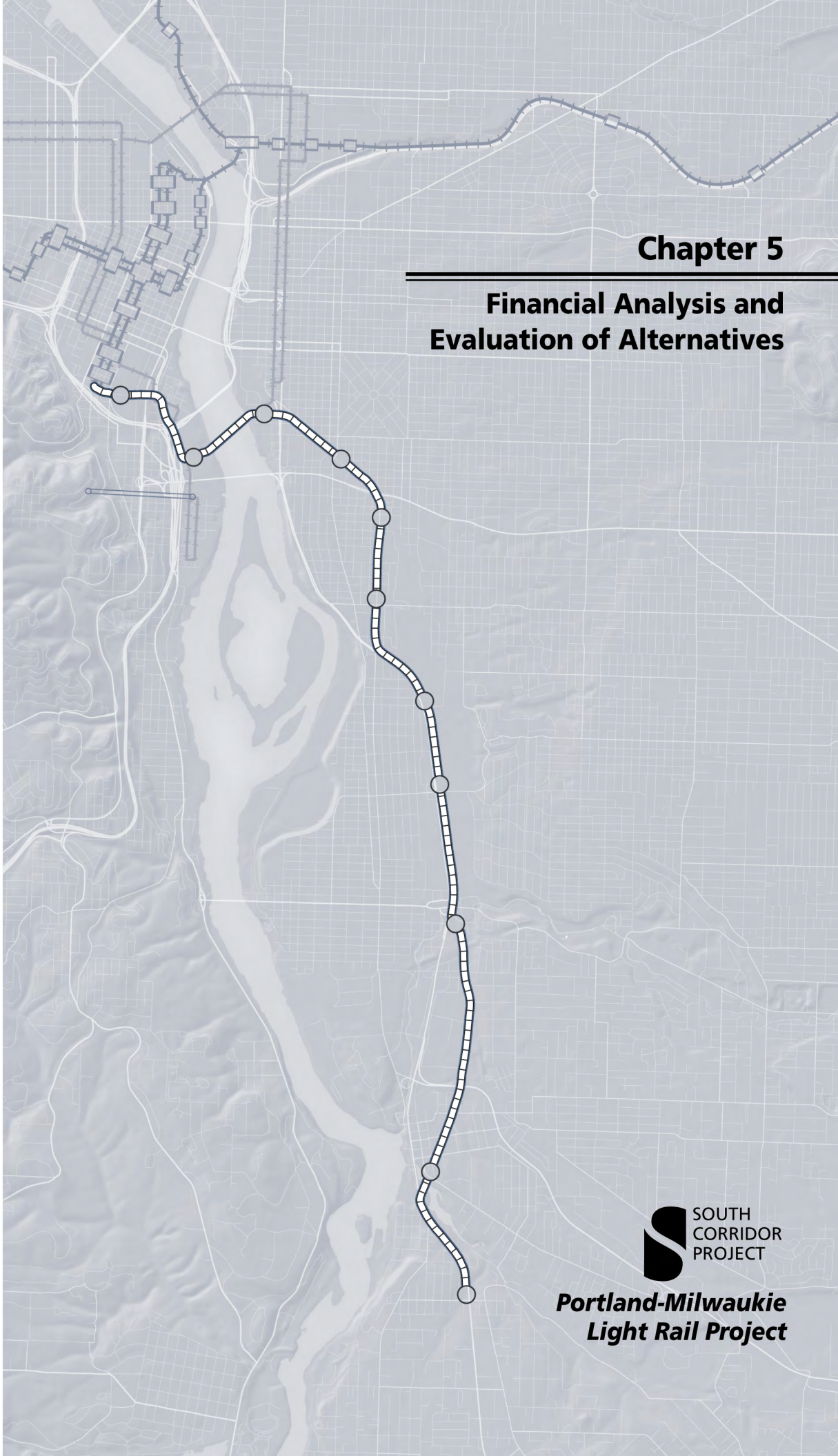

Chapter 5

Financial Analysis and Evaluation of Alternatives

SOUTH CORRIDOR PROJECT

Portland-Milwaukie Light Rail Project

5. FINANCIAL ANALYSIS AND EVALUATION OF ALTERNATIVES

This chapter presents a financial analysis and an evaluation of the Portland-Milwaukie Light Rail Project's ability to meet its purpose and need. Section 5.1, Financial Analysis, provides information to assess the fiscal feasibility of construction and operations. Section 5.2, Evaluation of the Project, synthesizes key findings of the other chapters of this Final Environmental Impact Statement (FEIS) to address measures of the effectiveness of the Portland-Milwaukie Light Rail Project related to its purpose and need. Section 5.3 describes the New Starts evaluation and rating process used by Federal Transit Administration (FTA) to decide which projects to recommend to Congress for New Starts funding and how the Portland-Milwaukie Light Rail Project has fared in that process.

CHAPTER CONTENTS

5.1 FINANCIAL ANALYSIS

This section analyzes the funding plans for the Portland-Milwaukie Light Rail Project. The analysis is conducted in two parts, a *Project Capital Funding Analysis* and a *System Funding Analysis*, to differentiate clearly between one-time-only project capital cost requirements and on-going system fiscal costs.

Project Capital funding plans are shown for each of the alternatives that assume New Start funds would provide 50 percent of the total project funding. New Starts funds are federal funds that are dedicated by federal statute to fixed guideway projects, such as light rail transit. Under these statutes, New Starts funds are granted to projects through a competitive process administered by FTA. Projects approved for funding receive a Full Funding Grant Agreement (FFGA) that establishes the maximum amount of New Starts funds available to the project, and the terms and conditions for receiving these New Start funds. The Project Capital funding plan also incorporates federal formula funds committed to the project through the region's Metropolitan Transportation Improvement Program (MTIP). In addition, 20-year system cash flow plans are presented that address the annual cash-flow needs of the entire TriMet system.

Project Capital Funding Analysis

The *Project Capital Funding Analysis* focuses on the capital resources required to construct the Portland-Milwaukie Light Rail Project. The capital costs addressed in this portion of the analysis

are only those costs associated with constructing the light rail project; other capital expenditures of TriMet are addressed in the *System Funding Analysis*.

The *Project Capital Funding Analysis* is based on the following key factors:

- **Construction Schedule.** The estimates of capital costs are provided in 2010 dollars and year-of-expenditure (YOE) dollars. The YOE estimate is based on a project development schedule that assumes final design, civil construction, vehicle and systems procurement, and right-of-way acquisition would occur between Fiscal Year (FY) 2011 and FY 2016 and revenue service would start in September 2015.
- **Construction Cost Inflation.** Construction costs are projected to inflate between 2010 (the date of the capital cost estimate in current year dollars) and the date when project construction is complete and revenue operations begin. The assumed annual inflation rates fluctuate by year ranging between 0.2 and 5.9 percent per year over the construction period.

System Funding Analysis

The *System Funding Analysis* focuses on whether there are adequate resources to operate and maintain the entire transit system, including operations of the Portland-Milwaukie Light Rail Project, over the fiscal year (FY) 2010-2030 planning period. System costs include all transit operating and maintenance costs and all transit capital expenditures through FY 2030 except for Portland-Milwaukie Light Rail Project capital costs. The *System Funding Analysis* is based on the following key factors:

- **Annual Transit Service Increase.** Bus service levels in FY 2010 and FY 2011 reflect the service cutbacks undertaken by TriMet in response to the economic slowdown. Bus service expansion (measured in revenue hours) is assumed to resume in FY 2013, growing at an annual rate of 0.25 percent in FY 2013 and FY 2014 and 0.8 percent between FY 2015 and FY 2030. In addition, over a 10-year period beginning in FY 2016 the bus service reductions that occurred in FY 2009 and 2010 are incrementally restored. Beginning in FY 2018, on average five additional buses are purchased every two years to support these bus service increases. In addition, the system capital plan incorporates a regular schedule of bus and light rail fleet replacement.

  Existing light rail and commuter rail operations are assumed to expand on an on-going basis in response to increasing demand. Specifically, the forecast assumes that rail vehicle hours will grow 0.6 percent per year and rail miles will grow 0.4 – 0.5 percent per year beginning in FY 2013, as the economy recovers from the recession. In addition, the forecast assumes that the light rail service reductions that occurred in FY 2009 and 2010 are incrementally restored over a 10-year period beginning in FY 2016. The forecast assumes a continuation of TriMet's payment of about one-half of the Portland Streetcar operations costs to SW Lowell Street, and beginning in FY 2012 an additional annual payment of $1.3 million (inflating) for Portland Streetcar operations on the east side. The assumed transit network incorporates the planned light rail extension between Expo Center and Clark College in Vancouver, Washington that is part of the locally preferred alternative for the Columbia River Crossing Project. In addition, it incorporates the specific rail and bus service increases associated with the LPA to Park Avenue, LPA Phasing Option, and the MOS to Lake Road, as applicable.

- **Operations Cost Inflation.** The forecast assumes that management wages are flat in FY 2010 and FY 2011 and increase 3 percent per year thereafter, consistent with recent trends. Growth in union wage rates, which is tied to the Consumer Price Index with a 5 percent ceiling, is assumed to be about 2.1 percent per year throughout the forecast period. Health benefit costs are assumed to escalate 5.6 percent in FY 2011. Thereafter, all health benefits are anticipated to grow 0.7 percent in FY 2012 (with the implementation of self-insurance), 6.0 percent in FY 2013, 7.5 percent in FY 2014, and 8.0 percent annually in FY 2015 and thereafter.

  The financial forecast uses the Energy Information Agency projections of diesel fuel cost. The annual escalation in fuel cost is assumed to be 7.0 percent in FY 2012, 6.0 percent in FY 2013 and 2014, and 5.0 percent in FY 2015 and thereafter. Beginning in FY 2016, fuel costs are anticipated to increase by 6.0 percent per year throughout the planning period. Electricity costs are anticipated to escalate at 5 percent per year, and other materials and service costs are assumed to escalate at 2.1 percent per year throughout the forecast period.
- **System Capital Cost Inflation.** Transit capital costs other than for the Portland-Milwaukie Light Rail Project are assumed to inflate at 3 percent per year throughout the forecast period. To balance expenditures with reduced revenues caused by the recent recession, $4 million of equipment replacement is deferred from FY 2011 to FY 2012.
- **Tax Revenue Increases.** The key assumptions underlying forecasts of payroll tax revenues, self-employment tax revenues, and state in-lieu tax revenues are documented in Section 5.1.2.2.
- **Fares.** The forecast assumes a continuation of this policy, with a 2.1 – 2.6 percent inflation-adjusted fare increase each year between FY 2011 and FY 2030.

5.1.1 Costs

This section examines both *project capital costs* and *systems costs.* Costs are shown in 2010 dollars and YOE dollars. YOE dollars were calculated by inflating 2010-dollar costs by the appropriate inflation index.

5.1.1.1 Portland-Milwaukie Light Rail Project Costs

This section addresses the capital costs and the operations and maintenance (O&M) costs of the Portland-Milwaukie Light Rail Project.

