

This section presents alternative funding scenarios for realizing the proposed Mississippi River crossing. The funding scenarios are based on a series of assumptions that should be considered while interpreting the results; the assumptions are discussed below. Some assumptions and conditions may not be realized, which would change the financial results. Sensitivity analyses and contingency considerations are presented to address such outcomes.

Capital, O&M, as well as total life-cycle cost estimates were developed for the project alternatives. Both capital and operating costs are expressed in current dollars and include contingencies, engineering and construction management, project administration, legal services, and insurance. These costs were then applied to a life-cycle costing methodology to compute a "total cost" of the project alternative throughout its life.

A theoretical financial analysis was prepared, resulting in a cash flow comparison over time. Sensitivity analyses evaluate the effect of changes in such factors as increased construction and O&M costs, differing toll structures, and alternate bonding interest rates.

A. PROPOSED PROJECT FUNDING SCENARIOS

The \$21.2 million traffic control system could be funded using regular formula federal and state transportation funding. Assuming an 80-percent federal match, Illinois will need to provide about \$2.6 million and Missouri will need to provide about \$1.7 million. Different funding sources may also be tapped to fund the downtown traffic control measures. The cost for the fiber optic communication backbone (\$6.0 million plus \$0.6 million in contingencies) included in the traffic control system's construction cost might ultimately be deleted from the project budget through innovative financing measures involving the private sector. Traffic control center improvements might be funded as an air quality enhancement using Congestion Mitigation Air Quality (CMAQ) funds.

Different methods may be considered to pay for the transit pricing incentive. The state of Illinois could fund the St. Clair and Madison County transit districts that contract with the Bi-State Development Agency for services. Special funds or expanded sales tax revenues could be enabled to allow these districts to pay for the transit pricing option, which will cost about \$600,000.

The use of special demonstration funding for the new Mississippi River bridge might be possible in the next federal transportation bill anticipated in 2003. A sum of \$215 million for the main river span is assumed to be fundable as a demonstration project, under such a traditional funding scenario. The total construction cost for the full build project (\$666 million for the new bridge and approaches plus \$21 million for the downtown traffic control system) is estimated to be about \$687 million in current dollars. Of the \$687 million total, \$112 million is committed under the Illinois-FIRST funding package, which includes the \$103 million needed to raise the existing I-55/70/64 interchange above the water table, a project that will need to be built regardless of whether the proposed action is undertaken.

Using a conservative three-percent inflation rate per year, the cost to complete the project's unfunded \$575 million in construction will escalate to \$647 million by the year 2004, which is the year in which federal funding could be available from the next federal transportation bill. Funding of all project components, including inflation, will total an estimated \$759 million, of which, \$112 million will be funded by Illinois-First and \$215 million is attributed to the main span, which is proposed to be funded using demonstration or discretionary funding. Thus, \$432 million may need to be funded by traditional sources. Assuming an 80-percent federal match, the states of Illinois and Missouri will need to provide \$49 million and \$37 million, respectively, spread over the project's multiple year implementation schedule.

Figure F5.B describes the construction activity and the estimated cost for each construction segment. The project's sequence of construction is based on the availability of Illinois-FIRST funding for reconstruction of the I-55/70/64 interchange and work relating to the separate relocated IL Rt. 3 roadway, the funded part of which extends from relocated St. Clair Avenue north to the McKinley Bridge at Venice. Providing usable traffic segments (including early utility from the investment in the new bridge across the river), maintaining traffic during construction, and improving access to the St. Louis Gateway International Raceway are also considerations. Four Missouri segments are proposed, and six with subset activities are proposed in Illinois in addition to three advance years of Illinois-FIRST-funded project components. The new bridge is programmed as an early two-state effort with a goal of building and opening the bridge with local access in both states within the first three years. I-64 will also be connected to the new bridge via relocated IL Rt. 3 at that time. I-70 is programmed to be relocated in Missouri by the end of the fifth year, and by the end of the sixth year in Illinois. All work is anticipated to be completed within seven years of beginning construction, if sufficient funding is available. Other sequences of construction are possible.

