichever is fastest) from selected residential neighborhoods in the Corridor.

b. The number of people (based on population forecasts documented in Technical Memorandum No. 29) within 30 minutes from selected commercial locations in the Corridor.

5. 1995 Environmental Quality

a. Energy Consumption:

Average per-mile energy consumption rates were applied to the vehicle-miles-of-travel estimates derived from UROAD and UNET for autos (gallons of gasoline), buses (gallons of diesel) and LRV's (kilowatt hours of electricity).

b. Neighborhood Quality:

Functional classification is the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide. Facilities designated in the Interim Transportation Plan (ITP), the region's adopted plan, as Expressway or Principal Arterial are intended to serve the regional travel movements which are the focus of this report. Other facilities are intended for use by various types of local trips. When the regional facilities in a corridor are overloaded, frustrated drivers attempt to find alternate routes to their destinations. Oftentimes they employ non-regional facilities which directly affect residential neighborhoods. This phenomenon is termed neighborhood infiltration. While it is not practical to measure this impact precisely, an indication of the scale of the problem can be gained by comparing the volume of regional travel movements at a cutline with the combined capacity of all facilities which are intended to accommodate regional movement (expressways and principal arterials). The difference indicates the relative degree of neighborhood infiltration which corridor residents might have to endure. Two areas, Beaverton and S. W. Portland were examined in this light. The potential regional traffic through both communities is provided for the p.m. peak-hour for each option.

c. Air Quality:

The State Implementation Plan (SIP) for the Portland airshed indicates the need for additional reductions in smog-related air contaminated emissions (hydrocarbon (HC) and nitrogen-oxide

(NOX)). HC and NOX emissions were estimated by the SAPOLLUT model (using the highway assignments from UROAD) on a 2-kilometer square basis for the region.

6. 1995 Costs and Efficiency

Capital costs for construction, right-of-way acquisition and stations were estimated on the basis of the engineering reconnaissance methodology reported in Technical Memorandum No 30: Preliminary Estimates of the Capital Costs for the Westside Transitway Options. The methodology for estimating the annual operating costs is described in Technical Memorandum No. 31: Preliminary Estimates of the Operating Costs for the Westside Transitway Options. Technical Memorandum No. 31 also describes the methodology for determining the rolling stock requirements for capital costs. System productivity was measured on the basis of (a) operating cost per passenger, (b) operating subsidy per passenger, (c) total annualized (8 percent rate) costs per passenger and (d) annualized local costs per passenger.

7. 1995 Land Use Considerations

An examination of (a) current land use patterns (Technical Memoranda No. 6 and 7), (b) committed development (Technical Memorandum No. 8), and (c) local land use plans was performed to determine the development potential of potential station area locations. Technical Memorandum No. 29 documents the population and employment forecasts used in the analysis of each transitway option.

8. Right-of-Way Impacts

The number of potential residential and commercial takings was estimated as part of the engineering reconnaissance work reported in Technical Memorandum No. 27: Preliminary Examination of the Physical Impacts of the Westside Transitway Options.

9. Ability to Increase Transit Network Capacity

The potential for future extensions of each of the route options was examined. Additionally, the fleet demands in the Portland CBD were estimated.

II. FINDINGS AND RECOMMENDATIONS

A. OVERVIEW

The Phase I evaluation of the Westside Transitway Options is aimed at three basic issues:

1. What level of transit service is appropriate to serve the Westside Corridor long-range travel demands? What is the best long-range method for providing that service?

2. What is the appropriate first increment for implementing the Westside Corridor improvement program?

3. What steps should be taken following the selection of the initial increment.

The details of the sketch evaluation of the 16 options with respect to the Westside Corridor objectives are provided in the Appendix to Special Report No. 6: Phase I Analysis of Westside Transitway Options. Four of the options were found to be fundamentally impractical (Beaverton-Hillsdale Two-Way Bus Lane, Beaverton-Hillsdale LRT, Sunset Bus Lane and Multnomah Bus Lane) and were immediately eliminated from further consideration. The applicable "fatal flaw" for these options are described in the Appendix. The remaining 12 options were analyzed with respect to the previously described transitway objectives and are presented in this section to respond to the three basic issues described above. Tables 3, 4 and 5 at the end of this report summarize the basic evaluation data for the 12 options.

B. LONG-RANGE IMPROVEMENT PROGRAM FOR THE WESTSIDE CORRIDOR

1. Issue

What level of transit service is appropriate to serve the Westside Corridor long-range travel demands? What is the best long-range method for providing that service?

2. Recommendation

The Regional (Long-Range) Transportation Plan should propose a Light Rail Transit (LRT) System which ultimately connects the Portland, Hillsboro, Tigard and Beaverton areas.

3. Rationale

The 50 percent population growth and 100 percent employment growth projected for the Westside Corridor during the next 15 years will totally overburden the antiquated, mostly rural, highway system in the Corridor. The result will be serious degradation of transportation service levels, degradation of neighborhood quality, continued violations of photochemical oxidant (smog) standards, significant losses in job opportunities within reasonable travel times and

little opportunity to assure orderly land use patterns. An "all-highway" solution to the problem is prohibitive in cost and impact and was recently rejected by the voters on a four-to-one basis. Furthermore, little opportunity exists to significantly increase highway capacity across the West Hills. A doubling of transit service levels in the next 15 years appears to offer a cost-effective portion of the total solution. Under current energy assumptions, depending upon the option selected, Westside transit expansion alone can realize the following benefits as compared to the Do Nothing option (Table 1):

(a) A 20 percent reduction in traffic congestion on Farmington Rd., Tualatin Valley Hwy., Walker Rd., Cornell Rd. and Sunset Hwy. at Murray Blvd.

(b) A 33 percent reduction in traffic congestion on Allen Blvd., Denny Rd., Beaverton-Hillsdale Hwy., Canyon Rd., and Sunset Hwy. at Hwy. 217.

(c) Roughly a 30-70 percent reduction in regional trips infiltrating Southwest Portland and Beaverton neighborhoods.

(d) A 1-2 percent reduction in regional levels of smog producing air pollutants (which brings the region 14-28 percent closer to meeting State Implementation Plan objectives).

(e) As much as a doubling the number of jobs available to corridor residents within a convenient travel time.

Expansion of transit service through the operation of buses in mixed traffic would lead to an annual Westside operating cost of $29 million (+70 percent above the Do Nothing option) and an operating subsidy of $22 million (+83 percent). Transit productivity is decreased by the severe reductions in highway speed caused by the huge increases in highway congestion.

An exclusive busway allows buses to operate at faster speeds, which makes possible a higher productivity and operating efficiency. LRT offers an even better technology to provide fast service over the steep grades in the West Hills portion of the Corridor and the added advantage of greater passenger capacity per driver. The results are that the transitway proposals offer 4-17 percent reductions in annual operating costs and 6-25 percent reductions in annual operating subsidies over the mixed traffic bus service expansion option.

A comparison of the busway option with analagous LRT options indicates the potential for LRT to attract 3-6 percent more passengers at an operating cost savings of 2-13 percent over the busway option. This results in a 3-20 percent savings in annual operating subsidy. The savings in operating subsidy will more than compensate for the additional capital expenditure required by LRT over the long-term. The LRT options provide higher benefits, better land use opportunities and better meet the bus volume constraints of downtown Beaverton and Portland than the bus expansion and busway options.

TABLE 1: ROLE OF TRANSIT IN MEETING WESTSIDE CORRIDOR OBJECTIVES

	WESTSIDE TRANSIT RIDERSHIP INCREASE	TRAFFIC CONGESTION DECREASE		"REGIONAL TRAFFIC THRU NEIGHBORHOODS" DECREASE	
		MURRAY BLVD	HWY 217	BEAVERTON	SW PORTLAND
OPTION WITH LEAST CHANGE FROM "DO NOTHING"	+39%	-20%	-33%	-28%	-29%
OPTION WITH GREATEST CHANGE FROM "DO NOTHING"	+58%	-20%	-33%	-70%	-71%

	JOB ACCESS INCREASE			WESTSIDE GAS USE DECREASE	WESTSIDE SMOG RELATED EMISSIONS DECREASE
	BEAVERTON	HILLSBORO	TIGARD		
OPTION WITH LEAST CHANGE FROM "DO NOTHING"	+10%	+17%	0	-5%	-5%
OPTION WITH GREATEST CHANGE FROM "DO NOTHING"	+115%	+37%	+100%	-7%	-8%

Additionally, LRT offers roughly twice the ultimate carrying capacity of a busway (even with articulated buses)--which may be required under future scenarios of constrained energy supply.

C. INITIAL INCREMENT OF THE WESTSIDE CORRIDOR IMPROVEMENT PROGRAM

1. Issue

What is the appropriate first increment for implementing the Westside Corridor improvement program?

2. Recommendation

Select the initial (15 years) increment of the long-range system from the following options:

(a) Do Nothing Options.

(b) Major expansion of Westside bus service without transitway construction.

(c) A Busway connecting the Portland CBD with the west Beaverton vicinity via the Sunset Hwy. and Hwy. 217.

(d) LRT connecting the Portland CBD with the west Beaverton vicinity via Macadam Ave. and Multnomah Blvd.

(e) LRT connecting the Portland CBD with the west Beaverton vicinity via the Sunset Hwy. and Hwy. 217.

3. Rationale

a. Options Selected for Detailed Study (Table 2)

Do Nothing: The Do Nothing alternative is maintained as a base case for comparison purposes. As defined in this analysis, the Do Nothing has no capital costs.

Bus Service Expansion (Mixed Traffic): Illustrates the choice of minimizing capital costs and right-of-way impacts at the long-term expense of higher operating costs. It essentially doubles the volume of buses used in the Westside Corridor without any major facility construction. This option, at $42 million capital cost, is projected to exhibit a 40 percent increase in transit ridership, a 20-33 percent decrease in traffic congestion, a 30 percent decrease in regional traffic through Southwest Portland and Beaverton neighborhoods and a five percent reduction in corridor air contaminant emissions and energy consumption in comparison to the Do Nothing option.

TABLE 2: OPTIONS CURRENTLY JUSTIFIED FOR DETAILED STUDY

OPTION	WESTSIDE CAPITAL COSTS ($Millions) LRT	BUS	TOTAL	WESTSIDE ANNUAL OPERATING COSTS ($Millions)	DAILY WESTSIDE TRANSIT RIDERS	WESTSIDE ANNUALIZED LOCAL COST PER PASSENGER	COMMENTS
DO NOTHING	$ 0	$ 0	$ 0	$17.1	58,800	$0.69	Base case
BUS SERVICE EXPANSION	0	42	42	29.2	81,800	0.95	Possible downtown bus volume problems
SUNSET BUSWAY TO BEAVERTON	0	106	106	28.0	84,900	0.88	Cheapest construction cost
SUNSET LRT TO BEAVERTON	113	15	128	24.3	90,400	0.68	Excellent commuter route
MULTNOMAH LRT TO BEAVERTON	131	21	152	27.5	87,300	0.85	Excellent land use possibilities Excellent branching opportunities

Sunset Busway to West Beaverton Vicinity: Represents the lowest cost ($106 Million) exclusive transitway option. This option provides for an operating cost savings of $1.2 million/year and a $1.4 million/year operating subsidy savings over the Bus Service Expansion option. Furthermore, the option exhibits a four percent higher transit ridership, a 25 percent further decrease in regional through traffic in Beaverton and a 70 percent increase in job accessibility. Additionally, it can be more readily expanded to a higher capacity mode (LRT) than the Bus Service Expansion option.

LRT to West Beaverton Vicinity (via Sunset Hwy.): Represents the option of providing the best commuter route between Portland and Beaverton. This option is considerably more expensive than the Bus Service Expansion option, but considerably more productive and efficient. For an $85 million capital cost in addition to the Bus Service Expansion option, the Sunset LRT option saves almost $5 million/year in operating costs and $5.5 million/year in operating subsidy. The Sunset LRT option attracts 10 percent more patronage than the Bus Service Expansion option which reduces peak-hour regional traffic through Beaverton by 15 percent and through Southwest Portland by 40 percent while job accessibility for Beaverton residents nearly double. The Sunset LRT to Beaverton option exhibits a total annualized cost savings of $0.17/passenger over the Bus Service Expansion option.

LRT to West Beaverton Vicinity (via Multnomah Blvd.): Is more expensive in terms of capital and operating costs than the Sunset LRT option, but offers certain service differences and other opportunities that call for its further consideration at this time. In particular, the Multnomah LRT option provides LRT service to more Westside neighborhoods, excellent branching opportunities to Lake Oswego, Milwaukie and Tigard, excellent economic development opportunities along the Willamette River (in the South Auditorium and John's Landing areas) and higher reductions in bus volumes in downtown Portland than the Sunset LRT option. The Multnomah LRT option exhibits operating costs and operating subsidy savings over the Bus Service Expansion option and, therefore, appears to be cost-effective in its own right.

b. Options Rejected for Detailed Study:

Beaverton-Hillsdale Reversible Bus Lane: Small ridership increase and operating savings over Bus Service Expansion only option for sizeable additional capital cost.

Beaverton-Hillsdale Two-Way Bus Lane: Very disruptive.

Beaverton-Hillsdale LRT: Very disruptive.

Sunset Bus Lane: Can not afford to remove existing auto lane, poor safety features.

Multnomah Bus Lane: Beaverton-Hillsdale Bus Lane is fundamentally superior. An exclusive right-of-way is needed from Oleson Rd. to

Beaverton. As a single-lane facility, there would be no efficient route for off-peak direction service; as a double-lane facility it would be extremely disruptive to Barbur Blvd.

Sunset and Multnomah LRT Extensions to Tigard and/or Hillsboro: High capital cost, not a cost-effective increment with current land use development and plans.

D. STEPS TO BE TAKEN BEYOND INITIAL INCREMENT

1. Issue

What steps should be taken following the selection of the initial increment?

2. Recommendation

Metro should begin project planning activities on the Tigard and/or Hillsboro extension of the LRT System (if LRT is selected for the initial increment) as soon as local land use plans and implementation strategies are adopted which justify the cost-effectiveness of either or both of these extensions within a 15-year time frame. Metro should begin work with the local jurisdictions to determine the land use patterns which are needed to justify these extensions.

3. Rationale

Given current land use plans, any extension of the system beyond the initial increment at this time results in a reduction in cost-effectiveness of the overall improvement.

However, an analysis which assumed land use densities 10-20 percent higher than those currently planned found that the extensions can be made marginally cost-effective if supportive land use strategies were adopted. Because it is essential to work closely with neighborhood groups while planning for higher densities (even when the difference is moderate and located along a relatively narrow corridor), the affected local jurisdictions are assigned the responsibility of weighing the community's desire for improved transit service with the higher densities required to support it. Detailed planning of the LRT extensions will begin as soon as supportive land use patterns are adopted.

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TABLE 3: WESTSIDE TRANSITWAY COSTS AND EFFICIENCIES

OPTION	WESTSIDE CAPITAL COSTS					1995 WESTSIDE PROJECT COSTS AND EFFICIENCY IMPACTS						RIGHT-OF-WAY IMPACTS	
	RIGHT-OF-WAY (Millions)	CONSTRUCTION & STATION (Millions)	LIGHT RAIL VEHICLES (Millions)	BUSES (Millions)	TOTAL	ANNUAL OPERATING COSTS (Millions)	1995 ANNUAL OPERATING SUBSIDY (Millions)	OPERATING COST PER PASSENGER	OPERATING SUBSIDY PER PASSENGER	TOTAL ANNUALIZED COST PER PASSENGER	ANNUALIZED LOCAL COST PER PASSENGER	Residential Displacements	Commercial Displacements
NULL	0	0	0	0	0	$17.1	$11.8	$1.00	$0.69	$1.00	$0.69	0	0
TSM-BUS ONLY	0	$3.0	0	$39.2	$42.2	29.2	22.0	1.23	0.93	1.36	0.95	0	0
BEAVERTON-HILLSDALE REVERSIBLE BUSLANE	$6.3	$41.6	0	36.4	84.3	28.6	21.3	1.19	0.89	1.39	0.93	8	14
BEAVERTON-HILLSDALE TWO-WAY BUS LANE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BEAVERTON-HILLSDALE LRT TO BEAVERTON	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SUNSET BUS LANE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SUNSET BUSWAY	7.3	66.5	0	32.5	106.3	28.0	20.6	1.14	0.83	1.38	0.88	5-9	28-33
SUNSET LRT TO BEAVERTON (158th)	7.3	90.6	15.2	15.4	128.5	24.3	16.5	0.93	0.63	1.19	0.68	5-9	11-26
SUNSET LRT TO TIGARD (& 158th)	12.7	123.5	23.2	11.1	170.5	24.2	16.3	0.91	0.61	1.23	0.68	13-17	13-28
SUNSET LRT TO HILLSBORO	18.7	119.3	24.0	13.2	175.2	24.4	16.4	0.91	0.61	1.25	0.68	7-12	11-31
SUNSET LRT TO TIGARD & HILLSBORO	24.1	152.2	33.6	9.7	219.6	24.4	16.4	0.91	0.61	1.33	0.70	15-20	13-28
MULTNOMAH LRT TO BEAVERTON (158th)	20.6	91.1	19.2	21.3	152.2	27.5	19.9	1.09	0.79	1.41	0.85	9	22-32
MULTNOMAH LRT TO TIGARD (& 158th)	25.2	114.2	23.2	18.1	180.7	27.3	19.5	1.06	0.76	1.44	0.84	9	22-32
MULTNOMAH LRT TO HILLSBORO	32.0	119.8	31.2	17.3	200.3	27.4	19.5	1.04	0.74	1.45	0.83	11-12	22-37
MULTNOMAH LRT TO TIGARD & HILLSBORO	36.6	143.0	40.8	19.2	239.6	27.1	19.0	1.01	0.71	1.48	0.80	11-12	22-37
MULTNOMAH BUS LANE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 4: 1995 WESTSIDE TRANSIT IMPACTS

TRIPS TO:	1995 DAILY TRANSIT TRIPS BETWEEN WESTSIDE COMMUNITIES								1995 AM PEAK HOUR TOTAL IN-BOUND RIDERSHIP	1995 TOTAL DAILY CORRIDOR RIDERSHIP	OTHER NETWORK CONSIDERATIONS
TRIPS FROM:	HILLSBORO/ALOHA		BEAVERTON		TIGARD		SOUTHWEST PORTLAND				
	Close-In Portland	Other Westside Communities	Close-In Portland	Other Westside Communities	Close-In Portland	Other Westside Communities	Close-In Portland	Other Westside Communities			
NULL	5,030	2,980	7,140	3,290	3,610	1,240	12,290	1,790	5,370	58,800	
TSM-BUS ONLY	6,940	4260	8,420	4,260	4,860	1,980	14,490	2,500	7,370	81,800	POSSIBLE DOWNTOWN BUS CAPACITY PROBLEM
BEAVERTON-HILLSDALE REVERSIBLE BUSLANE	7,220	4,430	8,380	4,090	4860	1,950	14,520	2,580	7,500	83,100	POSSIBLE DOWNTOWN BUS CAPACITY PROBLEM
BEAVERTON-HILLSDALE TWO-WAY BUS LANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BEAVERTON-HILLSDALE LRT TO BEAVERTON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SUNSET BUS LANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SUNSET BUSWAY	7,110	4,260	9,570	4,610	4,770	1,960	14,460	2,620	7,660	84,900	POSSIBLE DOWNTOWN BUS CAPACITY PROBLEM
SUNSET LRT TO BEAVERTON (158th)	7,900	4,650	10,550	4,770	4,830	1,960	14,450	2,320	8,030	90,400	POSSIBLE DOWNTOWN BUS CAPACITY PROBLEM; BRANCHING OPPORTUNITIES ON SUNSET HIGHWAY TO TIGARD & HILLSBORO
SUNSET LRT TO TIGARD (& 158th)	7,900	4,700	9,880	4,910	5,580	2,300	14,450	2,540	8,020	91,600	BRANCHING OPPORTUNITIES ON SUNSET HIGHWAY AND TO HILLSBORO
SUNSET LRT TO HILLSBORO	8,310	5,330	10,550	5,100	4,830	2,050	14,450	2,240	8,360	92,400	POSSIBLE DOWNTOWN BUS CAPACITY PROBLEM; BRANCHING OPPORTUNITIES ON SUNSET HIGHWAY AND TO TIGARD
SUNSET LRT TO TIGARD & HILLSBORO	8,310	5,430	9,880	5,190	5,580	2,390	14,090	2,460	8,300	92,500	BRANCHING OPPORTUNITY ON SUNSET HIGHWAY
MULTNOMAH LRT TO BEAVERTON (158th)	6,990	4,610	8,820	4,710	4,760	2,140	15,980	2,920	7,880	87,300	BRANCHING OPPORTUNITY TO TIGARD, HILLSBORO, LAKE OSWEGO & MILWAUKIE/OREGON CITY
MULTNOMAH LRT TO TIGARD (& 158th)	6,990	4,920	8,480	4,810	5,380	2,330	15,820	3,120	7,890	88,600	BRANCHING OPPORTUNITIES TO HILLSBORO, LAKE OSWEGO & MILWAUKIE/OREGON CITY
MULTNOMAH LRT TO HILLSBORO	7,500	5,560	8,650	5,100	4,760	2,250	15,980	3,120	8,150	90,300	BRANCHING OPPORTUNITY TO TIGARD, LAKE OSWEGO AND MILWAUKIE/OREGON CITY
MULTNOMAH LRT TO TIGARD & HILLSBORO	7,500	5,600	8,310	5,200	5,380	2,620	15,820	3,320	8,180	92,700	BRANCHING OPPORTUNITIES TO LAKE OSWEGO & MILWAUKIE/OREGON CITY
MULTNOMAH BUS LANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 5: 1995 HIGHWAY AND ENVIRONMENTAL IMPACTS

OPTION	WESTSIDE HIGHWAY IMPACTS: REDUCTION IN CAPACITY DEFICIENCY FROM NULL at Murray Blvd	WESTSIDE HIGHWAY IMPACTS: REDUCTION IN CAPACITY DEFICIENCY FROM NULL at Hwy 217	NEIGHBORHOOD LIVEABILITY: REGIONAL TRAFFIC THRU NEIGHBORHOODS (PEAK HR) Beaverton	NEIGHBORHOOD LIVEABILITY: REGIONAL TRAFFIC THRU NEIGHBORHOODS (PEAK HR) SW Portland	ACCESS TO JOB OPPORTUNITIES: NUMBER OF JOBS REACHABLE IN 30 MIN (IN 1000 NNNN) From Bvtn	From Hillsboro	From Tigard	From SW Portland	WESTSIDE AIR POLLUTANT EMISSIONS HYDROCARBONS TONS/YR	WESTSIDE ENERGY CONSUMPTION DAILY GALLONS OF GASOLINE
NULL	0%	0%	1400	1610	132	70	116	255	8,300	96,330
TSM-BUS ONLY	20	33	1030	1120	146	82	116	292	7,920	91,900
BEAVERTON-HILLSDALE REVERSIBLE BUS LANE	20	33	930	1030	146	85	116	292	7,900	91,710
BEAVERTON-HILLSDALE TWO-WAY BUS LANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BEAVERTON-HILLSDALE LRT TO BEAVERTON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SUNSET BUS LANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SUNSET BUSWAY	20	33	980	850	243	85	120	292	7,870	91,320
SUNSET LRT TO BEAVERTON (158th)	20	33	890	650	281	82	117	292	7,830	90,840
SUNSET LRT TO TIGARD (& 158th)	20	33	880	750	281	83	226	294	7,760	90,070
SUNSET LRT TO HILLSBORO	20	33	440	450	284	95	108	283	7,770	90,170
SUNSET LRT TO TIGARD & HILLSBORO	20	33	430	590	280	96	223	285	7,730	89,690
MULTNOMAH LRT TO BEAVERTON (158th)	20	33	1,020	1,050	245	81	119	299	7,860	91,230
MULTNOMAH LRT TO TIGARD (& 158th)	20	33	1,020	1,100	246	79	234	301	7,790	90,460
MULTNOMAH LRT TO HILLSBORO	20	33	510	950	246	91	118	301	7,820	90,750
MULTNOMAH LRT TO TIGARD & HILLSBORO	20	33	500	1,020	253	89	224	301	7,720	89,590
MULTNOMAH BUS LANE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX

PREFACE

The Appendix presents the technical data for each of the sixteen options studied during the Phase I Analysis.

I. SKETCH EVALUATION OF THE NULL OPTION

A. Description: Figure I-1

Continuation of existing Westside transit service with buses operating in mixed traffic on city streets and freeways; major trunk routes to timed transfer stations at the Barbur Transit Center, Tigard, Washington Square Shopping Center, Beaverton and Cedar Hills Shopping Center.

B. Type of Evaluation:

Fatal Flaw Analysis (Section C only)

✓Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

Applicable Not-Applicable✓

D. 1995 Transit use

✓Applicable Not-Applicable

1. Transit Service Levels

   a. Peak Hour Transit Travel Times Between Major Points in the Corridor: Table I-1

2. Transit Trips Between Communities in the Westside Corridor

   a. Peak-Hour Trips: Table I-2
   b. Daily Home Based Trips: Table I-3
   c. Corridor Ridership: Table I-4

3. Trips Using the Major Trunk Routes in the Null Option

   a. Total Daily Trips: Figure I-2

E. 1995 Highway Service Levels:

✓Applicable Not Applicable

1. Highway Use

   a. Daily Traffic Volumes on Selected Road Segments: Figure I-3
   b. Peak-Hour Capacity Deficiencies at Selected Cutlines: Table I-5

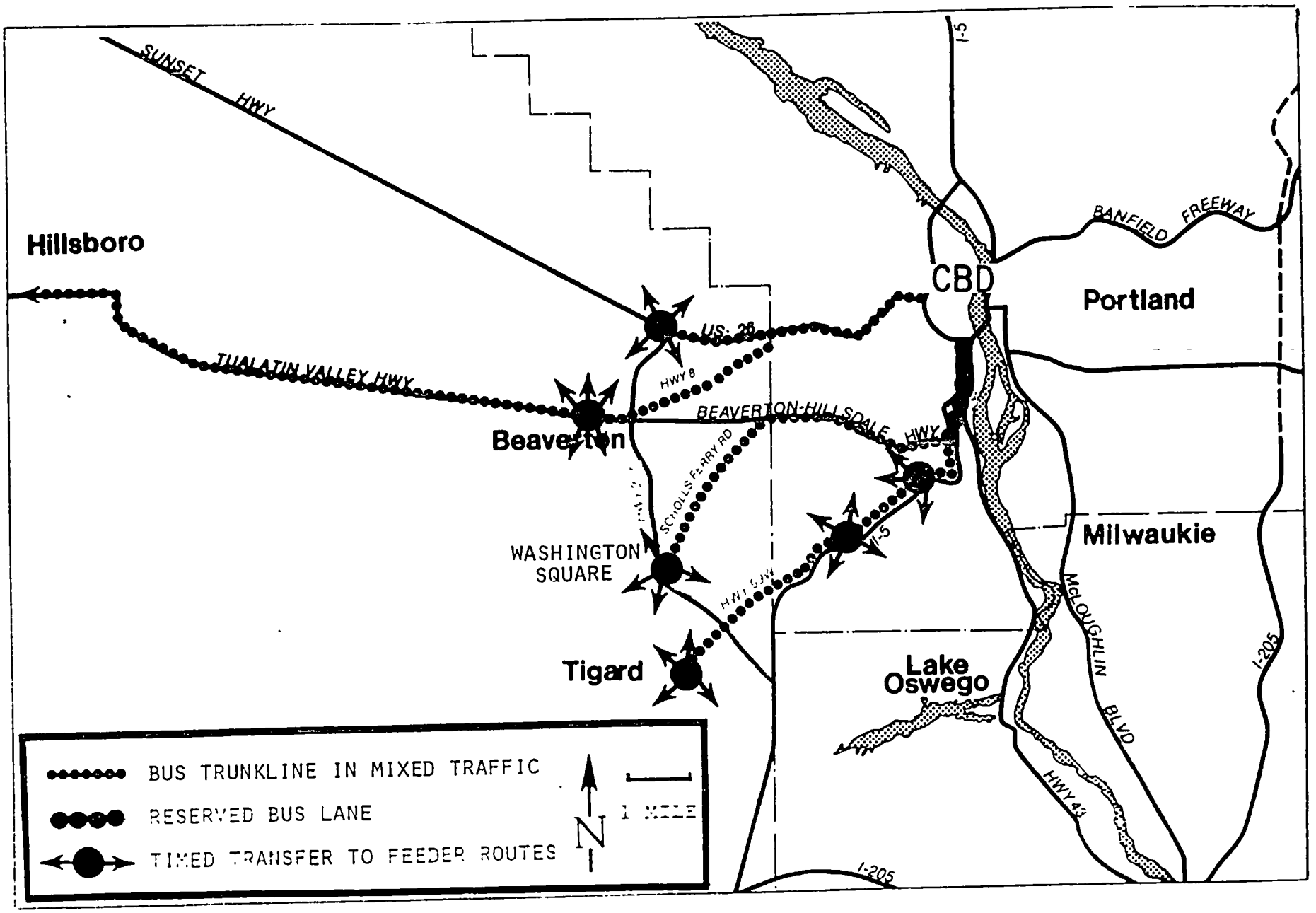

FIGURE I-1 : THE NULL OPTION

F. 1995 Access to Opportunities:

✓Applicable Not-Applicable

1. Job Opportunities for Corridor Residents: Table I-6

2. Potential Market for Major Business Areas: Table I-7

G. 1995 Environmental Quality:

✓Applicable Not-Applicable

1. Energy Consumption

   a. Daily Corridor Energy Consumption: Table I-8

2. Neighborhood Quality

   a. Regional Traffic through Neighborhoods: Table I-9

3. Air Quality

   a. Hydrocarbon and Nitrogen Oxide Emmissions: Table I-10

H. 1995 Costs and Efficiency:

✓Applicable Not-Applicable

1. Capital Costs: Table I-11

2. Operating Costs: Table I-12

3. Transit System Productivity: Table I-13

I. Description of Land Use Considerations:

Applicable Not-Applicable✓

J. Description of Right-of-Way Impacts

Applicable Not-Applicable✓

K. Transit Network Considerations:

Applicable Not-Applicable✓

Table I-1: 1995 P.M. Peak Hour Transit Travel Times Between Major Points in the Westside Corridor Assuming the Null Option

ORIGIN	DESTINATION: Hillsboro		Beaverton		Tigard		S.W. Portland		Portland CBD	
	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)
Hillsboro	xx	xx	24	N/A	62	N/A	85	N/A	69	N/A
Beaverton	24	N/A	xx	xx	38	N/A	45	N/A	45	N/A
Tigard	62	N/A	38	N/A	xx	xx	18	N/A	38	N/A
SW Portland	85	N/A	45	N/A	18	N/A	xx	xx	20	N/A

Table I-2: 1995 A.M. Peak Hour In-Bound Transit Use Between Communities in the Westside Corridor (Local Trips Excluded) Assuming the Null Option

ORIGIN	DESTINATION: Close-In Portland		DESTINATION: In-Bound Total	
	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity				
Transit Riders	650	N/A	840	N/A
Mode Split	58%	N/A	36%	N/A
Aloha Vicinity				
Transit Riders	320	N/A	420	N/A
Mode Split	25%	N/A	9%	N/A
West Beaverton Vicinity				
Transit Riders	460	N/A	590	N/A
Mode Split	39%	N/A	17%	N/A
East Beaverton Vicinity				
Transit Riders	330	N/A	420	N/A
Mode Split	23%	N/A	17%	N/A
S.W. Portland Vicinity				
Transit Riders	2,340	N/A	2,340	N/A
Mode Split	44%	N/A	44%	N/A
Tigard Vicinity				
Transit Riders	680	N/A	760	N/A
Mode Split	49%	N/A	37%	N/A
Total				
Transit Riders	4,780	N/A	5,370	N/A
Mode Split	41%	N/A	26%	N/A

Table I-3: 1995 Transit Use Between Communities in the Westside Corridor
Assuming the Null Option: Home Based Trips

TRIPS ATTRACTED TO:

TRIPS PRODUCED IN:	Hillsboro/ Forest Grove Vicinity		Aloha Vicinity		West Beaverton Vicinity		East Beaverton Vicinity		S.W. Portland		Close-in Portland		Tigard Vicinity		Portland C.B.D.	
	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null
Hillsboro/ Forest Grove Vicinity																
Trips	880	N/A	190	N/A	290	N/A	350	N/A	190	N/A	3,170	N/A	140	N/A	2,500	N/A
Mode Split	1%	N/A	4%	N/A	9%	N/A	12%	N/A	11%	N/A	40%	N/A	11%	N/A	60%	N/A
Aloha Vicinity																
Trips	90	N/A	190	N/A	220	N/A	230	N/A	120	N/A	1,860	N/A	90	N/A	1,700	N/A
Mode Split	4%	N/A	1%	N/A	1%	N/A	2%	N/A	3%	N/A	14%	N/A	2%	N/A	21%	N/A
West Beaverton Vicinity																
Trips	80	N/A	130	N/A	480	N/A	420	N/A	150	N/A	2,380	N/A	130	N/A	2,170	N/A
Mode Split	8%	N/A	1%	N/A	2%	N/A	3%	N/A	4%	N/A	22%	N/A	2%	N/A	32%	N/A
East Beaverton Vicinity																
Trips	80	N/A	120	N/A	360	N/A	860	N/A	300	N/A	4,760	N/A	180	N/A	4,330	N/A
Mode Split	11%	N/A	2%	N/A	3%	N/A	2%	N/A	6%	N/A	27%	N/A	3%	N/A	41%	N/A
S.W. Portland Vicinity																
Trips	80	N/A	50	N/A	70	N/A	140	N/A	980	N/A	12,290	N/A	470	N/A	11,260	N/A
Mode Split	10%	N/A	4%	N/A	4%	N/A	4%	N/A	2%	N/A	26%	N/A	5%	N/A	39%	N/A
Tigard Vicinity																
Trips	50	N/A	30	N/A	60	N/A	90	N/A	430	N/A	3,610	N/A	580	N/A	3,160	N/A
Mode Split	9%	N/A	4%	N/A	4%	N/A	1%	N/A	8%	N/A	31%	N/A	1%	N/A	48%	N/A

Table I-4: 1995 Daily (Home Based) Transit Ridership Between Communities in the Westside Corridor Assuming the Null Option

TRIPS PRODUCED IN:	TRIPS ATTRACTED TO: Close-In Portland 1995 Est.	Close-In Portland Diff From Null (%)	Rest of Corridor 1995 Est.	Rest of Corridor Diff From Null (%)	Total 1995 Est.	Total Diff From Null (%)
Hillsboro/ Forest Grove Vicinity						
Trips	3,170	N/A	2,040	N/A	5,210	N/A
Mode Split	40%	N/A	2%	N/A	4%	N/A
Aloha Vicinity						
Trips	1,860	N/A	940	N/A	2,800	N/A
Mode Split	14%	N/A	1%	N/A	3%	
West Beaverton Vicinity						
Trips	2,380	N/A	1,390	N/A	3,770	N/A
Mode Split	22%	N/A	2%	N/A	5%	N/A
East Beaverton Vicinity						
Trips	4,760	N/A	1,900	N/A	6,660	N/A
Mode Split	27%	N/A	3%	N/A	8%	N/A
S.W. Portland Vicinity						
Trips	12,290	N/A	1,790	N/A	14,080	N/A
Mode Split	26%	N/A	3%	N/A	13%	N/A
Tigard Vicinity						
Trips	3,610	N/A	1,240	N/A	4,850	N/A
Mode Split	31%	N/A	2%	N/A	7%	N/A
Total						
Trips	28,070	N/A	9,300	N/A	37,370	N/A
Mode Split	26%	N/A	2%	N/A	7%	N/A

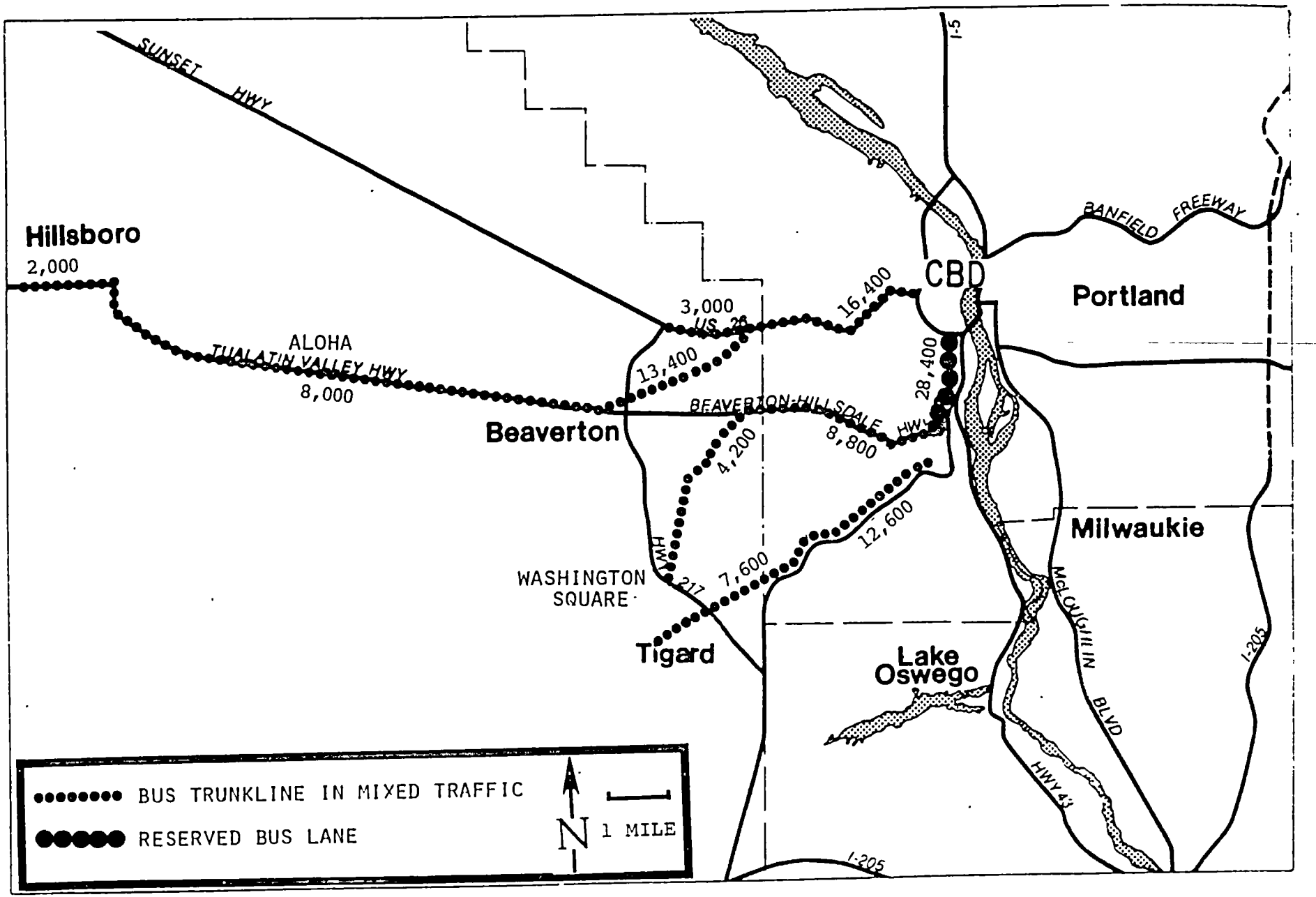

FIGURE 1-2 : TOTAL DAILY TRANSIT TRIPS USING THE MAJOR TRUNK ROUTES IN THE NULL OPTION

FIGURE 1-3: 1995 TRAFFIC VOLUMES ON SELECTED ROAD SEGMENTS ASSUMING THE NULL OPTION

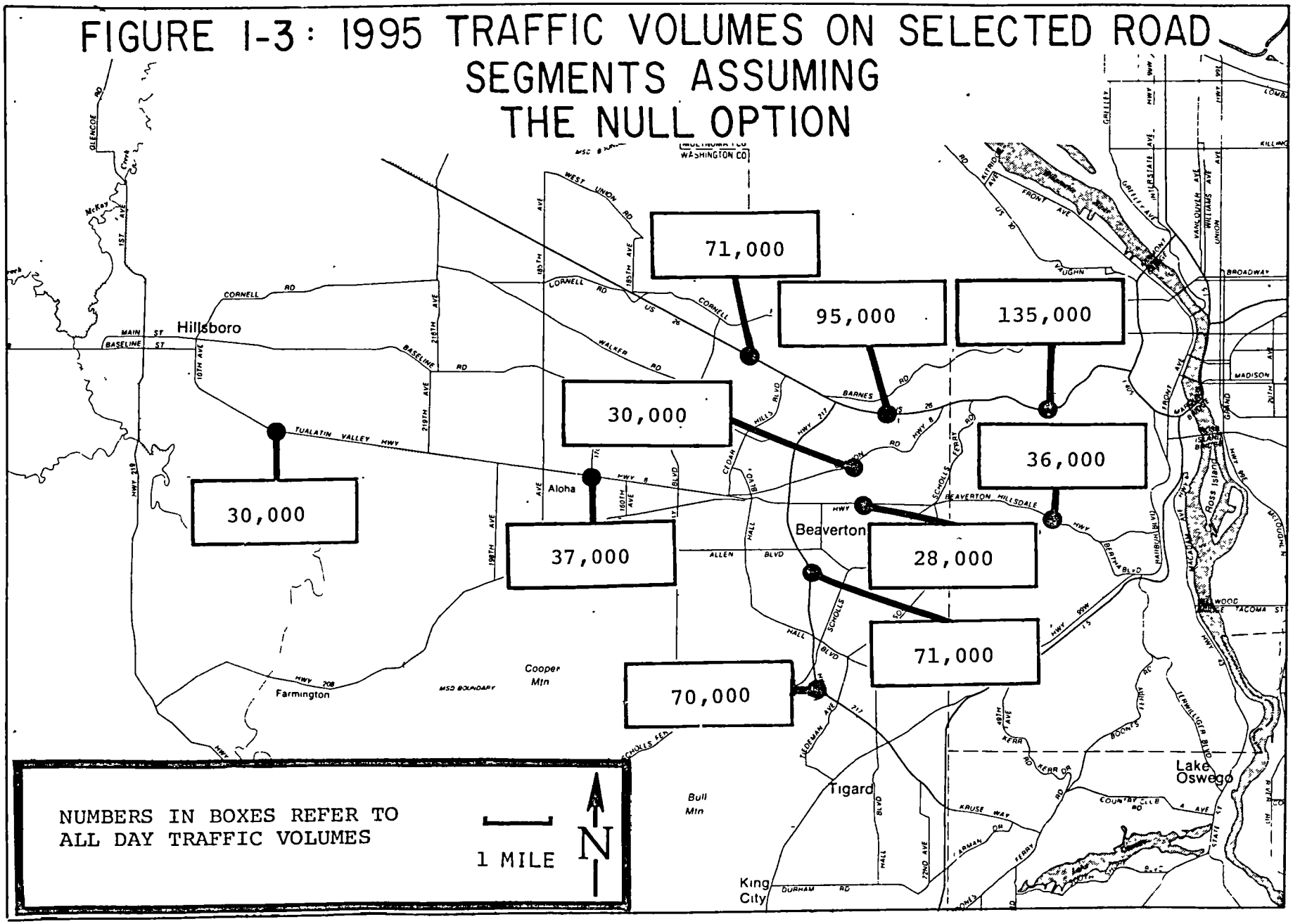

Table I-5: 1995 P.M. Peak Hour, Peak Direction Capacity Deficiencies at Selected Cutlines Assuming the Null Option

Cutline	Percent Above Capacity	Percent Reduction in Capacity Deficiency from the Null
Westside Corridor		
At SW 219th (from TV Hwy to Sunset Hwy)	0	N/A
At Murray Blvd (From TV Hwy to Cornell Rd)	50%	N/A
At Hwy 217 (From Denney Rd to Sunset Hwy)	30%	N/A
At Multnomah County Line (From Taylors Ferry Rd to Burnside)	10%	N/A

Table I-6: 1995 P.M. Peak Hour Job Accessibility for Corridor Residents Assuming the Null Option

Home Location	Number of Jobs Within 30 Minutes	Difference From Null
Beaverton	132,100	N/A
Hillsboro	69,900	N/A
Tigard	116,400	N/A
SW Portland	255,100	N/A

Table I-7: 1995 P.M. Peak Hour Market Potential for Major Business Centers in the Westside Corridor Assuming the Null Option

Business Location	Number of People Within 30 Minutes	Difference From Null
Beaverton CBD	336,000	N/A
Portland CBD	413,300	N/A
Hillsboro CBD	203,200	N/A
Washington Square	330,500	N/A

Table I-8: 1995 Daily Corridor Energy Consumption for the Null Option

	1995 Estimate	Difference From Null
Gasoline (Gallons)	96,330	N/A
Diesel (Gallons)	4,428	N/A
Electricity (KWH)[1]	N/A	N/A

[1] Light Rail Transit Propulsion

Table I-9: 1995 Potential Regional Traffic Through Neighborhoods During P.M. Peak-Hour Assuming the Null Option

Community	Potential Through Trips	Difference From Null
Beaverton	1,400	N/A
SW Portland	1,610	N/A

Table I-10: 1995 Air Pollution Emissions Assuming the Null Option

Geographic Area:	Hydrocarbon Emissions Tons/Year	Difference From Null	Nitrogen Oxide Tons/Year	Difference From Null
Westside Corridor	8,300	N/A	8,270	N/A
Regionwide	32,100	N/A	34,600	N/A

Table I-11: Project Capital Costs for the Null Option

Cost Item	Cost (1978 Dollars)
Right of Way	$0
Construction	0
Stations	0
Rolling Stock	$0
Total Cost	$0
Total Annualized Cost	$0

Table I-12: 1995 Transit Operating Costs and Subsidies for the Null Option

	Annual Costs and Revenues (1978 $)	Difference From Null
Westside Corridor		
Bus	$17,097,000	N/A
LRT	0	
Total Operating Costs	$17,097,000	N/A
Farebox Revenue	$5,258,000	N/A
Operating Subsidy	$11,839,000	N/A
Regionwide		
Bus	$62,064,000	N/A
LRT	3,570,000	N/A
Total Operating Costs	$65,634,000	N/A
Farebox Revenue	$19,995,000	N/A
Operating Subsidy	$45,639,000	N/A

Table I-13: 1995 Transit System Productivity for the Null Option

Productivity Measure	1995 Estimate	Difference From Null
Westside Corridor		
Operating Cost/ Passenger	$1.00	N/A
Operating Subsidy/ Passenger	.69	N/A
Farebox Revenue/ Operating Cost	31%	N/A
Total Annualized[1] Cost/Passenger	$1.00	N/A
Annualized Local[2] Cost/Passenger	.69	N/A
Regionwide		
Operating Cost/ Passenger	$1.10	N/A
Operating Subsidy/ Passenger	.77	N/A
Farebox Revenue/ Operating Cost	30%	N/A

---

[1]Total Annualized Cost = Annualized Capital Cost plus operating cost

[2]Annualized Local Cost = Local share of Annualized Cost plus operating subsidy

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II. SKETCH EVALUATION OF THE TSM-BUS IMPROVEMENTS ONLY OPTION

A. Description: Figure II-1

Expansion of service on the westside to provide more route coverage, better frequency and provision of major trunk routes on the Sunset Highway from downtown Portland to a timed-transfer station at Tanasbourne, on Beaverton-Hillsdale Highway to the Beaverton Transit Center and to Tualatin.

