Dulles Air Cushion Transit Plan Killed

By Jack Eisen
Washington Post Staff Writer

A congressional subcommittee has killed the Department of Transportation's plan to build a revolutionary air cushion shuttle line in the median strip of the Dulles International Airport highway.

Chairman John J. McFall (D-Calif.) of the House Transportation Appropriations Subcommittee confirmed yesterday that he notified Secretary John A. Volpe of the decision in a letter.

Experimentation with a tracked air cushion vehicle, or TACV, is "a very good idea," McFall said, but plans for hurried construction of a route with an uncertain future was judged inappropriate.

Volpe announced firm plans to build the 13½-mile line from Dulles to the Capital Beltway in a speech Feb. 16 to the Metropolitan Washington Council of Governments.

The proposal involved a vehicle that would ride on a cushion of air at 150 miles an hour above a track-like guideway.

The $22 million project was to have been built in time for an international transportation exhibition at Dulles next year.

It was intended primarily to demonstrate the TACV technology and, initially at least, not to serve airline passengers at Dulles. Volpe foresaw an eventual extension toward downtown Washington to provide such service.

Construction was dependent on shifting appropriated money from one Department of Transportation fund to another. It was this permission that the Subcommittee refused to grant.

Rep. Joel T. Broyhill (R-Va.), a critic of the proposal, said the TACV construction would have "injured our chance to get a more serviceable, useful (Metro rail) service out to Dulles."

MON. 10-9

ANCE

Department of Transportation REIMBURSABLE AGREEMENT	1. Document Control Number Modification 1, DOT-AT-40009

2. Parties to the Agreement

a. Reimbursing Organization	b. Organization to be Reimbursed
Urban Mass Transportation Administration Office of Research and Development	Federal Railroad Administration Office of Research, Development and Demonstrations

3. Effective Date	4. Cost (Estimated)		5. Appropriation Chargeable
	a. F.Y.	b. Amount	
October 31, 1973	1974	$2,825,686	69X4119 34.03.07.00 IT-06-0053: $600,000 IT-06-0031: $2,225,686

6. Summary (If additional space is required, use other side or attached sheet)

This modification is required to comply with provisions of DOT Order 1090.16, dated November 28, 1973.

DOT Order 1090.16 stipulates that unobligated funds reserved by UMTA for the UTACV project are to be made available to FRA and that the obligated balance of contracts DOT-UT-10031 and DOT-UT-10026 will not be transferred. Accordingly, the cost estimate in item 4.b. of this agreement is reduced from the original sum of $4,500,000 (which contemplated transfer of $1,674,314 of obligated funds not yet disbursed) to a new estimated cost of $2,825,686. FRA will submit an SF 1151 in the negative amount of $1,674,314 restoring the obligated funds to UMTA.

The funds provided by this agreement are to be obligated only for the 150 mph vehicle program known in FRA as the Prototype Tracked Air Cushion Vehicle (PTACV). FRA agrees to give high priority to obtaining early completion of the PTACV as required by the DOT Order and assumes full responsibility for program management, direction, administration and any future funding requirements. FRA agrees to assume program management of the two contracts listed in DOT Order 1090.16, DOT-UT-10031 and DOT-UT-10026.

FRA will provide UMTA with sufficient certification information necessary for the liquidation of prior obligations under the contracts

(continued)

7. Authorized Approvals

a. For Reimbursing Organization	b. For Organization to be Reimbursed
Signature Lloyd J. Money	Signature Milton Klein
Title Acting Associate Administrator for Research and Development, UMTA	Title Associate Administrator for Research, Development and Demonstrations, FRA
Date	Date

as the work is accomplished. Vouchers and accompanying certifications may be forwarded directly to UMTA's Accounting Branch, UAD-21, Room 6613, Buzzard Point.

All Government-owned property relative to Contracts DOT-UT-10031 and DOT-UT-10026 is hereby transferred from UMTA to FRA. All correspondence, reports and other printed information related to the contract administration and technical administration of these contracts have been transferred with the exception of accounting records required by UAD-21.

UMTA will transfer two positions and accompanying ceiling spaces to FRA.

FRA will provide to UMTA copies of progress reports, as issued, and, upon completion of the work contemplated by this agreement, a final report covering technical accomplishments and summarizing financial aspects of program progress attained with the UMTA funds. FRA will also provide a detailed financial accounting and return to UMTA any undisbursed funds remaining after completion of this work.

Public bodies interested in the PTACV for urban applications are to be advised that they are eligible to apply to the Urban Mass Transportation Administration under the terms of Sections 3, 4 and 9 of the Urban Mass Transportation Act of 1964, as amended, or any subsequent legislation that might supersede or augment UMTA's authority to grant such assistance.

Support by the DOT Transportation Systems Center will be provided under a Project Plan Agreement funded by the Federal Railroad Administration.

FRA will indicate its approval by signing three copies of this Modification and returning two of them to UMTA, ATTN: UAD-10.

Department of Transportation REIMBURSABLE AGREEMENT	1. Document Control Number DOT-AT-40009

2. Parties to the Agreement

a. Reimbursing Organization	b. Organization to be Reimbursed
Urban Mass Transportation Administration Office of Research and Development	Federal Railroad Administration Office of Research, Development and Demonstrations

3. Effective Date	4. Cost (Estimate)		5. Appropriation Chargeable
	a. F.Y.	b. Amount	
October 31, 1973	73	$ 4.5M	69x4119 34.03.07.00

6. Summary (If additional space is required, use other side or attached sheet)

Under this agreement, FRA assumes full responsibility for UTACV program direction, administration, and future funding requirements. UMTA transfers these funds for application only to development of the 150 mph UTACV system and the balance of unused UMTA funds, if any, will be transferred back to UMTA. FRA will provide copies of progress reports, as issued, and a final report covering technical accomplishments and summarizing financial aspects of the program progress attained with the UMTA funds. Copies of contractual arrangements shall be provided UAD-21. ~~Contractual transactions generated~~ by Rohr Co. after c.o.b. Sept. 30, 1973 are to be honored by FRA.
As part of the funding responsibility for the program, FRA will pay costs incurred for TSC support during FY 1974 and subsequent years.

FRA will assume full responsibility for audit, closeout, etc. of all UMTA originated UTACV contracts with Rohr, LTV and Pueblo Test Center:

DOT-UT-10031 (Rohr)
~~DOT-UT-10015 (LTV)~~
~~DOT-UT-10026 (LTV)~~
DOT-UT-30006 (LTV)
CO-06-0005 (FRA)

Transfer will be allocated via SF - 1151.

7. Authorized Approvals

a. For Reimbursing Organization	b. For Organization to be Reimbursed
Signature Robert A. Hermes	Signature
Title Associate Adminstrator, UMTA Office of Research & Development	Title Associate Administrator for Research, Development & Demonstrations Federal Railroad Administration
Date 9 NOV 1973	Date NOV 30 1973

Form DOT F 2300.1 (6-69)

Date: January 8, 1974

MEMORANDUM

Subject: Determination and Transfer Order: Urban Tracked Air Cushion Vehicle Project, 11/28/73

From: UAD-10

To: URD

Your office has been designated as the Office of Primary Responsibility (OPR) for subject issuance. Accordingly, the attachment is forwarded for XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX in accordance with UMTA Order 1320.3. XXXXXXXX the issuance requires implementation XXXXXXXXXXXXXXXXXXXXXX.

Please indicate below the action planned to implement subject issuance and return this memorandum to UAD-10 by 1/18/74.

Harriet G. Hawkins

Attachment

From: Date:__________

To: UAD-10

This office will complete the implementation of subject issuance on __________ (date) by taking the following action:

____ Preparing a change to the Internal Procedures Handbook (UMTA 1000.1).

____ Preparing a change to the External Operating Manual (UMTA 1000.2).

____ Preparing an UMTA Order.

____ Preparing an UMTA Notice.

____ Other:__________

____ No further action is required.

____

Original - return to UAD-10
Copy - retained by addressee

Revised 9/26/73

Office of the Secretary
Washington, D.C.

DOT 1090.16

11-28-73

SUBJECT: DETERMINATION AND TRANSFER ORDER: URBAN TRACKED AIR CUSHION VEHICLE PROJECT

1. DETERMINATIONS AND TRANSFERS.

a. This order documents my decision, as Secretary of Transportation, that the Urban Tracked Air Cushion Vehicle (UTACV) Project, currently under the cognizance of the Urban Mass Transportation Administration, can be accomplished more effectively and efficiently by the Federal Railroad Administration.

b. Accordingly, pursuant to the authority vested in me as Secretary of Transportation by the Department of Transportation Act, Public Law 89-670, I hereby transfer from the Urban Mass Transportation Administration those functions, contracts, records, and positions, identified in paragraph 2 herein, which I determine relate to the functions transferred, to be performed and utilized as directed by the Federal Railroad Administration subject to law. In addition, under Section 601 of the Economy Act (31 U.S.C. 686), UMTA and FRA will negotiate a reimbursable agreement subject to OST review for the use of all remaining unobligated funds assigned within UMTA for the UTACV project.

c. This transfer is in accordance with the Congressional guidance received during the FY 1974 appropriations hearings (Reference: House Report 93-285, pages 28 and 30).

d. The project, in the Federal Railroad Administration, will be called the Prototype Tracked Air Cushion Vehicle (PTACV).

2. RESOURCE IDENTIFICATION.

Accordingly, the following contracts, property and records, and positions are included in this transfer:

a: Contracts.

The program management of the following contracts will be transferred to FRA:
DOT Contract DOT-UT-10031 with Rohr
DOT Contract DOT-UT-10026 with LTV (currently in close-out phase)

The obligated balance of the contracts will not be transferred. Accordingly, UMTA and FRA will establish an appropriate mechanism

DISTRIBUTION: FRA (5 copies)
UMTA (5 copies)
S-50 (5 copies)
TAD-40 (10 copies)
TAD-10 (1 copy)
TGC-1 (1 copy)
TSC (5 copies)
TST (5 copies)

OPI: Office of Management of Systems

to provide UMTA with sufficient certification information necessary for the liquidation of prior obligations under the contracts as the work is accomplished. Since the Department does not have the legal authority to transfer funds between appropriations, the use of UMTA's unobligated funds by FRA will be accomplished as part of the reimbursable agreement provided in paragraph 1b.

b. Property and Records.

(1) All Government-owned property relative to Contracts DOT-UT-10031 and DOT-UT-10026.

(2) All correspondence, reports, and other printed information related to the contract administration and technical administration of the subject project.

c. Positions.

Two positions and accompanying employment ceiling spaces will be transferred from UMTA to FRA. Incumbent employees, if any, should be advised of their rights to transfer with the positions. Any required notification to Congress or OMB relative to the transfer will be accomplished by the Director of Budget, OST, prior to the date of the final action.

FY 1973 FUNDING RESTRICTIONS.

The UMTA/FRA reimbursable agreement for the obligation of carry-over FY 1973 UTACV funds is to be negotiated subject to the following restrictions:

a. These funds are to be obligated only for the 150 mph vehicle program.

b. At the completion of the expenditure of these funds, FRA is to provide UMTA with a technical and financial accounting report with respect to the accomplishments.

4. SYSTEM IMPLEMENTATION.

The Department will give high priority effort to obtaining early completion of the PTACV. The Federal Railroad Administration will take the lead in these activities, supported by the Urban Mass Transportation Administration and the Transportation Systems Center. Public bodies interested in the PTACV for urban applications are to be advised that they are eligible to apply to the Urban Mass Transportation Administration under the terms of Sections 3, 4, and 9 of the Urban Mass Transportation Assistance Act of 1973. The Transportation Systems Center's support will be provided under the Project Plan Agreement funded by the Federal Railroad Administration.

EFFECTIVE DATE.

Implementation of this transfer is to start on the date of this order, and the transfer is to be completed within one month.

FOR THE SECRETARY OF TRANSPORTATION:

William S. Heffelfinger
Assistant Secretary
Administration

Standard Form No. 1151
7 GAO 2000
1151-103

VOUCHER NO. PA-0533

NONEXPENDITURE TRANSFER AUTHORIZATION

URB

To DIVISION OF CENTRAL ACCOUNTS

BUREAU OF ACCOUNTS
TREASURY DEPARTMENT
Washington, D.C. 20226

DEC 14 1973

You are hereby authorized to effect the transfer indicated below.

TRANSFER FROM (D. O. Symbol 3000)		TRANSFER TO (D. O. Symbol 3000)	
Dept. OF TRANSPORTATION		Dept. OF TRANSPORTATION	
Bureau URBAN MASS TRANSPORTATION ADMIN.		Bureau FEDERAL RAILROAD ADMINISTRATION	
Address 2100 2ND ST. SW WASH. D.C. 20590		Address 400 7TH ST. SW WASH. D.C. 20590	
APPROPRIATION OR FUND SYMBOL	AMOUNT	APPROPRIATION OR FUND SYMBOL	AMOUNT
69X4119	$4,500,000.00	69X4119 (07)	$ 4,500,000.00

MM
MTE. NO.
NAT
MI

AUTHORITY

TRANSFER OF FUNDS IN ACCORDANCE WITH REIMBURSABLE AGREEMENT NO. DOT-AT-40009, UMTA PROJECT NOS. IT-06-0031, IT-06-0053 AND CO-06-0005.
SECTION 601 OF THE ECONOMY ACT (31 USC 686)

The above transfer is proper under the authority cited.

DECEMBER 13, 1973
(Date)

Willie F. Scrogins
(Approving Officer)
WILLIE F. SCROGGINS, CHIEF, ACCOUNTING SE

(Treasury Form 503)

(Dated)

*"Division of Central Accounts" or "Investment Branch" depending on type of transaction.

U.S. GOVERNMENT PRINTING OFFICE 1960 O—572728

865-635

Form DOT F 1320.1 (1-67)

Control No. 13645 URD

UNITED STATES GOVERNMENT

DEPARTMENT OF TRANSPORTATION

OFFICE OF THE SECRETARY

Memorandum

DATE: November 20, 1973

In reply refer to:

SUBJECT: A Long Range Plan for the High Speed Ground R&D Program

FROM : The Secretary

TO : Federal Railroad Administrator
Urban Mass Transportation Administrator
Assistant Secretary for Systems Development and Technology

I found the meeting of November 2, 1973 on the High Speed Ground program very useful. The analytical issue papers prepared by each of you provided the necessary background for an orderly review of our goals and objectives of this program and a basis for reaching decisions on the FY 1974 and 1975 budgets.

In order to implement the decisions mutually agreed upon at the meeting, I would like the Federal Railroad Administrator, working in conjunction with the Assistant Secretary for Systems Development and Technology, to develop long range (three to five years) plans for the development of improved rail passenger technology (previously the IPT program), TMLV and TACV technology programs. These program plans should be quite specific, detailing our goals and objectives over this period of time, the intended means for implementing them, identifying the major projects and milestones, and the resources required. They should, for example, take into consideration the status of outstanding contracts and ongoing projects and how we should proceed with them in light of the new directions we have set for these programs. This document should be an operational plan for the next several years. These will also serve as the basis for preparing our congressional budget justification.

A similar effort should be initiated by the Federal Railroad Administrator, working in this case in conjunction with the Urban Mass Transportation Administrator and the Assistant Secretary for Systems Development and Technology, for completing the PTACV program.

The long range plans should be submitted to me by the Assistant Secretary for Systems Development and Technology no later than December 21, 1973. He will coordinate a final review of these documents within the Office of the Secretary.

Claude S. Brinegar

DOT 2300.1
6/19/69

Department of Transportation REIMBURSABLE AGREEMENT	1. Document Control Number DOT-AT-40009

2. Parties to the Agreement

a. Reimbursing Organization	b. Organization to be Reimbursed
Urban Mass Transportation Administration Office of Research and Development	Federal Railroad Administration Office of Research, Development and Demonstrations

3. Effective Date	4. Cost (Estimated)		5. Appropriation Chargeable
	a. F.Y.	b. Amount	
October 31, 1973	73	$ 4.5M	69x4119 34.03.07.00

6. Summary (If additional space is required, use other side or attached sheet)

Under this agreement, FRA assumes full responsibility for UTACV program direction, administration, and future funding requirements. UMTA transfers these funds for application only to development of the 150 mph UTACV system and the balance of unused UMTA funds, if any, will be transferred back to UMTA. FRA will provide copies of progress reports, as issued, and a final report covering technical accomplishments and summarizing financial aspects of the program progress attained with the UMTA funds. Copies of contractual arrangements shall be provided UAD-21. Contractual transactions generated by Rohr Co. after c.o.b. Sept. 30, 1973 are to be honored by FRA.
As part of the funding responsibility for the program, FRA will pay costs incurred for TSC support during FY 1974 and subsequent years.

FRA will assume full responsibility for audit, closeout, etc. of all UMTA originated UTACV contracts with Rohr, LTV and Pueblo Test Center:

DOT-UT-10031 (Rohr)
DOT-UT-10015 (LTV)
DOT-UT-10026 (LTV)
DOT-UT-30006 (LTV)
CO-06-0005 (FRA)

Transfer will be allocated via SF - 1151.

7. Authorized Approvals

a. For Reimbursing Organization	b. For Organization to be Reimbursed
Signature	Signature
Title Associate Adminstrator, UMTA Office of Research & Development	Title Associate Administrator for Research, Development & Demonstrations Federal Railroad Administrator
Date 9 NOV 1973	Date

Form DOT F 2300.1 (6-69)

DOT LIBRARY
00399728

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
WASHINGTON, D.C. 20590

October 17, 1973

Bob Hemmes:

This may cause us some problem in defining what the extent of "unobligated FY 1973 funds" is, vis-a-vis work already completed in FY 1974 by TSC.

My initial suggestion is that we define the funding used already in FY 1974 by TSC as an obligation of part of the FY 1973 funds. The alternative is for FRA to transfer the funds to TSC, but I understand FRA is giving TSC static about this. TSC needs to be given some direction as to the level of support they can expect from FRA and how their UMTA bill is going to be paid.

Henry Nejako

HENRY
OK

11-26-73
apparently FRA will pick up tab for all FY74 TSC work on UTACV (PTACV).
NN

Form DOT F 1320.1 (1-67)

UNITED STATES GOVERNMENT

Memorandum

Hemmes

DEPARTMENT OF TRANSPORTATION

OFFICE OF THE SECRETARY

DATE: October 15, 1973

In reply refer to:

SUBJECT: Transfer of UTAGV Project from UMTA to FRA

FROM : R. W. Pinnes, OST (TST-42), Project Officer

TO : M. Klein, FRA (RA-40)
R. A. Hemmes, UMTA (URD-1)
J. L. Dennis, OST (S-53)
M. Miller, OST (TPI-10)
W. Toler, OST (TAD-235)

My memorandum of September 18, 1973, subject as above, requested comments on a draft of the Team's final report to the Deputy Under Secretary for Budget and Program Review on the subject assignment.

The following comments, received in response to my memorandum of September 18, 1973, are forwarded for your information:

(a) UMTA memorandum of September 25, 1973
(b) FRA memorandum of September 28, 1973
(c) OST (TAD) memorandum of October 10, 1973

On the basis of the comments received, there are two areas requiring further resolution:

(1) Transfer of positions from UMTA to FRA.
(2) Clarification of UMTA's continuing role in the project.

To attempt resolution of these issues, a meeting has been set up as follows:

Date: October 25, 1973 (Thursday)
Time: 9:30 A. M.
Place: NASSIF Building, Room 10432

It is requested that all Team members present the factual data required on the issues at the meeting, and be prepared to reach tentative agreement. It is hoped that the issues can be resolved at the Team level, rather than forwarding them to S-5 as unresolved issues. Please bring additional representatives from your office as required to meet this objective.

The current draft of our final report, incorporating the comments received to date, is attached for your consideration. Please provide any comments on this draft at the forthcoming meeting.

R. W. Pinnes

R. W. Pinnes

Attachments

cc: E. J. Ward, FRA (RA-41)
J. F. Campbell, UMTA (URD-22)
W. C. Steber, OST (TST-2)
R. E. Parsons, OST (TST-20)
R. L. Maxwell, OST (TST-41)

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE: SEP 25 1973

In reply refer to:

SUBJECT: Transfer of UTACV project from UMTA to FRA Planning dtd. 9/18/73

FROM: Robert A. Hemmes, Associate Administrator, RD&D UMTA

TO: R. W. Pinnes, OST (TST-42)

In response to your request for input on subject document, the following is offered:

1. There are no positions within UMTA to be transferred to FRA. When the former UTACV Project Manager decided to retire, his position was abolished and has not been maintained on the UMTA R&D personnel allotments.

2. The UMTA FY '73 funds as appropriated for the UTACV are in the amount of $6.351M. The transfer of the remaining FY '73 funds and commitments are to be a part of this transfer as long as

   (a) funds are spent on the 150 mph vehicle program,
   (b) FRA provides a technical and financial accounting report with respect to the accomplishments,
   (c) any overruns are not chargeable to UMTA.

3. With respect to the "Continuing UMTA responsibility" the following is believed appropriate:

   "Public bodies interested in the PTACV are eligible to apply to the Urban Mass Transportation for the designing, planning, and engineering of urban mass transportation projects under the Technical Studies activity of the Office of Transit Planning. The Federal Railroad Administration will provide the necessary technical support for these efforts. The Transportation Systems Center's support will be provided under the Project Plan Agreement funded by the Federal Railroad Administration."

Robert A. Hemmes

Robert A. Hemmes

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION

FEDERAL RAILROAD ADMINISTRATION

DATE: SEP 28 1973

In reply refer to:

TO: Robert W. Pinnes
Project Officer, TST-42

FROM: Associate Administrator for
Research, Development and Demonstrations
THRU: Associate Administrator for Administration

SUBJECT: Transfer of UTACV Project from UMTA to FRA

We have reviewed the draft documents forwarded with your memorandum of September 18 and have the following comments:

1. In the transmittal memorandum, under the Background section after the quotation from the Committee report, it is suggested that the following sentence be included: "The Department agreed to the transfer and so informed the Congress."

2. On the top of page 2, the first sentence under Action Recommended should be revised, since the action being discussed has already been decided and it is not a matter of our Project Team recommendation.

3. Under paragraph 2.a. of the Determination and Transfer Order add: "DOT Contract Number DOT-UT-10026 with LTV."

4. In the Determination and Transfer Order, paragraph 2.d. should be revised to change the position of "one contract administration" to "one contract specialist". With respect to personnel transfers, while the transfers stated are, as we understand it, the existing positions, it is obvious that additional positions will be required as the UTACV program gets to the testing and development stage. Therefore, FRA will require positions beyond those contained in the draft order.

5. For Attachment B, the following FRA assignments are made: Item 2, Wayne Wilson; Items 3, 4, 5, and 7, Ed Ward.

6. We suggest that the time estimated for completion of the various items listed in Attachment B be as follows: Item 2, two weeks; Item 3, one week; Item 4, two weeks; Item 5, one week; Item 7, one week; Item 8, three weeks; Item 9, four weeks; Item 10, four weeks.

6. With respect to Enclosure 2, the "estimated overrun" should be eliminated by reducing the O&M Manual estimate to $33,000, which will balance the books. Also, the "Alternative suggestion" on this sheet is out of date and should be eliminated.

MB Mitchell for

Milton Klein

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION

OFFICE OF THE SECRETARY

DATE: October 10, 1973

SUBJECT: Transfer of UTACV Project from UMTA to FRA

In reply refer to: TAD-234

FROM : Director of Management Systems

TO : R. W. Pinnes, Project Officer, TST-42

Per your September 18, 1973, request the following TAD comments are offered on your draft report concerning the UTACV transfer:

Draft Determination and Transfer Order

1a. Unless a real basis exists for FRA being able to accomplish this project more economically than UMTA, we recommend deletion of the word "economically" from this paragraph. There appears to be no indication that the Congressional committees anticipate any real economy from the shift.

2d. - In addition to the transfer of authorized positions, accompanying employment ceiling spaces should be mentioned.

- Consideration should be given to deleting the types of positions to be transferred. Although the total number needs to be included, it appears unnecessary and somewhat restrictive to identify the types of positions involved. FRA should determine for itself what kinds of jobs it needs to support the function being transferred.

- Regarding the statement that "no transfer of personnel" will take place, this entire action is considered a "transfer of function" under the RIF regulations. If the employees remain in UMTA with no loss of grade, they have no right to accompany the function. If separations or downgradings occur in UMTA as a result of the transfer, however, the employees have a right to accompany the function.

- It is suggested that when the transfer of this project from UMTA to FRA is to be effected the unions representing employees in UMTA and FRA (Locals 3313 and 2814, AFGE) be advised insofar as any personnel actions that may be involved.

- Specifically regarding the proposed transfer of a "contract administration" position, TAD's Procurement Operations Division (TAD-43) submits that during the past year only .4 manyears of

effort have been utilized in support of the UTACV project. Because of anticipated increases in workload in other contract activities, TAD-43 has forecasted even less expenditure of available manpower over the next 12 months for UTACV. (If significant discrepancies exist between statements of position requirements from UMTA, FRA, and TAD-40, a further, detailed review of staffing resources may be in order.)

Attachments 2 and 3

- It would be helpful if this backup briefly described the contract type, scope of work and status of performance under the contract.

- The financial data presented in the attachments would be more meaningful if

  a. the bottom line total amounts were shown on attachment 3 for all tasks and the total amount of the contract, and

  b. to the extent possible, relate the amounts shown on attachment 2 to those shown on attachment 3. This would reveal the levels of committed and obligated funds.

- It would also be useful if the suggestion in attachment 2 to install a shorter length of test track be expanded to include a brief description of how this is planned to be contractually accomplished and of the technical impact of using a shorter test rail.

John L. McGruder

Form DOT F 1320.1 (1-67)

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION

OFFICE OF THE SECRETARY

DATE: OCT 15 1973

In reply refer to:

DRAFT

SUBJECT: Transfer of UTACV Project from UMTA to FRA

FROM : Project Team

TO : Deputy Under Secretary for Budget and Program Review

Purpose

To present our proposed response to the Congressional direction on the UMTA Urban Tracked Air Cushion Vehicle (UTACV) project.

Background

Your memorandum of August 13, 1973, listed a number of "Special Reports and Actions Directed by the Appropriations Committee", and set up project teams to establish compliance with the Committee's direction.

This report addresses the following "Title and Subject", as outlined in the August 13, 1973, memorandum:

> "High Speed Ground R&D/UMTA R&D: The Committee sees virtually no practical application for a TACV in an urban mass transportation system (Page 28). The Committee feels that the 150 miles per hour TACV should be funded by the Federal Railroad Administration."

The above reference is to Page 28 of the House Appropriations Committee Report 93-285, of June 15, 1973.

The Department agreed to the proposed transfer. Specifically, the Secretary, in his letter of June 26, 1973, to Senator Robert C. Byrd, relative to the Fiscal Year 1974 appropriations, stated:

> "We intend to follow the House Committee's instructions to combine UMTA's urban TACV research with that conducted by FRA under the High Speed Ground Transportation R&D (HSGT) appropriation."

Project Team

The team established for this item is as follows:

R. W. Pinnes, OST (TST-42), Project Officer
M. Klein, FRA (RA-40)
R. A. Hemmes, UMTA (URD-1)
J. L. Dennis, OST (S-53)
M. Miller, OST (TPI-10)

In addition, the Project Officer requested W. Toler, OST (TAD-235), to serve on the team to assist in the preparation of the Determination and Transfer Order.

Action Required

In accordance with the Secretary's statement, the Department is to comply with the Committee's direction by transfering the UTACV project from UMTA to FRA. In FRA, the project will be called the Prototype Tracked Air Cushion Vehicle (PTACV).

The following attachments are presented for your consideration relative to the subject transfer:

Attachment A - A proposed DOT Order, "Determination and Transfer Order: Urban Tracked Air Cushion Vehicle Project", for the Secretary's signature.

Attachment B - A list of the actions required by the proposed DOT Order; the specific responsibilities assigned; and the estimated completion dates, relative to the release of the proposed DOT Order.

Completion of Assignment

We believe that this report completes our assignment. Please let us know if any further action is desired.

R. W. Pinnes, OST (TST-42)
Project Officer

M. Klein, FRA (RA-40)

R. A. Hemmes, UMTA (URD-1)

J. L. Dennis, OST (S-53)

M. Miller, OST (TPI-10)

W. Toler, OST (TAD-235)

Department of Transportation
Office of the Secretary
Washington, D.C.

DRAFT
OCT 15 1973

ATTACHMENT A

SUBJECT: DETERMINATION AND TRANSFER ORDER: URBAN TRACKED AIR CUSHION VEHICLE PROJECT

1. DETERMINATIONS AND TRANSFERS.

a. This order documents my decision, as Secretary of Transportation, that the Urban Tracked Air Cushion Vehicle (UTACV) Project, currently under the cognizance of the Urban Mass Transportation Administration, can be accomplished more effectively by the Federal Railroad Administration.

b. Accordingly, pursuant to the authority vested in me as Secretary of Transportation by the Department of Transportation Act, Public Law 89-670, I hereby transfer from the Urban Mass Transportation Administration those functions, contracts, records, funds, and positions, identified in paragraph 2 herein, which I determine relate to the functions transferred, to be performed and utilized as directed by the Federal Railroad Administration subject to law.

c. This transfer is in accordance with the Congressional guidance received during the FY 1974 appropriations hearings (Reference: House Report 93-285, pages 28 and 30).

d. The project, in the Federal Railroad Administration, will be called the Prototype Tracked Air Cushion Vehicle (PTACV).

2. RESOURCE IDENTIFICATION.

Accordingly, the following contracts, property and records, funds, and positions are included in this transfer:

a. Contracts

DOT Contract DOT-UT-10031 with Rohr
DOT Contract DOT-UT-10026 with LTV

b. Property and Records

(1) All government owned property relative to Contracts DOT-UT-10031 and DOT-UT-10026

(2) All correspondence, reports, and other printed information related to the contract administration and technical administration of the subject project.

DISTRIBUTION: FRA (5 copies)
UMTA (5 copies)
S-50 (5 copies)
TAD-40 (10 copies)
TAD-10 (5 copies)
TGC-1 (1 copy)
TSC (5 copies)
TST (5 copies)
OMS: Office of Management Systems

DRAFT
OCT 15 1973

c. Funds

All unobligated FY 1973 UTACV funds.

d. Positions

(Note: The transfer of positions, and the accompanying adjustments in employment ceiling spaces, is subject to further resolution. There will be no transfer of personnel.)

3. FY 1973 FUNDING RESTRICTIONS.

The transfer of FY1973 UTACV funds from UMTA to FRA is to be made subject to the following restrictions:

a. These funds are to be spent only on the 150 mph vehicle program.

b. At the completion of the expenditure of these funds, FRA is to provide UMTA with a technical and financial accounting report with respect to the accomplishments.

c. Any additional costs or overruns are to be funded by FRA.

4. SYSTEM IMPLEMENTATION.

The Department will continue to give high priority to efforts to obtain early implementation of the PTACV system. The Federal Railroad Administration will take the lead in these activities, supported by the Urban Mass Transportation Administration and the Transportation Systems Center. Public bodies interested in the PTACV for urban applications are to be advised that they are eligible to apply to the Urban Mass Transportation Administration for the designing, planning, and engineering of urban mass transportation projects under the Technical Studies activity of the Office of Transit Planning. The Transportation Systems Center's support will be provided under the Project Plan Agreement funded by the Federal Railroad Administration.

