

## Chapter 5: The Fiscal Year 1976 Program—Alternative Courses of Action

The major issues raised in the last chapter provide a frame of reference within which UMTA's FY 1976 budget request for Automated Guideway Transit research and development should be considered. Many of these issues have far reaching implications and are deserving of careful study by the Congress.

This chapter presents four possible alternative courses of action on the FY 76 budget for research and development of Automated Guideway Transit. For each of these alternatives, the points in favor and arguments against are summarized under the headings "Pro" and "Con". Consequences of each action are also discussed.

### ALTERNATIVE A

Approve the AGT R & D program as submitted. Provide \$10 million for the "High Performance Personal Rapid Transit (HPPRT)" Program and \$4 million for the "Automated Guideway Transit Technology" program, which will also receive \$4.4 million in reprogrammed or carry-over funds.

#### PRO

- The Automated Guideway Transit Technology program will contribute to AGT systems at all three levels of technology: shuttle and loop transit, group transit and personal rapid transit. This program will accomplish needed work on theory; research, development and testing of components and sub-systems; and preparation of standards and criteria for system acceptance.
- The "HPPRT" program will push forward the frontiers of technology in AGT. It will continue UMTA's thrust toward the development of automated guideway transit systems at the high-technology end of the spectrum—well beyond the capability of AIRTRANS and Morgantown.
- "HPPRT" will result in a test facility which can be used for further testing and evaluation.
- "HPPRT", through its Urban Deployability Studies, will develop simulations and generate data that, with the actual hardware, will be of assistance to urban communities which are considering or planning advanced GRT systems.
- A modest beginning on PAT concept evaluation will be made.

#### CON

- SLT systems receive minimal attention. No actions which would lead to a demonstration of this technology in an urban activity center are indicated.

- It may be too soon to embark on another GRT system development. The results of Morgantown and Dallas-1 Fort Worth are not yet in. Once these results have been thoroughly assessed, a new program could be better structured.
- The three system concepts selected for initial appraisal in Phase I of the "HPPRT" project are very different. It will be most difficult to determine which approach is worthy of full development before actual hardware is built and tested. Also, selection of a single supplier may inhibit multiple source competition for full-scale production if a significant market
- The "HPPRT" project does not address a known requirement for such systems. No urban communities have made plans for highly sophisticated GRT systems involving 12-passenger vehicles moving at 3 second headways with a 7 to 10 year development lead time.
- The program does not provide for R & D effort in the social and economic areas.
- The AGT program as currently structured does not place sufficient emphasis on such problems common to all systems, such as guideway improvements, passenger safety and security, and door mechanisms.

#### CONSEQUENCES

Approval of the program as submitted:

- Continues the policy of funding R & D for systems of increasing complexity, with emphasis on high technology.
- Leaves to private enterprise most of the task of product improvement for short-term and medium-term applications.
- Requires continuing appropriations in three subsequent years to complete the "HPPRT" test program and 3 to 6 years thereafter to achieve market-ready status with multiple suppliers.
- Leaves unresolved most of the important social and economic considerations bearing on the potential role of PRT.

#### ALTERNATIVE B

Provide no funds for Automated Guideway Transit Research and Development. Use carry-over funds for data gathering and analysis.

#### PRO

- Delay in funding R & D starts will allow time to assimilate information on installations already made at Morgantown and Dallas-Fort Worth. Also, more time will be available to review the need for GRT and PRT, including factors affecting social acceptability and economics.
- Industry will not look to UMTA for leadership in R & D and will thus be more inclined to undertake proprietary developments more responsive to the needs of the market place.
- Rejection by the Congress of proposals to proceed with the development of sophisticated systems will focus the interests of urban communities on conventional transit modes supplemented by shuttle and loop systems which are more nearly available.

CON

- Disapproval of further R & D funding will halt further regress in the United States toward the development and deployment of new urban transportation systems because industry has little incentive to spend its own resources on systems the Federal Government has rejected. State and local governments are not likely to expend resources without Federal participation in such programs.
- The possibility of perfecting a broader range of market-ready SLT systems from experience accumulated to date is diminished.
- Foreign exploitation of any potential United States market is invited with possible effects on balance of payments and United States dependence on foreign technology.

CONSEQUENCES

If no funds are provided, the following results can be expected:

- The United States will become increasingly dependent on foreign sources for high technology improvements to urban mobility.
- Companies which have developed R & D capabilities for AGT systems may abandon this line of business, thus reducing the number of available suppliers and dissipating the expertise they have acquired.
- The primary transportation options available to urban communities will remain limited to bus and rail, supplemented by SLT systems.
- It will be possible to acquire useful data on the performance of the systems installed at Morjantown and Dallas. Ft. Worth, if carry over funds are sufficient and are applied to this purpose.

ALTERNATIVE C

Approve the level of funding requested by UMTA for AGT, but restructure the program to provide:

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"HPPRT" :	
Continue detailed engineering work by the 3 selected manufacturers ..-	\$3.0
A & E and initial construction on test facility infrastructure and support facilities -----	3.0
AGT technology:	
Common development requirements, i.e., guideways, doors, brakes, etc-----	3.4
SLT—refinements and product improvements to facilitate an urban demonstration -----	2.0
GRT—analysis and operation of Morgantown system and surveillance of Airtrans operation -----	3.0
PRT—feasibility studies and simulations -----	2.0
AGT social and economic studies and analysis_ -----	2.0
Total, including \$4.4 million of carryover funds-----	18.4

PRO

- This restructured program provides improved balance in urban transit research between short-term improvements in capabilities and long range development of innovative new alternatives. It permits a start on the next logical stage in the development of advanced AGT systems, the "HPPRT" project. It recognizes the need for intensive work on social and economic issues which have heretofore been neglected.