B. Type of Evaluation:

Fatal Flaw Analysis (Section C only)

✓ Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

Applicable Not-Applicable ✓

D. 1995 Transit use

✓ Applicable Not-Applicable

1. Transit Service Levels

   a. Peak Hour Transit Travel Times Between Major Points in the Corridor: Table II-1

2. Transit Trips Between Communities in the Westside Corridor

   a. Peak-Hour Trips: Table II-2
   b. Daily Home Based Trips: Table II-3
   c. Corridor Ridership: Table II-4

3. Trips Using the Major Trunk Routes in the TSM-Bus Improvements Only Option

   a. Total Daily Trips: Figure II-2

E. 1995 Highway Service Levels:

✓ Applicable Not Applicable

1. Highway Use

   a. Daily Traffic Volumes on Selected Road Segments: Figure II-3
   b. Peak-Hour Capacity Deficiencies at Selected Cutlines: Table II-5

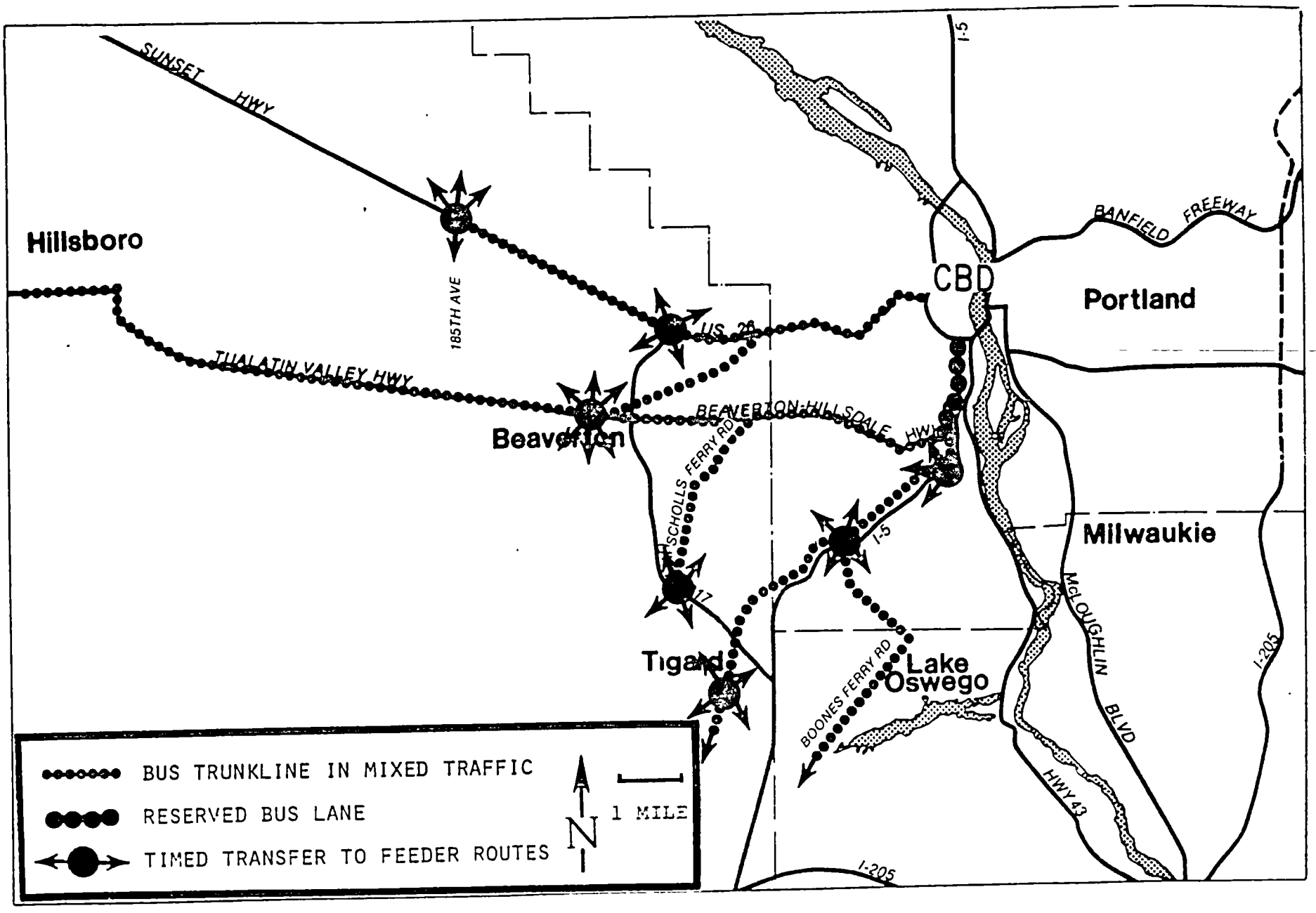

FIGURE II-1: THE TSM/BUS ONLY OPTION

F. 1995 Access to Opportunities:

✓ Applicable Not-Applicable

1. Job Opportunities for Corridor Residents: Table II-6

2. Potential Market for Major Business Areas: Table II-7

G. 1995 Environmental Quality:

✓ Applicable Not-Applicable

1. Energy Consumption

   a. Daily Corridor Energy Consumption: Table II-8

2. Neighborhood Quality

   a. Regional Traffic through Neighborhoods: Table II-9

3. Air Quality

   a. Hydrocarbon and Nitrogen Oxide Emmissions: Table II-10

H. 1995 Costs and Efficiency:

✓ Applicable Not-Applicable

1. Capital Costs: Table II-11

2. Operating Costs: Table II-12

3. Transit System Productivity: Table II-13

I. Description of Land Use Considerations:

Applicable Not-Applicable ✓

J. Description of Right-of-Way Impacts:

Applicable Not-Applicable ✓

K. Transit Network Considerations:

✓ Applicable Not-Applicable

This option results in 644 buses in downtown Portland per hour during peak periods. Of this number, 240 buses are from routes serving the Western and Southwestern Corridor, 152 of which would be articulated buses. This would exceed the capacity of the Transit Mall by 124 buses per hour. Major access points to downtown are Macadam Ave., Barbur Blvd. and the Sunset Hwy.

Table II-1: 1995 P.M. Peak Hour Transit Travel Times Between Major Points in the Westside Corridor Assuming the TSM-Bus Improvements Only Option

ORIGIN	DESTINATION: Hillsboro		Beaverton		Tigard		S.W. Portland		Portland CBD	
	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)
Hillsboro	xx	xx	24	0	49	-21	54	-36	52	-25
Beaverton	24	0	xx	xx	30	-21	34	-24	44	-2
Tigard	49	-21	30	-21	xx	xx	15	-17	33	-13
SW Portland	54	-36	34	-24	15	-17	xx	xx	17	-15

Table II-2: 1995 A.M. Peak Hour In-Bound Transit Use Between Communities in the Westside Corridor (Local Trips Excluded) Assuming the TSM-Bus Improvements Only Option

ORIGIN	DESTINATION: Close-In Portland		DESTINATION: In-Bound Total	
	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity				
Transit Riders	680	+5	900	+7
Mode Split	61%	+5	38%	+6
Aloha Vicinity				
Transit Riders	660	+106	870	+104
Mode Split	47%	+88	17%	+89
West Beaverton Vicinity				
Transit Riders	620	+35	800	+36
Mode Split	49%	+26	23%	+35
East Beaverton Vicinity				
Transit Riders	1,020	+212	1,130	+170
Mode Split	50%	+117	37%	+118
S.W. Portland Vicinity				
Transit Riders	2,680	+15	2,680	+15
Mode Split	49%	+11	49%	+11
Tigard Vicinity				
Transit Riders	890	+31	990	+31
Mode Split	60%	+22	46%	+24
Total				
Transit Riders	6,550	+37	7,370	+37
Mode Split	51%	+24	34%	+31

Table II-3: 1995 Transit Use Between Communities in the Westside Corridor
Assuming the TSM-Bus Improvements Only Option: Home Based Trips

TRIPS ATTRACTED TO:

TRIPS PRODUCED IN:	Hillsboro/ Forest Grove Vicinity		Aloha Vicinity		West Beaverton Vicinity		East Beaverton Vicinity		S.W. Portland		Close-in Portland		Tigard Vicinity		Portland C.B.D.	
	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null
Hillsboro/ Forest Grove Vicinity																
Trips	1,030	+17%	250	+32%	330	+14%	350	0	220	+16%	3,330	+5%	250	+79%	2,540	+2%
Mode Split	1%	0	6%	+50%	11%	+22%	12%	0	13%	+18%	42%	+5%	20%	+82%	61%	+2%
Aloha Vicinity																
Trips	170	+89%	340	+79%	440	+100%	460	+100%	190	+58%	3,610	+94%	230	+156%	3,290	+94%
Mode Split	7%	+75%	1%	0	2%	+100%	4%	+100%	5%	+67%	28%	+100%	5%	+150%	41%	+95%
West Beaverton Vicinity																
Trips	110	+38%	210	+62%	620	+29%	540	+29%	190	+27%	3,110	+31%	270	+108%	2,870	+32%
Mode Split	11%	+38%	2%	+100%	2%	0	4%	+33%	5%	+25%	29%	+32%	4%	+100%	43%	+34%
East Beaverton Vicinity																
Trips	100	+25%	180	+50%	440	+22%	980	+14%	330	+10%	5,310	+12%	290	+61%	4,870	+12%
Mode Split	14%	+27%	3%	+50%	4%	+33%	2%	0	7%	+17%	31%	+15%	6%	+100%	46%	+12%
S.W. Portland Vicinity																
Trips	130	+63%	60	+20%	110	+57%	220	+57%	1,250	+28%	14,490	+18%	730	+56%	13,040	+16%
Mode Split	17%	+70%	5%	+25%	6%	+50%	6%	+50%	3%	+50%	31%	+19%	8%	+60%	45%	+15%
Tigard Vicinity																
Trips	130	+160%	50	+67%	120	+100%	150	+67%	540	+26%	4,860	+35%	990	+71%	4,180	+32%
Mode Split	25%	+178%	4%	0	8%	+100%	7%	+600%	10%	+25%	42%	+35%	2%	+100%	63%	+31%

Table II-4: 1995 Daily (Home Based) Transit Ridership Between Communities in the Westside Corridor Assuming the TSM-Bus Improvements Only Option

TRIPS PRODUCED IN:	TRIPS ATTRACTED TO: Close-In Portland 1995 Est.	Close-In Portland Diff From Null (%)	Rest of Corridor 1995 Est.	Rest of Corridor Diff From Null (%)	Total 1995 Est.	Total Diff From Null (%)
Hillsboro/ Forest Grove Vicinity						
Trips	3,330	+5	2,430	+19	5,760	+11
Mode Split	42%	+5	2%	0	5%	+25
Aloha Vicinity						
Trips	3,610	+94	1,830	+95	5,440	+94
Mode Split	28%	+100	2%	+100	6%	+100
West Beaverton Vicinity						
Trips	3,110	+31	1,940	+40	5,050	+34
Mode Split	29%	+32	3%	+50	7%	+40
East Beaverton Vicinity						
Trips	5,310	+12	2,320	+22	7,630	+15
Mode Split	31%	+15	3%	0	8%	0
S.W. Portland Vicinity						
Trips	14,490	+18	2,500	+40	16,990	+21
Mode Split	31%	+19	4%	+33	16%	+23
Tigard Vicinity						
Trips	4,860	+35	1,980	+60	6,840	+41
Mode Split	42%	+35	3%	+50	10%	+43
Total						
Trips	34,710	+24	13,000	+40	47,710	+28
Mode Split	32%	+23	3%	+50	8%	+14

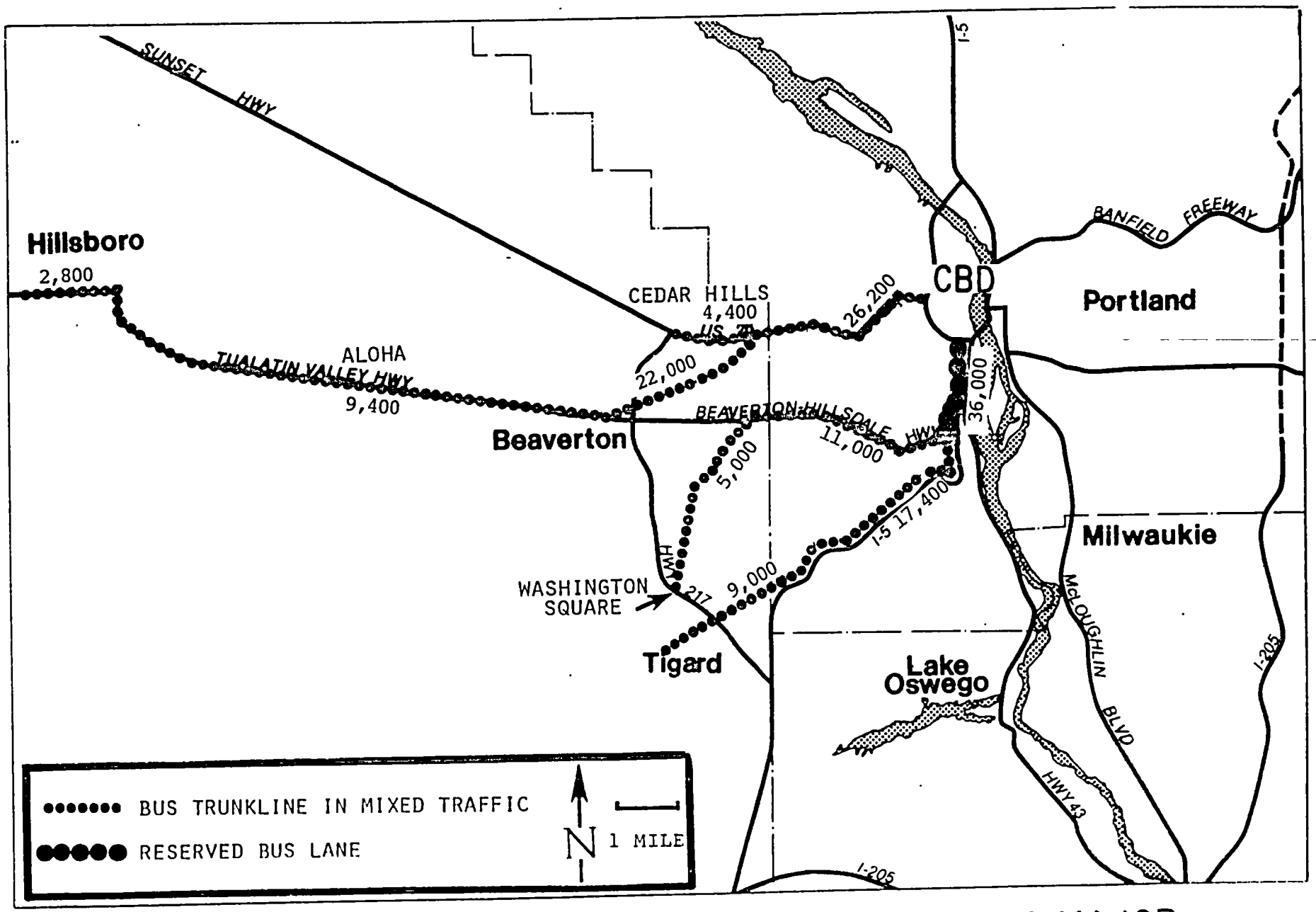

FIGURE II-2 :TOTAL DAILY TRANSIT TRIPS USING THE MAJOR TRUNK ROUTES IN THE TSM/BUS ONLY OPTION

FIGURE II-3: 1995 TRAFFIC VOLUMES ON SELECTED ROAD SEGMENTS ASSUMING THE TSM/BUS ONLY OPTION

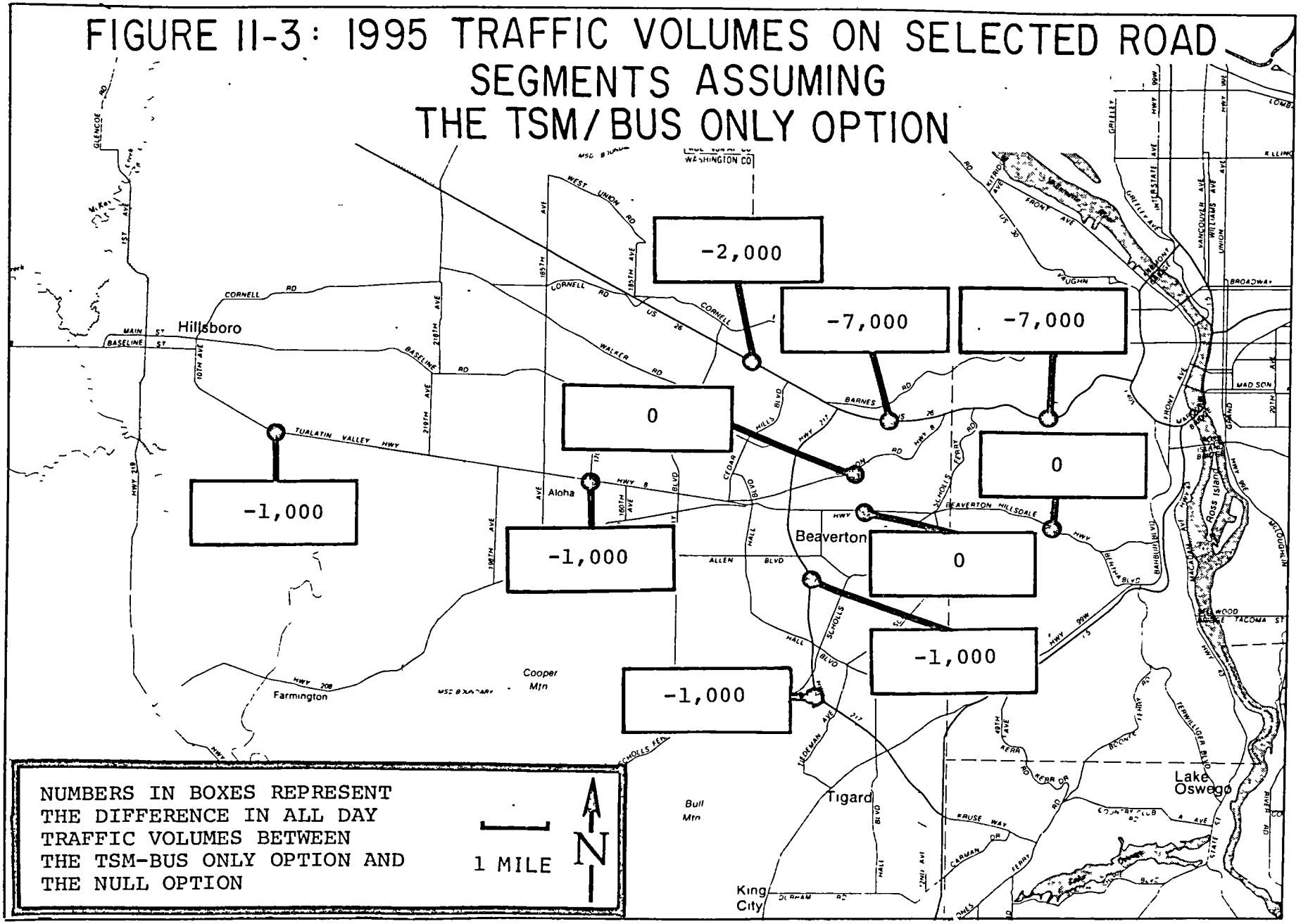

Table II-5: 1995 P.M. Peak Hour, Peak Direction Capacity Deficiencies at Selected Cutlines Assuming the TSM-Bus Improvements Only Option

Cutline	Percent Above Capacity	Percent Reduction in Capacity Deficiency from the Null
Westside Corridor		
At SW 219th (from TV Hwy to Sunset Hwy)	0	0
At Murray Blvd (From TV Hwy to Cornell Rd)	40%	-20%
At Hwy 217 (From Denney Rd to Sunset Hwy)	20%	-33%
At Multnomah County Line (From Taylors Ferry Rd to Burnside)	10%	0

Table II-6: 1995 P.M. Peak Hour Job Accessibility for Corridor Residents Assuming the TSM-Bus Improvements Only Option

Home Location	Number of Jobs Within 30 Minutes	Difference From Null
Beaverton	145,800	+10%
Hillsboro	82,000	+17%
Tigard	116,400	0
SW Portland	291;700	+14%

Table II-7: 1995 P.M. Peak Hour Market Potential for Major Business Centers in the Westside Corridor Assuming the TSM-Bus Improvements Only Option

Business Location	Number of People Within 30 Minutes	Difference From Null
Beaverton CBD	353,600	+5%
Portland CBD	501,900	+21%
Hillsboro CBD	217,700	+7%
Washington Square	330,500	0

Table II-8: 1995 Daily Corridor Energy Consumption for the TSM-Bus Improvements Only Option

	1995 Estimate	Difference From Null
Gasoline (Gallons)	91,900	-5%
Diesel (Gallons)	10,456	+136%
Electricity (KWH)[1]	N/A	N/A

[1] Light Rail Transit Propulsion

Table II-9: 1995 Potential Regional Traffic Through Neighborhoods During P.M. Peak-Hour Assuming the TSM-Bus Improvements Only Option

Community	Potential Through Trips	Difference From Null
Beaverton	1,030	-26%
SW Portland	1,120	-30%

Table II-10: 1995 Air Pollution Emissions Assuming the TSM-Bus Improvements Only Option

Geographic Area:	Hydrocarbon Emissions Tons/Year	Difference From Null	Nitrogen Oxide Tons/Year	Difference From Null
Westside Corridor	7,920	-5%	8,180	-1%
Regionwide	30,900	-4%	34,000	-2%

Table II-11: Project Capital Costs for the TSM-Bus Improvements Only Option

Cost Item	Cost (1978 Dollars)
Right of Way	N/A
Construction	3,000,000
Stations	N/A
Rolling Stock[1]	$39,155,000
Total Cost	$42,155,000
Annualized Capital Cost	3,125,000

[1]Vehicles required in addition to Null Option (Null: 186 buses at $135,000 per bus = $25,110,000)

Table II-12: 1995 Transit Operating Costs and Subsidies for the TSM-Bus Improvements Only Option

	Annual Costs and Revenues (1978 $)	Difference From Null
Westside Corridor		
Bus	$29,179,000	+71%
LRT	0	
Total Operating Costs	$29,179,000	+71%
Farebox Revenue	$ 7,168,000	+36%
Operating Subsidy	$22,002,000	+86%
Regionwide		
Bus	$89,084,000	+44%
LRT	3,570,000	0
Total Operating Costs	92,654,000	+41%
Farebox Revenue	$25,869,000	+25%
Operating Subsidy	$66,785,000	+46%

Table II-13: 1995 Transit System Productivity for the TSM-Bus Improvements Only Option

Productivity Measure	1995 Estimate	Difference From Null
Westside Corridor		
Operating Cost/ Passenger	$1.23	+23%
Operating Subsidy/ Passenger	.93	+35%
Farebox Revenue/ Operating Cost	25%	-19%
Total Annualized[1] Cost/Passenger	$1.36	+36%
Annualized Local[2] Cost/Passenger	.95	+38%
Regionwide		
Operating Cost/ Passenger	$1.17	+6%
Operating Subsidy/ Passenger	.86	+12%
Farebox Revenue/ Operating Cost	28%	-7%

[1]Total Annualized Cost = Annualized Capital Cost plus operating cost

[2]Annualized Local Cost = Local share of Annualized Cost plus operating subsidy

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III. SKETCH EVALUATION OF THE BEAVERTON-HILLSDALE REVERSIBLE BUS LANE OPTION

A. Description: Figure III-1

This alternative would consist of a continuous reversible bus lane from downtown Portland through Beaverton to S.W. 185th Ave., by way of the existing Barbur bus lane extended to Burlingame and thence by Bertha and Beaverton-Hillsdale Hwy. to Beaverton. West of Beaverton, the bus lane would continue along Tualatin Valley Hwy. to S. W. 185th Ave. Stops will be located at principal trip generators and transfer points. Local buses would be able to enter the bus lanes at most intersections.

As with the existing Barbur Blvd. bus lane, this alternative would involve the reservation of a lane for express buses during peak hours only. During the off-peak hour, left turns by auto traffic would be permitted. To take full advantage of the improved travel speeds provided by the bus lane, the existing Forest Grove and Beaverton routes would be diverted from the Sunset Highway to Beaverton-Hillsdale Hwy. Extension of the Barbur Blvd. bus lane to Bertha Blvd. also improves travel speeds for the major bus routes to Tigard and Tualatin. See Special Report No. 5: Westside Transitway Options for additional detail.

B. Type of Evaluation:

Fatal Flaw Analysis (Section C only)

✓ Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

Applicable Not-Applicable ✓

D. 1995 Transit use

✓ Applicable Not-Applicable

1. Transit Service Levels

   a. Peak Hour Transit Travel Times Between Major Points in the Corridor: Table III-1

2. Transit Trips Between Communities in the Westside Corridor

   a. Peak-Hour Trips: Table III-2
   b. Daily Home Based Trips: Table III-3
   c. Corridor Ridership: Table III-4

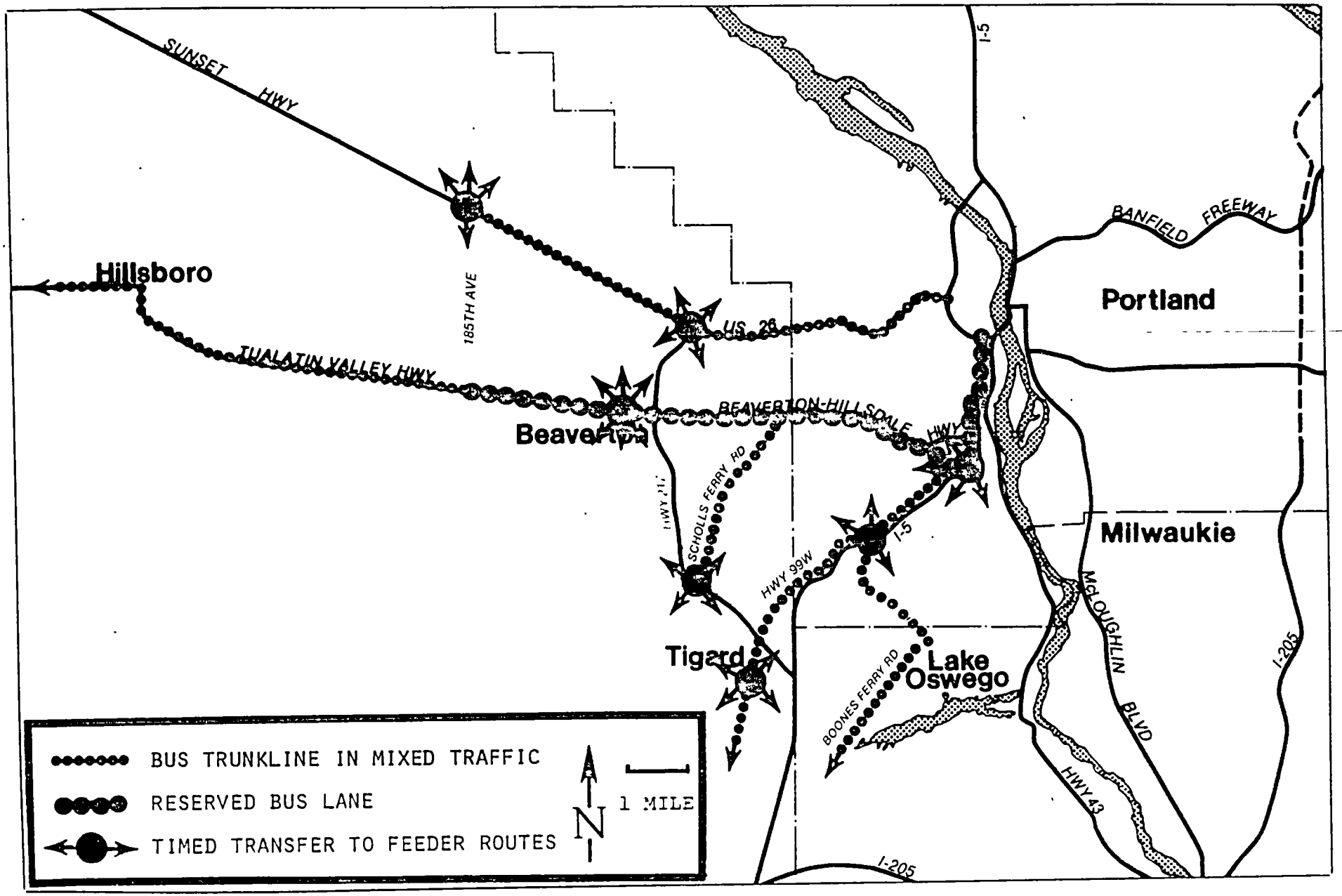

FIGURE III-1 : BEAVERTON-HILLSDALE REVERSIBLE BUS LANE OPTION

SEE SPECIAL REPORT NO. 5: WESTSIDE TRANSITWAY OPTIONS, SECTION II-C, FOR FURTHER DESCRIPTION

3. Trips Using the Major Trunk Routes in the Beaverton-Hillsdale Reversible Bus Lane Option

a. Total Daily Trips: Figure III-2

E. 1995 Highway Service Levels:

✓Applicable Not Applicable

1. Highway Use

a. Daily Traffic Volumes on Selected Road Segments: Figure III-3
b. Peak-Hour Capacity Deficiencies at Selected Cutlines: Table III-5

F. 1995 Access to Opportunities:

✓Applicable Not-Applicable

1. Job Opportunities for Corridor Residents: Table III-6

2. Potential Market for Major Business Areas: Table III-7

G. 1995 Environmental Quality:

✓Applicable Not-Applicable

1. Energy Consumption

a. Daily Corridor Energy Consumption: Table III-8

2. Neighborhood Quality

a. Regional Traffic through Neighborhoods: Table III-9

3. Air Quality

a. Hydrocarbon and Nitrogen Oxide Emmissions: Table III-10

H. 1995 Costs and Efficiency:

✓Applicable Not-Applicable

1. Capital Costs: Table III-11

2. Operating Costs: Table III-12

3. Transit System Productivity: Table III-13

I. Description of Land Use Considerations:

Applicable Not-Applicable ✓

J. Description of Right-of-Way Impacts

✓ Applicable Not-Applicable

The construction impacts of this option include the potential displacement of eight residential buildings and twelve commercial buildings, restricted left-turn movements from Hillsdale to SW 185th, and restricted access to numerous abutting projects.

The majority of building displacements will occur from SW 42nd to Cedar Hills Blvd. in Beaverton. All of the commercial displacement occurs in the vicinity of the Beaverton CBD.

K. Transit Network Considerations:

✓ Applicable Not-Applicable

As with the TSM Bus Improvement only option, this option results in 644 buses in downtown Portland per hour during peak periods. This will exceed the capacity of the Transit Mall by 124 buses per hour. However, with the reserved bus lanes, 172 are concentrated on Barbur Blvd., reducing the bus volume on the Sunset Hwy by 58 buses.

Table III-1: 1995 P.M. Peak Hour Transit Travel Times Between Major Points in the Westside Corridor Assuming the Beaverton-Hillsdale Reversible Bus Lane Option

ORIGIN	DESTINATION: Hillsboro		Beaverton		Tigard		S.W. Portland		Portland CBD	
	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)
Hillsboro	xx	xx	24	0	48	-23	46	-46	42	-39
Beaverton	24	0	xx	xx	30	-21	32	-29	34	-24
Tigard	48	-23	30	-21	xx	xx	15	-17	33	-13
SW Portland	46	-46	32	-29	15	-17	xx	xx	17	-15

Table III-2: 1995 A.M. Peak Hour In-Bound Transit Use Between Communities in the Westside Corridor (Local Trips Excluded) Assuming the Beaverton-Hillsdale Reversible Bus Lane Option

ORIGIN	DESTINATION: Close-In Portland		DESTINATION: In-Bound Total	
	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity				
Transit Riders	730	+13	980	+16
Mode Split	64%	+10	41%	+14
Aloha Vicinity				
Transit Riders	710	+124	920	+118
Mode Split	50%	+100	18%	+100
West Beaverton Vicinity				
Transit Riders	630	+38	800	+36
Mode Split	50%	+28	23%	+35
East Beaverton Vicinity				
Transit Riders	1,030	+216	1,150	+174
Mode Split	50%	+117	37%	+118
S.W. Portland Vicinity				
Transit Riders	2,660	+14	2,660	+14
Mode Split	48%	+9	48%	+9
Tigard Vicinity				
Transit Riders	890	+31	990	+31
Mode Split	60%	+22	46%	+24
Total				
Transit Riders	6,650	+40	7,500	+40
Mode Split	52%	+27	34%	+31

Table III-3: 1995 Transit Use Between Communities in the Westside Corridor
Assuming the Beaverton-Hillsdale Reversible Bus Lane Option: Home Based Trips

TRIPS ATTRACTED TO:

TRIPS PRODUCED IN:	Hillsboro/ Forest Grove Vicinity		Aloha Vicinity		West Beaverton Vicinity		East Beaverton Vicinity		S.W. Portland		Close-in Portland		Tigard Vicinity		Portland C.B.D.	
	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null
Hillsboro/ Forest Grove Vicinity																
Trips	1,070	+22%	260	+37%	310	+7%	360	+3%	320	+68%	3,500	+10%	250	+79%	2,600	+4%
Mode Split	1%	0	6%	+50%	10%	+11%	12%	0	19%	+73%	44%	+10%	20%	+82%	62%	+3%
Aloha Vicinity																
Trips	190	+111%	340	+79%	390	+77%	440	+91%	260	+117%	3,720	+100%	240	+167%	3,340	+96%
Mode Split	8%	+100%	1%	0	2%	+100%	3%	+50%	7%	+133%	29%	+107%	5%	+150%	42%	+100%
West Beaverton Vicinity																
Trips	90	+13%	220	+69%	610	+27%	490	+17%	210	+40%	3,090	+30%	250	+92%	2,840	+31%
Mode Split	9%	+13%	1%	0	2%	0	3%	0	6%	+50%	29%	+32%	4%	+100%	42%	+31%
East Beaverton Vicinity																
Trips	100	+25%	170	+42%	410	+14%	930	+8%	330	+10%	5,290	+11%	280	+56%	4,850	+12%
Mode Split	14%	+27%	3%	+50%	4%	+33%	2%	0	7%	+17%	30%	+11%	5%	+67%	45%	+10%
S.W. Portland Vicinity																
Trips	150	+88%	60	+20%	110	+57%	220	+57%	1,280	+31%	14,520	+18%	760	+62%	13,060	+16%
Mode Split	19%	+90%	5%	+25%	6%	+50%	6%	+50%	3%	+50%	31%	+19%	8%	+60%	45%	+15%
Tigard Vicinity																
Trips	130	+160%	40	+33%	100	+67%	150	+67%	540	+26%	4,860	+35%	990	+71%	4,180	+32%
Mode Split	25%	+178%	5%	+25%	7%	+75%	8%	+700%	10%	+25%	42%	+35%	2%	+100%	63%	+31%

Table III-4: 1995 Daily (Home Based) Transit Ridership Between Communities in the Westside Corridor Assuming the Beaverton-Hillsdale Reversible Bus Lane Option

	TRIPS ATTRACTED TO: Close-In Portland		Rest of Corridor		Total	
TRIPS PRODUCED IN:	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity						
Trips	3,500	+10	2,570	+26	6,070	+17
Mode Split	44%	+10	2%	0	5%	+25
Aloha Vicinity						
Trips	3,720	+100	1,860	+98	5,580	+99
Mode Split	29%	+107	3%	+200	7%	+133
West Beaverton Vicinity						
Trips	3,090	+30	1,870	+35	4,960	+32
Mode Split	29%	+32	2%	0	5%	0
East Beaverton Vicinity						
Trips	5,290	+11	2,220	+17	7,510	+13
Mode Split	30%	+11	3%	0	9%	+13
S.W. Portland Vicinity						
Trips	14,520	+18	2,580	+44	17,100	+21
Mode Split	31%	+19	4%	+33	16%	+23
Tigard Vicinity						
Trips	4,860	+35	1,950	+57	6,810	+40
Mode Split	42%	+35	4%	+100	11%	+57
Total						
Trips	34,980	+25	13,050	+40	48,030	+29
Mode Split	32%	+23	3%	+50	9%	+29

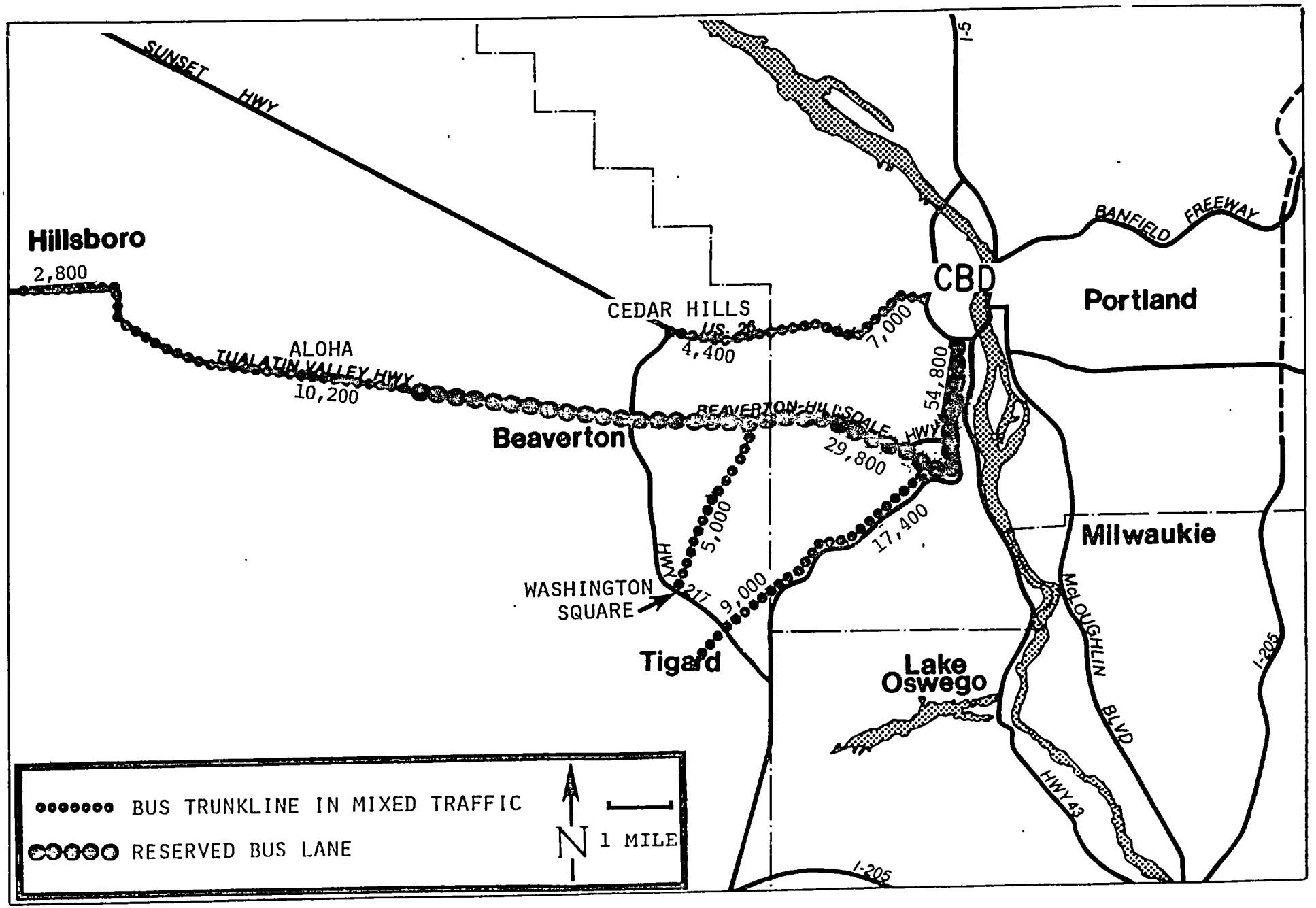

FIGURE III-2 : TOTAL DAILY TRANSIT TRIPS USING THE MAJOR TRUNK ROUTES IN THE BEAVERTON-HILLSDALE REVERSIBLE BUS LANE OPTION

FIGURE III-3: 1995 TRAFFIC VOLUMES ON SELECTED ROAD SEGMENTS ASSUMING THE BEAVERTON-HILLSDALE REVERSIBLE BUS LANE OPTION

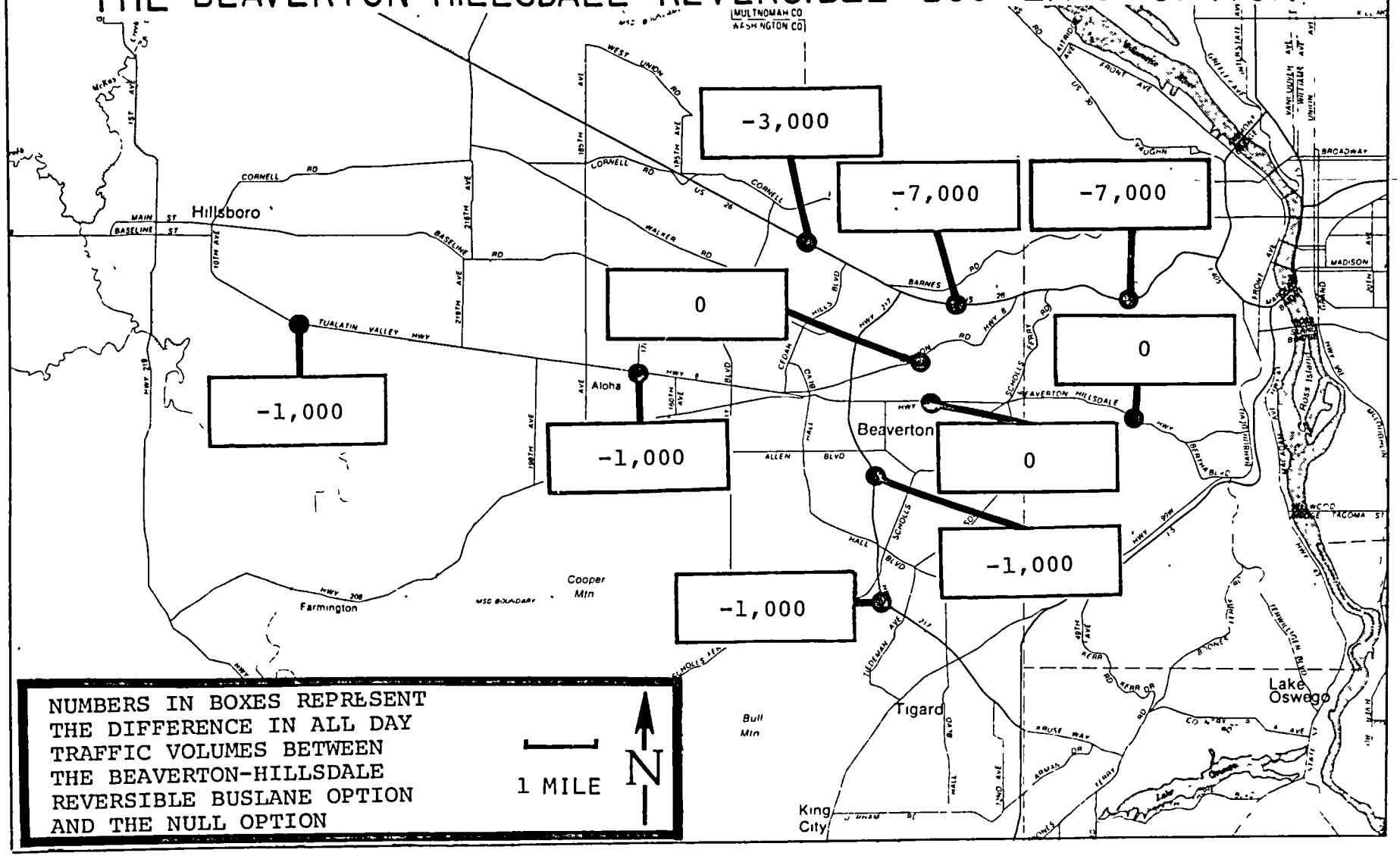

Table III-5: 1995 P.M. Peak Hour, Peak Direction Capacity Deficiencies at Selected Cutlines Assuming the Beaverton-Hillsdale Reversible Bus Lane Option

Cutline	Percent Above Capacity	Percent Reduction in Capacity Deficiency from the Null
Westside Corridor		
At SW 219th (from TV Hwy to Sunset Hwy)	0	0
At Murray Blvd (From TV Hwy to Cornell Rd)	40%	-20%
At Hwy 217 (From Denney Rd to Sunset Hwy)	20%	-33%
At Multnomah County Line (From Taylors Ferry Rd to Burnside)	10%	0

Table III-6: 1995 P.M. Peak Hour Job Accessibility for Corridor Residents Assuming the Beaverton-Hillsdale Reversible Bus Lane Option

Home Location	Number of Jobs Within 30 Minutes	Difference From Null
Beaverton	145,800	+10%
Hillsboro	85,000	+22%
Tigard	116,400	0
SW Portland	291,700	+14%

Table III-7: 1995 P.M. Peak Hour Market Potential for Major Business Centers in the Westside Corridor Assuming the Beaverton-Hillsdale Reversible Bus Lane Option

Business Location	Number of People Within 30 Minutes	Difference From Null
Beaverton CBD	353,600	+5%
Portland CBD	501,900	+21%
Hillsboro CBD	229,200	+13%
Washington Square	339,200	+3%

Table III-8: 1995 Daily Corridor Energy Consumption for the Beaverton-Hillsdale Reversible Bus Lane Option

	1995 Estimate	Difference From Null
Gasoline (Gallons)	91,710	-5%
Diesel (Gallons)	11,221	+153%
Electricity (KWH)[1]	N/A	N/A

[1] Light Rail Transit Propulsion

Table III-9: 1995 Potential Regional Traffic Through Neighborhoods During P.M. Peak-Hour Assuming the Beaverton-Hillsdale Reversible Bus Lane Option

Community	Potential Through Trips	Difference From Null
Beaverton	930	-34%
SW Portland	1,030	-36%

Table III-10: 1995 Air Pollution Emissions Assuming the Beaverton-Hillsdale Reversible Bus Lane Option

Geographic Area:	Hydrocarbon Emissions Tons/Year	Difference From Null	Nitrogen Oxide Tons/Year	Difference From Null
Westside Corridor	7,900	-5%	8,170	-1%
Regionwide	30,900	-4%	34,000	-2%

Table III-11: Project Capital Costs for the Beaverton-Hillsdale Reversible Bus Lane Option

Cost Item	Cost (1978 Dollars)
Right of Way	$ 6,320,000
Construction	31,740,000
Stations	9,880,000
Rolling Stock[1]	36,395,000
Total Cost	$84,335,000
Annualized Capital Cost	$4,792,000

[1]Vehicles required in addition to Null Option (Null: 186 buses at $135,000 per bus = $25,110,000)

Table III-12: 1995 Transit Operating Costs and Subsidies for the Beaverton-Hillsdale Reversible Bus Lane Option

	Annual Costs and Revenues (1978 $)	Difference From Null
Westside Corridor	$28,590,000	+67%
Bus		
LRT	0	0
Total Operating Costs	$28,590,000	+67%
Farebox Revenue	$7,253,000	+38%
Operating Subsidy	$21,337,000	+80%
Regionwide		
Bus	$88,504,000	+43%
LRT	3,570,000	0
Total Operating Costs	$92,074,000	40%
Farebox Revenue	25,995,000	+30%
Operating Subsidy	66,079,000	+45%

Table III-13: 1995 Transit System Productivity for the Beaverton-Hillsdale Reversible Bus Lane Option

Productivity Measure	1995 Estimate	Difference From Null
Westside Corridor		
Operating Cost/ Passenger	$1.19	+19%
Operating Subsidy/ Passenger	.89	+29%
Farebox Revenue/ Operating Cost	25%	-19%
Total Annualized[1] Cost/Passenger	$1.39	+39%
Annualized Local[2] Cost/Passenger	.93	+35%
Regionwide		
Operating Cost/ Passenger	$1.17	+6%
Operating Subsidy/ Passenger	.84	+ 9%
Farebox Revenue/ Operating Cost	28%	-6%

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[1]Total Annualized Cost = Annualized Capital Cost plus operating cost

[2]Annualized Local Cost = Local share of Annualized Cost plus operating subsidy

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IV. SKETCH EVALUATION OF THE BEAVERTON-HILLSDALE TWO-WAY BUS LANE OPTION

A. Description: Figure IV-1

This option is generally the same as the reversible lane option except that it provides an exclusive lane for buses in the non-peak direction. The additional lane eliminates the slow speed at which the non-peak direction buses would operate, if they were not on an exclusive lane. These faster speeds could make transit operations more reliable and efficient and lead to a minor operating cost savings.

