

UMTA and Major Investments: Evaluation Process and Results

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The recent debates over the federal transit budget have obscured the intent and nature of UMTA's major investment rating approach. The rating approach is the logical conclusion of a project development process that has evolved over the last 15 years, was enunciated in UMTA's May 1984 notice of major investment policy (1), and responds to the mandate of Section 303 of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (STURAA). The development process is, therefore, well known and is only briefly discussed. The rating system, on the other hand, is covered in some detail. A number of case studies are presented to illustrate how the investment rating system developed by UMTA has worked. These case studies are divided into two groups: those projects that were highly rated as potential federal transit investments and those that did not fare well. There are features common to each type of project that tend to be the cause of their respective good or bad ratings, and these are highlighted in the paper's conclusion. One common feature of the highly rated projects is that they are generally a critical piece of a much larger system, meaning that a relatively modest investment can be leveraged to produce tremendous benefits. Another feature is that nowhere near the same level of benefits could be produced by a more modest investment. A final positive feature of the highly rated projects is that they are backed by a strong local financial commitment to transit, not only in terms of the proposed project's initial capital costs, but also in terms of long-term operations and maintenance for the transit system as a whole. The common features of the poorly rated projects are their inability to generate significant new transit ridership despite large incremental investments and the precarious financial condition of transit in the respective communities.

In recent years, the debate over the nature and level of the federal transit budget has obscured the issue of precisely what type of transit projects the federal government should support with discretionary funding and how they should be selected. Given the current federal budget situation, the Administration's transit budget proposals for the last several years have sought to terminate the discretionary capital grant (Section 3) program and have all UMTA assistance delivered through a flexible, totally formula-allocated block grant program. This calls into question the need for a major investment rating system whose main purpose is to assist in making federal discretionary decisions. The Congress, however, has chosen to continue the discretionary program.

It is, therefore, useful to talk about the UMTA project rating system for several reasons. First, it is part of a rational

approach to decision making that is useful for any level of government that must operate in a resource constrained environment. Second, the Surface Transportation and Uniform Relocation Assistance Act of 1987 (STURAA) has essentially mandated the UMTA project development process. That is, it requires alternatives analysis and preliminary engineering as prerequisites for Section 3 "New Start" grants.

It also requires the Secretary of Transportation to determine that proposed New Start projects are cost-effective and supported by an adequate degree of local financial commitment, and it requires the annual submittal to the Congress of a proposed allocation of New Start funds among competing applicants. The rating system was developed to assist in making precisely these kinds of findings and recommendations.

Accordingly, this paper articulates the basic goals and objectives of the federal transit program and describes how these can be used to rate projects in terms of their federal investment worthiness. Both highly rated and poorly rated projects are described to illustrate how different types of projects fare under the rating system. The common features of both poorly and highly rated projects are summarized to show what kind of projects are most consistent with the federal interest in public transportation.

As an illustration of the discretionary decision-making environment that spawned the UMTA rating system, the aggregate cost to implement all the new fixed-guideway transit projects currently in some stage of project planning and development is over \$40 billion. Arrayed against this "demand" is federal New Start discretionary funding of about \$420 million per year.

In 1984 UMTA developed a major investment rating system designed to identify those proposals for capital assistance that would generate the largest amount of benefits in terms of the goals and objectives of the federal transit program. Focusing federal investments on these projects maximizes the payoff obtainable from an essentially fixed (or declining) resource.

The goals and objectives used by the rating system derive from the federal transit program's broad purpose, which is to assist the states and localities in providing a basic level of public mobility. Because of its responsibility to prudently manage public funds, UMTA cannot make investment decisions based on an interest in projects that provide maximum comfort, amenities, civic pride, and other such benefits. Therefore, these benefits are not reflected in UMTA's project-rating approach, but nothing precludes local authorities from proposing projects that do maximize them at the risk of decreasing their proposals' cost-effectiveness.

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TABLE 1 PROJECT SUMMARY

PROJECT	STATUS	TOTAL COST	UMTA SHARE	UMTA COST-EFFECTIVENESS INDEX	LOCAL FISCAL EFFORT		
					NON FEDERAL SHARE	CAPITAL FINANCING PLAN	STABILITY AND RELIABILITY OF OPERATING ASSISTANCE
SEATTLE BUS TUNNEL	UC	\$394M	\$197M	\$1.44/TRIP	50%	ACCEPTABLE	ACCEPTABLE
HOUSTON TRANSITWAYS	UC	\$356M	\$210M	\$3.78 - \$4.94/TRIP	40%	ACCEPTABLE	ACCEPTABLE
L.A. METRORAIL	UC/PE	\$1.25B	\$696M	\$3.30/TRIP (1)	44%	ACCEPTABLE	ACCEPTABLE
ST. LOUIS LIGHT RAIL	FE	\$384M	\$289M	\$9.50/TRIP	25%	(2)	DEFICIENT
MIAMI DPM EXTENSIONS	FE	\$248M	\$186M	\$15.20/TRIP	25%	ACCEPTABLE	DEFICIENT