The project schedule is based on beginning design work in 2000 and securing a Record of Decision (ROD) for the project by **mid-2001**. With the design under way and the ROD in hand, construction on the Illinois-FIRST-funded project components can begin in 2001. Early phase activities will include archeological surveying, completion of Phase II engineering, right-of-way acquisition, utility relocation, soil management for hazardous and non-hazardous waste, and wetlands mitigation. These activities are expected to take about two years, and be completed by early 2003. With federal funding available at the beginning of 2004, construction can begin in Missouri and on non-Illinois-FIRST segments in Illinois. Using this time line, the project could be completed and opened to the public by 2010, if adequate funding can be made available in each fiscal year.

Placing tolls on the proposed Mississippi River crossing, and as well, on existing crossings is an alternate project funding approach, **which is not part of the preferred alternative**. If traditional funding sources are constrained and unavailable in a timely fashion, user fees in the form of bridge tolls may be preferable to the region over the no-build option.

Although many potential sources of revenue other than tolls could be explored, few seem viable for a new Mississippi River crossing. Non-toll revenues, such as value capture, infrastructure banks, public/private partnerships, and design-build-operate-transfer, or special fee measures (as well as cost reduction measures) are generally volatile or unpredictable. The more predictable revenue sources are either small or problematic from an institutional or policy perspective. These revenue sources may be considered as possible supplements to the more promising toll option, or considered as contingency options for addressing any unexpected shortfalls.

B. FINANCIAL FEASIBILITY ANALYSIS

Preliminary planning-level construction costs have been estimated for the project and are subject to revision as the study progresses. They are based on current average unit costs of major construction items and factored up by ten percent to account for minor cost items not included and other costs that are normally incurred on a major project of this type. Unit costs are general at this level of analysis, and were based on comparable projects and local data.

The cost of operating and maintaining the various alternatives is a critical variable in determining financial feasibility. Generally, transportation departments fund roadway operating costs. Maintenance costs are a factor of the age of the highway, the climate, maintenance practices, reconstruction schedules, age of the buses, etc. O&M costs increase, in real dollars, as facilities age and as traffic volumes grow.

The project is also assumed to make up the toll revenue that would be lost by the city of Venice on the McKinley Bridge if a new toll-free bridge is built. This revenue will amount to about \$1.8 million a year in the year 2020. Currently, the city charges vehicles \$0.50 each way for crossing the bridge. The added capacity of a new bridge and its proximity to the McKinley Bridge would eliminate the usage of a tolled McKinley Bridge, but not the demand for that bridge's river crossing capacity.

In addition to construction and O&M costs, life-cycle costs were estimated for the various alternatives. Life-cycle cost is the total cost to the owner of acquiring, operating, and maintaining a property over its useful life. It includes the costs of development, construction, operation, maintenance, component replacement, and where applicable, disposal. Life-cycle costing considers that: 1) the value of money varies through time; 2) not all property has the same useful life; and 3) economic cost is used as the sole criterion for evaluation of the alternatives (economic benefits are not measured).

An economic life of 50 years was assumed for each alternative. The timing and value of future maintenance costs were assumed to vary according to the requirements of each cost account item. The study assumed an increase in costs at three percent per year with a discount rate of seven percent.

One key measure of a project is the comparison of relative costs and benefits, i.e., a benefit/cost ratio. This ratio is a measure of the transportation benefits that accrue directly to the user of the facility; it involves a comparison of the discounted benefits and costs for each alternative. A feasible alternative is one that has a benefit-cost ratio greater than 1.0, with the higher ratio yielding the better solution.

Costs include capital, operating, and maintenance expenses identified earlier as life-cycle costs. The user benefits are primarily a reduction in negative conditions that will no longer occur if an improvement is made. Reductions in accidents, travel costs, and travel time are the most direct benefits of transportation projects. The proposed action will yield a 15 percent higher return than the initial investment. Toll Option 1 will provide such a small revenue stream that it would not have the capacity to pay the bonds in a reasonable time frame. It will generate only \$500,000 in toll revenue by 2020, while O&M costs are expected to exceed \$10 million. Paying off bonds to build a new bridge with tolls only from the new bridge is not feasible.

The proposed action yields high benefits for three primary reasons. First, the new bridge will reduce traffic on the already congested Poplar Street Bridge and save almost 16,000 vehicle hours per day. Also, vehicle operating savings are based on vehicle miles saved and the new bridge will save operating costs by creating a shorter route for through traffic on I-70, resulting in more than 48,300 km (30,000 mi) of travel saved per day. In addition, the proposed action will reduce traffic crashes by diverting motorists currently using the Poplar Street approaches on the Illinois side, and these approaches have higher than average traffic-crash rates. By comparison, a toll option will yield less travel time, operating, and traffic-crash savings than without tolls, at a higher capital cost (for the toll collection infrastructure).