B. Type of Evaluation:

✓ Fatal Flaw Analysis (Section C only)

Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

✓ Applicable Not-Applicable

Widening for the two additional bus lanes would be necessary along sections of each arterial where turn lanes do not exist. Where a left-turn lane exists, it could be converted to one of the bus lanes requiring construction of three additional lanes, one more lane for buses and one on each side of the bus lanes for left turns. At station locations, additional widening would be necessary for bus pull-off lanes and loading platforms. The bus lanes would be curbed for their entire length except at signalized intersections to eliminate traffic conflict.

Widening along Barbur Boulevard would involve significant cut, fill and retaining wall construction due to the steep terrain. Addition of a lane between downtown and Capitol Highway would likely displace 16 residences that were recently encroached on for the constuction of the existing single bus lane. South of Capitol Highway, the two timber structures would require replacement since they are only 48' wide. Throughout the length of Barbur Boulevard, widening of one to three lanes would terminate many intersecting streets due to the steep terrain on either side of the highway.

Encroachment on fronting properties and limitation of turning movements would be very severe along Beaverton-Hillsdale Highway. Elimination of left turns would be most critical in the western portion where the continuous left turn lane presently provides access to commercial properties, and at

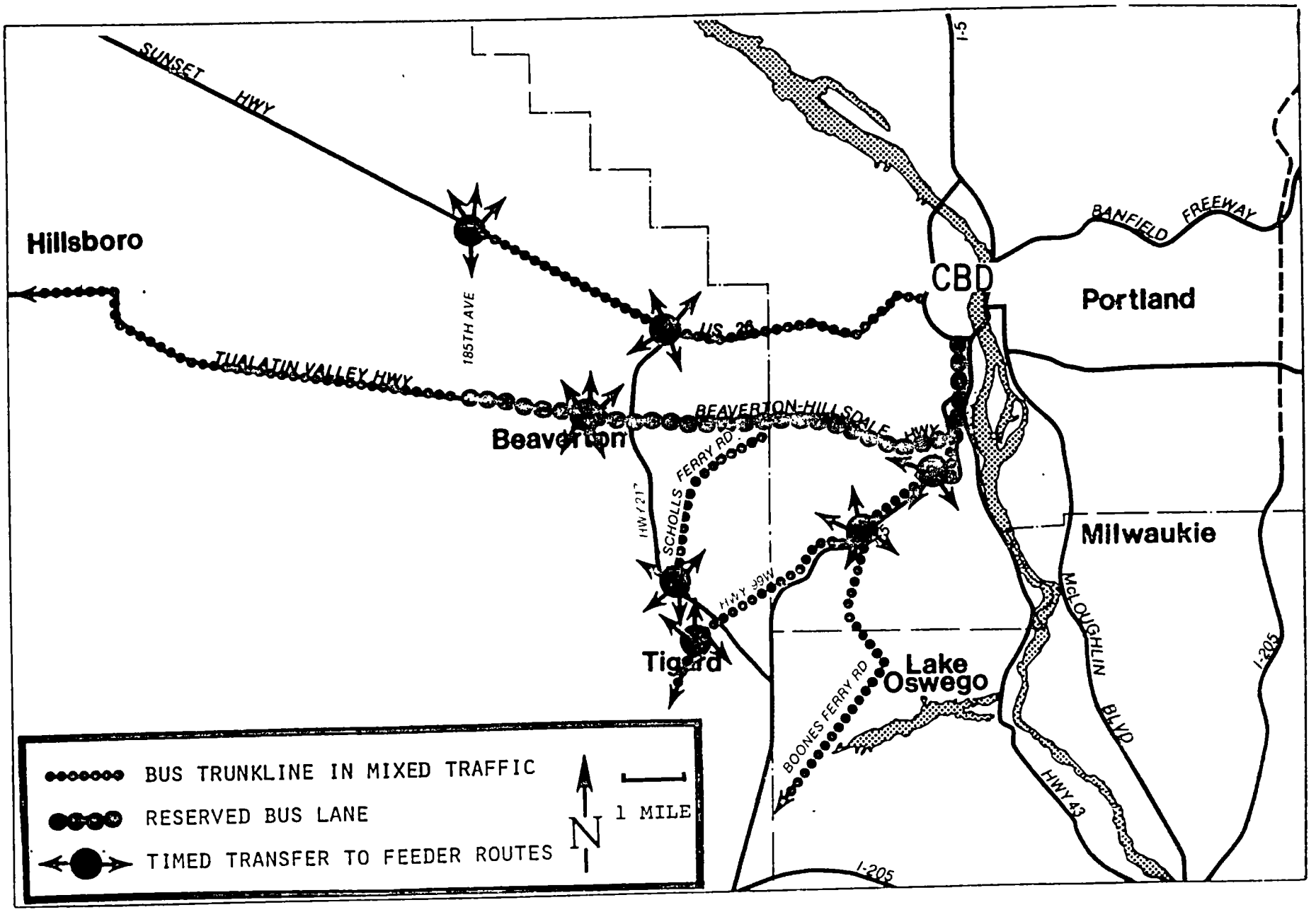

FIGURE IV-1 : THE BEAVERTON- HILLSDALE TWO-WAY BUSLANE OPTION

SEE SPECIAL REPORT NO. 5: WESTSIDE TRANSITWAY OPTIONS, SECTION II-D, FOR FURTHER DESCRIPTION

unsignalized minor streets that intersect the highway where bus lanes could not be crossed.

One of the most significant impacts would be the displacement required for bus stations as shown in Fig. 1. Intersection approaches would be widened from seven-lane to 11-lane width to accommodate the proper bus and auto lanes requiring an additional 50-55' of pavement. Transition between the station cross-section and the typical six-lane cross-section (four auto lanes and two bus lanes) would impact properties for 350' on both sides of the intersection.

In total, 36 residential buildings and 32 commercial buildings would be displaced. This total may be even higher because additional residential properties may be taken because driveways may not be able to be re-established due to elevation difference between road grade and property.

D. 1995 Transit use

Applicable Not-Applicable ✓

E. 1995 Highway Service Levels:

Applicable Not Applicable ✓

F. 1995 Access to Opportunities:

Applicable Not-Applicable ✓

G. 1995 Environmental Quality:

Applicable Not-Applicable ✓

H. 1995 Costs and Efficiency:

Applicable Not-Applicable ✓

I. Description of Land Use Considerations:

Applicable Not-Applicable ✓

J. Description of Right-of-Way Impacts:

Applicable Not-Applicable ✓

K. Transit Network Considerations:

Applicable Not-Applicable ✓

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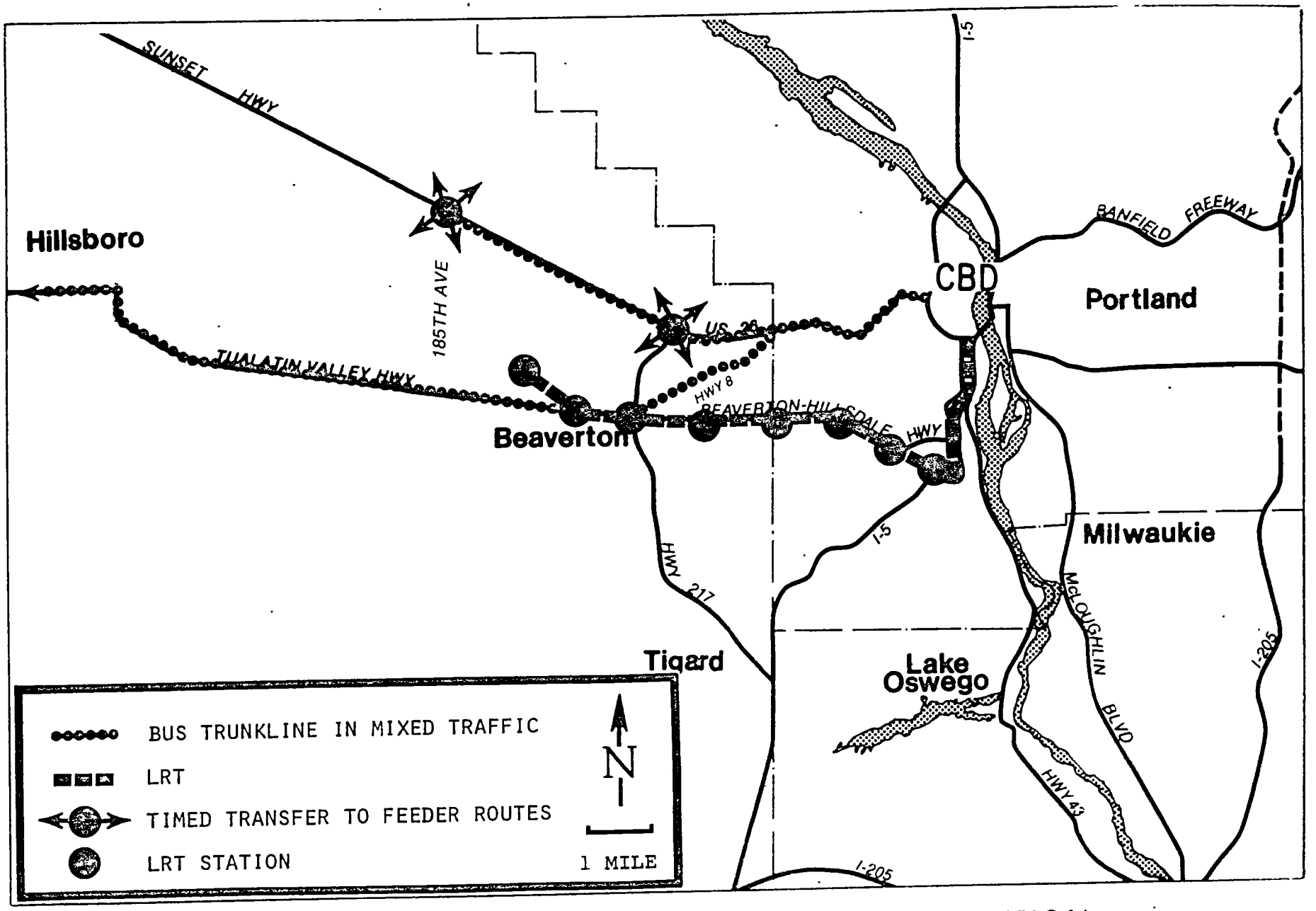

FIGURE V-1 : THE BEAVERTON-HILLSDALE LRT OPTION

SEE SPECIAL REPORT NO.5: WESTSIDE TRANSITWAY OPTIONS, SECTION II-E, FOR FURTHER DESCRIPTION

V. SKETCH EVALUATION OF THE BEAVERTON-HILLSDALE LRT OPTION

A. Description: Figure V-1

This option would generally follow the route described in the Beaverton-Hillsdale Bus Lanes Option.

B. Type of Evaluation:

✓ Fatal Flaw Analysis (Section C only)

Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

✓ Applicable Not-Applicable

LRT in the Beaverton-Hillsdale Highway Corridor should not be further pursued for the same types of reasons that the two way bus lane option was rejected. The cross-sections for LRT would be similar to the busway, requiring nearly the same amount of widening and having roughly the same level of construction impact and impact on turning auto traffic.

D. 1995 Transit use

Applicable Not-Applicable ✓

E. 1995 Highway Service Levels:

Applicable Not Applicable ✓

F. 1995 Access to Opportunities:

Applicable Not-Applicable ✓

G. 1995 Environmental Quality:

Applicable Not-Applicable ✓

H. 1995 Costs and Efficiency:

Applicable Not-Applicable ✓

I. Description of Land Use Considerations:

Applicable Not-Applicable ✓

J. Description of Right-of-Way Impacts:

Applicable Not-Applicable ✓

K. Transit Network Considerations:

Applicable Not-Applicable ✓

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VI. SKETCH EVALUATION OF THE SUNSET BUS LANE OPTION

A. Description: Figure VI-1

Use of reserved bus lanes on existing highway facilities in the Sunset Highway Corridor consists of three interrelated components:

1. Contra-flow bus lane on the Sunset Highway from downtown Portland to Canyon Road:

   This alternative would reserve the "fast" lane in the westbound direction during the morning peak hour and the "fast" lane in the eastbound direction during the evening peak hour on the Sunset Highway for the exclusive use of buses. This type of operation is intended to provide faster bus speeds with little cost by taking highway capacity (one lane) from the off-peak direction for the exclusive use of express bus service in the peak direction. The contra-flow lane would be in use between the Vista Ridge Tunnels and Canyon Road. This alternative would have to be terminated west of the tunnels because all lanes are required for weave movements to the I-405 and downtown Portland ramps. Buses would operate in mixed traffic through the tunnels.

2. Reserved median bus lane on Canyon Road from the Sunset Highway to Beaverton:

   This alternative consists of a single, reversible bus lane operating in the median of Canyon Road between the Sunset Highway and Beaverton. Canyon Road is defined as a principal arterial in the ITP. Widening for an additional lane in the eastern portion of Canyon Road would be required. In the western portion, a continuous left-turn lane would be converted to peak hour bus use with the elimination of peak hour auto left turn movements. During the off-peak hours, left turns by auto traffic would be permitted.

3. Reserved median bus lane on the Sunset Highway from Canyon Road to Highway 217:

   West of Canyon Road, the Sunset Highway narrows to two travel lanes in each direction. A grass median, approximately twelve feet in width, begins just west of the Canyon Road interchange. The Sunset median bus lane would be constructed in the grass median between Canyon Road and the Highway 217 interchange.

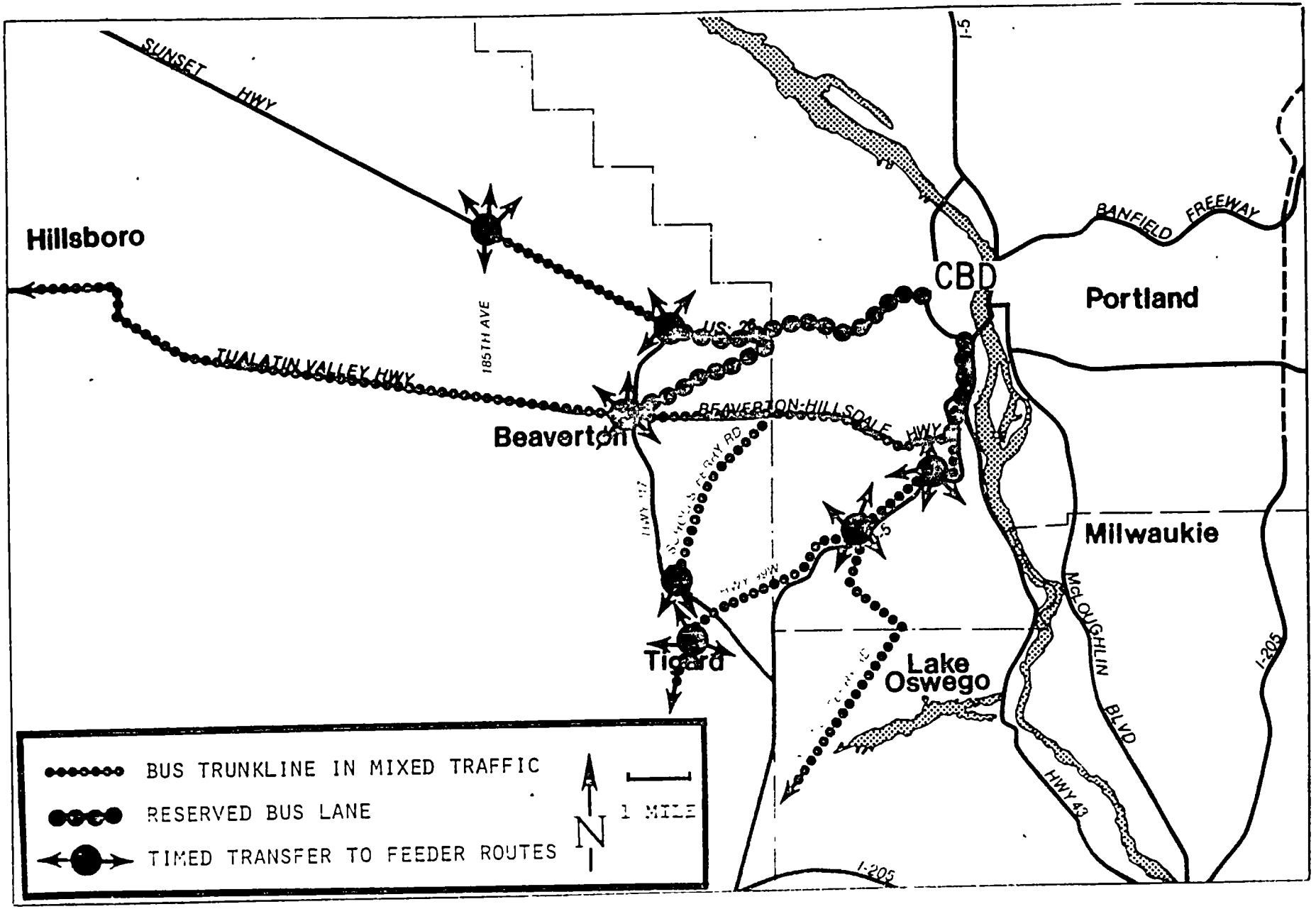

FIGURE VI-1: THE SUNSET BUSLANE OPTION

SEE SPECIAL REPORT NO. 5: WESTSIDE TRANSITWAY OPTIONS, SECTION III-C, FOR FURTHER DESCRIPTION

At Highway 217 buses would leave the Sunset and turn south to Beaverton in mixed traffic. Widening of the Sunset in this section would be required to accommodate the median bus lane.

The Sunset Hwy. Contra-flow bus lane is a necessary component if either reversible bus lane option is to be considered, since contra-flow operation would occur in the portion of the corridor which experiences the greatest congestion and delay. With the Sunset Hwy. contra-flow bus lane from downtown Portland to Canyon Rd., buses could operate west of Canyon Rd. in either reversible bus lane, in both bus lanes, or in mixed traffic.

B. Type of Evaluation:

✓Fatal Flaw Analysis (Section C only)

Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

✓Applicable Not-Applicable

Sunset Contra-Flow:

The Sunset Highway provides the only east-west freeway connection between Washington County and Portland. Constructon of the existing six-lane freeway was accomplished using significant cuts, fills and retaining walls to achieve the present four-six percent grades. The Sunset Highway route is the most direct of the three westside route options but has the most severe grades rising rapidly from an elevation of 150' downtown to 750' near the Skyline Boulevard interchange. The grade west of Highway 217 drops off more gradually to an elevation of 450'.

Fatal Flaw Analysis - Sunset Centra-flow Lane:

The Sunset Contra-flow lane is being discarded from further consideration for the following reasons:

- insufficient capacity exists to take a lane away from the off-peak direction;
- minor time savings would be achieved for the buses due to the short length of the facility;
- daily operating costs would be incurred to place and remove cones to reserve the lane;
- construction costs would be incurred to widen the fast lane in each direction to 16'; and
- the operation would be hazardous due to the steep grades.

1. Capacity

As shown in Table VI-1, during the a.m. peak hour, the westbound off-peak direction operates with an excess capacity of 750 vehicles per hour at Level of Service "C." If the fast lane were taken away from traffic for peak direction, contra-flow buses, the resultant volume/capacity ratio would be 2400/1775 = 1.35. This indicates that serious congestion would be created in the off-peak direction. This situation is caused by the reduction in westbound capacity from normal conditions due to the steep grade. In particular, the slow lane is severely reduced (to 400 veh/hr) due to slow moving truck traffic.

In the p.m. peak hour, the eastbound, off-peak direction operates with an excess capacity of 1645 vehicles per hour at Level of Service "C." If the fast lane were taken away, the resultant volume/capacity ratio would be 2750/2930 = .94. This indicates that excess capacity may be available to use for the p.m. contra-flow lane but the off-peak direction of travel would be approaching congested conditions. However, a p.m. contra-flow lane provides insufficient time savings to warrant construction due to the severe impact on bus speeds due to the grade (see next section).

2. Bus Speeds

As shown in Table VI-2, the maximum uphill speed that can be achieved by a bus is approximately 25 mph. As such the potential benefit attributable to a westbound contra-flow lane is to increase peak hour speeds of the bus from the highway congested level of 16 mph to 25 mph. Over the 7500' length of the facility, this would result in a travel time savings of only two minutes per bus (i.e., the bus would traverse the 7500' length in 3.4 minutes rather than 5.4 minutes).

Fatal Flaw Analysis - Sunset Median Bus Lane:

The Sunset median bus lane is being discarded from further consideration for the following reasons:

1. Buses would operate in mixed highway traffic from the end of the bus lane, at Canyon Road, to downtown Portland since it is infeasible to construct a contra-flow lane. As such, the reversible bus lane would provide 1.6 miles of improved speeds while the final 2.4 mile section to downtown from Canyon Rd. would be inhibited by peak hour auto speeds.

Table VI-1: Sunset Highway 1979 Volume and Capacity (Canyon Road to Jefferson Street ramps)

a. Eastbound (inbound) Capacity

Level of Service "C" -- 3 lanes @ 1465/lane = 4395 veh/hr
Level of Service "D" -- 3 lanes @ 1765/lane = 5295 veh/hr
Level of Service "E" -- 3 lanes @ 1915/lane = 5745 veh/hr

b. Westbound (outbound) Capacity

Level of Service "C" -- 2 lanes @ 1375/lane, slow lane @ 400/lane = 3150 veh/hr
Level of Service "D" -- 2 lanes @ 1750/lane, slow lane @ 500/lane = 4000 veh/hr
Level of Service "E" -- 2 lanes @ 2250/lane, slow lane @ 500/lane = 5000 veh/hr

c. Existing Peak-Hour Volumes

	AM	PM
Eastbound	5220	2750
Westbound	2400	4100

d. Existing V/C Ratio

	AM		PM	
	Eastbound	Westbound	Eastbound	Westbound
Level of Service "C"	1.2	.8	.6	1.3
Level of Service "D"	1.0	.6	.5	1.0
Level of Service "E"	.9	.5	.5	.8

Table VI-2: Sunset Highway Operating Speeds (Canyon Road to Jefferson Street ramps)

	Bus Speeds	Auto Speeds
Westbound (uphill)		
Peak hour - 1977	25	34
Peak hour - 1995	16	16
Free flow	25	55

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2. Major construction costs would be incurred by the highway widening and a "lift-out" structure at Highway 217. The median between Canyon Road and Highway 217 is approxiately 12 feet wide. A median bus lane would be 20 feet wide, to allow a disabled bus to be passed, plus eight feet for concrete barriers on each side. This results in 16 feet of highway widening necessary to accommodate a single bus lane.

   At the west end, a "lift-out" structure would be needed to allow buses to have high speed access to Highway 217, avoiding the highway weave movements. These major capital costs are not warranted for the short length of improved travel speeds.

3. Unsafe traffic conditions would be created at the east end of the bus lane. Since it is necessary for buses to operate in mixed traffic from Canyon Road to downtown, the buses would merge from the reserved lane to the normal traffic lanes. This left hand merge with the fast lane on the Sunset Highway would be an unsafe condition for both buses and autos.

Fatal Flaw Analysis - Canyon Road Median Bus Lane

Canyon Road is a four-lane arterial providing a connection between the Beaverton CBD and the Sunset Highway. Between the Sunset Highway and S.W. 87th the road traverses along a side hill consisting mainly of residential properties. The grade is between four and six percent in this section. A median bus lane would require additional widening which would impact abutting residential properties, many of which presently have difficult street access to Canyon Road. In addition, the significant cut and fill construc- tion which would be required would create some difficulty maintaining access to the few intersecting residential streets.

West of S.W. 87th the continuous left-turn lane would be converted to peak-hour bus use. This would eliminate left-turn movements during both the a.m. and p.m. peak. This section of Canyon Road is almost entirely devoted to commercial uses on both sides. Collectively this section of Canyon Road has been referred to as "Auto Row" because of the numerous auto dealerships found here. The remaining commercial interests on Canyon Road are all auto-oriented. In addition, roughly 10 streets intersect with Canyon and provide access to the residential areas on each side. Turning movements at intersections such as Walker Road and S.W. 107th are presently in excess of 500 vehicles per day.

There are presently only four traffic signals along the section of Canyon between the Sunset Highway and Highway 217. Three of these four signals provide access primarily to residential areas. This indicates the dependence placed on the continuous left-turn lane by the commercial interests. Because of the existing street pattern the majority of these businesses only have access to Canyon Road. The elimination of the continuous left-turn lane during peak hours would severely impact the commercial interests and the traffic circulation pattern on Canyon Road.

Because of grade restrictions on Canyon, buses in a reserved lane will achieve a maximum speed of 27 mph in the eastbound direction. By 1995, the peak hour highway speed on Canyon is expected to be 25 mph. No real time-savings in terms of travel speeds will be achieved by providing a reserved facility for buses. In addition, buses entering the Sunset Highway will operate in mixed traffic for the remainder of the trip to downtown Portland, providing no time-savings in this section.

A bus lane on Canyon Road between the Sunset Highway and Beaverton does not warrant further consideration for the following reasons:

1. Impact on commercial and residential access off of Canyon Road and traffic circulation by the removal of the continuous left turn lane during peak hours.

2. Impact on residential properties in the eastern portion of Canyon Road due to required widening of the additional lane.

3. Due to grade restrictions, bus travel speeds will be roughly equal to peak-hour highway speeds, thereby offering no time savings.

D. 1995 Transit use

Applicable Not-Applicable ✓

E. 1995 Highway Service Levels:

Applicable Not Applicable ✓

F. 1995 Access to Opportunities:

Applicable Not-Applicable ✓

G. 1995 Environmental Quality:

Applicable Not-Applicable ✓

H. 1995 Costs and Efficiency:

Applicable Not-Applicable ✓

I. Description of Land Use Considerations:

Applicable Not-Applicable ✓

J. Description of Right-of-Way Impacts:

Applicable Not-Applicable ✓

K. Transit Network Considerations:

Applicable Not-Applicable ✓

VII. SKETCH EVALUATION OF THE SUNSET BUSWAY OPTION

A. Description: Figure VII-1

The Sunset Busway alternative would consist of a grade separated, two-lane bus only roadway from a point on Canyon Road just west of the Vista Avenue Bridge in Portland to Canyon Road at Higwhay 217 in Beaverton, by way of Cedar Hills Shopping Center. At the east end of the busway, bus-only lanes on city streets would connnect to the Transit Mall. At the west end, bus-only lanes would provide a bus preferential route westwards from Highway 217 through Beaverton and along Tualatin Valley Highway, to S. W. 185th. See Special Report No. 5: Westside Transitway Options for more detail.

B. Type of Evaluation:

Fatal Flaw Analysis (Section C only)

✓ Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

Applicable Not-Applicable ✓

D. 1995 Transit use

✓ Applicable Not-Applicable

1. Transit Service Levels

   a. Peak Hour Transit Travel Times Between Major Points in the Corridor: Table VII-1

2. Transit Trips Between Communities in the Westside Corridor

   a. Peak-Hour Trips: Table VII-2
   b. Daily Home Based Trips: Table VII-3
   c. Corridor Ridership: Table VII-4

3. Trips Using the Major Trunk Routes in the Sunset Busway Option

   a. Total Daily Trips: Figure VII-2

E. 1995 Highway Service Levels:

✓ Applicable Not Applicable

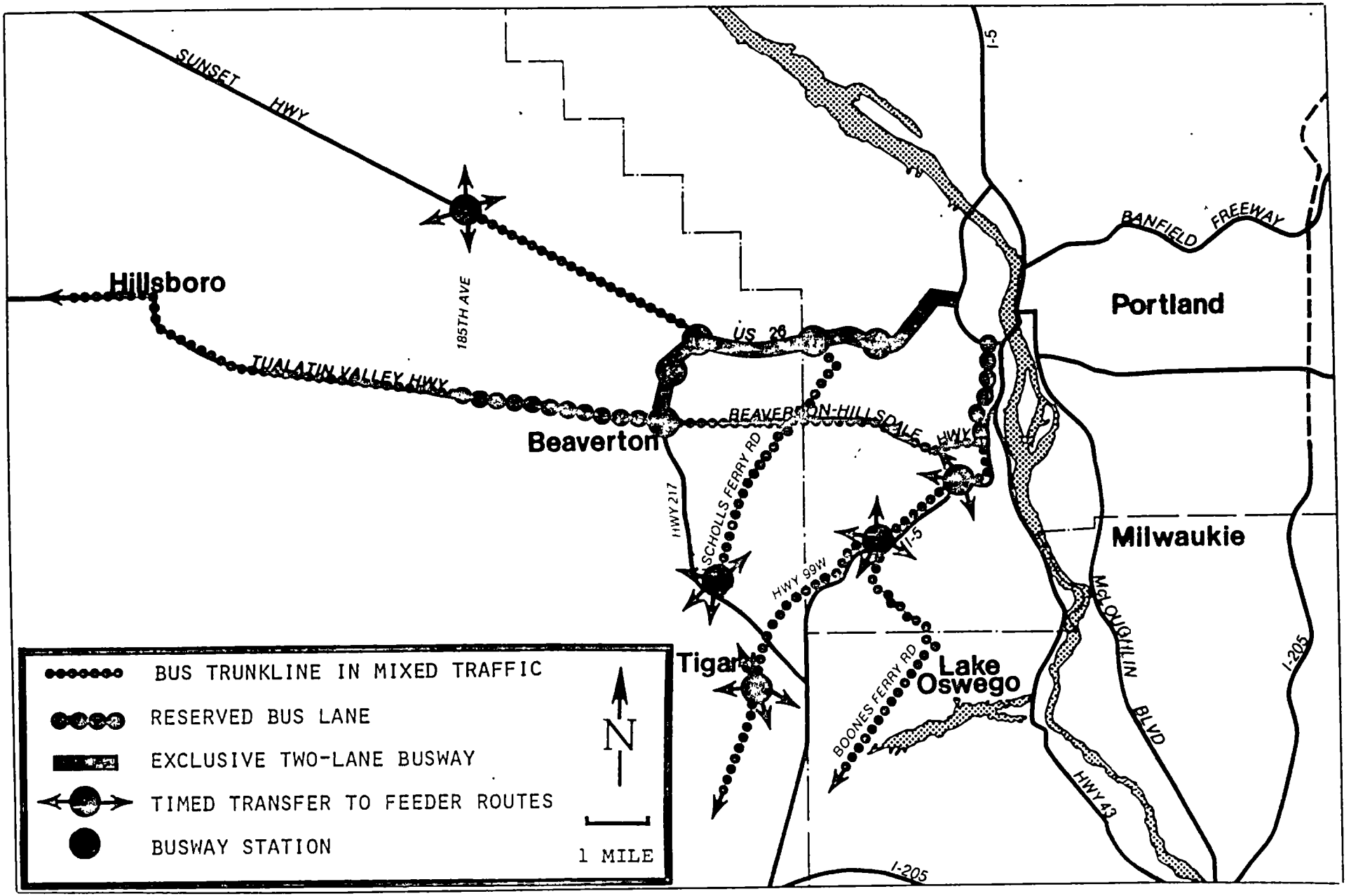

FIGURE VII-1: THE SUNSET BUSWAY OPTION

SEE SPECIAL REPORT NO. 5: WESTSIDE TRANSITWAY OPTIONS, SECTION III-D, FOR FURTHER DESCRIPTION.

1. Highway Use

   a. Daily Traffic Volumes on Selected Road Segments: Figure VII-3
   b. Peak-Hour Capacity Deficiencies at Selected Cutlines: Table VII-5

F. 1995 Access to Opportunities:

✓Applicable Not-Applicable

1. Job Opportunities for Corridor Residents: Table VII-6

2. Potential Market for Major Business Areas: Table VII-7

G. 1995 Environmental Quality:

✓Applicable Not-Applicable

1. Energy Consumption

   a. Daily Corridor Energy Consumption: Table VII-8

2. Neighborhood Quality

   a. Regional Traffic through Neighborhoods: Table VII-9

3. Air Quality

   a. Hydrocarbon and Nitrogen Oxide Emmissions: Table VII-10

H. 1995 Costs and Efficiency:

✓Applicable Not-Applicable

1. Capital Costs: Table VII-11

2. Operating Costs: Table VII-12

3. Transit System Productivity: Table VII-13

I. Description of Land Use Considerations:

✓Applicable Not-Applicable

Downtown Portland to the Highway 217 Interchange:

Major land use activities in this segment include the Washington Park Zoo/Oregon Museum of Science and Industry (OMSI) complex with over 1.1 million annual visitors, St. Vincents Medical Center and the Peterkort Development.

The latter two activities are situated at the Highway 217/Sunset interchange. St Vincents is a major regional medical facility with 1,200 employees. Land surrounding the medical facility has developed into ancillary uses, such as medical clinics and office uses.

The Peterkort Development is a proposed mixed-use development just west of St. Vincents. The proposal includes 1,060 dwelling units (2,200 population), the corporate headquarters of a major Oregon corporation (3,000 employees projected), and additional office and commercial uses. Total projected employment for all activities in the proposal is 8,115.

Existing residential activity in this segment is predominantly single-family use on the south side of the Sunset Highway. Multi-family uses are found at the Sylvan interchange area and along the north side of the Sunset between Sylvan and Hwy 217.

Highway 217 Interchange to Beaverton (Murray Boulevard)

As the route enters Beaverton, commercial activities prevail. Beaverton is presently reviewing the central business district activities through urban renewal plans. Two major developments, a 500,000 square foot shopping center presently under construction and a major hotel/retail/office complex scheduled for construction, will have a major influence on the future character of central Beaverton. Certain areas within the CBD are experiencing conversion to more intensive commercial and office uses.

Western Beaverton is dominated by the presence of Tektronix, Oregon's largest private employer. Tektronix has roughly 10,000 employees at this location and serves as the foundation for the largest employment concentration within Washington County. An additional 3,600 jobs are presently found within the immediate area.

The Beaverton vicinity is the major residential area within Washington County. Roughly 60 percent of the County's population resides in the Beaverton/Eastern Washington County area. Major residential areas include the South Beaverton/Farmington area and the Cedar Hills area, north of Beaverton.

Beaverton to S. W. 185th

West of Beaverton, the land uses reflect pockets of strip commercial and industrial development along the Tualatin Valley Hwy. Significant single-family development has occurred, primarily south of the route. Multi-family development is found interspersed along the highway. The

route would end at S. W. 185th in the Aloha area. A community level commercial center is located at this point.

J. Description of Right-of-Way Impacts:

✓Applicable Not-Applicable

The right-of-way impacts of this option include the potential displacements of nine residential buildings and 33 commercial buildings, and some restricted driveway access in Beaverton.

K. Transit Network Considerations:

✓Applicable Not-Applicable

As with the TSM Bus Improvements Only Option, this option results in 644 buses in downtown Portland per hour during peak periods. This would exceed the capacity of the Transit Mall by 124 buses per hour. However, 112 buses would be concentrated on the exclusive busway, reducing the bus volume in the Sunset Highway by 94 buses per hour and Barbur Blvd. by 76 buses per hour.

Table VII-1: 1995 P.M. Peak Hour Transit Travel Times Between Major Points in the Westside Corridor Assuming the Sunset Busway Option

ORIGIN	DESTINATION: Hillsboro		Beaverton		Tigard		S.W. Portland		Portland CBD	
	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)
Hillsboro	xx	xx	23	-4	48	-23	54	-36	44	-36
Beaverton	23	-4	xx	xx	30	-21	34	-24	27	-40
Tigard	48	-23	30	-21	xx	xx	15	-17	33	-13
SW Portland	54	-36	34	-24	15	-17	xx	xx	17	-15

Table VII-2: 1995 A.M. Peak Hour In-Bound Transit Use Between Communities in the Westside Corridor (Local Trips Excluded) Assuming the Sunset Busway Option

ORIGIN	DESTINATION: Close-In Portland		DESTINATION: In-Bound Total	
	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity				
Transit Riders	710	+9	950	+12
Mode Split	63%	+9	40%	+11
Aloha Vicinity				
Transit Riders	690	+116	890	+111
Mode Split	49%	+96	18%	+100
West Beaverton Vicinity				
Transit Riders	670	+46	850	+45
Mode Split	52%	+33	24%	+41
East Beaverton Vicinity				
Transit Riders	1,230	+276	1,360	+226
Mode Split	55%	+139	41%	+141
S.W. Portland Vicinity				
Transit Riders	2,640	+13	2,640	+13
Mode Split	48%	+9	48%	+9
Tigard Vicinity				
Transit Riders	880	+29	970	+28
Mode Split	60%	+22	48%	+30
Total				
Transit Riders	6,820	+43	7,660	+43
Mode Split	52%	+27	35%	+35

Table VII-3: 1995 Transit Use Between Communities in the Westside Corridor
Assuming the Sunset Busway Option: Home Based Trips

TRIPS PRODUCED IN:		TRIPS ATTRACTED TO: Hillsboro/ Forest Grove Vicinity		Aloha Vicinity		West Beaverton Vicinity		East Beaverton Vicinity		S.W. Portland		Close-in Portland		Tigard Vicinity		Portland C.B.D.	
		1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null
Hillsboro/ Forest Grove Vicinity	Trips	1,030	+17%	260	+37%	320	+10%	390	+11%	290%	+53%	3,440	+9%	240	+71%	2,570	+3%
	Mode Split	1%	0	6%	+50%	10%	+11%	13%	+8%	17%	+55%	44%	+10%	20%	+82%	62%	+3%
Aloha Vicinity	Trips	180	+100%	330	+74%	420	+91%	400	+74%	210	+75%	3,670	+97%	190	+111%	2,900	+71%
	Mode Split	7%	+75%	1%	0	2%	+100%	3%	+50%	6%	+100%	29%	+107%	4%	+100%	39%	+86%
West Beaverton Vicinity	Trips	100	+25%	210	+62%	620	+29%	530	+26%	190	+27%	3,330	+40%	280	+115%	3,050	+41%
	Mode Split	10%	+25%	2%	+100%	2%	0	4%	+33%	6%	+50%	31%	+41%	5%	+150%	46%	+39%
East Beaverton Vicinity	Trips	120	+50%	190	+58%	500	+39%	1,130	+31%	440	+47%	6,240	+31%	300	+67%	5,680	+31%
	Mode Split	16%	+45%	4%	+100%	5%	+67%	2%	0	8%	+33%	34%	+26%	6%	+100%	51%	+24%
S.W. Portland Vicinity	Trips	160	+100%	70	+40%	120	+71%	250	+79%	1,310	+34%	14,460	+18%	710	+52%	12,990	+15%
	Mode Split	20%	+100%	6%	+50%	7%	+75%	7%	+75%	3%	+50%	31%	+19%	8%	+60%	46%	+18%
Tigard Vicinity	Trips	130	+160%	50	+67%	130	+117%	170	+89%	530	+23%	4,770	+32%	950	+64%	4,130	+31%
	Mode Split	25%	+178%	7%	+75%	9%	+125%	9%	+800%	10%	+25%	45%	+45%	2%	+100%	64%	+33%

Table VII-4: 1995 Daily (Home Based) Transit Ridership Between Communities in the Westside Corridor Assuming the Sunset Busway Option

TRIPS PRODUCED IN:	TRIPS ATTRACTED TO: Close-In Portland 1995 Est.	Close-In Portland Diff From Null (%)	Rest of Corridor 1995 Est.	Rest of Corridor Diff From Null (%)	Total 1995 Est.	Total Diff From Null (%)
Hillsboro/ Forest Grove Vicinity						
Trips	3,440	+9	2,530	+24	5,970	+15
Mode Split	44%	+10	2%	0	4%	0
Aloha Vicinity						
Trips	3,670	+97	1,730	+84	5,400	+93
Mode Split	29%	+107	2%	+100	6%	+100
West Beaverton Vicinity						
Trips	3,330	+40	1,930	+39	5,260	+40
Mode Split	31%	+41	3%	+50	8%	+60
East Beaverton Vicinity						
Trips	6,240	+31	2,680	+41	8,920	+34
Mode Split	34%	+26	3%	0	8%	0
S.W. Portland Vicinity						
Trips	14,460	+18	2,620	+46	17,080	+21
Mode Split	31%	+19	4%	+33	16%	+23
Tigard Vicinity						
Trips	4,770	+32	1,960	+58	6,730	+39
Mode Split	45%	+45	3%	+50	10%	+43
Total						
Trips	35,910	+28	13,450	+44	49,360	+32
Mode Split	33%	+27	2%	0	8%	+14

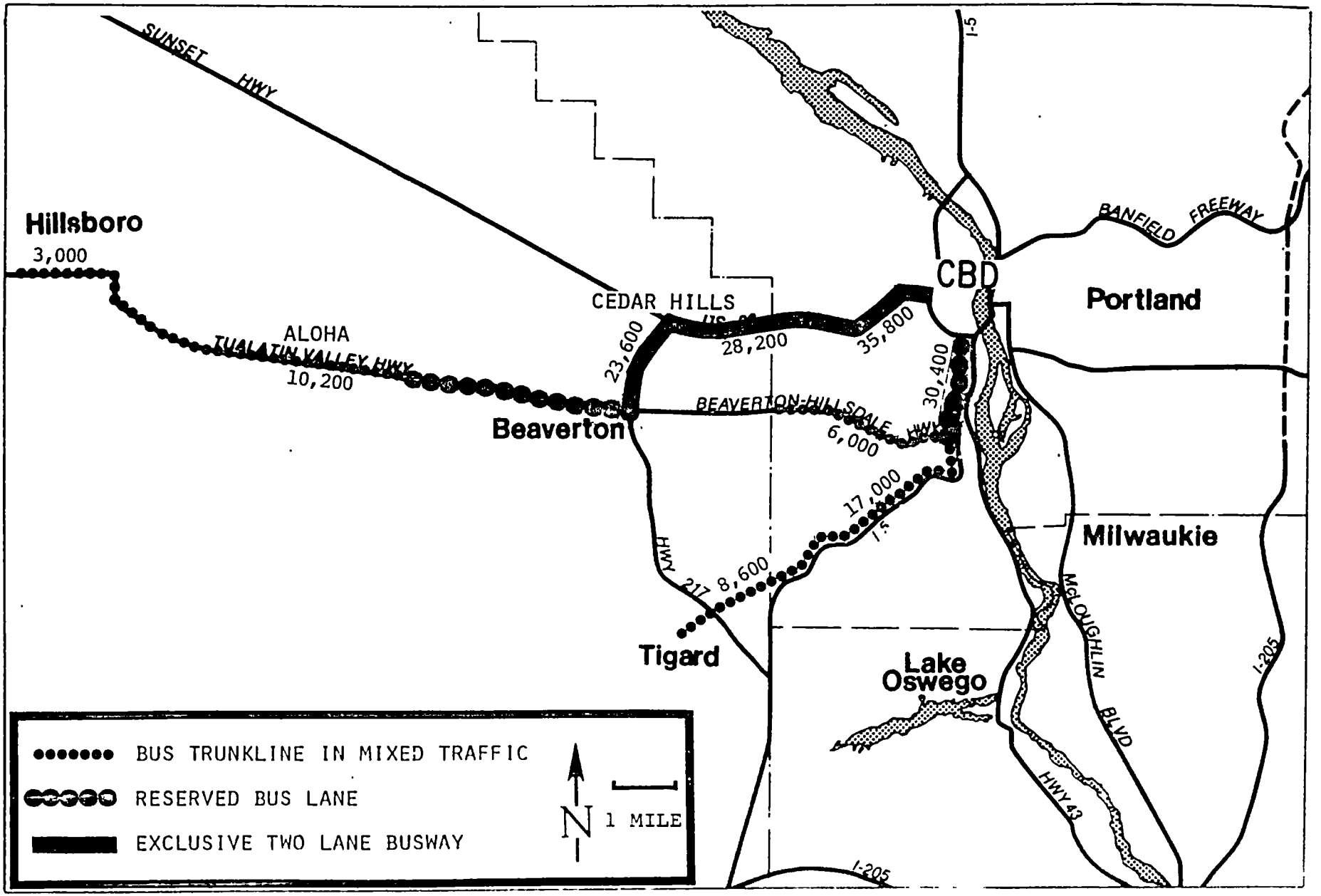

FIGURE VII-2: TOTAL DAILY TRANSIT TRIPS USING THE MAJOR TRUNK ROUTES IN THE SUNSET BUSWAY OPTION

FIGURE VII-3: 1995 TRAFFIC VOLUMES ON SELECTED ROAD SEGMENTS ASSUMING THE SUNSET BUSWAY OPTION

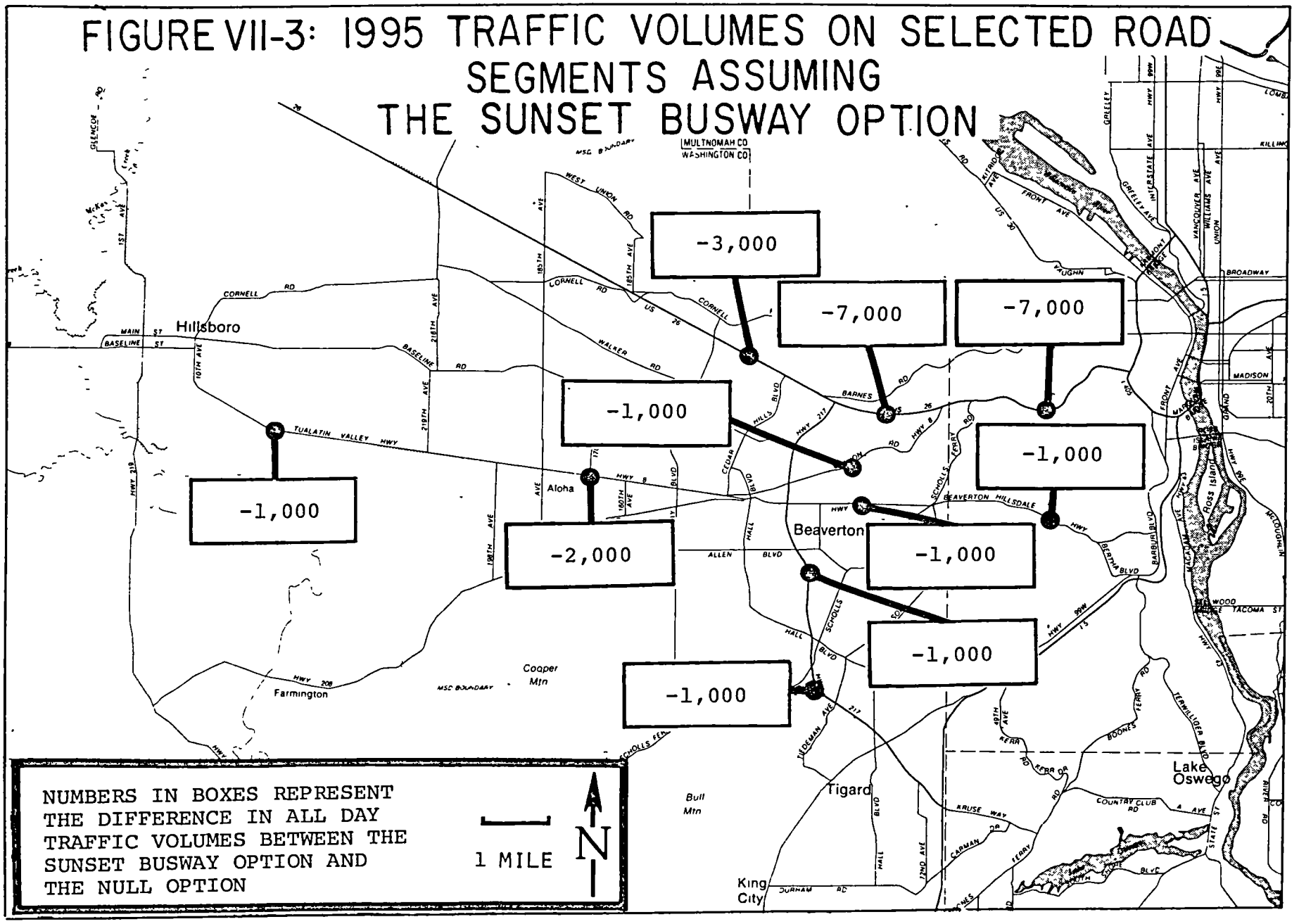

Table VII-5: 1995 P.M. Peak Hour, Peak Direction Capacity Deficiencies at Selected Cutlines Assuming the Sunset Busway Option