5. EFFECTIVE DATE.

Implementation of this transfer is to start on the date of this Order, and the transfer is to be completed within one month.

DRAFT

OCT 1 5 1973

ATTACHMENT B

TRANSFER OF U[illegible] PROJECT FROM UMTA TO FRA

No.	Action Item	Responsibility	Estimated Completion Date (Weeks after completion of Item No. 1)
1.	Release of DOT Determination and Transfer Order	OST: R. W. Pinnes, TST-42 (To obtain Secretary's signature)	0
2.	Transfer of Contract Administration	UMTA: D. V. Glascoe, TAD-43 FRA : W. W. Wilson, RA-11	2
3.	Transfer of Technical Administration	UMTA: J. F. Campbell, URD-22 FRA : E. J. Ward, RA-41	1
4.	Transfer of Unobligated FY 73 UTACV Funds	UMTA: J. F. Campbell, URD-22 FRA : E. J. Ward, RA-41	2
5.	Transfer of TSC Support	UMTA: J. F. Campbell, URD-22 FRA : E. J. Ward, RA-41	1
6.	Transfer of Positions	OST : W. Toler, TAD-235 (with S-5 Coordination)	2
7.	Assign Responsibility (1) in FRA for System Implementation Efforts, and (2) in UMTA for Possible Technical Studies Support.	FRA : E. J. Ward, RA-41 UMTA: R. H. MacManus, UTP-1	1
8.	Joint Memorandum from FRA and UMTA to Secretary Indicating Completion of Transfer	FRA : J. W. Ingram, RA-1 UMTA: F. C. Herringer, UOA-1 (To be initiated by FRA)	3
9.	Letters to Congressional Appropriations Committees (House and Senate)	OST : R. W. Pinnes, TST-42 (with TCI Coordination)	4
10.	Letter to OMB	OST : R. W. Pinnes, TST-42 (with S-50 Coordination)	4

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
WASHINGTON, D.C. 20590

December 13, 1973

Bob Hemmes:

I understand that the DOT Order transferring the UTACV to FRA was signed and awarded FRA two UMTA spaces, Herringer's objections notwithstanding.

Henry

Noted. Bob

~~Hammond~~
HENRY

Determination and Transfer Order: TACV

NOV 12 1973
NOV 13 1973

Administrator, UMTA

Assistant Secretary for Administration, TAD-1

Moving the TACV project to FRA, including unobligated balances, is a good management decision. The Congress did not express its movement in the exact manner in which the proposed determination would accomplish the move. The House report simply stated ". . . the Committee feels that the 150 mile per hour TACV should be funded by the Federal Railroad Administration. No funds are recommended under this [UMTA] appropriation for TACV research and development." The Department agreed and obtained FY 1974 funds under a FRA appropriation. The Congress did not enact an "appropriation transfer" for prior funds or authorized positions. However, earlier funds appropriated to UMTA can be moved to FRA under the authority of the Economy Act as stated in the proposed order without Congressional action.

With respect to the movement of authorized positions from UMTA to FRA, there are some constraints. I agree that manpower may be needed by FRA for this project and that such a request of the Congress should be made. In the meantime, the manpower can be provided by either increasing FRA's employment ceiling or UMTA detailing two employees until FRA obtains authorized positions.

The Senate Report took a strong stand on UMTA positions by stating, "The Committee directs that UMTA hire the 363 individuals which will become available upon the enactment of this bill." This indicates that it was not their intention to move positions from UMTA.

In earlier hearings, it was the sense of the Congress that the movement of the project should result in personnel economies. Accordingly, if there is a manpower problem, I recommend that either alternative mentioned above be followed.

/s/ Frank C. Herringer

CONCURRENCES

RTG. SYMBOL	INITIALS/SIG.	DATE
UAD		11/13

APPRO

WHBoswell:djm UAD-1 11/13/73 Frank C. Herringer
cc: Chron File-9228; Subj File; UOA-1; UAD-20; UAD-10 URD-1

Form DOT F 1320.65 (4-67)

OFFICIAL FILE COPY

DEPARTMENT OF TRANSPORTATION

RECORD OF COORDINATION AND APPROVAL

CHECK ONE: [X] ORDER [ ] NOTICE [ ] PAGE CHANGE [ ] OTHER

IDENTIFICATION NO. DOT 1090.

Termination and Transfer Order: Urban Tracked Air Cushion Vehicle Project

PERSON TO CONTACT ON ATTACHED

NAME	OFFICE	PHONE
S. J. Park	TAD-232	64738

EXPLANATION

The attached order documents the Secretary's decision to transfer action for the Urban Tracked Air Cushion Vehicle (UTACV) Project from the Urban Mass Transportation Administration to the Federal Railroad Administration.

ADDRESSEES WILL BE RECORDED AS CONCURRING IF NO RESPONSE IS RECEIVED BY THE DEADLINE DATE FOR COORDINATION.

ORIGINATING OFFICE CLEARANCE

TITLE	SIGNATURE	DATE	DEADLINE DATE FOR COORDINATION
Dep Asst Secretary for Administration	William B. Davis	11/8/73	November 13, 1973

COORDINATION ROUTING

OFFICE/OFFICIAL	SIGNATURE	DATE	CONCUR W/ COMMENT	CONCUR COMMENT	NON-CONCUR	COMMENT ADOPTED
Dep Under Secretary						
Asst Sec for Sys Development & Tech						
To: Administrator, FRA						
Administrator, UMTA	F R C Lilley	11/13/73		X		
DIRECTIVES CONTROL POINT CLEARANCE						
APPROVED (TITLE)						

AFTER SIGNATURE, RETURN TO: [ ] OST DIRECTIVES CONTROL POINT [ ] DIRECTIVES CONTROL POINT IN:

FORM DOT F 1320.3 (1-67)

Department of Transportation
Office of the Secretary
Washington, D.C.

ORDER

SUBJECT: DETERMINATION AND TRANSFER ORDER: URBAN TRACKED AIR CUSHION VEHICLE PROJECT

1. DETERMINATIONS AND TRANSFERS.

a. This order documents my decision, as Secretary of Transportation, that the Urban Tracked Air Cushion Vehicle (UTACV) Project, currently under the cognizance of the Urban Mass Transportation Administration, can be accomplished more effectively and efficiently by the Federal Railroad Administration.

b. Accordingly, pursuant to the authority vested in me as Secretary of Transportation by the Department of Transportation Act, Public Law 89-670, I hereby transfer from the Urban Mass Transportation Administration those functions, contracts, records, and positions, identified in paragraph 2 herein, which I determine relate to the functions transferred, to be performed and utilized as directed by the Federal Railroad Administration subject to law. In addition, under Section 601 of the Economy Act (31 U.S.C. 686), UMTA and FRA will negotiate a reimbursable agreement subject to OST review for the use of all remaining unobligated funds assigned within UMTA for the UTACV project.

To

c. This transfer is in accordance with the Congressional guidance received during the FY 1974 appropriations hearings (Reference: House Report 93-285, pages 28 and 30).

d. The project, in the Federal Railroad Administration, will be called the Prototype Tracked Air Cushion Vehicle (PTACV).

2. RESOURCE IDENTIFICATION.

Accordingly, the following contracts, property and records, and positions are included in this transfer:

a. Contracts

DOT Contract DOT-UT-10031 with Rohr
DOT Contract DOT-UT-10026 with LTV

DISTRIBUTION: FRA (5 copies) UMTA (5 copies) S-50 (5 copies) TAD-40 (10 copies) TAD-10 (1 copy) TGC-1 (1 copy) TSC (5 copies) TST (5 copies)

OPI: Office of Management Systems

Included in the reimbursable agreement mentioned in paragraph 1b will be a mechanism whereby FRA will provide information to UMTA indicating appropriate payment of all contract money obligated by UMTA prior to the project transfer.

b. Property and Records

(1) All Government-owned property relative to Contracts DOT-UT-10031 and DOT-UT-10026.

(2) All correspondence, reports, and other printed information related to the contract administration and technical administration of the subject project.

c. Positions

Two positions and accompanying employment ceiling spaces will be transferred from UMTA to FRA. Notification of Congress and OMB relative to the transfer of positions and other actions as appropriate will be accomplished by S-50 prior to the final action.

3. FY 1973 FUNDING RESTRICTIONS.

The UMTA/FRA reimbursable agreement for the obligation of carry-over FY 1973 UTACV funds is to be negotiated subject to the following restrictions:

a. These funds are to be obligated only for the 150 mph vehicle program.

b. At the completion of the expenditure of these funds, FRA is to provide UMTA with a technical and financial accounting report with respect to the accomplishments.

4. SYSTEM IMPLEMENTATION.

The Department will continue to give high priority to efforts to obtain early implementation of the PTACV system. The Federal Railroad Administration will take the lead in these activities, supported by the Urban Mass Transportation Administration and the Transportation Systems Center. Public bodies interested in the PTACV for urban applications are to be advised that they are eligible to apply to the Urban Mass Transportation Administration under the terms of Sections 3, 4, and 9 of the Urban Mass Transportation Assistance Act of 1973. The Transportation Systems Center's support will be provided under the Project Plan Agreement funded by the Federal Railroad Administration.

5. EFFECTIVE DATE.

Implementation of this transfer is to start on the date of this order, and the transfer is to be completed within one month.

To

APR 20 1973

EMPLOYMENT GENERATED BY UTACV PROGRAM

	Total Jobs	FY 1974 Jobs	FY 1975 Jobs	FY 1976 & Later Jobs
California				
Direct	15	5	8	2
Indirect	15	4	8	3
Colorado				
Direct	256	114	88	54
Indirect	254	113	88	53
Massachusetts				
Direct	71	14	17	40
Indirect	68	13	16	39
1/ Contract	77		36	41
Total Jobs	756	263	261	232
Direct	342	133	113	96
Indirect	337	130	112	95
Contract	77	-	36	41

1/ During FY 1975 and 1976 contracts relating to component development will be issued through TSC. Among the components to be developed are: a single sided linear induction motor, a variable frequency power controller, and obstacle detection devices. The contractors have not yet been selected, thus the employment manyears are shown under Massachusetts.

DEPARTMENT OF ...

October 16, 1972

EMPLOYMENT GENERATED BY UMTA RD&D PROJECTS, FY 1974

Assumptions Used in Estimates

1. Direct labor costs for engineering and the highly skilled manufacturing talent needed for prototype fabrication are approximately $22,000 per man-year for FY 1974.

2. Certain projects scheduled to be approved in FY 1974 will not begin until mid-fiscal year or late in the fiscal year. For these projects an estimated portion of the effort (man-years) funded is deducted from the year in which funds are approved and carried forward to the following year or later. (No reduction in the number of man-years thus carried forward was made to take into account inflation because contract negotiation will in general be at the wage level prevailing when the contract is awarded. For certain CPFF contracts, this may overstate the future year employment by a few per cent.)

3. To differentiate between direct and indirect labor costs, indirect labor is assumed to be equal to direct labor. Thus, for $1 million in FY 1974, 23 direct and 23 indirect man-years of employment will be generated.

4. The capital facilities, training, housekeeping and so on needed to support a direct labor man-year are assumed to be taken care of in the price of an indirect man-year.

5. Profit or fee is ignored; this is equivalent to assuming it is equally distributed between direct and indirect labor since these are considered each to utilize one-half of the amount budgeted for a project in a given fiscal year.

6. Exception: Because the service development effort does not require a high-technology labor mix, the following factor is used in estimating employment generated by service development projects: $17,000 per man-year in FY 1974. Also, the indirect labor complement was assumed to be only 50% of the direct. Thus, in FY 1974, $1 million of service development funds is assumed to purchase 59 man-years, 39 direct labor and 20 indirect.

7. As a rounding convention, whole numbers were used. If an odd number of man-years is funded by a given budget item, the extra man-year was considered to be direct labor. (This leads to cumulative totals in which indirect labor is 98% or 99% of direct, instead of 100%.)

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE: NOV 13 1973

In reply refer to:

SUBJECT: Determination and Transfer Order: TACV

FROM: Administrator, UMTA

TO: Assistant Secretary for Administration, TAD-1

Moving the TACV project to FRA, including unobligated balances, is a good management decision. The Congress did not express its movement in the exact manner in which the proposed determination would accomplish the move. The House report simply stated ". . . the Committee feels that the 150 mile per hour TACV should be funded by the Federal Railroad Administration. No funds are recommended under this [UMTA] appropriation for TACV research and development." The Department agreed and obtained FY 1974 funds under a FRA appropriation. The Congress did not enact an "appropriation transfer" for prior funds or authorized positions. However, earlier funds appropriated to UMTA can be moved to FRA under the authority of the Economy Act as stated in the proposed order without Congressional action.

With respect to the movement of authorized positions from UMTA to FRA, there are some constraints. I agree that manpower may be needed by FRA for this project and that such a request of the Congress should be made. In the meantime, the manpower can be provided by either increasing FRA's employment ceiling or UMTA detailing two employees until FRA obtains authorized positions.

The Senate Report took a strong stand on UMTA positions by stating, "The Committee directs that UMTA hire the 363 individuals which will become available upon the enactment of this bill." This indicates that it was not their intention to move positions from UMTA.

In earlier hearings, it was the sense of the Congress that the movement of the project should result in personnel economies. Accordingly, if there is a manpower problem, I recommend that either alternative mentioned above be followed.

Frank C. Herringer

DOT LIBRARY
00399729

8-8-73

Status of Urban Tracked Air Cushion Vehicle
Project

James F. Campbell, URD-22
Thru: Robert A. Hemmes, URD-1
Administrator

To assist the Secretary prepare for the forthcoming meeting with Rohr Company personnel, you asked this office to prepare a briefing memorandum on the status of the Urban Tracked Air Cushion Vehicle Project (UTACV).

I would like to discuss some of the technical aspects of this project.

Background

The UTACV is being looked at as a competitor to commuter rail systems in which a faster, smoother, safer ride can be offered at no appreciable increase in capital costs.

1. UMTA's association with the UTACV dates to May 1971 when Rohr entered a design competition with Vought Aeronautics.

2. Rohr was awarded a contract to construct the vehicle in February 1972. The award to Rohr was based primarily on Rohr's lower cost proposal and the experience level offered by incorporating the (French Aerotrain) Le Monteur Linear Induction Motor.

3. Design of the UTACV test track (located at the Pueblo test site) started in May 1972. Construction started in April 1973.

4. Through FY 1973, program appropriations are $17.3 million.

Status to Date

1. Vehicle acceptance was originally scheduled for July 1973 at Rohr's Chula Vista factory. The date is now set for October 15, 1973.

Status of Urban Tracked Air Cushion Vehicle
Project

James F. Campbell, DOT-TZ
Thomas Robert A. Hamman, UMTA-1

Administrator

To assist the Secretary prepare for the forthcoming meeting with Lear Company personnel, you asked this office to prepare a briefing memorandum on the status of the Urban Tracked Air Cushion Vehicle Project (UTACV).

I would like to discuss some of the industrial aspects of this project.

Background

The UTACV is being looked at as a competitor to commuter rail systems in which a faster, smoother, safer ride can be offered at an appreciable increase in capital cost.

1. UMTA's association with the UTACV dates to May 1971 when Lear entered a design competition with Bendix Corporation.

2. Lear was awarded a contract to construct the vehicle in February 1972. The award to Lear was based primarily on Lear's lower cost proposal and the appearance level offered by incorporating the French company) in Bendix (lower level).

3. Design of the UTACV test track (Jacques as the French call it) started in May 1972. Construction started in April 1973.

4. Through FY 1975, program appropriations are $17.3 million.

Status to date

1. Vehicle acceptance was originally scheduled for July 1973 at Lear's Santa Ana facility. The date is now set for October 31, 1974.

2. DOT and Rohr are near agreement on acceptance criteria for testing at Rohr's Chula Vista factory.

3. A major problem exists with the Variable Voltage Power Controller Unit (which is under Rohr contract with Le Monteur Linear of France and subcontracted to GE-CRLTD, also of France).

4. The UTACV was assembled with very limited component development test experience. For example, the air compressor for the air lentation system is reported to have only ten hours total test time. This could mean a considerable amount of development engineering expense may be required at Pueblo. However, this risk has been acceptable to DOT (TSC, FRA and UMTA) all along.

Test Track at Pueblo

1. Design of the test track started in May 1972. Construction started in April 1973. It is now estimated that a 3.13 mile test track will be completed in February 1974.

2. The full UTACV test track will be approximately ten miles long but a 3.13 mile track will permit tests to 150 mph.

3. The power rail contract has been withheld by DOT pending the final resolution of FY 1974 funds for FRA. Without new FY 1974 funding, the planned test track construction would have exhausted all available FY 1973 funds. We were faced with a situation in which the UTACV would be resting on the 3.13 mile track with no funds for test operations remaining. Approximately $0.9 million could be saved (and used for testing) by reducing the initial track length to 1.5 miles. This is one decision we considered. As of this date, the problem appears to be resolved by the August 6 joint Congressional resoultion appropriating an additional $3 million to FRA. The power rail will be purchased as originally planned.

Dallas-Fort Worth Regional Airport Study

1. The Northern Texas Council of Governments' (NTCOG) Study Committee are planning to recommend the UTACV to the citizenry.

2. The NTCOG requires reasonable demonstration proof that the Rohr concept proves viable through tests at Pueblo.

2. DOT and Boeing are near agreement on acceptance criteria for testing at Boeing's Seattle facility.

3. A major problem exists with the variable noise Boeing Government Jets (which is under Navy contract with is Boeing Lizmar of France and subcontracted to C-CELTO, also of France).

4. The VTOL's are associated with very limited commercial development conditions. For example, the air compressor for the air transition system is reported to have only ten hours total flight time. This would mean a considerable amount of development engineering may be required at Seattle. Further, this crft has been scheduled as DOT (FAA, FAA and NASA) crft alone.

Test Track at Seattle

1. Design of the test track started in May 1971. Construction started in April 1972. It is now estimated that a 3.13 mile test track will be completed in February 1977.

2. The full STOLT test track will be approximately one mile long but a 3.13 mile track will permit tests to 150 mph.

3. The power rail contract has been awarded by DOT covering the final repayment of $17 1/2 funds for FAA. Without the 17 1/2 funding, the planned test track construction would have commenced at Seattle 17 1/2 years. In more final with a situation in which the STOLT would be testing on the 3.13 mile track with an final for test operations remaining. Approximately 50.0 million dollars is saved just upon the testing to reactor the initial test length to 3.1 miles. This is one decision we contained. As of this date, the STOLT appears to be required to the longer 3 total (approximately) requisition appropriating an additional 12 million to FAA. The power rail will be purchased as artificially planned.

Dallas-Fort Worth Regional Airport Study

1. The Northern Texas Council of Governments (NTCOG) Study Committee has planning to recommend the STOLT to the citizenry.

2. The NTCOG requires resumed in commutation proof that the Boeing concept proves plants through tests at Seattle.

3. Considerable additional national interest surrounds these tests. As stated earlier, the UTRCV is being viewed as a competitor to commuter rail systems.

Notes of Interest

1. The government allocated program funds have now been exceeded and the Rohr project manager now estimates that Rohr will experience a $75,000 overrun. It is my opinion that the overrun may exceed this amount.

2. The Rohr project manager, George Ward, is transferring to another Rohr project. His replacement, Tom Tuttle, is acceptable to DOT.

3. Two high level Vought executives have recently been employed by Rohr. They are Walt Hess (Vice President of Advanced Transportation Systems) and Dan Hearn (Director of Marketing).

4. The Vought Corporation is still considered a worthy competitor to Rohr and a $600,000 contract award to Vought will assist in preserving the Vought competitive role.

5. The one big question in the minds of the Rohr corporate staff is "What does the Secretary of Transportation see as the future of this type of vehicle?"

cc:
URD Chron
UMTA File
URD-1(Symes)
URD-22(Campbell)
URD-1(Hejako)
URD-1:SYMES:ajj:8-8-73

3. Centcomm's authorized military interest extends beyond Iran. In global scopes, the CINCC is doing whom it a capability to computer full systems.

Areas of Interest

1. The government affected process that may you been conducted are for project another one relative that they will expedition a [?].00 program. It is my opinion that the pentcos my cause life secret.

2. The for project manager, Irene Kerr, is responsible to review for project. He professed the letter it acceptable to us.

3. Two high level Iranian executives have recently been replaced by Iran. They are Hajj Ibrahim (Vice President of Iranian Transportation Lines) and Ali Nader (Director of Tractors).

4. The Iranian Government is still considering a merger connection to Iran and a 100,000 contract award to Iranian will assist in preserving the Iranian connection role.

5. The one big question in the minds of the Iran personnel staff is "what does the Secretary of Transportation see as the future of the type of vehicle?"

cc:
Gen. Clark
DATA File
DDO-1(Cowen)
DDO-2(Campbell)
DDO-1(Mylan)
DDO-1:SWCS:ajj:6-6-72

Form DOT F 1320.1 (1-67)

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION

OFFICE OF THE SECRETARY

DATE: October 15, 1973

In reply refer to:

SUBJECT: Transfer of UTAGV Project from UMTA to FRA

FROM : R. W. Pinnes, OST (TST-42), Project Officer

TO : M. Klein, FRA (RA-40)
R. A. Hemmes, UMTA (URD-1)
J. L. Dennis, OST (S-53)
M. Miller, OST (TPI-10)
W. Toler, OST (TAD-235)

My memorandum of September 18, 1973, subject as above, requested comments on a draft of the Team's final report to the Deputy Under Secretary for Budget and Program Review on the subject assignment.

The following comments, received in response to my memorandum of September 18, 1973, are forwarded for your information:

(a) UMTA memorandum of September 25, 1973
(b) FRA memorandum of September 28, 1973
(c) OST (TAD) memorandum of October 10, 1973

On the basis of the comments received, there are two areas requiring further resolution:

(1) Transfer of positions from UMTA to FRA.
(2) Clarification of UMTA's continuing role in the project.

To attempt resolution of these issues, a meeting has been set up as follows:

Date: October 25, 1973 (Thursday)
Time: 9:30 A. M.
Place: NASSIF Building, Room 10432

It is requested that all Team members present the factual data required on the issues at the meeting, and be prepared to reach tentative agreement. It is hoped that the issues can be resolved at the Team level, rather than forwarding them to S-5 as unresolved issues. Please bring additional representatives from your office as required to meet this objective.

The current draft of our final report, incorporating the comments received to date, is attached for your consideration. Please provide any comments on this draft at the forthcoming meeting.

R. W. Pinnes

R. W. Pinnes

Attachments

cc: E. J. Ward, FRA (RA-41)
J. F. Campbell, UMTA (URD-22)
W. C. Steber, OST (TST-2)
R. E. Parsons, OST (TST-20)
R. L. Maxwell, OST (TST-41)

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE: SEP 25 1973

In reply refer to:

SUBJECT: Transfer of UTACV project from UMTA to FRA Planning dtd. 9/18/73

FROM: Robert A. Hemmes, Associate Administrator, RD&D UMTA

TO: R. W. Pinnes, OST (TST-42)

In response to your request for input on subject document, the following is offered:

1. There are no positions within UMTA to be transferred to FRA. When the former UTACV Project Manager decided to retire, his position was abolished and has not been maintained on the UMTA R&D personnel allotments.

2. The UMTA FY '73 funds as appropriated for the UTACV are in the amount of $6.351M. The transfer of the remaining FY '73 funds and commitments are to be a part of this transfer as long as

   (a) funds are spent on the 150 mph vehicle program,
   (b) FRA provides a technical and financial accounting report with respect to the accomplishments,
   (c) any overruns are not chargeable to UMTA.

3. With respect to the "Continuing UMTA responsibility" the following is believed appropriate:

   "Public bodies interested in the PTACV are eligible to apply to the Urban Mass Transportation for the designing, planning, and engineering of urban mass transportation projects under the Technical Studies activity of the Office of Transit Planning. The Federal Railroad Administration will provide the necessary technical support for these efforts. The Transportation Systems Center's support will be provided under the Project Plan Agreement funded by the Federal Railroad Administration."

Robert A. Hemmes

Robert A. Hemmes

UNITED STATES GOVERNMENT

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION

Memorandum

DATE: SEP 28 1973

In reply refer to:

TO : Robert W. Pinnes
Project Officer, TST-42

FROM : Associate Administrator for
Research, Development and Demonstrations
THRU: Associate Administrator for Administration

SUBJECT: Transfer of UTACV Project from UMTA to FRA

We have reviewed the draft documents forwarded with your memorandum of September 18 and have the following comments:

1. In the transmittal memorandum, under the Background section after the quotation from the Committee report, it is suggested that the following sentence be included: "The Department agreed to the transfer and so informed the Congress."

2. On the top of page 2, the first sentence under Action Recommended should be revised, since the action being discussed has already been decided and it is not a matter of our Project Team recommendation.

3. Under paragraph 2.a. of the Determination and Transfer Order add: "DOT Contract Number DOT-UT-10026 with LTV."

4. In the Determination and Transfer Order, paragraph 2.d. should be revised to change the position of "one contract administration" to "one contract specialist". With respect to personnel transfers, while the transfers stated are, as we understand it, the existing positions, it is obvious that additional positions will be required as the UTACV program gets to the testing and development stage. Therefore, FRA will require positions beyond those contained in the draft order.

5. For Attachment B, the following FRA assignments are made: Item 2, Wayne Wilson; Items 3, 4, 5, and 7, Ed Ward.

6. We suggest that the time estimated for completion of the various items listed in Attachment B be as follows: Item 2, two weeks; Item 3, one week; Item 4, two weeks; Item 5, one week; Item 7, one week; Item 8, three weeks; Item 9, four weeks; Item 10, four weeks.

6. With respect to Enclosure 2, the "estimated overrun" should be eliminated by reducing the O&M Manual estimate to $33,000, which will balance the books. Also, the "Alternative suggestion" on this sheet is out of date and should be eliminated.

MB Mitchell for

Milton Klein

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

DATE: October 10, 1973

SUBJECT: Transfer of UTACV Project from UMTA to FRA

In reply refer to: TAD-234

FROM : Director of Management Systems

TO : R. W. Pinnes, Project Officer, TST-42

Per your September 18, 1973, request the following TAD comments are offered on your draft report concerning the UTACV transfer:

Draft Determination and Transfer Order

1a. Unless a real basis exists for FRA being able to accomplish this project more economically than UMTA, we recommend deletion of the word "economically" from this paragraph. There appears to be no indication that the Congressional committees anticipate any real economy from the shift.

2d. - In addition to the transfer of authorized positions, accompanying employment ceiling spaces should be mentioned.

- Consideration should be given to deleting the types of positions to be transferred. Although the total number needs to be included, it appears unnecessary and somewhat restrictive to identify the types of positions involved. FRA should determine for itself what kinds of jobs it needs to support the function being transferred.

- Regarding the statement that "no transfer of personnel" will take place, this entire action is considered a "transfer of function" under the RIF regulations. If the employees remain in UMTA with no loss of grade, they have no right to accompany the function. If separations or downgradings occur in UMTA as a result of the transfer, however, the employees have a right to accompany the function.

- It is suggested that when the transfer of this project from UMTA to FRA is to be effected the unions representing employees in UMTA and FRA (Locals 3313 and 2814, AFGE) be advised insofar as any personnel actions that may be involved.

- Specifically regarding the proposed transfer of a "contract administration" position, TAD's Procurement Operations Division (TAD-43) submits that during the past year only .4 manyears of

effort have been utilized in support of the UTACV project. Because of anticipated increases in workload in other contract activities, TAD-43 has forecasted even less expenditure of available manpower over the next 12 months for UTACV. (If significant discrepancies exist between statements of position requirements from UMTA, FRA, and TAD-40, a further, detailed review of staffing resources may be in order.)

Attachments 2 and 3

- It would be helpful if this backup briefly described the contract type, scope of work and status of performance under the contract.

- The financial data presented in the attachments would be more meaningful if

  a. the bottom line total amounts were shown on attachment 3 for all tasks and the total amount of the contract, and

  b. to the extent possible, relate the amounts shown on attachment 2 to those shown on attachment 3. This would reveal the levels of committed and obligated funds.

- It would also be useful if the suggestion in attachment 2 to install a shorter length of test track be expanded to include a brief description of how this is planned to be contractually accomplished and of the technical impact of using a shorter test rail.

John L. McGruder

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

DATE: OCT 15 1973

In reply refer to:

DRAFT

SUBJECT: Transfer of UTACV Project from UMTA to FRA

FROM : Project Team

TO : Deputy Under Secretary for Budget and Program Review

Purpose

To present our proposed response to the Congressional direction on the UMTA Urban Tracked Air Cushion Vehicle (UTACV) project.

Background

Your memorandum of August 13, 1973, listed a number of "Special Reports and Actions Directed by the Appropriations Committee", and set up project teams to establish compliance with the Committee's direction.

This report addresses the following "Title and Subject", as outlined in the August 13, 1973, memorandum:

> "High Speed Ground R&D/UMTA R&D: The Committee sees virtually no practical application for a TACV in an urban mass transportation system (Page 28). The Committee feels that the 150 miles per hour TACV should be funded by the Federal Railroad Administration."

The above reference is to Page 28 of the House Appropriations Committee Report 93-285, of June 15, 1973.

The Department agreed to the proposed transfer. Specifically, the Secretary, in his letter of June 26, 1973, to Senator Robert C. Byrd, relative to the Fiscal Year 1974 appropriations, stated:

> "We intend to follow the House Committee's instructions to combine UMTA's urban TACV research with that conducted by FRA under the High Speed Ground Transportation R&D (HSGT) appropriation."

Project Team

The team established for this item is as follows:

R. W. Pinnes, OST (TST-42), Project Officer
M. Klein, FRA (RA-40)
R. A. Hommes, UMTA (URD-1)
J. L. Dennis, OST (S-53)
M. Miller, OST (TPI-10)

In addition, the Project Officer requested W. Toler, OST (TAD-235), to serve on the team to assist in the preparation of the Determination and Transfer Order.

Action Required

In accordance with the Secretary's statement, the Department is to comply with the Committee's direction by transfering the UTACV project from UMTA to FRA. In FRA, the project will be called the Prototype Tracked Air Cushion Vehicle (PTACV).

The following attachments are presented for your consideration relative to the subject transfer:

Attachment A - A proposed DOT Order, "Determination and Transfer Order: Urban Tracked Air Cushion Vehicle Project", for the Secretary's signature.

Attachment B - A list of the actions required by the proposed DOT Order; the specific responsibilities assigned; and the estimated completion dates, relative to the release of the proposed DOT Order.

Completion of Assignment

We believe that this report completes our assignment. Please let us know if any further action is desired.

R. W. Pinnes, OST (TST-42)
Project Officer

M. Klein, FRA (RA-40)

R. A. Hemmes, UMTA (URD-1)

J. L. Dennis, OST (S-53)

M. Miller, OST (TPI-10)

W. Toler, OST (TAD-235)

Office of the Secretary
Washington, D.C.