Portland-Milwaukie Light Rail Project Capital Costs

Table 5.1-1 shows the capital costs for the LPA to Park Avenue, LPA Phasing Option, and the MOS to Lake Road. The capital costs include all facility and system improvements, right-of-way costs, and vehicle purchases required for each of these that are in excess of the already-committed capital costs associated with the No-Build Alternative. They also include the value of the contributed right-of-way and land easements, the finance costs including the cost of interim borrowing, and the net finance costs during the project development period on borrowings used to provide local matching funds.

Table 5.1-1
Capital Costs for Portland-Milwaukie Light Rail Project
In Millions of 2010 and Year-of-Expenditure (YOE) Dollars

	LPA to Park Ave	LPA Phasing Option	MOS to Lake Rd
Insurance, Special Condition	$49.6	$49.3	$44.3
Utilities/street construction	$76.5	$76.8	$69.6
Track Grade, Structures, Installation	$274.1	$270.2	$247.7
Stations/Park and Rides	$50.1	$34.8	$48.6
System	$69.9	$69.1	$64.9
Operations/Maintenance Facility	$8.1	$5.1	$7.8
Right-of-Way [3]	$204.0	$203.6	$196.8
Vehicles [1]	$87.1	$77.3	$69.9
Professional Services	$173.5	$166.3	$154.8
Unallocated Contingency	$161.0	$159.6	$139.3
Sub-Total (2010 Dollars)	$1,153.9	$1,112.1	$1,043.7
Escalation to Year-of-Expenditure on Sub-Total	$120.6	$116.2	$111.1
Finance Charges [2]	$273.4	$262.1	$226.4
Total in Year-of-Expenditure Dollars	$1,547.9	$1,490.4	$1,381.2

Source: TriMet, 2010; numbers may not add due to rounding.

[1] LPA to Park Avenue cost incorporates 20 vehicles; LPA Phasing Option incorporates 18 vehicles, and MOS to Lake Road cost incorporates16 vehicles.

[2] Includes interest payments for interim borrowing and net finance costs during the construction period on bonds issued to provide local match. Finance costs are based on assumption that annual appropriations of New Start funds for the project would not exceed $100 million in any one year. Finance costs and, therefore, total project costs would change if assumption regarding annual appropriation levels change during Final Design.

[3] Includes Land and right-of-way purchased plus value of land and right-of-way donated to project.

As shown in Table 5.1-1, the LPA to Park Avenue is estimated to cost about $1.55 billion in YOE dollars, about $58 million more than the LPA Phasing Option and almost $167 million more than the MOS to Lake Road. The LPA Phasing Option is estimated to cost about $109 million (YOE dollars) more than the MOS to Lake Road.

Portland-Milwaukie Light Rail Project O&M Costs

Table 5.1-2 shows year 2030 transit O&M costs in 2010 dollars for the No-Build Alternative, the LPA to Park Avenue, LPA Phasing Option, and the MOS to Lake Road. These O&M costs include the cost of operating and maintaining the light rail transit (LRT) line, where applicable, and the buses in the Portland-Milwaukie corridor.

Table 5.1-2
Portland-Milwaukie Light Rail Project Operating Costs for Year 2030 Service Levels
In millions of 2010 dollars[1]

	No-Build	LPA to Park Ave	LPA Phasing Option	MOS to Lake Rd
Light Rail O&M Costs[1]	$0.00	$9.01	$8.66	$7.62
Corridor Bus O&M Costs[2]	$28.73	$28.60	$28.60	$28.60
Total Corridor O & M Costs	$28.73	$37.61	$37.26	$36.22
Difference from No-Build	NA	$8.89	$8.54	$7.49

Source: TriMet and Metro 2010.

[1] Portland-Milwaukie Light Rail Project O&M costs.

[2] O&M costs of buses serving the Portland-Milwaukie corridor.

As shown, the year 2030 corridor O&M costs for the LPA to Park Avenue are $8.89 million (2010 dollars) higher than the No-Build Alternative due to the increased service levels. Corridor buses would be replaced by light rail. While the LPA Phasing Option would exhibit the same 2030 corridor bus O&M cost as the LPA to Park Avenue, its 2030 light rail O&M costs would be about $0.35 million less due to its slightly longer headways. The 2030 corridor bus O&M costs for the MOS to Lake Road are the same as those of the LPA to Park Avenue and the LPA Phasing Option because in all of these alternatives trunk-line buses would be routed to the downtown Milwaukie transit center to facilitate transfers to intra-county buses. However, the 2030 light rail O&M cost for the MOS to Lake Road is estimated to be about $1.02 - $1.39 million (2010 dollars) less than for the LPA Phasing Option and LPA to Park Avenue, respectively, due to its shorter route miles and service hours.

5.1.1.2 System Costs

System costs include all capital and O&M expenditures by TriMet over the 21-year planning period, except the capital costs for building the Portland-Milwaukie Light Rail Project. Total system cost is the aggregate of *system operating costs* and *system capital costs*. *System operating costs* are the annual O&M costs of the TriMet system including the Portland-Milwaukie Light Rail Project. This includes the cost of operating and maintaining the existing transit and demand-responsive system, anticipated increases in transit service required to maintain headways and capacity, expanded demand-responsive service, expanded bus service, and operations of the planned light rail extension to Clark College in Vancouver, Washington, as part of the Columbia River Crossing Project. System costs also include TriMet's contribution toward annual Portland Streetcar operating costs.

TriMet must borrow funds to provide local match for the project by issuing revenue bonds to be repaid by its general fund revenues. The debt service on these revenue bonds is a system cost and the general fund revenues used to pay these revenue bonds are system revenues.

Table 5.1-3 shows the cumulative system operating and maintenance (O&M) costs for the light rail project alternatives compared to the No-Build Alternative in 10-year increments between FY 2010 and FY 2030 and the 21-year total in YOE dollars.

Table 5.1-3
Summary of Transit System Costs: Cumulative Total from FY 2010 to FY 2030
In Millions of Year-of-Expenditure Dollars

	No-Build	LPA to Park Ave	LPA Phasing Option	MOS to Lake Rd
2010 System Operating Cost	$411.5	$411.5	$411.5	$411.5
2010 System Capital Cost	$60.0	$60.0	$60.0	$60.0
2010 Total	**$471.6**	**$471.6**	**$471.6**	**$471.6**
2020 System Operating Cost	639.6	$653.4	$652.6	$652.5
2020 System Capital Cost	$67.3	$67.3	$67.3	$67.3
2020 Total	**$706.9**	**$720.7**	**$719.9**	**$719.9**
2030 System Operating Cost	$1,011.9	$1,025.6	$1,024.4	$1,022.7
2030 System Capital Cost	$62.2	$62.2	$62.2	$62.2
2030 Total	**$1,074.1**	**$1,087.8**	**$1,086.5**	**$1,084.8**
Total 2010-2030 System Operating Costs[1]	$13,671.6	$13,893.4	$13,877.2	$13,867.2
Total 2010-2030 System Capital Costs[2]	$1,408.7	$1,470.2	$1,470.2	$1,470.2
2010-2030 Total	**$15,080.3**	**$15,363.6**	**$15,347.4**	**$15,337.4**

Source: TriMet 2010.

[1] All operating and maintenance costs between FY 2010 and FY 2030, including the Portland-Milwaukie Light Rail Transit Project.

[2] All capital replacement and improvement costs between FY 2010 and FY 2030, excluding Portland-Milwaukie Light Rail Project

Table 5.1-3 also shows the cumulative *system capital costs* of the light rail project. *System capital costs* include all currently committed capital projects except the Portland-Milwaukie Light Rail Project, a regular schedule of vehicle replacement purchases, and the purchase of additional vehicles required by anticipated service increases.

The *total system cost* of an alternative is the sum of *system capital costs* and *system operating costs*. Table 5.1-3 shows that *total system costs* for the build alternatives during the planning period are about $257 - $283 million higher than for the No Build alternative. Over the planning period, *total systems costs* for the LPA to Park Avenue would be about $16 million more than for the LPA Phasing Option and about $26 million more than for the MOS to Lake Road.

5.1.2 Available Resources

Two categories of available revenue resources are examined within this section: (i) revenue resources for Portland-Milwaukie Light Rail Project *capital costs* and (ii) revenue resources for its *transit system costs*.

5.1.2.1 Available Project Capital Revenues

The required amounts of local matching funds for each of the alternatives is shown below in Table 5.1-4.

Table 5.1-4
Required Local Matching Funds
In Millions of Year-of-Expenditure (YOE) Dollars

	LPA to Park Ave.	LPA Phasing Option	MOS to Lake Rd.
Total Capital Cost in YOE Dollars [1]	$1,547.9	$1,490.4	$1,381.2
Proposed Percent of New Starts Funds	50%	50%	50%
Proposed Amount of New Starts Funds	$773.9	$745.2	$690.6
Required Amount of Local Funds	$773.9	$745.2	$690.6

Note: Numbers may not add due to rounding

Up to $656.5 million (YOE dollars) of local matching funds are currently available to pay the capital costs of the Portland-Milwaukie Light Rail Project, depending on the alternative. The currently available local matching funds are the same for the LPA to Park Avenue and LPA Phasing Option. However, certain funds that are available for these alternatives are not available for the MOS to Lake Road. The following paragraphs describe these currently available local matching funds.

$250 million in State Lottery Bond Proceeds. In June 2007, the Oregon Legislature passed House Bill 5036, which authorized $250 million in lottery bond proceeds for the Portland-Milwaukie Light Rail Project. Lottery bonds are borrowings undertaken by the State of Oregon that pledge the proceeds from the state lottery to repay the bonds. TriMet's general fund revenue is not affected by repayment of the lottery bonds. Consistent with the act, these lottery bonds have been issued and the proceeds have been deposited in an account dedicated to the project. These funds, including interest earnings on the bond proceeds, must be provided to TriMet for the project. Bond proceeds are distributed to TriMet as TriMet establishes finance plans to complete the project or a phase of the project. TriMet and the Oregon Department of Transportation (ODOT) have executed an intergovernmental agreement that sets forth the detailed terms and conditions for the distribution and use of these funds.

$99.8 million in GARVEE Bonds Issued by TriMet: A Grant Anticipation Revenue Vehicle (GARVEE) bond is a debt-financing instrument that pledges future federal funds to repay bondholders (23 USC 122(a) and (b)). TriMet plans to issue GARVEE bonds secured by a stream of Metropolitan Transportation Improvement Program (MTIP) funds pledged to TriMet by Metro for the Portland-Milwaukie Light Rail Project. MTIP funds include federal Surface Transportation Program (STP) funds and Congestion Management Air Quality (CMAQ) Program funds, which are funds allocated to Metro as the Portland Metropolitan Planning Organization (MPO).

Metro Resolutions No. 08-0932 and No. 10-4133 provide TriMet a multi-year commitment of such funds totaling $144.8 million to support borrowings that allow TriMet to be reimbursed for the $13.3 million it provided to the Westside Express Service Project and to provide $72.5 million in net bond proceeds for the Portland-Milwaukie Light Rail Project. Metro Resolution 10-4185 added $66.0 million or regional flexible funds to the multi-year commitment to support additional borrowings to provide approximately another $27.4 million for the Portland-Milwaukie Light Rail Project (making a total of about $99.8 million available to the project from this source) and $12.0 million for high capacity transit studies in other corridors.