- The program provides for follow-on detailed engineering by the three manufacturers selected for the "HPPRT" project. This avoids the necessity to select a single concept for further development on the basis of paper studies only.
- Allocation of R & D funds to perfecting and monitoring SLT systems will facilitate the deployment of such systems by documenting unproved performance and costs. It will also encourage suppliers stay in business, thus preserving opportunities for competition and more options for urban consideration. Successful initial efforts could lead to a federally funded demonstration project in an urban area.
- Industry should be stimulated to fund product improvement work.
- The benefits of earlier GRT programs are maximized, while the forward momentum of the program is maintained.

CON

- The time required to design, build, test and evaluate advanced technologies would be stretched out.
- UMTA would be in the business of financing development and engineering, a responsibility previously allocated to industry.
- Significantly increasing the number of subjects to be addressed in the AGT R & D program may cause administration and coordination problems.

CONSEQUENCES

Redirecting the emphasis to near-term solutions:

- Shifts the balance of new systems R & D from exploring distance possibilities toward exploiting existing technology.
- Involves government in the process of product development which has been considered by UMTA to be the function of industry.
- Delays the possibility of installing the more advanced AGT systems in United States cities. In some cases, stretching out the development period may prompt local agencies to abandon such programs.
- Recognizes the potential of simpler SLT Systems as useful supplements to conventional transit modes which are currently available.
- Acknowledges that the long range potential of PRT warrants a modest investment of R & D funds for economic studies, market analyses, social acceptability studies and limited operational simulations.

ALTERNATIVE D

Increase the scope and funding for AGT R & D as follows:

	<i>Amounts in millions</i>
"HPPRT" : Detailed engineering and hardware work by the 3 selected manufacturers, plus a start on construction of the test facility	\$15.0
AGT technology:	
Common development requirements	5.4
SLT—refinements and product improvements and support of urban demonstration project	3.0
GRT—analysis and improvement of Morgantown and Airtrans systems	:: :
PRT—feasibility and urban deployability studies and simulations	:: :
AGT social and economic studies and analysis	3.0
Total, including \$4.4 million of carryover funds	34+ 4

## PRO

- Increasing the AGT funding level to \$34.4 million, by reducing \$30.0 million in new fiscal Year 1976 funds, will bring UMTA'S R & D budget to a level more in keeping with other government programs.
- The probability of making a good decision on the selection of a preferred "HPPRT" concept will be improved if it is based on the evaluation of operational hardware rather than paper design concepts, as is currently planned. The three manufacturers selected for Phase I are designing three very different approaches: a suspended monorail with magnetic levitation, an air cushion suspension and linear motor propulsion, and rubber tires with conventional traction motors. Final selection of the concept to be demonstrated in urban use will be difficult even after extensive test track operations.

The increased cost of carrying three hardware concepts through the prototype testing stage can be minimized by the use of common facilities, such as:

A multi-purpose guideway, wayside power supply "and control cabling system to serve the two bottom-supported systems; and

Central control computer, shop and support facilities to serve all three test programs.

- A significant increase in funding for R & D of components and common development requirements, as well as a stepped-up effort to learn from the Morgantown and AIRTRANS experiences, will maximize the possibility that AGT systems will become cost-effective alternatives for urban transit.
- Such action will demonstrate interest by the government in finding better ways to provide urban mobility through technological innovation.
- It will stimulate innovation by manufacturers, particularly in the area of product improvements, and will allow industry to plan on a continuing Federal commitment.
- With more money available, it will be appropriate to make a significant start toward determining the technical, operational, and economic feasibility for PRT systems.

## CON

- Any large increase in funding for AGT systems is inappropriate until the need for such systems has been more clearly established and the national potential market has been assessed.
- Additional time and funds will be required to meet the "HPPRT" program goals through testing three prototype systems. Even with maximum use of common facilities, a total program cost on the order of \$50 million (in lieu of UMTA'S estimate of \$34.5 million for the current proposal) should be anticipated.
- Management of the "HPPRT" program will be complicated by testing three prototype systems concurrently through the use of common support services.

- **UMTA** may not have the management capacity and organizational structure to handle an expanded R & D program so as to insure that the funds are spent where they will do the most good.
- There is no point in stepping up R & D efforts until better procedures are developed to prepare for delivery of the results of R & D to the marketplace.

CONSEQUENCES

A significant increase in funds implies the following:

- **There will be a need to continue the significant increase in R & D funding over a period of several years.**
- **A substantial increase in UMTA's R & D program will require a corresponding expansion and improvement of R & D management capability.**
- **An expanded R & D program will increase employment in this business sector and will sustain employment in at least two companies which are likely otherwise to be forced to curtail or abandon this line of business.**
- **Emphasis on SLT and GRT concepts in this program will generate requests for Federal funds to plan and install such systems in urban areas.**
- **Actual installation of systems will be dependent not only on success of R & D but also on linking R & D to capital grant programs.**