DRAFT
OCT 15 1973

ATTACHMENT A

SUBJECT: DETERMINATION AND TRANSFER ORDER: URBAN TRACKED AIR CUSHION VEHICLE PROJECT

1. DETERMINATIONS AND TRANSFERS.

a. This order documents my decision, as Secretary of Transportation, that the Urban Tracked Air Cushion Vehicle (UTACV) Project, currently under the cognizance of the Urban Mass Transportation Administration, can be accomplished more effectively by the Federal Railroad Administration.

b. Accordingly, pursuant to the authority vested in me as Secretary of Transportation by the Department of Transportation Act, Public Law 89-670, I hereby transfer from the Urban Mass Transportation Administration those functions, contracts, records, funds, and positions, identified in paragraph 2 herein, which I determine relate to the functions transferred, to be performed and utilized as directed by the Federal Railroad Administration subject to law.

c. This transfer is in accordance with the Congressional guidance received during the FY 1974 appropriations hearings (Reference: House Report 93-285, pages 28 and 30).

d. The project, in the Federal Railroad Administration, will be called the Prototype Tracked Air Cushion Vehicle (PTACV).

2. RESOURCE IDENTIFICATION.

Accordingly, the following contracts, property and records, funds, and positions are included in this transfer:

a. Contracts

DOT Contract DOT-UT-10031 with Rohr
DOT Contract DOT-UT-10026 with LTV

b. Property and Records

(1) All government owned property relative to Contracts DOT-UT-10031 and DOT-UT-10026

(2) All correspondence, reports, and other printed information related to the contract administration and technical administration of the subject project.

DISTRIBUTION: FRA (5 copies)
UMTA (5 copies)
S-50 (5 copies)
TAD-40 (10 copies)
TAD-10 (5 copies)
TGC-1 (1 copy)
TSC (5 copies)
TST (5 copies)
OPM: Office of Management Systems

DRAFT
OCT 15 1973

c. Funds

All unobligated FY 1973 UTACV funds.

d. Positions

(Note: The transfer of positions, and the accompanying adjustments in employment ceiling spaces, is subject to further resolution. There will be no transfer of personnel.)

3. FY 1973 FUNDING RESTRICTIONS.

The transfer of FY1973 UTACV funds from UMTA to FRA is to be made subject to the following restrictions:

a. These funds are to be spent only on the 150 mph vehicle program.

b. At the completion of the expenditure of these funds, FRA is to provide UMTA with a technical and financial accounting report with respect to the accomplishments.

c. Any additional costs or overruns are to be funded by FRA.

4. SYSTEM IMPLEMENTATION.

The Department will continue to give high priority to efforts to obtain early implementation of the PTACV system. The Federal Railroad Administration will take the lead in these activities, supported by the Urban Mass Transportation Administration and the Transportation Systems Center. Public bodies interested in the PTACV for urban applications are to be advised that they are eligible to apply to the Urban Mass Transportation Administration for the designing, planning, and engineering of urban mass transportation projects under the Technical Studies activity of the Office of Transit Planning. The Transportation Systems Center's support will be provided under the Project Plan Agreement funded by the Federal Railroad Administration.

5. EFFECTIVE DATE.

Implementation of this transfer is to start on the date of this Order, and the transfer is to be completed within one month.

DRAFT

OCT 15 1973

ATTACHMENT B

TRANSFER OF U[illegible] PROJECT FROM UMTA TO FRA

No.	Action Item	Responsibility	Estimated Completion Dat[illegible] (Weeks after completion [illegible] Item No. 1)
1.	Release of DOT Determination and Transfer Order	OST: R. W. Pinnes, TST-42 (To obtain Secretary's signature)	0
2.	Transfer of Contract Administration	UMTA: D. V. Glascoe, TAD-43 FRA : W. W. Wilson, RA-11	2
3.	Transfer of Technical Administration	UMTA: J. F. Campbell, URD-22 FRA : E. J. Ward, RA-41	1
4.	Transfer of Unobligated FY 73 UTACV Funds	UMTA: J. F. Campbell, URD-22 FRA : E. J. Ward, RA-41	2
5.	Transfer of TSC Support	UMTA: J. F. Campbell, URD-22 FRA : E. J. Ward, RA-41	1
6.	Transfer of Positions	OST : W. Toler, TAD-235 (with S-5 Coordination)	2
7.	Assign Responsibility (1) in FRA for System Implementation Efforts, and (2) in UMTA for Possible Technical Studies Support.	FRA : E. J. Ward, RA-41 UMTA: R. H. MacManus, UTP-1	1
8.	Joint Memorandum from FRA and UMTA to Secretary Indicating Completion of Transfer	FRA : J. W. Ingram, RA-1 UMTA: F. C. Herringer, UOA-1 (To be initiated by FRA)	3
9.	Letters to Congressional Appropriations Committees (House and Senate)	OST : R. W. Pinnes, TST-42 (with TCI Coordination)	4
10.	Letter to OMB	OST : R. W. Pinnes, TST-42 (with S-50 Coordination)	4

Henry:
You might be interested to see this
— from UPA file [illegible]
DJS

URBAN TRANSPORTATION APPLICATIONS OF A TACV SYSTEM

By H. W. Merritt[1]

INTRODUCTION

In 1968, at the request of Congress, the Urban Transportation Administration of the U. S. Department of Housing and Urban Development completed a study of new systems of urban transportation.(1) This study found that a combination of new systems would be required to meet the projected needs for urban transportation while creating opportunities for improved urban development.

No single device was conceived that could satisfy the diverse origins and destinations of those who are dependent upon public transportation. While the private automobile was recognized as a close approximation to a universal transportation system, it has serious disadvantages that have been adequately documented elsewhere.

Acknowledgement: This paper was prepared with assistance from the Advanced Systems Division, Office of Research, Development and Demonstrations, Federal Railroad Administration, Washington, D. C., and the Ground Systems Program Division, Office of the Director of Transportation Systems Development, Transportation Systems Center, Cambridge, Massachusetts. 8 June 1973.

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1 Director, Special Projects, Urban Mass Transportation Administration
U. S. Department of Transportation

A comprehensively planned, integrated, combination of systems was considered a more effective means of meeting future needs than the conventional systems presently in use. This realization has led to the development of the following new urban transportation systems:

-- Dial-a-Ride for low density suburban town travel

-- Personal Rapid Transit for higher density trips in extended urban areas

-- Fast Transit Links for providing high-speed service between the remote concentrated centers of activity in metropolitan areas

This paper discusses the urban transportation applications of a tracked air cushion vehicle (TACV). Of the various technologies investigated, a TACV system was considered as having the greatest potential for a fast transit link to:

-- Connect two or more contiguous urban complexes

-- Provide access to remote regional airports

-- Connect large long-haul airports with several short-haul airports

-- Provide commutation along corridors connecting urban centers and new communities.

The characteristics, advantages, costs and potential applications of a TACV system as well as the objectives and schedule of the development program are presented in the following sections.

SYSTEM CHARACTERISTICS

Specifications for an Urban TACV are outlined in Table 1. Performance specifications for this system were prepared by the Transportation Systems

TABLE I. - VEHICLE SPECIFICATIONS (PROTOTYPE)

VEHICLE	
Passenger Capacity	60
DIMENSIONS	
Overall Length	94.0 ft.
Overall Height	10.8 ft.
Overall Width	10.7 ft.
Interior Cabin Height	6.8 ft.
Interior Cabin Width	9.5 ft.
WEIGHT	
Net Vehicle Weight	46,000 lb.
Passenger and Baggage	14,000 lb.
Gross Vehicle Weight	60,000 lb.
POWER	
LIM Propulsion at 150 mph	2,000 KW
Auxiliary Electrical Load	700 KW
Total Electrical Load (Cruise)	2,700 KW
NOISE	
External, 50 ft. at Cruise	73db(A)
Internal	65db(A)

PERFORMANCE	
Cruising Speed	150 mph
Maximum Speed	170 mph
Acceleration Distance to Cruising Speed	1.75 mi.
Normal Stopping Distance	1.5 mi.
Emergency Stopping Distance	0.5 mi.
Allowable Grade at Cruise Speed	5.5%
GUIDEWAY	
Aerial Guideway	142 in.
Reaction Rail Height (Overall)	33 in.
Surface Waviness	1/8" in.25'
Minimum Vertial Turn Radius	10,000 ft.
Minimum Horizontal Turning Radius	1,500 ft.
ELECTRIFICATION (3-Phase AC Power Supplied from Wayside)	
Frequency	60 Hz
Voltage	4,160 volt
Substation Spacing	5.0 mi.

Center in Cambridge, Massachusetts, under the technical direction of the Federal Railroad Administration. They are based on progress in the development of a 300 mph tracked air cushion research vehicle. Performance is considered within the state-of-the-art and reflects current technology developed in the United States, England and France. A cut-away view of the vehicle is shown in Figure 1.[2] Significant features of the UTACV are discussed below:

Guideway. The guideway consists of two elements: the supporting structure and reaction rail. The supporting structure design represents a trade-off between specified ride comfort criteria for the vehicle and economy of construction. By limiting surface waviness to one-eighth inch in 25 feet, the guideway slab can be constructed within the state-of-the-art for modern aircraft runways. Use of standard highway construction practice is also acceptable, if the slab is overlaid with a lift of asphalt to provide the final specified surface smoothness. The asphalt lift offers the additional advantages of simplifying restoration of guideway smoothness disturbed by supporting structure settlement.

Supporting structures for elevated spans can be designed with conventional precast concrete sections. These designs can take advantage

[2] The prototype UTACV is being fabricated by Rohr Industries, Inc., Chula Vista, California, for the Urban Mass Transportation Administration under the U. S. Department of Transportation Contract DOT-UT-10031.

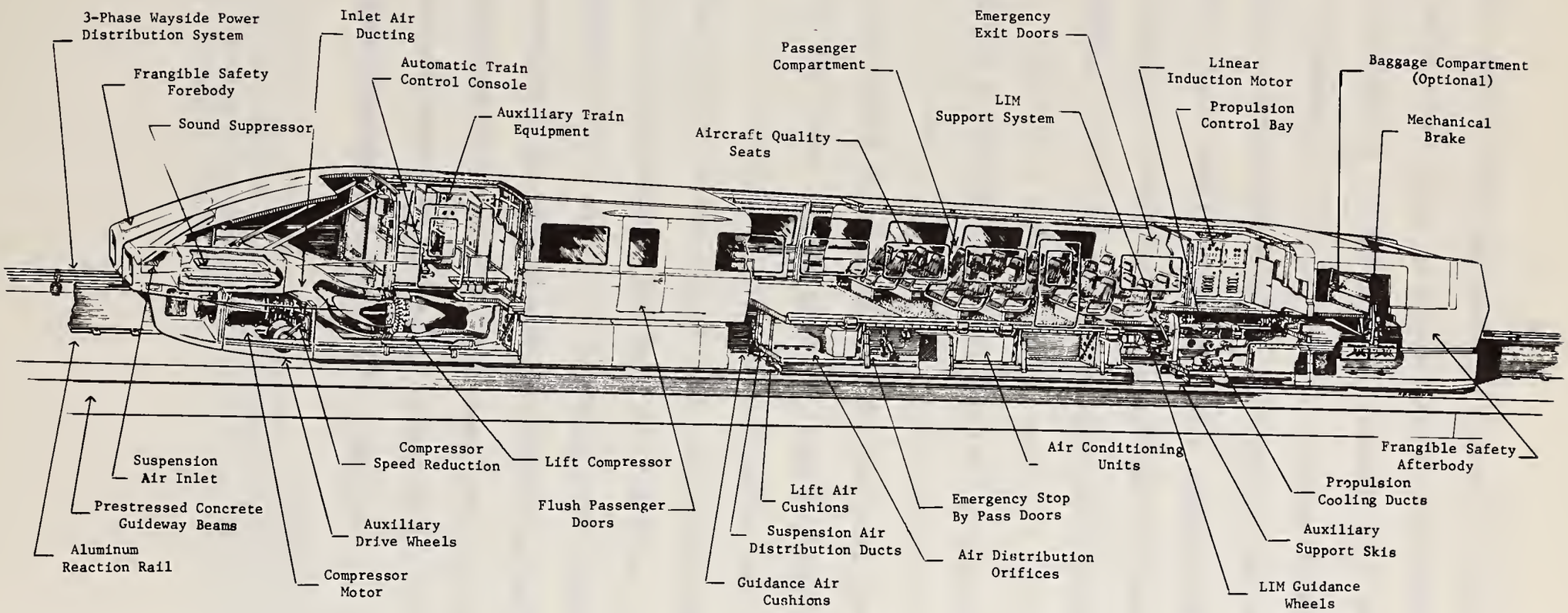


Figure 1. Cutaway view of the 60-passenger prototype UTACV

of the vehicle loads distributed through the air cushions. The most severe design restraint is that imposed by passenger comfort requirements.

The reaction rail performs two functions: it serves as the secondary of the linear induction motor to give thrust to the vehicle, and it provides lateral guidance for the vehicle. The reaction rail is an aluminum extrusion 33 inches high and tapered from 1.8 inches at the base to 0.68 inches at the top. A seven-inch wide flange at the bottom of the rail permits fastening to the guideway slab. The rail extrusions will be 60 feet long of 6061-T6 aluminum alloy with a maximum conductivity of 37 percent. The rail sections will be welded together upon installation with only a few expansion joints needed.

Air Cushions. The vehicle is both supported and guided by air cushions. The cushion designs are based on developments of the Societe Bertin & Cie under the direction of the Societe de l'Aerotrain.

Air is supplied by two electrically driven 350 HP compressors through plenum chambers separately serving the guidance and lift cushions. The lift cushions cover approximately 80 percent of the area under the vehicle. This area and the specified guideway smoothness permit the cushions to operate with an air gap of about one-eighth inch and a nominal air pressure of 0.68 psig. Under these conditions, 200 HP is required to levitate the vehicle. The remaining air supply is required for the guidance cushions and for cooling the linear induction motor.

The guidance cushions have been modified to accommodate a 1500-foot radius curve. They have also been designed to meet lateral acceleration limits with steady winds up to 30 mph and wind gusts up to 60 mph from any direction. The guidance cushions must also be able to laterally support the vehicle on curves with up to ten degrees of superelevation.

The cushion lips are fabricated of flexible material to reduce wear and to enable the vehicle to surmount small obstacles without damage.

Power and Propulsion.[3] Four elements comprise the power and propulsion subsystem.

Primary power to the UTACV system is supplied from an urban power grid at available subtransmission voltages. Distribution along the guideway at primary voltage will be generally underground in urban areas. Substations located at intervals along the guideway will provide control, protection and transformation of primary power to the specified wayside power rail voltage. For the prototype system, a three-phase, 4160 volt, alternating current wayside power system has been selected.

Power collection is from three equally spaced power rails, arranged in delta form, installed along the edge of the guideway. A three-phase pick-up plug, attached to the vehicle by a pantograph, rides captive between the rails. Up to five megawatts of power is transmitted through brushes on the plug to the power conditioning unit in the vehicle.

[3] The linear induction motor and power collector for the prototype vehicle have been supplied by LeMoteur Lineaire, Grenoble, France. The power conditioning unit has been assembled by General Electric Control Rectifiers, Ltd., Stafford, England.

Power conditioning regulates delivered power to provide both smooth, jerk-limited acceleration, and braking when the power supply is reversed. The prototype power conditioning unit is a solid-state thyristor controller which does not vary the frequency. Fixed frequency LIMs do not have a high thrust at zero speed. A small hydraulic motor with two auxiliary drive wheels will accelerate the vehicle to about seven mph, at which point the LIM provides enough thrust to continue accelerating the vehicle without danger of overheating the reaction rail. Development of a variable frequency, variable voltage, power conditioning unit is expected to improve the efficiency and performance of the LIM propulsion subsystem.

The Linear Induction Motor (LIM) provides a starting thrust of approximately 5000 pounds, a maximum thrust of about 10,000 pounds, and 7,000 pounds of thrust at 150 mph cruise speeds. The LIM is double-sided with a cobalt-iron core. Windings are delta connected, concentric wound, with four poles. The motor develops about 2,500 H.P. with 4,160 volts, 60Hz, and is cooled by forced air circulation. The motor mount permits some lateral movement. Eight guide wheels, four forward and four aft, allow the motor to closely follow the reaction rail rather than the motion of the vehicle.

Braking. Three independent braking subsystems provide deceleration from 150 mph to standstill.

Normal braking is accomplished by reversing the phases of the power supply to the LIM (plugging). The reversed thrust will slow the vehicle to approximately 20 mph. Hydraulically actuated mechanical caliper brakes are blended in to bring the vehicle to a complete stop within 1.50 miles from the start of braking action. Back-up for the hydraulic system is provided by a one-time pneumatic actuator. The specified maximum deceleration is 0.15g and average deceleration is 0.0815g.

Emergency braking simultaneously combines LIM plugging and mechanical braking. During an emergency stop, a maximum of 0.4g deceleration is permitted. A complete stop from 150 mph full speed is required within one-half mile.

Redundant braking is effected when an accelerometer fails to sense a 0.25g minimum deceleration rate with all braking systems actuated during emergency braking. The suspension system air plenum is vented, the vehicle is dropped onto five pairs of longitudinal skids and is stopped by guideway friction.

Automatic Control and Communication. This subsystem consists of elements in the vehicle and on the wayside. Automatic Train Operation (ATO) and Automatic Train Protection (ATP) comprise the on-board elements. Wayside elements provide line supervision for a single or multiple vehicle system.

Automatic train operation enables the vehicle to be operated with minimum human intervention. Greater predictability of response and faster response times required for high-speed vehicle operation can be achieved than with manual operation. ATO performs the following sequential functions:

-- Complete the start sequence upon receipt of a dispatch signal from the station attendant

-- Close doors

-- Accelerate to line speed

-- Adjust speed for civil speed changes and schedule deviations

-- Sense station approach

-- Perform stopping profile

-- Stop at station, open doors and start dwell

Automatic train protection is primarily concerned with enforcing civil speed limits and headway control. ATP performs the following functions:

-- Vehicle speed enforcement

-- Right-of-way hazard detection

-- Attendant initiated emergency stops

-- Monitoring vital vehicle functions

-- Vehicle separation control

-- Interlocking (doors closed before vehicle moves)

Manual controls are provided to override the automatic operation in the event an emergency arises which is not within the normal automatic mode of operation. Manual operation is also necessary if the automatic controls fail. A train attendant's console displays status information on speed, acceleration, the status of critical subsystems, and includes a start and an emergency stop button. Foot pedals control thrust and braking. The attendant will be able to operate the vehicle in either a forward or reverse direction with speeds up to 30 mph in reverse. The attendent will also be able to operate the vehicle at creep speeds in stations, on a turntable, or in a maintenance area.

The wayside control system consists of passive position indicators (PPI's) mounted on the guideway and a two-channel radio link. The wayside line surpervision functions include:

-- Central and local line supervision

-- Vehicle dispatching

-- Operating status

-- Corrective strategies

-- Performance level adjustment

-- Dwell adjustment

-- Schedule revision

-- Emergency shut-down of the system.

The PPIs are Alnico-5 bar magnets, 1 by 4 inches, fastened to the concrete subsurface and encapsulated in the asphaltic concrete overlayment. Combinations of PPIs at predetermined locations along the guideway impart pulses to sensors in the vehicle from which speed and location data are derived. The PPIs function as speed zone markers, station stop profile indicators and berthing index markers.

A speedometer/odometer mounted on the LIM guidance wheel provides back-up information on the vehicle speed and distance traveled.

A two-channel 450-470 mHz radio link provides door and emergency controls from the wayside. One channel carries the paired tone burst codes of the commands and acknowledgements required. The other channel is used for voice communication between the station and vehicle attendants.

In summary, vehicle performance has been specified at levels that will insure the system is as comfortable and quiet as the best available public transportation. The linear induction motor and air cushion suspension provide frictionless acceleration and deceleration. Noise and pollution levels are below those of other public transportation systems. The cruise speed of 150 mph can achieve significant savings in line haul travel time with station spacings of 5 to 10 miles and for trip distances out to 50 miles. Completely automatic controls have been specified as being safest at these speeds, though provisions have been made for manual monitoring of operations and overriding the controls.

Systems based on the same technology have been developed and demonstrated in France and England. The system under development in the United States is an advancement over the others in the following aspects:

-- It is the first passenger-carrying prototype to combine all-electric power for both the linear induction motor and air fans

-- It is the first to use fully automatic controls

These are characteristics which should make a UTACV system attractive for urban transportation applications.

SYSTEM ADVANTAGES

For point-to-point line haul travel where patronage levels, system length and station spacings can take advantage of high speeds, a TACV system offers the following potential advantages over a conventional steel wheel on steel rail system:

-- Higher Speed. The maximum operational speed for conventional rail rapid transit cars is 80 mph. The top speed for sustained safe operation of steel wheels on steel rails is about 160 mph. A TACV system can operate at cruise speeds of 150 mph and has the potential for speeds up to 250-300 mph.

-- More Consistent Comfort. Steel rail alignment and wheel roundness are increasingly difficult to maintain as speeds increase. The resulting vibration makes riding less comfortable. TACV air cushions

virtually eliminate contact with the guideway. More consistent passenger comfort results from the lack of high frequency vibrations which would otherwise be transmitted from guideway irregularities.

-- Greater Derailment Safety. The TACV is held captive on the guideway by a 33-inch high rail. This rail provides both vehicle guidance and reactive thrust for the linear electric motor. The risk of derailment is far less than that for a conventional rail system traveling at the same high speeds.

-- Quieter Operations. TACV system specifications require that the external noise level shall not exceed the following at 50 feet from the nearest noise source on the vehicle:

Cruise speed (150 mph)	73 dB(A)
Braking, idling, in terminals	63 dB(A)

Special attention to the design of fan, fan motors, air ducts, cushion lips and other possible sources of noise will make this vehicle quieter than a conventional transit bus pulling away from a stop.

-- Lower Guideway Costs. The absence of concentrated wheel loads and the distribution of lighter loads through the air cushions offer the potential of less expensive guideway construction. Innovations in materials and construction techniques suited to an air cushion suspension

system offer the further possibilities of lower guideway costs. Analyses by the Massachusetts Institute of Technology suggest that significant reductions in guideway construction materials can result from a combination of air cushion suspension and a three-span semi-continuous guideway of advanced design. Maintenance costs should be minimal, since there is virtually no wear on the guideway surface. (No maintenance costs have been incurred in three years for the 11.5-mile guideway for testing the 155 mph Aerotrain TACV near Orleans, France).[2]

Advantages of Higher Speeds. Speeds up to 150 mph for urban travel can be advantageous only if the line haul system is served with an adequate feeder and distributor system. With efficient intermodal integration, speeds up to 150 mph offer several advantages. These advantages are principally in economy of time for the traveler and improved productivity for a given investment in right-of-way and vehicles.[3] These points are discussed in the following sections.

Economy of Time. Total travel time is as much a function of collection and distribution as it is of the line-haul segment of a trip. Travel times associated with feeder services are quite variable and dependent upon local site-specific conditions. Where these services can be adequately integrated into the total transportation system, the implications of line-haul trip times become significant.

Typical urban commutation trips may range from 20 minutes to an hour. The relationship between these times and the distances traversed are shown in Figure 2.

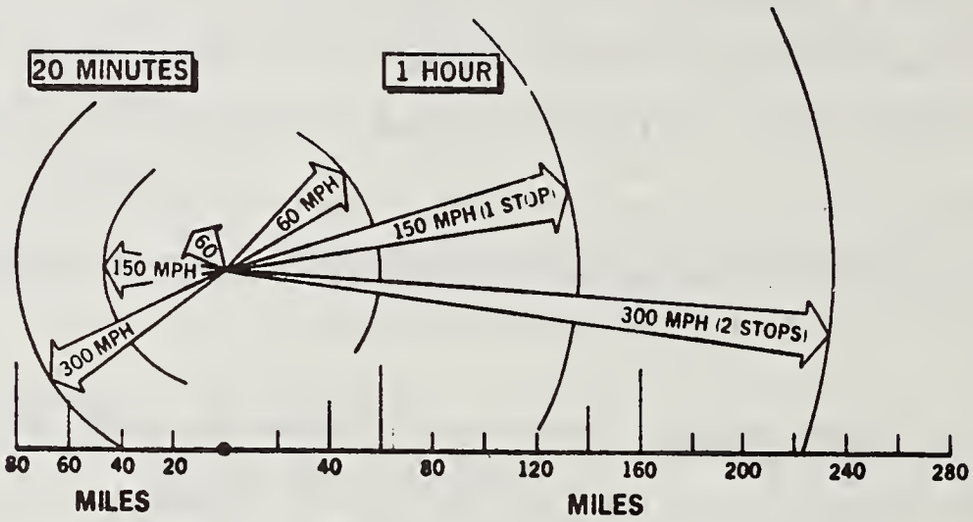


Figure 2. Relationships between speed and trip distance for given travel times.

-- A 20-minute trip using 60 mph conventional transit technology would cover about 19.4 miles, or 17.9 miles with one intermediate one-minute stop

-- The same 20-minute trip with a 150 mph UTACV would extend to 46.5 miles, or 28.5 miles with one-minute stop at eight-mile intervals

-- A one-hour commuter trip served by a 60 mph system would reach about 50 miles with one-minute stops about every 8 miles

-- The same 50-mile trip could be made in about 33.4 minutes with a 150 mph UTACV system

-- A one-hour trip served by a 150 mph system could extend the commutation range to 140 miles with one intermediate stop and to 87 miles with stops about every 8 miles

Similiar relationships are shown in Figure 2 for a 300 mph advanced tracked levitated vehicle system.

The economy of time offered by a 150 mph TACV system makes possible several urban planning alternatives.

-- For a given investment in travel time, a UTACV system can widen the sphere of commercial and social interaction

. Additional housing and job opportunities could be made available within the time people are willing to spend commuting between home and work

. Large regional airports, with their environmental problems, could be located at greater distances from urban centers, yet would be accessible within reasonable travel times (4)

-- The availability of a high-speed ground transportation system could change the development patterns of metropolitan areas

. Several short-haul airports could be interconnected with a high-speed access system to serve a single, large, long-haul, regional airport (5)

. The spatial organization of metropolitan areas could be changed through the development of multi-centered cities (new communities, new towns in town), with preserved open spaces between (6)

-- For a given line-haul distance, a 150 mph UTACV system can reduce travel times to half those of conventional systems. While trips on stage lengths shorter than eight miles can make use of the 150 mph speed capability, actual time savings with a UTACV system do not become significant until system lengths exceed 30 miles. For systems less than 30 miles long there are other compensating advantages which are discussed below.

Increased Productivity. Higher speeds improve system productivity for a given stage length by:

-- Increasing the level and frequency of service for a given inventory of vehicles, or

-- Reducing the number of vehicles required to provide a given level and frequency of service.

These principles are illustrated in the following two figures. Figure 3 shows that more seat miles and more frequent service can be provided in a fixed period of time as vehicle speeds are increased from 60 mph to 150 mph and 300 mph.

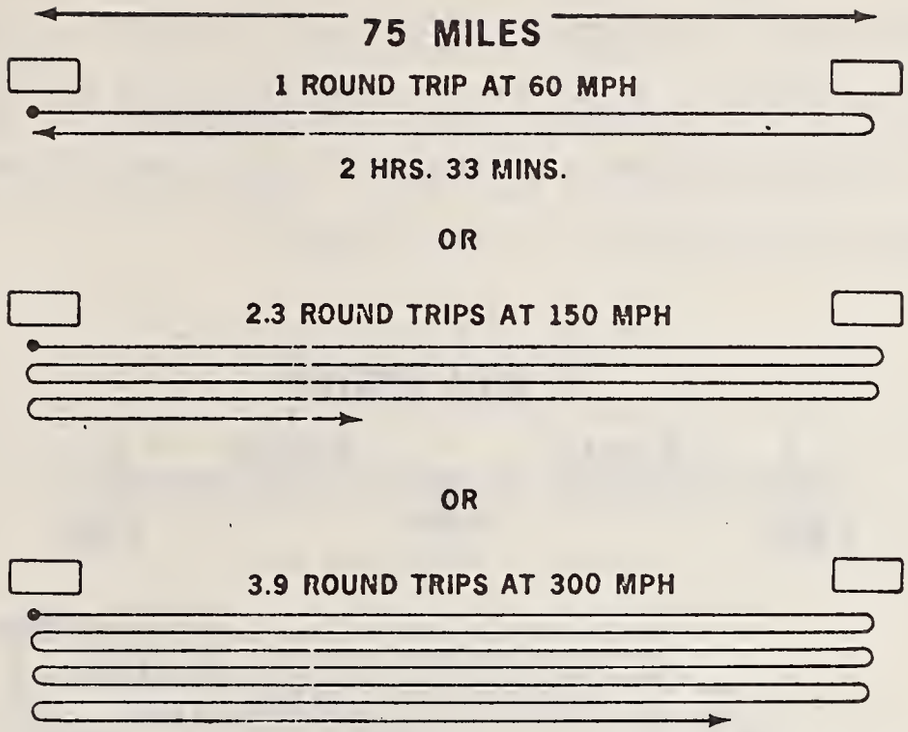


Figure 3. Relationship between round trips and increased vehicle speeds.

Figure 4 roughly approximates the Dallas-Fort Worth airport access system presently under study. For a 60 mph system, eight trains operating at 9.7-minute headways can provide travel times at a minimum of 34 minutes and a maximum of 43.7 minutes. At speeds up to 100 mph, six trains at 9.2-minute headways can reduce travel times to a range of 22.6 to 31.8 minutes. Increasing the speed another 50 mph to 150 mph can save another five minutes. While this saving may not be significant, five 150 mph trains could service the system

at 8.9-minute headways and four trains, or half the number of 60 mph trains, could service the system at 11.4-minute headways. A 150 mph speed appears optimum for this stage length, since increasing the speed to 200 mph at ten-minute headways requires the same number of trains (four) with no appreciable reduction in travel times.[3]

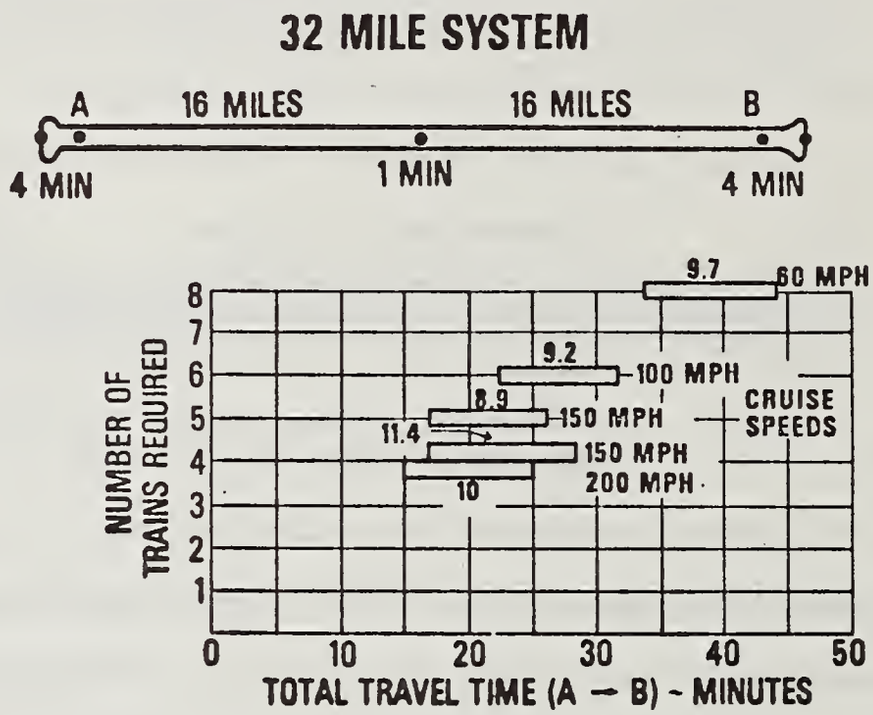


Figure 4. Relationship between number of trains and total travel time for a given operational profile

In summary, a UTACV system offers many performance characteristics that are potentially advantageous for urban transportation applications. The system can provide more consistent comfort, quieter operations, greater derailment safety over less costly guideways at higher speeds

than conventional rail systems. The higher speeds offer the opportunity to reduce travel times and increase productivity for a given investment in facilities. These advantages, if used creatively, can influence commutation patterns and urban development in growing metropolitan areas.