Cutline	Percent Above Capacity	Percent Reduction in Capacity Deficiency from the Null
Westside Corridor		
At SW 219th (from TV Hwy to Sunset Hwy)	0	0
At Murray Blvd (From TV Hwy to Cornell Rd)	40%	-20%
At Hwy 217 (From Denney Rd to Sunset Hwy)	20%	-33%
At Multnomah County Line (From Taylors Ferry Rd to Burnside)	10%	0

Table VII-6: 1995 P.M. Peak Hour Job Accessibility for Corridor Residents Assuming the Sunset Busway Option

Home Location	Number of Jobs Within 30 Minutes	Difference From Null
Beaverton	243,900	+85%
Hillsboro	85,200	+22%
Tigard	120,000	+3%
SW Portland	292,400	+15%

Table VII-7: 1995 P.M. Peak Hour Market Potential for Major Business Centers in the Westside Corridor Assuming the Sunset Busway Option

Business Location	Number of People Within 30 Minutes	Difference From Null
Beaverton CBD	362,900	+8%
Portland CBD	541,100	+31%
Hillsboro CBD	230,400	+13%
Washington Square	339,700	+3%

Table VII-8: 1995 Daily Corridor Energy Consumption for the Sunset Busway Option

	1995 Estimate	Difference From Null
Gasoline (Gallons)	91,320	-5%
Diesel (Gallons)	11,549	+161%
Electricity (KWH)[1]	N/A	N/A

[1] Light Rail Transit Propulsion

Table VII-9: 1995 Potential Regional Traffic Through Neighborhoods During P.M. Peak-Hour Assuming the Sunset Busway Option

Community	Potential Through Trips	Difference From Null
Beaverton	980	-30%
SW Portland	850	-47%

Table VII-10: 1995 Air Pollution Emissions Assuming the Sunset Busway Option

Geographic Area:	Hydrocarbon Emissions Tons/Year	Difference From Null	Nitrogen Oxide Tons/Year	Difference From Null
Westside Corridor	7,870	-5%	8,190	-1%
Regionwide	30,800	-4%	33,900	-2%

Table VII-11: Project Capital Costs for the Sunset Busway Option

Cost Item	Cost (1978 Dollars)
Right of Way	$ 7,300,000
Construction	48,660,000
Stations	17,840,000
Rolling Stock[1]	32,495,000
Total Cost	$106,295,000
Annualized Capital Cost	$6,122,000

[1]Vehicles required in addition to Null Option (Null: 186 buses at $135,000 per bus = $25,110,000)

Table VII-12: 1995 Transit Operating Costs and Subsidies for the Sunset Busway Option

	Annual Costs and Revenues (1978 $)	Difference From Null
Westside Corridor		
Bus	$27,970,000	+64%
LRT	0	0
Total Operating Costs	$27,970,000	+64%
Farebox Revenue	$7,414,000	+41%
Operating Subsidy	$20,556,000	+74%
Regionwide		
Bus	$87,884,000	+42%
LRT	3,570,000	0
Total Operating Costs	$91,454,000	+39%
Farebox Revenue	$26,171,000	+31%
Operating Subsidy	65,283,000	+43%

Table VII-13: 1995 Transit System Productivity for the Sunset Busway Option

Productivity Measure	1995 Estimate	Difference From Null
Westside Corridor		
Operating Cost/ Passenger	$1.14	+14%
Operating Subsidy/ Passenger	.83	+20%
Farebox Revenue/ Operating Cost	27%	-13%
Total Annualized[1] Cost/Passenger	$1.38	+38%
Annualized Local[2] Cost/Passenger	.88	+29%
Regionwide		
Operating Cost/ Passenger	$1.16	+5%
Operating Subsidy/ Passenger	.83	+8%
Farebox Revenue/ Operating Cost	29%	-3%

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[1]Total Annualized Cost = Annualized Capital Cost plus operating cost

[2]Annualized Local Cost = Local share of Annualized Cost plus operating subsidy

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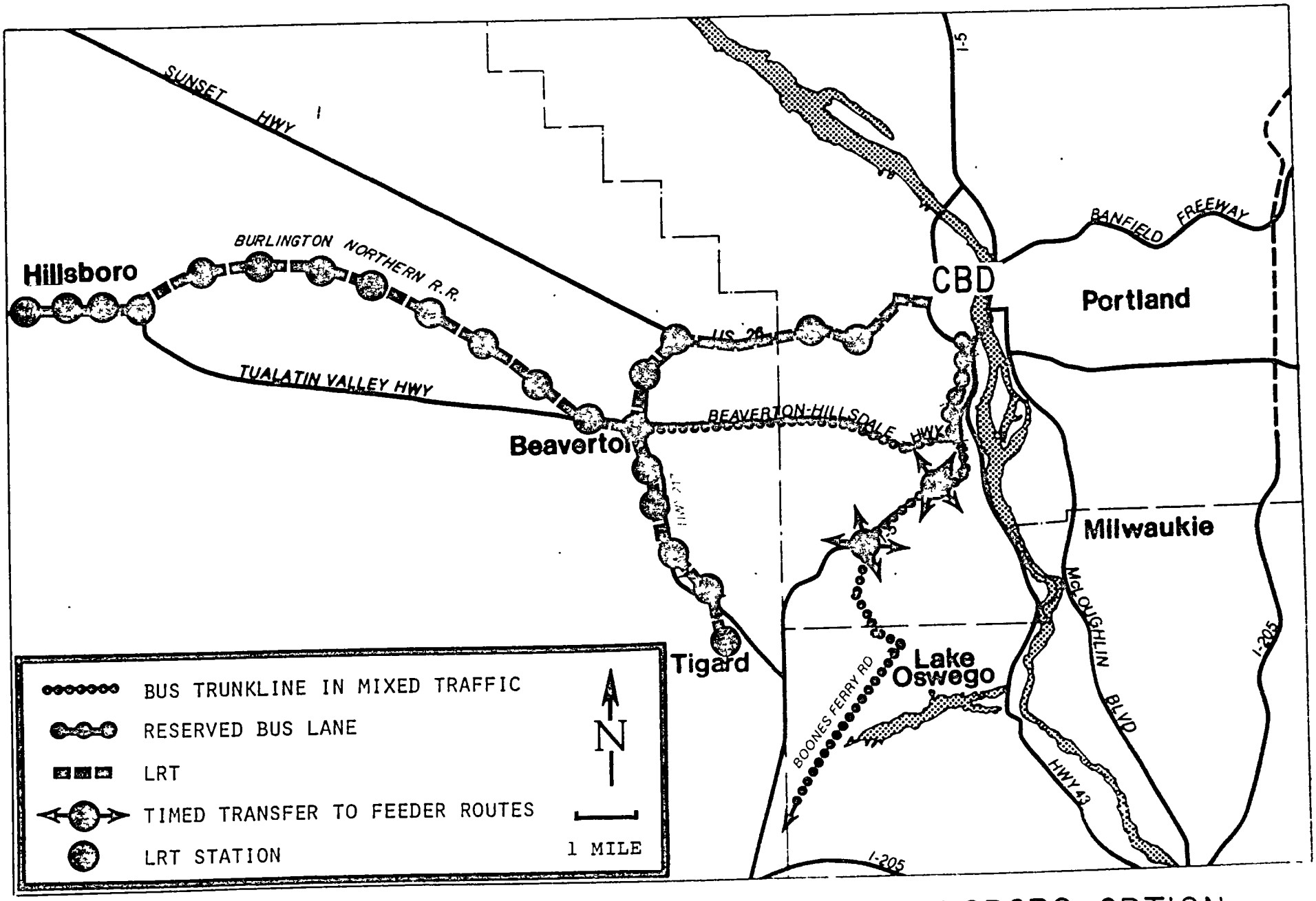

FIGURE VIII-I: THE SUNSET LRT TO TIGARD AND HILLSBORO OPTION

SEE SPECIAL REPORT NO. 5: WESTSIDE TRANSITWAY OPTIONS, SECTION III-H, FOR FURTHER DESCRIPTION

VIII. SKETCH EVALUATION OF THE SUNSET LRT TO TIGARD AND HILLSBORO OPTION

A. Description: Figure VIII-1

This Sunset LRT option would extend from downtown Portland, where it would connect directly with the Banfield LRT, to Beaverton via Sunset Highway and Highway 217. From Beaverton the LRT line would extend westwards to Hillsboro via either (a) Tualatin Valley Highway, (b) the Southern Pacific Railroad R.O.W. or (c) the Burlington Northern Railroad R.O.W. In addition, the LRT network would extend southward near Highway 217 to Washington Square and Tigard.

B. Type of Evaluation:

Fatal Flaw Analysis (Section C only)

✓ Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

Applicable Not-Applicable ✓

D. 1995 Transit use

✓ Applicable Not-Applicable

1. Transit Service Levels

   a. Peak Hour Transit Travel Times Between Major Points in the Corridor: Table VIII-1

2. Transit Trips Between Communities in the Westside Corridor

   a. Peak-Hour Trips: Table VIII-2
   b. Daily Home Base Trips: Table VIII-3
   c. Corridor Ridership: Table VIII-4

3. Trips Using the Major Trunk Routes in the Sunset LRT to Tigard and Hillsboro Option

   a. Total Daily Trips: Figure VIII-2

E. 1995 Highway Service Levels:

✓ Applicable Not Applicable

1. Highway Use

a. Daily Traffic Volumes on Selected Road Segments: Figure VIII-3
b. Peak-Hour Capacity Deficiencies at Selected Cutlines: Table VIII-5

F. 1995 Access to Opportunities:

✓Applicable Not-Applicable

1. Job Opportunities for Corridor Residents: Table VIII-6

2. Potential Market for Major Business Areas: Table VIII-7

G. 1995 Environmental Quality:

✓Applicable Not-Applicable

1. Energy Consumption

a. Daily Corridor Energy Consumption: Table VIII-8

2. Neighborhood Quality

a. Regional Traffic through Neighborhoods: Table VIII-9

3. Air Quality

a. Hydrocarbon and Nitrogen Oxide Emmissions: Table VIII-10

H. 1995 Costs and Efficiency:

✓Applicable Not-Applicable

1. Capital Costs: Table VIII-11

2. Operating Costs: Table VIII-12

3. Transit System Productivity: Table VIII-13

I. Description of Land Use Considerations:

✓Applicable Not-Applicable

Downtown Portland to the Highway 217 Interchange:

Major land use activities in this segment include the Washington Park Zoo/Oregon Museum of Science and Industry (OMSI) complex with over 1.1 million annual visitors, St. Vincents Medical Center and the Peterkort Development. The latter two activities are situated at the Highway

217/Sunset interchange. St Vincents is a major regional medical facility with 1,200 employees. Land surrounding the medical facility has developed into ancillary uses, such as medical clinics and office uses.

The Peterkort Development is a proposed mixed-use development just west of St. Vincents. The proposal includes 1,060 dwelling units (2,200 population), the corporate headquarters of a major Oregon corporation (3,000 employees projected), and additional office and commercial uses. Total projected employment for all activities in the proposal is 8,115.

Existing residential activity in this segment is predominantly single-family use on the south side of the Sunset Highway. Multi-family uses are found at the Sylvan interchange area and along the north side of the Sunset between Sylvan and Hwy 217.

Highway 217 Interchange to Beaverton (Murray Boulevard)

As the route enters Beaverton, commercial activities prevail. Beaverton is presently reviewing the central business district activities through urban renewal plans. Two major developments, a 500,000 square foot shopping center presently under construction and a major hotel/retail/office complex scheduled for construction, will have a major influence on the future character of central Beaverton. Certain areas within the CBD are experiencing conversion to more intensive commercial and office uses.

Western Beaverton is dominated by the presence of Tektronix, Oregon's largest private employer. Tektronix has roughly 10,000 employees at this location and serves as the foundation for the largest employment concentration within Washington County. An additional 3,600 jobs are presently found within the immediate area.

The Beaverton vicinity is the major residential area within Washington County. Roughly 60 percent of the County's population resides in the Beaverton/Eastern Washington County area. Major residential areas include the South Beaverton/Farmington area and the Cedar Hills area, north of Beaverton.

Beaverton to Hillsboro

This segment of the route passes through a rapidly urbanizing portion of unincorporated Washington County. Much of this land is presently designated as Urban Intermediate on the County's Framework Plan and, therefore, is vacant. The County is presently considering major proposals for conversion to Urban designations in the S. W. 185th vicinity.

Existing land uses in this segment include the Tualatin Valley Park and Recreation complex, the Town Center/ Tanasbourne area, and the industrial area at S. W. 185th and Walker Road. The Town Center/Tanasbourne area includes a major shopping center and medium to high density condominiums. Tektronix has another site at the S. W. 185th industrial area with 200 employees. Also included at this site are the Oregon Primate Research Center and the Oregon Graduate Center.

As the route enters Hillsboro it passes through the Hawthorne Farms Industrial Park. The Intel Corporation has just completed construction of a major electronics pland which is projected to employ 3,500 persons by 1983. The Washington County Fairgrounds and the Hillsboro Airport are located just west of Hawthorne Farms.

The City of Hillsboro has a current population of 26,000. The city has doubled its population in the past decade. Projections indicate a continuation of the rapid growth in this area.

Beaverton to Tigard

The majority of land uses along this segment are devoted to industrial and commercial uses. The Western Avenue Industrial Area (1,600 employees) is located just south of the Beaverton CBD. Washington Square, the region's largest shopping center with 1.5 million square feet, is located at the intersection of Scholls Ferry Road. The shopping center has stimulated significant office and high density residential development in the surrounding area. At the Highway 217/Hall Boulevard intersection, two major industrial developments, the GAF photo products manufacturing plant and the Knoll Business Center, have a combined employment of 1,600. Sizable vacant parcels are available for further expansion.

Residential concentrations are found in the Washington Square/Progress area and the City of Tigard.

As the route continues south to Tigard it passes through the Cascade Industrial Park prior to entering the residential areas of Tigard.

J. Description of Right-of-Way Impacts:

✓Applicable Not-Applicable

The most significant construction impacts occur in the Portland CBD to Beaverton segment of this option. Roughly 13 residential and 23 commercial buildings would be displaced in this segument. In addition, the most access restrictions occur in this segment, primarily in the

Beaverton CBD. Of the two options west of Beaverton to Hillsboro, the Southern Pacific Railroad route has the highest construction impact, 10 commercial buildings and two residential buildings as opposed to three residential buildings on the Burlington Northern Railroad route. Between Beverton and Tigard, two commercial and eight residential buildings would potentially be displaced.

K. Transit Network Considerations:

✓ Applicable Not-Applicable

1. Bus Volumes: This option results in 30 two-car trains per hour and 520 buses per hour in downtown Portland during peak periods. This reduces the total bus volume by 20 percent to equal the capacity of the Transit Mall and the Westside bus volume by 52 percent. All buses on the Sunset Hwy. to downtown would be eliminated and the bus volume on Barbur Blvd. would be reduced by 88 buses per hour.

2. Future Branching Opportunities: The Sunset Hwy. northwest of the Hwy 217 interchange is a limited access divided highway. The grass median presents the opportunity to construct a branch LRT facility at some future time, if required by new develvopment.

Table VIII-1: 1995 P.M. Peak Hour Transit Travel Times Between Major Points in the Westside Corridor Assuming the Sunset LRT to Tigard and Hillsboro Option

	DESTINATION									
ORIGIN	Hillsboro		Beaverton		Tigard		S.W. Portland		Portland CBD	
	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)
Hillsboro	xx	xx	20	-17	36	-42	45	-47	38	-45
Beaverton	20	-17	xx	xx	17	-55	25	-44	19	-58
Tigard	36	-42	17	-55	xx	xx	15	-17	29	-24
SW Portland	45	-47	25	-44	15	-17	xx	xx	17	-15

Table VIII-2: 1995 A.M. Peak Hour In-Bound Transit Use Between Communities in the Westside Corridor (Local Trips Excluded) Assuming the Sunset LRT to Tigard and Hillsboro Option

ORIGIN	DESTINATION: Close-In Portland		In-Bound Total	
	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity				
Transit Riders	860	+32	1,140	+35
Mode Split	75%	+29	46%	+28
Aloha Vicinity				
Transit Riders	870	+174	1,160	+173
Mode Split	59%	+136	22%	+144
West Beaverton Vicinity				
Transit Riders	720	+56	910	+55
Mode Split	57%	+46	26%	+53
East Beaverton Vicinity				
Transit Riders	1,210	+272	1,350	+222
Mode Split	56%	+143	52%	+206
S.W. Portland Vicinity				
Transit Riders	2,600	+11	2,600	+11
Mode Split	47%	+7	47%	+7
Tigard Vicinity				
Transit Riders	1,040	+54	1,140	+50
Mode Split	65%	+33	50%	+35
Total				
Transit Riders	7,300	+53	8,300	+55
Mode Split	55%	+34	38%	+46

Table VIII-3: 1995 Transit Use Between Communities in the Westside Corridor
Assuming the Sunset LRT to Tigard and Hillsboro Option: Home Based Trips

TRIPS ATTRACTED TO:

TRIPS PRODUCED IN:	Hillsboro/ Forest Grove Vicinity		Aloha Vicinity		West Beaverton Vicinity		East Beaverton Vicinity		S.W. Portland		Close-in Portland		Tigard Vicinity		Portland C.B.D.	
	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null
Hillsboro/ Forest Grove Vicinity																
Trips	1,120	+27%	450	+137%	360	+24%	400	+14%	220	+16%	4,010	+26%	290	+107%	3,110	+24%
Mode Split	1%	0	8%	+100%	12%	+33%	15%	+25%	17%	+55%	53%	+33%	26%	+136%	72%	+20%
Aloha Vicinity																
Trips	280	+211%	570	+200%	670	+205%	570	+126%	190	+58%	4,300	+131%	310	+244%	3,820	+125%
Mode Split	9%	+125%	2%	+100%	3%	+200%	4%	+100%	6%	+100%	35%	+150%	7%	+250%	51%	+143%
West Beaverton Vicinity																
Trips	160	+100%	440	+238%	670	+40%	550	+31%	170	+13%	3,690	+55%	340	+162%	3,290	+52%
Mode Split	13%	+63%	4%	+300%	3%	+50%	4%	+33%	6%	+50%	36%	+64%	6%	+200%	52%	+63%
East Beaverton Vicinity																
Trips	160	+100%	330	+175%	560	+56%	1,090	+27%	320	+7%	6,190	+30%	400	+122%	5,600	+29%
Mode Split	17%	+55%	5%	+150%	5%	+67%	2%	0	7%	+17%	35%	+30%	8%	+167%	52%	+27%
S.W. Portland Vicinity																
Trips	200	+150%	110	+120%	120	+71%	240	+71%	1,050	+7%	14,090	+15%	740	+59%	12,750	+13%
Mode Split	21%	+110%	8%	+100%	6%	+50%	6%	+50%	3%	+50%	43%	+65%	8%	+60%	44%	+13%
Tigard Vicinity																
Trips	230	+360%	130	+333%	190	+217%	240	+167%	510	+19%	5,580	+55%	1,090	+88%	4,710	+49%
Mode Split	34%	+278%	13%	+225%	11%	+175%	12%	+1,100%	10%	+25%	45%	+45%	2%	+100%	67%	+40%

Table VIII-4: 1995 Daily (Home Based) Transit Ridership Between Communities in the Westside Corridor Assuming the Sunset LRT to Tigard and Hillsboro Option

TRIPS PRODUCED IN:	TRIPS ATTRACTED TO: Close-In Portland 1995 Est.	Close-In Portland Diff From Null (%)	Rest of Corridor 1995 Est.	Rest of Corridor Diff From Null (%)	Total 1995 Est.	Total Diff From Null (%)
Hillsboro/ Forest Grove Vicinity						
Trips	4,010	+26	2,840	+39	6,850	+31
Mode Split	53%	+33	2%	0	5%	+25
Aloha Vicinity						
Trips	4,300	+131	2,590	+176	6,890	+146
Mode Split	35%	+150	4%	+300	8%	+167
West Beaverton Vicinity						
Trips	3,690	+55	2,330	+68	6,020	+60
Mode Split	36%	+64	4%	+100	8%	+60
East Beaverton Vicinity						
Trips	6,190	+30	2,860	+51	9,050	+36
Mode Split	35%	+29	4%	+33	10%	+25
S.W. Portland Vicinity						
Trips	14,090	+15	2,460	+37	16,550	+18
Mode Split	43%	+65	4%	+33	19%	+46
Tigard Vicinity						
Trips	5,580	+55	2,390	+92	7,970	+64
Mode Split	45%	+45	4%	+100	10%	+43
Total						
Trips	37,860	+35	15,470	+66	53,330	+43
Mode Split	41%	+58	3%	+50	10%	+43

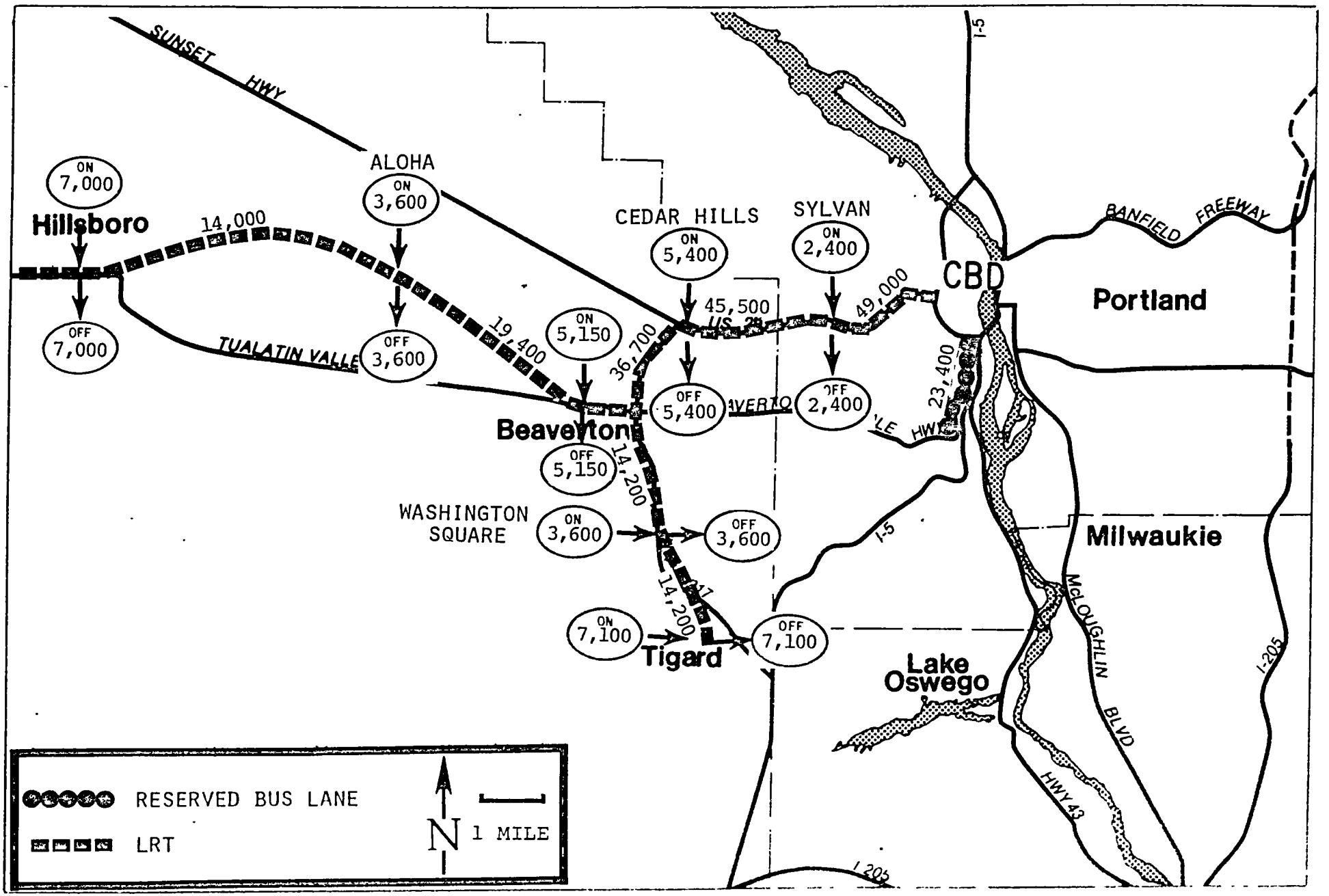

FIGURE VIII-2: TOTAL DAILY TRANSIT TRIPS USING THE SUNSET LRT TO TIGARD AND HILLSBORO OPTION

FIGURE VIII-3 :1995 TRAFFIC VOLUMES ON SELECTED ROAD SEGMENTS ASSUMING THE SUNSET LRT TO TIGARD AND HILLSBORO OPTION

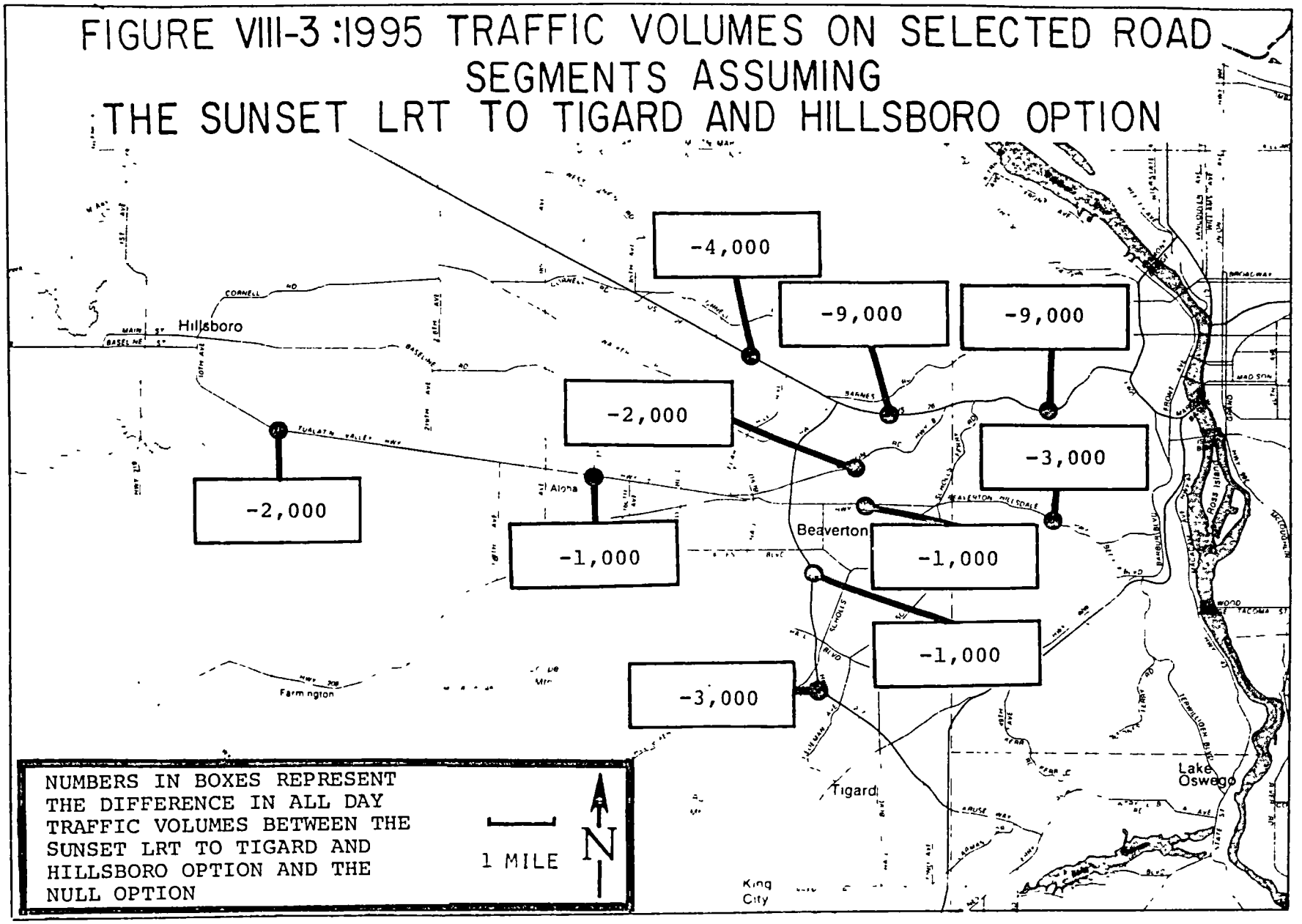

Table VIII-5: 1995 P.M. Peak Hour, Peak Direction Capacity Deficiencies at Selected Cutlines Assuming the Sunset LRT to Tigard and Hillsboro Option

Cutline	Percent Above Capacity	Percent Reduction in Capacity Deficiency from the Null
Westside Corridor		
At SW 219th (from TV Hwy to Sunset Hwy)	0	0
At Murray Blvd (From TV Hwy to Cornell Rd)	40%	-20%
At Hwy 217 (From Denney Rd to Sunset Hwy)	20%	-33%
At Multnomah County Line (From Taylors Ferry Rd to Burnside)	0%	-100%

Table VIII-6: 1995 P.M. Peak Hour Job Accessibility for Corridor Residents Assuming the Sunset LRT to Tigard and Hillsboro Option

Home Location	Number of Jobs Within 30 Minutes	Difference From Null
Beaverton	285,900	+116%
Hillsboro	95,900	+37%
Tigard	223,300	+92%
SW Portland	285,400	+12%

Table VIII-7: 1995 P.M. Peak Hour Market Potential for Major Business Centers in the Westside Corridor Assuming the Sunset LRT to Tigard and Hillsboro Option

Business Location	Number of People Within 30 Minutes	Difference From Null
Beaverton CBD	380,300	+13%
Portland CBD	614,300	+49%
Hillsboro CBD	232,100	+14%
Washington Square	388,700	+18%

Table VIII-8: 1995 Daily Corridor Energy Consumption for the Sunset LRT to Tigard and Hillsboro Option

	1995 Estimate	Difference From Null
Gasoline (Gallons)	89,690	-7%
Diesel (Gallons)	7,620	+59%
Electricity (KWH)[1]	45,340	N/A

[1] Light Rail Transit Propulsion

Table VIII-9: 1995 Potential Regional Traffic Through Neighborhoods During P.M. Peak-Hour Assuming the Sunset LRT to Tigard and Hillsboro Option

Community	Potential Through Trips	Difference From Null
Beaverton	430	-69%
SW Portland	590	-63%

Table VIII-10: 1995 Air Pollution Emissions Assuming the Sunset LRT to Tigard and Hillsboro Option

Geographic Area:	Hydrocarbon Emissions Tons/Year	Difference From Null	Nitrogen Oxide Tons/Year	Difference From Null
Westside Corridor	7,730	-7%	8,130	-2%
Regionwide	30,500	-5%	33,800	-2%

Table VIII-11: Project Capital Costs for the Sunset LRT to Tigard and Hillsboro Option

Cost Item	Cost (1978 Dollars)
Right of Way	$24,070,000
Construction	123,620,000
Stations	28,610,000
Rolling Stock[1]	43,330,000
Total Cost	$219,630,000
Annualized Capital Cost	$11,383,000

[1]Vehicles required in addition to Null Option (Null: 186 buses at $135,000 per bus = $25,110,000)

Table VIII-12: 1995 Transit Operating Costs and Subsidies for the Sunset LRT Tigard and Hillsboro Option

	Annual Costs and Revenues (1978 $)	Difference From Null
Westside Corridor		
Bus	$19,700,000	+15%
LRT	4,676,000	-
Total Operating Costs	$24,376,000	+43%
Farebox Revenue	$8,005,000	+52%
Operating Subsidy	$16,371,000	+38%
Regionwide		
Bus	$79,614,000	+28%
LRT	8,246,000	+131%
Total Operating Costs	$87,860,000	+34%
Farebox Revenue	$26,901,000	+35%
Operating Subsidy	60,959,000	+34%

Table VIII-13: 1995 Transit System Productivity for the Sunset LRT to Tigard and Hillsboro Option

Productivity Measure	1995 Estimate	Difference From Null
Westside Corridor		
Operating Cost/ Passenger	$.91	-9%
Operating Subsidy/ Passenger	.61	-12%
Farebox Revenue/ Operating Cost	33%	+6%
Total Annualized[1] Cost/Passenger	$1.33	+33%
Annualized Local[2] Cost/Passenger	.70	+1%
Regionwide		
Operating Cost/ Passenger	$1.08	-2%
Operating Subsidy/ Passenger	.75	-3%
Farebox Revenue/ Operating Cost	31%	+3%

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[1]Total Annualized Cost = Annualized Capital Cost plus operating cost

[2]Annualized Local Cost = Local share of Annualized Cost plus operating subsidy

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IX. SKETCH EVALUATION OF THE SUNSET LRT TO TIGARD OPTION

A. Description: Figure IX-1

This Sunset LRT option would extend from downtown Portland to Beaverton and Tigard via Sunset Highway and Highway 217. See Special Report No. 5: Westside Transitway Options for additional details.

B. Type of Evaluation:

Fatal Flaw Analysis (Section C only)

✓ Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

Applicable Not-Applicable ✓

D. 1995 Transit use

✓ Applicable Not-Applicable

1. Transit Service Levels

   a. Peak Hour Transit Travel Times Between Major Points in the Corridor: Table IX-1

2. Transit Trips Between Communities in the Westside Corridor

   a. Peak-Hour Trips: Table IX-2
   b. Daily Home Based Trips: Table IX-3
   c. Corridor Ridership: Table IX-4

3. Trips Using the Major Trunk Routes in the Sunset LRT to Tigard Option

   a. Total Daily Trips: Figure IX-2

E. 1995 Highway Service Levels:

✓ Applicable Not Applicable

1. Highway Use

   a. Daily Traffic Volumes on Selected Road Segments: Figure IX-3
   b. Peak-Hour Capacity Deficiencies at Selected Cutlines: Table IX-5

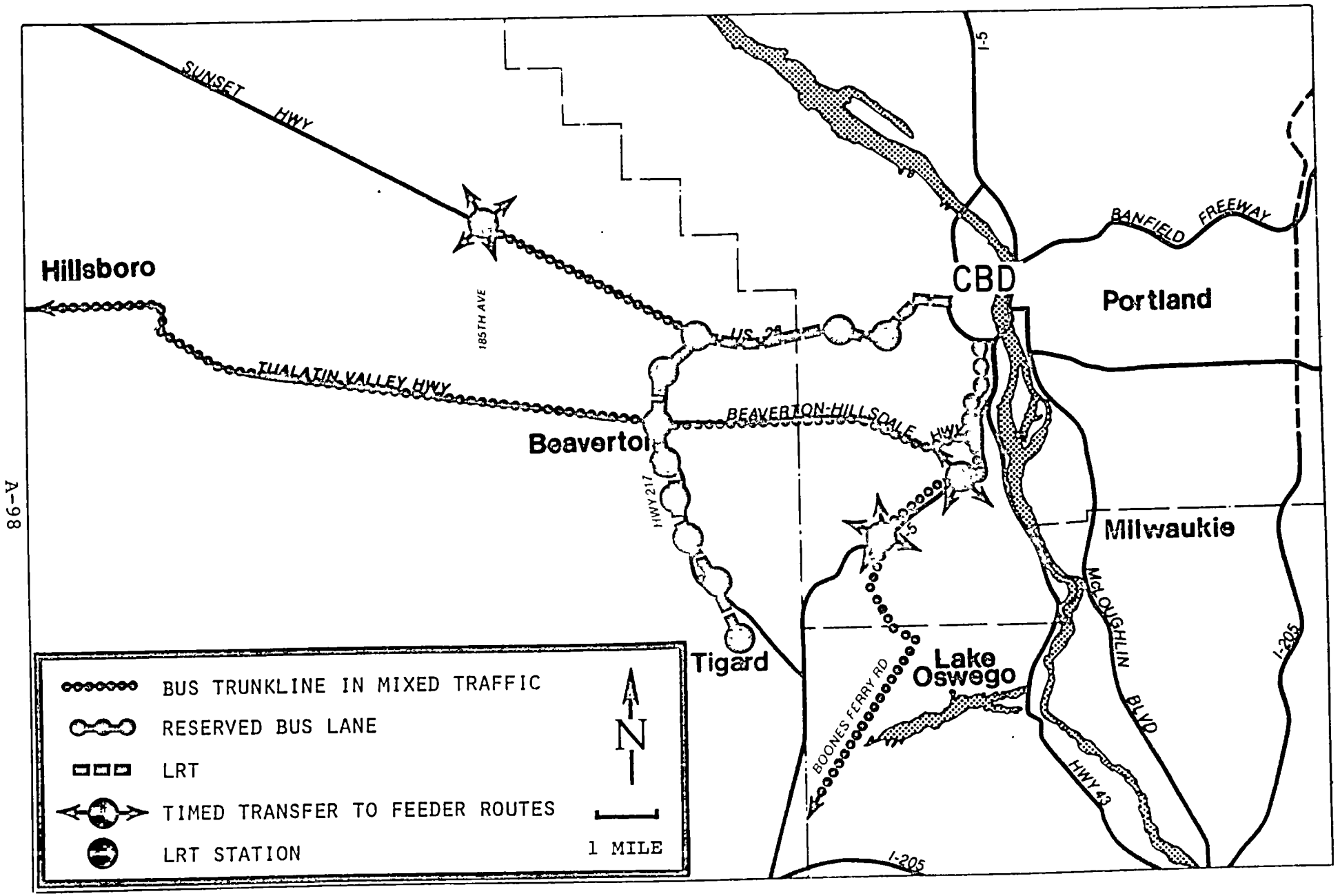

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FIGURE IX-1: THE SUNSET LRT TO TIGARD OPTION

SEE SPECIAL REPORT NO.5: WESTSIDE TRANSITWAY OPTIONS, SECTION III-G, FOR FURTHER DESCRIPTION.

F. 1995 Access to Opportunities:

✓Applicable Not-Applicable

1. Job Opportunities for Corridor Residents: Table IX-6

2. Potential Market for Major Business Areas: Table IX-7

G. 1995 Environmental Quality:

✓Applicable Not-Applicable

1. Energy Consumption

   a. Daily Corridor Energy Consumption: Table IX-8

2. Neighborhood Quality

   a. Regional Traffic through Neighborhoods: Table IX-9

3. Air Quality

   a. Hydrocarbon and Nitrogen Oxide Emmissions: Table IX-10

H. 1995 Costs and Efficiency:

✓Applicable Not-Applicable

1. Capital Costs: Table IX-11

2. Operating Costs: Table IX-12

3. Transit System Productivity: Table IX-13

I. Description of Land Use Considerations:

✓Applicable Not-Applicable

Downtown Portland to the Highway 217 Interchange:

Major land use activities in this segment include the Washington Park Zoo/Oregon Museum of Science and Industry (OMSI) complex with over 1.1 million annual visitors, St. Vincents Medical Center and the Peterkort Development. The latter two activities are situated at the Highway 217/Sunset interchange. St Vincents is a major regional medical facility with 1,200 employees. Land surrounding the medical facility has developed into ancillary uses, such as medical clinics and office uses.

The Peterkort Development is a proposed mixed-use development just west of St. Vincents. The proposal includes 1,060 dwelling units (2,200 population), the corporate headquarters of a major Oregon corporation (3,000 employees projected), and additional office and commercial uses. Total projected employment for all activities in the proposal is 8,115.

Existing residential activity in this segment is predominantly single-family use on the south side of the Sunset Highway. Multi-family uses are found at the Sylvan interchange area and along the north side of the Sunset between Sylvan and Hwy 217.

Highway 217 Interchange to Beaverton (Murray Boulevard)

As the route enters Beaverton, commercial activities prevail. Beaverton is presently reviewing the central business district activities through urban renewal plans. Two major developments, a 500,000 square foot shopping center presently under construction and a major hotel/retail/office complex scheduled for construction, will have a major influence on the future character of central Beaverton. Certain areas within the CBD are experiencing conversion to more intensive commercial and office uses.

Western Beaverton is dominated by the presence of Tektronix, Oregon's largest private employer. Tektronix has roughly 10,000 employees at this location and serves as the foundation for the largest employment concentration within Washington County. An additional 3,600 jobs are presently found within the immediate area.

The Beaverton vicinity is the major residential area within Washington County. Roughly 60 percent of the County's population resides in the Beaverton/Eastern Washington County area. Major residential areas include the South Beaverton/Farmington area and the Cedar Hills area, north of Beaverton.

Beaverton to Tigard

The majority of land uses along this segment are devoted to industrial and commercial uses. The Western Avenue Industrial Area (1,600 employees) is located just south of the Beaverton CBD. Washington Square, the region's largest shopping center with 1.5 million square feet, is located at the intersection of Scholls Ferry Road. The shopping center has stimulated significant office and high density residential development in the surrounding area. At the Highway 217/Hall Boulevard intersection, two major industrial developments, the GAF photo products manufacturing plant and the Knoll Business Center, have a combined employment of 1,600. Sizable vacant parcels are available for further expansion.

Residential concentrations are found in the Washington Square/Progress area and the City of Tigard.

As the route continues south to Tigard it passes through the Cascade Industrial Park prior to entering the residential areas of Tigard.

J. Description of Right-of-Way Impacts:

✓Applicable Not-Applicable

The most significant right-of-way impacts occur in the Portland CBD to Beaverton segment of this option. Roughly 13 residential and 23 commercial buildings would be displaced in this segment. In addition, the most access restrictions occur in this segment, primarily in the Beaverton CBD. Between Beaverton and Tigard, two commercial and eight residential buildings would potentially be displaced.

K. Transit Network Considerations:

✓Applicable Not-Applicable

1. Bus Volume: This option results in 30 two-car trains per hour and 520 buses per hour in downtown Portland during peak periods. This reduces the total bus volume by 20% to equal the capacity of the Transit Mall and the Westside bus volume by 52%. All buses on the Sunset Hwy. to downtown would be eliminated and the bus volume on Barbur Blvd. would be reduced by 88 buses per hour.

2. Future Branching Opportunities: West of Beaverton, the existing Southern Pacific Railroad and Burlington Northern Railroad provide opportunities to extend the LRT facility at some future time to the City of Hillsboro. In addition, the Sunset Hwy., northwest of the Hwy. 217 interchange includes a grass median that could be used to construct a branch LRT facility. In the interim, the Tigard area would be connected to downtown Portland by bus.