TriMet and Metro have entered into an "*Intergovernmental Agreement to Provide and Utilize MTIP Funds to Implement the Milwaukie LRT and Commuter Rail Funding Plan*," which sets forth the rights and obligations of the parties with respect to these funds[1]. TriMet will be responsible for implementing the borrowing program that provides the stated amount of funds to the Portland-Milwaukie Light Rail Project, and will structure debt service so that principal and interest can be fully paid with the flow of MTIP funds.

Up to $100.3 million in Committed State, Local, and Regional Funds. The state, regional, and local governmental entities participating in the project have executed binding agreements with TriMet committing $100.3 million to fund project costs of the LPA to Park Avenue and LPA Phasing Option and $75.0 million to fund the cost of the MOS to Lake Road.

On June 17, 2009, the Portland City Council approved Resolution No. 36709, which established a $30 million funding plan for the City of Portland's contribution to the Portland-Milwaukie Light Rail Project. Subsequently, TriMet and the City of Portland have entered into an intergovernmental agreement that commits the City of Portland to provide $30 million to TriMet to pay project costs. TriMet and Clackamas County have entered into a similar intergovernmental agreement committing Clackamas County to provide $25 million for project costs, depending on the alternative. In December 2008, the City of Milwaukie executed a similar agreement with TriMet, committing $5 million to the project. Under the intergovernmental agreements, these funds would be available to the project within sixty days from the date the Full Funding Grant Agreement (FFGA) committing New Start funds to the project is executed.

TriMet has committed or budgeted to provide $40.0 million to the project. TriMet has committed $30 million in intergovernmental agreements with local jurisdictions, and is carrying another $10.0 million in its financial plans. Thus, $30 million is considered currently available from TriMet and the remaining $10.0 million is considered additional (i.e. budgeted) revenue (see Section 5.1.4.1, below). As explained above, TriMet will need to borrow funds to provide these amounts to the project by issuing revenue bonds that will be repaid with TriMet payroll tax revenues. TriMet expects to issue these revenue bonds when the FFGA is executed.

In addition to the $90.0 million committed through intergovernmental agreements, Metro has provided TriMet a $349,000 "*Nature in Neighborhoods*" grant that will be used to pay eligible expenses of the Portland-Milwaukie Light Rail Project near the SE Park Avenue terminus of the LPA and LPA Phasing alternatives. These funds are not available to pay the project costs of the MOS to Lake Road. In addition, ODOT has provided a $10.0 million grant of Congestion Mitigation/Air Quality (CMAQ) funds to the project; these funds are available for all of the alternatives.

[1] The current intergovernmental agreement addresses the funds committed under Resolution 08-0932 and Resolution No. 10-4133; the agreement will be amended to address the additional funds committed under Resolution 10-4185.

Up to $164.9 million in Committed State and Local Revenues Used to Pay Net Finance Costs during the Construction Period on Bonds Used for Local Match. Under FTA policy, the financing costs paid during the project development period on bonds issued to provide local match for a project, net of any interest earnings on the bond proceeds, constitute project costs (and are included in the capital cost estimates shown in Table 5.1-1). The local revenues used to pay such net finance costs constitute project revenues. The project development period begins when preliminary engineering is authorized and ends at the later of: (i) the start of revenue operations or (ii) receipt of the final federal funds committed to the project in the FFGA. Based on the project cash flows shown in Tables 5.1-9, the development period is anticipated to end in 2020 for the LPA to Park Avenue and LPA Phasing Option and 2019 for the MOS to Lake Road, upon receipt of the final allocation of federal funds for the respective alternative.

As discussed above, several separate bond issuances are anticipated to fulfill the existing commitments to provide local match to the project. These include: (i) $250 million from lottery bonds issued by the state, (ii) $99.8 million from GARVEE bonds issued by TriMet, (iii) $40.0 million (of which $30 million is currently committed) from TriMet revenue bonds, and (iv) an estimated $40.0 million in bonds issued by the City of Portland, City of Milwaukie, and Clackamas County (for the LPA to Park Avenue and LPA Phasing Option) to provide a portion of their committed local matching funds. The net amount of local revenues currently available to pay the net finance costs associated with these bonds during the project development period are estimated to be $164.9 million (YOE dollars) for the LPA to Park Avenue and LPA Phasing Option and $144.6 million for the MOS to Park Avenue.

Additional local matching funds are required for each of the alternatives, which will require additional bonds to be issued by the local funding partners. Since these bonds are planned but not committed, the local revenues associated with paying the net finance costs on these additional local bonds are not currently committed, but instead are an additional planned funding source addressed in Section 5.1.4.1.

$41.5 million Committed In-Kind Contribution of Real Property. The value of the right-of-way and other real property interests contributed to the project are the same for all of the alternatives. Agreements committing the donation are currently in place for most of the anticipated in-kind contributions; the value of the in-kind contribution that is not fully committed in an existing agreement is addressed as a future additional funding source in Section 5.1.4.1.

Portions of the Willamette Shore Line right-of-way, owned by the Willamette Shore Line Consortium, will be used for project improvements and mitigation. The governing bodies comprising the Willamette Shore Line Consortium approved the donation of the affected right-of-way to the project and entered into an intergovernmental agreement authorizing the conveyance. The donated real property has an estimated market value of about $26.3 million in YOE dollars, which would be used as in-kind match.

TriMet has also entered into an agreement with Oregon Health and Science University (OHSU) wherein OHSU commits to donate real property needed for right-of-way and a temporary easement on another parcel for construction staging. This contribution has an estimated market value of about $15.2 million in YOE dollars.

Discussions are underway with participating governmental and non-profit agencies to secure additional in-kind contributions of right-of-way and construction staging areas; these are discussed in Section 5.1.4.1.

5.1.2.2 Available Transit System Revenues

Available transit system revenues are derived from a variety of sources. Other than interest earnings and passenger revenues, the system revenue sources are not affected by the alternative. The major sources of available transit system revenues and the key assumptions used to forecast these revenues follow.

Payroll Tax Revenues

Payroll taxes are TriMet's largest source of operating revenue, accounting for approximately 52 percent (about $195 million) of FY 2010 operating revenues.

As of January 2010, the payroll tax is currently levied at 0.6818 percent ($6.818 per $1,000) on the gross payrolls of private businesses and municipalities within the district. In August 2004, the TriMet Board authorized a one-hundredth of one percent per year increase in the payroll tax rate over ten years, which will ultimately reach 0.7218 percent on January 1, 2014.

In its 2009 session, the Oregon Legislature (Senate Bill 34) granted the TriMet Board the authority to further increase the payroll tax rate to 0.8218 percent. The legislation specifies that the tax rate increase cannot be implemented until the TriMet Board determines that the economy in the district has sufficiently recovered to warrant the increase; that it must be phased in over ten years; and that no annual increase can exceed 0.02 percent. The forecast anticipates that TriMet begins to implement the additional payroll tax authority in Senate Bill 34 on January 1, 2015, increasing the rate an additional one-one hundredth of a percent for ten years. This would result in a payroll tax rate of 0.8218 percent beginning January 1, 2024.

In addition to the increases in the tax rate, payroll tax collections are anticipated to grow as the number of jobs in the district and wages grow. Underlying (i.e., excluding any increase in tax rate) payroll tax receipts in FY 2010 declined by 4.0 percent (the decline was 2.6 percent with the increase in the tax rate). The underlying annual growth in payroll tax receipts is assumed to be 3 percent increase in FY 2011, 4.4 percent in FY 2012, 4.9 percent in FY 2013, and 4.5 percent in FY 2014 and subsequent years.

Self-Employment Tax Revenues

In addition to the payroll tax, TriMet currently levies a 0.6818 percent tax on the net income earned within its district by self-employed individuals. The self-employment tax rate will increase at the same rate as the payroll tax rate.

The annual fluctuations in the amount proceeds received from the self-employment tax are wider than for the payroll tax. After growth of 4 percent in FY 2004 and 5.0 percent in FY 2005, self-employment tax receipts increased 19.8 percent in FY 2006 and 21.3 percent in FY 2007. Because of the recent economic turndown, self-employment tax revenues decreased 2.7 percent in FY 2008, 7.7 percent in FY 2009, and 2.6 percent in FY 2010. The forecast of self-employment tax revenues assumes an underlying (excluding any tax rate increase) annual growth of 3 percent in FY 2011 and 4.5 percent in FY 2012 through FY 2030.

State Payroll "In-Lieu" Revenues

State of Oregon government offices located within TriMet's district boundaries are not subject to the municipal payroll tax. Instead, they make "in lieu of" tax payments to TriMet based on 0.6218 percent of their gross payrolls within the TriMet district.

State "in-lieu" revenues increased by 7.8 percent in FY 2010, and are assumed to grow by 3.0 percent in FY 2011 and 4.5 percent annually in FY 2012 through FY 2030, consistent with historic trends since OHSU was converted from a state agency to a private employer paying TriMet's payroll tax.

Grants and Capital Reimbursement

Currently TriMet receives about $45 million annually in federal transit formula funds, which are used for maintenance. In addition, TriMet receives about $11 million dollars annually in federal transportation funds from the Surface Transportation Program (STP) and Congestion Mitigation Air Quality (CMAQ) programs, which are used for the regional rail program, passenger amenity improvements, and promoting transit use. Federal funds in total constitute about 15 percent of TriMet's O&M revenues.

Section 5307 Urbanized Area Formula Funds are TriMet's primary federal formula grant funds. The forecast assumes that Section 5307 Urbanized Area Formula Funds are flat in FY 2010 and FY 2011, and grow 1.7 percent in FY 2012, 2.0 percent in FY 2013, and 3 percent per year in FY 2014 and subsequent years.

Fixed Guideway Modernization Funds (Mod Funds) represent TriMet's second largest source of federal formula funds. Mod Funds is a federal formula funding program, administered by FTA, that provides dedicated funding to transit agencies that operate fixed guideway transit lines such as light rail, streetcar, and commuter rail Under the federal statutes, a transit district's allocation of Mod Funds is based, in part, on the number of light rail and streetcar vehicle miles operated within its district for at least for seven years (Rail Mod funds are not provided to a project during its first seven years of operations). TriMet's allocation of Mod Funds is forecast to grow 6.5 percent in FY 2010, stay flat in FY 2011, and grow 3 percent per year between FY 2012 and FY 2016. In FY 2017, when Westside Express Service (WES) Commuter Rail enters its eighth year of operation, Mod Funds are anticipated to increase 17 percent. A 15 percent increase is anticipated in FY 2018, when the Green Line enters its eighth year of operation. A 14.5 percent increase is projected for FY 2023, when the Portland-Milwaukie light rail line would enter its eighth year of operation.

In addition, the amounts of STP funds currently approved by Metro's Joint Policy Advisory Committee on Transportation (JPACT) and Metro for TriMet's preventive maintenance program are assumed to continue throughout the forecast period. The forecast also assumes the continuation of the regional allocation of the federal CMAQ funds for public education and outreach activities to promote increased transit use.

