Chapter 15

Transportation Improvements Financing

CHAPTER 15

TRANSPORTATION IMPROVEMENTS FINANCING

As part of this long range plan, the costs of implementing the recommendations are compared with the funding expected to be available. This cost comparison clarifies the financial issues that may need to be addressed in the process of building the region's future transportation system.

This plan's financial analysis was developed in response to the requirements for a "financially constrained plan" that were introduced in ISTEA and continued in TEA-21. This plan considers both capital costs and operation and maintenance (O&M) costs associated with the preservation and continued operation of the existing transportation system, as well as the costs associated with the recommended improvements which are presented in this plan. It also projects revenues from all sources which will be available to pay for these improvements.

The procedure builds on the analysis conducted in 1997 for the previous update, but is modified and enhanced in several major respects. The similarities and differences in the 1997 and 2000 analyses will be explained below.

FUNDING EXPECTATIONS

Funding for transportation improvements are provided from federal, state, and local sources. Future funding levels were estimated based on past trends, as originally described in *Looking Ahead: 2020 Metropolitan Transportation Plan* (MTP), adopted in May 1998. More specifically, those funding projections had been re-evaluated and updated as part of the analysis for Amendment 2 to the 2020 MTP, which was adopted in April 2000. In addition, cross-referencing of these projections with transit revenue figures contained in OKI's *FY 2000-2003 Transportation Improvement Program* (TIP) produced additional upward adjustments in annual transit revenue estimates, which were added to the original figures and carried forward through the planning period. Resulting estimates of expected annual revenues and their sources are listed in Table 15-1 on the following page.

It is important to note that the funds identified in Table 15-1 are, for the most part, funds which OKI or other local governments receive on an ongoing, annual basis, i.e., they are generally apportioned on a formula basis, and are therefore, repetitive and predictable. This table does also include, however, an approximation of other additional funds which may reasonably be expected to become available on a competitive or discretionary basis, based on a review of the region's recent history in securing these types of funds. In the past, transit

bus fleet replacement projects and new maintenance/administration facilities have been funded through discretionary FTA grants, and highway projects such

Table 15-1

Projected Annual Transportation Revenues*

Funding Sources	Kentucky	Ohio	Region
Federal Sources			
IM Funds	$4,132,000	$21,069,000	$25,201,000
NHS Funds	$4,495,000	$11,213,000	$15,708,000
STP	$6,400,000	$11,951,000	$18,351,000
Enhancements	$930,000	$3,180,000	$4,110,000
STP Discretionary	$6,979,000	$4,828,000	$11,807,000
Safety	$930,000	$3,180,000	$4,110,000
Bridge	$2,539,000	$18,791,000	$21,330,000
CM/AQ	$3,066,000	$11,490,000	$14,556,000
FTA Capital & Operating	$3,543,000	$14,038,000	$17,581,000
Total Federal Sources	$33,014,000	$99,740,000	$132,754,000
State Sources			
State Projects - Construction	$8,375,000		$8,375,000
State Projects - Maintenance	$6,500,000		$6,500,000
LTIP		$8,473,000	$8,473,000
SCIP		$10,850,000	$10,850,000
Public Transit Grant		$4,807,000	$4,807,000
Unspecified Programs	$6,588,000	$15,465,000	$22,053,000
Total State Sources	$21,463,000	$39,595,000	$61,058,000
Local Sources			
Transit Capital Fund	$12,220,000	$51,629,000	$63,849,000
SCM&R		$1,676,000	$1,676,000
Total Local Sources	$12,220,000	$53,305,000	$65,525,000
All Sources Combined			
Federal Funds	$33,014,000	$99,740,000	$132,754,000
State Funds	$21,463,000	$39,595,000	$61,058,000
Local Funds	$12,220,000	$53,305,000	$65,525,000
Total Annual Revenue	$66,697,000	$192,640,000	$259,337,000

*As modified from Amendment 2 to the *2020 Metropolitan Transportation Plan*, dated April 2000. This table reflects only revenues that can be projected and annualized over the entire 30-year planning period. It does not include new revenues from unspecified sources that will be required to fund implementation of individual MIS and corridor study programs.

as new freeway interchanges and the Michael A. Fox Highway have been funded with discretionary state appropriations. It is anticipated that special funding for these types of projects will continue to become available to the region at approximately the same levels as reflected by recent annualized averages. Table

15-1 specifically does not include funding from new, and at this time unidentified, revenue sources which will need to be secured to support development of light rail, commuter rail, and other major systems evolving out of the major investment studies.