Table IX-1: 1995 P.M. Peak Hour Transit Travel Times Between Major Points in the Westside Corridor Assuming the Sunset LRT to Tigard Option

ORIGIN	DESTINATION: Hillsboro		Beaverton		Tigard		S.W. Portland		Portland CBD	
	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)
Hillsboro	xx	xx	23	-4	41	-34	50	-41	43	-38
Beaverton	23	-4	xx	xx	17	-55	25	-44	19	-58
Tigard	41	-34	17	-55	xx	xx	15	-17	29	-24
SW Portland	50	-41	25	-44	15	-17	xx	xx	17	-15

Table IX-2: 1995 A.M. Peak Hour In-Bound Transit Use Between Communities in the Westside Corridor (Local Trips Excluded) Assuming the Sunset LRT to Tigard Option

ORIGIN	DESTINATION: Close-In Portland		In-Bound Total	
	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity				
Transit Riders	730	+12	940	+12
Mode Split	64%	+10	40%	+11
Aloha Vicinity				
Transit Riders	790	+149	1,030	+142
Mode Split	54%	+116	20%	+122
West Beaverton Vicinity				
Transit Riders	720	+56	930	+58
Mode Split	57%	+46	26%	+53
East Beaverton Vicinity				
Transit Riders	1,210	+272	1,370	+227
Mode Split	56%	+143	42%	+147
S.W. Portland Vicinity				
Transit Riders	2,600	+11	2,600	+11
Mode Split	47%	+7	47%	+7
Tigard Vicinity				
Transit Riders	1,050	+54	1,150	+51
Mode Split	64%	+31	50%	+35
Total				
Transit Riders	7,100	+49	8,020	+49
Mode Split	57%	+39	36%	+38

Table IX-3: 1995 Transit Use Between Communities in the Westside Corridor
Assuming the Sunset LRT to Tigard Option: Home Based Trips

TRIPS PRODUCED IN:		TRIPS ATTRACTED TO: Hillsboro/ Forest Grove Vicinity		Aloha Vicinity		West Beaverton Vicinity		East Beaverton Vicinity		S.W. Portland		Close-in Portland		Tigard Vicinity		Portland C.B.D.	
		1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null
Hillsboro/ Forest Grove Vicinity	Trips	1,030	+17%	270	+42%	330	+14%	390	+11%	230	+21%	3,540	+12%	260	+86%	2,640	+6%
	Mode Split	10%	+900%	6%	+50%	11%	+22%	13%	+8%	14%	+27%	43%	+8%	22%	+100%	61%	+2%
Aloha Vicinity	Trips	180	+100%	370	+95%	+610	+177%	520	+126%	220	+83%	4,360	+134%	290%	+222%	3,860	+127%
	Mode Split	7%	+75%	1%	0	3%	+31%	4%	+100%	6%	+100%	34%	+143%	7%	+250%	49%	+133%
West Beaverton Vicinity	Trips	100	+25%	260	+100%	630	+31%	590	+40%	220	+47%	3,690	+55%	340	+162%	3,290	+52%
	Mode Split	10%	+25%	3%	+200%	2%	0	4%	+33%	6%	+50%	36%	+64%	6%	+200%	52%	+63%
East Beaverton Vicinity	Trips	110	+38%	220	+83%	540	+50%	1,110	+29%	390	+30%	6,190	+30%	400	+122%	5,600	+29%
	Mode Split	14%	+27%	4%	+100%	5%	+67%	2%	0	8%	+33%	35%	+30%	8%	+167%	52%	+27%
S.W. Portland Vicinity	Trips	140	+75%	60	+20%	120	+71%	230	+64%	1,250	+28%	14,450	+18%	740	+59%	13,000	+15%
	Mode Split	18%	+80%	5%	+20%	7%	+75%	6%	+50%	3%	+50%	31%	+19%	8%	+60%	46%	+18%
Tigard Vicinity	Trips	180	+260%	90	+200%	190	+217%	240	+167%	510	+19%	5,580	+55%	1,090	+88%	4,710	+49%
	Mode Split	30%	+233%	11%	+175%	11%	+175%	12%	+1,100%	10%	+25%	45%	+45%	2%	+100%	67%	+40%

Table IX-4: 1995 Daily (Home Based) Transit Ridership Between Communities in the Westside Corridor Assuming the Sunset LRT to Tigard Option

TRIPS PRODUCED IN:	TRIPS ATTRACTED TO: Close-In Portland 1995 Est.	Close-In Portland Diff From Null (%)	Rest of Corridor 1995 Est.	Rest of Corridor Diff From Null (%)	Total 1995 Est.	Total Diff From Null (%)
Hillsboro/ Forest Grove Vicinity						
Trips	3,540	+12	2,510	+23	6,050	+16
Mode Split	43%	+8	2%	0	5%	+25
Aloha Vicinity						
Trips	4,360	+134	2,190	+133	6,550	+134
Mode Split	34%	+143	3%	+200	8%	+167
West Beaverton Vicinity						
Trips	3,690	+55	2,140	+54	5,830	+55
Mode Split	36%	+64	3%	+50	8%	+60
East Beaverton Vicinity						
Trips	6,190	+30	2,770	+46	8,960	+35
Mode Split	35%	+30	4%	+33	10%	+25
S.W. Portland Vicinity						
Trips	14,450	+18	2,540	+42	16,990	+21
Mode Split	31%	+19	4%	+33	16%	+23
Tigard Vicinity						
Trips	5,580	+55	2,300	+85	7,880	+62
Mode Split	45%	+45	4%	+100	10%	+43
Total						
Trips	37,810	+35	14,450	+55	52,260	+40
Mode Split	35%	+35	3%	+50	10%	+43

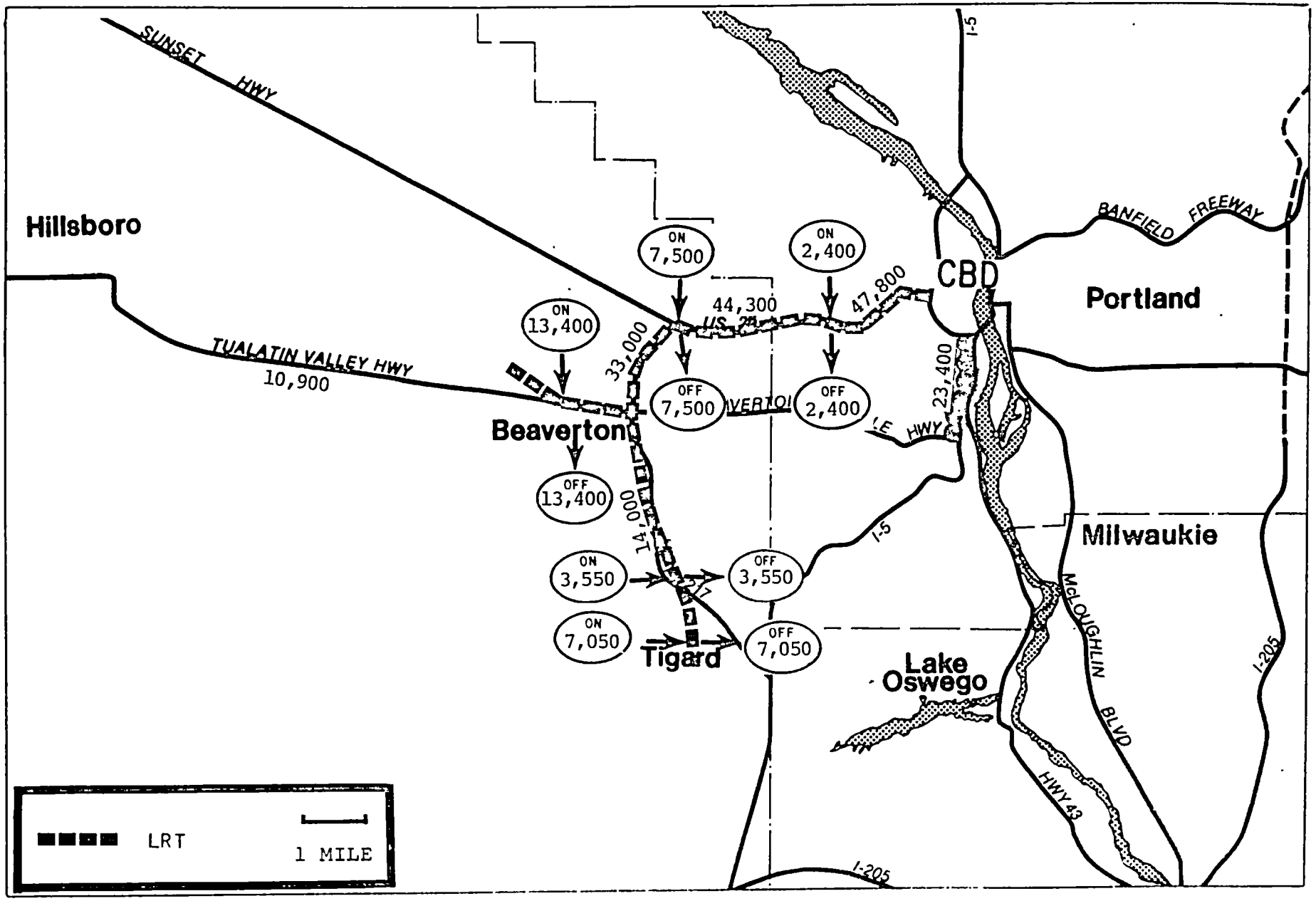

FIGURE IX-2: TOTAL DAILY TRANSIT TRIPS USING THE SUNSET LRT TO TIGARD OPTION

FIGURE IX-3: 1995 TRAFFIC VOLUMES ON SELECTED ROAD SEGMENTS ASSUMING THE SUNSET LRT TO TIGARD OPTION

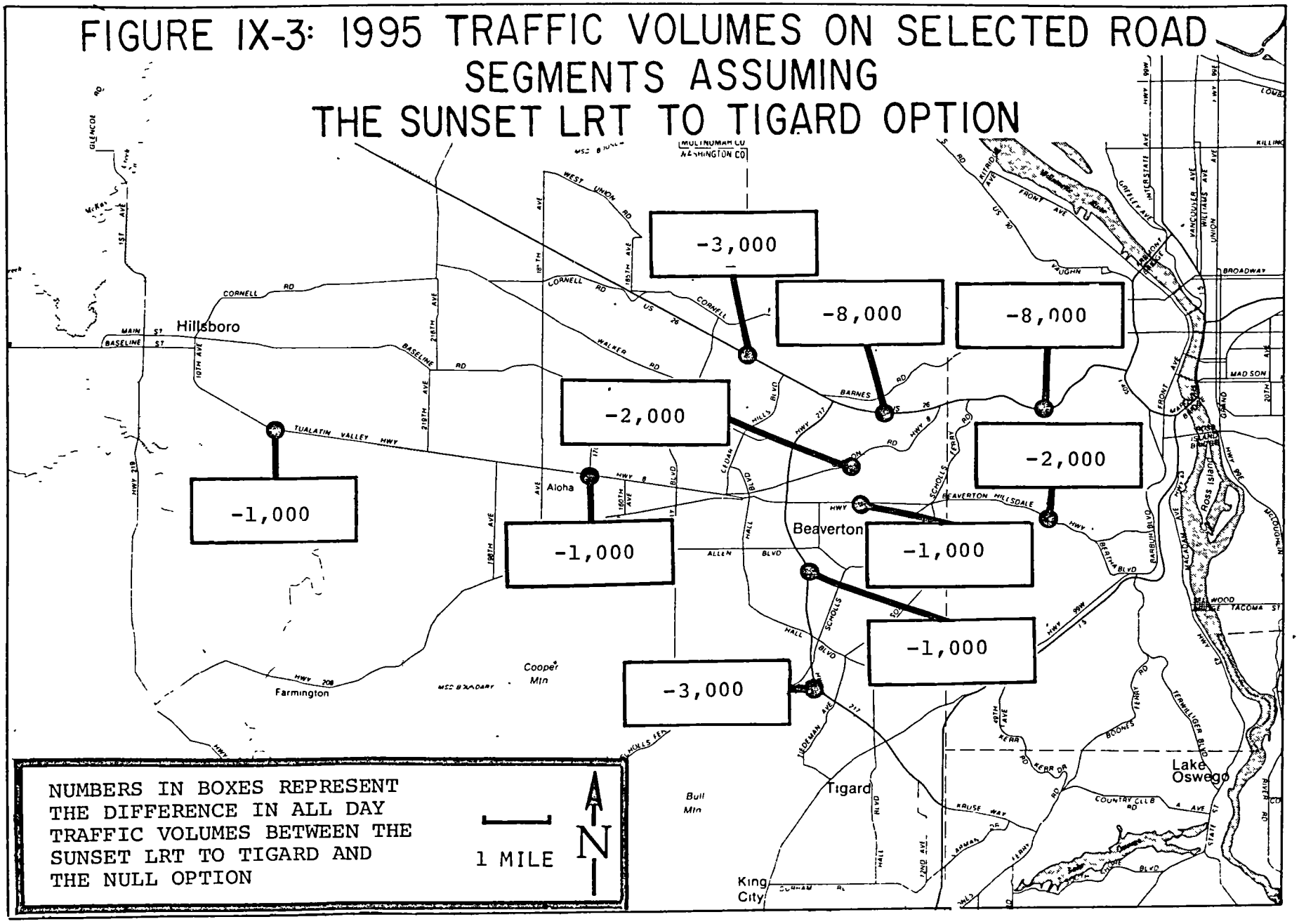

Table IX-5: 1995 P.M. Peak Hour, Peak Direction Capacity Deficiencies at Selected Cutlines Assuming the Sunset LRT to Tigard Option

Cutline	Percent Above Capacity	Percent Reduction in Capacity Deficiency from the Null
Westside Corridor		
At SW 219th (from TV Hwy to Sunset Hwy)	0	0
At Murray Blvd (From TV Hwy to Cornell Rd)	40%	-20%
At Hwy 217 (From Denney Rd to Sunset Hwy)	20%	-33%
At Multnomah County Line (From Taylors Ferry Rd to Burnside)	10%	0%

Table IX-6: 1995 P.M. Peak Hour Job Accessibility for Corridor Residents Assuming the Sunset LRT to Tigard Option

Home Location	Number of Jobs Within 30 Minutes	Difference From Null
Beaverton	281,300	+113%
Hillsboro	82,800	+18%
Tigard	225,500	+94%
SW Portland	293,800	+15%

Table IX-7: 1995 P.M. Peak Hour Market Potential for Major Business Centers in the Westside Corridor Assuming the Sunset LRT to Tigard Option

Business Location	Number of People Within 30 Minutes	Difference From Null
Beaverton CBD	379,000	+13%
Portland CBD	613,500	+48%
Hillsboro CBD	218,100	+7%
Washington Square	389,500	+18%

Table IX-8: 1995 Daily Corridor Energy Consumption for the Sunset LRT to Tigard Option

	1995 Estimate	Difference From Null
Gasoline (Gallons)	90,070	-6%
Diesel (Gallons)	8,250	+73%
Electricity (KWH)[1]	29,500	N/A

[1] Light Rail Transit Propulsion

Table IX-9: 1995 Potential Regional Traffic Through Neighborhoods During P.M. Peak-Hour Assuming the Sunset LRT to Tigard Option

Community	Potential Through Trips	Difference From Null
Beaverton	880	-37%
SW Portland	750	-53%

Table IX-10: 1995 Air Pollution Emissions Assuming the Sunset LRT to Tigard Option

Geographic Area:	Hydrocarbon Emissions Tons/Year	Difference From Null	Nitrogen Oxide Tons/Year	Difference From Null
Westside Corridor	7,760	-7%	8,130	-2%
Regionwide	30,600	-5%	33,800	-2%

Table IX-11: Project Capital Costs for the Sunset LRT to Tigard Option

Cost Item	Cost (1978 Dollars)
Right of Way	$12,680,000
Construction	99,840,000
Stations	23,620,000
Rolling Stock[1]	34,345,000
Total Cost	$170,485,000
Annualized Capital Cost	$8,443,000

[1]Vehicles required in addition to Null Option (Null: 186 buses at $135,000 per bus = $25,110,000)

Table IX-12: 1995 Transit Operating Costs and Subsidies for the Sunset LRT to Tigard

	Annual Costs and Revenues (1978 $)	Difference From Null
Westside Corridor		
Bus	$21,070,000	+23%
LRT	3,178,000	-
Total Operating Costs	$24,248,000	+42%
Farebox Revenue	$7,919,000	+51%
Operating Subsidy	$16,329,000	+38%
Regionwide		
Bus	$80,984,000	+30%
LRT	6,748,000	+89%
Total Operating Costs	$87,732,000	+34%
Farebox Revenue	$26,824,000	+34%
Operating Subsidy	60,908,000	+33%

Table VIX-13: 1995 Transit System Productivity for the Sunset LRT to Tigard

Productivity Measure	1995 Estimate	Difference From Null
Westside Corridor		
Operating Cost/ Passenger	$.91	-9%
Operating Subsidy/ Passenger	.61	-12%
Farebox Revenue/ Operating Cost	33%	+6%
Total Annualized[1] Cost/Passenger	$1.23	+23%
Annualized Local[2] Cost/Passenger	.68	-1%
Regionwide		
Operating Cost/ Passenger	$1.09	-1%
Operating Subsidy/ Passenger	.75	-3%
Farebox Revenue/ Operating Cost	31%	+3%

[1]Total Annualized Cost = Annualized Capital Cost plus operating cost
[2]Annualized Local Cost = Local share of Annualized Cost plus operating subsidy

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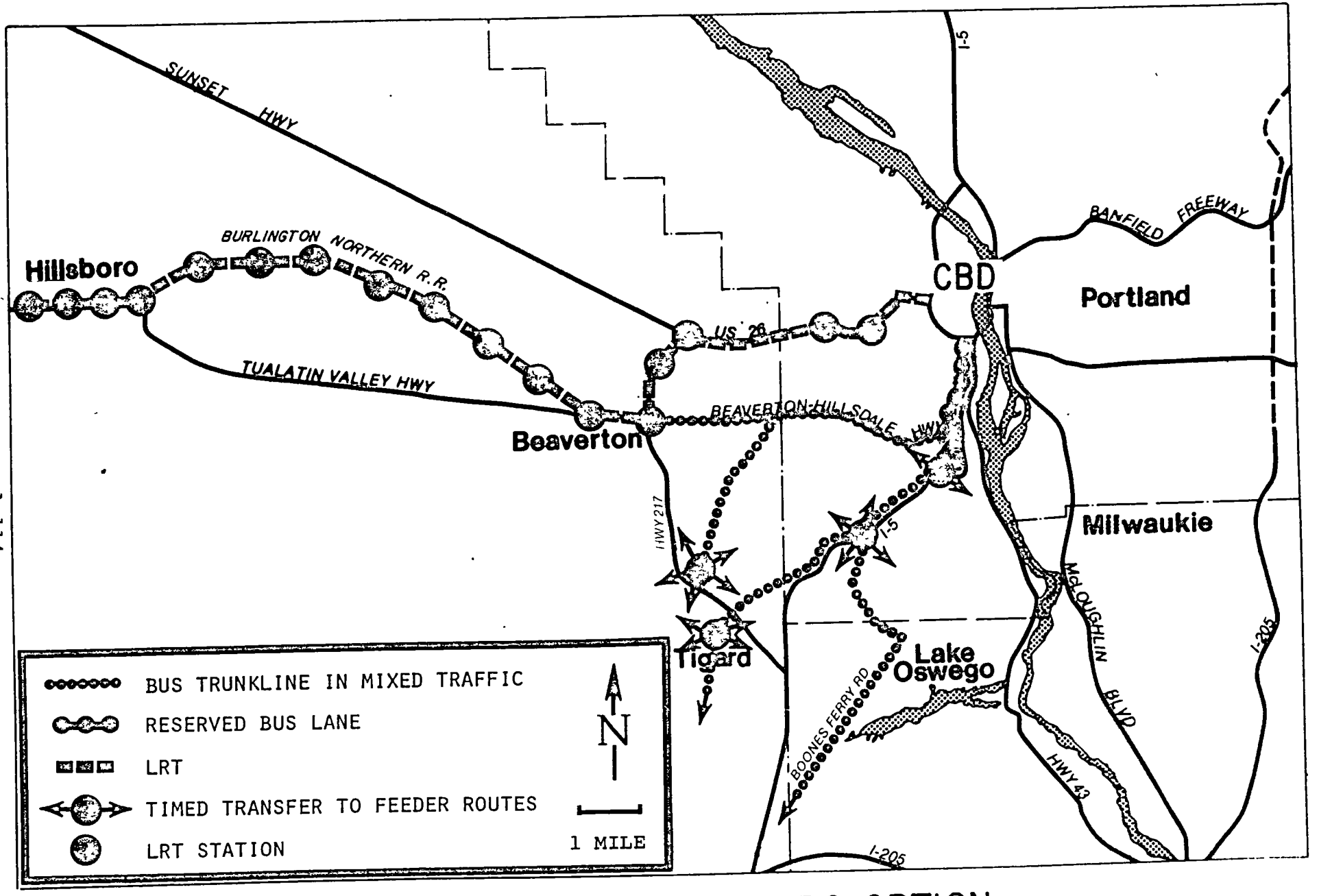

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FIGURE X-1: THE SUNSET LRT TO HILLSBORO OPTION

SEE SPECIAL REPORT NO.5: WESTSIDE TRANSITWAY OPTIONS, SECTION III-F, FOR FURTHER DESCRIPTION

X. SKETCH EVALUATION OF THE SUNSET LRT TO HILLSBORO OPTION

A. Description: Figure X-1

This Sunset LRT option would extend from downtown Portland to Beaverton and Hillsboro. The option would follow Sunset Hwy. and Hwy. 217 to Beaverton. From Beaverton to Hillsboro the option would follow either the (a) Tualatin Valley Hwy., (b) Southern Pacific Railroad R.O.W., or (c) Burlington Northern Railroad R.O.W. See Special Report No. 5: Westside Transitway Options, for additional details.

B. Type of Evaluation:

Fatal Flaw Analysis (Section C only)

✓Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

Applicable Not-Applicable✓

D. 1995 Transit use

✓Applicable Not-Applicable

1. Transit Service Levels

a. Peak Hour Transit Travel Times Between Major Points in the Corridor: Table X-1

2. Transit Trips Between Communities in the Westside Corridor

a. Peak-Hour Trips: Table X-2
b. Daily Home Based Trips: Table X-3
c. Corridor Ridership: Table X-4

3. Trips Using the Major Trunk Routes in the Sunset LRT to Hillsboro Option

a. Total Daily Trips: Figure X-2

E. 1995 Highway Service Levels:

✓Applicable Not Applicable

1. Highway Use

a. Daily Traffic Volumes on Selected Road Segments: Figure X-3

b. Peak-Hour Capacity Deficiencies at Selected Cutlines: Table X-5

F. 1995 Access to Opportunities:

✓ Applicable Not-Applicable

1. Job Opportunities for Corridor Residents: Table X-6

2. Potential Market for Major Business Areas: Table X-7

G. 1995 Environmental Quality:

✓ Applicable Not-Applicable

1. Energy Consumption

a. Daily Corridor Energy Consumption: Table X-8

2. Neighborhood Quality

a. Regional Traffic through Neighborhoods: Table X-9

3. Air Quality

a. Hydrocarbon and Nitrogen Oxide Emmissions: Table X-10

H. 1995 Costs and Efficiency:

✓ Applicable Not-Applicable

1. Capital Costs: Table X-11

2. Operating Costs: Table X-12

3. Transit System Productivity: Table X-13

I. Description of Land Use Considerations:

✓ Applicable Not-Applicable

Downtown Portland to the Highway 217 Interchange:

Major land use activities in this segment include the Washington Park Zoo/Oregon Museum of Science and Industry (OMSI) complex with over 1.1 million annual visitors, St. Vincents Medical Center and the Peterkort Development. The latter two activities are situated at the Highway 217/Sunset interchange. St Vincents is a major regional medical facility with 1,200 employees. Land surrounding the medical facility has developed into ancillary uses, such as medical clinics and office uses.

The Peterkort Development is a proposed mixed-use development just west of St. Vincents. The proposal includes 1,060 dwelling units (2,200 population), the corporate headquarters of a major Oregon corporation (3,000 employees projected), and additional office and commercial uses. Total projected employment for all activities in the pro- posal is 8,115.

Existing residential activity in this segment is predominantly single-family use on the south side of the Sunset Highway. Multi-family uses are found at the Sylvan interchange area and along the north side of the Sunset between Sylvan and Hwy 217.

Highway 217 Interchange to Beaverton (Murray Boulevard)

As the route enters Beaverton, commercial activities prevail. Beaverton is presently reviewing the central business district activities through urban renewal plans. Two major developments, a 500,000 square foot shopping center presently under construction and a major hotel/retail/office complex scheduled for construction, will have a major influence on the future character of central Beaverton. Certain areas within the CBD are experiencing conversion to more intensive commercial and office uses.

Western Beaverton is dominated by the presence of Tektronix, Oregon's largest private employer. Tektronix has roughly 10,000 employees at this location and serves as the foundation for the largest employment concentration within Washington County. An additional 3,600 jobs are presently found within the immediate area.

The Beaverton vicinity is the major residential area within Washington County. Roughly 60 percent of the County's population resides in the Beaverton/Eastern Washington County area. Major residential areas include the South Beaverton/Farmington area and the Cedar Hills area, north of Beaverton.

Beaverton to Hillsboro

This segment of the route passes through a rapidly urbanizing portion of unincorporated Washington County. Much of this land is presently designated as Urban Intermediate on the County's Framework Plan and therefore, is vacant. The County is presently considering major proposals for conversion to Urban designations in the S. W. 185th vicinity.

Existing land uses in this segment include the Tualatin Valley Park and Recreation complex, the Town Center/Tanasbourne area, and the industrial area at S. W. 185th and Walker Road. The Town Center/Tanasbourne area

includes a major shopping center and medium to high density condominiums. Tektronix has another site at the S.W. 185th industrial area with 200 employees. Also included at this site are the Oregon Primate Research Center and the Oregon Graduate Center.

As the route enters Hillsboro it passes through the Hawthorne Farms Industrial Park. The Intel Corporation has just completed construction of a major electronics plant which is projected to employ 3,500 persons by 1983. The Washington County Fairgrounds and the Hillsboro Airport are located just west of Hawthorne Farms.

The City of Hillsboro has a current population of 26,000. The city has doubled population in the past decade. Projections indicate a continuation of the rapid growth in this area.

J. Description of Right-of-Way Impacts:

✓Applicable Not-Applicable

The most significant right-of-way impacts occur in the Portland CBD to Beaverton segment of this option. Roughly 13 residential and 23 commercial buildings would be displaced in this segment. In addition, the most access restrictions occur in this segment, primarily in the Beaverton CBD. Of the two options west of Beaverton to Hillsboro, the Southern Pacific Railroad route has the highest construction impacts, 10 commercial building and two residential buildings as opposed to three residential buildings on the Burlington Northern Railroad route.

K. Transit Network Considerations:

✓Applicable Not-Applicable

1. Bus Volume: This option results in 24 two-car trains per hour and 544 buses per hour in downtown Portland during peak periods. This reduces the total bus volume by 16% to slightly exceed the capacity of the Transit Mall and the Westside bus volume by 42%. All buses on the Sunset Hwy. to downtown would be eliminated and the bus volume on Barbur Blvd. would be reduced by 6 buses per hour.

2. Future Branching Opportunities: South of Beaverton, an LRT facility could be extended along Hwy. 217 to Washington Square Shopping Center and the City of Tigard at some future time. In addition, the Sunset Hwy., northwest of the Hwy. 217 interchange includes a grass median that could be used to construct a branch LRT facility. In the interim, the Tigard area would be connected to downtown Portland by bus.

Table X-1: 1995 P.M. Peak Hour Transit Travel Times Between Major Points in the Westside Corridor Assuming the Sunset LRT to Hillsboro Option

ORIGIN	DESTINATION: Hillsboro		Beaverton		Tigard		S.W. Portland		Portland CBD	
	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)
Hillsboro	xx	xx	20	-17	42	-32	48	-44	38	-45
Beaverton	20	-17	xx	xx	32	-16	34	-24	19	-58
Tigard	42	-32	32	-16	xx	xx	15	-17	33	-13
SW Portland	48	-44	34	-24	15	-17	xx	xx	17	-15

Table X-2: 1995 A.M. Peak Hour In-Bound Transit Use Between Communities in the Westside Corridor (Local Trips Excluded) Assuming the Sunset LRT to Hillsboro Option

ORIGIN	DESTINATION: Close-In Portland		DESTINATION: In-Bound Total	
	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity				
Transit Riders	860	+33	1,140	+35
Mode Split	75%	+29	46%	+28
Aloha Vicinity				
Transit Riders	870	+174	1,150	+172
Mode Split	59%	+136	22%	+144
West Beaverton Vicinity				
Transit Riders	780	+71	980	+68
Mode Split	59%	+51	38%	+124
East Beaverton Vicinity				
Transit Riders	1,290	+295	1,430	+240
Mode Split	57%	+148	42%	+147
S.W. Portland Vicinity				
Transit Riders	2,680	+15	2,680	+15
Mode Split	49%	+11	49%	+11
Tigard Vicinity				
Transit Riders	880	+30	980	+30
Mode Split	60%	+22	46%	+24
Total				
Transit Riders	7,360	+54	8,360	+56
Mode Split	56%	+37	37%	+42

Table X-3: 1995 Transit Use Between Communities in the Westside Corridor
Assuming the Sunset LRT to Hillsboro Option: Home Based Trips

TRIPS ATTRACTED TO:

TRIPS PRODUCED IN:	Hillsboro/ Forest Grove Vicinity		Aloha Vicinity		West Beaverton Vicinity		East Beaverton Vicinity		S.W. Portland		Close-in Portland		Tigard Vicinity		Portland C.B.D.	
	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null
Hillsboro/ Forest Grove Vicinity																
Trips	1,120	+27%	450	+137%	360	+24%	400	+14%	220%	+16%	4,010	+26%	260	+86%	3,110	+24%
Mode Split	1%	0	8%	+200%	12%	+25%	15%	+25%	17%	+55%	53%	+33%	23%	+109%	72%	+20%
Aloha Vicinity																
Trips	280	+211%	570	+200%	670	+205%	520	+126%	190	+58%	4,300	+131%	290	+222%	3,820	+125%
Mode Split	9%	+125%	2%	+100%	3%	+200%	4%	+100%	6%	+100%	35%	+150%	7%	+250%	51%	+143%
West Beaverton Vicinity																
Trips	160	+100%	440	+238%	670	+40%	550	+30%	220	+47%	3,960	+66%	290	+123%	3,550	+64%
Mode Split	13%	+63%	4%	+300%	2%	0	4%	+33%	6%	+50%	37%	+68%	5%	+150%	53%	+66%
East Beaverton Vicinity																
Trips	160	+100%	330	+175%	560	+56%	1,090	+27%	320	+7%	6,590	+38%	310	+72%	5,600	+29%
Mode Split	17%	+55%	5%	+150%	5%	+40%	2%	0	7%	+17%	36%	+33%	6%	+100%	52%	+27%
S.W. Portland Vicinity																
Trips	200	+150%	110	+120%	120	+71%	240	+71%	1,050	+7%	14,450	+18%	520	+10%	12,750	+13%
Mode Split	21%	+110%	8%	+100%	7%	+75%	6%	+50%	3%	+50%	31%	+19%	8%	+60%	44%	+13%
Tigard Vicinity																
Trips	180	+260%	100	+217%	120	+100%	150	+67%	530	+23%	4,830	+34%	970	+67%	4,160	+32%
Mode Split	30%	+233%	12%	+200%	10%	+150%	8%	+700%	10%	+42%	42%	+35%	2%	+100%	63%	+31%

Table X-4: 1995 Daily (Home Based) Transit Ridership Between Communities in the Westside Corridor Assuming the Sunset LRT to Hillsboro Option

TRIPS PRODUCED IN:	TRIPS ATTRACTED TO: Close-In Portland 1995 Est.	Close-In Portland Diff From Null (%)	Rest of Corridor 1995 Est.	Rest of Corridor Diff From Null (%)	Total 1995 Est.	Total Diff From Null (%)
Hillsboro/ Forest Grove Vicinity						
Trips	4,010	+26	2,810	+38	6,820	+31
Mode Split	53%	+33	2%	0	5%	+25
Aloha Vicinity						
Trips	4,300	+131	2,520	+168	6,820	+144
Mode Split	35%	+150	4%	+300	8%	+167
West Beaverton Vicinity						
Trips	3,960	+66	2,330	+68	6,290	+67
Mode Split	37%	+68	3%	+50	8%	+60
East Beaverton Vicinity						
Trips	6,590	+38	2,770	+46	8,960	+35
Mode Split	36%	+33	4%	+33	10%	+25
S.W. Portland Vicinity						
Trips	14,450	+18	2,240	+25	16,330	+16
Mode Split	31%	+19	4%	+33	16%	+23
Tigard Vicinity						
Trips	4,830	+34	2,050	+65	6,880	+42
Mode Split	42%	+35	4%	+100	10%	+43
Total						
Trips	38,140	+36	14,720	+58	52,860	+41
Mode Split	36%	+38	3%	+50	9%	+29

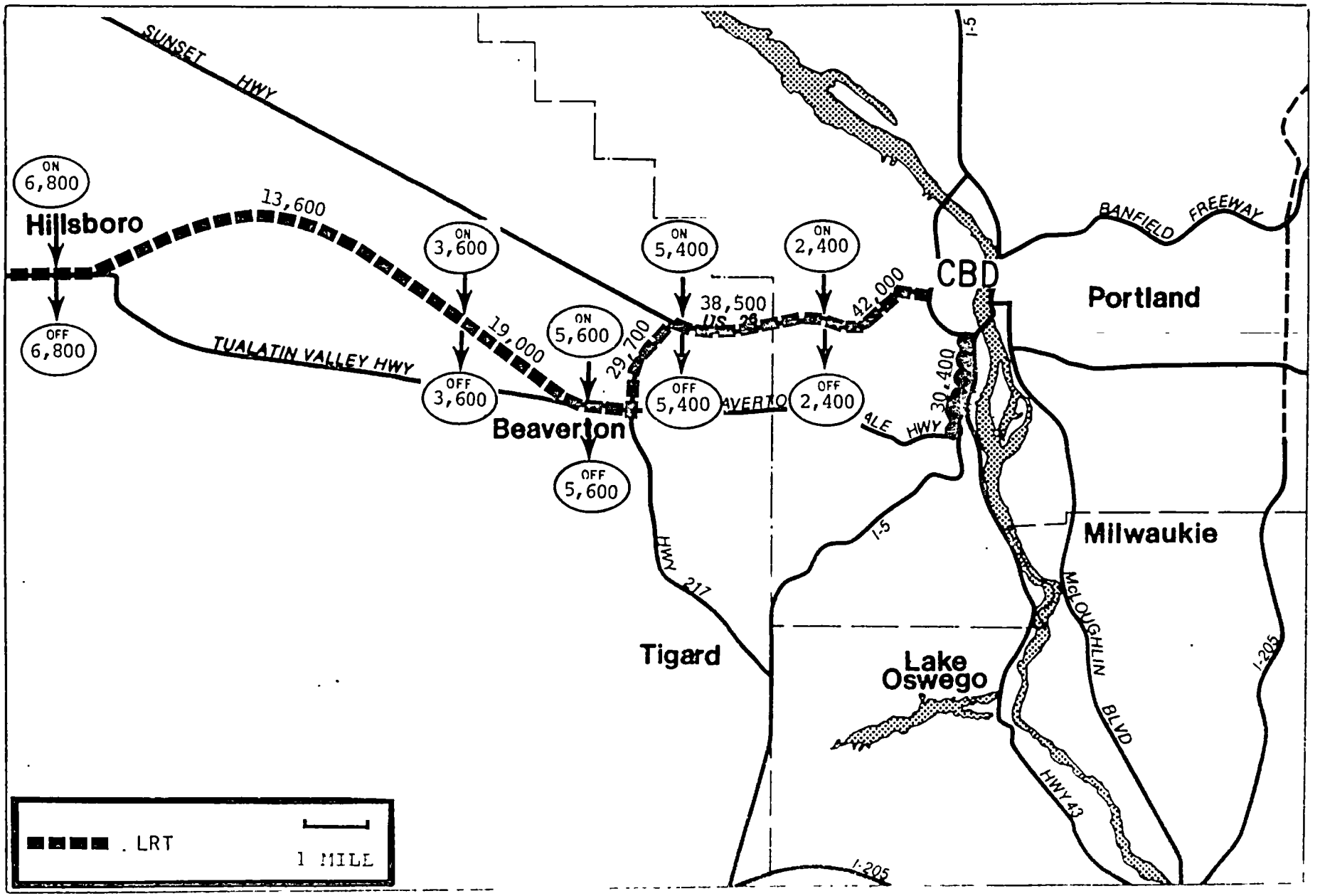

FIGURE X-2: TOTAL DAILY TRANSIT TRIPS USING THE SUNSET LRT TO HILLSBORO OPTION

FIGURE X-3: 1995 TRAFFIC VOLUMES ON SELECTED ROAD SEGMENTS ASSUMING THE SUNSET LRT TO HILLSBORO OPTION

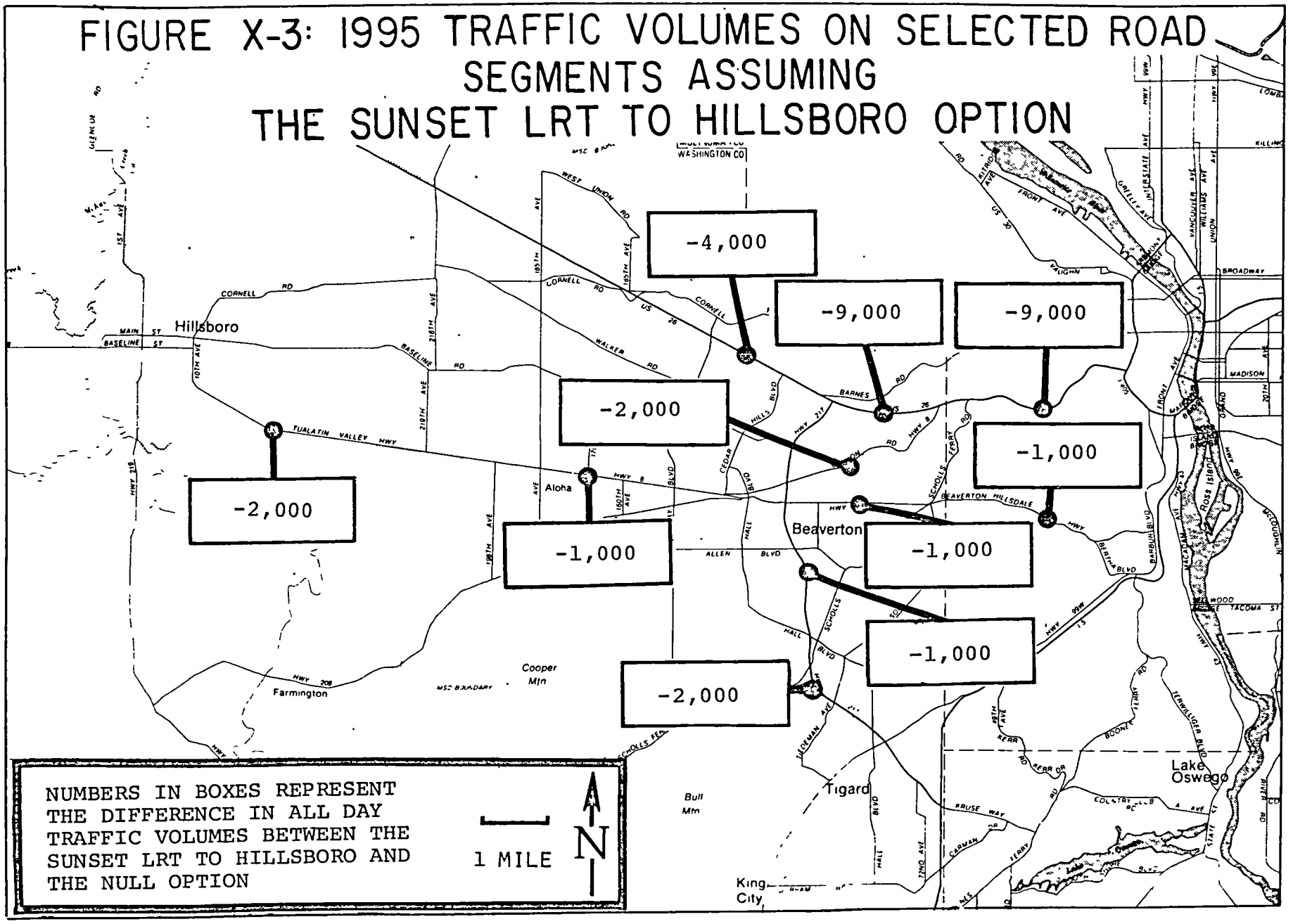

Table X-5: 1995 P.M. Peak Hour, Peak Direction Capacity Deficiencies at Selected Cutlines Assuming the Sunset LRT to Hillsboro Option

Cutline	Percent Above Capacity	Percent Reduction in Capacity Deficiency from the Null
Westside Corridor		
At SW 219th (from TV Hwy to Sunset Hwy)	0	0
At Murray Blvd (From TV Hwy to Cornell Rd)	40%	-20%
At Hwy 217 (From Denney Rd to Sunset Hwy)	20%	-33%
At Multnomah County Line (From Taylors Ferry Rd to Burnside)	0%	-100%

Table X-6: 1995 P.M. Peak Hour Job Accessibility for Corridor Residents Assuming the Sunset LRT to Hillsboro Option

Home Location	Number of Jobs Within 30 Minutes	Difference From Null
Beaverton	283,800	+115%
Hillsboro	95,000	+36%
Tigard	107,800	-7%
SW Portland	283,400	+11%

Table X-7: 1995 P.M. Peak Hour Market Potential for Major Business Centers in the Westside Corridor Assuming the Sunset LRT to Hillsboro Option

Business Location	Number of People Within 30 Minutes	Difference From Null
Beaverton CBD	379,400	+13%
Portland CBD	573,900	+39%
Hillsboro CBD	232,300	+14%
Washington Square	339,000	+3%

Table X-8: 1995 Daily Corridor Energy Consumption for the Sunset LRT to Hillsboro Option

	1995 Estimate	Difference From Null
Gasoline (Gallons)	90,170	-6%
Diesel (Gallons)	8,140	+70%
Electricity (KWH)[1]	36,250	N/A

[1] Light Rail Transit Propulsion

Table X-9: 1995 Potential Regional Traffic Through Neighborhoods During P.M. Peak-Hour Assuming the Sunset LRT to Hillsboro Option

Community	Potential Through Trips	Difference From Null
Beaverton	440	-69%
SW Portland	450	-72%

Table X-10: 1995 Air Pollution Emissions Assuming the Sunset LRT to Hillsboro Option

Geographic Area:	Hydrocarbon Emissions Tons/Year	Difference From Null	Nitrogen Oxide Tons/Year	Difference From Null
Westside Corridor	7,770	-6%	8,130	-2%
Regionwide	30,600	-5%	33,800	-2%

Table X-11: Project Capital Costs for the Sunset LRT to Hillsboro Option

Cost Item	Cost (1978 Dollars)
Right of Way	$18,660,000
Construction	98,610,000
Stations	20,740,000
Rolling Stock[1]	37,225,000
Total Cost	$175,235,000
Annualized Capital Cost	$9,238,000

[1]Vehicles required in addition to Null Option (Null: 186 buses at $135,000 per bus = $25,110,000)

Table X-12: 1995 Transit Operating Costs and Subsidies for the Sunset LRT to Hillsboro Option

	Annual Costs and Revenues (1978 $)	Difference From Null
Westside Corridor		
Bus	$20,770,000	+21%
LRT	3,608,000	-
Total Operating Costs	$24,378,000	+43%
Farebox Revenue	$7,983,000	+52%
Operating Subsidy	$16,395,000	+38%
Regionwide		
Bus	$80,684,000	+30%
LRT	7,178,000	+101%
Total Operating Costs	$87,862,000	+34%
Farebox Revenue	$26,901,000	+35%
Operating Subsidy	60,961,000	+36%

Table X-13: 1995 Transit System Productivity for the Sunset LRT to Hillsboro Option

Productivity Measure	1995 Estimate	Difference From Null
Westside Corridor		
Operating Cost/ Passenger	$.91	-9%
Operating Subsidy/ Passenger	.61	-12%
Farebox Revenue/ Operating Cost	33%	+6%
Total Annualized[1] Cost/Passenger	$1.25	+25%
Annualized Local[2] Cost/Passenger	.68	+1%
Regionwide		
Operating Cost/ Passenger	$1.08	-2%
Operating Subsidy/ Passenger	.75	-3%
Farebox Revenue/ Operating Cost	31%	+3%

[1]Total Annualized Cost = Annualized Capital Cost plus operating cost
[2]Annualized Local Cost = Local share of Annualized Cost plus operating subsidy

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XI. SKETCH EVALUATION OF THE SUNSET LRT TO BEAVERTON OPTION

A. Description: Figure XI-1

This Sunset LRT option simply connects Beaverton with downtown Portland via Sunset Hwy. and Hwy. 217. See Special Report No. 5: Westside Transitway Options, for additional details.