Passenger Revenues

Revenues from passenger fares (from LIFT Paratransit Program, MAX Light Rail, WES Commuter Rail, demand-responsive transit, and bus services) are TriMet's second largest

revenue source, contributing about $92.6 million (over 25 percent) of continuing operating revenue in FY 2010. In 1990, TriMet implemented a policy of regular fare increases, and the passenger revenue forecast is based on a continuation of this policy. The passenger revenue forecast assumes a 2.0 – 2.6 percent per year increase in fares during the planning period.

Passenger revenue forecasts also reflect the forecast of bus and rail ridership. Due to year-over-year declines in gas prices and job losses in the region, bus ridership is projected to decline 8 percent in FY 2010. Bus ridership is expected to remain flat in FY 2011 due to service reductions on low-ridership bus lines planned for FY 2011, which are expected to offset anticipated bus ridership gains from an anticipated gradual increase in employment. Thereafter, bus ridership on existing services is forecast to grow 2.0 – 2.5 percent per year. With the newly opened Green Line, MAX (the aggregation of the Blue, Red, Yellow, and Green lines) ridership is estimated to grow by 9.1 percent in FY 2010. Ridership on these lines is projected to grow 3.0 percent in FY 2011 and 3.5 percent each year thereafter, consistent with the underlying historic trend.

Table 5.1-5 shows, based on the assumptions described above, that transit system O&M revenue sources are projected to provide between $14.32 billion and $14.43 billion (YOE dollars) through FY 2030, depending on the alternative. The range primarily reflects differences in passenger revenues and interest earnings.

Table 5.1-5
Summary of Transit System Revenues: Cumulative Total from FY 2010 to FY 2030
Millions of Year-of-Expenditure Dollars

System O&M Revenues	No-Build	LPA to Park Ave.	LPA Phasing Option	MOS to Lake Rd.
Passenger Revenue	$3,505	$3,629	$3,621	$3,615
Other Operating Revenue	$379	$379	$379	$379
Employer/Municipal Payroll Tax[1]	$7,564	$7,564	$7,564	$7,564
Self-Employment Tax	$349	$349	$349	$349
State In-Lieu Payment	$89	$89	$89	$89
Grants and Capital Reimbursement	$1,595	$1,615	$1,615	$1,615
Interest Earnings	$133	$95	$99	$97
Accessible Transportation/Other	$706	$706	$706	$706
Total System O&M Revenues	$14,321	$14,426	$14,422	$14,414
System Capital Revenues[2]				
Grants: State and Federal	$123	$123	$123	$123
Bond Proceeds	$934	$998	$998	$998
Transfer from General Fund	$352	$349	$349	$349
Total System Capital Revenues	$1,409	$1,470	$1,470	$1,470

Source: TriMet 2010.

[1] Includes implementation of payroll tax rate increase authorized by House Bill 3183 (2009 Legislative Session) beginning January 2013.

[2] System capital revenues exclude capital revenues for New Starts projects

5.1.3 Existing Revenue Shortfalls

This section discusses the additional *project* and *system* revenues needed to make the project fiscally feasible. The project is fiscally feasible if:

- Project capital revenues are sufficient to meet the capital costs
- On-going revenues are sufficient to meet on-going total system costs, including the operations of the Portland-Milwaukie Light Rail Project, and to maintain an on-going beginning-of-the-year cash and cash equivalent reserve (*Beginning Cash Reserve*) of at least 12 percent of annual system operating costs

5.1.3.1 Existing Project Capital Revenue Shortfalls

Table 5.1-6 summarizes the capital funding shortfalls (project capital cost minus currently available capital revenues) in YOE dollars. Additional capital revenues are required to make the capital project fiscally feasible. Opportunities for eliminating the shortfall are discussed in Section 5.1.4.

Table 5.1-6
Summary of Capital Revenue Shortfalls
In Millions of Year-of-Expenditure Dollars

	LPA to Park Ave.	LPA Phasing Option	MOS to Lake Rd.
Capital Cost	$1,547.9	$1,490.4	$1,381.2
Available Capital Revenues	($656.5)	($656.5)	($611.0)
Capital Revenue Shortfall	$891.4	$833.9	$770.2

5.1.3.2 Existing System Revenue Shortfalls

For each alternative, system costs and revenues were projected for each year of the 21-year planning period based on the assumptions described in previous sections.

Table 5.1-7 shows the *Beginning Cash Reserve* results for each alternative expressed in YOE dollars and in percent of annual operations. As mentioned previously, the fiscal condition of transit system operations is considered adequate if the *Beginning Cash Reserve* is maintained at 12 percent of annual operations costs each year.

Table 5.1-7
System Fiscal Feasibility Analysis: Beginning Cash Reserves by Fiscal Year
In Millions of Year-of-Expenditure Dollars

Fiscal Year	Beginning Reserve[1]	% Annual Operating Cost[2]	Beginning Reserve[1]	% Annual Operating Cost[2]	Beginning Reserve[1]	% Annual Operating Cost[2]	Beginning Reserve[1]	% Annual Operating Cost[2]
FY2010	$57.5	16%	$57.5	16%	$57.5	16%	$57.5	16%
FY2011	$93.9	25%	$93.9	25%	$93.9	25%	$93.9	25%
FY2012	$80.1	21%	$80.1	21%	$80.2	22%	$80.1	21%
FY2013	$81.7	21%	$79.7	20%	$80.0	20%	$79.7	20%
FY2014	$79.2	19%	$73.3	18%	$74.3	18%	$73.3	18%
FY2015	$79.8	18%	$70.7	16%	$72.4	17%	$70.7	16%
FY2016	$83.2	18%	$68.0	15%	$70.6	15%	$68.1	15%
FY2017	$88.1	18%	$66.1	14%	$69.1	14%	$66.2	14%
FY2018	$97.5	19%	$68.8	13%	$72.2	14%	$68.9	13%
FY2019	$110.7	21%	$75.3	14%	$79.1	15%	$75.5	14%
FY2020	$121.8	22%	$78.4	14%	$82.7	14%	$78.6	14%
FY2021	$131.3	22%	$80.0	13%	$84.8	14%	$80.3	13%
FY2022	$138.3	22%	$79.0	13%	$84.3	13%	$79.4	13%
FY2023	$147.1	23%	$80.0	12%	$85.8	13%	$80.5	12%
FY2024	$157.5	23%	$83.5	12%	$90.0	13%	$85.3	12%
FY2025	$171.7	24%	$91.0	12%	$98.2	13%	$94.2	13%
FY2026	$190.0	25%	$102.2	13%	$110.2	14%	$106.9	14%
FY2027	$207.1	26%	$112.6	14%	$121.4	15%	$118.9	15%
FY2028	$236.4	29%	$135.4	16%	$145.0	17%	$143.5	17%
FY2029	$259.9	30%	$152.9	18%	$163.4	19%	$162.8	19%
FY2030	$290.9	32%	$178.6	20%	$190.0	21%	$190.5	21%

[1] Amount of unrestricted cash and cash equivalents available at beginning of fiscal year. Unrestricted cash reserves are equal to total cash minus cash restricted to pay debt service.

[2] Percent of annual operating costs that could be funded with beginning year unrestricted cash and cash equivalents. % Annual Operating cost does not include debt service costs or revenues, as restricted cash is dedicated to debt service payments.

As shown in Table 5.1-7, the *Beginning Cash Reserves* do not dip below the 12 percent threshold in any year during the planning period for any alternative. Thus, the project is fiscally feasible from a *total systems costs* perspective.

5.1.4 Opportunities for Additional Revenues

This section discusses opportunities for additional revenues that TriMet may seek to eliminate revenue shortfalls.

5.1.4.1 Project Capital Revenue Options

All of the alternatives require additional capital revenues to cover the shortfalls shown in Table 5.1-6. Potential sources to eliminate the shortfalls in local and regional revenues are listed below.

Additional Budgeted TriMet Contribution of Up To $10 Million

As discussed earlier in Section 5.1.2.1, TriMet is budgeting in its agency finance plans a $40.0 million contribution to the Portland-Milwaukie Light Rail Project finance plan. This is $10.0 million more than it committed to provide to the project in intergovernmental agreements with the participating local governments. These additional funds would be provided through additional borrowings to be repaid with TriMet's payroll tax revenues.

Additional Budgeted Property Donations as In-Kind Match

Section 5.1.2.1 described $41.5 million (YOE dollars) in right-of-way and temporary construction easements that would be donated to the project as in-kind local match. There is a conditional (non-binding) agreement with another property owner regarding a donation of the right to use a parcel for construction staging (in lieu of leasing such properties). The estimated market value of this additional in-kind contribution is about $5.2 million in YOE dollars.

Additional Planned Local Matching Funds

Additional local matching funds are required for all alternatives beyond those local matching funds discussed above that are committed or budgeted. Depending on the alternative, committed and budgeted funds account for about 86.6 – 90.5 percent of the required local matching funds. The participating local governmental entities are engaged in implementing a plan to address the remaining funding requirements.

Discussions are on-going with several governmental and non-profit entities regarding additional in-kind donations of real property, either in the form of right-of-way, field office space, or temporary staging areas. The finance plan targets an additional $10 million in real property interests to be secured as in-kind contributions. All total with these additional in-kind contributions, the finance plan would incorporate about $56.7 million in real property contributions used as in-kind local match.

The participating local governmental entities are also engaged in securing additional revenues for the project. As part of this plan, the Project Management Group and Project Steering Committee are preparing a prioritized list of project scope deferrals, which would be phased-in or eliminated in the event that the full amount of planned local matching funds is not secured. The range of environmental impacts documented in this FEIS account for the differing impacts that would be incurred if these project scope deferrals are required.

Revenues Used to Pay Net Finance Costs during the Construction Period on Bonds for Additional Planned and Budgeted Local Matching Funds

As discussed earlier in Section 5.1.2.1, under FTA policy the financing costs paid during the project development period on borrowings used to provide the additional local funding described above constitute project costs (and are included in the capital cost estimates shown in Table 5.1-1). The local revenues used to pay such net finance costs constitute local matching funds.

The finance plan for all of the alternatives incorporate $3.2 million in additional net finance costs derived from the budgeted $10 million TriMet contribution. In addition, each of the alternatives incorporates the additional net finance costs from borrowings required to provide their respective planned amounts of additional local revenues. All total, these additional amounts of net finance costs range from about $8.3 to $11.7 million depending on the alternative.

5.1.4.2 System Revenue Options

As shown in Table 5.1-7 and discussed in Section 5.1.3.2, with implementation of the payroll tax authority provided by Senate Bill 34, TriMet will have sufficient system revenues to operate the Portland-Milwaukie Light Rail Project and maintain adequate *Beginning Cash Reserves* under its existing authorities.

5.1.5 Conclusions

A 21-year cash flow analysis was prepared, in which transit revenues (by source expenditures, transit expenditures, and line item) were projected by year using key elements of the fiscal analysis described in previous sections. The following paragraphs summarize the analysis.