FEDERAL FUNDING SOURCES

As shown in Table 15-1, an estimated $132.8 million per year is expected to flow into the region from federal sources. This expectation is based on estimates of the region's share of funds from programs authorized by TEA-21 and appropriated by Congress. The region's share of these TEA-21-funded programs is based on the assumption that current funding levels will be sustained each year through 2030. It is worth noting that this approach extrapolates funding into the future based on TEA-21 appropriations that have consistently been lower than authorized funding levels.

The TEA-21 programs that provide funding for the region's transportation system are described briefly below.

Interstate Maintenance

The Interstate Maintenance (IM) program finances projects to rehabilitate, restore, and resurface the interstate system. Reconstruction is eligible if it does not add capacity. In addition, high-occupancy vehicle and auxiliary lanes can be added. The match rate for this program is 90 percent federal and ten percent state or local. It is administered by the states.

National Highway System

The National Highway System (NHS) consists of 160,000 miles of the nation's major roads. It includes all interstate routes, a large percentage of urban and rural principal arterials, the defense strategic highway network, and strategic highway connectors. The match rate is 80 percent federal, 20 percent state or local.

Surface Transportation Program

The Surface Transportation Program (STP) is a block grant type of program. Funds from this program may be used by the states and localities for any roads that are not functionally classified as local or rural minor collectors or for transit capital projects.

Once the STP funds are distributed to the states, each state must allocate its funds as follows:

- Ten percent for safety construction activities, i.e., hazard elimination and rail-highway crossings

- Ten percent for transportation enhancements, which encompass a broad range of environmentally related projects, including improvements for pedestrian and bicycle travel
- Twenty-five percent by population among each of its areas over 200,000 in population (this is the source of OKI's allocation)
- Twenty-five percent to the remaining areas of the state
- Thirty percent for discretionary use in any area of the state

Projects which receive OKI's STP funding are initiated by OKI in consultation with ODOT or KYTC. The highways eligible for this category of funds include those that have a federal functional classification of rural major collector or higher. Other modal projects eligible for STP funds include capital transit projects, commuter rail, bus terminals and facilities, carpool projects, traffic monitoring, and bicycle and pedestrian facilities (above and beyond the transportation enhancement allocation).

In addition to OKI's STP allocation, estimates are also developed for OKI's share of the discretionary funds potentially available for safety construction activities, transportation enhancements, and a portion of the funds that can be used anywhere in the state.

Congestion Mitigation/Air Quality

The Congestion Mitigation and Air Quality Improvement Program (CM/AQ) provides funds for transportation projects in maintenance areas for ozone and carbon monoxide. These projects contribute to meeting the attainment of national ambient area air quality standards. The OKI region is eligible for these funds because of its designation as an ozone maintenance area. Transportation projects and programs are eligible for CM/AQ program funds only if they are associated with documented emissions reductions.

Bridge Replacement and Rehabilitation Program

This program is authorized nationally for $16.1 billion. It enables the states to replace significant bridges that are unsafe because of structural deficiencies, physical deterioration, or functional obsolescence. Forty percent of a state's bridge funds may be transferred to the NHS or the STP programs for purposes consistent with either program. The match rate is 80 percent federal, 20 percent state or local.

Federal Transit Administration Funding

The Section 5307 (formerly Section 9) formula grant program makes funds available on the basis of a statutory formula to all urbanized areas in the country. Section 5307 funds may be used for highway projects in Transportation Management Areas (TMAs), all urbanized areas over 200,000, or any other area

a governor requests if all needs related to the Americans with Disabilities Act are met, the Metropolitan Planning Organization (MPO) approves, and there is a balanced local approach to funding highways and transit.