COMPARATIVE COST ANALYSIS

The ability of a transportation system to defray total annualized costs through fare-box revenues is a measure of the system's financial viability. This ability is also a useful basis for comparing different systems providing comparable service.

The Transportation Systems Center, Cambridge, Massachusetts, has conducted an analysis of UTACV system costs in comparison with costs of other line-haul systems, including rail rapid transit and express bus systems.[7] The total annualized costs of the systems include all costs for operations, maintenance and debt financing of capital facilities. The primary parameters considered in this analysis included the method of system financing, the system length and the volume of system patronage.

To facilitate this comparison a baseline transportation system for line-haul service was established. Each case assumed a route over an exclusive guideway with one-third of the route elevated and two-thirds at grade. A range of patronage from 2.3 to 10.6-million passenger trips per year was

analyzed for route lengths of 10, 20 and 35 miles. The baseline vehicle characteristics for the three systems are summarized in Table 2 below.

TABLE 2. BASELINE VEHICLE CHARACTERISTICS

	UTACV	RAIL RAPID	EXP.BUS
Vehicle Cruise Speed, mph	150	75	50
Vehicle Capacity, passengers	80	75	50

Table 3 lists the base unit operating and maintenance costs for the various baseline systems. Table 4 provides the unit capital costs used for comparative purposes.

TABLE 3

BASE UNIT OPERATING AND MAINTENANCE COSTS FOR VARIOUS BASELINE SYSTEMS

PARAMETER	UTACV	RAPID RAIL	EXPRESS BUS
ENERGY, ¢/SEAT MILE	.20	.11	.08
OPERATIONS & LABOR ¢/SEAT MILE	.61	.70	1.16
VEHICLE MAINTENANCE, ¢/SEAT MI	.28	.31	.44
ELECTRICAL MAINTENANCE, ¢/SEAT MILE	.11	.13	0
OVERHEAD; ¢/SEAT MILE	.23	.27	.60
GUIDEWAY MAINTENANCE, $/LN. MI./YR.	2000	2000	4000

TABLE 4

UNIT CAPITAL COSTS USED FOR COMPARATIVE PURPOSES

COST PARAMETER	UTACV	RAPID RAIL	EXPRESS BUS
1. GUIDEWAY (1/3 ELEVATED 2/3 ON-GRADE), ALL COSTS $MILLION/MILE			
A. Base Cost	1.86	1.86	1.86
B. Electrification	0.344	0.344	0
C. Control & Instrumentation	0.411	0.411	0.035
D. Safety Guards	0.042	0.042	0.042
E. Substructure	0.172	0.172	0.172
F. Site Preparation	0.155	0.155	0.155
G. Reaction Rail	0.165	0	0
H. Electrical Substation	0.02	0.02	0
I. Engineering (% of total cost)	4.5%	4.5%	4.5%
Total Cost, $Million/Mile	3.2	3.0	2.3
2. VEHICLES, $MILLION			
A. First Vehicle	2.6	0.75	0.09
B. Over Ten	1.85	0.50	0.06
3. TERMINALS, AIR, $MILLION			
A. Base Cost	7.5	7.5	7.5
B. Vol. Dep. Cost, f (PHR), f =	0.006	0.006	0.006
4. TERMINALS, COMMUTER, $MILLION			
A. Base Cost	0.86	0.86	0.86
B. Vol. Dep. cost, f (PHR), f =	0.004	0.004	0.004
5. PARKING LOTS, $MILLION	0.275	0.275	0.275
6. MAINTENANCE FACILITIES, $MILLION			
A. Base Cost	5.0	5.0	5.0
B. Vol. Dep, Cost, f (No. Veh.), f =	0.025	0.025	0.025

Analysis of Primary Parameters. The results of the analyses of the primary parameters contained in reference (7) are summarized in the following discussion.

Method of Financing. The method of financing determines how system revenues are allocated to cover total annualized costs. The Urban Mass Transportation Act of 1964 recognized the need to assist local transit agencies in the construction, acquisition or improvement of facilities and rolling stock where revenues were not likely to cover total annualized costs. The Act authorizes capital assistance up to two-thirds of the cost of that part of the project which cannot be reasonably financed from revenues (net project cost). The remaining one-third of the net project cost must be provided by the local community from cash surpluses, replacement or depreciation funds, or reserves available in cash or new capital. The local one-third share cannot be provided from sources such as bonds financed by fare-box revenues.

Where a project qualifies for Federal financial assistance, the break-even fare level need cover only the system operating and maintenance costs. Under this method of financing, there are several advantages in lower operating and maintenance costs which warrant consideration in planning a new urban transportation system.

-- Comparatively lower fare levels should obtain for a highly automated system that is less labor intensive, has fewer items of rotating machinery and has less guideway wear than conventional systems

-- Fare levels less sensitive to inflationary escalation should become comparatively more favorable as time progresses

-- The higher capital cost of a more sophisticated system may be partially offset by the reduced numbers of vehicles required for a given level of service at high speeds. The reduced number of vehicles should also contribute to overall lower operating and maintenance costs.

System Length. The TSC analyses (7) found that for a given volume of patronage, the break-even fare level required to defray the total annualized costs is affected by the system length. The method of financing determines the degree to which fare levels are affected by system length. Where there is no debt financing and revenues are applied only to operating and maintenance costs, fare levels are relatively insensitive to system length. With full debt financing, break-even fare levels are significantly affected by the length of the system.

The primary factor affecting this relationship is the ratio of vehicle costs to guideway costs. As trip distances decrease, the average speed of the

vehicles decrease, their productivity is reduced and the ratio of vehicle costs to guideway costs increases. This ratio causes fare levels for a UTACV system to begin to increase for system lengths less than 40 miles. A sharp increase occurs at lengths less than ten miles which suggests that a UTACV system shorter than ten miles is financially undesirable, unless it can be incorporated into extensions more than 40 miles long.

System Patronage. For a given system installation, the break-even fare level is dependent upon system patronage. An acceptable fare level requires a minimum volume of patronage. To be economically viable, a typical ten-mile UTACV system would require a minimum of 4-million passengers per year to totally annualize the costs at a fare level of 25 cents per passenger mile. Without the need for debt financing, either the patronage or fare level could be considerably reduced while maintaining a viable system.

The relationships discussed above are shown in Figure 5. The break-even fare level versus annual ridership for three comparable systems is presented. For full debt retirement, fare levels for a UTACV exceed the least expensive express bus by about six cents per passenger mile at 2-million passengers per year. This difference is reduced to three cents per passenger mile or less at patronage volume of 4-million or more passengers per year. Where no debt service is required, three cents per passenger mile makes a UTACV system an attractive alternative to a rail rapid or express bus line-haul system.

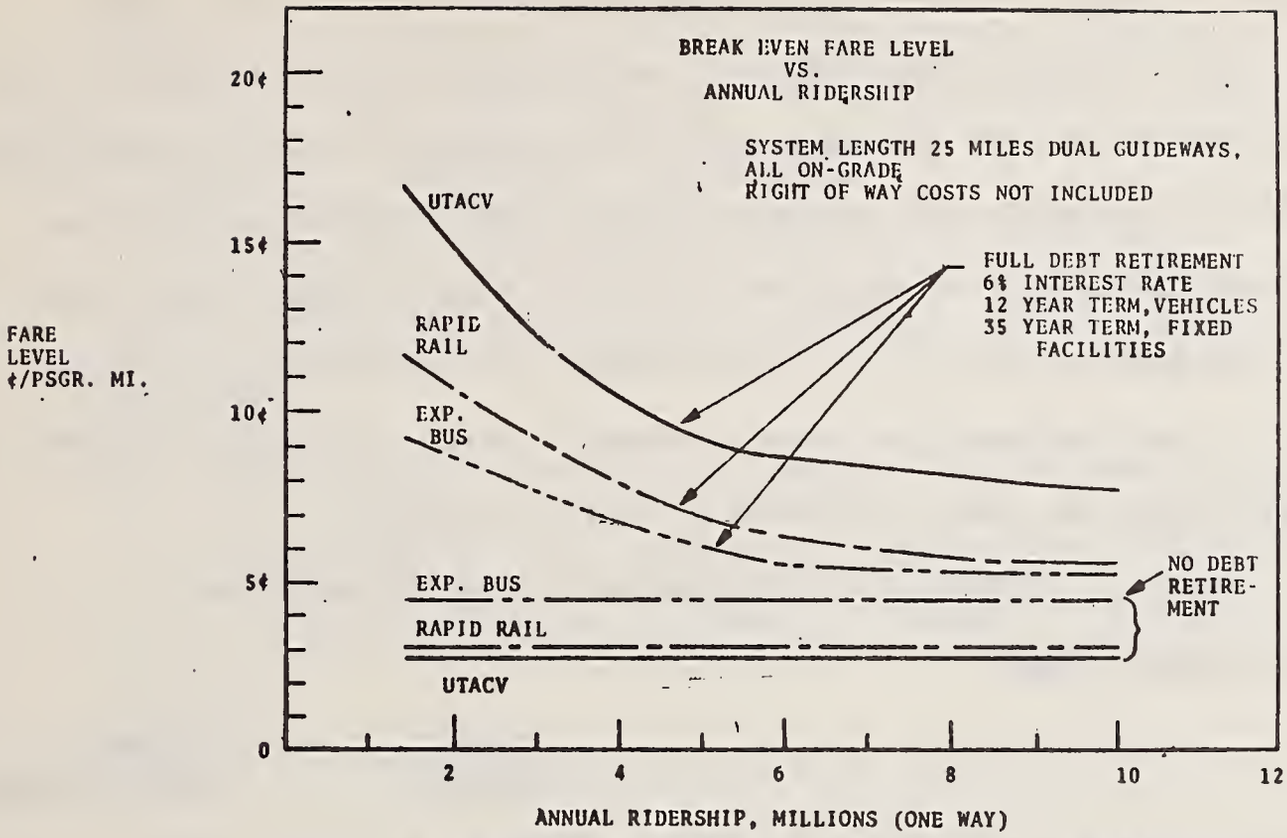
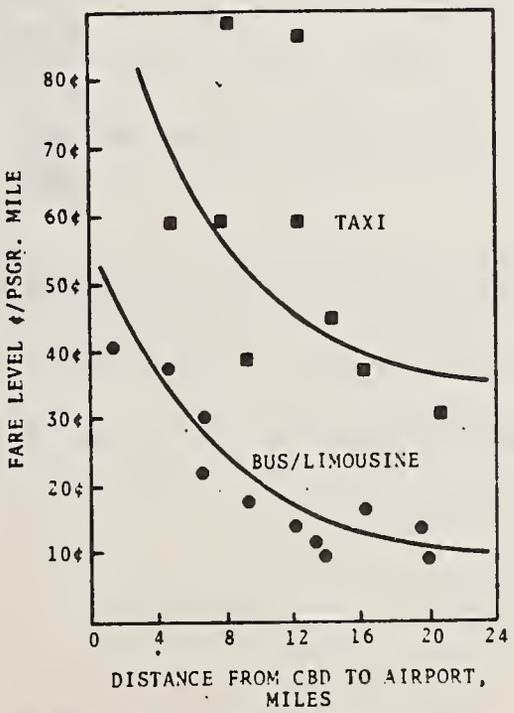


Figure 5. Break-even fare level vs. annual ridership

Even with full debt financing, the fare levels for a UTACV system are likely to be less than those presently being charged for access to major airports, as shown in Figure 6.



*Source, "Survey of Ground-Access Problems at Airports, "Transportation Engineering Journal Proceedings of the American Society of Civil Engineers, February 1969.

Figure 6. Existing Fare Structures for Access to Major Airports

UTACV guideway and system costs need not be out of line with other transit system installations. Table 5 presents data collected in October 1972 on the capital costs for guideways and total systems for current installations. Estimates for the UTACV were based on the study for a 16-mile installation between the Los Angeles International Airport and San Fernando Valley, and on firm fixed-price bids for a 13-mile installation at Dulles International Airport. These estimates have been confirmed recently by the bids received for constructing the UTACV test track at Pueblo, Colorado.

TABLE 5. COMPARISON OF GUIDEWAY AND SYSTEM CAPITAL COSTS

GUIDEWAY CAPITAL COSTS

	TRANSIT SYSTEM	GUIDEWAY COST ($M/Mile)
Rail Rapid Transit	BART	3.4
	CTA	4.0
	MBTA	4.6
Transit Expressway	TERL	5.7
UTACV	-	3-5

TOTAL SYSTEM CAPITAL COSTS

	TRANSIT SYSTEM	TOTAL COST ($M/Mile)
Rail Rapid Transit	BART	16
	CTA	7.5*
	MBTA	11.7
	D. C. Metro	30
Transit Expressway	TERL	20
UTACV	—	10-15*

* Right-of-way available.

Based on the assumption that a new guideway would be required for all the compared systems operating under the defined baseline situations, the TSC comparative cost study concluded that:

-- The O&M costs for a UTACV system are less than for the other systems compared and will become increasingly favorable as time progresses

-- The capital costs for the UTACV are somewhat greater than for the other systems compared, but this disadvantage can be effectively offset, as seen through the fare levels, by means of non-revenue financing

-- The method of system financing has a large impact on required fare levels. Adoption of methods currently in practice with existing ground transportation systems and encouraged by the 1964 Urban Mass Transportation Act tends to favor those systems such as the UTACV which are capital intensive and low in O&M costs

-- The UTACV system is financially more suitable for applications involving long hauls or widely spaced station stops while the slower systems such as the express bus are more suitable for short haul applications

-- It is estimated that, for the Nation's 20 largest airports, there exist potential applications where a high speed ground access system can generate ridership sufficient to financially support the UTACV system.

UTACV PROGRAM PLAN

The goal of the Urban Tracked Air Cushion Vehicle Program is to establish a TACV system as a viable urban transportation alternative for funding under the UMTA Capital Grant Program. The specific limited objectives of the program are to:

-- Verify system performance on such features as ride quality, noise and safe high-speed operations

-- Provide public officials with measured data on system performance, reliability, safety and environmental impact.

The UTACV Program has been planned and is being accomplished in four phases:

Phase I - Engineering Design

This phase covered the engineering design of a state-of-the-art, 60-passenger prototype vehicle propelled by a linear electric motor, design of site independent aspects of facilities for a complete system including guideway, wayside power distribution, wayside control system, passenger and baggage handling facilities, and a vehicle maintenance facility.

On May 12, 1971 proposals were requested for the design and fabrication of a TACV in conformance with a scope of work and performance specifications prepared by the Transportation Systems Center and the Federal Railroad Administration. On June 30, 1971 cost plus fixed fee contracts were awarded to

Rohr Industries, Inc. and to the Vought Aeronautics Company. Designs were completed and proposals submitted in December 1971 for fabrication of the prototype vehicle. Following review of these designs a cost plus incentive fee contract was awarded to Rohr on 18 Feburary 1972, for fabrication of the prototype vehicle, representing the state-of-the-art in TACV technology.

Vought has continued the study of several innovations not included in the original UTACV designs. These new concepts are potentially advantageous for certain revenue applications and include the following features:

-- Single-sided linear induction motor

-- Variable frequency power conditioner

-- Magnetic guidance

-- High pressure levitation cushions on moveable trucks.

Phase II - Vehicle Fabrication

The second phase provides for fabrication of a prototype vehicle in accordance with documentation prepared under Phase I. Components and subsystems will be tested prior to and during assembly in the vehicle. The complete vehicle will be checked out both statically and through operational tests on a short, 500-foot, section of guideway, at the Rohr plant.

Final documentation is to include engineering drawings and design specifications in sufficient detail for competitive procurement of a vehicle and related facilities by a local public agency. This phase will also require the delivery of in-plant vehicle test results, system-engineering design studies, costs analyses, and a system test plan. Phase II will extend for 16 months after the contract award.

Phase III - Test Operations

This phase includes the acquisition of test facilities at the Department's High-Speed Ground Test Center at Pueblo, Colorado, as well as the acceptance and system tests to be conducted with the prototype vehicle.

Test facilities are planned to include:

-- 10.5 miles of test track with:

  . concrete guideway slab

  . three-phase, 4160 volt, wayside power rails

  . aluminum reaction and guide rail

  . an elevated, eight-span, section of track

  . a guideway switch

-- Access and service road with drainage and erosion control

-- Maintenance building and control center

-- Primary power supply and substation provided by the Federal Railroad Administration

Designs of the facilities are complete. Bid packages were released on 23 February 1973; proposals were submitted on 20 March 1973. Contract awards were made on 4 May 1973 and construction is expected to start before the end of the month. The UTACV test facilities are shown in Figure 7 on the attached map of the High Speed Ground Test Center.

Depending upon the availability of completed facilities, test operations are planned in accordance with the following schedule:

-- July 1973 - October 1973
  Low-speed tests on an initial 500 to 1500 feet of guideway

-- November 1973 - June 1974
  High-speed tests on 3 to 5 miles of guideway

-- July 1974 to December 1974
  Operational tests on the completed 10.5-mile loop

Experience gained from construction of these test facilities and results of the test operations are expected to provide local officials with valid data for planning a revenue system.

Phase IV - Revenue System

Installation of a revenue system is expected to be accomplished with financial assistance from UMTA's technical studies and capital grants programs. No demonstration of a UTACV system in an urban area is contemplated with RD&D funds.

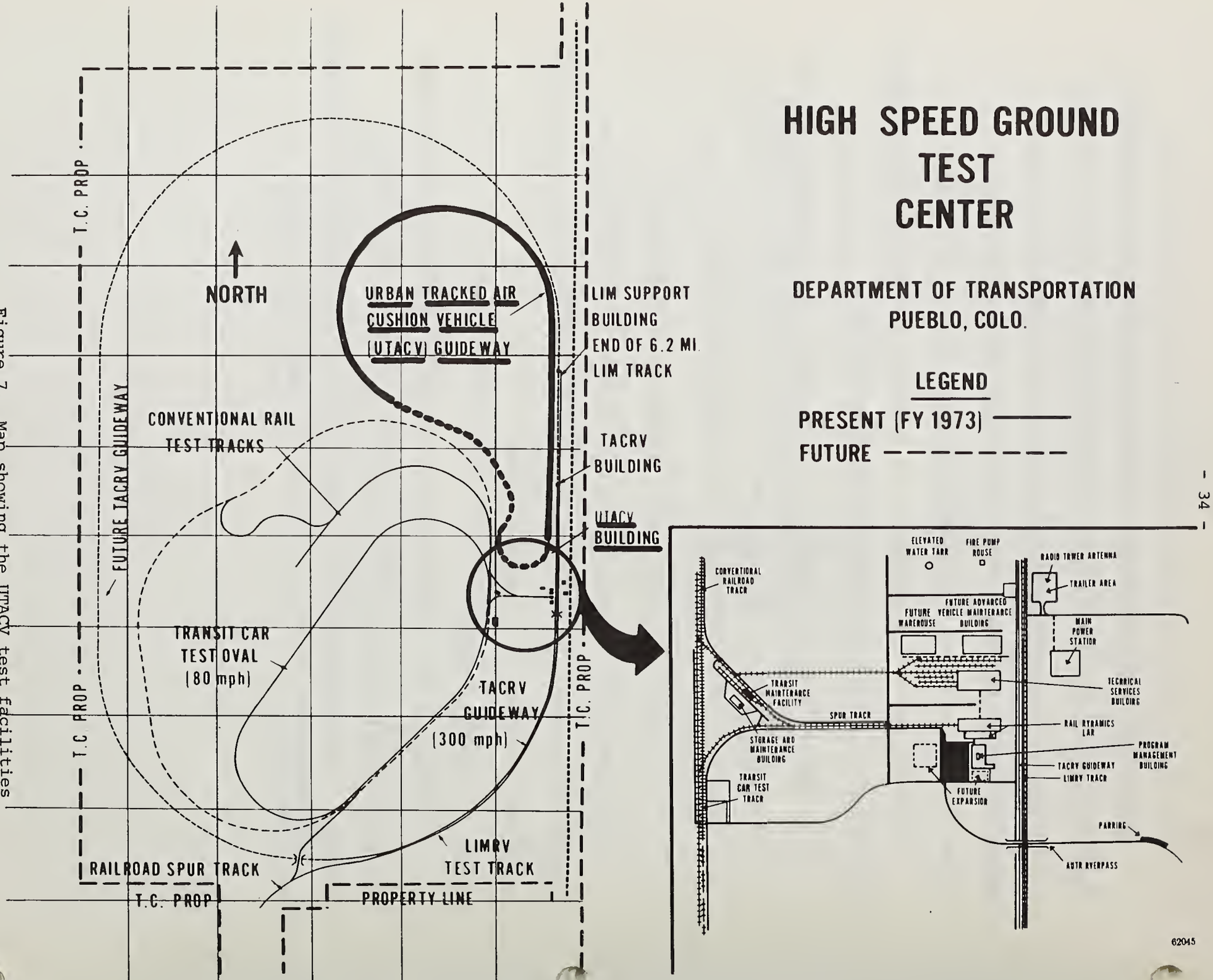


Figure 7. Map showing the UTACV test facilities

On 20 March 1972 the City Council of Dallas, Texas, and on 27 March 1972 the City Council of Fort Worth, Texas, passed similar resolutions to support an Addendum to the Regional Public Transportation Study to perform a UTACV technical study. These resolutions provided:

-- Funds or contributed services in the amount of $83,000 each as the matching share of a $332,000 technical study grant from UMTA

-- Agreed to actively seek to obtain the necessary funds to construct a TACV system within the travel corridor, if the study indicates that the construction of a TACV system is not only feasible, but in the best interest of the citizens from a financial, environmental, and travel demand standpoint.

On 6 June 1972, the Administrator, UMTA, approved the technical study, with the provision that certain tasks of the Regional Public Transportation Study be completed before proceeding with all the tasks on the TACV study. The evaluation of alternative transportation systems in the travel corridor has been completed sufficiently to substantiate the possible application of a TACV system in revenue service. Results of the regional transportation study warrant a detailed analysis of the proposed TACV installation.

On January 23, 1973 the North Central Texas Council of Governments was authorized to proceed with the remaining tasks in the TACV technical study. This study encompasses the following three main elements:

-- Preliminary engineering of the route, including aerial surveys, soil analyses and the need for right-of-way acquisition

-- Economic analysis of the system, including patronage, revenue return, operating costs, capital costs and methods of financing

-- Environmental impact analysis, including noise, visual impacts, intrusion, disruption and other social and economic effects of the installation

This study will be completed in about one year. Results of the study will provide the basis for local decisions on whether to proceed with the project, to hold public hearings and to develop an application for capital assistance under the Urban Mass Transportation Act. Results from testing the state-of-the-art prototype and from the analysis of advanced system designs will play major roles in the local and Federal decisions to proceed with a revenue system.

A more detailed program schedule is presented in Table 6.

Program Management

The Director, Special Projects, in UMTA, is responsible for overall management of the UTACV Program. Project engineering is provided by the Advanced Systems Division of the Federal Railroad Administration. Technical support for the project is provided by the UTACV program team of the Transportation Systems Center. Responsibilities for TSC include:

-- Preparation of system technical and performance specifications

-- Monitoring vehicle fabrication contracts to insure compliance with technical and performance specifications as well as with quality assurance standards

TABLE 6. UTACV PROGRAM SCHEDULE

-- Phase I - Engineering Design	
. Prototype Vehicle Design Contracts Awarded	28 June 1971
. Designs Completed, Phase II Proposals Submitted	15 December 1971
. Advanced TLV Design Contract Award	15 May 1973
. Advanced TLV Design Complete	15 February 1974
-- Phase II - Vehicle Fabrication	
. Contract Awarded	18 February 1972
. Vehicle Complete	30 June 1973
. Acceptance Tests Completed	15 August 1973
. Vehicle Received at Pueblo	1 September 1973
-- Phase III - Test Operations	
. Facility Design Contract Awarded	30 June 1972
. Facility Designs Complete	1 November 1973
. Construction Contract Awarded	4 May 1973
. Construction Complete	1 July 1974
. Test Operations Begin	1 September 1973
. Test Operations Complete	15 July 1975
-- Phase IV - Revenue System	
. Proceed with Technical Study	23 January 1973
. Complete Technical Study	15 January 1974
. Complete Capital Grant Application	1 June 1974
. Commence Final Design	30 June 1974
. Complete Final Design	1 April 1975
. Commence Construction	1 July 1975

-- Supervising test operations, including the inspection of test facilities, the planning of test programs and the evaluation of test results

-- Conducting technology and systems analyses to investigate the worth of advanced alternate concepts, to verify the engineering on critical components, and to establish the costs and environmental impacts of system applications.

Though the UTACV is being developed as a Department-wide program, it is being managed by UMTA for three reasons:

-- Such a system, whether inter or intra-urban, must begin, end and/or pass through an urban area. The routes, stations, service levels,and transportation feeder systems must evolve as part of the local comprehensively planned metropolitan area transportation system. Adequate consideration must be given to the disruption, socio-economic effects and environmental impacts this system would have on the local communities it would traverse.

-- Close coordination of research and development with technical planning studies will help insure that the tested system can satisfy an operational requirement in an urban setting. This coordination can also help local transportation planners take full advantage of the capabilities this new system offers.

-- UMTA's technical study and capital grant programs can make Federal financial assistance available to qualified local agencies for the implementation of a revenue system in an urban area.

With continued strong support from other offices and administrations in the Department, the likelihood is good that the program's goals and objectives will be achieved.

APPENDIX A

REFERENCES

1. U. S. Department of Housing and Urban Development; Tomorrow's Transportation - New Systems for the Urban Future; Report from the President to the Congress; Washington, D. C. ; May 1968.
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4. U. S. Department of Transportation and National Aeronautics and Space Administration; Civil Aviation Research and Development Policy Study; Joint DOT-NASA Report; Washington, D. C. ; March 1971.
5. Aviation Advisory Commission; The Long Range Needs of Aviation; Report to the President and the Congress; Washington, D. C. ; 3 January 1973.
6. Stanford Research Institute; Future Urban Transportation Systems; Impacts on Urban Life and Form; Final Report II prepared for the U. S. Department of Housing and Urban Development; Menlo Park, California; March 1968.
7. U. S. Department of Transportation; Engineering Cost Analysis of the Urban Tracked Air Cushion Vehicle System; Preliminary Memorandum prepared by the Transportation Systems Center, Cambridge, Massachusetts; June 1972.

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE: FEB 1 1973

In reply refer to:

SUBJECT: Acquisition Paper for Urban Tracked Air Cushion Vehicle Program

FROM : Administrator

TO : The Secretary

Through: Chairman, Transportation Systems Acquisition Review Council (TSARC)

Forwarded for your review is an Acquisition Paper (AP) for the UMTA Urban Tracked Air Cushion Vehicle Project.

This paper complies with the 7 December 1972 Memorandum from the Executive Secretary, TSARC (TAD-60) in that:

-- It does not include any plans for prototyping the Vought vehicle,
-- It is supported by a credible commitment by Vought if another $600,000 of design were funded, to compete with other UTLV producers on a fixed price basis,
-- It encompasses the entire UMTA TACV program, rather than just the Vought effort.

This paper also reflects guidance from TSARC on acquisition of the UTACV test facilities. This guidance was imparted during the review on 21 December 1972 and in Executive Secretary, TSARC, Memorandum of 4 January, 1973.

Approval is requested to proceed with the design only of the advanced UTLV. Concurrence with action taken to revise acquisition of the UTACV test facilities is also requested.

/s/ C. C. Villarreal
Administrator

C. C. Villarreal

Attachment

UMTA URBAN TRACKED AIR CUSHION VEHICLE PROJECT

I. Major Systems Identification

a) System Description

The Urban Mass Transportation Administration is currently engaged in a multi-phased program to design, fabricate, test and introduce into revenue service urban tracked air cushion vehicle (UTACV) systems. Because of its unique performance characteristics, the UTACV possesses significant potential for improving transportation within the urban environment. The technical features of the UTACV including 150 mph speed, air levitation, linear induction motor propulsion, wayside power pick-up and fully automated operation exhibit significant operational advantages over more conventional systems for urban line haul applications. The UTACV will permit shorter travel times, improved passenger comfort, reduced operational and maintenance costs, increased safety and less environmental intrusion for the following urban applications:

-- Linking two or more contiguous urban complexes

-- Connecting large outlying airports with urban centers

-- Linking major activity centers or densely populated suburbs with the CBD

-- Connecting large long haul airports with several short haul airports.

The ultimate goal of the UMTA TACV Program is to qualify two competing sources for revenue service. Since construction and installation of the system would be assisted financially under UMTA's Capital Grant Program, competitive procurement is required under the grant procedures as a matter of policy. This two-source concept was initiated in July 1971 with a design competition for two TACV systems between Rohr Industries, Inc. and the Vought Aeronautics Company.

b) Description of Acquisition Techniques

The UTACV Project has been planned in four phases. Each phase and appropriate acquisition techniques are described in the following sections:

Phase I - Engineering Design

Phase IA - This phase covered the engineering design of a state-of-the-art, 60-passenger prototype vehicle propelled by a linear electric motor, design of site-independent aspects of facilities for a complete system including guideway, wayside power distribution, wayside control system, passenger and baggage handling facilities, and a vehicle maintenance facility.

Also included in the first phase was the preparation of a full-scale mockup of the vehicle. Six months after the start of Phase I, the contractors were to submit preliminary engineering drawings and design specifications, supporting analyses, a program plan, and a cost proposal for undertaking Phase II.

On 12 May 1971 proposals were requested for the design and fabrication of a TACV in conformance with a scope of work and performance specifications prepared by TSC and FRA. On 30 June 1971 cost plus fixed fee contracts were awarded to Rohr Industries, Inc. and to the Vought Aeronautics Company, Designs were completed and proposals submitted in December 1971 for fabrication of the prototype vehicle. Following review of these designs a contract was awarded to Rohr, in February 1972, for fabrication of the first vehicle, representing the state-of-the-art in TACV technology.

Phase IB - Subsequent to the award of the Rohr prototype contract, Vought reexamined its corporate position with respect to TACV technology. From this examination, two corporate decisions were made:

-- Vought intends to remain competitive in the TACV field. This position is supported by the attached letter dated 8 January 1973 from the Vice President and General Manager of their Ground Transportation Division.

-- Vought intends to advance TACV technology to enhance the usefulness of this system in urban applications. This advanced system is to be designated an Urban Tracked Levitated Vehicle (UTLV).