B. Type of Evaluation:

Fatal Flaw Analysis (Section C only)

✓Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

Applicable Not-Applicable✓

D. 1995 Transit use

✓Applicable Not-Applicable

1. Transit Service Levels

   a. Peak Hour Transit Travel Times Between Major Points in the Corridor: Table XI-1

2. Transit Trips Between Communities in the Westside Corridor

   a. Peak-Hour Trips: Table XI-2
   b. Daily Home Based Trips: Table XI-3
   c. Corridor Ridership: Table XI-4

3. Trips Using the Major Trunk Routes in the Sunset LRT to Beaverton Option

   a. Total Daily Trips: Figure XI-2

E. 1995 Highway Service Levels:

✓Applicable Not Applicable

1. Highway Use

   a. Daily Traffic Volumes on Selected Road Segments: Figure XI-3
   b. Peak-Hour Capacity Deficiencies at Selected Cutlines: Table XI-5

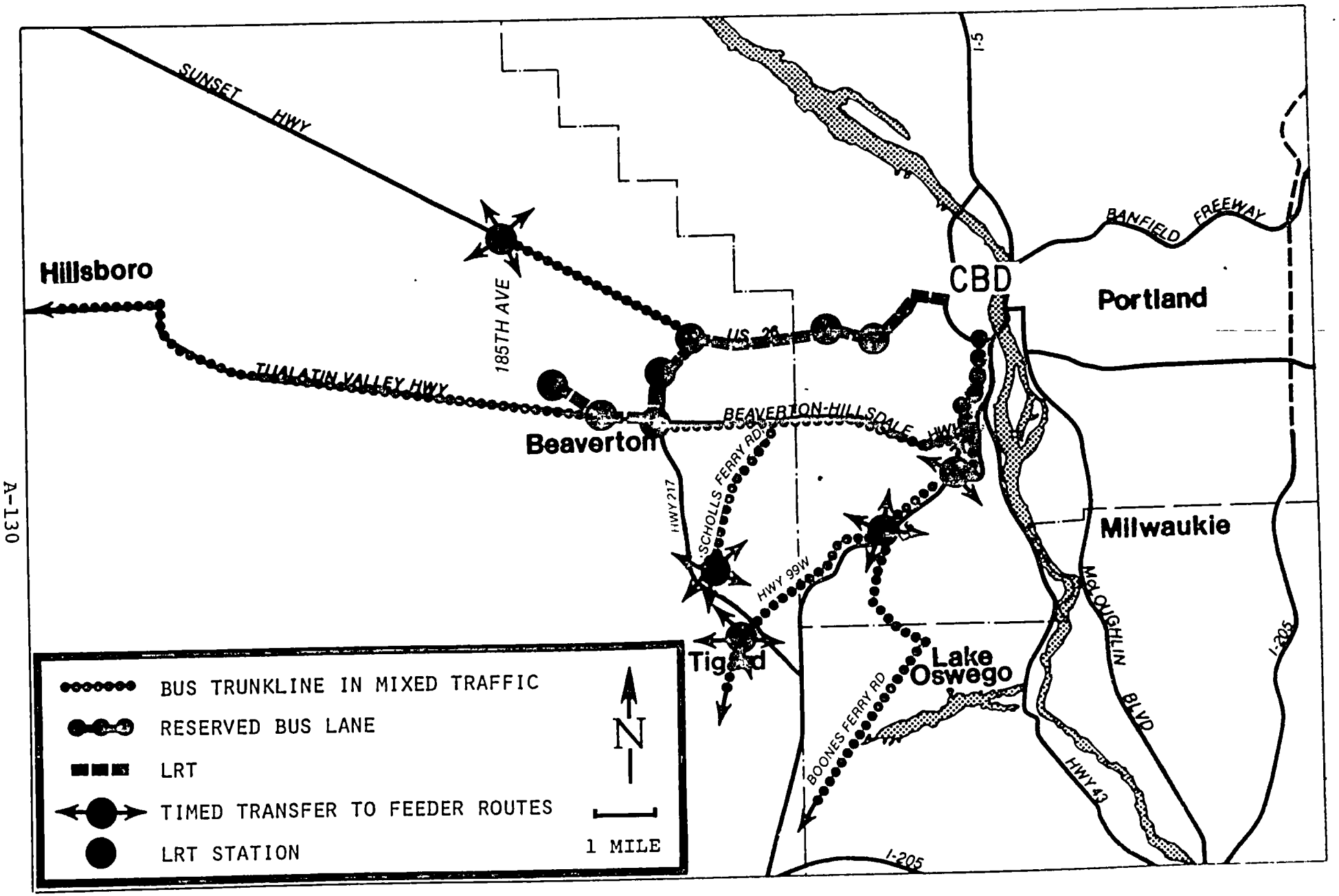

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FIGURE XI-1: THE SUNSET LRT TO BEAVERTON OPTION

SEE SPECIAL REPORT NO.5: WESTSIDE TRANSITWAY OPTIONS, SECTION III-E, FOR FURTHER DESCRIPTION.

F. 1995 Access to Opportunities:

✓Applicable Not-Applicable

1. Job Opportunities for Corridor Residents: Table XI-6

2. Potential Market for Major Business Areas: Table XI-7

G. 1995 Environmental Quality:

✓Applicable Not-Applicable

1. Energy Consumption

   a. Daily Corridor Energy Consumption: Table XI-8

2. Neighborhood Quality

   a. Regional Traffic through Neighborhoods: Table XI-9

3. Air Quality

   a. Hydrocarbon and Nitrogen Oxide Emmissions: Table XI-10

H. 1995 Costs and Efficiency:

✓Applicable Not-Applicable

1. Capital Costs: Table XI-11

2. Operating Costs: Table XI-12

3. Transit System Productivity: Table XI-13

I. Description of Land Use Considerations:

✓Applicable Not-Applicable

Downtown Portland to the Highway 217 Interchange:

Major land use activities in this segment include the Washington Park Zoo/Oregon Museum of Science and Industry (OMSI) complex with over 1.1 million annual visitors, St. Vincents Medical Center and the Peterkort Development. The latter two activities are situated at the Highway 217/Sunset interchange. St Vincents is a major regional medical facility with 1,200 employees. Land surrounding the medical facility has developed into ancillary uses, such as medical clinics and office uses.

The Peterkort Development is a proposed mixed-use development just west of St. Vincents. The proposal includes 1,060 dwelling units (2,200 population), the corporate headquarters of a major Oregon corporation (3,000 employees projected), and additional office and commercial uses. Total projected employment for all activities in the proposal is 8,115.

Existing residential activity in this segment is predominantly single-family use on the south side of the Sunset Highway. Multi-family uses are found at the Sylvan interchange area and along the north side of the Sunset between Sylvan and Hwy 217.

Highway 217 Interchange to Beaverton (Murray Boulevard)

As the route enters Beaverton, commercial activities prevail. Beaverton is presently reviewing the central business district activities through urban renewal plans. Two major developments, a 500,000 square foot shopping center presently under construction and a major hotel/retail/office complex scheduled for construction, will have a major influence on the future character of central Beaverton. Certain areas within the CBD are experiencing conversion to more intensive commercial and office uses.

Western Beaverton is dominated by the presence of Tektronix, Oregon's largest private employer. Tektronix has roughly 10,000 employees at this location and serves as the foundation for the largest employment concentration within Washington County. An additional 3,600 jobs are presently found within the immediate area.

The Beaverton vicinity is the major residential area within Washington County. Roughly 60 percent of the County's population resides in the Beaverton/Eastern Washington County area. Major residential areas include the South Beaverton/Farmington area and the Cedar Hills area, north of Beaverton.

J. Description of Right-of-Way Impacts:

✓Applicable Not-Applicable

The right-of-way impacts of this option include the potential displacement of 13 residential and 23 commercial buildings. Restricted access to commercial properties in the Beaverton CBD.

K. Transit Network Considerations:

✓Applicable Not-Applicable

1. Bus Volume: This option results in 24 two-car trains per hour and 544 buses per hour in downtown Portland during peak periods. This reduces the total bus volume by 16% to slightly exceed the capacity of the Transit Mall and the Westside bus volume by 42%. All buses on the Sunset Hwy. to downtown would be eliminated and the bus volume on Barbur Blvd. would be reduced by 6 buses per hour.

2. Future Branching Opportunities: West of Beaverton, the existing Southern Pacific Railroad and Burlington Northern Railroad provide opportunities to extend the LRT facility at some future time to the City of Hillsboro. South of Beaverton, an LRT facility could be extended along Highway 217 to Washington Square Shopping Center and the City of Tigard. The Sunset Hwy, northwest of the Hwy 217 interchange includes a grass median that could be used to construct a branch LRT facility. In the interim, the Tigard area would be connected to downtown.

Table XI-1: 1995 P.M. Peak Hour Transit Travel Times Between Major Points in the Westside Corridor Assuming the Sunset LRT to Beaverton Option

ORIGIN	DESTINATION: Hillsboro		Beaverton		Tigard		S.W. Portland		Portland CBD	
	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)
Hillsboro	xx	xx	23	-4	48	-23	54	-36	43	-38
Beaverton	22	-8	xx	xx	32	-16	34	-24	19	-58
Tigard	48	-23	32	-16	xx	xx	15	-17	33	-13
SW Portland	54	-36	34	-24	15	-17	xx	xx	17	-15

Table XI-2: 1995 A.M. Peak Hour In-Bound Transit Use Between Communities in the Westside Corridor (Local Trips Excluded) Assuming the Sunset LRT to Beaverton Option

ORIGIN	DESTINATION: Close-In Portland		DESTINATION: In-Bound Total	
	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity				
Transit Riders	730	+12	940	+11
Mode Split	64%	+10	40%	+11
Aloha Vicinity				
Transit Riders	790	+149	1,020	+141
Mode Split	54%	+116	20%	+122
West Beaverton Vicinity				
Transit Riders	780	+71	980	+68
Mode Split	59%	+51	27%	+59
East Beaverton Vicinity				
Transit Riders	1,290	+295	1,430	+240
Mode Split	57%	+148	42%	+147
S.W. Portland Vicinity				
Transit Riders	2,680	+15	2,680	+15
Mode Split	49%	+11	49%	+11
Tigard Vicinity				
Transit Riders	880	+30	980	+30
Mode Split	60%	+22	46%	+24
Total				
Transit Riders	7,150	+50	8,030	+49
Mode Split	54%	+32	36%	+38

Table XI-3: 1995 Transit Use Between Communities in the Westside Corridor
Assuming the Sunset LRT to Beaverton Option: Home Based Trips

TRIPS ATTRACTED TO:

TRIPS PRODUCED IN:	Hillsboro/ Forest Grove Vicinity		Aloha Vicinity		West Beaverton Vicinity		East Beaverton Vicinity		S.W. Portland		Close-in Portland		Tigard Vicinity		Portland C.B.D.	
	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null
Hillsboro/ Forest Grove Vicinity																
Trips	1,030	+17%	270	+42%	330	+14%	390	+11%	230	+21%	3,540	+12%	230	+64%	2,640	+6%
Mode Split	1%	0	6%	+2%	11%	+22%	13%	+8%	14%	+27%	43%	+8%	19%	+73%	61%	+2%
Aloha Vicinity																
Trips	180	+100%	370	+95%	610	+177%	520	+126%	220	+45%	4,360	+134%	270%	+200%	3,860	+127%
Mode Split	7%	+75%	1%	0	3%	+200%	4%	+100%	6%	+100%	34%	+143%	6%	+200%	49%	+133%
West Beaverton Vicinity																
Trips	100	+25%	260	+100%	630	+31%	590	+40%	220	+47%	3,960	+66%	290	+123%	3,550	+64%
Mode Split	10%	+25%	3%	+200%	2%	0	4%	+33%	6%	+50%	37%	+68%	5%	+150%	53%	+66%
East Beaverton Vicinity																
Trips	110	+38%	220	+83%	540	+50%	1,110	+29%	390	+30%	6,590	+38%	310	+72%	5,950	+37%
Mode Split	14%	+27%	4%	+100%	5%	+60%	2%	0	8%	+33%	36%	+33%	6%	+100%	53%	+29%
S.W. Portland Vicinity																
Trips	140	+75%	60	+20%	120	+71%	230	+64%	1,250	+28%	14,450	+18%	520	+10%	13,000	+15%
Mode Split	18%	+80%	5%	+25%	7%	+75%	6%	+50%	3%	+50%	31%	+19%	8%	160%	46%	+18%
Tigard Vicinity																
Trips	130	+160%	60	+100%	120	+100%	150	+67%	530	+23%	4,830	+34%	970	+67%	4,160	+32%
Mode Split	25%	+178%	8%	+100%	8%	+100%	8%	+700%	10%	+25%	42%	+35%	2%	+100%	63%	+31%

Table XI-4: 1995 Daily (Home Based) Transit Ridership Between Communities in the Westside Corridor Assuming the Sunset LRT to Beaverton Option

	TRIPS ATTRACTED TO: Close-In Portland		Rest of Corridor		Total	
TRIPS PRODUCED IN:	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity						
Trips	3,540	+12	2,480	+22	6,020	+16
Mode Split	43%	+8	2%	0	5%	+25
Aloha Vicinity						
Trips	4,360	+134	2,170	+131	6,530	+133
Mode Split	34%	+143	3%	+200	8%	+167
West Beaverton Vicinity						
Trips	3,960	+66	2,090	+50	6,050	+60
Mode Split	37%	+68	3%	+50	8%	+60
East Beaverton Vicinity						
Trips	6,590	+38	2,680	+41	9,270	+39
Mode Split	36%	+33	4%	+33	10%	+25
S.W. Portland Vicinity						
Trips	14,450	+18	2,320	+30	16,770	+19
Mode Split	31%	+19	4%	+33	16%	+23
Tigard Vicinity						
Trips	4,830	+34	1,960	+58	6,790	+40
Mode Split	42%	+35	3%	+50	10%	+43
Total						
Trips	37,730	+34	13,700	+47	51,430	+38
Mode Split	35%	+35	3%	+50	9%	+29

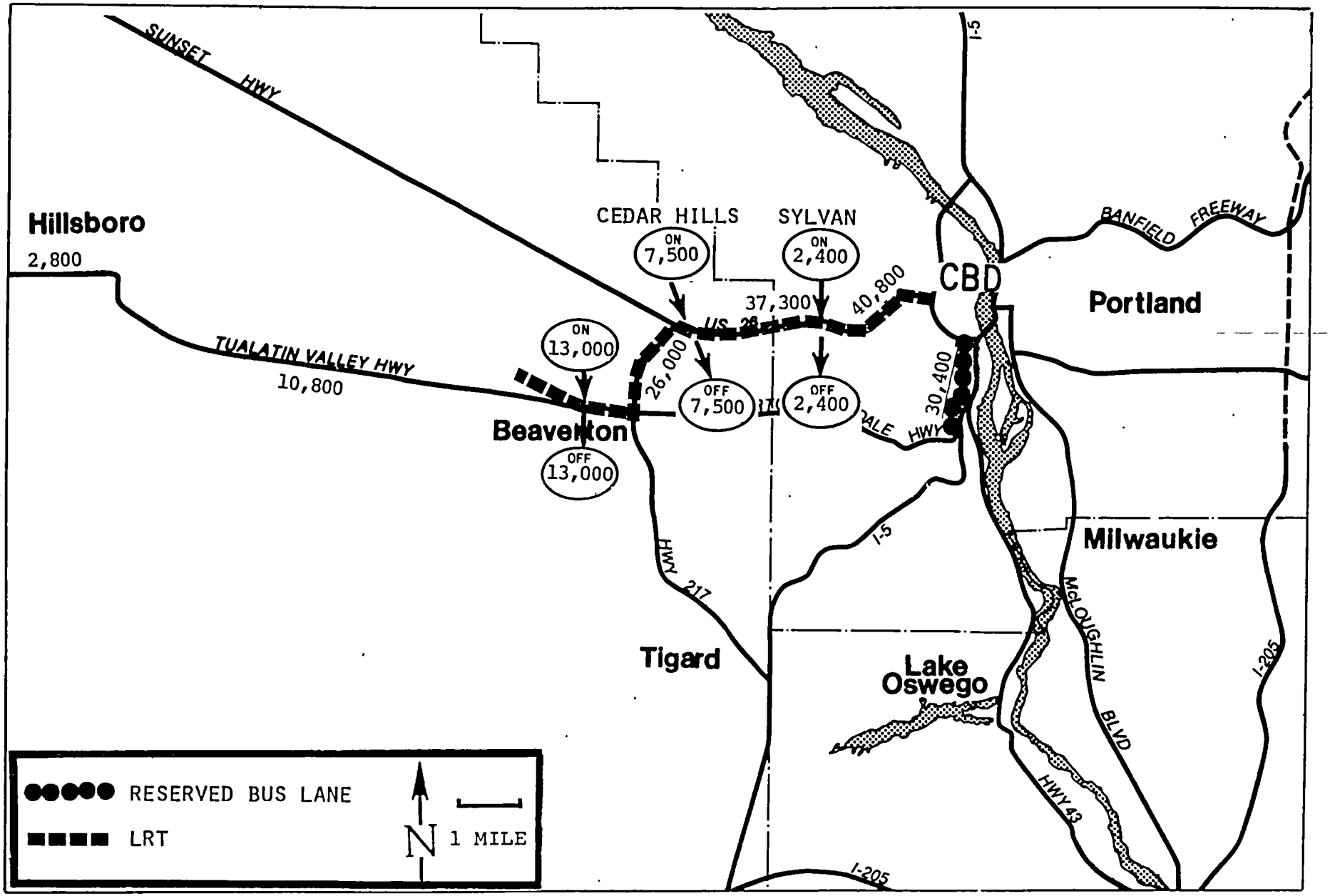

FIGURE XI-2 : TOTAL DAILY TRANSIT TRIPS USING THE SUNSET LRT TO BEAVERTON OPTION

FIGURE XI-3: 1995 TRAFFIC VOLUMES ON SELECTED ROAD SEGMENTS ASSUMING THE SUNSET LRT TO BEAVERTON OPTION

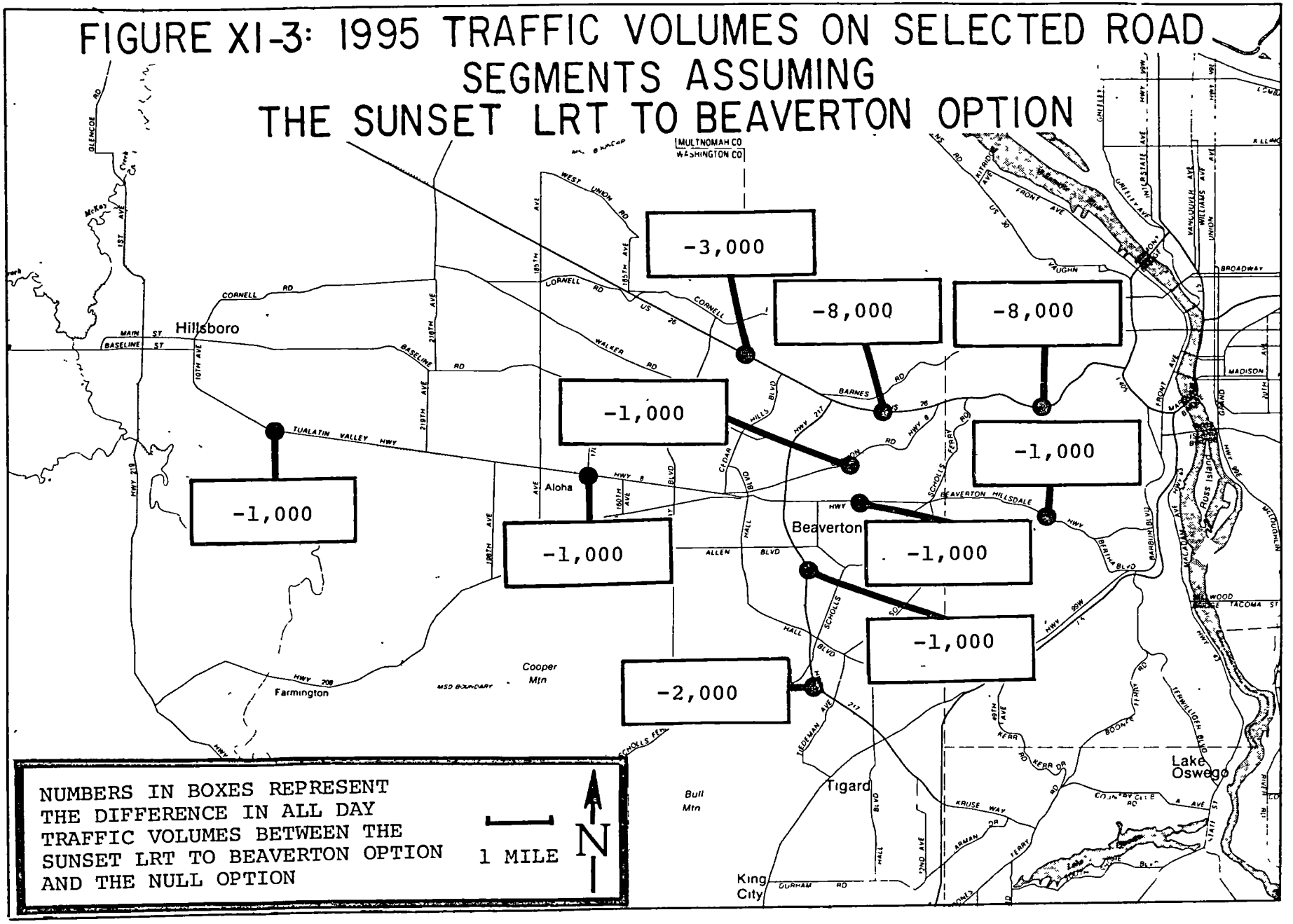

Table XI-5: 1995 P.M. Peak Hour, Peak Direction Capacity Deficiencies at Selected Cutlines Assuming the Sunset LRT to Beaverton Option

Cutline	Percent Above Capacity	Percent Reduction in Capacity Deficiency from the Null
Westside Corridor		
At SW 219th (from TV Hwy to Sunset Hwy)	0	0
At Murray Blvd (From TV Hwy to Cornell Rd)	40%	-20%
At Hwy 217 (From Denney Rd to Sunset Hwy)	20%	-33%
At Multnomah County Line (From Taylors Ferry Rd to Burnside)	10%	0

Table XI-6: 1995 P.M. Peak Hour Job Accessibility for Corridor Residents Assuming the Sunset LRT to Beaverton Option

Home Location	Number of Jobs Within 30 Minutes	Difference From Null
Beaverton	280,500	+112%
Hillsboro	82,100	+17%
Tigard	117,000	+1%
SW Portland	292,400	+15%

Table XI-7: 1995 P.M. Peak Hour Market Potential for Major Business Centers in the Westside Corridor Assuming the Sunset LRT to Beaverton Option

Business Location	Number of People Within 30 Minutes	Difference From Null
Beaverton CBD	378,400	+13%
Portland CBD	573,000	+39%
Hillsboro CBD	218,600	+8%
Washington Square	339,700	+3%

Table XI-8: 1995 Daily Corridor Energy Consumption for the Sunset LRT to Beaverton Option

	1995 Estimate	Difference From Null
Gasoline (Gallons)	90,840	-6%
Diesel (Gallons)	8,900	+86%
Electricity (KWH)[1]	21,890	N/A

1 Light Rail Transit Propulsion

Table XI-9: 1995 Potential Regional Traffic Through Neighborhoods During P.M. Peak-Hour Assuming the Sunset LRT to Beaverton Option

Community	Potential Through Trips	Difference From Null
Beaverton	890	-36%
SW Portland	650	-60%

Table XI-10: 1995 Air Pollution Emissions Assuming the Sunset LRT to Beaverton Option

Geographic Area:	Hydrocarbon Emissions Tons/Year	Difference From Null	Nitrogen Oxide Tons/Year	Difference From Null
Westside Corridor	7,830	-6%	8,130	-2%
Regionwide	30,800	-4%	33,900	-2%

Table XI-11: Project Capital Costs for the Sunset LRT to Beaverton Option

Cost Item	Cost (1978 Dollars)
Right of Way	$7,270,000
Construction	74,830,000
Stations	15,750,000
Rolling Stock[1]	30,615,000
Total Cost	$128,465,000
Annualized Capital Cost	$6,901,000

[1]Vehicles required in addition to Null Option (Null: 186 buses at $135,000 per bus = $25,110,000)

Table XI-12: 1995 Transit Operating Costs and Subsidies for the Sunset LRT to Beaverton Option

	Annual Costs and Revenues (1978 $)	Difference From Null
Westside Corridor		
Bus	$22,070,000	+29%
LRT	2,262,000	-
Total Operating Costs	$24,332,000	+42%
Farebox Revenue	$7,811,000	+49%
Operating Subsidy	$16,521,000	+40%
Regionwide		
Bus	$81,984,000	+32%
LRT	5,832,000	+63%
Total Operating Costs	$87,816,000	+34%
Farebox Revenue	$26,707,000	+34%
Operating Subsidy	61,109,000	+34%

Table XI-13: 1995 Transit System Productivity for the Sunset LRT to Beaverton Option

Productivity Measure	1995 Estimate	Difference From Null
Westside Corridor		
Operating Cost/ Passenger	$.93	-7%
Operating Subsidy/ Passenger	.63	-9%
Farebox Revenue/ Operating Cost	32%	+3%
Total Annualized[1] Cost/Passenger	$1.19	+19%
Annualized Local[2] Cost/Passenger	.68	-1%
Regionwide		
Operating Cost/ Passenger	$1.09	-1%
Operating Subsidy/ Passenger	.76	-1%
Farebox Revenue/ Operating Cost	30%	0

[1]Total Annualized Cost = Annualized Capital Cost plus operating cost
[2]Annualized Local Cost = Local share of Annualized Cost plus operating subsidy

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XII. SKETCH EVALUATION OF THE MULTNOMAH BUS LANE OPTION

A. Description: Figure XII-1

A reserved bus lane in this corridor could be constructed as an expansion of the existing Barbur Blvd. bus lane. West of Barbur Blvd., it could be constructed in or along Multnomah Blvd., then on its own right-of-way into Beaverton.

B. Type of Evaluation:

✓ Fatal Flaw Analysis (Section C only)

Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

✓ Applicable Not-Applicable

The technical merits of this option are patently inferior to that of the Beaverton/Hillsdale Bus Lane. The Multnomah Blvd. route to Murray Blvd. is 6,300 feet longer than the Beaverton/Hillsdale route. Secondly, the land uses along Beaverton/Hillsdale Hwy. are more compatible with Bus Lane operations than Multnomah Blvd. Thirdly, the capital costs of a Beaverton/Hillsdale Hwy. facility would be less than the Multnomah Blvd. option due to the extra length and the need to construct a portion of the Multnomah facility on new right-of-way, separate from existing highway.

D. 1995 Transit use

Applicable Not-Applicable ✓

E. 1995 Highway Service Levels:

Applicable Not Applicable ✓

F. 1995 Access to Opportunities:

Applicable Not-Applicable ✓

G. 1995 Environmental Quality:

Applicable Not-Applicable ✓

H. 1995 Costs and Efficiency:

Applicable Not-Applicable ✓

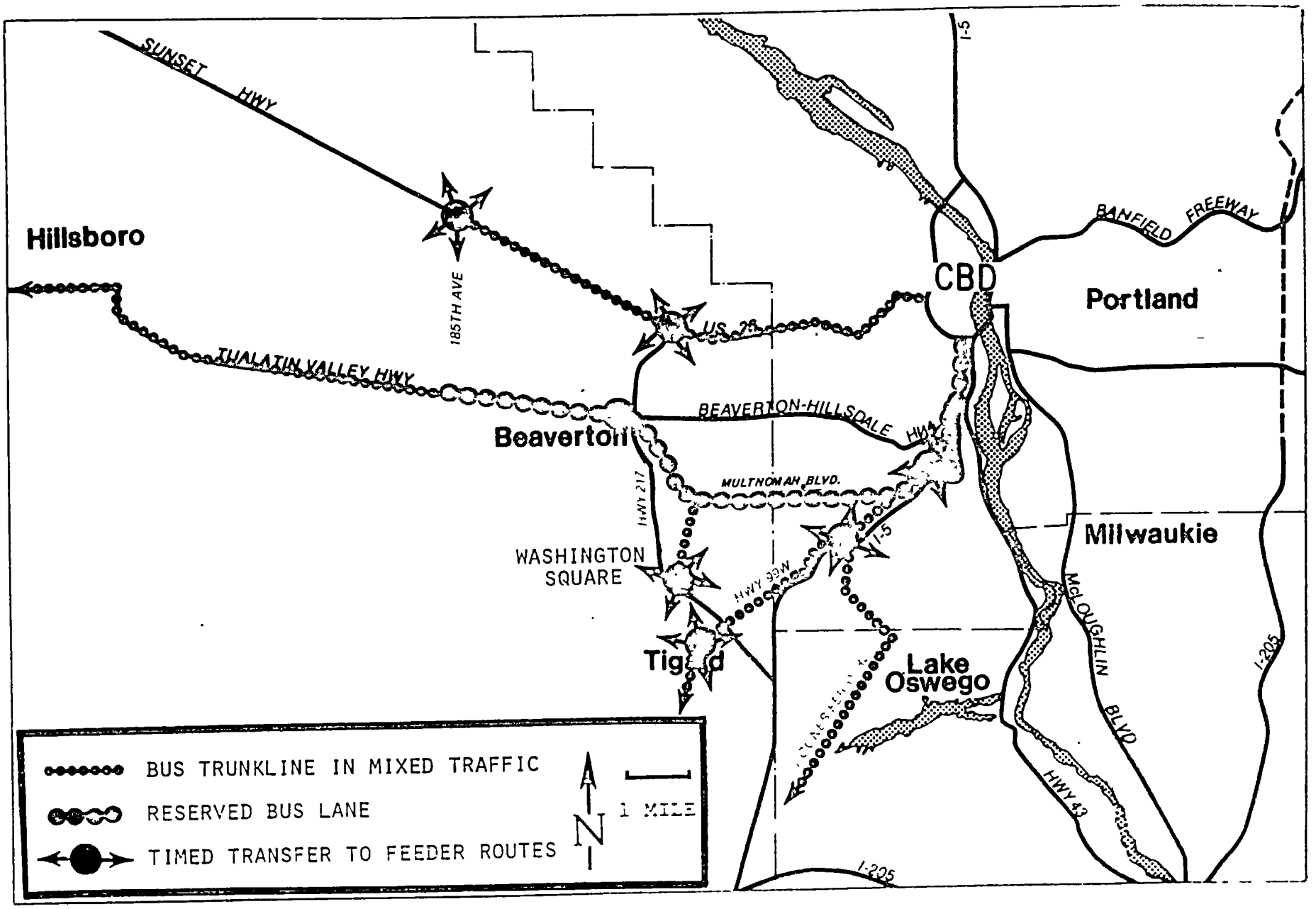

FIGURE XII-1: THE MULTNOMAH BUSLANE OPTION

SEE SPECIAL REPORT NO. 5: WESTSIDE TRANSITWAY OPTIONS, SECTION IV-C, FOR FURTHER DESCRIPTION

I. Description of Land Use Considerations:

Applicable Not-Applicable ✓

J. Description of Right-of-Way Impacts:

Applicable Not-Applicable ✓

K. Transit Network Considerations:

Applicable Not-Applicable ✓

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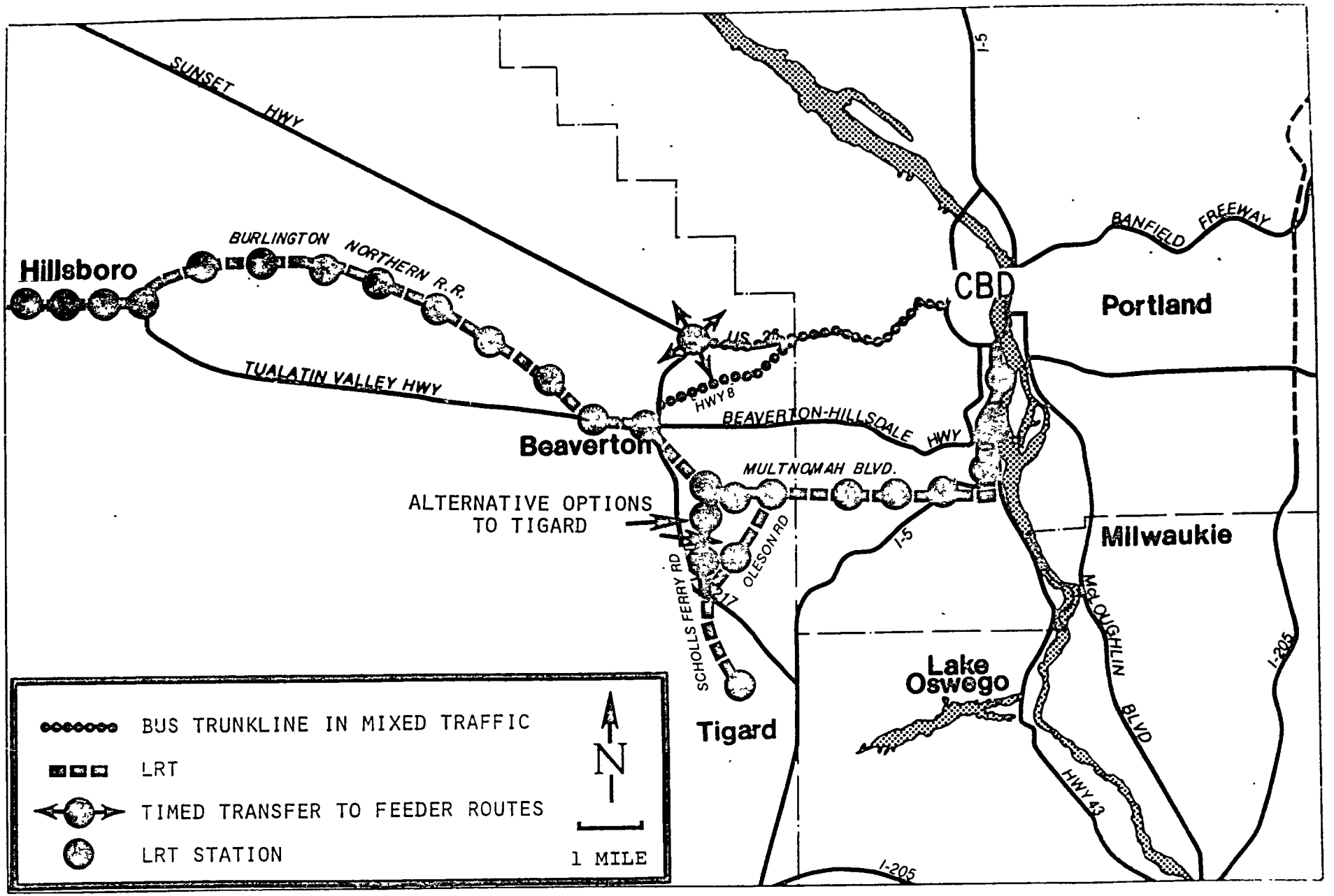

FIGURE XIII-1: THE MULTNOMAH LRT TO TIGARD AND HILLSBORO OPTION

SEE SPECIAL REPORT NO. 5: WESTSIDE TRANSITWAY OPTIONS, SECTION IV-G, FOR FURTHER DESCRIPTION

XIII. SKETCH EVALUATION OF THE MULTNOMAH LRT TO TIGARD AND HILLSBORO OPTION

A. Description: Figure XIII-1

The Multnomah LRT alternative calls for a light rail line leaving Portland southwards along the west bank of the Willamette River. This line would follow the Southern Pacific's Jefferson Street branch (parallel to Macadam Ave.) to Taylors Ferry Road, and then turn west climbing to Barbur Blvd. parallel to Taylors Ferry Road. From Barbur Blvd. it would follow Mulntomah Blvd., to Beaverton. Westwards from Beaverton, this alternative would follow the same alignment possibilities as the Sunset LRT Alternative to Hillsboro. The branch to Tigard can follow either Oleson or Scholls Ferry Roads, passing through Washington Square. See Special Report No. 5: Westside Transitway Options for additional details. The basic operating concept for the Multnomah LRT line would be similar to that for the other transitways in that transfer focal points would be created at Hillsboro, Beaverton, and Washington Square, and bus service would be reoriented to provide local and feeder service on the west side.

B. Type of Evaluation:

Fatal Flaw Analysis (Section C only)

✓ Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

Applicable Not-Applicable ✓

D. 1995 Transit use

✓ Applicable Not-Applicable

1. Transit Service Levels

   a. Peak Hour Transit Travel Times Between Major Points in the Corridor: Table XIII-1

2. Transit Trips Between Communities in the Westside Corridor

   a. Peak-Hour Trips: Table XIII-2
   b. Daily Home Based Trips: Table XIII-3
   c. Corridor Ridership: Table XIII-4

3. Trips Using the Major Trunk Routes in the Multnomah LRT to Tigard and Hillsboro Option

   a. Total Daily Trips: Figure XIII-2

E. 1995 Highway Service Levels:

✓Applicable Not Applicable

1. Highway Use

   a. Daily Traffic Volumes on Selected Road Segments: Figure XIII-3
   b. Peak-Hour Capacity Deficiencies at Selected Cutlines: Table XIII-5

F. 1995 Access to Opportunities:

✓Applicable Not-Applicable

1. Job Opportunities for Corridor Residents: Table XIII-6

2. Potential Market for Major Business Areas: Table XIII-7

G. 1995 Environmental Quality:

✓Applicable Not-Applicable

1. Energy Consumption

   a. Daily Corridor Energy Consumption: Table XIII-8

2. Neighborhood Quality

   a. Regional Traffic through Neighborhoods: Table XIII-9

3. Air Quality

   a. Hydrocarbon and Nitrogen Oxide Emmissions: Table XIII-10

H. 1995 Costs and Efficiency:

✓Applicable Not-Applicable

1. Capital Costs: Table XIII-11

2. Operating Costs: Table XIII-12

3. Transit System Productivity: Table XIII-13

I. Description of Land Use Considerations:

✓Applicable Not-Applicable

Downtown Portland to Burlingame: This segment of the route passes through an area which is experiencing significant redevelopment. Old warehouses are being converted to office, retail, and high density residential uses. Referred to as the John's Landing area, historic land use patterns along Macadam Ave. are being significantly altered to reflect a more intensive use. By 1981 approximately 400 condominiums will be located here. In addition, three office buildings totaling 60,000 square feet, are scheduled for construction within the next two years.

The connection to Burlingame follows a ravine approximately one mile in length. Surrounding land uses are almost entirely single family residential. At Burlingame, the route passes a community level shopping center (80 acres), surround by office and multi-family uses.

Burlingame to Beaverton: This segment passes through a predominently single family residential area in S.W. Portland and eastern Washington County. Commercial centers are found in the Multnomah neighborhood, Garden Home and Beaverton. The Multnomah neighborhood includes a collection of antique/novelty stores as well as the community commerical activities. Multi-family development has occured around the commercial area.

The Garden Home area includes community commercial shopping centers. Some multi-family development has occured surrounding the center, however, single family uses prevail in this area.

The more intensive land uses are found as the route enters Beaverton. The Western Ave. Industrial Area (1,600) employees) is located at the eastern edge of Beaverton. West of the industrial area the route enters the office and commercial core of Beaverton. As the route enters Beaverton, commercial activities prevail. Beaverton is presently reviewing the central business district activities through urban renewal plans. Two major developments, a 500,000 square foot shopping center presently under construction and a major hotel/retail/ office complex scheduled for construction, will have a major influence on the future character of central Beaverton. Certain areas within the CBD are experiencing conversion to more intensive commercial and office uses.

Western Beaverton is dominated by the presence of Tektronix, Oregon's largest private employer. Tektronix has roughly 10,000 employees at this location and serves

as the foundation for the largest employment concentration within Washington County. An additional 3,600 jobs are presently found within the immediate area.

The Beaverton vicinity is the major residential area within Washington County. Roughly 60 percent of the County's population resides in the Beaverton/Eastern Washington County area. Major residential areas include the South Beaverton/Farmington area and the Cedar Hills area, north of Beaverton.

Beaverton to Hillsboro

This segment of the route passes through a rapidly urbanizing portion of unincorporated Washington County. Much of this land is presently designated as Urban Intermediate on the County's Framework Plan and therefore, is vacant. The County is presently considering major proposals for conversion to Urban designations in the S. W. 185th vicinity.

Existing land uses in this segment include the Tualatin Valley Park and Recreation complex, the Town Center/Tanasbourne area, and the industrial area at S. W. 185th and Walker Road. The Town Center/Tanasbourne area includes a major shopping center and medium to high density condominiums. Tektronix has another site at the S.W. 185th industrial area with 200 employees. Also included at this site are the Oregon Primate Research Center and the Oregon Graduate Center.

As the route enters Hillsboro it passes through the Hawthorne Farms Industrial Park. The Intel Corporation has just completed construction of a major electronics plant which is projected to employ 3,500 persons by 1983. The Washington County Fairgrounds and the Hillsboro Airport are located just west of Hawthorne Farms.

The City of Hillsboro has a current population of 26,000. The city has doubled population in the past decade. Projections indicate a continuation of the rapid growth in this area.

Garden Home to Tigard: Land uses along Scholls Ferry Road are primarily residential (both single and multi-family) between Multnomah Blvd. and Hall Blvd. At Hall Blvd., land uses are dominated by Washington Square, the region's largest shopping center. Development in this area reflects the influence of Washington Square. Substantial multi-family and office development has occured in this area. Current employment figures indicate 2,500 employees at Washington Square and an additional 3,000 employees in the surrounding area.

South of Washington Square, the route passes through the Cascade Industrial Park before entering the residential areas of Tigard.

J. Description of Right-of-Way Impacts:

✓Applicable Not-Applicable

In total, 41 commercial and 14 residential buildings would potentially be displaced by this option. In the Macadam Avenue segment, 12 commercial buildings would be displaced and access to other businesses would be restricted. The impacts along Multnomah Blvd. are primarily restricted driveway and street access. Two residential units may be taken. As the route enters Beaverton, 14 commercial buildings would be displaced. Examining the two options west from Beaverton to Hillsboro, the Southern Pacific Railroad route may require the displacement of 10 commercial and two residential buildings as opposed to three residential buildings on the Burlington Northern route. In the Beaverton to Tigard segment, the most significant impacts would be (a) the removal of street parking on Scholls Ferry Rd., (b) the loss of some frontages and (c) restricted turning movements into roughly 50 driveways.

K. Transit Network Considerations:

✓Applicable Not-Applicable

1. Bus Volumes: This option results in 34 two-car trains per hour and 496 buses per hour in downtown Portland during peak periods. This reduces the total bus volume by 23 percent to be within the capacity limitation of the Transit Mall and the Westside bus volume by 62 percent. The bus volume on the Sunset Hwy. would be reduced by 80 buses per hour, on Barbur Blvd. by 56 buses per hour and on Multnomah Ave. north of Taylors Ferry Rd., by 6 buses per hour.

2. Future Branching Opportunities: From Macadam Ave. the LRT facility could branch east across the Willamette River and continue south to Oregon City using an abandoned Portland Traction Co. right-of-way. It could also branch south along the Willamette River to Lake Oswego if the Southern Pacific track is abandoned.