For capital projects, the match rate is 80 percent federal, 20 percent state or local. Capital funds are used for transit maintenance, such as replacing buses, as well as other projects. For operating assistance, the match rate is 50 percent federal, 50 percent state or local. Operating assistance is capped at a percentage of the total Section 5307 apportionment for each urban area.

The FTA Section 5309 discretionary program is a potential funding source for the recommended rail transit system. Funds are split 40 percent for "new starts," 40 percent for rail modernization, and 20 percent for bus and other. The match rate is 80 percent federal, 20 percent state or local.

STATE AND LOCAL FUNDING SOURCES

State and local funding sources from which funds can be estimated are expected to provide about $126.6 million per year for transportation projects, as shown in Table 15-1.

In Ohio, these sources include the State Capital Improvements Program (SCIP) and the Local Transportation Improvement Program (LTIP), which are used for highways and bridges; the Ohio Public Transportation Grant Program, which is used for transit operations; the Street Construction, Maintenance, and Repair Fund, for operation and maintenance of state and federal highways; and local transit tax revenues. In Kentucky, sources from which funds can be estimated are the State Projects and Rural Secondary Programs, and local transit revenues.

At the state level in Ohio, the SCIP, popularly known as Issue 2, was renewed by the voters in November 1995. Slightly modified from the original version, it provides $120 million per year for the next ten years for a total of $1.2 billion for local governments. It also increased the limit on ODOT bond issues for highways paid with gasoline tax revenues from $100 million a year to $220 million a year.

The LTIP raises money through a one cent gas tax for use on roads and bridges. Both SCIP and LTIP funds are distributed for local government capital projects (roads, bridges, and water treatment) throughout Ohio on a competitive and population basis among 19 districts established by the Ohio Public Works Commission. Hamilton County is a district by itself (District 2). Butler, Clermont, and Warren Counties are in a district that includes Clinton County (District 10). Funding estimates from these two programs are based on the assumption that they will be renewed when they expire.

The Ohio Street Construction, Maintenance, and Repair Fund is supported by 7.5 percent of the state's gas tax. The funds are distributed on an annual basis to counties, townships, and municipalities that host federal and/or state roads. Each jurisdiction is obligated to use its share of SCM&R funds for the operation and maintenance of federal and state highways within its boundaries. Among these jurisdictions, the funds are distributed in proportion to annual auto registrations.

In Kentucky, funds for both the State Projects and Rural Secondary Programs are derived from gasoline tax receipts, and are expended under the direction of the Department of Highways. These funds may be used for the construction, reconstruction, and maintenance of state and county roads and bridges.

Another source of state funds is from Unspecified Programs, which encompass all the state revenue that both Kentucky and Ohio allocate to the OKI counties that does not fall into any of the established state programs. These allocations usually finance 100 percent of these projects. As illustrated in Table 15-1, this revenue has been significant over the years. Funds were estimated based on a ten-year average (adjusted for inflation) of state-funded projects in the region, derived from TIP historical records.

Among local transportation funds, the largest source is the subsidy that the transit operators in the OKI region receive from local governments. These funds help with the operating needs of these operators.

FUNDING NEEDS

To identify funding needs, the costs of operation and maintenance and needed capital expenditures for the region's transportation system over the 30-year horizon have been estimated.

Capital Costs

The capital cost of the needed transportation improvements as identified in this plan update is estimated to be $5,129,147,000. The total capital cost is the sum of the following estimates:

FY 2002-2005 Transportation Improvement Program: $392,147,000
-$188,463,000 for Kentucky projects
-$203,684,000 for Ohio projects

Transit: $2,575,500,000
-$1,090,000,000 for the I-71 light rail alignment (represents phases I & II)
-$231,000,000 for the Eastern Corridor rail alignment
-$400,000,000 for the North-South Corridor (represents phase I MOS)
-$107,500,000 for the Southeastern Corridor (1/2 of the total system)

Transit (continued)
-$107,500,000 for the Western Corridor (1/2 of the total system)
-$115,000,000 for the Central Area Loop Study (transit portion)
-$500,000,000 for bus capital improvements
-$22,000,000 for transit centers
-$2,500,000 for park-and-ride lots