NOTES

- (1) COST-EFFECTIVENESS INDEX IS FOR THE 8 MILE SEGMENT DEFINED IN 1983 FEIS
- (2) LOCAL MATCH CONSISTED ENTIRELY OF EXISTING BRIDGE, TUNNEL AND RAIL ROW; NO CASH MATCH
- (3) UC - UNDER CONSTRUCTION
 FE - FINAL ENGINEERING
 PE - PRELIMINARY ENGINEERING

May of 1984, institutionalized the manner in which UMTA evaluates projects competing for federal capital funding. The evaluation process it articulated uses two primary evaluation criteria, cost-effectiveness and local financial effort, to place project proposals into one of essentially three groups, those that would be highly desirable federal investments, those that would be undesirable, and those in between.

The key factors explicitly accounted for in the cost-effectiveness assessment process, consistent with the above discussion of federal goals and objectives, are new transit ridership potential; travel time-savings for existing riders; and incremental capital, operating, and maintenance costs, all compared to a base condition. These factors are combined into a "cost-effectiveness index"—in effect, the total marginal cost of attracting a new trip to public transportation.

This index is essentially computed as the total incremental cost of the given investment over the base condition, decreased by the value of travel time-savings for existing transit users, divided by the number of additional trips attracted to transit. The base condition for comparative purposes, called the transportation systems management [TSM] alternative, is comprised of modest investments in the existing transportation system designed to maximize its efficiency and effectiveness.

Though UMTA defines cost-effectiveness only in transportation terms, the factors directly accounted for are excellent surrogates for other transit-related benefits, such as reduced fuel consumption, enhanced air quality, and land development effects. Clearly, projects that attract little additional transit ridership over what would be there anyway and that do not provide travel time-savings for large numbers of existing transit riders will do little to save energy, reduce air pollution, and influence urban development.

UMTA's evaluations also reflect the nature and level of nonfederal public and private funding proposed to support construction of a given project and subsequent operation of the entire transit system of which it will be a part. Important criteria here are the share of total implementation costs that

would come from nonfederal sources and the stability and reliability of local sources of operating assistance.

Other factors such as the historical involvement of the private sector (e.g., small and minority business) in the provision of public mobility, the degree of local commitment to the project, and so on, are used as additional rating criteria. These factors can help distinguish between projects that are similarly rated in terms of the two major criteria, and they can make a marginal project acceptable.

A number of projects are discussed in the next sections to illustrate how the UMTA cost-effectiveness assessment process differentiates among projects competing for limited federal funds. The projects are divided into two groups: those that were highly rated in terms of federal investment worthiness and those that were not found to be desirable federal investments because of poor cost-effectiveness and an unsatisfactory financing proposal. Both types are described in terms of their physical and operational characteristics, their potential cost-effectiveness, and the strength of the financial plan proposed to support their construction and subsequent operation (see Table 1).

HIGHLY RATED PROJECTS

Seattle Downtown Bus Tunnel

Seattle METRO is currently constructing a \$435 million downtown bus tunnel that will be the critical link in a regional bus/high occupancy vehicle (HOV) rapid transit system. This system, once complete, will include about 100 mi of exclusive transit (and other HOV) lanes, over 15,000 dedicated parking spaces, and 46 transit centers or major fringe parking facilities. The key to the Seattle tunnel project's high UMTA investment rating is the factor that the clear majority of the regional bus system's over 200,000 daily riders will benefit.

The significant increases in speed and reliability afforded

by off-street operation in the congested, geographically constrained regional core will not only benefit existing central business district (CBD) bound transit users, but will attract new riders and save operating and maintenance costs as well. The net result of the great new ridership and time savings potential is that the UMTA total cost-effectiveness index is only \$1.44 per trip for the project.

The other feature of the tunnel project that is attractive to UMTA is that Seattle METRO is committed to paying half the aggregate cost of constructing the project (as opposed to a statutory 25 percent) and has a solid dedicated transit tax base for supporting subsequent operations and maintenance.

Houston Transitways

Houston METRO is in the process of planning or constructing transitways in the medians of five existing highways. UMTA has been asked to fund and is funding significant shares of the North, Northwest and Southwest facilities, which are integral parts of a 76-mi regional system, of which 37 mi are open. Construction is proceeding on these facilities (respectively, 19.7, 13.5, and 13.8 mi in length), and they rated well as UMTA investments because of their modest cost (respectively, \$141 million, \$117 million, and \$98 million), their potential to attract large numbers of new riders to transit and HOVs, and the travel time and reliability improvements they would afford large numbers of existing transit users.