5.1.5.1 Project Capital Funding Conclusions

Table 5.1-8 illustrates the proposed capital funding plans for the LPA to Park Avenue, LPA Phasing Option, and MOS to Lake Road.

Table 5.1-8
Capital Funding Plan for Portland-Milwaukie Light Rail Project
In Millions of Year-of-Expenditure Dollars

		LPA to Park Ave.	LPA Phasing Option	MOS to Lake Rd.
Capital Cost in YOE Dollars		$1,547.9	$1,490.4	$1,381.2
Capital Revenues				
U	New Starts	$773.9	$745.2	$690.6
A	State Lottery Bond Proceeds	$250.0	$250.0	$250.0
A	MTIP-GARVEEs	$99.8	$99.8	$99.8
A/U	In-Kind Property Contributions	$56.7	$56.7	$56.7
A	Milwaukie	$5.0	$5.0	$5.0
A	Portland	$30.0	$30.0	$30.0
A	Clackamas County	$25.0	$25.0	
A/U	TriMet	$40.0	$40.0	$40.0
A	Metro Grant	$0.3	$0.3	
U	Additional Local	$80.6	$54.2	$46.2
A	ODOT CMAQ Grant	$10.0	$10.0	$10.0
A/U	Local Funds for Net Finance Costs for Local Match	$176.6	$174.2	$153.0
	TOTAL	$1,547.9	$1,490.4	$1,381.2

Source: TriMet, 2010

U = Unavailable Currently (subject to future approvals), A = Available, A/U = Partially Available

Even with an FFGA, a project must have New Starts funds appropriated to it by Congress on an annual basis to actually receive such funds. The amount of New Start funds appropriated to the Project is subject to a variety of variables such as budget limits and the demand for appropriations from other projects. The amount of New Starts funds appropriated to a project in a given year may be less than the Portland-Milwaukie Light Rail Project requires that year.

In years when less New Starts funds are appropriated for the project than are needed by the project, the finance plan must use interim borrowing to maintain its optimum construction schedule. Interim-borrowed funds would be repaid with later-appropriated New Starts funds, but the Portland-Milwaukie Light Rail Project would incur interest costs during that interim. The cost estimates shown in Tables 5.1-1 include the finance costs associated with the interim-borrowing program.

5.1.5.2 System Fiscal Feasibility Conclusions

As explained in Section 5.1.3.2, the transit system cash flow analysis for the light rail project found that there were sufficient *Beginning Cash Reserve* amounts to meet transit system needs. Table 5.1-9 shows the year-by-year system cash flow, including the project capital cost, for the LPA Phasing Option. Similar analyses were prepared for the LPA to Park Avenue and MOS to Lake Road.

5.1.5.3 Implementation of the Finance Plan

Implementation of the finance plan depends on successfully obtaining:

- Issuance of the Record of Decision (ROD) by FTA
- Formal commitments of the budgeted and planned donations of right-of-way and construction staging areas to be used as in-kind local match
- Formal commitments of the additional budgeted and planning local matching funds.
- A sufficient New Starts rating to be eligible for New Starts funding
- FTA approval to begin final design
- FTA approval of an FFGA that provides Section 5309 New Starts funds in the amount required by the finance plan

Table 5.1-9: Summary of Detailed Cash Flow Analysis - LPA Phasing Option
In Millions of Year-of-Expenditure Dollars

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Operating Revenues																					
Passenger	92.6	96.7	100.9	105.5	111.0	117.8	130.1	137.7	145.7	154.8	163.8	173.3	183.4	194.0	205.3	217.5	230.1	243.4	257.5	272.4	288.1
Taxes	208.2	217.5	230.3	245.0	259.6	274.8	291.0	308.2	326.3	345.4	365.5	386.8	409.2	432.9	457.9	482.8	504.5	527.2	551.0	575.8	601.7
Other	212.5	140.5	167.3	161.1	152.7	137.3	155.6	120.2	177.9	129.6	180.5	216.1	356.7	172.1	180.4	183.0	192.2	298.8	189.3	192.6	203.5
Total	513.3	454.7	498.5	511.5	523.2	529.9	576.7	566.0	649.9	629.8	709.8	776.2	949.3	799.0	843.6	883.4	926.9	1,069.4	997.7	1,040.7	1,093.3
Operating Cost	415.5	407.8	422.6	446.3	466.5	486.7	520.8	544.8	571.7	604.6	635.8	670.5	710.4	743.8	779.4	816.9	853.0	898.4	922.5	960.0	999.1
System Capital Revenues																					
Grants	23.7	28.4	5.9	3.1	4.5	3.0	4.4	3.0	4.3	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.5	3.6	3.6	3.6
General Fund Bonds	36.3	29.3	65.9	67.2	54.2	38.9	53.0	14.0	66.9	14.9	63.7	95.6	232.3	45.6	50.7	49.0	52.4	152.2	54.3	52.1	58.6
Total	60.0	57.8	71.8	70.3	58.7	41.9	57.4	17.0	71.2	18.5	67.3	99.2	235.9	49.2	54.3	52.5	55.9	155.7	57.9	55.6	62.2
System Capital Cost	60.0	57.8	71.8	70.3	58.7	41.9	57.4	17.0	71.2	18.5	67.3	99.2	235.9	49.2	54.3	52.5	55.9	155.7	57.9	55.6	62.2
Beginning Cash Reserves																					
Beginning Unrestricted Cash	57.5	93.9	80.2	80.0	74.3	72.4	70.6	69.1	72.2	79.1	82.7	84.8	84.3	85.8	90.0	98.2	110.2	121.4	145.0	163.4	190.0
%of Annual Operating Cost	16%	25%	22%	20%	18%	17%	15%	14%	14%	15%	14%	14%	13%	13%	13%	13%	14%	15%	17%	19%	21%
Portland-Milwaukie LRT Project Costs and Revenues																					
Costs:													Total								
Design/Construction	22.2	54.7	210.3	378.8	409.3	147.3	5.6	0	0	0	0		1,228.3								
Finance Costs	9.8	9.8	11.4	17.9	30.6	39.6	39.2	35	29.6	23.9	15.5		262.1								
Total Costs	31.9	64.5	221.7	396.7	439.9	187.0	44.8	35.0	29.6	23.9	15.5		1490.4								
Revenues:																					
Federal New Starts				100.0	100.0	100.0	100.0	100.0	100.0	100.0	45.2		745.2								
State	250.0												250.0								
GARVEE Bonds		99.8											99.8								
In-Kind Property Donations				56.7									56.7								
Local		10.0		100.0	0.3	54.2							164.5								
Interim Borrowing				50.3	321.4	13.2	(74.8)	(84.6)	(88.9)	(93.4)	(43.2)		0.0								
Local Revenue for Net Finance	9.8	9.8	11.4	17.2	18.2	19.6	19.7	19.5	18.4	17.3	13.5		174.2								
Total Revenues	259.8	119.5	11.4	324.1	439.9	187.0	44.8	35.0	29.6	23.9	15.5		1,490.4								
Cumulative Costs	31.9	96.4	318.1	714.8	1,154.7	1,341.6	1,386.5	1,421.4	1,451.0	1,474.9	1,490.4										
Cumulative Revenues	259.8	379.3	390.6	714.8	1,154.7	1,341.6	1,386.5	1,421.4	1,451.0	1,474.9	1,490.4										
Cum. Revenues-Expenditures	227.9	282.9	72.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0										

Source: TriMet, 2010

(a) Excludes the capital costs and revenues for the Portland-Milwaukie LRT Project.

(b) Project costs and revenues shown in FY 2010 represent total of FY 2009 plus FY 2010.

5.2 EVALUATION OF THE PROJECT

This section presents an evaluation of ability of the Portland Milwaukie Light Rail Project to meet the purpose and need and its related performance objectives.

5.2.1 Effectiveness in Meeting Corridor Objectives

Based on the purpose and need, seven objectives were established during the *South Corridor Project Supplemental Draft Environmental Impact Statement* in 2002. These remained the objectives used to determine the Locally Preferred Alternative for the Portland-Milwaukie Light Rail Project following the publication of the *2008 Portland-Milwaukie SDEIS*. Table 5.2-1 outlines the criteria and measures that are associated with each objective. Most of the measures summarized in this section are based on analyses documented in Chapter 2, Alternatives; Chapter 3, Environmental Analysis and Consequences; and Chapter 4, Transportation. See those chapters for more detail.

Table 5.2-1
Objectives, Criteria, and Measures of Effectiveness

Objective/Criteria	Measure
Provide High Quality Transit Service	
Access to and from the light rail network	Change in households and employment with access to light rail station (2030) Ability to provide park-and-ride access
Transferability	Ease of transfers
Travel times	In-vehicle travel times between major origins and destinations in the corridor Total travel times between major origins and destinations in the corridor
Reliability	Miles of light rail right-of-way Passenger miles on light rail right-of-way Percent of total corridor passenger miles on light rail right-of-way
Ridership	Total system-wide average weekday transit ridership (2030) Total system-wide average weekday light rail ridership (2030) Transit mode share between the corridor and downtown Portland (2030)
Ensure Effective Transit System Operations	
Operating effectiveness	Operational safety considerations Operating considerations
Maximize the Ability of the Transit Network to Accommodate Future Growth in Travel Demand	
Future Expansion Capability	Corridor transit network expansion capability
Minimize Traffic Congestion and Traffic Infiltration through Neighborhoods	
Highway System Use	PM vehicle volumes on parallel highways Vehicle miles traveled, Vehicle hours traveled, Vehicle hours of delay
Traffic Infiltration into Neighborhoods	PM peak volumes on local parallel streets

Table 5.2-1
Objectives, Criteria, and Measures of Effectiveness

Objective/Criteria	Measure
Promote Desired Land Use Patterns and Development	
Support of Activity Centers	Ability to provide high quality transit connections between the Portland Central City, Regional Centers, and Town Centers Ability to be physically and functionally integrated into activity centers Ability of transit stations and access points to be pedestrian-accessible and visible
Support of Land Use Policies	Compatibility with state and regional land use plans and policies
Access to Labor Force and Employment	Ability to provide residential areas with good access to jobs Change in short-term and long-term employment
Provide for a Fiscally Stable and Financially Efficient Transit System	
Cost-Effectiveness Measures	Cost per boarding ride
Financial Feasibility	Capital costs, Operating and maintenance costs
Maximize the Efficiency and Environmental Sensitivity of the Engineering Design	
Displacements	Number of residential units, businesses, and public facilities displaced
Noise and Vibration	Number of receptors exposed to noise impacts requiring mitigation Number of structures exposed to vibration impacts requiring mitigation
Air Quality	Reduction in carbon monoxide emissions and support for Air Quality Plans
Ecosystems, Wetlands, and Parks	Acres of impacted wetlands Cubic feet of fill in the 100-year floodplain Number of and acres of parks used
Historic and Cultural Resources	Number of historic resources adversely impacted Number of archaeologically sensitive areas potentially affected
Significant Design Considerations/Trade-offs	Major engineering and project development considerations

5.2.1.1 Provide High Quality Transit Service

Access

The light rail project will provide direct access to transit service for residential and employment sites (within one-half mile of a light rail station) and to accommodate future growth within the region's adopted urban growth boundary (UGB) as envisioned by state, regional, and local land use plans. Under Metro's 2040 Growth Concept, many fixed-guideway stations would receive more intense and more broadly ranging mix of uses. Table 5.2-2 lists the number of households and jobs in the Portland-Milwaukie corridor for 2005 and 2030 within one-half mile of proposed light rail transit stations. There is strong projected growth between through 2030 for areas within one-half mile of the proposed light rail station areas. From 2008 to 2030, households within station areas are expected to grow by 29 percent, and jobs by 73 percent. The project also provides up to two light rail stations with parking to meet the demand for park-and-ride in the southern portion of the corridor.