Table XIII-1: 1995 P.M. Peak Hour Transit Travel Times Between Major Points in the Westside Corridor Assuming the Multnomah LRT to Tigard and Hillsboro Option

ORIGIN	DESTINATION: Hillsboro		Beaverton		Tigard		S.W. Portland		Portland CBD	
	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)
Hillsboro	xx	xx	20	-17	37	-40	38	-55	46	-33
Beaverton	20	-17	xx	xx	18	-53	18	-60	27	-40
Tigard	37	-40	18	-53	xx	xx	15	-17	27	-29
SW Portland	38	-55	18	-60	15	-17	xx	xx	17	-15

Table XIII-2: 1995 A.M. Peak Hour In-Bound Transit Use Between Communities in the Westside Corridor (Local Trips Excluded) Assuming the Multnomah LRT to Tigard and Hillsboro Option

ORIGIN	DESTINATION: Close-In Portland		In-Bound Total	
	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity				
Transit Riders	760	+18	1,080	+28
Mode Split	70%	+21	44%	+22
Aloha Vicinity				
Transit Riders	730	+128	1,040	+145
Mode Split	53%	+112	20%	+122
West Beaverton Vicinity				
Transit Riders	640	+39	860	+46
Mode Split	54%	+38	24%	+41
East Beaverton Vicinity				
Transit Riders	980	+201	1,130	+169
Mode Split	51%	+122	37%	+118
S.W. Portland Vicinity				
Transit Riders	2,930	+25	2,930	+25
Mode Split	52%	+18	52%	+18
Tigard Vicinity				
Transit Riders	1,010	+49	1,140	+50
Mode Split	65%	+33	49%	+32
Total				
Transit Riders	7,050	+48	8,180	+52
Mode Split	55%	+34	37%	+42

Table XIII-3: 1995 Transit Use Between Communities in the Westside Corridor
Assuming the Multnomah LRT to Tigard and Hillsboro Option: Home Based Trips

TRIPS ATTRACTED TO:

TRIPS PRODUCED IN:	Hillsboro/ Forest Grove Vicinity		Aloha Vicinity		West Beaverton Vicinity		East Beaverton Vicinity		S.W. Portland		Close-in Portland		Tigard Vicinity		Portland C.B.D.	
	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null
Hillsboro/ Forest Grove Vicinity																
Trips	1,120	+27%	450	+138%	370	+26%	400	+15%	350%	+84%	3,600	+14%	280	+100%	2,850	+14%
Mode Split	1%	0	8%	+200%	13%	+44%	15%	+25%	22%	+100%	50%	+25%	25%	+127%	70%	+17%
Aloha Vicinity																
Trips	270	+200%	570	+200%	660	+200%	530	+130%	300	+150%	3,900	+110%	300	+233%	3,520	+107%
Mode Split	9%	+120%	2%	+100%	4%	+300%	4%	+200%	8%	+167%	32%	+129%	7%	+250%	46%	+119%
West Beaverton Vicinity																
Trips	160	+100%	450	+246%	670	+40%	610	+45%	250	+67%	3,220	+35%	340	+162%	2,920	+35%
Mode Split	13%	+63%	4%	+300%	2%	0	4%	+33%	7%	+75%	32%	+45%	6%	+200%	46%	+44%
East Beaverton Vicinity																
Trips	160	+100%	300	+150%	530	+47%	1,000	+16%	370	+23%	5,090	+7%	360	+100%	4,640	+7%
Mode Split	17%	+55%	5%	+150%	3%	0	2%	0	7%	+16%	31%	+15%	7%	+133%	45%	+9%
S.W. Portland Vicinity																
Trips	270	+238%	160	+220%	190	+171%	320	+129%	1,450	+48%	15,820	+29%	930	+99%	14,290	+27%
Mode Split	26%	+160%	11%	+175%	9%	+125%	8%	+100%	3%	+50%	34%	+26%	10%	+100%	48%	+23%
Tigard Vicinity																
Trips	240	+380%	130	+333%	190	+217%	260	+189%	690	+60%	5,380	+49%	1,110	+91%	4,600	+46%
Mode Split	35%	+289%	14%	+250%	11%	+175%	13%	+1,200%	11%	+38%	46%	+48%	2%	+100%	66%	+38%

Table XIII-4: 1995 Daily (Home Based) Transit Ridership Between Communities in the Westside Corridor Assuming the Multnomah LRT to Tigard and Hillsboro Option

	TRIPS ATTRACTED TO: Close-In Portland		Rest of Corridor		Total	
TRIPS PRODUCED IN:	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity						
Trips	3,600	+14	2,970	+46	6,570	+26
Mode Split	50%	+25	2%	0	5%	+25
Aloha Vicinity						
Trips	3,900	+110	2,630	+180	6,530	+133
Mode Split	32%	+129	3%	+200	7%	+133
West Beaverton Vicinity						
Trips	3,220	+35	2,480	+78	5,700	+51
Mode Split	32%	+45	3%	+50	7%	+40
East Beaverton Vicinity						
Trips	5,090	+7	2,720	+43	7,810	+17
Mode Split	31%	+15	3%	0	8%	0
S.W. Portland Vicinity						
Trips	15,820	+29	3,320	+85	19,140	+36
Mode Split	34%	+31	5%	+67	16%	+23
Tigard Vicinity						
Trips	5,380	+49	2,620	+111	8,000	+65
Mode Split	34%	+10	4%	+100	10%	+42
Total						
Trips	37,010	+32	16,740	+80	53,750	+44
Mode Split	36%	+38	3%	+50	9%	+29

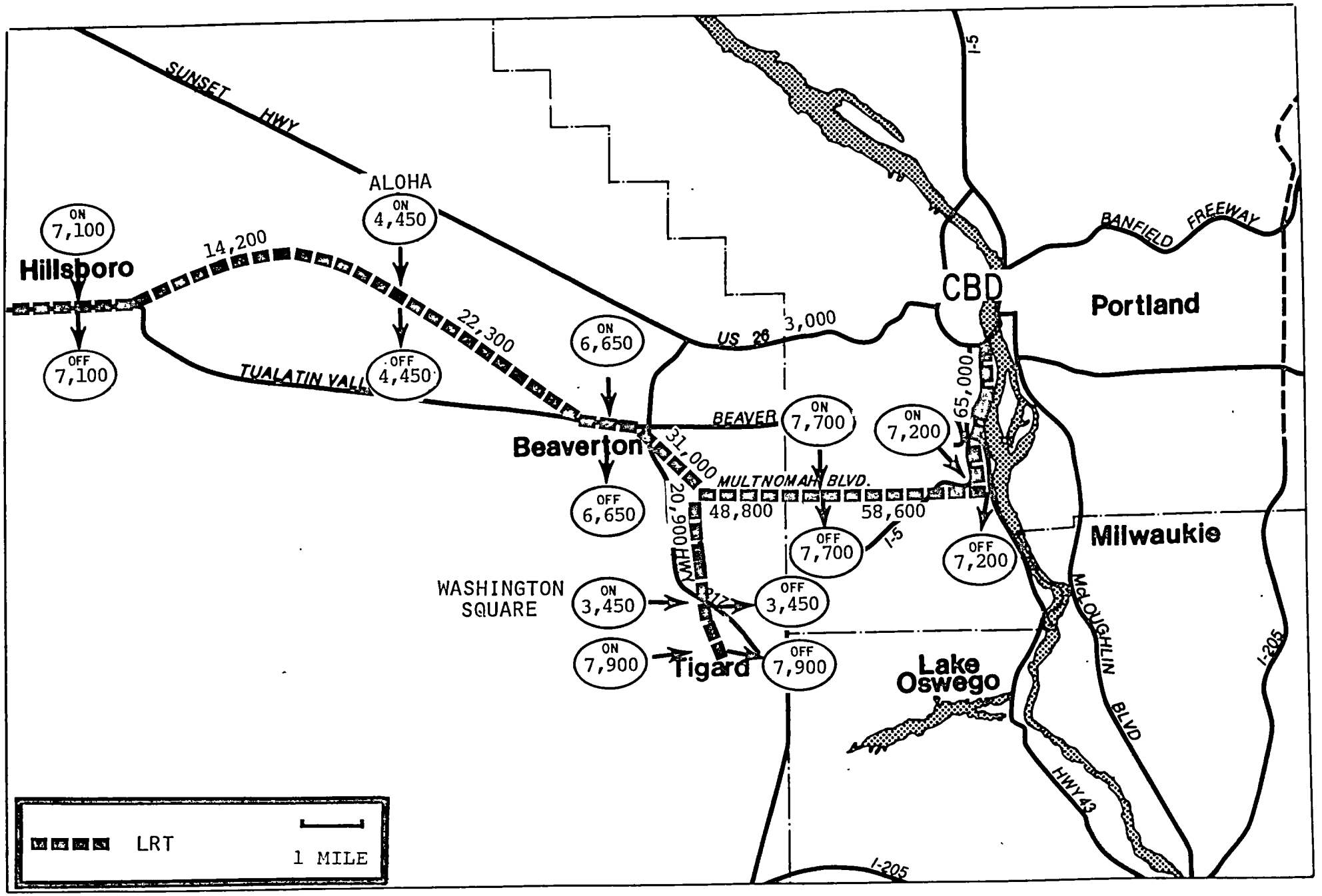

FIGURE XIII-2: TOTAL DAILY TRANSIT TRIPS USING THE MULTNOMAH LRT TO TIGARD AND HILLSBORO OPTION

FIGURE XIII-3:1995 TRAFFIC VOLUMES ON SELECTED ROAD SEGMENTS ASSUMING THE MULTNOMAH LRT TO TIGARD AND HILLSBORO OPTION

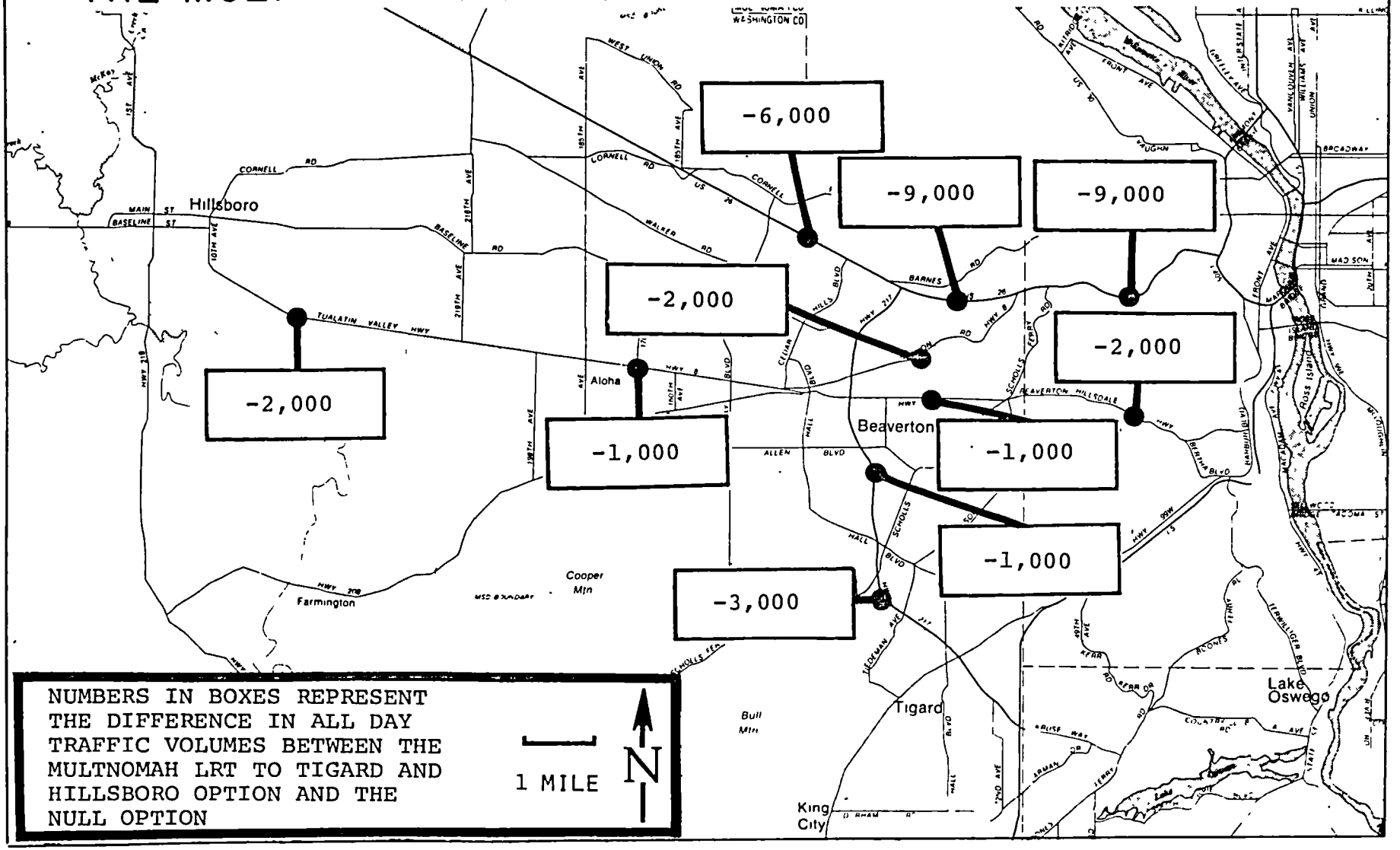

Table XIII-5: 1995 P.M. Peak Hour, Peak Direction Capacity Deficiencies at Selected Cutlines Assuming the Multnomah LRT to Tigard and Hillsboro Option

Cutline	Percent Above Capacity	Percent Reduction in Capacity Deficiency from the Null
Westside Corridor		
At SW 219th (from TV Hwy to Sunset Hwy)	0	0
At Murray Blvd (From TV Hwy to Cornell Rd)	40%	-20%
At Hwy 217 (From Denney Rd to Sunset Hwy)	20%	-33%
At Multnomah County Line (From Taylors Ferry Rd to Burnside)	10%	0

Table XIII-6: 1995 P.M. Peak Hour Job Accessibility for Corridor Residents Assuming the Multnomah LRT to Tigard and Hillsboro Option

Home Location	Number of Jobs Within 30 Minutes	Difference From Null
Beaverton	252,700	+91%
Hillsboro	89,200	+28%
Tigard	224,000	+92%
SW Portland	301,300	+18%

Table XIII-7: 1995 P.M. Peak Hour Market Potential for Major Business Centers in the Westside Corridor Assuming the Multnomah LRT to Tigard and Hillsboro Option

Business Location	Number of People Within 30 Minutes	Difference From Null
Beaverton CBD	365,900	+9%
Portland CBD	562,300	+36%
Hillsboro CBD	217,000	+7%
Washington Square	353,200	+7%

Table XIII-8: 1995 Daily Corridor Energy Consumption for the Multnomah LRT to Tigard and Hillsboro Option

	1995 Estimate	Difference From Null
Gasoline (Gallons)	89,590	-7%
Diesel (Gallons)	8,150	+71%
Electricity (KWH)[1]	55,190	N/A

[1] Light Rail Transit Propulsion

Table XIII-9: 1995 Potential Regional Traffic Through Neighborhoods During P.M. Peak-Hour Assuming the Multnomah LRT to Tigard and Hillsboro Option

Community	Potential Through Trips	Difference From Null
Beaverton	500	-64%
SW Portland	1,020	-34%

Table XIII-10: 1995 Air Pollution Emissions Assuming the Multnomah LRT to Tigard and Hillsboro Option

Geographic Area:	Hydrocarbon Emissions Tons/Year	Difference From Null	Nitrogen Oxide Tons/Year	Difference From Null
Westside Corridor	7,720	-7%	8,090	-2%
Regionwide	30,500	-5%	33,800	-2%

Table XIII-11: Project Capital Costs for the Multnomah LRT to Tigard and Hillsboro Option

Cost Item	Cost (1978 Dollars)
Right of Way	$36,580,000
Construction	117,730,000
Stations	25,240,000
Rolling Stock[1]	60,040,000
Total Cost	$239,590,000
Annualized Capital Cost	$12,701,000

[1]Vehicles required in addition to Null Option (Null: 186 buses at $135,000 per bus = $25,110,000)

Table XIII-12: 1995 Transit Operating Costs and Subsidies for the Multnomah LRT to Tigard and Hillsboro Option

	Annual Costs and Revenues (1978 $)	Difference From Null
Westside Corridor		
Bus	$21,740,000	+27%
LRT	5,374,000	-
Total Operating Costs	$27,114,000	+59%
Farebox Revenue	$8,090,000	+54%
Operating Subsidy	$19,024,000	+61%
Regionwide		
Bus	$81,654,000	+32%
LRT	8,944,000	+151%
Total Operating Costs	$90,598,000	+38%
Farebox Revenue	$26,931,000	+35%
Operating Subsidy	63,667,000	+40%

Table XIII-13: 1995 Transit System Productivity for the Multnomah LRT to Tigard and Hillsboro Option

Productivity Measure	1995 Estimate	Difference From Null
Westside Corridor		
Operating Cost/ Passenger	$1.01	+1%
Operating Subsidy/ Passenger	.71	+3%
Farebox Revenue/ Operating Cost	30%	-3%
Total Annualized[1] Cost/Passenger	$1.48	+48%
Annualized Local[2] Cost/Passenger	.80	+16%
Regionwide		
Operating Cost/ Passenger	$1.12	+2%
Operating Subsidy/ Passenger	.78	+1%
Farebox Revenue/ Operating Cost	30%	0

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[1]Total Annualized Cost = Annualized Capital Cost plus operating cost

[2]Annualized Local Cost = Local share of Annualized Cost plus operating subsidy

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XIV. SKETCH EVALUATION OF THE MULTNOMAH LRT TO TIGARD OPTION

A. Description: Figure XIV-1

This LRT option extends from downtown Portland to Beaverton via the Southern Pacific R.O.W. parallel to Macadam Avenue and Multnomah Blvd. A branch line from Multnomah Blvd. to Washington Square and Tigard would follow either Oleson Road or Scholls Ferry Road. See Special Report No. 5: Westside Transitway Options for additional details.

B. Type of Evaluation:

Fatal Flaw Analysis (Section C only)

✓Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

Applicable Not-Applicable✓

D. 1995 Transit use

✓Applicable Not-Applicable

1. Transit Service Levels

   a. Peak Hour Transit Travel Times Between Major Points in the Corridor: Table XIV-1

2. Transit Trips Between Communities in the Westside Corridor

   a. Peak-Hour Trips: Table XIV-2
   b. Daily Home Based Trips: Table XIV-3
   c. Corridor Ridership: Table XIV-4

3. Trips Using the Major Trunk Routes in the Multnomah LRT to Tigard Option

   a. Total Daily Trips: Figure XIV-2

E. 1995 Highway Service Levels:

✓Applicable Not Applicable

1. Highway Use

   a. Daily Traffic Volumes on Selected Road Segments: Figure XIV-3
   b. Peak-Hour Capacity Deficiencies at Selected Cutlines: Table XIV-5

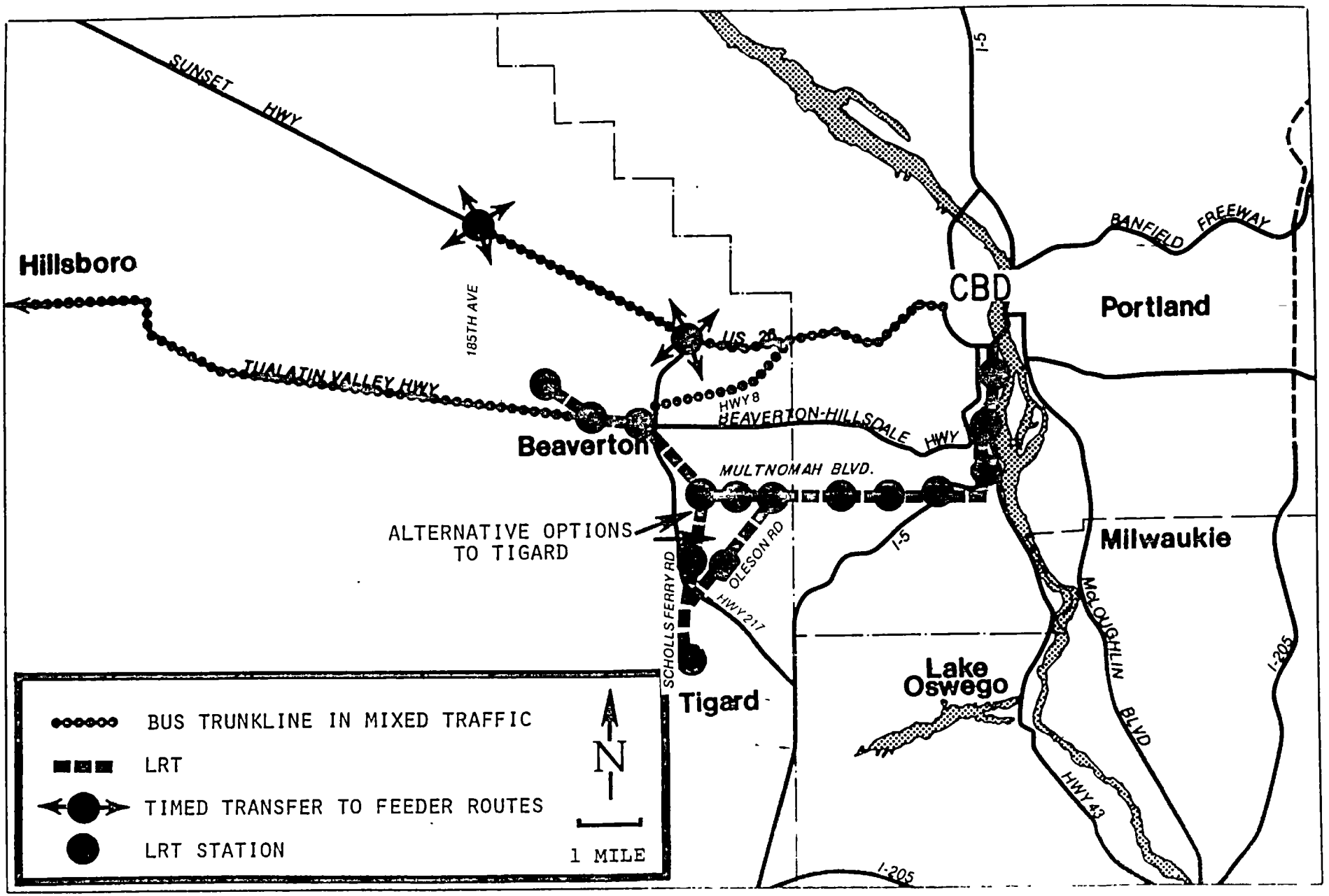

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FIGURE XIV-1: THE MULTNOMAH LRT TO TIGARD OPTION

SEE SPECIAL REPORT NO. 5: WESTSIDE TRANSITWAY OPTIONS, SECTION IV-F, FOR FURTHER DESCRIPTION

F. 1995 Access to Opportunities:

✓Applicable Not-Applicable

1. Job Opportunities for Corridor Residents: Table XIV-6

2. Potential Market for Major Business Areas: Table XIV-7

G. 1995 Environmental Quality:

✓Applicable Not-Applicable

1. Energy Consumption

   a. Daily Corridor Energy Consumption: Table XIV-8

2. Neighborhood Quality

   a. Regional Traffic through Neighborhoods: Table XIV-9

3. Air Quality

   a. Hydrocarbon and Nitrogen Oxide Emmissions: Table XIV-10

H. 1995 Costs and Efficiency:

✓Applicable Not-Applicable

1. Capital Costs: Table XIV-11

2. Operating Costs: Table XIV-12

3. Transit System Productivity: Table XIV-13

I. Description of Land Use Considerations:

✓Applicable Not-Applicable

Downtown Portland to Burlingame: This segment of the route passes through an area which is experiencing significant redevelopment. Old warehouses are being converted to office, retail, and high density residential uses. Referred to as the John's Landing area, historic land use patterns along Macadam Ave. are being significantly altered to reflect a more intensive use. By 1981 approximately 400 condominiums will be located here. In addition, three office buildings totaling 60,000 square feet, are scheduled for construction within the next two years.

The connection to Burlingame follows a ravine approximately one mile in length. Surrounding land uses are almost entirely single family residential. At Burlingame, the route passes a community level shopping center (80 acres), surround by office and multi-family uses.

Burlingame to Beaverton: This segment passes through a predominently single family residential area in S.W. Portland and eastern Washington County. Commercial centers are found in the Multnomah neighborhood, Garden Home and Beaverton. The Multnomah neighborhood includes a collection of antique/novelty stores as well as the community commerical activities. Multi-family development has occured around the commercial area.

The Garden Home area includes community commercial shopping centers. Some multi-family development has occured surrounding the center, however, single family uses prevail in this area.

The more intensive land uses are found as the route enters Beaverton. The Western Ave. Industrial Area (1,600) employees) is located at the eastern edge of Beaverton. West of the industrial area the route enters the office and commercial core of Beaverton. As the route enters Beaverton, commercial activities prevail. Beaverton is presently reviewing the central business district activities through urban renewal plans. Two major developments, a 500,000 square foot shopping center presently under construction and a major hotel/retail/office complex scheduled for construction, will have a major influence on the future character of central Beaverton. Certain areas within the CBD are experiencing conversion to more intensive commercial and office uses.

Western Beaverton is dominated by the presence of Tektronix, Oregon's largest private employer. Tektronix has roughly 10,000 employees at this location and serves as the foundation for the largest employment concentration within Washington County. An additional 3,600 jobs are presently found within the immediate area.

The Beaverton vicinity is the major residential area within Washington County. Roughly 60 percent of the County's population resides in the Beaverton/Eastern Washington County area. Major residential areas include the South Beaverton/Farmington area and the Cedar Hills area, north of Beaverton.

Garden Home to Tigard: Land uses along Scholls Ferry Road are primarily residential (both single and multi-family) between Multnomah Blvd. and Hall Blvd. At Hall Blvd.,

land uses are dominated by Washington Square, the region's largest shopping center. Development in this area reflects the influence of Washington Square. Substantial multi-family and office development has occured in this area. Current employment figures indicate 2,500 employees at Washington Square and an additional 3,000 employees in the surrounding area.

South of Washington Square, the route passes through the Cascade Industrial Park before enterin the residential areas of Tigard.

J. Description of Right-of-Way Impacts:

✓Applicable Not-Applicable

In the Macadam Avenue segment, 12 commercial buildings would be potentially displaced and access to some businesses would be restricted. The impacts along Multnomah Blvd. are primarily restricted driveway and street access. Two residential units may be taken. As the route enters Beaverton, 14 commercial buildings would potentially be displaced. In the Beaverton to Tigard segment, the most significant impacts would be (a) the removal of street parking on Scholls Ferry Rd., (b) the loss of some frontages and (c) restricted movements into roughly 50 driveways.

K. Transit Network Considerations:

✓Applicable Not-Applicable

1. Bus Volumes: This option results in 34 two-car trains per hour and 504 buses per hour in downtown Portland during peak periods. This reduces the total bus volume by 22 percent to be within the capacity limitation of the Transit Mall and the Westside bus volume by 58 percent. The bus volume on the Sunset Hwy. would be reduced by 72 buses per hour, on Barbur Blvd. by 56 buses per hour and on Macadam Ave. north of Taylors Ferry Rd., by 6 buses per hour.

2. Future Branching Opportunities: From Macadam Ave. the LRT facility could branch east across the Willamette River and continue south to Oregon City using an abandoned Portland Traction Co. right-of-way. It could also branch south along the Willamette River to Lake Oswego if the Southern Pacific track is abandoned. West of Beaverton, the existing Southern Pacific Railroad and Burlington Northern Railroad provided opportunities to extend the LRT facility west to the City of Hillsboro.

Table XIV-1: 1995 P.M. Peak Hour Transit Travel Times Between Major Points in the Westside Corridor Assuming the Multnomah LRT to Tigard Option

DESTINATION

ORIGIN	Hillsboro		Beaverton		Tigard		S.W. Portland		Portland CBD	
	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)
Hillsboro	xx	xx	23	-42	43	-31	43	-49	51	-26
Beaverton	23	-4	xx	xx	18	-53	18	-60	27	-40
Tigard	43	-31	18	-53	xx	xx	15	-17	27	-29
SW Portland	43	-49	18	-60	15	-17	xx	xx	17	-15

Table XIV-2: 1995 A.M. Peak Hour In-Bound Transit Use Between Communities in the Westside Corridor (Local Trips Excluded) Assuming the Multnomah LRT to Tigard Option

ORIGIN	DESTINATION: Close-In Portland		DESTINATION: In-Bound Total	
	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity				
Transit Riders	650	0	880	+5
Mode Split	58%	0	37%	+3
Aloha Vicinity				
Transit Riders	690	+118	950	+125
Mode Split	50%	+100	19%	+111
West Beaverton Vicinity				
Transit Riders	650	+41	860	+46
Mode Split	54%	+38	24%	+41
East Beaverton Vicinity				
Transit Riders	1,010	+210	1,130	+170
Mode Split	51%	+122	37%	+117
S.W. Portland Vicinity				
Transit Riders	2,930	+25	2,930	+25
Mode Split	52%	+18	52%	+18
Tigard Vicinity				
Transit Riders	1,010	+49	1,140	+50
Mode Split	65%	+33	49%	+32
Total				
Transit Riders	6,940	+46	7,890	+47
Mode Split	54%	+32	36%	+38

Table XIV-3: 1995 Transit Use Between Communities in the Westside Corridor
Assuming the Multnomah LRT to Tigard Option: Home Based Trips

TRIPS ATTRACTED TO:

TRIPS PRODUCED IN:	Hillsboro/ Forest Grove Vicinity		Aloha Vicinity		West Beaverton Vicinity		East Beaverton Vicinity		S.W. Portland		Close-in Portland		Tigard Vicinity		Portland C.B.D.	
	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null
Hillsboro/ Forest Grove Vicinity																
Trips	1,040	+18%	270	+42%	370	+28%	390	+11%	330	+74%	3,200	+1%	270	+93%	2,380	-5%
Mode Split	1%	0	6%	+50%	11%	+22%	13%	+8%	18%	+64%	40%	0	23%	+109%	57%	-5%
Aloha Vicinity																
Trips	180	+100%	350	+84%	650	+195%	520	+126%	280	+133%	3,790	+104%	270	+200%	3,400	+100%
Mode Split	8%	+100%	1%	0	3%	+200%	4%	+100%	7%	+133%	30%	+114%	6%	+200%	44%	+109%
West Beaverton Vicinity																
Trips	100	+25%	270	+108%	660	+38%	620	+48%	260	+73%	3,290	+38%	340	+162%	2,980	+37%
Mode Split	11%	+38%	3%	+200%	2%	0	4%	+33%	7%	+75%	32%	+45%	6%	+200%	46%	+44%
East Beaverton Vicinity																
Trips	100	+25%	190	+58%	500	+39%	1,030	+20%	380	+27%	5,190	+9%	360	+100%	4,730	+9%
Mode Split	20%	+82%	4%	+100%	5%	+67%	2%	0	7%	+17%	31%	+15%	7%	+133%	45%	+9%
S.W. Portland Vicinity																
Trips	180	+125%	90	+80%	170	+143%	310	+121%	1,440	+47%	15,820	+29%	930	+99%	14,350	+27%
Mode Split	23%	+130%	8%	+100%	9%	+125%	8%	+100%	3%	+50%	34%	+26%	10%	+100%	49%	+26%
Tigard Vicinity																
Trips	190	+280%	90	+200%	190	+217%	260	+189%	490	+14%	5,380	+49%	1,110	+91%	4,600	+46%
Mode Split	31%	+244%	10%	+150%	11%	+175%	13%	+1,200%	11%	+40%	46%	+48%	2%	+100%	66%	+38%

Table XIV-4: 1995 Daily (Home Based) Transit Ridership Between Communities in the Westside Corridor Assuming the Multnomah LRT to Tigard Option

TRIPS PRODUCED IN:	TRIPS ATTRACTED TO: Close-In Portland 1995 Est.	Close-In Portland Diff From Null (%)	Rest of Corridor 1995 Est.	Rest of Corridor Diff From Null (%)	Total 1995 Est.	Total Diff From Null (%)
Hillsboro/ Forest Grove Vicinity						
Trips	3,200	+1	2,670	+31	5,870	+13
Mode Split	40%	0	2%	0	4%	0
Aloha Vicinity						
Trips	3,790	+104	2,250	+139	6,040	+116
Mode Split	30%	+114	3%	+200	6%	+100
West Beaverton Vicinity						
Trips	3,290	+38	2,250	+62	5,540	+47
Mode Split	32%	+45	4%	+100	8%	+60
East Beaverton Vicinity						
Trips	5,190	+9	2,560	+35	7,750	+17
Mode Split	31%	+15	4%	+33	10%	+25
S.W. Portland Vicinity						
Trips	15,820	+29	3,120	+74	18,940	+35
Mode Split	34%	+26	5%	+67	15%	+15
Tigard Vicinity						
Trips	5,380	+29	2,330	+88	7,710	+59
Mode Split	46%	+26	4%	+100	10%	+43
Total						
Trips	36,670	+31	15,180	+63	51,850	+38
Mode Split	32%	+23	3%	+50	8%	+14

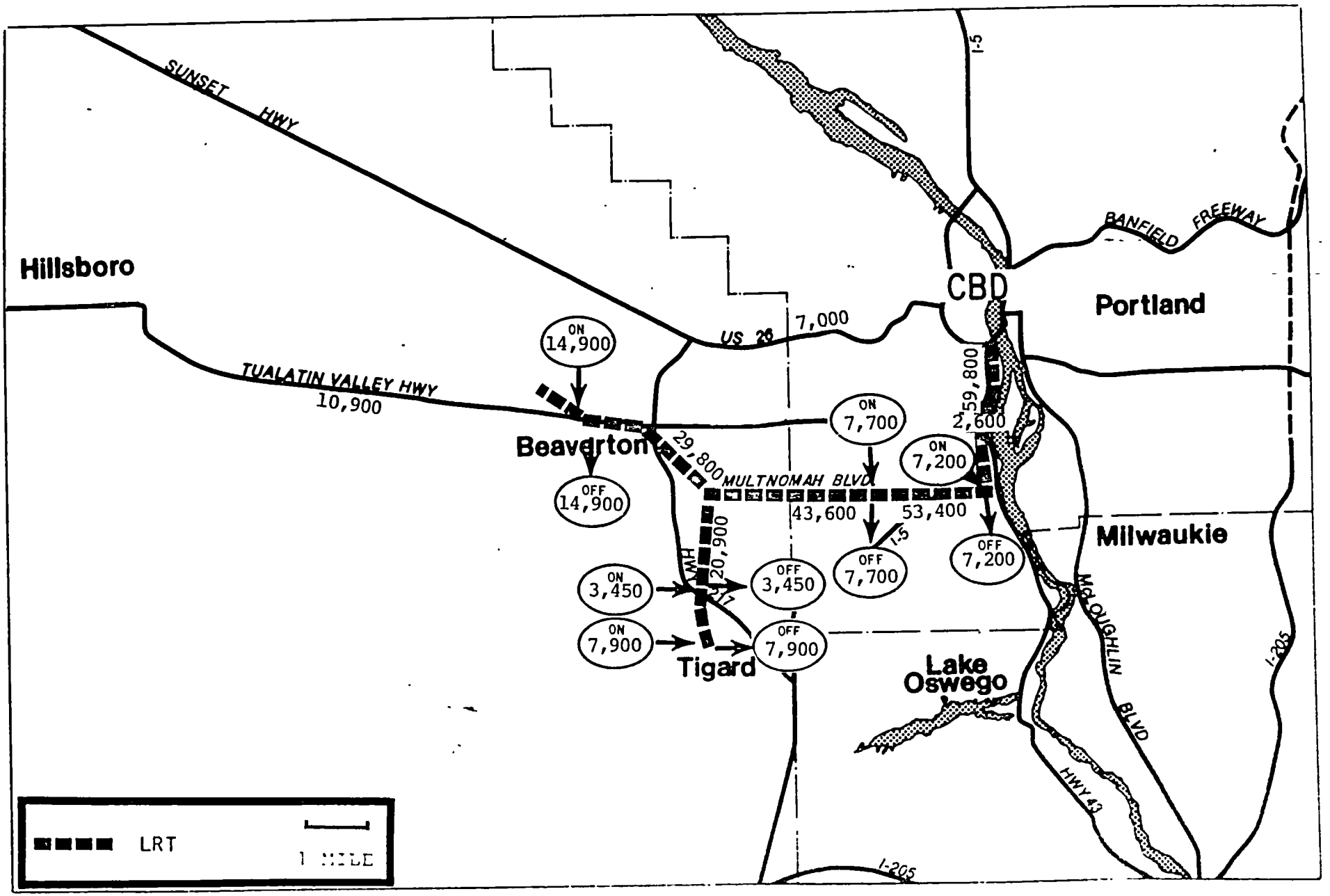

FIGURE XIV-2: TOTAL DAILY TRANSIT TRIPS USING THE MULTNOMAH LRT TO TIGARD OPTION

FIGURE XIV-3 : 1995 TRAFFIC VOLUMES ON SELECTED ROAD SEGMENTS ASSUMING THE MULTNOMAH LRT TO TIGARD OPTION

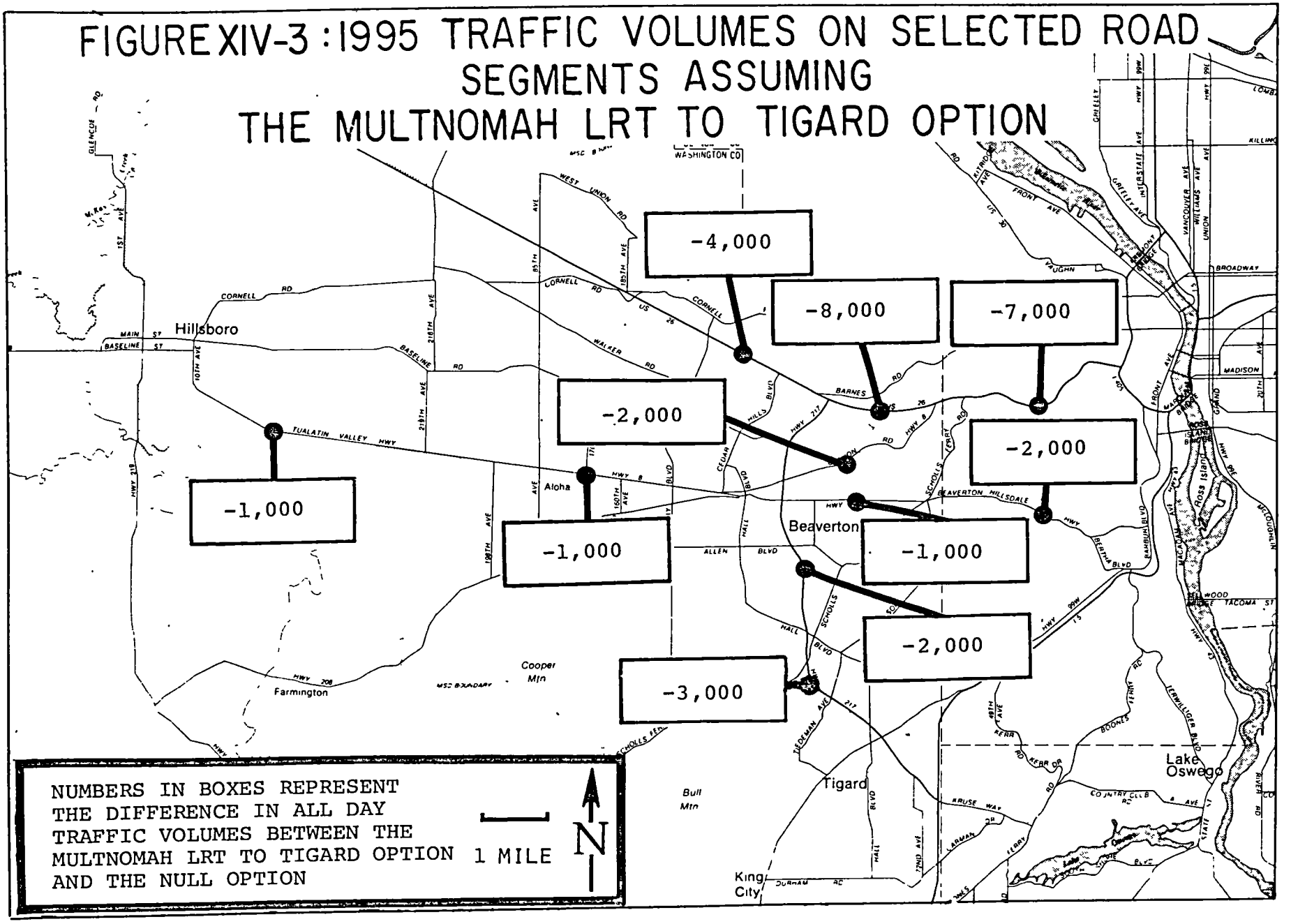

Table XIV-5: 1995 P.M. Peak Hour, Peak Direction Capacity Deficiencies at Selected Cutlines Assuming the Multnomah LRT to Tigard Option

Cutline	Percent Above Capacity	Percent Reduction in Capacity Deficiency from the Null
Westside Corridor		
At SW 219th (from TV Hwy to Sunset Hwy)	0	0
At Murray Blvd (From TV Hwy to Cornell Rd)	40%	-20%
At Hwy 217 (From Denney Rd to Sunset Hwy)	20%	-33%
At Multnomah County Line (From Taylors Ferry Rd to Burnside)	10%	0

Table XIV-6: 1995 P.M. Peak Hour Job Accessibility for Corridor Residents Assuming the Multnomah LRT to Tigard Option

Home Location	Number of Jobs Within 30 Minutes	Difference From Null
Beaverton	246,200	+86%
Hillsboro	79,400	+14%
Tigard	233,700	+92%
SW Portland	301,000	+18%

Table XIV-7: 1995 P.M. Peak Hour Market Potential for Major Business Centers in the Westside Corridor Assuming the Multnomah LRT to Tigard Option

Business Location	Number of People Within 30 Minutes	Difference From Null
Beaverton CBD	364,000	+8%
Portland CBD	563,100	+36%
Hillsboro CBD	214,600	+6%
Washington Square	353,600	+7%

Table XIV-8: 1995 Daily Corridor Energy Consumption for the Multnomah LRT to Tigard Option

	1995 Estimate	Difference From Null
Gasoline (Gallons)	90,460	-6%
Diesel (Gallons)	9,210	+93%
Electricity (KWH)[1]	32,930	N/A

[1] Light Rail Transit Propulsion

Table XIV-9: 1995 Potential Regional Traffic Through Neighborhoods During P.M. Peak-Hour Assuming the Multnomah LRT to Tigard Option

Community	Potential Through Trips	Difference From Null
Beaverton	1,020	-27%
SW Portland	1,100	-32%

Table XIV-10: 1995 Air Pollution Emissions Assuming the Multnomah LRT to Tigard Option

Geographic Area:	Hydrocarbon Emissions Tons/Year	Difference From Null	Nitrogen Oxide Tons/Year	Difference From Null
Westside Corridor	7,790	-6%	8,120	-2%
Regionwide	30,600	-5%	33,800	-2%

Table XIV-11: Project Capital Costs for the Multnomah LRT to Tigard Option

Cost Item	Cost (1978 Dollars)
Right of Way	$25,190,000
Construction	93,950,000
Stations	20,250,000
Rolling Stock[1]	41,275,000
Total Cost	$180,665,000
Annualized Capital Cost	$9,625,000

[1]Vehicles required in addition to Null Option (Null: 186 buses at $135,000 per bus = $25,110,000)

Table XIV-12: 1995 Transit Operating Costs and Subsidies for the Multnomah LRT to Tigard Option

	Annual Costs and Revenues (1978 $)	Difference From Null
Westside Corridor		
Bus	$23,910,000	+40%
LRT	3,368,000	-
Total Operating Costs	$27,278,000	+60%
Farebox Revenue	$7,736,000	+47%
Operating Subsidy	$19,542,000	+65%
Regionwide		
Bus	$83,824,000	+35%
LRT	6,938,000	+94%
Total Operating Costs	$90,762,000	+38%
Farebox Revenue	$26,531,000	+33%
Operating Subsidy	64,231,000	+41%

Table XIV-13: 1995 Transit System Productivity for the Multnomah LRT to Tigard Option

Productivity Measure	1995 Estimate	Difference From Null
Westside Corridor		
Operating Cost/ Passenger	$1.06	+6%
Operating Subsidy/ Passenger	.76	+10%
Farebox Revenue/ Operating Cost	28%	-10%
Total Annualized[1] Cost/Passenger	$1.44	+44%
Annualized Local[2] Cost/Passenger	.84	+22%
Regionwide		
Operating Cost/ Passenger	$1.13	+3%
Operating Subsidy/ Passenger	.80	+4%
Farebox Revenue/ Operating Cost	29%	-3%

[1]Total Annualized Cost = Annualized Capital Cost plus operating cost

[2]Annualized Local Cost = Local share of Annualized Cost plus operating subsidy

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XV. SKETCH EVALUATION OF THE MULTNOMAH LRT TO HILLSBORO OPTION

A. Description: Figure XV-1

This LRT option extends from downtown Portland to Beaverton via the Southern Pacific R.O.W. parallel to Macadam Avenue and Multnomah Blvd. From Beaverton to Hillsboro, the LRT would follow either the (a) Tualatin Valley Hwy., (b) Southern Pacific Railroad R.O.W. or (c) Burlington Northern Railroad R.O.W. See Special Report No. 5: Westside Transitway Options for additional details.

B. Type of Evaluation:

Fatal Flaw Analysis (Section C only)

✓Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

Applicable Not-Applicable✓

D. 1995 Transit use

✓Applicable Not-Applicable

1. Transit Service Levels

a. Peak Hour Transit Travel Times Between Major Points in the Corridor: Table XV-1

2. Transit Trips Between Communities in the Westside Corridor

a. Peak-Hour Trips: Table XV-2
b. Daily Home Based Trips: Table XV-3
c. Corridor Ridership: Table XV-4

3. Trips Using the Major Trunk Routes in the Multnomah LRT to Hillsboro Option

a. Total Daily Trips: Figure XV-2

E. 1995 Highway Service Levels:

✓Applicable Not Applicable

1. Highway Use

a. Daily Traffic Volumes on Selected Road Segments: Figure XV-3

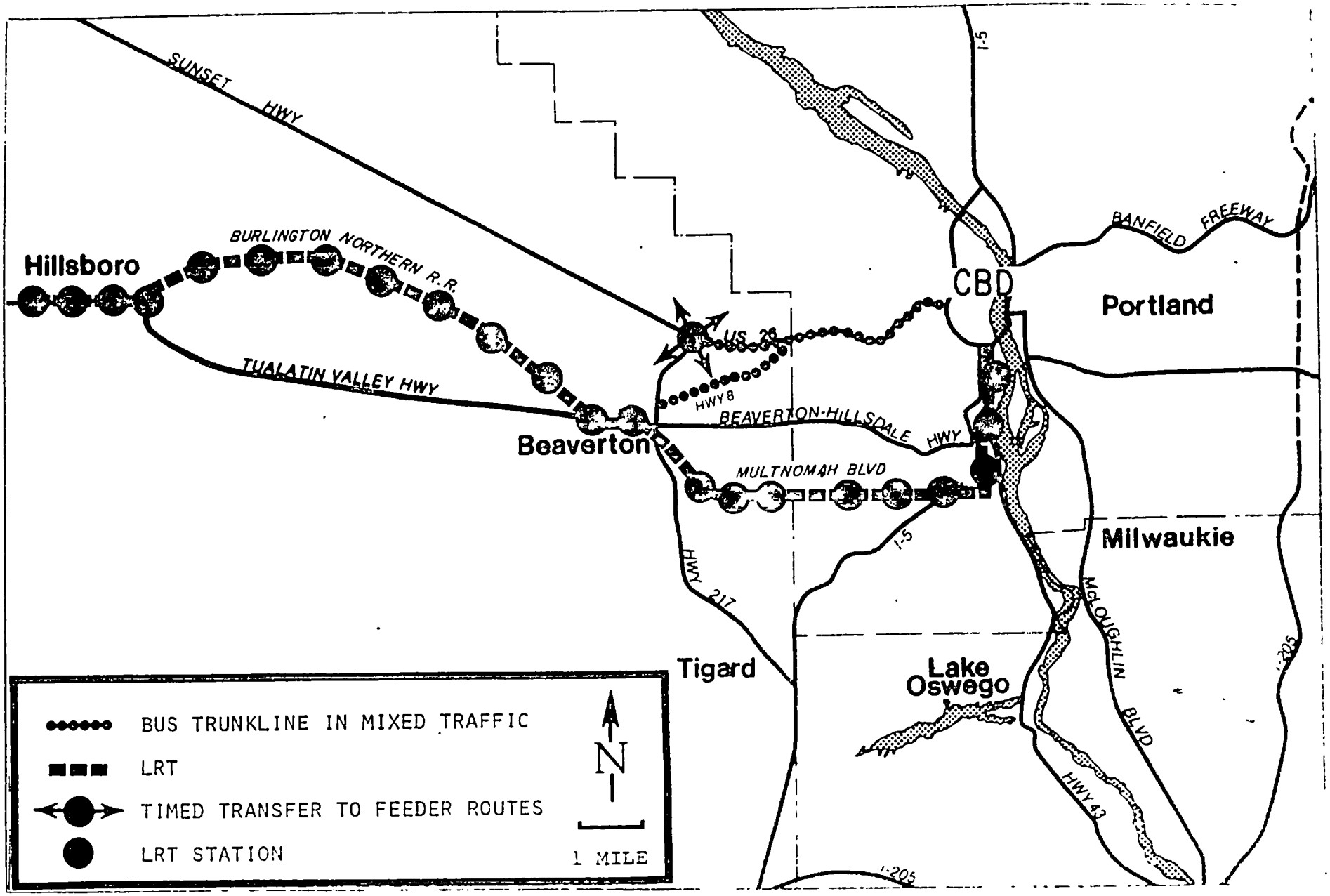

FIGURE XV-1 : THE MULTNOMAH LRT TO HILLSBORO OPTION

SEE SPECIAL REPORT NO. 5: WESTSIDE TRANSITWAY OPTIONS, SECTION IV-E, FOR FURTHER DESCRIPTION

b. Peak-Hour Capacity Deficiencies at Selected Cutlines: Table XV-5

F. 1995 Access to Opportunities:

✓Applicable Not-Applicable

1. Job Opportunities for Corridor Residents: Table XV-6

2. Potential Market for Major Business Areas: Table XV-7

G. 1995 Environmental Quality:

✓Applicable Not-Applicable

1. Energy Consumption

a. Daily Corridor Energy Consumption: Table XV-8

2. Neighborhood Quality

a. Regional Traffic through Neighborhoods: Table XV-9

3. Air Quality

a. Hydrocarbon and Nitrogen Oxide Emmissions: Table XV-10

H. 1995 Costs and Efficiency:

✓Applicable Not-Applicable

1. Capital Costs: Table XV-11

2. Operating Costs: Table XV-12

3. Transit System Productivity: Table XV-13

I. Description of Land Use Considerations:

✓Applicable Not-Applicable

Downtown Portland to Burlingame: This segment of the route passes through an area which is experiencing significant redevelopment. Old warehouses are being converted to office, retail, and high density residential uses. Referred to as the John's Landing area, historic land use patterns along Macadam Ave. are being significantly altered to reflect a more intensive use. By 1981 approximately 400 condominiums will be located here. In addition, three office buildings totaling 60,000 square feet, are scheduled for construction within the next two years.

The connection to Burlingame follows a ravine approximately one mile in length. Surrounding land uses are almost entirely single family residential. At Burlingame, the route passes a community level shopping center (80 acres), surround by office and multi-family uses.

Burlingame to Beaverton: This segment passes through a predominently single family residential area in S.W. Portland and eastern Washington County. Commercial centers are found in the Multnomah neighborhood, Garden Home and Beaverton. The Multnomah neighborhood includes a collection of antique/novelty stores as well as the community commerical activities. Multi-family development has occured around the commercial area.

The Garden Home area includes community commercial shopping centers. Some multi-family development has occured surrounding the center, however, single family uses prevail in this area.

The more intensive land uses are found as the route enters Beaverton. The Western Ave. Industrial Area (1,600) employees) is located at the eastern edge of Beaverton. West of the industrial area the route enters the office and commercial core of Beaverton. As the route enters Beaverton, commercial activities prevail. Beaverton is presently reviewing the central business district activities through urban renewal plans. Two major developments, a 500,000 square foot shopping center presently under construction and a major hotel/retail/office complex scheduled for construction, will have a major influence on the future character of central Beaverton. Certain areas within the CBD are experiencing conversion to more intensive commercial and office uses.

Western Beaverton is dominated by the presence of Tektronix, Oregon's largest private employer. Tektronix has roughly 10,000 employees at this location and serves as the foundation for the largest employment concentration within Washington County. An additional 3,600 jobs are presently found within the immediate area.