Continued corporate support has led to a proposal for revision of its earlier prototype design that will incorporate several technical innovations not included in the UTACV system. These new concepts are potentially advantageous for certain revenue applications and include the following features:

-- Single-sided linear induction motor

-- Variable frequency power conditioner

-- Magnetic guidance

-- High pressure levitation cushions on moveable trucks.

These factors offer the potential for:

-- Increasing system efficiency by -

- Reducing thermal losses during acceleration and braking
- Reducing costs for power distribution and propulsion
- Reducing energy requirements for guidance

-- Improving system versatility through -

- Shorter turn radii
- Simpler switching

The acquisition technique to be utilized for this contract will consist of a sole-source contract with Vought for a feasibility study and preliminary design of the UTLV system. A cost-plus fixed fee contract with a ceiling not to exceed $600,000 has been proposed. This procurement request and sole source justification was reviewed and approved by a Sole Source Board on 5 September 1972.

Phase II - Vehicle Fabrication

The second phase includes the fabrication of a prototype vehicle in accordance with documentation prepared under Phase I. Components and subsystems would be tested prior to and during assembly in the vehicle. The complete vehicle would be checked out both statically and through operational tests on a short, 500-foot, section of guideway.

Final documentation is to include engineering drawings and design specifications in sufficient detail for competitive procurement of a vehicle and related facilities by a local public agency. This phase will also require the delivery of in-plant vehicle test results, system-engineering design studies, cost analyses, and a system test plan. Phase II will extend for sixteen months after the contract award.

A cost plus incentive fee contract with a ceiling of $5,340,000 was awarded to Rohr Industries, Inc. on 18 February, 1972.

Acquisition of a UTLV prototype is not contemplated. Satisfactory completion of the designs and component testing under Phase IB are expected to provide data on the technological advancements with which to judge the competitive stature of this system. Vought considers that this design and test effort coupled with other experience in ground transportation would enable them to compete for a revenue system installation.

Phase III - Test Operations

Included in Phase III are acceptance tests and system tests of the prototype vehicle to be conducted on facilities at the Department's High-Speed Ground Test Center at Pueblo, Colorado. The acquisition of a test track, maintenance facilities and test operations was reviewed by TSARC on 21 December 1972. The following is a summary of the design work, construction/hardware, and test operations required at HSGTC.

Design

Phase III-A: Test Facility Design

- 7 miles of at-grade UTACV guideway
- maintenance building

(Note: Phase III-A was conducted by Rohr with Architect-Engineer services of ABAM Engineers, Inc., concurrently with UTACV fabrication, and was completed in October 1972).

Phase III-C: Completion of Guideway Design

- extension of the 7-mile guideway to a 10.5-mile loop (The additional engineering and preparation of bid packages for the remaining 3.5 miles of guideway will be accomplished by amendment to the ABAM contract through Rohr).
- eight 70-foot elevated guideway sections (The design of these sections will be furnished to Rohr by TSC).
- switch for entering the loop (Rohr's Phase II contract requires the conceptual design of site-independent switch configurations. This task will be changed to require a site-specific switch design for the test track.)

Facilities

Phase III-B: Construction of Phase III-A Test Facility Designs

This acquisition is to be a turn-key operation through a sole-source contract with Rohr who will provide the system integration management. Rohr, in turn, has used the following acquisition techniques:

-- Maintenance Facilities: Competitive bids were requested from minority business enterprises. When the apparent low bidder (who was not a minority business) protested, all bids were rejected. Rohr is readvertising as a general contractor and is taking separate bids on the structure, electrical, mechanical, and site work.

-- Guideway Slab: Engineering has been completed for seven miles of slab, drainage, and access road. Competitive bids were taken with options to reduce quantities by 25%, which would have provided 5.25 miles of slab. However, the cost of power and guide rails will only afford about 3 miles of test track. In accordance with TSARC approval provisions, the construction bids have been rejected. They will be readvertised to provide a basic contract for about 3 miles of track with options to complete the 10.5-mile loop upon availability of FY 1974 funds.

-- Power and Reaction Rails: Procurement of these rails was competitively negotiated by Rohr. Installation of the power rail will be performed by the hardware supplier. Rohr will weld the guide rail sections and will otherwise be responsible for its installation. Front-end costs for these rails, including engineering and tooling, have adversely affected the length of track which could be acquired within available funds. In accordance with TSARC approval provisions, these cost proposals have been rejected. Rohr has been requested to submit a reviewed proposal that reduces these front-end costs and which includes provisions for prorating the costs over the full 10.5-mile loop under options to complete the loop when FY 1974 funds become available.

-- Hardware, including the following items, will be procured or otherwise furnished by Rohr:

- automatic train control and communications
- test instrumentation
- maintenance equipment and tools
- electrical umbilical connections

Primary power lines and substations are being provided by FRA.

Phase III-D: Construction of Phase III-C Designs

That part of the loop, not constructed under Phase III-B, will be completed by exercising the options available with Rohr and their subcontractors. Rohr will have the opportunity to make or buy the elevated sections and the switch. If FY 1974 funds limit the length of track that can be procured, it is recognized that the project must be managed to provide for elevated sections, or to substitute at-grade guideway sections, so that there will be no discontinuities in the useable test track.

Test Operations

The following tests are described in Figure 1. UTACV Test Schedule.

Figure 1. UTACV [illegible]T SCHEDULE

OBJECTIVES	PART A: July 73 - October 73 500' - 1500' GUIDEWAY	PART B: November 73-June 74 3-MILE GUIDEWAY	PART C; July 74 -Dec. 74 10.5 -MILE LOOP
rify Basic Performance eck-out Functional perations	Systematic Sub-System Check-Out Low-Speed Tests (Rohr Report 2.14, Sec. 312) Guideway Measurements	DOT Speed Specifications Velocity Acceleration Guideway Measurements	Vehicle Dynamics on Curves Monitor Performance Under Changing Weather Conditions Monitor Guideway Changes Elevated Guideway Measurements
asure External nvironmental Impact	External Noise Measurements Stationary Low-Speed Radio Frequency Interference	External Noise Radio Frequency Interference Ground Vibrations Aerodynamic effects	Monitor Impact at Full Speed Noise Radio Frequency Interference Electromagnetic Interference Aerodynamic Effects Vehicle/Guideway Dynamics
asure Passenger cceptability	Internal Noise Measurements Stationary Low-Speed Electromagnetic Interference Air Conditioning	Ride Comfort Visual Effect Internal Noise Electromagnetic Interference Air Conditioning	Monitor Passenger Environment Effects of Sustained High-Speed Riding
eck-Out Safety rovisions	Access/Egress Electrical Hazards Guideway Hazards Test Operations Safety Emergency Conditions at Station	Emergency Braking Manual Override Simulate Failures Emergency Conditions on Guideway	Special tests, e.g. high-speed passing System Degration, e.g. Rail Alignment Simulate Emergency Conditions (with passengers)
tablish Operational	Vehicle Start-Up-Procedures	Electrical Power System Characteristics Maintenance Procedures	Simulate Revenue Service Operations Crew Training Maintenance & Repair Procedures Measure Wear on Cushion Tip, LIM Guide Wheel, Brakes

Phase III-Test: Part A

low-speed tests on initial 500 to 1500 feet of guideway

Phase III-Test: Part B

high-speed tests on 3 miles of guideway

Phase III-Test: Part C

operational tests on completed 10.5 mile loop

Conduct of the test operations will be negotiated as a sole-source, cost plus fixed fee, contract with Rohr. Establishment of test requirements, test supervision and data analysis will be accomplished by TSC. Some support from the HSGTC O&M Contractor is contemplated.

Phase IV - Revenue System

Installation of a revenue system is expected to be accomplished with financial assistance from UMTA's technical studies and capital grants programs. No demonstration of a UTACV system in an urban area is contemplated with RD&D funds.

UMTA's policies for the acquisition of equipment and facilities with capital grant assistance require free and open competition. Many state and local procurement procedures make such competition mandatory.

Completion of the fabrication and testing of the state-of-the-art UTACV under the Rohr contract will provide local officials with necessary data for planning and designing the installation of a revenue system. Completion of UTLV designs proposed under Phase IB will provide additional data on technological improvements which could be incorporated in local plans. This design effort will also result in avoiding the creation of a sole system source with possible higher costs to local agencies.

c) Description of Life Cycle

Figure 2 shows the UTACV project schedule and financial plan. The relationship of the four phases of this plan are discussed below.

Figure 2.

UTACV PROJECT SCHEDULE

($000's)

CALENDAR YEAR	1971	1972	1973	1974	1975	1976
FISCAL YEAR	FY 1971	FY 1972	FY 1973	FY 1974	FY 1975	FY 1976
PHASE I						
Engineering & Design	3,000	151				
Backup P&P		500				
Mockups		74				
Advanced Design			600			
PHASE II (Vehicle Fabrication)						
Prototype Vehicle		5,340				
PHASE III (Test & Eval.)						
Test Site Engineering		193				
Test Facility Acq.			4,677	5,500		
Test Operations			300	600	175	
PHASE IV (Revenue System)						
Study Grant						
Capital Grant Application Dev.						
Engineering Design & Construction					Design	Constr
TSC Support	562	944	723	800	500	-
Totals	3,562	7,202	6,300	6,900	675	-

Phase I - Engineering Design

Phase IA - The design competition for a state-of-the-art UTACV was completed in December 1971 and provided the basis for commencing the vehicle fabrication under Phase II in February 1972.

Phase IB - This phase for the design of an UTLV is analagous to a combination of the Exploratory Development and Advanced Development stages of six life cycle phases. Phase IB will last nine months from initiation of contract and will build upon the basic design configuration achieved by Vought during Phase IA (already completed). The objectives of this phase will be:

(1) An analysis of the technical feasibility of modifying the original design through the utilization of more technically advanced subsystems, and
(2) The preliminary design of the vehicle.

Exploratory and advanced development will be required of the variable frequency power conditioning unit, the single-sided linear induction motor, magnetic guidance system and the high-pressure air cushions. As the suitability of these subsystems for use in the UTLV is demonstrated through design analyses and experimental tests, the program will evolve into an advanced development of these critical subsystems culminating in a preliminary design of the UTLV system.

Phase IB would be completed by the end of calendar year 1973. Design data resulting from this contract would be available in time to influence development of a capital grant application and the design of a revenue system scheduled to commence in July 1974.

Phase II - Vehicle Fabrication

The prototype vehicle is expected to be complete in March 1973. The linear electric motor and power pick-up were shipped from Grenoble, France, on 16 January 1973. The power conditioning unit is expected to be shipped from England on 23 February 1973. Though installation of these components in the vehicle will be complete during March, there will be insufficient time to check out the vehicle, if it were to be shipped to Pueblo in March.

Since it has been found advisable to readvertise the construction contracts, there would be no maintenance or test facilities at Pueblo to receive the vehicle upon delivery in April.

It has been agreed to extend the period of vehicle acceptance testing at Chula Vista through 30 June 1973. This extension offers several advantages to the program:

-- The vehicle will be in the best possible condition prior to shipment and prior to the start of operational tests at Pueblo

-- Greater use will be made of the 500-foot test track installed at Chula Vista

-- Vehicle delivery will be compatible with completion of maintenance and test facilities at Pueblo.

The vehicle will be delivered to the UTACV Maintenance Building at HSGTC, Pueblo on or about 16 July 1973.

Phase III - Test Operations

After a post-delivery checkout, the vehicle will be tested in accordance with the schedule described on Figure I. Adherence to this schedule is contingent upon the timely completion of segments of the test track, and upon adequate performance of the vehicle. The test schedule is summarized below:

Phase III - Test: Part A
July 1973 - October 1973
Low-speed tests on the first 500 to 1500 feet of completed guideway

Phase III - Test: Part B
November 1973 - June 1974
High-speed tests on 3-miles of completed guideway
(This length will permit only an instantaneous operation of 150 mph without a half mile overrun for safe stopping. Steady state operations for 20 seconds can occur at 110 mph.)

Phase III - Test: Part C
July 1974 - December 1974
Sustained operational tests on the completed 10.5-mile loop (Depending upon vehicle performance, the adequacy of test results and the availability of funds, it may be desirable to extend the Part C test period).

Phase IV - Revenue System

On 20 March 1972 the City Council of Dallas, Texas, and on 27 March 1972 the City Council of Fort Worth, Texas, passed similar resolutions to support an Addendum to the Regional Public Transportation Study to perform a UTACV technical study. These resolutions provided:

-- Funds or contributed services in the amount of $83,000 each as the matching share of a $332,000 technical study grant from UMTA

-- Agreed to actively seek to obtain the necessary funds to construct a TACV system within the travel corridor, if the study indicates that the construction of a TACV system is not only feasible, but in the best interest of the citizens from a financial, environmental, and travel demand standpoint.

On 6 June 1972, the Administrator, UMTA, approved the technical study, with the provision that certain tasks of the Regional Public Transportation Study be completed before proceeding with all the tasks on the TACV study. The evaluation of alternative transportation systems in the travel corridor has been completed sufficiently to substantiate the possible application of a TACV system in revenue service. Results of the regional transportation study warrant a detailed analysis of the proposed TACV installation. During a meeting with the Administrator on 20 December 1972, the mayors, city managers, and representatives of the city councils of Dallas and Fort Worth, as well as the General Manager of the Dallas Transit System, reaffirmed their support and commitment to the TACV project. The need for a competitive system source was emphasized.

On 23 January 1973 the Administrator authorized the North Central Texas Council of Governments to proceed with the remaining tasks in the TACV technical study. This study encompasses the following three main elements:

-- Preliminary engineering of the route, including aerial surveys, soil analyses and the need for right-of-way acquisition

-- Economic analysis of the system, including patronage, revenue return, operating costs, capital costs and methods of financing

-- Environmental impact analysis, including noise, visual impacts, intrusion, disruption and other social and economic effects of the installation.

This study will be completed in about one year. Results of the study will provide the basis for local decisions on whether to proceed with the project, to hold public hearings and to develop an application for capital assistance under the Urban Mass Transportation Act. Results from testing the state-of-the-art prototype and from the analysis of Phase IB UTLV advanced system designs will play major roles in the local and Federal decisions to proceed with a revenue system.

Other areas considering the application of a UTACV system include:

-- Louisiana (Baton Rouge - New Orleans)

-- Florida (Orlando - Disney World - Tampa)

-- California (San Diego to the border)

-- Illinois (Chicago Crosstown Expressway)

Plans have not progressed in these areas to the extent that they have for a UTACV system between Dallas, Fort Worth and the new regional airport.

II. Purpose of TSARC Review

Two acquisition papers have been submitted on the UTACV Program for TSARC review. The first, transmitted on 7 November 1972, covered Phase IB for the design of a UTLV system. This AP was reviewed by TSARC on 27 November 1972, and rejected on 7 December 1972. The Council agreed to reconsider a new AP provided that:

-- It does not include any plans for prototyping the Vought vehicle

-- It is supported by a credible commitment by Vought if another $600,000 of design were funded, to compete with other UTLV producers on a fixed price basis

-- It encompasses the entire UMTA TACV program, rather than just the Vought effort.

This new AP has been prepared to incorporate the above provisions.

-- Plans for a second prototype have been eliminated and dropped from the FY 1974 budget

-- The attached letter from Vought makes a credible commitment to compete for installation of a revenue system

-- The entire UMTA TACV Program has been consolidated in the single document, relating the design of a UTLV system with the overall UTACV project.

A second AP was submitted on 4 December 1972 and covered the procurement of test facilities and test operations. This AP was reviewed by TSARC on 21 December 1972 and approved on 4 January 1973 with the following provisions:

-- That the price for guideway construction is fully analyzed and completely negotiated, and that particular attention in negotiation be given to the appropriate amount of G&A and profit for the prime contractor, in view of his apparent limited contribution to the effort.

-- That options be negotiated to provide for eventual construction of the full seven miles of operational guideway. Consideration shall be given to scheduling construction to permit minimizing costs as well as meshing with the budget cycle for purposes of exercising the options in a timely manner.

The portion of the AP covering the design, construction and operation of the test facilities has been revised to reflect the second point above. These changes are reflected primarily in the procurement activity and schedules.

The purpose of the TSARC review of this AP is to be assured of compliance with the Council's previous guidance. TSARC approval of a contract with the Vought Aeronautics Company for the design only of a UTLV system is also requested.

III. Program Plans

a) Program Goals and Objectives

1. Overall Goal

The ultimate goal of the program is to provide a new high-speed, line-haul system for travel in corridors where travel time is a significant factor. Such systems (UTACV and UTLV) will offer alternatives to urban transportation planners and local officials who are considering establishment of new systems with financial assistance under the UMTA capital grant program.

2. Program Objectives

The specific limited objectives of the Urban TACV Project are to:

-- Verify system performance on such features as ride quality, noise and safe high-speed operations

-- Provide public officials with measured data on system performance, reliability, safety and environmental impact.

3. Relationship of this Acquisition to Program Goals and Objectives

The acquisition proposed in this paper will accomplish two purposes:

-- The design of a UTLV will:

- Establish the feasibility of technical innovations which could be considered in the performance specifications and the final designs of a revenue system
- Establish a potential second source, with United States suppliers, for a TACV system to be competitively procured by a local government agency.

-- The facilities to be acquired will enable the test program to achieve the following objectives:

- Verification of basic vehicle performance
- Measurement of external environmental impact
- Measurement of passenger acceptability
- Check-out of system safety
- Establishment of operational procedures

At the end of the test program, UMTA will have sufficient data on system safety, performance, reliability, maintainability, environmental impact, and costs to enable planners to fully assess the applicability of the UTACV to a particular urban transportation problem. These data, coupled with results of the design and analysis of an advanced tracked levitated vehicle, will also be sufficient to design and prepare procurement bid packages for a complete revenue system.

b) Prior and Current Related Efforts

A test facility for the FRA Tracked Air Cushion Vehicle is now under construction at HSGTC. The TACRV guideway uses a channel configuration to provide lateral vehicle guidance from the side walls. The UTACV receives lateral guidance from the central vertical reaction rail. The TACRV is a test bed intended to address the problems of achieving ground transportation speeds in excess of 250 mph. The UTACV is a prototype passenger-carrying vehicle designed to assess the operational characteristics for a revenue system, at cruise speeds of 150 mph.

Other programs funded by DOT which relate to the UTACV Program include the following:

(1) FRA funded Tracked Air Cushion Research Vehicle Program,

(2) UMTA Technical Study grant No. TEX-9-5, UTACV Technical Study Addendum to the Public Transportation Study within the North Central Texas Region

(3) UMTA Funded Contract to Vought Aeronautics (Phase IA) for Design of a UTACV System, DOT-UT-10026

(4) TSC sponsored research on innovative guideway designs, vehicle-guideway dynamics, and power/propulsion systems.

c) Funding Estimates

Funding estimates for the UTACV Program are shown on Figure 2. It should be noted that $600,000 for test facility acquisition in FY 1973 have been deferred to FY 1974. The total life-cycle cost of the RD&D program is estimated at $24,639,000.

d) Government Facility Needs

Phase IA & B - None

Phase II - A 500-foot test track has been constructed at the Rohr plant in Chula Vista upon which to conduct vehicle acceptance tests.

Phase III - Figure 3 shows the proposed UTACV test guideway layout at the HSGTC. The government will provide the two sub-stations and the primary power supply for operations on the guideway. The Phase III-B contractor will interface with the government-provided sub-stations at the secondary side of the power transformers.

Other government-provided equipment and services will include all those items that are available at the HSGTC and applicable to the UTACV program. Such items include:

- Security
- Fire-fighting equipment
- Overall test administration
- Office space

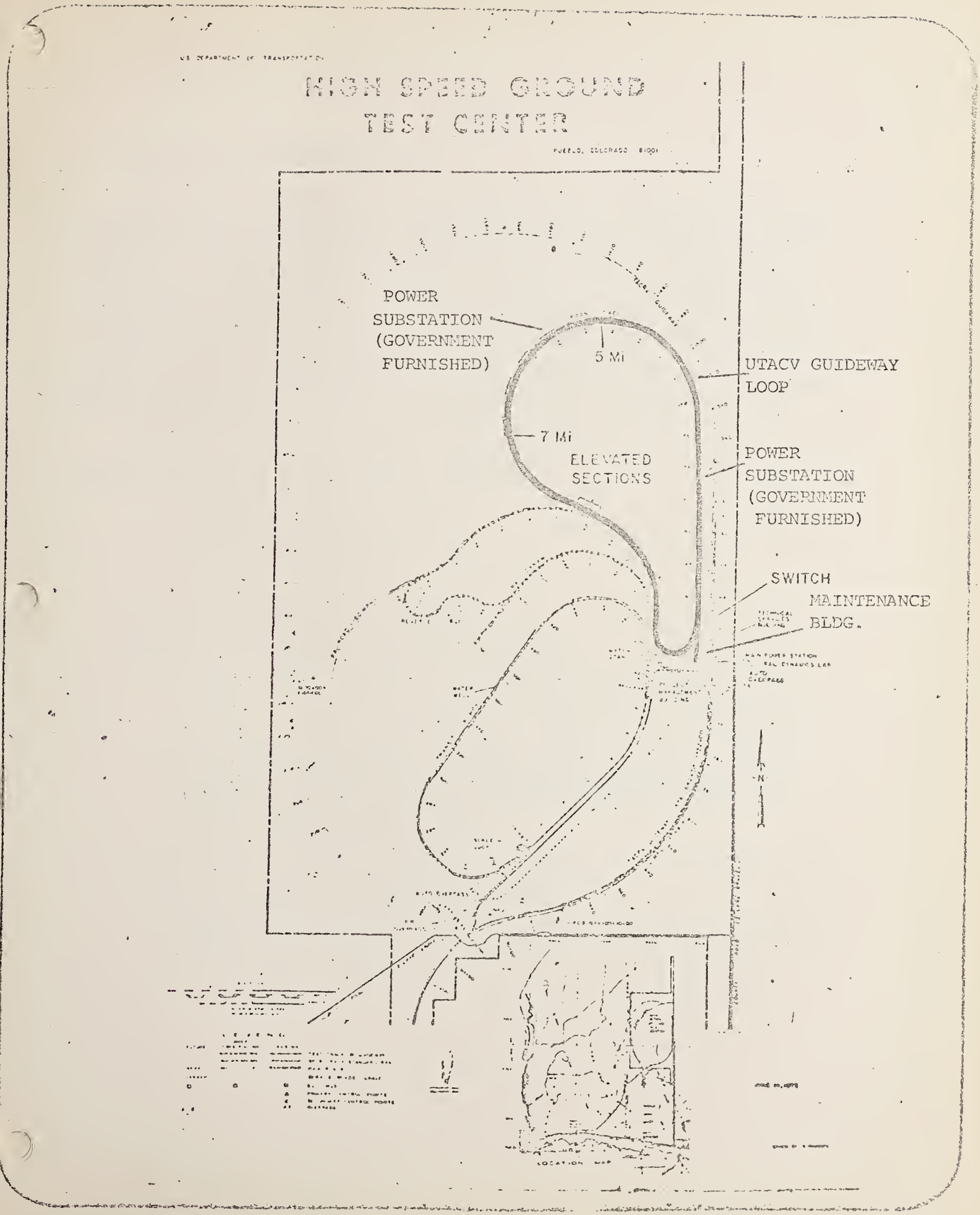


FIGURE 3. UTACV TEST FACILITIES

e) Technical and Budgetary Risks

Phase IB - Technical risks during Phase IB are minimized by two considerations. First, the effort builds upon the prior research and engineering performed by the Department and Vought through earlier contracts. Second, this phase will be a feasibility evaluation and preliminary design study. All of the innovative subsystems designs proposed for the UTLV will be fully evaluated by the contractor and reviewed by DOT during the course of this study. The decision to incorporate these advancements in the final design of a revenue system will depend upon the adequacy of contract results and DOT's assessment of the advantage and risks of including them in the bid packages.

Phase II - Technical risks during the Phase II fabrication of the prototype by Rohr involve three elements:

-- The linear electric motor

-- The power conditioning unit

-- The automatic control system

Efforts to minimize these risks involve:

-- Insuring that the engineering design of the components is basically sound and requires no technological breakthrough

-- Testing the components by their suppliers prior to delivery to Rohr. (These tests have already been satisfactorily completed by Bendix on the automatic controls and by LML on the linear electric motor)

-- Testing the elements within the vehicle on the 500-foot test track prior to delivery to Pueblo

-- Testing the vehicle as part of the total UTACV system on the test track at Pueblo.

Phase III - The principal technical risks during this phase involve the guideway construction. These risks will be substantially minimized, since the guideway designed for the UTACV can be constructed using high-quality highway techniques. Also, experience gained during construction of the initial segment of the FRA TACRV guideway will help reduce the risks. The construction contractors have been provided with all available climatic, soil, and topographic data on the site. Rohr has assumed the responsibility for site surveying, the establishment of initial lines and grades for the guideway and for controlling the accuracy of the guideway alignment during construction. Thus, construction contractors' risks in achieving the required smoothness and alignment should be further reduced. Fabrication of a 500-foot length of test track at the Rohr plant during Phase II should further reduce the risks associated with installing the reaction rail and power rail. Technical risks which might be encountered during test operations will be minimized by the enforcement of sound safety, operational, and maintenance procedures. FRA experience with both the LIMRV and TACRV will be utilized to further reduce these risks.

Phase IV - During this phase, various interested local governmental agencies will submit technical application studies preliminary to requests for capital grant assistance in the implementation of a revenue TACV system. Major risks involve the successful construction and operation of a TACV system within costs, schedules and estimated ridership and revenue proposed by the application study. These risks will be minimized through verification of the TACV's technical feasibility during prior program phases and through the preparation of comprehensive regional transportation planning studies by the interested local governments and their critical review by DOT before commitment of DOT funds.

f) Other Problems

No other operational, cost, legal, environmental and safety or procurement problems are anticipated for the program.

g) Procurement of ADP Processing Equipment and Services

Not applicable.

IV. Acquisition Plan

a) Logistics

The overall strategy to put the UTACV system into operational use involves the following:

-- The design, fabrication, and testing of a passenger-carrying prototype vehicle, will be accomplished under UMTA's RD&D Program.

- The design and fabrication phases have been performed under competitive contracts

- Test facilities at HSGTC, Pueblo will be acquired under firm, fixed-price contracts. A sole source contract with Rohr Industries, Inc. as the vehicle fabricator, will provide overall systems integration management for both facilities acquisition and the conduct of test operations

- The test program will proceed from the verification of system performance on a short length of guideway to high-speed tests on 3 miles of guideway and culminate in fully operational tests on a 10.5-mile guideway loop.

-- Data resulting from the vehicle performance tests and high-speed tests will provide information for transportation planners and local officials to plan the installation of an UTACV revenue system. Performance specifications for the system would be prepared by DOT, incorporating features of the advanced UTLV design as appropriate. These specificatons would be furnished local agencies for their use in planning the system. This planning would be accomplished with financial assistance under UMTA's Technical Study Program. A grant to a local public agency, requiring a matching one-third share, would result in third-party, negotiated, architect-engineer contracts to assist in the study. The scope of the technical study would cover:

- Preliminary engineering, including route feasibility; foundation analyses, aerial surveys, real estate rights-of-ways
- Economic analyses, including estimates of patronage, fare levels, construction and operating costs
- Environmental impact, including the social and economic effects on users and non-users in the region served by the system

-- Upon satisfactory completion of the planning and resolution of any remaining details through public hearings, financial assistance for final engineering and construction could be provided under UMTA's Capital Grant Program if:

- Financial commitments for the local share of the net project cost were satisfactory

- The project satisfied the guidelines established for capital grants

-- Final designs would be accomplished through negotiated architect-engineer contracts administered by the grantee. Construction and system procurement would be accomplished through publicly advertised competitive contracts in accordance with UMTA policy.

-- It is expected that the system would undergo a thorough shakedown after construction and before revenue operation.

b) Schedule and Milestones

The milestone schedule for the significant program events, including major procurement actions, is shown on Figure 4.

c) Procurement Approach

Phase IA - UTACV Design. This phase has been completed.
Phase IB - UTLV Design. This design will be accomplished by Vought Aeronautics Company as a sole-source, CPFF contract with a ceiling
Phase II - Vehicle Fabrication - A cost plus incentive fee contract with a ceiling was awarded to Rohr Industries as the result of a design competition.
Phase III - Test Operations. The procurement approach for this phase includes the following:

Figure 4. Procurement Schedule and Milestones

Phase IA - UTACV Engineering Design (Completed)	
Issued RFP	12 May 1971
Received Proposals	14 June 1971
Notice to Proceed	28 June 1971
Complete Design, Submit Phase II Proposal	15 December 1971
Phase IB - UTLV - Engineering Design (Proposed)	
Issued RFP	11 October 1972
Received Proposals	31 October 1972
Notice to Proceed	1 March 1973
Design Complete	1 December 1973
Phase II - Vehicle Fabrication (Underway)	
Notice to Proceed	18 February 1972
Vehicle Completed	31 March 1973
Issue RFP (Phase II Amendment)Phase III Tests	15 February 1973
Receive Proposals	15 March 1973
Notice to Proceed	15 April 1973
Acceptance Tests Completed	22 June 1973
Vehicle Received at Pueblo	16 July 1973
Post Delivery Preparation Completed	10 August 1973
Phase III-A: Test Facility Design	
Issue RFP for Engineering Design	10 May 1972
Proposal Received	8 June 1972
Notice to Proceed	30 June 1972
Completion of Design	16 October 1972
Receive Proposals for Construction	19 December 1972
Receive Revised Proposals	12 March 1973

Phase III-B: Construction of Test Facility (3 to 5 miles)

Evaluate Proposals, Negotiate	12 March 1973
Notice to Proceed	2 April 1973
Sub-Contractor Awards	9 April 1973
Maintenance Building	
Foundation Start	15 April 1973
Foundation Complete	18 May 1973
Building and Utilities Complete	13 July 1973
Guideway Slab	
Start Construction	23 April 1973
First 4500 ft. Complete	29 June 1973
Phase III-A Increment Complete	27 July 1973
Reaction Rail	
Start Construction	25 June 1973
First 4500 ft. Installed	6 August 1973
Phase III-A Increment Complete	19 October 1973
Wayside Power	
Start Construction	9 July 1973
First 4500 ft. Installed	21 September 1973
Phase III-A Increment Complete	9 November 1973
Automatic Controls and Communication	
Start Procurement	9 April 1973
Delivery	29 June 1973
Installation Complete	27 July 1973

Phase III-C: Completion of Guideway Design (Elevated Section & Switch)

Notice to Proceed	22 January 1973
Design Completion	1 July 1973

Phase III-D: Completion of Guideway Loop

At-Grade Sections (Including Reaction and Power Rails)

Notice to Proceed	15 July 1973
Construction Start	16 July 1973
Construction Complete	31 December 1973
Rail Installation Complete	1 July 1974

Elevated Sections and Switch Construction

Issue RFP	8 October 1973*
Receive Proposals	1 November 1973*
Notice to Proceed	15 November 1973*
Construction Start	19 November 1973*
Construction Complete	31 March 1974*

Phase III Test Part A

Notice to Proceed with Tests	10 August 1973
Complete Tests	2 November 1973

Phase III Test Part B

Notice to Proceed with Tests	5 November 1973*
Complete Tests	5 July 1974*

Part III Test Part C

Issue RFP	15 April 1974*
Receive Proposal	17 May 1974*
Notice to Proceed	8 July 1974**
Complete Tests	15 July 1975**

Phase IV - Revenue System

Proceed with Technical Study	23 January 1973
Complete Technical Study	1 December 1973
Complete Capital Grant Application	1 June 1974
Commence Final Design	30 June 1974
Complete Final Design	1 April 1975
Commence Construction	1 July 1975

* Dates contingent upon Fiscal Year 1974 appropriations.