Table 5.2-2
Households and Employment within One-Half Mile of Stations by 2030

	LPA to Park Ave.[1]	MOS to Lake Rd.
2008 Households	17,750	16,000
2030 Households	22,820	21,190
2008 Employment	48,410	48,010
2030 Employment	83,680	82,580

[1] Includes LPA Phasing Option.

Transferability

The light rail project will serve many trips without requiring transfers, but it is also designed to accommodate transfers between other elements of the transit system. The light rail project will provide direct access to the Portland Streetcar at Portland State University (PSU), in the South Waterfront, and near the OMSI Station. It will provide access to bus lines operating in the south end of downtown Portland. In southeast Portland, at the Clinton, Rhine, Holgate, and Bybee stations, passengers could transfer between light rail and bus lines. At the Tacoma Station, in downtown Milwaukie, and at the Park Avenue Station in Clackamas County, stations will be designed to provide convenient transfers between light rail and connecting buses. The light rail project will have convenient walk access to the Portland Aerial Tram at OHSU, with a light rail station within one-quarter mile of the tram and even closer access via a streetcar transfer.

Travel Times

For the origins and destinations illustrated in Table 5.2-3, the light rail project will improve PM peak 2030 transit travel times compared to the No-Build Alternative, and also provides more competitive travel times compared to the automobile. Travel between South Waterfront and Milwaukie (SE Lake Road) improves the most, with total travel times decreasing by 32 minutes.

Table 5.2-3
Transit and Auto Average Weekday PM Peak Hour Travel Times to Selected Locations from Selected Downtown Portland Locations, Year 2030

	No-Build		LPA to Park Ave.			MOS to Lake Rd.	
Origin/Destination	**Auto**	**Transit**	**Auto**	**Transit**	**Transit- LPA Phasing Option[3]**	**Auto**	**Transit**
In-Vehicle Travel Time[1]							
To Milwaukie - Lake Rd. from:							
Pioneer Square	24	28	24	24	24	24	24
Portland State University	23	27	23	19	19	23	19
South Waterfront	22	38	22	15	15	22	15
To Milwaukie - Park Ave. from:							
Pioneer Square	27	33	26	26	26	26	31
Portland State University	26	32	25	20	20	25	24
South Waterfront	25	43	24	16	16	24	20

Table 5.2-3
Transit and Auto Average Weekday PM Peak Hour Travel Times to Selected Locations from Selected Downtown Portland Locations, Year 2030

	No-Build		LPA to Park Ave.			MOS to Lake Rd.	
Origin/Destination	**Auto**	**Transit**	**Auto**	**Transit**	**Transit- LPA Phasing Option[3]**	**Auto**	**Transit**
Total Travel Time[2]							
To Milwaukie- Lake Rd. from:							
Pioneer Square	29	34	29	31	32	29	31
Portland State University	28	41	28	26	27	28	26
South Waterfront	27	54	27	22	23	27	22
To Milwaukie- Park Ave. from:							
Pioneer Square	32	39	31	33	34	31	40
Portland State University	31	46	30	28	28	30	34
South Waterfront	30	60	29	24	24	29	29

Source: Metro 2010.

[1] In minutes; in-vehicle time is only the time that a passenger would spend within a public transit vehicle or an automobile.

[2] In minutes; total time is the sum of in-vehicle time and all other time related to completing the trip, including walking and waiting time.

[3] Total travel time with LPA Phasing Option is one-half minute longer between origins and destinations compared to LPA to Park Avenue due to less frequent service in the peak period (8.6-minute headways vs. 7.5-minute headways).

5.2.1.2 Reliability

In 2008, 87 percent of TriMet light rail trains were on time, compared to bus on-time arrivals of 82 percent. The light rail vehicles had higher on-time performance because they are less subject to the traffic congestion and delay that buses often encounter. Table 5.2-4 shows that the added miles of light rail right-of-way will accommodate more than 87,500 additional passenger miles each weekday, or 22 to 24 percent of transit trips in the corridor.

Table 5.2-4
Reliability: Miles of Light Rail[1] Right-of-Way and Average Weekday Passenger Miles on Light Rail Right-of-Way in Corridor,[2] Year 2030

Light Rail Right-of-Way Measure	No-Build	LPA to Park Ave.	LPA Phasing Option	MOS to Lake Rd.
Miles of Light Rail	0	7.3	7.3	6.5
Average Weekday Passenger Miles (2030)[2]	0	87,500	80,000	79,900
% of Total Corridor Passenger Miles[2]	0	24%	22%	22%

Source: Metro 2010.

[1] Light rail provides an exclusive grade-separated and/or barrier-separated transit right-of-way.

[2] Excludes downtown Portland and inner NW Portland in order to isolate transit lines that primarily serve the corridor.

Transit Ridership

Table 5.2-5 summarizes total 2030 average weekday ridership system-wide and in the project corridor; it compares No-Build Alternative and the LPA to Park Avenue and MOS to Lake Road. The Portland-Milwaukie Light Rail Project would result in up to 14,000 more average weekday trips system-wide than the No-Build Alternative.

Table 5.2-5
Average Weekday Total System-wide and Portland-Milwaukie Corridor Transit Trips,[1] Year 2030

			LPA to Park Ave.			MOS to Lake Rd.	
	Existing (2005)	No-Build	without Streetcar Loop	with Streetcar Loop	LPA Phasing Option	without Streetcar Loop	with Streetcar Loop
Total Corridor Transit Trips (originating rides)	143,500	285,600	298,800	299,600	296,310	298,400	299,200
Change from Existing	N/A	142,100	155,300	156,100	152,850	154,900	155,700
% Change from Existing	N/A	+99%	+108%	+109%	+106%	+108%	+109%
Change from No-Build	N/A	N/A	13,200	14,000	10,700	12,800	13,600
% Change from No-Build	N/A	N/A	+5%	+5%	+4%	+5%	+5%
Total System-wide Transit Trips	277,100	532,500	545,800	547,000	541,000	545,400	546,600

Source: Metro 2009. Numbers may not sum due to rounding.

Note: N/A = Not Applicable

[1] Transit trips are one-way linked trips from an origin (e.g., home) to a destination (e.g., place of work or school), independent of whether the trip requires a transfer or not. A person traveling from home to work and back counts as two trips. Total corridor transit trips include all light rail, bus, and streetcar trips produced in or attracted to the Portland-Milwaukie Corridor. Trips within the Central Business District are not included.

Transit Mode Share to Portland Central City

Table 5.2-6 summarizes the average weekday transit mode share (bus, streetcar, or light rail) from the Portland-Milwaukie corridor to Portland Central City. Intra-Central City trips are excluded. The light rail project is projected to increase transit mode share in 2030 for all trips between the corridor and the Portland Central City by up to 4 percentage points.

Table 5.2-6
Average Weekday Transit Mode Share to Downtown Portland, Year 2030[1,2,3]

			LPA to Park Ave.			MOS to Lake Rd.	
	Existing (2005)	No-Build	without Streetcar Loop	with Streetcar Loop	LPA Phasing Option	without Streetcar Loop	with Streetcar Loop
Home-Based Work[1]							
Transit	5,040	10,990	12,830	12,840	12,040	12,790	12,800
Transit Mode Share	29%	47%	56%	56%	54%	56%	56%
Nonwork[2]							
Transit	6,600	13,990	15,620	15,680	15,270	15,550	15,600
Transit Mode Share	12%	17%	19%	19%	19%	19%	19%
Total							
Transit	11,640	24,980	28,450	28,520	27,310	28,340	28,400
Transit Mode Share	16%	23%	27%	27%	26%	27%	27%

Source: Metro 2010. Numbers may not sum due to rounding.

[1] Home-based work trips are defined as trips taken directly between one's home and one's place of work.

[2] Nonwork trips are defined as all trips that are not home-based work trips.

5.2.1.3 Ensure Effective Transit System Operations

Operational Safety

The light rail project will provide operational safety by using adopted local and industry-wide design standards. It includes safety measures that have been developed through preliminary engineering, and that will continue to be refined through final design. Compared to the No-Build Alternative, the light rail project provides more sections for transit to operate without potential conflicts with other vehicles, either through the use of exclusive rights-of-way, grade-separated crossings at several locations, and signal systems and gates at other crossing locations.

Operating Considerations

The light rail project includes structures and alignments that help minimize steep grades and other factors that can be problematic during periods of ice or snow. It avoids tight radius curves that would require track lubrication or increase wear to the track and light rail vehicles. Some design features increase operating complexity but provide greater benefits to safety and mobility. The grade-protected at-grade crossing of the Oregon Pacific Railroad involves specialized equipment and maintenance. Having light rail, buses, and streetcars on the bridge and shared transitway is also a unique operational factor, and it requires additional switches and signal/controls systems compared to a light rail-only bridge.

The project has specific design features providing safe and effective operations along sections where in-street operations and intersection crossings occur, and where the project is along railroad right-of-way and encounters at-grade crossings. This includes grade-separated crossings of SW Harbor Boulevard and OR 99/SE McLoughlin Boulevard, and improved intersections along the existing rail line in the Central Eastside Industrial District.

5.2.1.4 Transit Network's Ability to Accommodate Future Growth in Travel Demand

Light rail can carry approximately five times as many riders per two-car train than a standard 40-foot bus. At 2030 service levels, light rail will operate at 7.5-minute headways during the peak period in the peak direction and at 15-minute headways during the off-peak period. This frequency can be expanded to serve more riders as demand warrants. The light rail line can carry approximately 2,000 riders per hour in each direction, and future expansion of the light rail line has capacity to serve 5,000 riders per hour in each direction.

5.2.1.5 Minimize Traffic Congestion and Traffic Infiltration Through Neighborhoods

Table 5.2-7 shows that light rail project would reduce PM peak vehicle demand at key points in the corridor. The largest reductions (about 2.5 percent) would be on SE McLoughlin Boulevard and adjacent parallel streets south of SE Powell Boulevard with the LPA to Park Avenue. The MOS to Lake Road also provides a reduction, while the LPA Phasing Option less reduction.

Table 5.2-7
Highway System Use: 2030 Average Weekday Two-hour PM Peak Vehicle Volumes[1] at Select Corridor Screenlines

	No-Build	LPA to Park Ave.	LPA Phasing Option	MOS to Lake Rd.
SE McLoughlin Blvd. and Parallel Streets at SE Powell Blvd.[1]	19,700	19,200	19,500	19,200
SE McLoughlin Blvd. and Parallel Streets North of Milwaukie[2]	17,800	17,600	17,800	17,700

Source: Metro 2010.