Highway Expansion Capacity Projects: $2,161,500,000
-$300,000,000 for Brent Spence Bridge replacement
-$100,000,000 for the Northwest Butler County Transportation Study projects
-$30,500,000 for the Central Area Loop Study projects (highway portion)
-$1,781,000,000 for recommended projects

The capital costs of projects already committed are programmed in OKI's *FY 2002-2005 Transportation Improvement Program*. The unit costs for highway capacity projects in Ohio is estimated at $2,800,000 per lane-mile (year 2000 dollars). Engineering, right-of-way, construction and utilities are all included in the total cost. This per lane-mile cost for capacity enhancement projects includes reconstruction of the existing lanes plus the added cost of the new lanes. This is the normal procedure for implementing widening projects by combining a reconstruction activity with the addition of lanes. Kentucky projects will use cost estimates developed for each project by Kentucky Transportation Cabinet District 6.

ARTIMIS Deployment: $52,000,000

Studies: $7,175,000
-$650,000 to study strategic planning
-$275,000 to study ramp metering
-$650,000 to study traffic signal synchronization
-$300,000 to study an alternative routing system
-$2,900,000 for corridor and operational studies
-$2,000,000 for an Ohio River corridor study
-$400,000 for a scenic highway network plan

Operation and Maintenance Costs
For operating and maintaining the region's existing transportation system, the average annual cost over the planning period is estimated to be $184 million. This total cost is the sum of the following estimates:

-$90,000,000 for highways, including the cost of resurfacing, rehabilitation, and reconstruction (widening shoulders or improving alignment) as well as seasonal maintenance activities such as road-salting and grass-cutting

-$89,000,000 for bus transit, including Metro, TANK, Butler County RTA, Warren County and Clermont County systems
-$5,400,000 for ARTIMIS

The process of estimating highway maintenance costs is complicated by a lack of data for tracking this type of expenditure. In the Ohio counties, which are under Ohio Home Rule provisions, the tracking process is further complicated by differences in roadway maintenance responsibilities between municipalities and unincorporated areas (although interstate maintenance responsibility consistently belongs to the state, regardless of local jurisdiction).

To account and plan for highway maintenance expenditures, OKI relied on historical TIP records to obtain a ten-year average estimate (adjusted for inflation). While this estimate was a benchmark, the TIP does not present an adjusted cost for a project after it is sold, nor does it account for such factors as routine maintenance, repairing potholes, grass-cutting, and certain resurfacing jobs. Accordingly, the TIP estimate was adjusted upwards to account for these extra expenses.

For bus transit, the cost estimate applies to operational and maintenance cost for the six transit operators in the region. Information obtained from the various systems was supplemented with information from OKI's most recent TIP.

In general, costs for operation and maintenance include labor costs for system administration, operations, and maintenance and non-labor costs for contracted services, utilities, rental property, maintenance materials, and other factors.

For future rail transit, the operation and maintenance (O&M) cost estimates are based on the best available information from ongoing or recently completed MIS reports. For the most part, this involves figures developed for the I-71 light rail system, which show annual O&M costs estimated at $1 million per mile. The Eastern Corridor commuter rail study (for a different technology) included significantly lower O&M cost estimates. Estimated O&M costs for the various rail transit system elements assumed to be put into operation during the planning period are as follows:

-I-71 light rail, phase I (MOS): $18 million per year, beginning in 2008
-I-71 light rail, phase II: $13.5 million per year, beginning in 2020
-Eastern Corridor: $5 million per year, beginning in 2010
-North-South Corridor, phase I (MOS): $15 million per year, beginning in 2018
-Central Area Loop Study: $3 million per year, beginning in 2015
-Southeastern Corridor (1/2): $1.75 million per year, beginning in 2020
-Western Corridor (1/2): $1.75 million per year, beginning in 2020

Combining these projected annual O&M costs for the various rail transit elements and adjusting for the assumed number of years of operation of each gives an average annualized O&M cost of $29 million per year during the planning period.

FINANCIAL OUTLOOK

This plan involves a considerable degree of uncertainty regarding the willingness, even more than the ability, of the citizens of this region to financially support its implementation. Over the past decade, this region has embarked on a new course, which, if carried through to execution, will bring to the region an extensive network of major transit facilities which will provide a viable alternative to single-occupant automobile travel.