Neither of these benefits could be achieved without an investment in new, transit-only lanes because of intense congestion on the existing freeway system, as \$3.78 to \$4.94 per trip cost-effectiveness indices for the projects would indicate. In each case, the dedicated transit freeway lanes complement other investments in both on-line and off-line transit stations and fringe parking facilities. For example, the North Transitway will serve users of four existing major park-ride lots with an aggregate of 6,400 spaces, whereas the Southwest Transitway will leverage the investment already made in four park-ride lots with 3,350 spaces.

The high UMTA investment rating for the Houston Transitway projects also reflects the financial strength afforded by a 1-cent sales tax dedicated to transit. The federal share of the construction of these particular dedicated transit facilities ranges from about 60 to 75 percent with the federal transit share of the entire transitway program only 40 percent. In addition to funds from the Metropolitan Transit Authority and UMTA, both federal and state highway funding is being used to construct the transitway system.

Los Angeles Metrorail

The first 4½ mi of an eventual 18-mi heavy rail line is currently under construction in Los Angeles' Wilshire Corridor. Despite repeated alignment changes for the portion of the line beyond the initial segment because of environmental problems, the full 18-mi, approximately \$3.5-billion project continues to be highly rated.

The high cost-effectiveness rating (a cost-effectiveness index of \$3.30 per trip for the 8-mi segment covered in the 1983 Environmental Impact Statement) stems from a number of

factors. First, even without the presence of a grade-separated transit facility, the corridor already has a tremendous number of people using public transportation. Current ridership on the Wilshire bus line, one of the busiest in the nation, exceeds 65,000 per day, and current bus ridership on all lines serving the corridor as a whole exceeds 150,000. Both are on a par with the volumes for corridors in other smaller cities which have rail lines already serving them.

This high ridership results from Los Angeles' large CBD (over 200,000 jobs, the nation's seventh largest), the large number of transit dependents in the region, the relatively dense residential development in the corridor, and congestion on the corridor's arterial street system. At the same time, the lack of close-by parallel freeways or other available rights-of-way and the near saturation of the arterial streets in the corridor make it extremely difficult to achieve improvements in transit levels of service at low cost.

The Los Angeles project also rates well from a financial perspective. Only about 56 percent of the cost of the first 4½ mi are being paid by the federal government, and there is the expectation that the federal share of the remainder of the line's construction will be similar. In addition to a variety of state taxes dedicated to transit construction, Los Angeles County has a one-half percent sales tax dedicated to public transportation capital costs and operating subsidies. Though there have been implementation problems, there are also special benefits assessment districts around all Metrorail stations with an annual tax yield of over 20 cents per sq ft of floor space.

POORLY RATED PROJECTS

St. Louis Light Rail Project

An alternatives analysis, completed in 1984 and documented in a Draft Environmental Impact Statement (DEIS), showed that simply upgrading and expanding the existing bus system at a cost of \$40 million would attract more new riders than an approximately 20-mi light rail transit (LRT) line, then estimated to cost \$251 million. The good showing for the much-lower-cost bus alternative reflected the high speed afforded express bus operations on the corridor's extensive and relatively uncongested arterial and freeway system.

More recent numbers from preliminary engineering suggest that under a more optimistic set of assumptions, the St. Louis LRT project could actually attract a small number of additional transit riders compared to a TSM alternative. However, this benefit would come at such a high cost that the key UMTA cost-effectiveness indicator, the marginal cost of attracting an additional rider to public transportation, would be over \$9.50 per trip, far in excess of UMTA's cost-effectiveness threshold of \$6.00 per trip.

UMTA was also concerned about the ability of the local area to pay for any cost overruns and to operate the resultant transit system without service reductions once the rail line is operational. St. Louis is donating abandoned railroad rights-of-way, including a bridge and tunnel, as its entire local match for the project. No cash contribution has been committed. In fact, in the early 1980s the St. Louis bus system was cut from

over 800 to 625 coaches because of financial difficulties, with a resultant drop in ridership from 76 million unlinked trips in 1980 to 48 million in 1987.

Taken together, these points suggested that the St. Louis region might not possess the financial resources to both successfully implement a major transit project and operate the resultant bus and rail system in a way that would generate even the small marginal benefits the project promises.

In the Fall of 1988, per congressional direction, UMTA signed a full funding contract with St. Louis officials committing the federal government to provide \$289 million for construction of the Airport LRT line. Through FY1989, the Congress had specifically earmarked approximately \$150 million for the project out of UMTA's annual appropriations.

Miami Metromover Extensions

Dade County sought federal funding for two extensions to the existing Metromover downtown automated guideway loop, a 1.4-mi leg south and a 1.1-mi leg to the north, costing \$240 million in total. These extensions rated poorly because of their significant cost and because they would make only a miniscule net improvement to the region's transit system.