[1] Screenline comprises the following roadways: SE McLoughlin Boulevard, SE Milwaukie Avenue, and SE 17th Avenue.

[2] Screenline comprises the following roadways: SE 17th Avenue, SE McLoughlin Boulevard, SE Main Street, and SE 32nd Avenue.

Vehicle Miles and Hours Traveled and Vehicle Hours of Delay

As shown in Table 5.2-8, the LPA to Park Avenue and the MOS to Lake Road will reduce VMT, VHT, and VHD compared to the No-Build Alternative.

Table 5.2-8
Highway System Use: 2030 Region-wide VMT, VHT, and VHD compared to the No-Build

		LPA to Park Ave.			MOS to Lake Rd.	
	No-Build	without Streetcar Loop	with Streetcar Loop	LPA Phasing Option[3]	without Streetcar Loop	with Streetcar Loop
Vehicle Miles Traveled (VMT)[1]	58,388,500	58,327,200	58,322,400	58,336,900	58,324,400	58,319,000
VMT Change from No-Build	N/A	-61,300	-66,100	-51,600	-64,100	-69,500
Vehicle Hours Traveled (VHT)[1]	2,263,800	2,258,100	2,257,700	2,259,00	2,257,700	2,257,200
VHT Change from No-Build	N/A	-5,700	-6,100	-4,800	-6,100	-6,600
Vehicle Hours of Delay (VHD)[1,2]	39,900	39,500	39,600	39,600	39,500	39,500
VHD Change from No-Build	N/A	-400	-300	-300	-400	-400

Source: Metro 2010.

[1] Based on average weekday conditions in 2030.

[2] Based on PM peak-hour conditions in 2030 on freeways, major and minor arterials, and collector streets.

3 Sensitivity analysis based on vmt/vht/vhd reduction per new transit rider with LPA to Park Avenue without Streetcar Loop model results.

5.2.1.6 Ability to Promote Desired Land Use Patterns and Development

Connections between the Portland Central City, Regional Centers, and Town Centers

The light rail project will improve transit service in the corridor to Portland Central City and the Milwaukie Town Center. It will provide a new high quality light rail transit connection of the Milwaukie Town Center with the Portland Central City, with light rail transit connections to other regional centers throughout the region. Milwaukie will have new high quality transit connections to several activity centers contained within the Portland Central City, including the Central Eastside Industrial District.

Physical and Functional Integration into Activity Centers

The light rail project will integrate with mixed-use activity centers, helping the centers achieve land use and density objectives consistent with regional and local plans. Having transit service in the centers also helps increase the amount of transit use.

In the Portland Central City, the light rail project will connect with transit on the Downtown Portland Transit Mall on SW 5th and SW 6th avenues in downtown Portland, providing expanded access and higher levels of service in the Portland State University, south downtown, and South Waterfront areas. The project will provide more direct service with a station in South Waterfront, which will allow transfers to and from the Portland Streetcar. The new bridge and its shared transitway will improve connections within the Portland Central City for streetcar, buses, bicycles, and pedestrians. The light rail project will also provide a station in the Milwaukie Town Center in downtown Milwaukie.

Pedestrian-Accessible and Visible Transit Stations

The light rail project's stations have a variety of pedestrian environments. Stations in downtown Portland, South Waterfront, and downtown Milwaukie will be highly visible in a pedestrian-friendly and highly urbanized environment. Many of the stations in southeast Portland and north

Milwaukie will be in or near single-family residential neighborhoods with a good pedestrian environment and visibility. The Bybee and Tacoma stations will provide improved pedestrian linkages and feature bus transfer facilities. The Park Avenue Station will be on a major transportation corridor, with several adjacent residential neighborhoods, and a direct connection to the multi-use Trolley Trail. All stations will have lighting, open railings, and other design details to maximize visibility and connections between the street, pedestrian facilities, connecting transit elements, and surrounding activities.

Support of Land Use Policies

Statewide Planning Goals

Oregon law mandates that statewide planning goals be implemented through state, regional, and local comprehensive plans. The light rail project is supportive of the Statewide Planning Goals, by providing improved transit service to lands within the region's UGB targeted to receive urban development, particularly Goal 11 – Public Facilities and Services, Goal 12 – Transportation, and Goal 14 – Urbanization. The proposed transit improvements do not convert rural lands to urban uses, consistent with the emphasis of Goal 3 – Agricultural Lands, Goal 4 – Forest Lands, and Goals 11, 12, and 14.

The light rail project will support Statewide Planning Goals by providing convenient transportation systems to help reduce reliance on the automobile and achieve state and regional goals for reducing per capita VMT.

Regional Plans and Policies

Regional plans and policies, including the Regional Urban Growth Goals and Objectives, the 2040 Growth Concept, the Regional Transportation Plan (RTP), and the Regional Framework Plan, emphasize maintaining compact urban form by focusing new growth in specific mixed-use activity centers. The light rail project will support regional plans and policies because it will provide light rail connections between designated regional centers and town centers, as well as major regional employment, commercial, and residential areas, including the Portland Central City, the Milwaukie Town Center, and other activity centers such as OMSI and the South Waterfront. It also will expand the regional light rail system's ability to support regional growth patterns.

5.2.1.7 Ability to Provide for a Fiscally Stable and Financially Efficient Transit System

The ability of the light rail project to provide for a fiscally stable and financially efficient transit system is measured through two sets of measures: a range of cost-effectiveness measures and capital and O&M costs.

Cost-Effectiveness

Compared to the No-Build Alternative, the light rail project would result in a decrease in cost per boarding ride in the corridor, with a cost of $1.43 per boarding ride (in 2010 dollars; see Table 5.2-9). Transit VHT in the corridor would be 7 to 9 percent greater with the light rail project compared to the No-Build Alternative, and corridor transit person trips would increase by 9 to 14 percent (see Section 4.2).

Table 5.2-9
Cost-Effectiveness: Corridor Cost Per Boarding Ride,[1] Year 2030

	No-Build	LPA to Park Ave.	MOS to Lake Rd.
Cost Per Boarding Ride in Dollars	$1.51	$1.43	$1.37

Source: Metro 2010.

[1] Costs and boardings are included for the entire length of bus lines occurring within the corridor and for the Portland-Milwaukie Light Rail Project (Lincoln Station to terminus).

Financial Feasibility

Capital Costs

Capital costs for the Portland-Milwaukie Light Rail Project are expressed in both current (2010) dollars and YOE dollars. Chapter 2 describes the methodology used to prepare the current year cost. YOE costs are based on the base year cost estimates, a current construction schedule, projected inflation rates for right-of-way and construction costs, and estimated finance costs. A description of the methodology used to prepare the YOE cost estimates and a more detailed breakdown of those cost estimates is found in Section 5.1, with additional background provided in the *Portland-Milwaukie Project Capital Cost Methods Report* (TriMet 2010). Table 5.1-1 summarizes the capital cost for the LPA to Park Avenue and the MOS to Lake Road. As shown in Table 5.1-1, the LPA to Park Avenue is estimated to cost about $1.55 billion (YOE dollars), the LPA Phasing Option about $1.49 billion, and the MOS to Lake Road about $1.38 billion (in YOE dollars).

O&M Costs

O&M costs for the Portland-Milwaukie Light Rail Project are based on ridership forecasts for 2030 and on the resulting transit operating plan that would accommodate that ridership demand, expressed in current year (2010) dollars. Transit corridor O&M costs include the Portland Milwaukie Light Rail Project O&M costs plus the O&M costs for the buses serving the Portland-Milwaukie corridor. Table 5.1-2 summarizes the 2030 corridor O&M costs (in 2010 dollars) for the Portland-Milwaukie Light Rail Project. The 2030 corridor O&M cost for the LPA to Park Avenue is estimated to be about $37.6 million (2010 dollars), about $8.9 million more than the No-Build Alternative. The 2030 corridor O&M cost for the MOS to Lake Road is estimated to be about $36.2 million (2010 dollars), about $7.5 million more than the No-Build Alternative. The LPA Phasing Option would be about $37.2 million (2010 dollars), or $8.5 million more than the No-Build Alternative. The cost increases associated with the light rail project result from increases in light rail vehicle hours and miles and the reduction in bus miles and hours in the corridor.

5.2.1.8 Ability to Maximize Efficiency and Environmental Sensitivity

Table 5.2-10 highlight impacts and benefits that reflect the environmental performance of the light rail project.

Table 5.2-10
Summary of Environmental Impacts

Measures	No-Build	LPA to Park Ave.*	MOS to Lake Rd.	Related Bridge Area Facilities	Ruby Junction**
Displacements and Acquisitions					
Full Acquisitions	0	93-95	77-78	0	9-14
Partial Acquisitions	0	112-120	107	6	1
Permanent Easements	0	2	2	0	0
Displaced Residences; Businesses; Vacant Buildings;Other	0	11; 56-58; 3	1; 52-53; 4	0;0	5-9; 6-9
Land Use and Economic					
Compatibility with Local Land Use Plans	Low	High	High	High	High
Construction: Potential Temporary Increase in Personal Income (millions) direct and indirect	0	$532-573	$513	Included in LPA and MOS	Included in LPA and MOS
Construction: Estimated Increase in Employment (jobs)	0	13,500-14,500	13,000	Included in LPA and MOS	Included in LPA and MOS
Estimated Jobs Displaced	0	675-850	651-726	0	79
Tax Revenue Impact Due to Full Property Acquisition	0	$1.14-1.15 million	$1.08 million	0	$19,400-41,905
Community Impact Assessment					
Neighborhood Benefits	Low	High	High	High	Low
Neighborhood Impacts	Low	Low	Low	Low	Low-Medium
Visual Resources Impacts	Low	Low-High	Low-High	Medium-High	Low
Historic and Archaeological Resources					
Properties with Identified Historic Resources	0	53	44	2	0
Historic Resources with Expected Adverse Effects	0	3	3	0	0
Recorded Sites in APE; Sites or Potential Probability Areas for Encountering Archaeological Resources	7; 0	6; 26	2; 22	1; 2 (overlap with LPA;MOS)	1;1
Parks and Recreational Resources					
Number of Existing Parks Impacted	0	4	3	0	0
Number of Planned Parks Impacted	0	2	1	0	0
Geology and Soils Impacts	None	None	None	None	None
Ecosystems					
Wetland Filled; Spanned (acres)	0	1.11	1.11	0	0
Permanent Footprint of Project Area Stream Crossings (ft^2)	0	122,785	114,785	0	0
Impervious Surface Area (acres)	0	18.5 - 20.3	15.7	4.7	0.4 - 0.7
Vegetation Impacts Excluding Open Water (acres)	0	16.2	11.4	0	0
Impacts to Threatened or Endangered Fish-Bearing Streams (lineal feet)	0	222	182	0	0
Water Quality; Hydrology					
Combined Acreage in Floodplain	0	5.3	5.2	2.3	<0.01
Noise and Vibration					
Noise Impacts without Mitigation	0	51	40	0	0-1
Vibration Impacts without Mitigation	0	40	32	0	0

Table 5.2-10
Summary of Environmental Impacts

Measures	No-Build	LPA to Park Ave.*	MOS to Lake Rd.	Related Bridge Area Facilities	Ruby Junction**
Regional Air Quality (tons per day) and Greenhouse Gas					
Carbon Monoxide	584.5	584.0	583.9	Included in LPA	Included in LPA
Nitrogen Oxides	15.9	15.9	15.9	Included in LPA	Included in LPA
Volatile Organic Compounds	18.0	18.0	18.0	Included in LPA	Included in LPA
Carbon Dioxide	36,292	36,255	36,253	Included in LPA	Included in LPA
Energy Consumption					
Regional Daily Vehicle (10^9 BTU)	495.458	494.945	494.912	Included in LPA	Included in LPA
Hazardous Materials					
Acquired Sites of Concern; Sites of Highest Concern	0	65; 32	65; 33	Included in LPA; MOS	1
Public Services Impacts	None	Minor	Minor	Minor	Minor

* Ranges indicate the LPA to Park Avenue and LPA Phasing Option and phased development of the Ruby Junction Facility. When no range is shown, effects for the LPA Phasing Option are similar to the LPA to Park Avenue.