** Full test program contingent upon Fiscal Year 1975 appropriations.

Design and Construction

-- Phase III-A: Test Facility Design
Already consummated through a sole-source CPFF contract with Rohr and a subcontract with ABAM Engineers, Inc.

-- Phase III-B: Construction of Phase III-A Test Facility Designs
A CPFF contract with a ceiling is to be negotiated with Rohr based on competitive bids for facility construction

-- Phase III-C: Completion of Guideway Design
- Elevated sections are to be designed under an ongoing contract administered by TSC Cambridge
- Guideway switch is to be designed by Rohr through substitution of tasks under the existing Phase II contract.
- Design of remaining loop is to be accomplished by amending the Phase III-A design contract with Rohr/ABAM.

-- Phase III-D: Construction of Phase III-C Designs
Construction will be accomplished by exercising options under the Phase III-B contract with Rohr and their construction subcontractor and material suppliers.

Test Operations

-- Phase III Test, Part A - Low Speed Tests
A sole source, CPFF with ceiling, contract will be negotiated with Rohr covering the low-speeds test.

-- Phase III Test, Part B - High Speed Tests
Option to extend the Rohr contract covering Part A

-- Phase III Test, Part C - Operational Tests
A new CPFF contract, with a ceiling, would be negotiated with Rohr, Inc.

-- Phase IV - Revenue System
This phase will be accomplished under UMTA's technical study and capital grant programs.

V. Special Funding Arrangements

Phase IB, II and III will require no special funding arrangement. Phase IV, implementation of revenue service, will require funding under provisions of the UMTA Technical Study and Capital Grant Programs. These provisions require that the local public agency finance a share of the capital cost that cannot be amortized from revenues. Thus, the local agency must make a commitment to raise the local share of the net project cost before engineering and construction can commence. Other provisions of the Urban Mass Transportation Act would have to be satisfied before Federal financial assistance could be provided. Results of the UTACV test operations and UTLV designs will influence these local commitments.

VI. Responsibilities

The Director, Special Projects, in UMTA is responsible for overall management of the UTACV Program. Project engineering is provided by the Advanced Systems Division of the Federal Railroad Adminstration. Technical support for the project is provided by the UTACV program team of the Transportation Systems Center. Responsibilities of TSC include:

-- Preparation of system technical and performance specifications

-- Monitoring vehicle fabrication contracts to insure compliance with technical and performance specifications as well as with quality assurance standards

-- Supervising test operations, including the inspection of test facilities, the planning of test programs and the evaluation of test results

-- Conducting technology and systems analyses to investigate the worth of advanced alternate concepts, to verify the engineering on critical components, and to establish the costs and environmental impacts of system applications.

VII. Recommendations

It is recommended that this Acquisition Paper for the UTACV Program be approved. This action will authorize contracting for the design of a UTLV system, thus assuring continued progress towards the UMTA program goal of providing competing sources with the best technological advancements available.

Approval will also evidence concurrence with revisions in the procurement procedures resulting from TSARC's review of the Phase III activity conducted on 21 December 1972. This concurrence is recommended for the following reasons:

-- The procurement will provide facilities at the Department's Test Center on which to test a vehicle which is nearly completed under a previous contract

-- Acceptance tests will assess the capability of the system to perform in accordance with contractual specifications

-- High-speed tests will confirm system performance and will begin to provide measured data of interest to transportation planners

Concurrence with the proposed methods of procurement is also recommended for the following reasons:

-- A single contractor, Rohr Industries, Inc., will have the responsibility for managing the phased integration of the several subsystems and for maintaining schedule adherence

-- Responsibility for managing the interfaces between the vehicle, automatic control system, power system, reaction rail, and guideway, will be lodged with a single organization

-- Total system performance, including the vehicle, automatic controls, power and propulsion will be the responsibility of a single contractor.

VIII. Alternative Acquisition Actions

Phase IB - UTLV Design
Alternative A: -

1. Action - Program Delay

2. Impact - A program delay would produce the following impacts:

   -- A delay in the acquisition of technical data from an advanced system for use by public agencies in planning alternative urban transportation systems

   -- A delay in making alternative solutions available to public officials concerned with the solution to urban transportaton problems and improvements in urban development

Alternative B: -

1. Action - Program Cancellation

2. Impact - A program cancellation would produce the following impacts:

   -- A loss of design, analytic, and test data on a number of technological innovations to the TACV system all of which could have a significant impact on operational capabilities of the UTACV in a revenue service environment

   -- The loss of a second competing source for a tracked air cushion vehicle system which could be considered by interested local public agencies for possible use in a revenue system acquired with UMTA financial assistance

Phase III - Test Facilities and Operations

Alternative A:

1. Action - Open Procurement to Further Competition

2. Impact

Acquisition of the test track, and maintenance building is being procured through publicly advertisied, firm, fixed-price contracts. Materials for the reaction rail and power rail are being procured through competititve negotiation. Rohr is to be retained through a sole-source contract to manage the system interfaces and to integrate schedules. Through this arrangement, Rohr, as the vehicle supplier, will have responsibility -- without redress -- for acceptable performance of the total UTACV system. If Rohr is not assigned this responsibility the project will be affected in the following ways:

-- The vehicle contractor (Rohr) could be relieved of specified performance due to such factors as guideway roughness, misalignment of the reaction rail, or inadequate installation of the power rail,

-- Management of subsystem interfaces would have to be accomplished through a substantial increase in DOT/TSC staff, or through retention of an outside technical support contractor.

Alternative B:

1. Action - Program Delay

2. Impact

A delay in this acquisition for further review or additional competition will cause an irretriewable slowdown in obtaining an operational UTACV system. Prompt approval and implementation of the proposed acquisition will allow the program to proceed on schedule and will allow the completion of the maintenance support facility and the initial portion of the test guideway to coincide with the delivery of the UTACV prototype at HSGTC. A program delay would produce the following impacts:

-- A delay in the availability of test facilities will result in an idle vehicle from which few test results would be forthcoming

-- A delay in the acquisition of operational data for use by public agencies in planning high-speed urban transportation systems

-- A delay in making alternative solutions available to public officials concerned with the solution to urban transportation problems and improvements in urban development.

Alternative C:

1. Action - Project Cancellation

2. Impact

Cancellation of this procurement would effectively stop the entire UTACV Program. Without test facilities, there is no way in which vehicle performance can be assessed. The Government's investment in the vehicle would largely be wasted. Cancellation would have the following additional effects:

-- Operational data on an alternative high-speed transportation system would be unavailable

-- Public authorities seeking innovative solutions to urban transportation problems would lose interest in this technological advancement.

Attachment No. 1

GROUND TRANSPORTATION DIVISION

P.O. BOX 5907
DALLAS, TEXAS 75222

6-50200/3L-TACV-1

January 8, 1973

To: Department of Transportation, OST
Urban Mass Transportation Administration
400 Seventh Street, S. W.
Washington, D. C. 20591

Attention: Mr. H. W. Merritt, Director-Special Projects

Subject: TACV Program Objectives

As a result of the TACV studies performed to date by the Ground Transportation Division (GTD) of LTV Aerospace, we sincerely believe that a substantial demand for these vehicles will ultimately develop and intend to compete for sales of such systems when the opportunity arises. The Company has maintained a continuous technical program since 1968. This program, sustained by both corporate resources as well as DOT contracts, has produced a design concept for an advanced TACV, employing magnetic guidance devices, which we feel is indeed a major improvement over existing concepts.

Further development of this design is the subject of a proposal made by GTD to DOT in November 1972 (as modified in December 1972). It was the hope of GTD that the design phase which was proposed would be followed by a contract to develop a full scale prototype of the vehicle. We recognize that budget considerations may prevent DOT from funding development of the prototype. GTD has therefore evaluated its competitive posture in the event the prototype cannot be funded. We conclude that a truly competitive posture, under reasonable circumstances, will require the following capabilities:

a. a system design which is sufficiently well developed to permit firm commitments by the contractor on performance, cost, and schedule;

b. personnel resources that are qualified to implement the program.

We feel that the program which we have proposed to DOT is adequate to meet the first requirement and will maintain our technical staff over the life of the contract. Thus if an opportunity develops to compete for an operational system within a reasonable time frame, and under reasonable contract terms, we feel that GTD would be in a competitive situation and would expect to compete.

Respectfully,

James E. Martin

James E. Martin

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE: 27 April 1973

In reply refer to:

SUBJECT: Secretary Briefing by Mr. Burt Raynes, Chairman and Chief Executive Officer, Rohr Industries, Inc.

FROM : Director, Special Projects

TO : Administrator

The attached background paper has been prepared for submission to the Secretary prior to his meeting with Mr. Raynes at 11 o'clock on 9 May 1973.

Dr. Hemmes has been advised of the briefing. I have suggested that he prepare background material on other Rohr projects with UMTA, including TransBus, the Advanced Concept Train, Personal Rapid Transit Systems, and the Dual Mode Program.

H. W. Merritt

Attachment

cc's Daniels
Gray
Lilienn
Di Mario

URBAN TRACKED AIR CUSHION VEHICLE PROJECT

BACKGROUND ON ROHR INDUSTRIES PARTICIPATION

EARLY ACTION TACV PROGAM

In March 1970, Mr. Raynes offered Secretary Volpe a proposal to build a TACV demonstration system. The $10-million fixed-price proposal included:

-- Ten miles of single track along the median strip of the Dulles Airport Access Highway
-- A 60-passenger, 150 mph prototype vehicle with linear induction motor and automatic controls
-- Two temporary passenger loading platforms.

The project was to commence in March 1970, and be completed on 4 July 1972.

The Secretary was prevailed upon to refuse the offer. The price seemed unrealistic, the budget had not anticipated such a project and no provisions had been made to comply with local planning requirements or environmental impact analyses. In light of recent experience with the cost of building the prototype and constructing the test track at Pueblo, it is generally agreed that refusal of Mr. Raynes' fixed-price proposal probably saved Rohr Industries from serious financial difficulties.

PRESS STATEMENTS

The attached March 4, 1972 clipping from the San Diego Union was brought to the attention of Mr. John McFall, Chairman of the House Subcommittee on Transportation Appropriations just prior to the FY 1973 Hearings. Though Mr. Raynes' explanation in the attached letter was made a record in the hearings, the Committee has never fully accepted the urban application of a 150 mph TACV system.

CURRENT UTACV PROJECT

Rohr Industries, Inc. has been awarded the following contracts:

Phase I - Engineering Design - $1,888,463

-- This contract was awarded on 30 June 1971 for the design of a 60-passenger prototype 150 mph TACV. In addition the scope covered:

. Design and analysis of site independent features such as a guideway, power supply, automatic control system and maintenance facilities. Alternative power and propulsion system designs from:
AIResearch Manufacturing Division, Garrett Corporation, Los Angeles, California
LeMoteur Lineaire, Merlin-Gerin, Grenoble, France
. Fabrication and shipment of a mock-up to TRANSPO

-- In November 1971 the design phase was completed and a proposal was submitted for building the prototype

Phase II - Vehicle Fabrication - $4,969,359

-- This contract was awarded on 18 February 1972 as the result of a competitive negotiation
-- The contract provides for an incentive fee which increases to a maximum of 14 percent if costs are below the target, but decreases to 1 percent if costs reach the ceiling of $5,340,000
-- The vehicle was moved out of the shops on 2 December and is now about 90 percent complete
-- The power conditioning unit failed high voltage tests on 13 March. Reconstruction of the PCU and labor disputes will delay delivery of the unit until June
-- Completion of the vehicle is not expected until the end of June 1973
-- Tests at Pueblo could begin in September, 1973.

Phase III - Test Operations - $233,000

-- Rohr was awarded a "turn-key" contract on September 15, 1972 to design the first increment of tests facilities at HSGTC, Pueblo. FY 1973 funds in the amount of $4.9-million are available for this construction. The scope of work covered:

. 5 to 7 miles of test track, including:
  slab, reaction rail, power rail, access road and erosion control
. secondary power supply
. automatic control system
. maintenance building

-- A subcontract with ABAM Engineers, Inc. of Tacoma, Washington provided the construction engineering
-- The design was completed and contracts were advertised in October. Construction bids were opened on 22 November 1972. Rohr submitted their consolidated proposal for the test facilities on 19 December, 1972. This proposal was rejected because it exceeded available funds.
-- The test facilities have been redesigned to provide for a basic bid of 3.1 miles with options for 5.1, 7.1 and 10.7 miles of track. Bids were readvertised on 23 February, and were opened on 12 March.
-- Rohr submitted a consolidated proposal on 20 March. Though the proposal was technically acceptable and within the budget, contract negotiations have been particularly difficult for the following reasons:

. Rohr has submitted a CPFF proposal based on fixed-price bids for certain of the construction items. DOT has insisted on a fixed-price contract with Rohr for those items which would be accomplished on a fixed-price basis.
. Rohr's current CPFF contract for vehicle fabrication includes a ceiling price. DOT has insisted that the new contract covering reimburseable items also include a ceiling. This position reflects a limitation on FY 1973 appropriations for this project imposed by the Congress. On 17 April Rohr accepted the principle of a ceiling price on the cost reimburseable items but the details have yet to be resolved.

-- Rohr has in hand a letter contract acceptable to the Department which authorizes them to commence work on certain construction items and incure costs as of 23 April. Rohr has extended the validity period of their proposal to 5 May and both parties are optimistic about consummating a contract, but Rohr has not accepted the letter contract as of 27 April 1973.

27 April 1973

ROHR INDUSTRIES, INC.
CHULA VISTA, CALIFORNIA

BURT F. RAYNES
CHAIRMAN AND CHIEF EXECUTIVE

March 24, 1972

Mr. Carlos C. Villarreal, Administrator
Urban Mass Transportation Administration
Department of Transportation
400 7th Street, S. W.
Washington, D. C. 20024

Dear Carlos:

I have received some questions on recent comments attributed to me by the press, stating the TACV was impractical for urban use. These comments were taken out of context and I would like to clarify the situation.

I consider the tracked air cushion vehicle to be practical for both urban and interurban service. TACV, however, is not too practical for short station spacing, such as under ten miles. In planning urban TACV systems consideration should be given toward their becoming a leg in an interurban system.

Rohr wholeheartedly endorses the tracked air cushion vehicle for those applications which can best utilize the high speeds and very desirable ride and safety characteristics.

I hope this clarifies the situation.

Sincerely,

Burt

Air Car Called Unsuitable For Urban System

Intercity Use Urged By Rohr

By JOHN STEWART
Transportation Writer
The San Diego Union

The tracked air cushion vehicle is impractical for a short-haul transportation system within the San Diego metropolitan area but it would work well on an inter-urban route between here and Los Angeles, Burt Raynes said yesterday.

Raynes is chairman and chief executive of Rohr Industries, Inc., in Chula Vista which is developing a prototype TACV system under a $5 million federal contract.

He said his comments were based on a report San Diego sent to the Urban Mass Transportation Administration in Washington in February. That report asked the designation of San Diego as the site for a TACV demonstration project and recommended the system be constructed along a fixed-route route between the city

BE IMPRACTICAL

"This would simply be impractical for this system," Raynes said.

However, that report has been scrapped by the city in the face of new plans from UMTA to discard the demonstration project in favor of an operational, revenue-producing line.

A new city report issued yesterday calls for a revenue producing line to be constructed between Lindbergh Field and the border as the first link in a system between here and Los Angeles.

In response to a question, Raynes said he would support the new proposal as "the first leg in an inter-urban system."

LONG DISTANCES

He discussed TACV and its uses during a visit to Rohr yesterday by members of the Comprehensive Planning Organization's executive committee and city and county transportation planners.

"This vehicle is designed to go long distances at high speed and it is not designed for urban transportation," Raynes said. "I definitely could not recommend TACV solely for handling transportation within greater San Diego, such as from San Ysidro to Del Mar or from downtown to El Cajon."

He assured the gathering, however, that he would support San Diego in its bid to obtain federal help in constructing part of a TACV system here.

Mayor Wilson will carry the city's new proposal to Washington tomorrow to present to federal transportation officials as an indication of the area's interest in receiving federal funds to build the nation's first air cushion vehicle system.

In support of the city's

Air Car Called Unsuitable For Urban System

(Continued)

request, the CPO executive committee yesterday designated Wilson as the "regional representative" of San Diego County in his efforts to build the TACV system here.

They armed him with a formal resolution expressing CPO's support of TACV as a transportation system "consistent with the goals and objectives of the Regional Planning Program."

Wilson also has obtained the signatures of officials of all governmental agencies affected by the proposed system on a cover letter to the city's report to assure its "regionality."

The signatories include Richard Silberman, chairman of the city transit company's board of directors; George Bailey, chairman of the CPO Policy Committee; Richard Brown, chairman of the CPO Transit Coordinating Committee; Harry Scheidle, chairman of the Board of Supervisors; [illegible] Hamilton Jr., mayor [illegible] la Vista; and Kile Morga[illegible] mayor of National City.

DOT 0770 #16207

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE: DEC 11 1972

In reply refer to:

DEC 12 PM 3:00

SUBJECT: Acquisition Paper for Urban Tracked Levitated Vehicle System

FROM : Administrator, UMTA

TO : The Under Secretary

On 7 November 1972 I submitted an acquisition paper for procurement of the design phase and planning for the prototype phase of an Urban Tracked Levitated Vehicle Project. This project was reviewed by TSARC on 27 November 1972.

I have been advised that the AP was rejected, but that another would be reconsidered with the following changes:

-- That the second prototype be eliminated.

-- That Vought make a commitment to offer fixed-price bids on a revenue system at the conclusion of the design phase.

-- That the AP be rewritten to encompass the total UTACV program.

I request reconsideration of this action on the following basis:

-- Revenue installation of a TACV system will most likely occur under provisions of the UMTA Capital Grant Program. It has been our policy to require competitive sources for such procurements by local agencies. Recent experience with the Metroliners and the BART cars indicates it would be most imprudent to entertain competitive procurements from prospective suppliers who have not adequately tested or thoroughly checked out prototypes of their systems.

-- Vought officials were asked on 5 December whether they would commit to a fixed-price bid for a revenue system upon the conclusion of the design phase. Their response was:

. It would be difficult to make such a commitment until the design phase was completed.

. They prefer not to make commitment to submit such a bid until they have an opportunity to review the bid package which [illegible] specifications, the site specific features, and the contract terms and conditions.

-- Preparation of a new AP will take time that will adversely affect this procurement as well as others planned under the UTACV Project. On 4 December, I submitted an additional AP covering the construction of test facilities for the Rohr vehicle. Delays to review these procurements in the context of the total program will make it impossible to provide test facilities coincident with the scheduled delivery of the Rohr vehicle to Pueblo.

In view of the above, I recommend the following:

-- That you authorize procurement of the design phase. Useful technical information will be developed from this effort. At the conclusion of this phase, Vought and the Department would be in a much better position to know whether they could commit to a fixed-price proposal without prototype testing.

-- That the decision on a second prototype be deferred until the conclusion of the design phase. Consideration has been given to a test-bed vehicle which may be adequate to prove the advanced design features of less cost than a prototype. Whether such a vehicle will meet the objectives of testing the advanced technologies and providing a second competitive source will not be known until the design phase is completed.

I will prepare an AP which consolidates the total UTACV Program. However, it is requested that this paper be used for decisions concerning acquisitions proposed for FY 1974. These procurements would involve completion of the test track loop at Pueblo and fabrication of the second UTLV prototype or a test-bed vehicle. I request that decisions concerning the initial facilities construction at Pueblo and the design of a UTLV under FY 1973 appropriations not be delayed for the review of this new AP.

C. C. Villarreal

APPROVED:_____

DISAPPROVED:_____

CONCUR_____ _____

TAD

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE: 7 February 1973

In reply refer to:

SUBJECT: Acquisition Paper for Urban Tracked Air Cushion Vehicle Program

FROM : Director, Special Projects, UOA-20

TO : Director, Office of Installations and Logistics, TAD-60

On 1 February 1973 the Administrator, UMTA, transmitted an AP covering the Urban Tracked Air Cushion Vehicle Program. In accordance with a request on 5 February 1973 from Mr. Flaharty, TAD-62, the following supplemental information is provided:

1. There are no other program planning documents which encompass the entire UTACV program. The AP provides the most complete and concise description of the program currently available.

2. Descriptions of earlier efforts to install a UTACV system in Los Angeles and for access to Dulles Airport are attached. These descriptions should supplement PART III.(b), Prior and Current Related Efforts, of the AP.

3. Figure 2, page 9, the UTACV Project Schedule, has been revised to clarify the fiscal year in which funding of project elements occur. Recent changes in the FY 1974 budget require paragraph III (c), Funding Estimates, on page 17 to be revised to read as follows:

   "Funding estimates for the UTACV Program are shown on Figure 2. The total life cycle cost of the RD&D Program is estimated at $24,060,000."

4. Page 8 of the AP, in a discussion of the Phase III Test Operations, advises that "some support from the HSGTC O&M Contractor is contemplated." This support involves such items as:

   -- Coordination of security guard services for test runs,
   -- Clearing snow and tumbleweeds from the access road and guideway,
   -- Performing routine maintenance and repairs on the test facilities,
   -- Providing crane operations for special lifts.

   Normally, this support would be budgeted and furnished by the Federal Railroad Administration. Emergency situations may require some cost reimbursement, but these are not expected to be of a magnitude to require separate budgeting in the program plan.

H. W. Merritt

Supplement to AP transmitted 1 February 1973

III. b) Prior and Current Related Efforts

1). Los Angeles TACV Urban Project

The purpose of this project was to improve access to the Los Angeles International Airport (LAX). A high-speed ground transportation system was to provide service along the most densely traveled corridor between LAX and San Fernando Valley. Ultimately the system was to have been extended to the proposed intercontinental airport at Palmdale 50 miles to the north.

The project was initiated on 19 January 1970 by a memorandum from the Under Secretary which designated UMTA as the program manager. Engineering responsibility for the program was delegated to FRA. The project formally got underway on 11 March 1970 with an UMTA technical study grant to the Los Angeles Department of Airports (LADOA). This grant enabled Kaiser Engineers to prepare the preliminary engineering and preliminary cost estimates for a 16.4-mile installation between LAX and Sepulveda Dam in the San Fernando Valley. Route feasibility data were also required for an 8.5-mile extension to Van Norman Lakes. The route was to follow Sepulveda Boulevard from LAX, then along the San Diego Freeway to the north.

On 10 July 1970 the technical study grant was amended to provide for the following:

-- Marketing and Economic Feasibility Analyses - The Systems Analysis Research Corporation (SARC)
-- Detailed Engineering, including soil borings, subsoil analyses and support structure engineering - Kaiser Engineers

Subsequent amendments provided studies on:

-- Traffic and earnings, including both the TACV access system and an intra-airport transit (IAT) system - Peat, Marwick, Mitchell & Co.
-- An analysis of the effects of the February 1971 earthquake on the structural designs - Kaiser Engineers

On 19 October 1970, a prospective bidders' information meeting was held in Los Angeles. The route, construction schedule, technical features of the system, and contracting procedures were discussed. The meeting was attended by 156 persons representing 102 organizations.

In the spring of 1971, negotiations had commenced with firms interested in performing the environmental impact analyses. These negotiations were curtailed and the project essentially was brought to a close in April 1971 with litigation over the environmental impact of the Palmdale Airport, which the TACV system was ultimately to serve. The LADOA General Manager concluded it would be imprudent to continue planning the high-speed ground access system to a new airport that was being challenged on environmental grounds. Other factors which lead to the demise of this project included:

-- Estimated capital costs, including the IAT system, exceeded the financing capability which LADOA could generate from the airlines
-- The route along the San Diego Freeway tapped one of the few potentially lucrative routes for a rail rapid transit system in Los Angeles. The TACV project drew opposition from transit planners and transit operators in the area
-- The 2.2-mile segment of guideway between the San Diego Freeway and LAX proved the most difficult to design. Serious political and community opposition developed from groups who contended this project was one more example of LAX intrusion into their lives.

2). Dulles Airport TACV Access Project

In January 1971 Secretary Volpe announced plans for a major speech to the Metropolitan Washington Council of Governments. This speech was to suggest improvements which could be made in urban transportation in the Washington, D. C. metropolitan area. One suggestion to be considered for possible inclusion in this speech was the demonstration of a TACV system along the median strip of the Dulles Airport Access Road.

On 10 February 1971 the Secretary was briefed on the feasibility of constructing a demonstration system and having it operational in time for TRANSPO in May 1972. The briefing covered the following subjects:

-- Route feasibility
-- Cost estimates
-- Procurement procedures
-- Environmental impact
-- Necessary clearances.

At the conclusion of this briefing the Secretary decided to announce the project on 16 February. This project would demonstrate the technical feasibility and public acceptance of a TACV system. Concurrently with the demonstration, the Department expected to work with local government officials to plan extensions to the demonstration line to make it part of the comprehensively planned, regional transportation system. The scope of the demonstration project included:

-- 13.5 miles of electrified guideway along the median strip of the Dulles Airport Access Road
-- West end of the guideway near the Dulles Airport terminal, the east end on government-owned right-of-way near Dolly Madison Highway.
-- One 60-passenger prototype vehicle, utilizing air cushion suspension, linear electric propulsion, wayside power pickup, automatic controls, with a top speed of 150 mph.

The estimated cost of the project was $22-million. An additional $2.5-million of the vehicle cost was to be derived through cost sharing with the system suppliers. The cost of operating the system during FY 1973 was estimated at $1.5-million.

The 10 February decision set off the following chronology of events:

11 February - a.m. - Principals of the following firms were advised of plans for the project and requested to participate:
- Grumman Aerospace Corporation
- LTV Aerospace Corporation
- Rohr Corporation

11 February - p.m. - Representatives of OMB were briefed on the project -- their support was assured.

15-16 February -- Members of Congress, key committee staffs, and local government officials were advised of plans for the project.

16 February - a.m. -- System performance specifications, a scope of work, and a request for proposals was prepared. A sole source justification for three parallel feasibility study contracts for $100,000 each had been prepared, reviewed and approved.

16 February - p.m. The Secretary announced the project. The project schedule called for:

- Award Project Feasibility Studies -- 17 February
- Receive Proposals - 22 March
- Award Demonstration Project Contract - 1 April
- Complete Engineering - 1 July
- Start Guideway Construction - 1 August
- Complete Guideway and Vehicle - 1 May 1972
- Shake-down and Start-up - 19 May 1972

17 February - Officials from DOT met with representatives of three prospective prime contractors to review details of the project. By close of business, Rohr and LTV signed feasibility study contracts. Grumman would not accept the terms of the contract, but did agree to submit a feasibility study and cost proposal for constructing the demonstration system. Cost proposals were to be submitted on the following basis:

- Engineering - Fixed Price
- Vehicle - Cost Shared
- Construction - Competitive Cost, plus 6% Management

23 February - Letters were submitted to the Chairmen, Subcommittee on Transportation, Senate and House of Representatives, requesting authority to adjust the FY 1971 UMTA RD&D budget by $9.3-million to initiate the project. Additional funds required were to be requested through the regular FY 1972 and FY 1973 appropriations.

24 February - A Draft Environmental Impact Statement was published in the Federal Register and distributed to appropriate Federal, State and local governmental agencies for review and comment within 30 days.

9 March - Source of electric power arranged with VEPCO. Personnel, procedures, and criteria established for the evaluation and selection of the prime contractor.

16 March - Grumman advised they considered the project technically feasible, but were not willing to contract for system delivery by May 1, 1972 on the terms and conditions established.

19 March - The Northern Virginia Transportation Commission unanimously endorsed the project and offered assistance in operating the system. Congressman William Scott of Virginia expressed concern for the political wisdom of proceeding with the project. Congressman Joel Broyhill of Virginia publicly opposed the project.

22 March - Feasibility studies and cost proposals were received from LTV, Rohr and Grumman. The LTV and Rohr proposals complied with the RFP; the Grumman proposal did not.

23 March - The Transportation Subcommittee of the House Appropriations Committee conducted hearings on the request for reprogramming. The main issues were concerned with:

-- The shortness of the time schedule
-- The need to relate the demonstration project to TRANSPO
-- The relationship between the TACV project and the METRO system

26 March - Senator Robert Byrd, Chairman of the Transportation Subcommittee Senate Appropriations Committee, advised of his intentions to hold hearings and requested that no further demonstration contracts be awarded prior to the hearings.

29-30 March - Technical discussions to clarify evaluations of the proposals were held with Rohr and LTV respectively.

1 April - The Department was advised that the House Committee on Appropriations did not approve the requested reprogramming. Contract negotiations scheduled to begin on Saturday, 3 April, were cancelled.

16 April - Members of the House Appropriations Subcommittee were repolled on the request for reprogramming. Again, the request was denied. Prospective contractors were advised that no contract would be awarded.

3) Relevance to Current UTACV Program.
These two prior projects provided much of the basis for the current UTACV Program. Lessons learned from these related efforts include the following:

-- The Department of Transportation can function as a team with a quick reaction capability. Substantial contributions to the overall effort were made by UMTA, FRA, TSC, FHWA, FAA, TST, TEU, OGC and TAD (43 and 60).

-- Participation by local government officials from the onset of an in situ demonstration project is essential to the success of planning, financing and public acceptance of the project

-- Guidelines have been prepared to assist local government agencies in the implementation of a UTACV system. The format for these guidelines is applicable to any new transportation system. The guidelines cover preliminary route engineering, economic feasibility analyses, and environmental impact analyses

-- A tight set of technically achievable system performance specifications have been developed

-- Valid cost factors have been developed for most of the subsystems and components

-- Availability of good cost and performance information has permitted parametric analyses of potential site installations in a way to help judge whether a proposed project makes economic sense.

The present four-phase UTACV Program has a high chance of succeeding in the installation of a revenue system as a result of experience gained with these prior projects.

NOV 15 1972

COMMENTS ON UMTA ACQUISITION PAPER
URBAN TRACKED LEVITATED VEHICLE SYSTEM (UTLV)

General: UMTA has submitted an acquisition paper for an Urban Tracked Levitated Vehicle System procurement for review and approval of preliminary design (Phase IB) and planning for detail design and fabrication (Phase IIB). Initiation of sole source procurement action to LTV (Vought) has previously been requested from and approved by the Under Secretary prior to TSARC review. Contract award will not be completed until TSARC approval is obtained.

TST Recommendation: TST recommends approval of the acquisition paper for Phase IB (preliminary design) and Phase IIB planning (vehicle design and fabrication). TSARC should review the program prior to release of Phase IIB funds in FY 1974 to appraise the then current status of needs, requirements and potential applications for both UTACV and UTLV systems, test facility plans, and the technical solutions evaluated during the Phase IB evaluation tests.

Specific Comments:

1. Sole source procurement from Vought is justified and consistent with UMTA's goal of qualifying two tracked levitated vehicles for urban applications. Incorporation of the proposed technical innovations into an existing design which was technically accepted will be more cost effective than introducing a totally new concept or vendor into the program.