The alternatives analysis showed that these legs would add only 2,000 riders per day to the existing Metrorail elevated heavy rail and Metromover systems' patronage. Virtually all of the new transit trips that would be generated by the project would be short trips, which could be served by other modes at far less cost. At the same time, bus ridership to and from the expanded CBD would be expected to decline by 400 trips per day because of forced transfers at the Omni station for trips destined to the city's CBD only 1 mi away. The UMTA cost-effectiveness index for the extensions, taken together, is over \$15 per trip.

The last factor that contributed to the Miami projects' poor investment rating was Miami transit's precarious financial condition. Previous Miami investments in Metrorail and Metromover facilities, instead of reducing overall transit operating costs, increased the deficit to such a degree that cutbacks in bus service were required, with attendant losses of transit ridership. Miami now operates 400 buses in the peak hour, although the original plans called for a fleet of 1,000 buses to provide feeder service to Metrorail.

Through FY1989, a total of \$152 million had been earmarked by the Congress for the Miami Metromover projects. The Congress had also directed UMTA to enter negotiations with Dade County leading to a federal commitment to the projects' construction. At one point, however, there was some question as to whether Dade County would proceed with the projects.

A number of individuals on the county board questioned the wisdom of building new transit facilities when there was not enough money to maintain and satisfactorily operate the existing bus, rail, and people-mover systems. It was felt that a new dedicated source of funding for transit was needed as a prerequisite for going forward. Nonetheless, at the end of March the board voted to endorse a full funding grant agreement with UMTA and proceed with the projects' construction.

CONCLUSIONS

The preceding discussion was an attempt to clarify the federal government's approach to evaluating proposals for discretionary investments in major new transit guideway facilities. This clarification is needed because the budget debates over the past several years have obscured the rigorous objective process UMTA has developed to identify those projects whose construction would generate the largest total benefit from a limited federal resource.

That process flows from the federal purpose defined in the Urban Mass Transportation Act itself (2). The achievement of this purpose, to assist states and localities in providing a basic level of urban mobility, is reflected in a series of UMTA cost-effectiveness indicators that directly reflect the basic transportation interest of the federal program and indirectly reflect its social, environmental, and economic objectives.

There are at least three common features of the proposals that rate highly under the system. First, the projects would be a critical piece of a much larger transit system. This results in a synergism through which a relatively modest investment can produce tremendous benefits. Second, congestion, the lack of available street space for exclusive transit use, and other factors make it impossible to achieve anywhere near the level of benefits obtainable with the proposed investments through modest improvements to the existing transportation system. Finally, the highly rated proposals generally come from communities with a strong financial commitment both to the specific project in question and to transit in general.

The first contrasting common feature of the poorly rated projects is their inability to produce significant incremental transportation (and therefore other) benefits over more modest investments in the existing transportation system, despite the great additional capital and operating cost. From a financial perspective, the poorer proposals are not backed by a strong local commitment, and the general financial state of transit in the given communities is precarious even without the additional costs associated with the proposed projects.

In closing, it should be noted that the UMTA project evaluation process results in a project being "rated" for federal investment worthiness in terms of a small number of investment worthiness indicators but does not result in a precise ranking of projects. The intention is to divide the proposals for federal funding into, essentially, three groups, those that would be most desirable as federal investments, those that would not be desirable, and those in between.

A precise ranking of projects is avoided for two basic reasons. First, the cost estimation and travel simulation processes are not sufficiently accurate to distinguish among similar projects in a way that would allow them to be precisely ordered. The second reason has to do with the way that decisions are made for discretionary projects.

UMTA recognizes that decision making on discretionary projects is a cooperative exercise involving not only the executive branch of government, but the Congress as well. In fact, STURAA effectively mandates the UMTA project development process and calls for the Secretary of Transportation to make determinations and recommendations well served by the rating system.

In Section 303, STURAA calls for the Secretary of Transportation to determine that proposed projects ultimately receiving Section 3 discretionary funding are: (a) "based on the results of an alternatives analysis and preliminary engineering," (b) "cost-effective," and (c) "supported by an acceptable degree of local financial commitment, including evidence of stable and dependable funding sources to construct, maintain, and operate the system or extension." Section 304 of STURAA calls for the Secretary to report to the Congress by January 20th of each year how the Department proposes to allocate Section 3 discretionary New Start funds among competing proposals in the succeeding year.

A precise ranking of competing projects would imply that all the positive and all the negative aspects of projects could be accounted for in a single calculus. For such a ranking process to work, trade-offs between various program goals and objectives would have to be done as part of a technical process, not by the people actually making the decisions. By simply dividing the universe of proposals into a few groups of similar investment worthiness and providing attendant technical information useful to decision makers, UMTA has more closely conformed to the intent of the Congress and best satisfied the needs of the executive branch.

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