The Beaverton vicinity is the major residential area within Washington County. Roughly 60 percent of the County's population resides in the Beaverton/Eastern Washington County area. Major residential areas include the South Beaverton/Farmington area and the Cedar Hills area, north of Beaverton.

Beaverton to Hillsboro

This segment of the route passes through a rapidly urbanizing portion of unincorporated Washington County. Much of this land is presently designated as Urban Intermediate on the County's Framework Plan and therefore, is vacant. The County is presently considering major proposals for conversion to Urban designations in the S. W. 185th vicinity.

Existing land uses in this segment include the Tualatin Valley Park and Recreation complex, the Town Center/Tanasbourne area, and the industrial area at S. W. 185th and Walker Road. The Town Center/Tanasbourne area includes a major shopping center and medium to high density condominiums. Tektronix has another site at the S.W. 185th industrial area with 200 employees. Also included at this site are the Oregon Primate Research Center and the Oregon Graduate Center.

As the route enters Hillsboro it passes through the Hawthorne Farms Industrial Park. The Intel Corporation has just completed construction of a major electronics plant which is projected to employ 3,500 persons by 1983. The Washington County Fairgrounds and the Hillsboro Airport are located just west of Hawthorne Farms.

The City of Hillsboro has a current population of 26,000. The city has doubled population in the past decade. Projections indicate a continuation of the rapid growth in this area.

J. Description of Right-of-Way Impacts:

✓Applicable Not-Applicable

In the Macadam Avenue segment, 12 commercial buildings would be potentially displaced and access to some businesses would be restricted. The impacts along Multnomah Blvd. are primarily restricted driveway and street access. Two residential units may be taken. As the route enters Beaverton, 14 commercial buildings would potentially be displaced. Examining the two options west from Beaverton to Hillsboro, the Southern Pacific Railroad route may require the displacement of 10 commercial and two residential buildings as opposed to three residential buildings on the Burlington Northern Route.

K. Transit Network Considerations:

✓Applicable Not-Applicable

1. Bus Volumes: This option results in 24 two-car trains per hour and 508 buses per hour in downtown Portland during peak periods. This reduces the total bus volume by 21 percent to be within the capacity limitation of the Transit Mall, and the Westside bus volume by 57 percent. The bus volume on the Sunset Hwy. would be reduced by 80 buses per hour, on Barbur Blvd. by 44 buses per hour and on Macadam Ave. north of Taylors Ferry Rd., by 6 buses per hour.

2. Future Branching Opportunities: From Macadam Ave. the LRT facility could branch east across the Willamette River and continue south to Oregon City using an abandoned Portland Traction Co. right-of-way. It could also branch south along the Willamette River to Lake Oswego, if the Southern Pacific track is abandoned. At Scholls Ferry Rd. or Oleson Rd., the LRT facility could branch south to connect to Washington Shopping Center and the City of Tigard.

Table XV-1: 1995 P.M. Peak Hour Transit Travel Times Between Major Points in the Westside Corridor Assuming the Multnomah LRT to Hillsboro Option

ORIGIN	DESTINATION: Hillsboro		Beaverton		Tigard		S.W. Portland		Portland CBD	
	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)
Hillsboro	xx	xx	20	-17	45	-27	40	-53	46	-33
Beaverton	20	-17	xx	xx	23	-39	18	-60	27	-40
Tigard	45	-27	23	-39	xx	xx	15	-17	33	-13
SW Portland	40	-53	18	-60	15	-17	xx	xx	17	-15

Table XV-2: 1995 A.M. Peak Hour In-Bound Transit Use Between Communities in the Westside Corridor (Local Trips Excluded) Assuming the Multnomah LRT to Hillsboro Option

ORIGIN	DESTINATION: Close-In Portland		In-Bound Total	
	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity				
Transit Riders	760	+18	1,070	+27
Mode Split	70%	+21	44%	+22
Aloha Vicinity				
Transit Riders	730	+128	1,030	+144
Mode Split	53%	+112	20%	+122
West Beaverton Vicinity				
Transit Riders	670	+46	890	+52
Mode Split	54%	+38	25%	+47
East Beaverton Vicinity				
Transit Riders	1,030	+216	1,190	+184
Mode Split	51%	+122	37%	+118
S.W. Portland Vicinity				
Transit Riders	2,980	+27	2,980	+27
Mode Split	52%	+18	52%	+18
Tigard Vicinity				
Transit Riders	870	+29	990	+31
Mode Split	60%	+22	45%	+22
Total				
Transit Riders	7,040	+48	8,150	+52
Mode Split	54%	+32	37%	+42

Table XV-3: 1995 Transit Use Between Communities in the Westside Corridor
Assuming the Multnomah LRT to Hillsboro Option: Home Based Trips

TRIPS ATTRACTED TO:

TRIPS PRODUCED IN:	Hillsboro/ Forest Grove Vicinity		Aloha Vicinity		West Beaverton Vicinity		East Beaverton Vicinity		S.W. Portland		Close-in Portland		Tigard Vicinity		Portland C.B.D.	
	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null
Hillsboro/ Forest Grove Vicinity																
Trips	1,120	+27%	450	+137%	370	+28%	400	+14%	350	+84%	3,600	+14%	270	+93%	2,850	+14%
Mode Split	1%	0	8%	+200%	13%	+44%	15%	+25%	22%	+100%	50%	+25%	23%	+109%	70%	+17%
Aloha Vicinity																
Trips	270	+200%	570	+200%	660	+200%	530	+130%	300	+150%	3,900	+110%	270	+200%	3,520	+107%
Mode Split	9%	+125%	2%	+100%	4%	+300%	4%	+100%	8%	+167%	32%	+35%	6%	+200%	46%	+119%
West Beaverton Vicinity																
Trips	160	+100%	450	+246%	670	+40%	610	+45%	250	+67%	3,360	+41%	290	+123%	3,030	+39%
Mode Split	13%	+63%	4%	+300%	2%	0	4%	+33%	7%	+75%	33%	+50%	5%	+150%	47%	+47%
East Beaverton Vicinity																
Trips	160	+100%	300	+150%	530	+47%	1,000	+16%	370	+23%	5,290	+11%	310	+72%	4,820	+11%
Mode Split	17%	+55%	5%	+150%	3%	0	2%	0	7%	+17%	31%	+15%	6%	+100%	46%	+12%
S.W. Portland Vicinity																
Trips	270	+239%	160	+220%	190	+171%	320	+129%	1,450	+48%	15,980	+30%	730	+55%	14,290	+27%
Mode Split	26%	+160%	11%	+175%	9%	+125%	8%	+100%	3%	+50%	33%	+27%	9%	+60%	48%	+23%
Tigard Vicinity																
Trips	190	+280%	90	+200%	130	+117%	190	+111%	660	+53%	4,760	+32%	990	+71%	4,080	+29%
Mode Split	31%	+244%	10%	+150%	9%	+125%	10%	+900%	11%	+38%	41%	+32%	2%	+100%	62%	+29%

Table XV-4: 1995 Daily (Home Based) Transit Ridership Between Communities in the Westside Corridor Assuming the Multnomah LRT to Hillsboro Option

	TRIPS ATTRACTED TO: Close-In Portland		Rest of Corridor		Total	
TRIPS PRODUCED IN:	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity						
Trips	3,600	+14	2,960	+45	6,560	+26
Mode Split	50%	+25	2%	0	5%	+25
Aloha Vicinity						
Trips	3,900	+110	2,600	+177	6,500	+132
Mode Split	32%	+129	4%	+300	8%	+167
West Beaverton Vicinity						
Trips	3,360	+41	2,430	+75	5,790	+53
Mode Split	33%	+50	3%	+50	7%	+40
East Beaverton Vicinity						
Trips	5,290	+11	2,670	+40	7,960	+19
Mode Split	31%	+15	3%	0	8%	0
S.W. Portland Vicinity						
Trips	15,980	+30	3,120	+74	19,100	+36
Mode Split	33%	+27	3%	0	17%	+31
Tigard Vicinity						
Trips	4,760	+32	2,250	+81	7,010	+44
Mode Split	41%	+32	4%	+100	10%	+43
Total						
Trips	36,890	+31	16,030	+72	52,920	+42
Mode Split	35%	+35	3%	+50	9%	+29

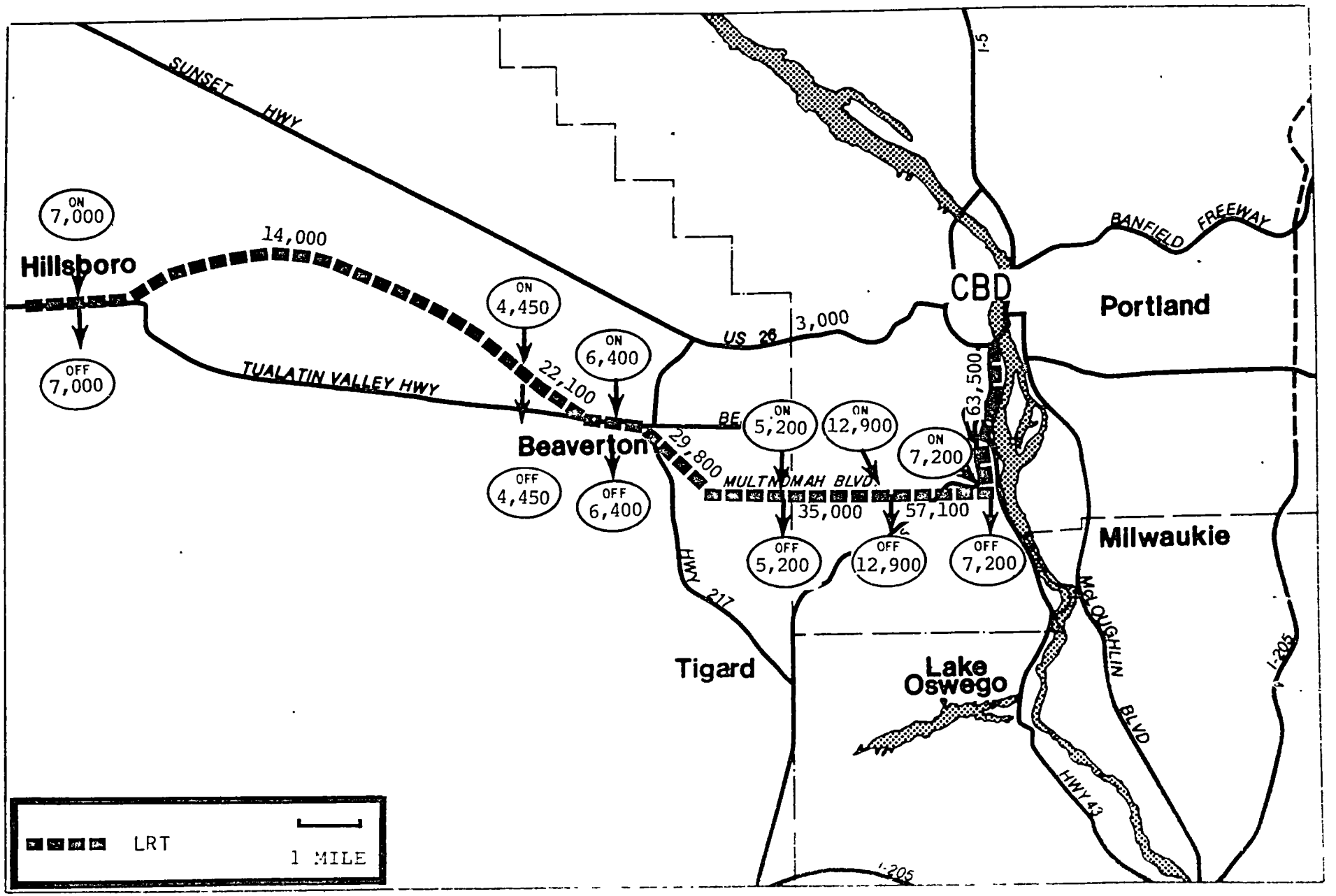

FIGURE XV-2: TOTAL DAILY TRANSIT TRIPS USING THE MULTNOMAH LRT TO HILLSBORO OPTION

FIGURE XV-3 :1995 TRAFFIC VOLUMES ON SELECTED ROAD SEGMENTS ASSUMING THE MULTNOMAH LRT TO HILLSBORO OPTION

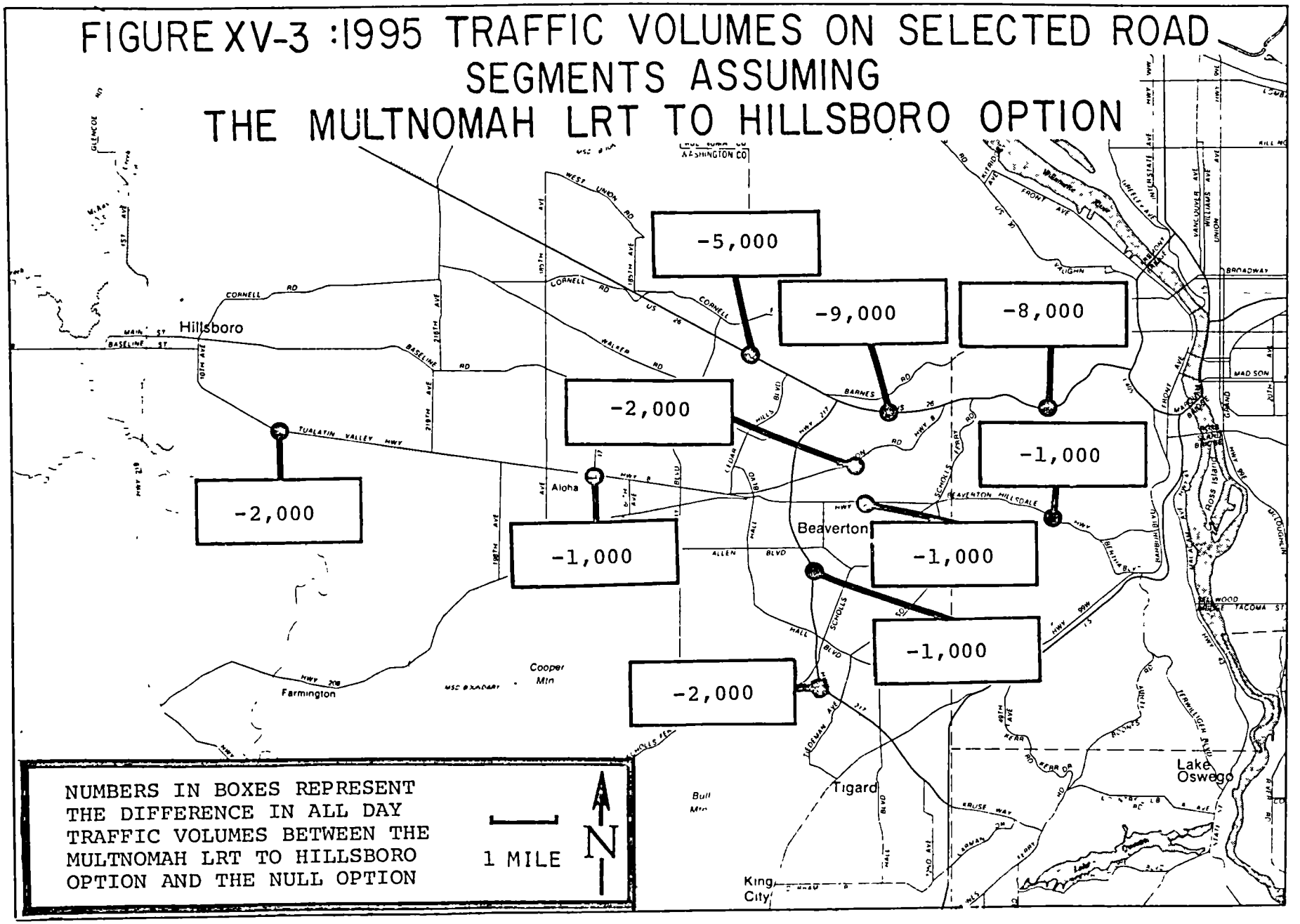

Table XV-5: 1995 P.M. Peak Hour, Peak Direction Capacity Deficiencies at Selected Cutlines Assuming the Multnomah LRT to Hillsboro Option

Cutline	Percent Above Capacity	Percent Reduction in Capacity Deficiency from the Null
Westside Corridor		
At SW 219th (from TV Hwy to Sunset Hwy)	0	0
At Murray Blvd (From TV Hwy to Cornell Rd)	40%	-20%
At Hwy 217 (From Denney Rd to Sunset Hwy)	20%	-33%
At Multnomah County Line (From Taylors Ferry Rd to Burnside)	10%	0

Table XV-6: 1995 P.M. Peak Hour Job Accessibility for Corridor Residents Assuming the Multnomah LRT to Hillsboro Option

Home Location	Number of Jobs Within 30 Minutes	Difference From Null
Beaverton	246,200	+86%
Hillsboro	90,500	+29%
Tigard	118,400	+2%
SW Portland	301,000	+18%

Table XV-7: 1995 P.M. Peak Hour Market Potential for Major Business Centers in the Westside Corridor Assuming the Multnomah LRT to Hillsboro Option

Business Location	Number of People Within 30 Minutes	Difference From Null
Beaverton CBD	364,000	+8%
Portland CBD	524,800	+27%
Hillsboro CBD	214,600	+6%
Washington Square	339,800	+3%

Table XV-8: 1995 Daily Corridor Energy Consumption for the Multnomah LRT to Hillsboro Option

	1995 Estimate	Difference From Null
Gasoline (Gallons)	90,750	-6%
Diesel (Gallons)	8,650	+81%
Electricity (KWH)[1]	46,310	N/A

[1] Light Rail Transit Propulsion

Table XV-9: 1995 Potential Regional Traffic Through Neighborhoods During P.M. Peak-Hour Assuming the Multnomah LRT to Hillsboro Option

Community	Potential Through Trips	Difference From Null
Beaverton	510	-64%
SW Portland	950	-41%

Table XV-10: 1995 Air Pollution Emissions Assuming the Multnomah LRT to Hillsboro Option

Geographic Area:	Hydrocarbon Emissions Tons/Year	Difference From Null	Nitrogen Oxide Tons/Year	Difference From Null
Westside Corridor	7,820	-6%	8,130	-2%
Regionwide	30,700	-5%	33,900	-2%

Table XV-11: Project Capital Costs for the Multnomah LRT to Hillsboro Option

Cost Item	Cost (1978 Dollars)
Right of Way	$31,970,000
Construction	100,190,000
Stations	19,650,000
Rolling Stock[1]	48,505,000
Total Cost	$200,315,000
Annualized Capital Cost	$10,632,000

[1]Vehicles required in addition to Null Option (Null: 186 buses at $135,000 per bus = $25,110,000)

Table XV-12: 1995 Transit Operating Costs and Subsidies for the Multnomah LRT to Hillsboro Option

	Annual Costs and Revenues (1978 $)	Difference From Null
Westside Corridor		
Bus	$22,900,000	+34%
LRT	4,491,000	-
Total Operating Costs	$27,391,000	+60%
Farebox Revenue	$7,887,000	+50%
Operating Subsidy	$19,504,000	+65%
Regionwide		
Bus	$82,814,000	+33%
LRT	8,061,000	+126%
Total Operating Costs	$90,875,000	+38%
Farebox Revenue	$26,697,000	+34%
Operating Subsidy	64,178,000	+41%

Table XV-13: 1995 Transit System Productivity for the Multnomah LRT to Hillsboro Option

Productivity Measure	1995 Estimate	Difference From Null
Westside Corridor		
Operating Cost/ Passenger	$1.04	+4%
Operating Subsidy/ Passenger	.74	+7%
Farebox Revenue/ Operating Cost	29%	-6%
Total Annualized[1] Cost/Passenger	$1.45	+45%
Annualized Local[2] Cost/Passenger	.83	+20%
Regionwide		
Operating Cost/ Passenger	$1.13	+3%
Operating Subsidy/ Passenger	.80	+4%
Farebox Revenue/ Operating Cost	29%	-3%

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[1]Total Annualized Cost = Annualized Capital Cost plus operating cost

[2]Annualized Local Cost = Local share of Annualized Cost plus operating subsidy

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XVI. SKETCH EVALUATION OF THE MULTNOMAH LRT TO BEAVERTON OPTION

A. Description: Figure XVI-1

This Multnomah LRT option simply connects Beaverton and downtown Portland via the Southern Pacific R.O.W. parallel to MacAdam Avenue and Multnomah Boulevard. See Special Report No. 5: Westside Transitway Options for additional details.

B. Type of Evaluation:

Fatal Flaw Analysis (Section C only)

✓ Cost-Effectiveness Analysis (Skip Section C)

C. Description of Fatal Flaw:

Applicable Not-Applicable ✓

D. 1995 Transit use

✓ Applicable Not-Applicable

1. Transit Service Levels

a. Peak Hour Transit Travel Times Between Major Points in the Corridor: Table XVI-1

2. Transit Trips Between Communities in the Westside Corridor

a. Peak-Hour Trips: Table XVI-2
b. Daily Home Based Trips: Table XVI-3
c. Corridor Ridership: Table XVI-4

3. Trips Using the Major Trunk Routes in the Multnomah LRT to Beaverton Option

a. Total Daily Trips: Figure XVI-2

E. 1995 Highway Service Levels:

✓ Applicable Not Applicable

1. Highway Use

a. Daily Traffic Volumes on Selected Road Segments: Figure XVI-3

b. Peak-Hour Capacity Deficiencies at Selected Cutlines: Table XVI-5

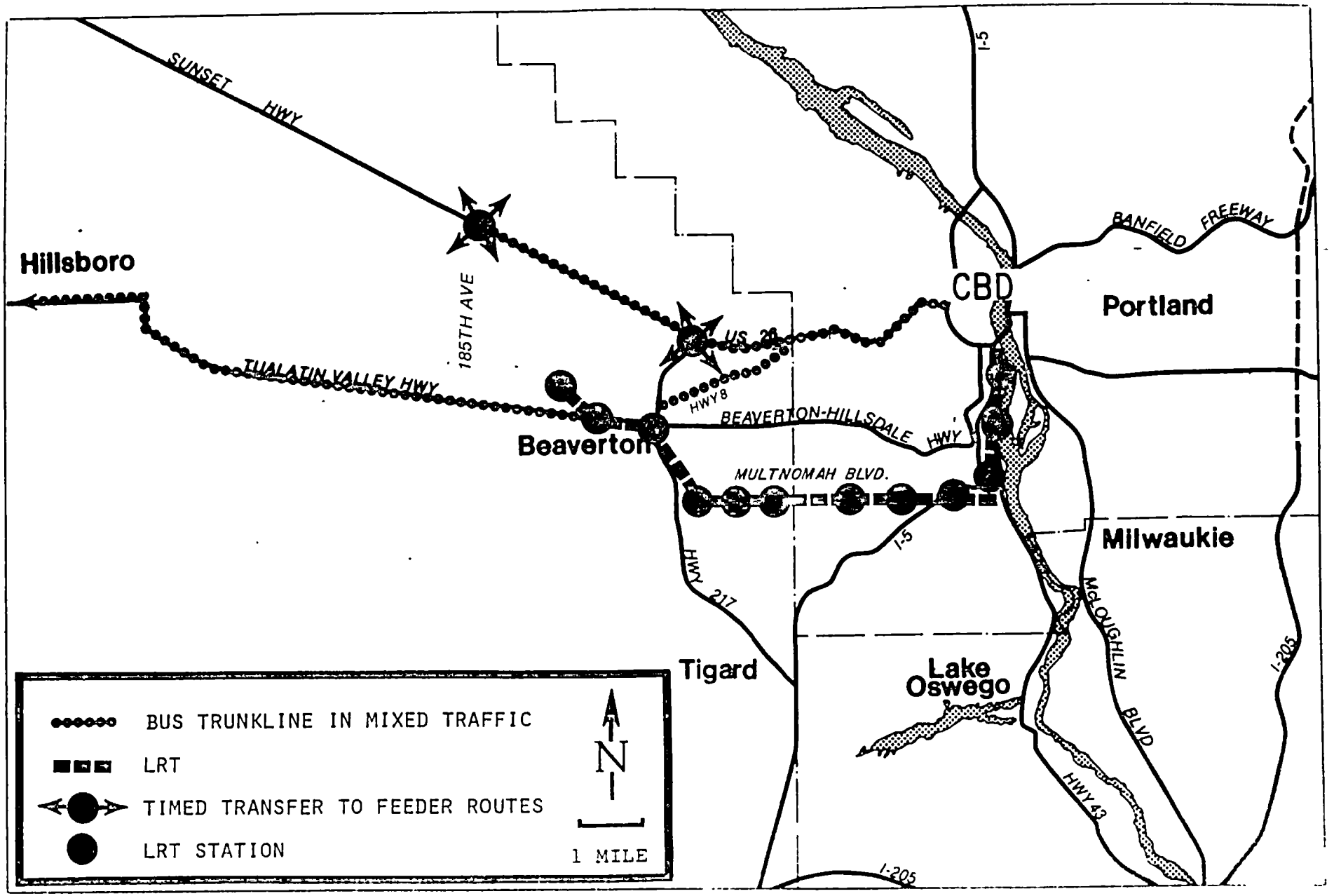

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FIGURE XVI-1: THE MULTNOMAH LRT TO BEAVERTON OPTION

SEE SPECIAL REPORT NO. 5: WESTSIDE TRANSITWAY OPTIONS, SECTION IV-D, FOR FURTHER DESCRIPTION

F. 1995 Access to Opportunities:

✓Applicable Not-Applicable

1. Job Opportunities for Corridor Residents: Table XVI-6

2. Potential Market for Major Business Areas: Table XVI-7

G. 1995 Environmental Quality:

✓Applicable Not-Applicable

1. Energy Consumption

   a. Daily Corridor Energy Consumption: Table XVI-8

2. Neighborhood Quality

   a. Regional Traffic through Neighborhoods: Table XVI-9

3. Air Quality

   a. Hydrocarbon and Nitrogen Oxide Emmissions: Table XVI-10

H. 1995 Costs and Efficiency:

✓Applicable Not-Applicable

1. Capital Costs: Table XVI-11

2. Operating Costs: Table XVI-12

3. Transit System Productivity: Table XVI-13

I. Description of Land Use Considerations:

✓Applicable Not-Applicable

Downtown Portland to Burlingame: This segment of the route passes through an area which is experiencing significant redevelopment. Old warehouses are being converted to office, retail, and high density residential uses. Referred to as the John's Landing area, historic land use patterns along Macadam Ave. are being significantly altered to reflect a more intensive use. By 1981 approximately 400 condominiums will be located here. In addition, three office buildings totaling 60,000 square feet, are scheduled for construction within the next two years.

The connection to Burlingame follows a ravine approximately one mile in length. Surrounding land uses are almost entirely single family residential. At Burlingame, the route passes a community level shopping center (80 acres), surround by office and multi-family uses.

Burlingame to Beaverton: This segment passes through a predominently single family residential area in S.W. Portland and eastern Washington County. Commercial centers are found in the Multnomah neighborhood, Garden Home and Beaverton. The Multnomah neighborhood includes a collection of antique/novelty stores as well as the community commerical activities. Multi-family development has occured around the commercial area.

The more intensive land uses are found as the route enters Beaverton. The Western Ave. Industrial Area (1,600) employees) is located at the eastern edge of Beaverton. West of the industrial area the route enters the office and commercial core of Beaverton. As the route enters Beaverton, commercial activities prevail. Beaverton is presently reviewing the central business district activities through urban renewal plans. Two major developments, a 500,000 square foot shopping center presently under construction and a major hotel/retail/office complex scheduled for construction, will have a major influence on the future character of central Beaverton. Certain areas within the CBD are experiencing conversion to more intensive commercial and office uses.

Western Beaverton is dominated by the presence of Tektronix, Oregon's largest private employer. Tektronix has roughly 10,000 employees at this location and serves as the foundation for the largest employment concentration within Washington County. An additional 3,600 jobs are presently found within the immediate area.

The Beaverton vicinity is the major residential area within Washington County. Roughly 60 percent of the County's population resides in the Beaverton/Eastern Washington County area. Major residential areas include the South Beaverton/Farmington area and the Cedar Hills area, north of Beaverton.

J. Description of Right-of-Way Impacts:

✓ Applicable Not-Applicable

In the Macadam Avenue segment, 12 commercial buildings may be displaced and access to some businesses may be restricted. The impacts along Multnomah Blvd. are primarily restricted driveway and street access. Two residential units may be taken. As the route enters Beaverton, 14 commercial buildings may be displaced.

K. Transit Network Considerations:

✓ Applicable Not-Applicable

1. Bus Volumes: This option results in 24 two-car trains per hour and 516 buses per hour in downtown Portland during peak periods. This reduces the total bus volume by 20 percent to be within the capacity limitation of the Transit Mall, and the Westside bus volume by 53 percent. The bus volume on the Sunset Hwy. would be reduced by 72 buses per hour, on Barbur Blvd. by 44 buses per hour and on Macadam Ave. north of Taylors Ferry Rd., by 6 buses per hour.

2. Future Branching Opportunities: From Macadam Ave. the LRT facility could branch east across the Willamette River and continue south to Oregon City using an abandoned Portland Traction Co. right-of-way. It could also branch south along the Willamette River to Lake Oswego, if the Southern Pacific track is abandoned. At Scholls Ferry Rd. or Oleson Rd., the LRT facility could branch south to connect to Washington Square Shopping Center and the City of Tigard. West of Beaverton, the facility could extend west to the City of Hillsboro along the Southern Pacific Railroad or the Burlington Northern Railroad.

Table XVI-1: 1995 P.M. Peak Hour Transit Travel Times Between Major Points in the Westside Corridor Assuming the Multnomah LRT to Beaverton Option

ORIGIN	DESTINATION: Hillsboro		Beaverton		Tigard		S.W. Portland		Portland CBD	
	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)	Min.	Diff. From Null(%)
Hillsboro	xx	xx	23	-4	48	-23	43	-49	51	-26
Beaverton	23	-4	xx	xx	23	-39	18	-60	27	-40
Tigard	48	-23	23	-39	xx	xx	15	-17	33	-13
SW Portland	43	-49	18	-60	15	-17	xx	xx	17	-15

Table XVI-2: 1995 A.M. Peak Hour In-Bound Transit Use Between Communities in the Westside Corridor (Local Trips Excluded) Assuming the Multnomah LRT to Beaverton Option

ORIGIN	DESTINATION: Close-In Portland		DESTINATION: In-Bound Total	
	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity				
Transit Riders	650	0	880	+4
Mode Split	58%	0	36%	0
Aloha Vicinity				
Transit Riders	690	+118	950	+124
Mode Split	50%	+100	18%	+100
West Beaverton Vicinity				
Transit Riders	680	+48	890	+52
Mode Split	54%	+38	25%	+47
East Beaverton Vicinity				
Transit Riders	1,050	+223	1,190	+184
Mode Split	51%	+122	37%	+118
S.W. Portland Vicinity				
Transit Riders	2,980	+27	2,980	+27
Mode Split	52%	+18	52%	+18
Tigard Vicinity				
Transit Riders	870	+29	990	+31
Mode Split	60%	+22	45%	+22
Total				
Transit Riders	6,920	+45	7,880	+47
Mode Split	53%	+29	35%	+35

Table XVI-3: 1995 Transit Use Between Communities in the Westside Corridor
Assuming the Multnomah LRT to Beaverton Option: Home Based Trips

TRIPS ATTRACTED TO:

TRIPS PRODUCED IN:	Hillsboro/ Forest Grove Vicinity		Aloha Vicinity		West Beaverton Vicinity		East Beaverton Vicinity		S.W. Portland		Close-in Portland		Tigard Vicinity		Portland C.B.D.	
	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null	1995 Est.	Diff. From Null
Hillsboro/ Forest Grove Vicinity																
Trips	1,040	+18%	260	+37%	340	+17%	280	-20%	330	+74%	3,200	+1%	260	+86%	2,380	-5%
Mode Split	1%	0	6%	+50%	10%	+11%	9%	-33%	18%	+64%	40%	+5%	21%	+91%	57%	-5%
Aloha Vicinity																
Trips	180	+100%	350	+84%	630	+186%	430	+87%	280	+133%	3,790	+104%	230	+156%	3,400	+100%
Mode Split	8%	+100%	1%	0	3%	+200%	3%	+50%	7%	+133%	30%	+114%	5%	+150%	44%	+105%
West Beaverton Vicinity																
Trips	100	+25%	270	+108%	660	+38%	620	+48%	260	+73%	3,430	+44%	290	+123%	3,090	+42%
Mode Split	11%	+38%	3%	+200%	2%	0	4%	+33%	7%	+75%	33%	+50%	5%	+150%	47%	+47%
East Beaverton Vicinity																
Trips	100	+25%	190	+58%	500	+39%	1,030	+20%	380	+27%	5,390	+13%	310	+72%	4,910	+13%
Mode Split	20%	+82%	4%	+100%	5%	+67%	2%	0	7%	+17%	31%	+15%	6%	+100%	46%	+12%
S.W. Portland Vicinity																
Trips	180	+125%	90	+80%	170	+143%	310	+121%	1,440	+47%	15,980	+30%	730	+55%	14,350	+27%
Mode Split	23%	+130%	8%	+100%	9%	+125%	8%	+100%	3%	+50%	33%	+27%	8%	+60%	49%	+26%
Tigard Vicinity																
Trips	130	+160%	40	+33%	130	+117%	190	+111%	660	+53%	4,760	+32%	990	+71%	4,080	+29%
Mode Split	25%	+178%	6%	+50%	9%	+125%	10%	+900%	11%	+38%	41%	+32%	2%	+100%	62%	+29%

Table XVI-4: 1995 Daily (Home Based) Transit Ridership Between Communities in the Westside Corridor Assuming the Multnomah LRT to Beaverton Option

	TRIPS ATTRACTED TO: Close-In Portland		Rest of Corridor		Total	
TRIPS PRODUCED IN:	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)	1995 Est.	Diff From Null (%)
Hillsboro/ Forest Grove Vicinity						
Trips	3,200	+1	2,510	+23	5,710	+10
Mode Split	40%	0	2%	0	4%	0
Aloha Vicinity						
Trips	3,790	+103	2,100	+123	5,890	+110
Mode Split	30%	+114	3%	+200	7%	+133
West Beaverton Vicinity						
Trips	3,430	+44	2,200	+58	5,630	+49
Mode Split	33%	+50	4%	+100	8%	+60
East Beaverton Vicinity						
Trips	5,390	+13	2,510	+32	7,900	+19
Mode Split	31%	+15	3%	0	9%	+13
S.W. Portland Vicinity						
Trips	15,980	+30	2,920	+63	18,900	+34
Mode Split	33%	+27	4%	+33	16%	+23
Tigard Vicinity						
Trips	4,760	+32	2,140	+73	6,900	+42
Mode Split	41%	+32	4%	+100	10%	+43
Total						
Trips	36,550	+30	14,380	+55	50,930	+36
Mode Split	34%	+31	3%	+50	9%	+29

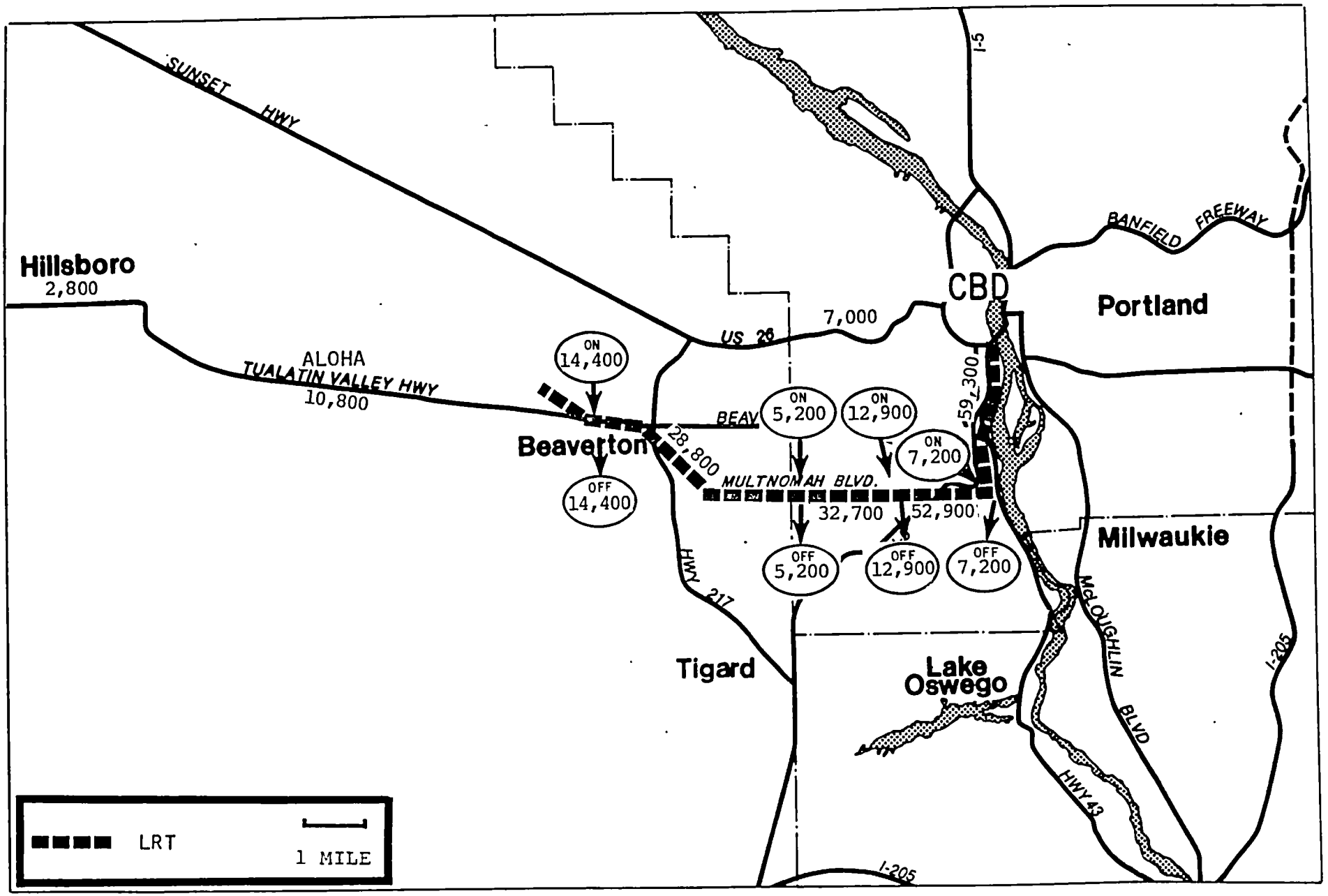

FIGURE XVI-2: TOTAL DAILY TRANSIT TRIPS USING THE MULTNOMAH LRT TO BEAVERTON OPTION

FIGURE XVI-3:1995 TRAFFIC VOLUMES ON SELECTED ROAD SEGMENTS ASSUMING THE MULTNOMAH LRT TO BEAVERTON OPTION

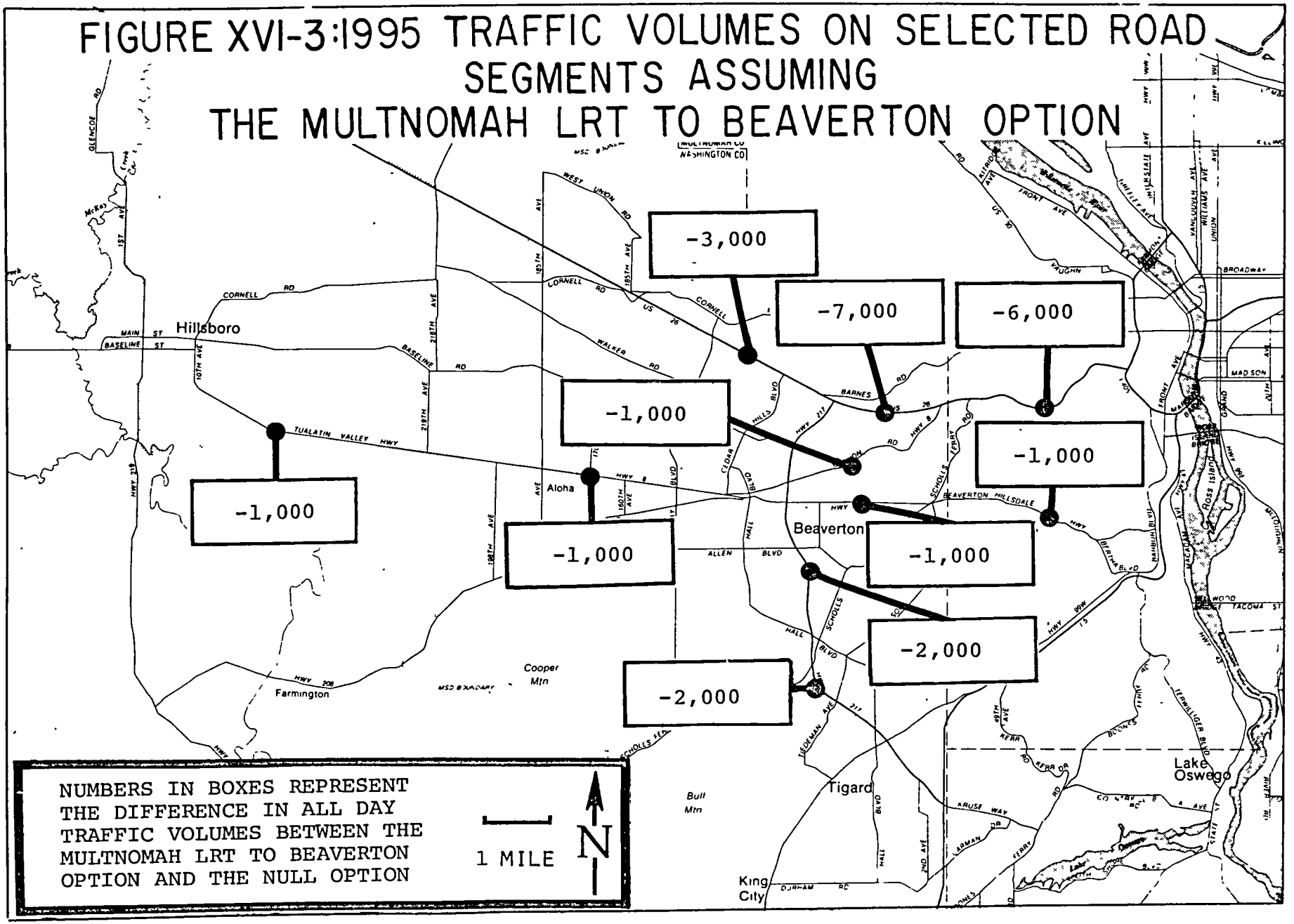

Table XVI-5: 1995 P.M. Peak Hour, Peak Direction Capacity Deficiencies at Selected Cutlines Assuming the Multnomah LRT to Beaverton Option

Cutline	Percent Above Capacity	Percent Reduction in Capacity Deficiency from the Null
Westside Corridor		
At SW 219th (from TV Hwy to Sunset Hwy)	0	0
At Murray Blvd (From TV Hwy to Cornell Rd)	40%	-20%
At Hwy 217 (From Denney Rd to Sunset Hwy)	20%	-33%
At Multnomah County Line (From Taylors Ferry Rd to Burnside)	10%	0

Table XVI-6: 1995 P.M. Peak Hour Job Accessibility for Corridor Residents Assuming the Multnomah LRT to Beaverton Option

Home Location	Number of Jobs Within 30 Minutes	Difference From Null
Beaverton	245,200	+86%
Hillsboro	81,200	+16%
Tigard	119,200	+2%
SW Portland	299,300	+17%

Table XVI-7: 1995 P.M. Peak Hour Market Potential for Major Business Centers in the Westside Corridor Assuming the Multnomah LRT to Beaverton Option

Business Location	Number of People Within 30 Minutes	Difference From Null
Beaverton CBD	363,400	+8%
Portland CBD	522,500	+26%
Hillsboro CBD	215,800	+6%
Washington Square	340,500	+3%

Table XVI-8: 1995 Daily Corridor Energy Consumption for the Multnomah LRT to Beaverton Option

	1995 Estimate	Difference From Null
Gasoline (Gallons)	91,230	-5%
Diesel (Gallons)	9,570	+100%
Electricity (KWH)[1]		

[1] Light Rail Transit Propulsion

Table XVI-9: 1995 Potential Regional Traffic Through Neighborhoods During P.M. Peak-Hour Assuming the Multnomah LRT to Beaverton Option

Community	Potential Through Trips	Difference From Null
Beaverton	1,020	-27%
SW Portland	1,050	-35%

Table XVI-10: 1995 Air Pollution Emissions Assuming the Multnomah LRT to Beaverton Option

Geographic Area:	Hydrocarbon Emissions Tons/Year	Difference From Null	Nitrogen Oxide Tons/Year	Difference From Null
Westside Corridor	7,860	-5%	8,150	-1%
Regionwide	30,800	-4%	33,900	-2%

Table XVI-11: Project Capital Costs for the Multnomah LRT to Beaverton Option

Cost Item	Cost (1978 Dollars)
Right of Way	$20,580,000
Construction	76,410,000
Stations	14,660,000
Rolling Stock[1]	40,470,000
Total Cost	$152,120,000
Annualized Capital Cost	$8,251,000

[1]Vehicles required in addition to Null Option (Null: 186 buses at $135,000 per bus = $25,110,000)

Table XVI-12: 1995 Transit Operating Costs and Subsidies for the Multnomah LRT to Beaverton Option

	Annual Costs and Revenues (1978 $)	Difference From Null
Westside Corridor		
Bus	$24,640,000	+44%
LRT	2,860,000	-
Total Operating Costs	$27,500,000	+61%
Farebox Revenue	$7,629,000	+45%
Operating Subsidy	$19,871,000	+68%
Regionwide		
Bus	$84,554,000	+36%
LRT	6,430,000	+80%
Total Operating Costs	$90,984,000	+39%
Farebox Revenue	$26,405,000	+32%
Operating Subsidy	64,579,000	+41%

Table XVI-13: 1995 Transit System Productivity for the Multnomah LRT to Beaverton Option

Productivity Measure	1995 Estimate	Difference From Null
Westside Corridor		
Operating Cost/ Passenger	$1.09	+9%
Operating Subsidy/ Passenger	.79	+14%
Farebox Revenue/ Operating Cost	28%	-10%
Total Annualized[1] Cost/Passenger	$1.41	+41%
Annualized Local[2] Cost/Passenger	.85	+23%
Regionwide		
Operating Cost/ Passenger	$1.15	+5%
Operating Subsidy/ Passenger	.81	+5%
Farebox Revenue/ Operating Cost	29%	-3%

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[1]Total Annualized Cost = Annualized Capital Cost plus operating cost

[2]Annualized Local Cost = Local share of Annualized Cost plus operating subsidy

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