These transit systems represent a significant departure from the traditional highway-oriented system around which the region has evolved, and which continues to dominate development today. Major investment studies have been completed for the I-71 and Eastern Corridors, and the logical next steps have already been initiated. The North/South Transportation Initiative, the Central Area Loop Study, and the Northwest Butler Transportation Study are currently under way, and several other major investment studies are proposed herein to address transportation needs in other corridors.

While the outcomes of these studies cannot accurately be predicted at present, reasonable "best guess" estimates are necessary for long range planning purposes. This plan includes "placeholder" projections for several of these corridors, which, together with the rail components already identified, outline a rail-oriented transit system serving much of the region.

The development of this rail-oriented system will represent a radical departure from that which produced the highway-oriented system we have today. From a financial standpoint, it will require a radical departure from the approach to transportation financing which applies to a highway-oriented system. Automobile-oriented systems depend on a substantial public investment to develop the roadway network on which private vehicles can operate, but they also require a much more substantial ongoing private investment on the part of the vehicle owners. This private contribution to the operation of an automobile-oriented highway system is often overlooked, and grossly under-appreciated.

To illustrate, the travel demand model used to develop projections of future transportation demands and related facility requirements is also used to replicate and quantify present travel patterns. According to this model, total current vehicular travel within the OKI region on a daily basis is estimated at approximately 40 million miles per day. Generally accepted estimates of the cost to own and operate an automobile typically are in the range of thirty to forty cents per mile. At thirty cents per mile, the private sector costs to own and

operate motor vehicles in this region on a daily basis total approximately $12 million per day. Extrapolated to an annual basis, these private sector costs to maintain the total automotive fleet which uses the highway system total some $3.5 to $4.0 billion per year.

To put this expenditure into the context of this plan, the previous plan update established that all of the needed transportation improvements identified in that plan could be fully funded with additional revenues of only $150 million per year, or an increase in private sector transportation expenditures of less than five percent. Put another way, annual private sector transportation expenditures exceed current public sector expenditures ($260 million per year, see Table 15-1) by a rough factor of 14 to 1.

This exercise is significant because it goes to the heart of the development of a regional rail transit system, as outlined in this plan. From a financial standpoint, this region as a whole clearly has the resources to support rail transit, if that is the will of the people. From a planning context, the problem is that this public will must be expressed in a different way for transit than it is for automobile travel.

As established above, the vast majority of expenditures for an automobile-based transportation system come from private funds, and these expenditures are made on a piecemeal, day-to-day basis. These expenditures include purchases of fuel, tires, repair services, insurance, and other expenses, in addition to the initial purchase of the vehicle itself. Their cumulative total is not readily evident to the individual user.

Furthermore, public sector expenditures for roadway purposes are also made essentially on a piecemeal basis, as existing roads are typically repaired or widened, or new roads are built, one small section at a time (relative to the entire system). These individual projects can all be done independently, as funding becomes available.

In contrast, the development of rail transit in the region, starting from a base of zero, cannot be done in a similar piecemeal basis of any comparable scale. The initial "minimum operable segment" for the I-71 corridor, needed to provide even a basic rail transport capability, would be 18 miles long, with a construction cost approaching $1 billion. This represents a commitment of public funds to one "project" equal to four times the total annual public expenditures for transportation in the region. Similarly, the cost to implement the transit portion of the Eastern Corridor study, which would be done as a single "project", exceeds $230 million, or almost another entire year's worth of public expenditures.

These levels of expenditures clearly cannot be made out of the current public sector revenue stream, and indeed, over the years there has never been any expectation that they would. In other regions of the country where rail transit has been developed, this has been the case as well. In nearly every instance of rail transit development, identification of a major new funding source has preceded actual construction of the system.

The funding philosophy behind the major investment studies and the development of rail transit in this region is illustrated by the history of the continuing development of the I-71 corridor study.