2. The features to be introduced into the design are considered technically achievable and could favorably affect system applications by reducing guideway costs, reducing guideway turning radii, and providing improved ride quality and environment. Technical risks are considered minimal and evaluations during Phase IB will be performed to demonstrate the new air cushion and magnetic guidance designs prior to Phase II fabrication release. An appreciable portion of the data and

analyses generated under prior contract is still valid-allowing Vought to concentrate their effort into the innovative systems to be considered. For this reason, the schedule of 9 months and projected costs are consistent with the work statement and can be completed as planned.

3. The scheduled interrelationship between the UTAC and the UTLV projects will be difficult to maintain. The schedule assumes completion of the UTACV test loop by mid FY 1974 with funds to be authorized by the FY 1974 budget - and this forecast is deemed somewhat optimistic. Initiation of UTLV test operations on the modified UTACV guideway by the end of the final quarter of FY 1975 allows only 9 months for UTACV testing and demonstrations and initial guideway modification for UTLV. UMTA's plan for an approximate one year test, evaluation, and demonstration on a UTACV completed guideway loop is obviously incompatable with the integrated schedule. The schedule and funding plan, however, are consistent with incremental funding needs to maintain program continuity.

4. Through FY 1974, UMTA will have invested over $10M in UTACV facilities at HSGTC-Pueblo. The acquisition plan indicates using this facility for approximatly 9 months prior to modification for UTLV tests - at an added investment of $5.0M for the modification. This major changeover is necessitated by the dissimilarities between the two vehicles and guideway configurations. Salvageable investment from the UTACV guideway will be the concrete guideway bed, wayside power distribution system, and the guideway installed automatic control system hardware (estimated value $4 - 5M). A capability for alternate operations for either of the two vehicles cannot be maintained on a single guideway configuration.

URD-1

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE: 22 January 1973

In reply refer to: IT-06-0031(08)

SUBJECT: UTACV Project: Fund Reservation for Additional Test Track Engineering

FROM : Director, Special Projects

TO : Administrator

Background

Engineering design and bid packages have been prepared for 7.0 miles of test track at HSGTC, Pueblo. The route surveys, soil samples and representative cross sections of the remaining 3.5 miles have also been completed.

As a result of the TSARC review of the UTACV Test Facilities acquisition on 21 December, 1972, the council approved the acquisition provided:

-- That options be negotiated to provide for evenutal construction of the full length of test track

-- That consideration be given to scheduling construction to permit minimizing costs as well as meshing with the budget cycle for purposes of exercising the options in a timely manner.

Construction bids taken on the basic seven-mile design include options for decreasing the unit quantities by 25 percent. Thus a minimum of 5.25 miles of track could be constructed under this contract. Since costs of a complete track (slab, road, power rail and reaction rail) appear to limit the length of track that can be built with available FY 1973 funds to three miles, counsel has advised rejecting bids and readvertising the construction contracts. In order to comply with TSARC's approval provisions, readvertising the contract to include options to extend construction approximately seven miles when FY 1974 funds become available will require additional engineering for the three additional miles of track.

Scope of Work

The scope of work for this proposed procurement provides for:

-- The design of an additional three miles of guideway to complete the 10.5-mile test track loop. This design is to include:

- Slab with options for an asphalt overlay
- Service road
- Drainage and erosion control

-- Preparation of bid packages, including engineering drawings and specifications for a basic bid of approximately three miles with options to contract for an additional seven miles when FY 1974 funds become available.

The designs are to be based on field data acquired by Rohr's engineering subcontractor --- ABAM Engineers, Inc. -- under Procurement Request No. DOT-UT-10031/6 approved 31 July 1972.

Schedule

An amendment to the existing Rohr/ABAM contract would be issued by 22 January, 1973. The bid packages would be complete in three weeks. Construction contract proposals would be submitted by 27 February. Rohr's revised proposal would be submitted to DOT by 12 March. A notice to proceed with construction could be issued by 2 April 1973.

Funding

Funds required from the FY 1973 RD&D Program for this additional task will not exceed $40,000.

Legal Determination

The Office of the Chief Counsel has reviewed this proposed procurement and has found that it is authorized under Section 6 of the Act.

Labor Determination

The labor protection of Section 13(c) of the Act is not applicable to the proposed procurement since no revenue operations are involved.

Environmental Protection

Pursuant to the requirements of Section 14 of the Act, policy and procedures pertaining thereto, review of statements and comments pursuant to the National Environmental Policy Act of 1969 and such additional information and analysis as deemed necessary, I am satisfied that this procurement will not have a significant impact on the environment.

Recommendation

This procurement, like all other procurements in the UTACV project, will assist in the reduction of urban transportation needs, improve mass transportation service, and make a contribution toward the meeting of total urban transportation needs of minimum cost.

The additional test track engineering and readvertising of construction costs are expected to achieve some long-term economics by:

-- Prorating some of the "front-end" costs over the full length of the guideway
-- Permitting construction to take place during a more agreeable time of the year
-- Meshing a more reasonable vehicle delivery schedule with the availability of test facilities at Pueblo.

I recommend approval of this additional engineering.

H. W. Merritt

I have reviewed this request.

Robert A. Hemmes, Associate Administrator
Office of Research, Development
and Demonstration

I have reserved $40,000 for this procurement.

Harriet C Hawkins 1/30/73
Harriet Hawkins, UAD-10

Approved:

Administrator

Date 1/31/73

Read Instructions on Reverse. NO CARBON REQUIRED

PROCUREMENT REQUEST

1. (Check one) ☐ NEW PROCUREMENT ☒ CONTRACT MODIFICATION

2. ORIG. REQN. NO.

3. DATE: 22 January 1973

4. CROSS REF.: PRN/CON # DOT-UT-10031

21. PROCUREMENT REQ. NO.: PRN

22. DATE RECEIVED

5. NAME (Last name — first name — middle initial): Merritt, H. W.

5a. PHONE EXT.: 62697

5b. ROUTING SYMB.: UOA-20

7. SECURITY CLASSIFICATION

23. SET ASIDE ACTION: a. SMALL BUS. b. LABOR SURPLUS

5c. BRANCH/DIVISION: UMTA

6. PROJECT/TASK NO.: IT-06-0031 (08)

8. PROJECT MANAGER: Merritt, H. W.

9. APPROP./LIMIT'N/FISCAL PROG./DISTRIB./OBJECT: 69x4119

10. APPROVALS

a. APPROVING OFFICIALS	ROUTING SYMBOL	DATE	b. INTERNAL ROUTING: INITIALS	RTG. SYM.
(1) AUTHORIZED REQUISITIONER: C. C. Villarreal	UOA-1	1/30/73		
(2) MATERIEL MANAGEMENT OFFICER: H. W. Merritt	UOA-20	1/30/73		
(3) CLEARANCE OFF.—CONTR. COMMODITY/SVC.: Willie Scroggins	UAD-21	1/30/73		
(4) ACCOUNTING CERTIFICATION OFFICER: W. H. Boswell	UAD-1	1/30/73		

11. DATE(S) REQUIRED (see instructions)

12. SHIP TO — CONSIGNEE AND DESTINATION

ITEM NO.	14. DESCRIPTION OF ARTICLES AND/OR SERVICES (Including specifications and other pertinent data)	15. QUANTITY	16. UNIT	17. ESTIMATED COST a. UNIT	b. TOTAL
	Additional engineering to complete the design and prepare bid packages for the full 10.5-mile UTACV Test Track at Pueblo, Colorado. Work is to be based on field data previously acquired under PRN DOT-UT-10031/6. Bid packages are to be completed and advertised by 15 February 1973.			$	40,000

18. GOVERNMENT FURNISHED PROPERTY ☐ NO ☐ YES (If "YES" attach list) ESTIMATED VALUE $

AGGREGATE COST $40,000

SUGGESTED SOURCES OF SUPPLY (If known)

NAME	ADDRESS
Rohr Industries, Inc.	Chula Vista, California

20. REMARKS (See instructions).

1-29-73

FOR: "STATE OF THE BUSINESS MEMO"

Urban Tracked Air Cushion Vehicle Project Status:

A 60-passenger 150 mph prototype TACV is nearing completion at Rohr Industries in Chula Vista, California. Upon installation of the linear electric motor and power control unit in March, the vehicle will be ready for pre-acceptance tests. These tests will be conducted on a 500-foot length of test track at the Rohr plant. If these tests are satisfactory, the vehicle will be shipped to the Department's High-Speed Ground Test Center in Pueblo, Colorado, on 30 June 1973. Upon shipment to Pueblo, this prototype will represent a Federal investment of $7,228,423 in FY 1971 and 1972 funds.

The FY 1973 authorization provides for the following:

	($ 000)	
Test Facility Acquisition	4.677	(1)
Test Operations	.300	
Advanced UTLV Design	.600	
TSC Technical Support	.923	(2)
	6.500	

(1) $600,000 have been deferred to FY 1974
(2) $200,000 have been deferred to FY 1974

Contracts for the test facilities were advertised in October, 1972. Rohr submitted a "turn-key" proposal to build these facilities in December 1972. This proposal exceeded available funds and has been rejected. Rohr is now readvertising the construction contracts and will submit a revised proposal by 12 March 1973. Lower costs are expected by contracting a shorter length of test track with options to extend the contract over the full 10.5-mile test track loop, thus prorating the front-end costs for mobilization, tooling and engineering. A notice to proceed with construction is expected by 2 April, 1973.

Issues:

In accordance with Under Secretary Memorandum of 19 January 1970, program management is provided by UMTA, but engineering responsibility is assigned FRA. A project engineer has been assigned from FRA. Technical support for the project has been provided by the Transportation Systems Center, Cambridge.

Until August 1972, administrative support for the project was provided temporarily by the assignment of an exchange executive under the President's Executive Interchange Program. Since August no assistance has been available for financial management, procurement support, or project planning. A position needs to be assigned and filled to provide continuity to these functions.

Construction contracts amounting to about $4-million are expected to be awarded by 2 April 1973. If the FY 1974 Congressional budget is approved, an additional $5.5-million in facilities construction could be underway in the Fall of 1973. DOT Notice DOT N 1130.7 of 14 September 1972 requires that project monitors assigned to the Pueblo Test Center be provided by the sponsoring operating administration. A second position should be established and filled before April 1973 to represent the Government's interests in the construction of UTACV test facilities at Pueblo.

H. W. Merritt
29 January 1973

27 December 1972

URBAN TRACKED AIR CUSHION VEHICLE PROGRAM

Descriptive Overview of the Program

The goal of the Urban TACV Program is to establish a TACV system as a viable urban transportation alternative for funding under UMTA's Capital Grant Program. The specific limited objectives of the program are to:

-- Verify system performance on such features as ride quality, noise and safe high-speed operations.

-- Provide public officials with measured data on system performance, reliability, safety and environmental impact.

The program is planned for accomplishment under the following four phases:

Phase I: Engineering Design. Two competing designs were prepared in response to performance specifications developed by the Transportation Systems Center at Cambridge.

Phase II: Vehicle Fabrication. Rohr Industries, Inc. was selected to build the prototype vehicle in accordance with designs prepared during Phase I.

Phase III: Test Operations. A 10.5-mile test track loop has been planned at the Department's High Speed Ground Test Center at Pueblo, Colorado. Engineering designs for the first increment of this track, for a maintenance building and power supply have been completed. Construction can commence upon the conclusion of contract negotiations. Test operations will commence in the spring of 1973 upon completion of the first segment of the test track and upon delivery of the completed vehicle to HSGTC Pueblo.

Phase IV: Revenue Service: Upon completion of satisfactory tests at Pueblo, a UTACV system would be considered ready for revenue service without further demonstration. Upon meeting applicable statutory requirements, a local public agency could be assisted financially with a revenue installation under UMTA's technical study and capital grant programs.

URBAN TRACKED AIR CUSHION VEHICLE PROGRAM

1. Program Description

The Urban Tracked Air Cushion Vehicle (UTACV) provides high-speed ground transportation with linear electric propulsion, air cushion levitation and guidance, on an exclusive guideway, and with fully automatic controls. The UTACV system will satisfy, at high speed and with minimum adverse environmental impact the requirement for line-haul links in an urban mass transportation system such as:

-- Access to a regional airport from the central business district
-- Airport to airport interchange
-- Commutation between new community developments and established metropolitan areas
-- Travel between contiguous urban complexes.

The advantages of a UTACV system accrue in those applications where:

-- Station stops are five miles or more apart
-- Travel distances are 10 to 50 miles long
-- Rights-of-way, such as median strips of urban freeways or abandoned railroads are available, and
-- Adequate feeder and distribution systems can be provided at each end of the line-haul link.

(a) Pros and Cons of an UTACV and a 150 mph Conventional Rail System

Where there is in existence an established rail passenger service, there is no particular advantage in replacing it with a TACV system. Upgrading the roadbed and replacing rolling stock with improved equipment would probably be more cost effective than replacing it with a TACV system. Integration of an improved passenger train system into existing trackage does have several disadvantages.

-- The disruption of service on existing lines during the period of conversion would be greater than if a new, elevated, TACV guideway were built over the same right-of-way

-- Steel rail alignment is difficult to maintain. Pounding increases with speed resulting in less comfort and higher maintenance costs
-- The risk of derailment with potentially greater catastrophic results increases as speed increases
-- 160 mph is considered the maximum speed for conventional steel-wheel/steel-rail technology. There is no technological growth potential beyond this point.

A TACV system is considered to have several advantages over a 150 mph conventional rail system. These advantages are particularly apparent where there is no existing system and a capital investment would be required from the ground on up.

-- Since there is virtually no contact between the TACV and guideway, maintenance costs should be much lower.
(On 30 May 1972, Mr. Jean Bertin, Societe de l'Aerotrain, advised the Department that no maintenance costs had been incurred in three years for the 11.5-mile guideway for testing the 155 mph TACV near Orleans, France).
-- The air cushion suspension and lack of physical contact should insure more consistent ride comfort for the passengers
-- Since propulsion does not depend upon wheel/rail adhesion, TACV operations should be less affected by adverse weather
-- Lighter vehicles with loads distributed through the air cushions offer the potential for lower elevated structure costs
-- Since the TACV is virtually confined to a guideway by the reaction rail, derailment safety should be better than for a conventional rail system
-- The TACV system has the potential for growth to even higher speeds. Experience gained with testing and introducing a 150 mph TACV system into revenue service will pave the way for a 300 mph TACV system.At this higher speed, a ground transportation system can begin to offer significant savings in travel time for trips from 100 to 500 miles. In this regime, a TACV system can become a valid alternative to air travel in heavily congested corridors.

(b) Program Goals and Objectives

(1) Overall Goal

The ultimate goal of the UTACV Program is to provide a new high-speed, line-haul system for travel in corridors where travel time is a significant factor. Such a system will offer alternatives to urban transportation planners and local officials who are considering establishment of new systems with financial assistance under the UMTA capital grant program.

(2) Program Objectives

The specific limited objectives of the Urban TACV Program are to:

-- Verify system performance on such features as ride quality, noise and safe high-speed operations
-- Provide public officials with measured data on system performance, reliability, safety and environmental impact

(c) Program Plan

The Urban TACV Program has been planned in four phases designed to make a state-of-the-art UTACV system available for revenue service in FY 1976.

Phase I: Engineering Design - Designs for a prototype vehicle were initiated in the latter half of 1971 and were completed in January 1972. This phase provided for the engineering design of a state-of-the-art 60-passenger prototype vehicle propelled by a linear electric motor. Phase I covered the site-independent aspects of facilities for a complete system, including guideway, wayside power distribution, wayside control system, passenger and baggage handling facilities, and a vehicle maintenance facility. Also included was the fabrication of a full-scale mockup of this vehicle. Parallel contracts were awarded to Rohr Industries, Inc. and Vought Aeronautics Company. A rendering and a schematic of the Rohr design are attached.

Phase II: Vehicle Fabrication - In February 1972 Rohr was selected to fabricate the state-of-the-art prototype in accordance with designs developed in Phase I. The vehicle is essentially complete and has been moved to a short section of guideway at the Rohr plant to commence provisional acceptance prior to comprehensive testing and evaluation in Phase III. Photographs of the vehicle as it was rolled out on 2 December 1972 are attached. The vehicle is to be shipped to the Department's High-Speed Ground Test Center (HSGTC) at Pueblo, Colorado, in the spring of 1973 for the Phase III test program.

Phase III: Test Operations - Plans have been made for a 10.5-mile test track loop at HSGTC, Pueblo. Engineering designs and specifications have been prepared for the first increment of the test facility. This increment provides:

-- Three to seven miles of guideway, including: the concrete slab, guide rail, wayside power rail, and service road with drainage and erosion control.
-- Maintenance facilities, including: a control room, work shop areas, hydraulic hoist, loading platform, and support equipment
-- An option to obtain and use an asphalt heater-planer for guideway maintenance
-- Communications and equipment for control of the vehicle from the control center
-- The Federal Railroad Administration is providing primary power and the substation. Secondary distribution and booster cables to the power rail will be installed under the UMTA project.

During FY 1973, this phase of the project will also cover:

-- Tests of the system, including vehicle acceptance tests, up to 1 July 1973 with an option to continue test operations through June 1974
-- Construction engineering and inspection of the test facility as well as the system integration management.

Proposals for constructing the test facilities were submitted by Rohr Industries on 19 December. These proposals are being evaluated preparatory to negotiations. Contracts are expected to be awarded early in February 1973, if approved by the Department's Transportation Systems Acquisition Review Council (TSARC).

The FY 1974 budget request provides for completing the test track at Pueblo. The scope of this effort includes:

-- Closing the 10.5-mile loop to permit sustained operations at 150 mph
-- Constructing eight elevated track sections to assess vehicle/guideway dynamic interactions. The elevated sections will also provide experience with erection techniques and costs of this type of guideway
-- Installing a switch to establish the feasibility of switching a TACV and to provide access between the maintenance facility and test track loop.

During FY 1974, test operations will shift from assessing vehicle performance for short durations at 150 mph to sustained operational tests. These tests, to be concluded in FY 1975, will provide data on system safety, maintainability and reliability.

Phase IV: Revenue System - The most promising site for application of UTACV technology in revenue operation is between Dallas, Fort Worth and their new regional airport. The city councils of both cities have adopted resolutions which:

-- Provide the one-third local matching share of an UMTA technical study grant to plan the revenue system
-- Commit the cities to actively seek the local share of the capital costs of a UTACV system, if the technical study indicates it is feasible and if it is in the best interests of the cities to do so.

Work under the technical study was initiated in FY 1973 by the North Central Texas Council of Governments and encompasses:

-- Preliminary route engineering including rights-of-way, foundation analyses, and integration with the comprehensively planned transportation system for the region
-- Economic feasibility, including estimates of patronage, revenues, capital and operating costs
-- Environmental impact, including the social and economic effect of the system on the region it serves.

This study should be completed within the next 12 months.

Other sites having potential application of a UTACV revenue system include:

-- New Orleans - Baton Rouge, Louisiana
-- Orlando - Disney World, Florida
-- Seattle - Tacoma, Washington
-- San Diego, California - Tijuana, Mexico

(d) Advanced Tracked Levitated Vehicle (ATLV)

The Vought Aeronautics Company has proposed the design of an advanced concept vehicle. This design will incorporate the following innovations:

-- Single-sided linear electric motor for propulsion
-- Solid state variable frequency, variable voltage, motor controls
-- Magnetic guidance.

These features will simplify guideway construction, facilitate high-speed switching and improve the efficiency of the system. Award of this contract will also provide a potential second system source. This is consistent with UMTA's policy of requiring free and open competition in the acquisition of equipment and facilities with capital grant assistance. Approval of this contract is also contingent upon TSARC concurrence. Fund limitations imposed by the Office of Management and Budget preclude the fabrication of an ATLV prototype.

2. Contractors

Phase I: Engineering Design

Rohr Industries, Inc., with:

Societe de l'Aerotrain
Garrett Corporation
LeMoteur Lineaire
Bertin et Cie
Bendix Corporation
Dow Chemical Corporation
ABAM Engineers, Inc.
John M. Parkin Corporation

Vought Aeronautics Company, with:

Garrett Corporation
General Electric Company
Walter Dorwin Teague Associates, Inc.
Raymond Technical Facilities, Inc.
General Railway Signal Company

Phase II: Vehicle Fabrication

Rohr Industries, Inc, with:

Same as above, but omitting:

Garrett Corporation
John M. Parkin Corporation

Phase III: Test Operations

Rohr Industries, Inc. with:

ABAM Engineers, Inc.
Austin Research Engineers, Inc.
Construction contractors to be determined

Phase IV: Revenue System

To be competitively awarded by the local government agency

3. Type of Contracts

Phase I: Engineering Design

Cost plus fixed fee with ceiling

Phase II: Vehicle Fabrication

Cost plus incentive fee with ceiling

Phase III: Test Operations

Under negotiation

Phase IV: Revenue System

Competitively bid fixed price

4. Program Funding ($000)

	FY71	FY72	FY73	FY74	FY75
Phase I					
Engineering Design	3,000	151			
Power and Propulsion		500			
Mock-ups		74			
Advanced TLV Design			600		
Phase II					
Vehicle Fabrication		5,340			
Phase III					
Test Site Engineering		193			
Facility Construction			4,677	5,500	
Test Operations			300	600	175
Phase IV					
(To be funded under Technical Study and Capital Grant Programs)					
TSC Support	562	944	723	800	500
Total	3,562	7,202	6,300	6,900	675

5. Program Schedule

Phase I -

Design Contracts Award	June 1971
Designs Completed	December 1971

Phase II

Vehicle Fabrication Contract Awarded	February 1972
Vehicle Complete	March 1973

Phase III

Test Facilities

Issue RFP for Test Facility A&E Services	May 1972
Award A&E Contract for Facility Engineering	June 1972
Engineering Complete, Contracts Advertised	October 1972
Test Facility Proposals Submitted	December 1972
Facilities Contract Awarded	January 1973
Initial Segment Complete	July 1973
FY1973 Increment Complete	October 1973

Test Operations

Issue RFP	January 1973
Receive Proposals, Award Contract	March 1973
Start Tests	April 1973
Complete Tests	January 1974

6. Principal Accomplishments

-- Performance specifications for a state-of-the art 150 mph tracked air cushion vehicle have been developed

-- A prototype vehicle designed to meet the performance specifications is nearing completion

-- Engineering is complete for test facilities at the Department's High Speed Ground Test Center

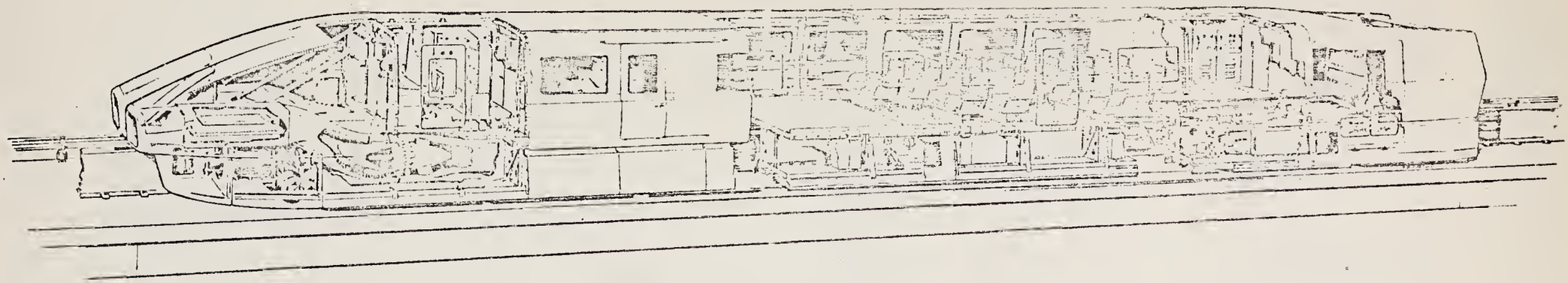
-- Proposals have been received and contracts are ready to be negotiated for constructing the test facilities

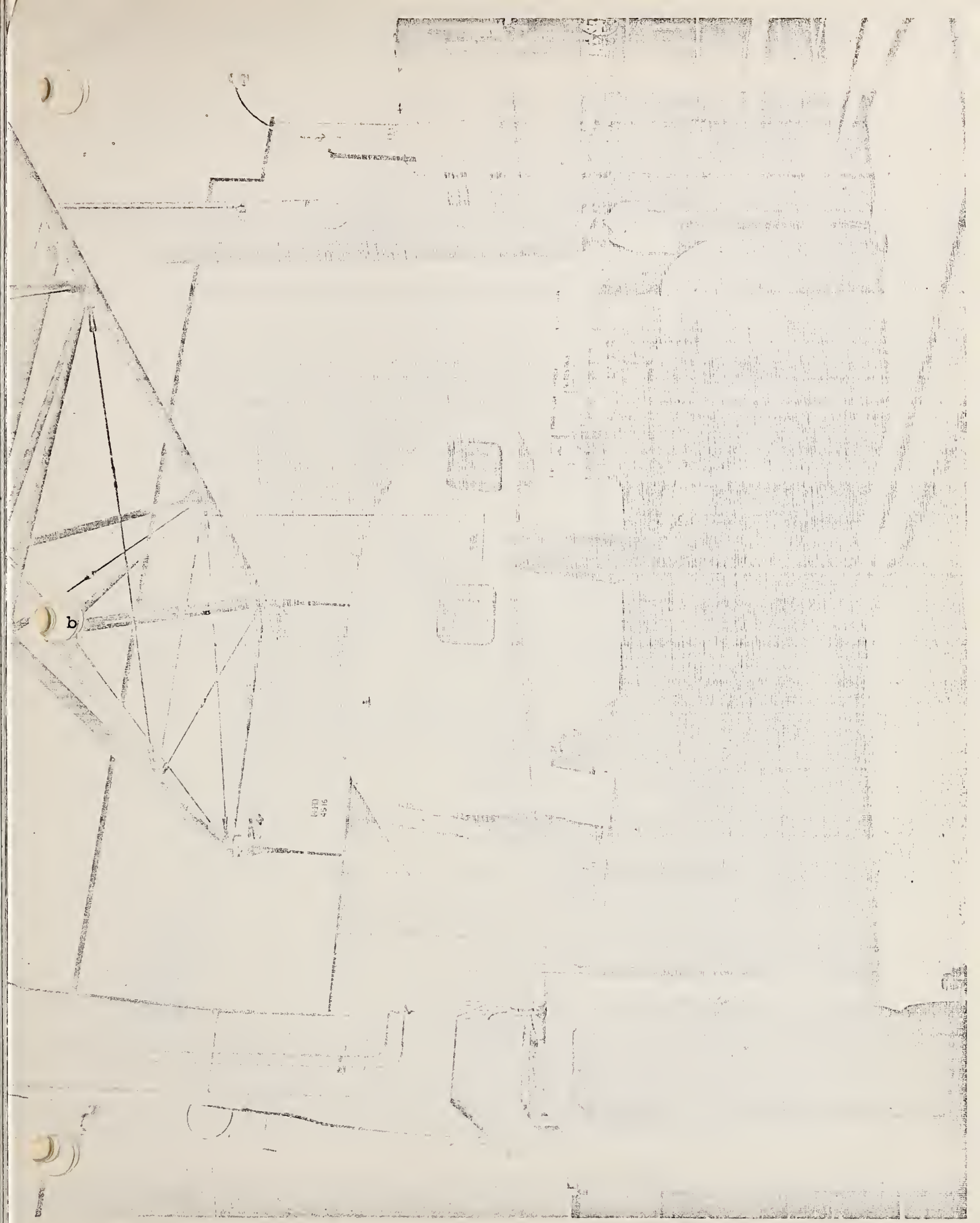
-- Test requirements have been established preparatory to issuing a request for proposals to conduct the test operations

-- Economic analyses have been conducted to establish the viability of a UTACV system as part of a comprehensive urban mass transportation system

-- Planning guidelines for a UTACV system for use by local government agencies are in preparation. These guidelines will cover the route engineering, the economic analyses

-- A technical study has been initiated to assess the the feasibility of installing a UTACV system between Dallas, Fort Worth and their new regional airport.