5.2.2 Significant Trade-offs

This section draws on the evaluations in the preceding sections to identify the major trade-offs that would be involved in the development of the light rail project compared to the No-Build Alternative. All estimates of ridership, operating cost, coverage, and highway system use that follow are 2030 estimates, and the capital and O&M costs are based on 2030 service levels and expressed in 2010 dollars.

The light rail project will result in:

- Up to 22,820 more households and 83,680 more employees within one-half mile of light rail access (2030)
- Between 1,400 (LPA to Park Avenue) to 1,275 (MOS to Lake Road) to 675 (LPA Phasing Option) additional park-and-ride lot spaces
- Up to 59 percent total travel time reductions within the corridor
- Up to 79,800 additional passenger miles on fixed-guideway right-of-way
- Up to 24,480 additional light rail rides per average weekday
- Up to a 4 percent increase in the transit mode split between the corridor and downtown Portland
- Up to 12,100 additional linked transit trips (linked trips)
- Short-term construction-related jobs (which would produce up to $573 million in additional direct, indirect, and induced personal income in the region)
- Eighteen to 32 additional long-term jobs compared to the No-Build Alternative

The light rail project will also promote land use patterns and policies that are more compatible with state and regional land use plans than the No-Build Alternative.

The No-Build Alternative would avoid:

- Up to 95 property acquisitions and related displacements (an additional 9 to 14 properties would be affected by the Ruby Junction Facility, but that expansion could still occur with the Columbia River Crossing Project.)
- Adversely impacting up to three historic resources and construction within up to 26 areas with potential for archaeological resources
- Minor impacts to up to four existing and two planned parks, which would largely be confined to construction periods
- Impacts to 222 lineal feet of Threatened and Endangered Species (TES) fish-bearing streams
- Between $1.38 and $1.55 billion in construction costs (YOE dollars)
- Up to $8.9 million in annual O&M costs (2010 dollars)

5.3 NEW STARTS EVALUATION PROCESS

The Section 5309 "New Starts" program is the federal government's primary program for providing major capital support to locally planned, implemented, and operated fixed-guideway transit projects. The New Starts evaluation process is used in conjunction with the evaluation process under the National Environmental Policy Act (NEPA) for which this FEIS has been prepared. This section describes the how FTA evaluates projects for its New Starts funding recommendations. The Portland-Milwaukie Light Rail Project is seeking New Starts funding and, therefore, will be subject to this evaluation and rating process.

Each year FTA submits its *Annual Report on Funding Recommendations* to Congress as a companion document to the annual budget submitted by the President. The report provides recommendations for the allocation of New Starts funds under Section 5309 of Title 49 of the United States Code. As required by the Safe Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), FTA uses the following project justification criteria to evaluate New Starts projects: mobility improvements; environmental benefits; cost-effectiveness; operating efficiencies; transit-supportive land use policies, existing and future land use patterns, and economic development; and other factors. FTA must also consider the local financial commitment for the proposed project. In total, the criteria are intended to measure the overall merits of the project and the sponsor's ability to build and operate it. The Portland-Milwaukie Light Rail Project is presented on page A-159 of the most recent report, which is for fiscal year 2011, at:
http://www.fta.dot.gov/publications/reports/reports_to_congress/_11092.html

Prior to authorizing entry into final design, FTA will review the project's justification criteria in Fall 2010 as part of its annual New Starts evaluation reporting. FTA reviews the project justification and local financial commitment criteria for each candidate project and assigns a rating for each criterion. For some of the project justification criteria, the proposed project is compared against a New Starts "baseline alternative." The New Starts baseline alternative consists of improvements to the transit system that are relatively low in cost and represent the "best that can be done" to improve transit without major capital investment in new guideway infrastructure. As such, the New Starts baseline alternative is usually different from the No-Build

Alternative, which is the NEPA baseline against which environmental impacts are measured in this FEIS.

A candidate project is given an overall rating of "High," "Medium-High," "Medium," "Medium-Low," or "Low," based on ratings assigned by FTA to each of the project justification and local financial commitment criteria described above. These ratings are important, because FTA considers them in its decision to recommend projects for New Starts funding. Specifically, FTA will not recommend funding for projects which are rated "Medium-Low" or "Low." Moreover, federal budget constraints mean that a "High," "Medium-High," or "Medium" rating does not automatically translate into a funding recommendation, although the potential for receiving New Starts funding is much greater with these ratings.

The New Starts evaluation of a project is an on-going process. FTA's evaluation and rating occurs annually in support of budget recommendations presented in the *Annual Report on Funding Recommendations* and intermittently when the project sponsor requests FTA approval to enter into preliminary engineering or final design. Consequently, as proposed New Starts projects proceed through the project development process, information concerning costs, benefits, and impacts is refined and the ratings are updated to reflect new information. The following represents FTA's most recent rating of the Portland-Milwaukie Light Rail Project.

5.3.1 Project Justification: Medium-High

The project justification takes into account the following six factors:

Mobility Improvements: Medium-High

In its evaluation of the mobility improvements that would be realized by implementation of a proposed project, FTA evaluates four measures:

1. User Benefits per Passenger Mile on the Project
2. Number of Transit Dependents Using the Project
3. Transit Dependent User Benefits per Passenger Mile on the Project
4. Share of User Benefits Received by Transit Dependents Compared to Share of Transit Dependents in the Region

User Benefits essentially represent all the travel time savings to transit riders in the forecast year that result from the New Starts project as compared to the New Starts baseline alternative. The benefits include reductions in walk times, wait times, transfers, and, most importantly, in-vehicle times. In order to rate projects in comparison to other proposed New Starts, this measure is normalized by the annual passenger miles traveled on the New Starts project in the forecast year. The result is a measure of the intensity of the user benefits.

Number of Transit Dependent Individuals Using the Project and Transit Dependent User Benefits per Passenger Mile on the Project: These two measures represent the number of transit dependents affected by the project and the intensity of the benefits to those transit dependent users. The first is self-explanatory, while the second is defined the same as the

measure of user benefits per passenger mile described above, but for transit dependent passengers.

Share of User Benefits Received by Transit Dependents Compared to Share of Transit Dependents in the Region: This measure represents the extent to which the project benefits transit dependents compared to their regional representation. For example, if 10 percent of the user benefits for the project accrued to transit dependents, but they represented 20 percent of the region's population, the measure would be 0.5, indicating that the project did not benefit transit dependents compared to their share of the region's population.

Environmental Benefits: Medium

In its evaluation of environmental benefits that would be realized through the implementation of a proposed project, FTA considers the current air quality designation of the project area by the U.S. Environmental Protection Agency (EPA). This measure is defined for each of the transportation-related pollutants (ozone, CO, and PM_{10} and $PM_{2.5}$) as the current air quality designation by EPA for the metropolitan region in which the proposed project is located, indicating the severity of the metropolitan area's noncompliance with the health-based EPA standard (NAAQS) for the pollutant, or its compliance with that standard. FTA has found that the air quality information submitted to assess the environmental benefits does not significantly distinguish the competing New Starts projects. While FTA reports the information submitted by project sponsors on environmental benefits to Congress in the *Annual Report on Funding Recommendations*, it does not formally incorporate this measure in its evaluation of New Starts projects.

Operating Efficiencies: Medium

Based upon its prior experience in evaluating New Starts projects, FTA has previously determined that locally generated and reported information in support of the operating efficiencies criterion does not distinguish in any meaningful way differences between competing major transit capital investments. FTA further believes that the anticipated operating efficiencies of proposed New Starts projects are adequately captured under its measure for evaluating project cost-effectiveness.

Cost-Effectiveness: Medium

Significant among the project justification criteria is cost-effectiveness, which is the annualized capital and operating cost per hour of user benefits for the forecast year. It captures the additional costs of the New Starts project compared to the transportation benefits to transit riders. User benefits are defined identical to the measure used in the mobility improvements criterion.

New Starts projects must be rated "Medium" for cost-effectiveness, in addition to receiving an overall "Medium" rating, in order to be considered by the FTA for New Starts funding.

Transit-Supportive Land Use: Medium

This criterion reflects the population and employment densities within 0.5 mile of each proposed station in the project.

Economic Development: High

This criterion addresses the extent that transit-oriented development is likely to occur in the New Starts project's corridor. FTA explicitly considers the following transit-supportive land use categories and factors:

1. Transit-Supportive Plans and Policies, including the following factors:
    - Growth management;
    - Transit-supportive corridor policies;
    - Supportive zoning regulations near transit stations; and
    - Tools to implement land use policies.
2. Performance and Impacts of Policies, including the following factors:
    - Performance of land use policies; and
    - Potential impact of transit project on regional land use.

5.3.2 Local Financial Commitment: Medium

Proposed New Starts projects must be supported by evidence of stable and dependable financial resources to construct, operate, and maintain the existing and the new transit system. The measures FTA uses to evaluate local financial commitment are:

Local Share: Medium

FTA examines the proposed share of total project costs from sources other than Section 5309 New Starts, including federal formula and flexible funds, the local match required by federal law, and any additional capital funding. The share of the project cost covered from funding sources other than Section 5309 New Starts will be 50 percent.

Strength of Capital Financing Plan: Medium

FTA looks at the stability and reliability of the proposed capital financing plan, including the current capital condition of the project sponsor, the level of commitment of capital funds to the proposed project and to other projects, the financial capacity of the project sponsor to withstand cost overruns or funding shortfalls, and the reliability of the capital cost estimates and planning assumptions.

Strength of Operating Financing Plan: Medium

FTA looks at the ability of the sponsoring agency to fund operation and maintenance of the entire system (including existing service) as planned, once the guideway project is built. This includes: an examination of the current operating condition of the project sponsor; the level of commitment of operating funds for the transit system; the financial capacity of the project sponsor to operate and maintain all proposed, existing, and planned transit services; and the reliability of the operating cost estimates and planning assumptions.