During the entire development of the I-71 Light Rail Transit project, the understanding has been that the project would be funded through FTA's New Starts program. In negotiations with the region's U.S. Representatives, the FTA portion was established at 50 percent, and this would be discretionary money, that is, new money which would not otherwise come into this region for transportation purposes. The other 50 percent would come from state and local sources. In particular, the need for a new local revenue source (gas tax, sales tax, or other) has been essentially a given throughout the I-71 project. In other words, the local share would also be new money, which is not currently being spent on transportation in our region. This same approach has been applied to all the other (presumed) New Start Programs included herein (except for the Northwest Butler Transportation Study, which is assumed to consist more of "traditional" highway projects). If they are ever to be built, "new" money (i.e., not included in this analysis), whether federal, state, or local, will need to be found to pay for them. Thus, they are all included here, but before they can actually be built, all costs will need to be offset by corresponding new revenues.

Furthermore, O&M costs for all New Starts are also assumed to be covered by this new local revenue source (as well as by farebox revenues), so those new expenses are also offset by new revenues.

The complete financial component of this plan is outlined in Table 15-2, which presents a summation of projected costs for all major plan elements. Capital and O&M costs are included separately, and the costs are broken down by respective states. Projected capital costs over the planning period total an estimated $4.872 billion. Total operating and maintenance costs over the same period are estimated at $6.418 billion. In combination, the total transportation-related expenditures represented by this plan are estimated at $11.290 billion. Table 15-3 and Figure 15-1 present the plan estimated costs by mode. The difference between the estimated revenues ($260M/year x 30 years = $7.8B) and the estimated cost of the projects described in this plan ($11.3B) is approximately $3.5B and will need to be secured through new sources to advance an expanded transit system.

This plan update is, accordingly, a financially constrained plan in that it represents a reasonable scenario regarding the future funding of transportation projects in this region. Funding to continue to maintain the existing transportation system has been provided for, as has funding to support a recommended program of roadway improvement projects. Funding for the remaining identified corridor studies has been provided, so planning work can continue on these corridors to the point where they can be submitted to the public for ratification. Actual construction of all major rail components of the regional transportation system will be dependent upon the concurrence of the citizens of the region, as evidenced by their willingness to provide the funding necessary to see these projects through to implementation.

Table 15-2

Full Implementation Plan

(includes staged implementation of all MIS-derived projects as outlined in the plan narrative)

Type of Cost	Project	Ohio	Kentucky	Region
Capital Costs	Bus Transit	$426,000,000	$98,500,000	$524,500,000
	Highways	$1,322,800,000	$838,700,000	$2,161,500,000
	Rail Transit	$1,443,410,000	$607,590,000	$2,051,000,000
	ARTIMIS	$43,680,000	$8,320,000	$52,000,000
	Studies	$5,391,000	$1,784,000	$7,175,000
	Total	$3,241,281,000	$1,554,894,000	$4,796,175,000
O&M Cost/Year	Bus Transit	$76,294,000	$12,800,000	$89,094,000
	Highways	$75,600,000	$14,400,000	$90,000,000
	Rail Transit	$22,124,000	$7,326,000	$29,450,000
	ARTIMIS	$4,536,000	$864,000	$5,400,000
	Total	$178,554,000	$35,390,000	$213,944,000
Total Capital Costs		$3,241,281,000	$1,554,894,000	$4,796,175,000
Total O&M Costs		$5,356,620,000	$1,061,700,000	$6,418,320,000
Overall Total 2001-2030		$8,597,901,000	$2,616,594,000	$11,214,495,000

Table 15-3
Plan Cost by Mode

Mode	Submode	Component	Cost
Transit			
	Bus	Capital	524,500,000
		O&M	2,672,820,000
		Total Bus	3,197,320,000
	Rail	Capital	2,051,000,000
		O&M	883,500,000
		Total Rail	2,934,500,000
	All	Total Cap	2,598,680,000
		Total O&M	3,556,320,000
		Total	6,131,820,000
Highway			
	Roads	Capital	2,161,500,000
		O&M	2,700,000,000
		Total Roads	4,861,500,000
	ARTIMIS	Capital	52,000,000
		O&M	162,000,000
		Total ART	214,000,000
	Studies	Total	7,175,000
	All	Total Cap	2,213,500,000
		Total O&M	2,869,175,000
		Total	5,082,675,000
Plan		Total	10,172,525,000

Figure 15-1
Plan Cost Distribution by Mode