A cash flow analysis was performed based on the estimated expenses and revenues of each alternative. Inputs to the cash flow analysis include capital costs, toll revenue, operating and maintenance costs, amount of bonds issued, and interest paid on bonds. A level of debt service was calculated, using a general obligation bond issue of 5.5 percent as a base case, and at other rates to test the sensitivity. General obligation bonds would be backed by the full faith and credit of the states of Illinois and Missouri. The total dollar value of the bonds required for each toll option was calculated along with the years required for bond payback.

Figure F5.B
Sequence of Project Construction and Capital Expenditures

Year	Time (in years)							Description of Construction	Estimated Construction Costs (\$ million)
	1	2	3	4	5	6	7		
Missouri									
1								Main span of Mississippi River Bridge	\$89
2								Parkway/relocated I-70 from west of Mississippi River Bridge to west terminus including ramps to and from Tucker and 14th Street	\$42
3								Modification of existing I-70 and completion of north interchange, with mainline connection to and from westbound I-70 completed in year 5	\$84
4								Ramp modifications to I-55/I-64 interchange (Poplar Street Bridge)	\$32
Illinois - FIRST									
1								Relocation of Cahokia Creek, railroads, and utility lines near relocated I-70/IL Rt. 3 interchange.	\$7
2A								Relocated IL Rt. 3 (Costs are for construction necessary to tie into this project only).	\$2
2B								Modification of I-55/64 interchange including all ramps and local streets, plus I-64 Connector to relocated IL Rt. 3	\$103
Illinois									
3								Main span of Mississippi River Bridge	\$102
4A								Relocated I-70 from relocated IL Rt. 3 to IL Rt. 203, including Ramps A and B of the IL Rt. 203 interchange and Ramps B, C, E, and F of the relocated IL Rt. 3 interchange.	\$65
4B								Relocated I-70 from east end of Mississippi River Bridge to relocated IL Rt. 3, including structure portion of EB and WB I-64 Connector and Ramps A and D of the relocated IL Rt. 3 interchange.	\$73
5								Relocated I-70 from IL Rt. 203 to I-55 tie-in	\$48
6								I-64 Connector from relocated I-70 to I-64 Connector Ramps at relocated IL Rt. 3.	\$19

Subtotal	\$666
Downtown Traffic Control TSM Additions	\$21
Subtraction*	(\$103)
Total	\$584

Construction Costs per year (in current dollars)											TOTAL
Missouri				\$ 30	\$ 51	\$ 51	\$ 28	\$ 28	\$ 44	\$ 16	\$ 247
Illinois - FIRST	\$ 42	\$ 35	\$ 34								\$ 112
Illinois				\$ 34	\$ 70	\$ 70	\$ 32	\$ 56	\$ 24	\$ 19	\$ 307
Total				\$ 64	\$ 121	\$ 121	\$ 60	\$ 84	\$ 68	\$ 36	\$ 666

Construction Costs per Year (in inflated dollars)											
Year				2004	2005	2006	2007	2008	2009	2010	TOTAL
Missouri				\$ 34	\$ 59	\$ 61	\$ 34	\$ 35	\$ 57	\$ 22	\$ 302
Illinois				\$ 38	\$ 81	\$ 84	\$ 40	\$ 71	\$ 31	\$ 26	\$ 372
Total				\$ 72	\$ 140	\$ 145	\$ 74	\$ 107	\$ 89	\$ 48	\$ 674

Note: If a toll option is implemented, toll plaza construction would begin on the new bridge in Year 3 and on all other bridges in Year 1

End of Year 3: New Mississippi River Bridge completed along with local access in Illinois (relocated IL Rt. 3) and in Missouri (Tucker & 14th); and I-64 Connector via relocated IL Rt. 3 tied into relocated I-70 and new bridge.

End of Year 6: I-70 relocated in both Illinois and Missouri (at end of Year 5 in Missouri).

End of Year 7: All improvements completed

*Illinois - FIRST funding to raise I-55/64 interchange out of water table.