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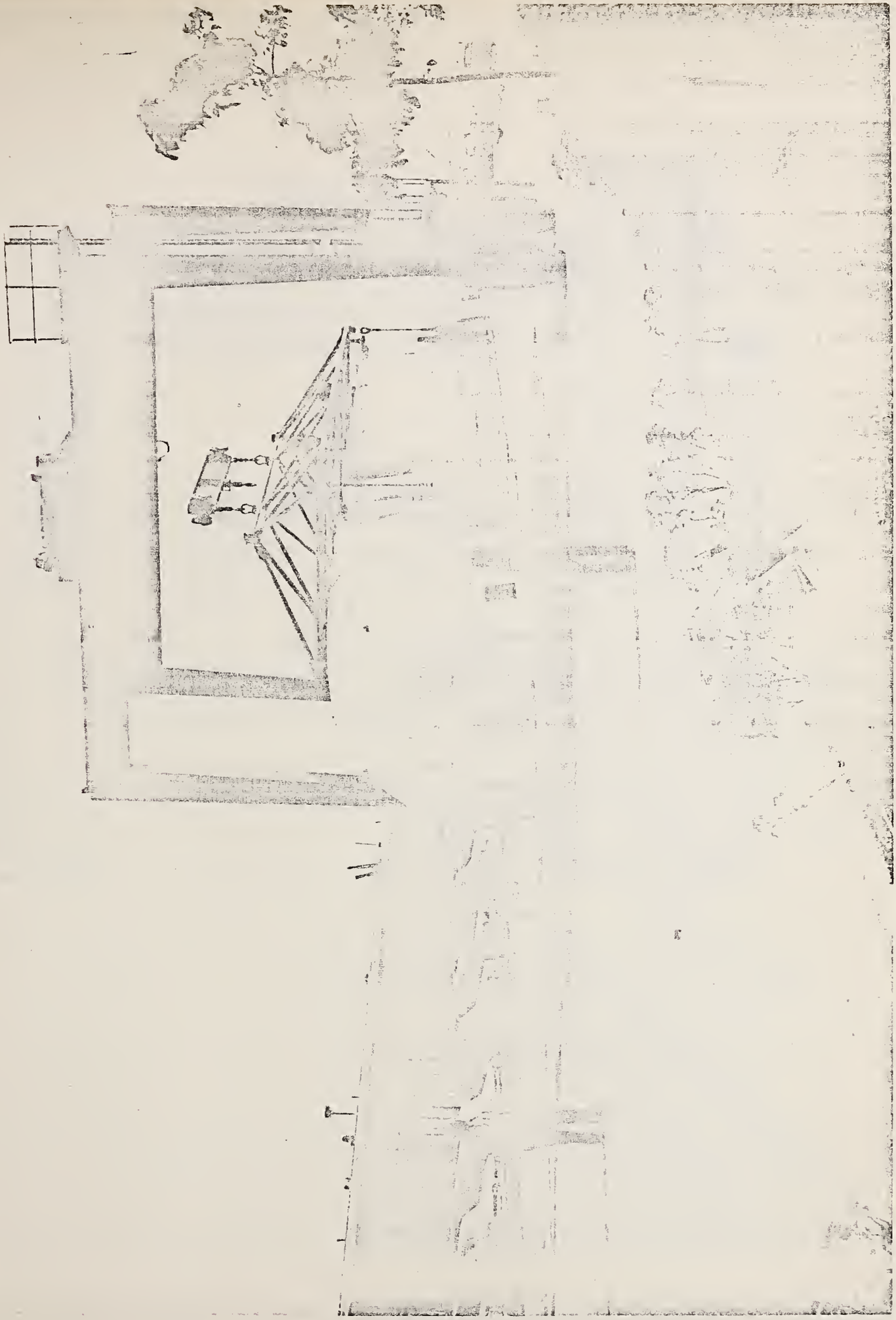

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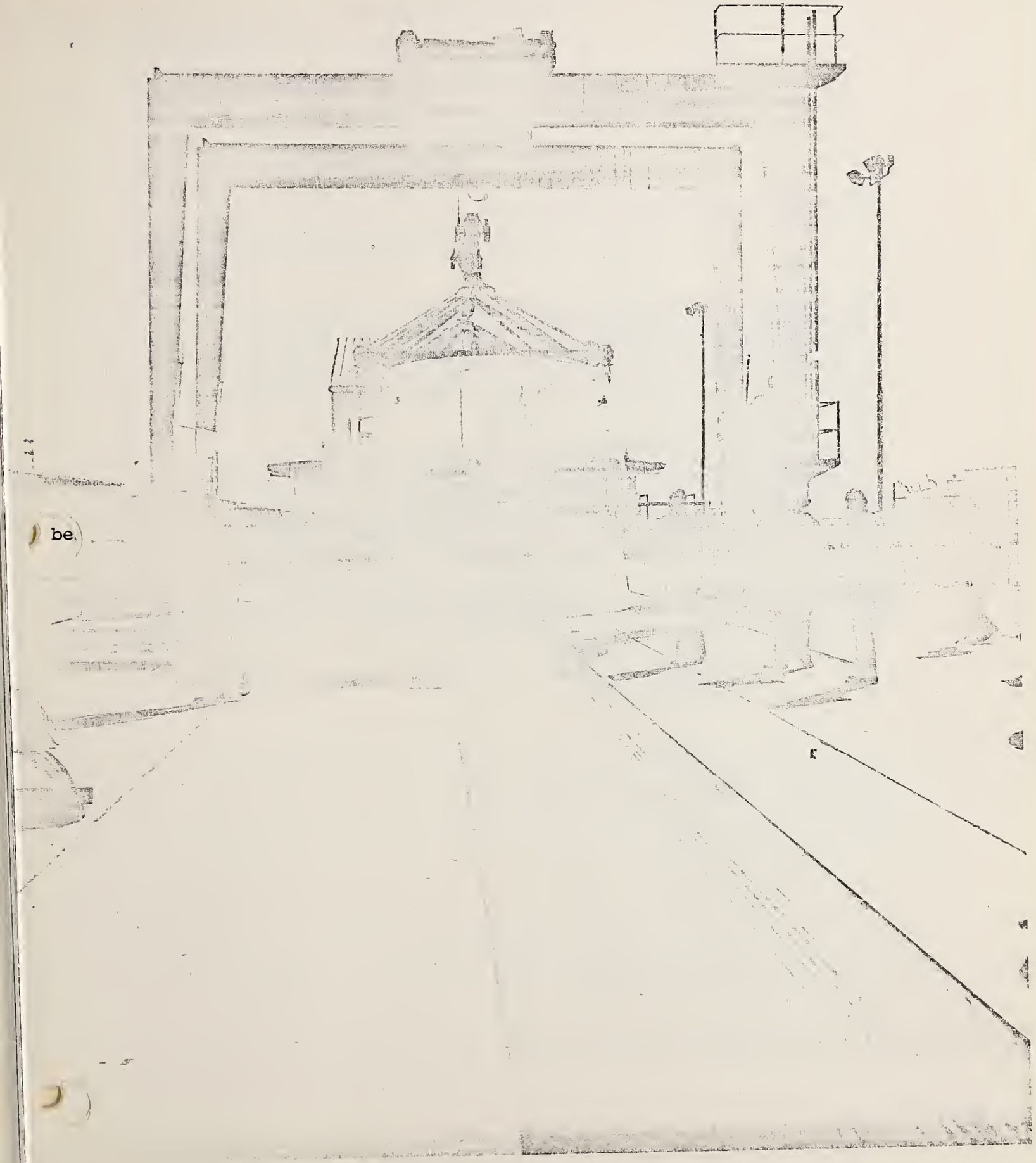

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Form DOT F 1320.1 (1-67)

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION

OFFICE OF THE SECRETARY

DATE: January 4, 1973

In reply refer to: TAD-60

SUBJECT: Acquisition Paper - UTACV Test Facilities and Operations

FROM : Executive Secretary, TSARC

TO : Urban Mass Transportation Administrator

The Acquisition Paper for the Urban Tracked Air Cushion Vehicle Test Facilities and Operations has been approved by the TSARC, providing:

a. That the price for guideway construction is fully analyzed and completely negotiated, and that particular attention in negotiation be given to the appropriate amount of G&A and profit for the prime contractor, in view of his apparent limited contribution to the effort.

b. That options be negotiated to provide for eventual construction of the full seven miles of operational guideway. Consideration shall be given to scheduling construction to permit minimizing costs as well as meshing with the budget cycle for purposes of exercising the options in a timely manner.

Please provide this office with a copy of any resulting contract.

D. L. Siegel

UNITED STATES GOVERNMENT

Memorandum

① Ngjako
② Abraham

URD-1

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

34030704

DATE: 16 NOV 1972

In reply refer to:

SUBJECT: UTACV Project: Fund Reservation for Phase III Test Facilities Construction

FROM: Director, Special Projects

TO: Administrator

Background

During the 25 January 1972 UTACV Program briefing, the Secretary made the decision to test the prototype vehicle at the Department's High Speed Ground Test Center (HSGTC) at Pueblo, Colorado. At the conclusion of these tests, the UTACV system is to proceed directly to an operational revenue system without an intervening system demonstration.

On 16 March 1972, you approved a fund reservation for the engineering design and preparation of cost proposals for test facilities. To insure that the UTACV guideway, wayside power supply, control system and maintenance shop were compatible with the vehicle, it was determined to be in the Department's best interests to make Rohr Industries, Inc. responsible for the interfaces.

Consequently, Rohr has been awarded a contract to perform the test facilities engineering for seven miles of test guideway and support facilities at the HSGTC, Pueblo, Colorado. Field surveys, plans and specifications for the guideway have been prepared through a subcontract with ABAM consulting engineers.

Schedule

The engineering design has been completed and IFB's have been sent out for the construction. Bids are scheduled to be opened by Rohr for the guideway, maintenance shop, and related construction on 17 November 1972. Subsequently, Rohr Industries, Inc. will submit their proposal for the construction of the complete test facility on 1 December 1972. A detailed schedule is attached.

Scope of Work

The scope of work for this proposed procurement provides for:

-- Construction of the first segment from five to seven miles of test guideway including grading, drainage and erosion control, comprising:

  . service road
  . concrete slab
  . reaction rail
  . wayside power rail

-- Construction of a maintenance building,including:

  . control room and work shop areas
  . hydraulic hoist
  . loading platform
  . support equipment

-- An option to obtain and use an asphalt heater-planer

-- Provision of communications and equipment for control of the vehicle from the control center

-- Installation of secondary power between Government-furnished substations and the wayside power system

-- Phase III test operations of the system, including the vehicle acceptance tests, up to 1 July 1973 with an option to continue test operations through June 1974

-- Construction engineering and inspection of the test facility as well as the system integration management.

Funding

The FY 1973 funding required for the Phase III test facilities construction and operation is $4.90 million.

Legal Determination

The Office of the Chief Counsel has reviewed this proposed procurement and has found that it is authorized under Section 6 of the Act.

Labor Determination

The labor protection of Section 13(c) of the Act is not applicable to the proposed procurement since no revenue operations are involved.

Environmental Protection

Pursuant to the requirements of Section 14 of the Act, policy and procedures pertaining thereto, review of statements and comments pursuant to the National Environmental Policy Act of 1969 and such additional information and analysis as deemed necessary, I am satisfied that this procurement will not have a significant impact on the environment.

Recommendation

This procurement, like all other procurements in the UTACV project, will assist in the reduction of urban transportation needs, improve mass transportation service, and make a contribution toward the meeting of total urban transportation needs at minimum cost.

The consolidation of Phase III test site facilities acquisition and prototype vehicle fabrication with a single contractor is in the best interests of the Department for two basic reasons:

-- It facilitates all vehicle/test site interface coordination, overall contract administration and project control and

-- It provides the least risk in facilities acquisition for a successful Phase III program.

It is recommended that construction of the test facilities be undertaken in accordance with the engineering design produced by Rohr Industries, Inc.

Upon your approval of this procurement request, the contract will be executed.

H. W. Merritt

I have reviewed this request.

for Henry A. Kejako, Jr 11-16-72
Robert A. Hemmes, Associate Administrator
Office of Research, Development
and Demonstration

I have reserved the $4,900,000 for this procurement.

Harriet Hawkins 11-17-72
Harriet Hawkins, UAD-10

Approved:

C. C. Villarreal

C. C. Villarreal

Date: 11/26/72

PHASE III UTACV Test Facility

Engineering & Construction
Pueblo, Colorado

Preliminary Schedule for Turn-Key Operation

Proposal submitted for design ONLY	5/1/72
UTACV contract amended for design task	5/15/72
Design review completed	10/4/72
Test Site Construction Cost Proposal Submitted	12/1/72
Amendment to contract issued	12/15/72
Construction started at Pueblo	12/19/72
Concrete paving started	3/6/73
Installation of reaction and power rails started	3/15/73
Electrical power available at test facility	3/31/73
UTACV delivered to site	3/31/73
First 1500 feet test track complete	4/24/73
Facility complete	9/25/73

cc - UOA-1
UAD-30
UOA-20 (2)
UAD-21
UCC-1
UCR-1
UPA-1
FRA-41
TAD-43
URD-1
TST-25

UOA-20/MERRITT/mnb
16 November 1972

SOLE SOURCE JUSTIFICATION

PHASE III TEST FACILITIES ACQUISITION CONTRACTOR

UTACV

Phase III of the UTACV Project, Test and Evaluation, provides for the performance verification and passenger acceptance of the prototype UTACV being fabricated by Rohr Industries, Inc. Under contract DOT-UT-10031, Phase III will be conducted at the Department's High-Speed Ground Test Center at Pueblo and start in March 1973, upon delivery of the prototype vehicle.

Under Phase II, Rohr Industries, Inc. is the developer at this time for the key hardware elements (i.e., the vehicle, reaction rail, power rail) of the Urban TACV system to be tested at Pueblo. System performance is an integral function of these elements. To achieve necessary systems integration control, it is mandatory that Rohr be the prime contractor for the design and construction effort. Assigning responsibility for the Phase III test facilities design and construction to the vehicle contractor (Rohr Industries, Inc.) is the most effective approach for the following reasons:

-- The guideway design and construction must be totally compatible with the reaction rail, power rail and vehicle which is currently being furnished by Rohr. An authentic assessment

of vehicle performance must preclude any inadvertent perturbations from the test site facilities. To insure system compatibility, Rohr has prepared the complete guideway design except for the site dependent aspects under their Phase I contract. Assignment of responsibility for execution of those designs and interface control through guideway construction will minimize any degradation of vehicle performance attributable to guideway deficiencies.

-- Fabrication and installation of both the reaction and power rails must be compatible with the guideway and vehicle. Designs for these rails and their mountings have been prepared by Rohr under their Phase I contract. Short lengths of the reaction rail and power rail will be provided by Rohr for system integration with the vehicle under their Phase II contract. To insure that this integration is carried forward to the test phase, Rohr should be assigned responsibility for providing and installing the reaction and power rails. By so doing, a single organization can be held accountable for the electrical continuity of both sets of rails, differential thermal expansion between the rails and the guideway, and dimensional relationships of the rails, guideway and vehicle.

-- Automatic controls for the TACV involve elements on board the vehicle, in the guideway, and a communication link to a central

control point. Rohr has completed the design of these elements. Assigning Rohr the total systems management responsibility for providing and installing an integrated automatic control system will insure compatibility of on-board equipment, wayside equipment and central control facilities. Without fixed responsibility for control system interfaces, testing of the automatic controls could be inconclusive; operation of the vehicle could even become hazardous.

In summary, a contract with Rohr Industries, Inc. to design and construct the Phase III test facilities is in the best interests of the Government for the following reasons:

-- Rohr is the only organization that has the necessary expertise to insure compatibility between the vehicle, reaction rail, power rail, automatic controls, test instrumentation and support facilities.

-- Rohr is the only contractor in view of the overall system integration involved that can effectively insure that the performance requirements of the prototype vehicle can be successfully achieved at the test facility.

PROCUREMENT REQUEST

1. (Check one) ☐ NEW PROCUREMENT ☒ CONTRACT MODIFICATION

2. ORIG. REQN. NO.

3. DATE

4. CROSS REF. PRN/CON # DOT-UT-10031

21. PROCUREMENT REQ. NO. PRN

22. DATE RECEIVED

5. NAME (Last name — first name — middle initial) MERRITT, H. W.

5a. PHONE EXT.

5b. ROUTING SYMB.

7. SECURITY CLASSIFICATION

23. SET ASIDE ACTION a. SMALL BUS. b. LABOR SURPLUS

5c. BRANCH/DIVISION UMTA

6. PROJECT/TASK NO. IT-06-0031

8. PROJECT MANAGER Merritt, H. W.

9. APPROP./LIMIT'N/FISCAL PROG./DISTRIB./OBJECT 64x4119

10. APPROVALS

a. APPROVING OFFICIALS	ROUTING SYMBOL	DATE	b. INTERNAL ROUTING INITIALS	b. INTERNAL ROUTING RTG. SYM.
(1) AUTHORIZED REQUISITIONER C. C. Villarreal	UOA-1			
(2) MATERIEL MANAGEMENT OFFICER H. W. Merritt	UOA-1			
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(4) ACCOUNTING CERTIFICATION OFFICER W. H. Boswell	UAD=1			

11. DATE(S) REQUIRED (see instructions)

12. SHIP TO — CONSIGNEE AND DESTINATION

13. ITEM NO.	14. DESCRIPTION OF ARTICLES AND/OR SERVICES (Including specifications and other pertinent data)	15. QUANTITY	16. UNIT	17. ESTIMATED COST a. UNIT	17. ESTIMATED COST b. TOTAL
	Contract to perform the detailed site construction for the UTACV test facility at the HSGTC, Pueblo Special tasks include:				$ 4,900,000
	-- Construction of the first segment from 5 to 7 miles of test guideway including grading, drainage and erosion control, comprising:				
	. service road				
	. concrete slab				
	. reaction rail				
	. wayside power rail				
	-- Construction of a maintenance building, including:				
	. control room and work shop areas				
	. hydraulic hoist				
	. loading platform				
	. support equipment				

18. GOVERNMENT FURNISHED PROPERTY ☐ NO ☐ YES (If "YES" attach list) ESTIMATED VALUE $

AGGREGATE COST $ 4,900,000

19. SUGGESTED SOURCES OF SUPPLY (If known)

NAME	ADDRESS
Rohr Industries, Inc.	Chula Vista, California

20. REMARKS (See instructions).

PROCUREMENT REQUEST - CONTINUATION SHEET

21. PROCUREMENT REQ. NO.

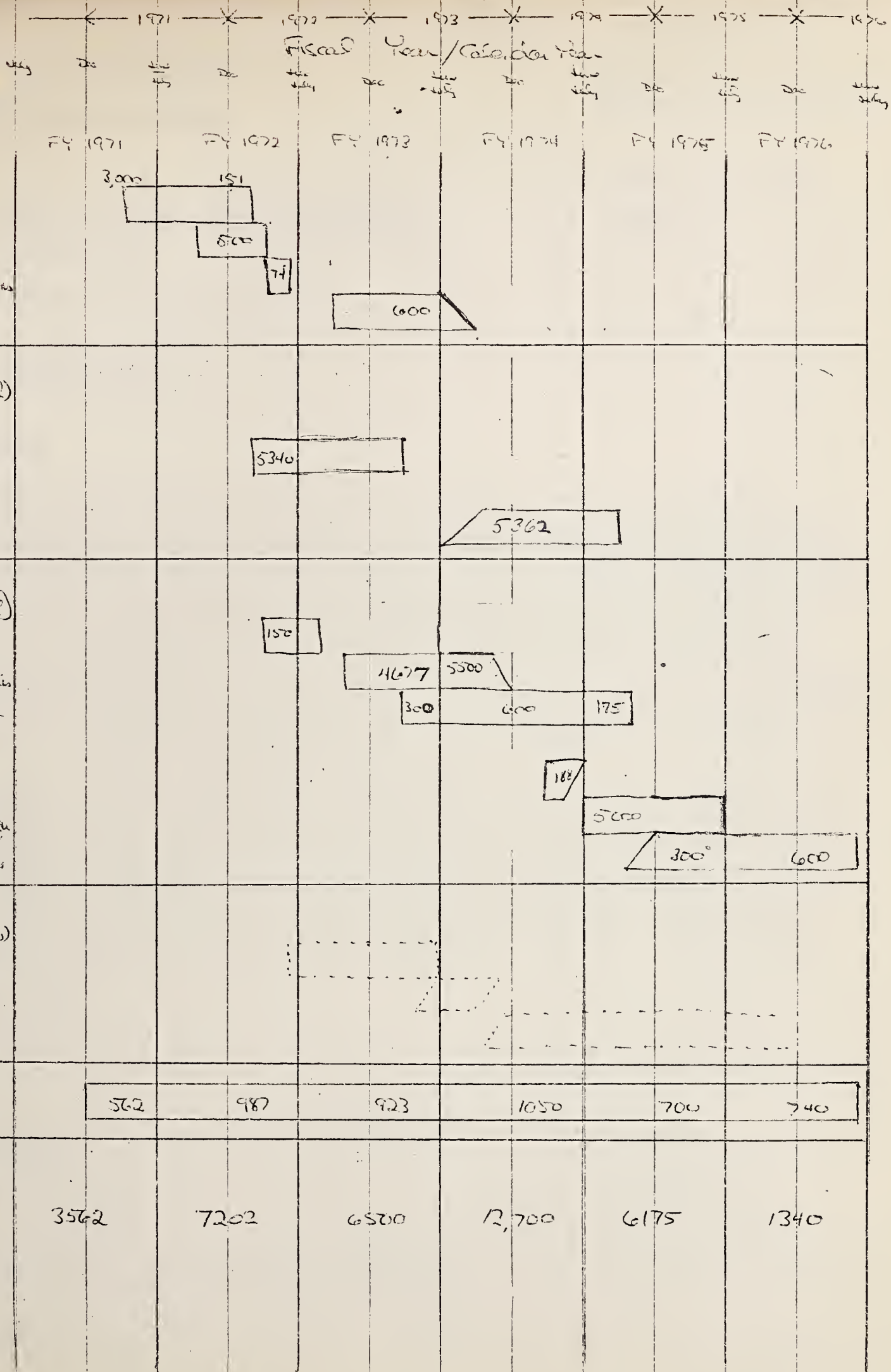
PRN

ITEM NO.	14. DESCRIPTION OF ARTICLES AND/OR SERVICES (Including specifications and other pertinent data)	15. QUANTITY	16. UNIT	17. ESTIMATED COST a. UNIT	b. TOTAL
	-- An option to obtain and use an asphalt heater-planer				
	-- Provision of communications and equipment for control of the vehicle from the control center				
	-- Installation of secondary power between Government-furnished substations and the wayside power system				
	-- Phase III test operations of the system, including the vehicle acceptance tests, up to 1 July 1973 with an option to continue test operations through June 1974				
	-- Construction engineering and inspection of the test facility, as well as the system integration management.				

9/18/72

DJM

UTACV Milestones



3403.0704
UMR-1

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

I

DATE: 5 July 1972

In reply refer to: IT-06-0031

SUBJECT: UTACV Project: Fund Reservation Phase III Test Facilities Additional Engineering

FROM : Director, Special Projects

TO : Administrator

Background

The design of the UTACV test facilities at HSGTC, Pueblo is in progress. Rohr Industries, Inc. is the prime contractor; ABAM Engineers, Inc. is their A&E subcontractor. They are performing the detailed design which will result in bid packages for the construction of the first 7 miles of the 11-mile UTACV loop and the associated support maintenance checkout equipment. Rohr will advertise these bid packages and solicit competitive bids in accordance with Federal Procurement Regulations. They will prepare a cost proposal for the construction and initial checkout of the test site. This proposal will provide for cost reimbursement with an incentive fee based on a target cost. A ceiling price will be included. Provisions for cost renegotiation will be made for unusual or unexpected conditions over which the contractor has no control.

Assessment of the test facilities design plan shows that it will be most cost effective and in the best interest of the Department to continue the route surveying and soil investigation for the complete 11-mile UTACV loop. Performing this effort at the present time will insure a continuity of effort by the same A&E contractor and eliminate multiple start up costs. Additionally, this effort will provide the base data for the development of budgetary estimates for completing construction for out year UTACV project planning. This funding reservation will cover this additional effort.

Scope of Work

The expanded effort for this test site facilities design contract would provide for:

-- Route surveying of the final increment of the UTACV loop (from 7 miles to 11 miles)

-- Soil sampling and analysis of the final increment of the UTACV loop

-- Representative cross sections of the UTACV guideway at several locations in the final increment of the UTACV loop

-- Design of a boarding platform to be located adjacent to the maintenance facility.

Schedule

The surveying and soil sampling of the final increment would be an extension of the surveying operations being performed for the initial 7-mile guideway increment. The design of the platform would be accomplished to permit its construction estimate to be part of the construction cost proposal to be submitted in October.

Funding

The funding required for this additional effort would be $43,135. This funding would be reserved from UTACV project resources in the RD&D budget which accrue from a lower than planned expenditure at TSC for the support of the UTACV project in FY 1972. Approximately $50,000 will be carried over to TSC's FY 1973 budget. The amount, $43,135, will be reduced from their FY 1973 budget and reprogrammed to test site engineering.

Legal Determination

The Office of the Chief Counsel has reviewed this proposed procurement and has found that it is authorized under Section 6 of the Act.

Labor Determination

The labor protection of Section 13(c) of the Act is not applicable to the proposed procurement since no revenue operations are involved.

Environmental Protection

Pursuant to the requirements of Section 14 of the Act, policy and procedures pertaining thereto, review of statements and comments pursuant to the National Environmental Policy Act of 1969 and such additional information and analysis as deemed necessary, I am satisfied that this procurement will not have a significant impact on the environment.

Upon your approval of this procurement request, this additional work will be incorporated into the Phase III Test facilities design effort.

H. W. Merritt

I have reviewed this request.

Henry A. Rejako, Jr
for Robert A. Hemmes
Associate Administrator
Office of Research, Development and
Demonstration

I have reserved $43,135 for this procurement.

Harriet Hawkins
Harriet Hawkins, UAD-10

Approved:

W. S. [illegible]
for C. C. Villarreal

Date 31 July 1972

Read Instructions on Reverse — NO CARBON REQUIRED — Page 1 of Pages

PROCUREMENT REQUEST

1. (Check one) ☐ NEW PROCUREMENT ☒ CONTRACT MODIFICATION
2. ORIG. REQN. NO.
3. DATE
4. CROSS REF. PRN/CON # DOT-UT-10031
21. PROCUREMENT REQ. NO. PRN
22. DATE RECEIVED
5. NAME (Last name — first name — middle initial) MERRITT, HAROLD W.
5a. PHONE EXT.
5b. ROUTING SYMB.
7. SECURITY CLASSIFICATION
23. SET ASIDE ACTION a. SMALL BUS. b. LABOR SURPLUS
5c. BRANCH/DIVISION UMTA
6. PROJECT/TASK NO. INT-RDC-10
8. PROJECT MANAGER H. W. Merritt
9. APPROP./LIMIT'N/FISCAL PROG./DISTRIB./OBJECT 69 x 4119 34.01 10.00

10. APPROVALS

a. APPROVING OFFICIALS	ROUTING SYMBOL	DATE	b. INTERNAL ROUTING INITIALS	RTG. SYM.
(1) AUTHORIZED REQUISITIONER C. C. Villarreal				
(2) MATERIEL MANAGEMENT OFFICER H. W. Merritt				
(3) CLEARANCE OFF.—CONTR. COMMODITY/SVC. ~~T. E. Hoadley~~				
(4) ACCOUNTING CERTIFICATION OFFICER W. H. Boswell	UAOT	7/21/72		

11. DATE(S) REQUIRED (see instructions)

12. SHIP TO — CONSIGNEE AND DESTINATION

ITEM NO.	14. DESCRIPTION OF ARTICLES AND/OR SERVICES (Including specifications and other pertinent data)	15. QUANTITY	16. UNIT	17. ESTIMATED COST a. UNIT	b. TOTAL
	Perform the following services for the UTACV test facility design at HSGTC -- Route surveying of the final 4 miles of the 11-mile UTACV test loop -- Soils sampling and analysis of the final 4 miles of the 11-mile route -- Design of a boarding platform				$43,135

18. GOVERNMENT FURNISHED PROPERTY ☐ NO ☐ YES (If "YES" attach list) ESTIMATED VALUE $

AGGREGATE COST $43,135

19. SUGGESTED SOURCES OF SUPPLY (If known)

NAME	ADDRESS
Rohr Industries, Inc.	Chula Vista, California

20. REMARKS (See instructions)

Additional tasks to the UTACV Test Site Facilities Design

34.03.07.70
URD-1

Read Instructions on Reverse — NO CARBON REQUIRED — Page 1 of Pages

PROCUREMENT REQUEST

1. (Check one) ☐ NEW PROCUREMENT ☒ CONTRACT MODIFICATION
2. ORIG. REQN. NO.
3. DATE: 9-August 1972
21. PROCUREMENT REQ. NO.: PRN
4. CROSS REF.: PRN/CON # DOT-UT-10026
22. DATE RECEIVED
5. NAME (Last name — first name — middle initial): MERRITT, H. W.
5a. PHONE EXT.: 62697
5b. ROUTING SYMB.: UOA-20
7. SECURITY CLASSIFICATION
23. SET ASIDE ACTION: a. SMALL BUS. b. LABOR SURPLUS
5c. BRANCH/DIVISION: UMTA
6. PROJECT/TASK NO.: ~~INT-RDC-10~~ IT-06-3053
8. PROJECT MANAGER: H. W. MERRITT
9. APPROP./LIMIT'N/FISCAL PROG./DISTRIB./OBJECT: 69 x 4119

10. APPROVALS

a. APPROVING OFFICIALS	ROUTING SYMBOL	DATE	b. INTERNAL ROUTING: INITIALS	RTG. SYM.
(1) AUTHORIZED REQUISITIONER: C. Villarreal	UOA-1	8/18/72		
(2) MATERIEL MANAGEMENT OFFICER: H. W. Merritt	UOA-20	8-9-72		
(3) CLEARANCE OFF.—CONTR. COMMODITY/SVC.: T. E. Hoadley	UAD-20	8/18/72		
(4) ACCOUNTING CERTIFICATION OFFICER: for Willie F. Scroggins	UAD-21	8/18/72		

11. DATE(S) REQUIRED (see instructions)

12. SHIP TO — CONSIGNEE AND DESTINATION

13. ITEM NO.	14. DESCRIPTION OF ARTICLES AND/OR SERVICES (Including specifications and other pertinent data)	15. QUANTITY	16. UNIT	17. ESTIMATED COST a. UNIT	b. TOTAL
	Amend Phase I contract to perform the following tasks:				$600,000
	-- Preliminary system study advanced TACV design				
	-- Single-sided LIM Power/propulsion system design				
	-- Electro-magnetic guidance design				
	-- High pressure air levitation cushion design				
	-- New switch and guideway design				
	-- Firm cost estimate for prototype vehicle construction				

18. GOVERNMENT FURNISHED PROPERTY ☐ NO ☐ YES (If "YES" attach list) ESTIMATED VALUE $

AGGREGATE COST $600,000

19. SUGGESTED SOURCES OF SUPPLY (If known)

NAME	ADDRESS
ght Aeronautics Co.	Grand Prairie, Texas

20. REMARKS (See instructions)

SOLE SOURCE JUSTIFICATION
VOUGHT TACV CONCEPT ADVANCED
STATE-OF-THE-ART DESIGN

UMTA requires that Vought Aeronautics Co. perform additional work on the Urban TACV design which they developed during Phase I, Design Engineering, of Contract DOT-UT-10026. This work will permit the incorporation of cost effective design refinements and technical innovations into the Vought design which has already been judged technically acceptable. Further, it will benefit the UTACV program by developing alternative technical solutions in key design areas.

The UTACV system will provide a new type revenue system option for the line haul urban express link. At present the Department is contracting for the fabrication of a state-of-the-art prototype UTACV to verify performance and operations feasibility. It is essential that as much technological innovation as possible be brought to bear on the UTACV system to insure that the most advanced practical systems are available to transportation planners.

Based on the Phase I effort, it was observed that significant design improvement could be realized in the concept proposed in the following areas:

-- Guidance System using electromagnetic techniques

-- Suspension/Levitation System using high pressure air cushions

-- Propulsion System using the single-sided linear induction motor

-- Guideway/Reaction Rail System using simplified construction techniques and a horizontal reaction rail

Each of these advances will contribute toward more versatile system operation through simplified switching and short turn radii and lower system costs through more efficient guideway and reaction rail designs.

This additional design work will insure that the most advanced technology which can be used in an operational revenue system is incorporated in the UTACV system. It will resolve several of the critical system cost and operations factors and provide cities and regional authorities with the most advanced systems applicable.

Vought is the only firm which can effectively integrate the design concepts into the UTACV system which they originally developed. They have the program and engineering personnel who developed the basic design concept. The cost required to familarize another contractor with the UTACV concepts would be prohibitive and the experience gained in Phase I lost. Therefore, sole source to Vought for this work is recommended.

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE: 9 August 1972

In reply refer to:

SUBJECT: UTACV Project: Fund Reservation for the Advanced Engineering of a Second Prototype Vehicle

FROM: Director, Special Projects

TO: Administrator

Objective

The prototype vehicle under contract represents the current state-of-the-art for both the United States and foreign technology. This funding reservation will provide for the engineering design leading to a second prototype vehicle, which represents a significant advance in the state-of-the-art.

-- It will permit the development of simplified guideway designs and of advancement in guidance, suspension, power conditioning, and propulsion systems;

-- It will insure that competitive sources are available for the procurement of all major equipments for the revenue system. This is a requirement for any system built with UMTA capital grant assistance.

By proceeding through prototype fabrication and test of a second vehicle the Department could demonstrate a reasonable attempt to preclude the creation of a single system source.

This advanced state-of-the-art vehicle design will exploit the new technological development to

-- Reduce System Cost. The potential for reducing cost is achieved by simplifying the guideway design and eliminating the vertical reaction rail through the use of a single-sided LIM and variable frequency power control;

-- Increased System Versatility. Increased system versatility for urban applications is achieved by switch concepts and short turn radii ($\approx$150 ft.). The primary innovation to bring this versatility about is the articulated trucks which provide for levitation, guidance and propulsion in a single integrated unit. Levitation would be provided by high pressure air cushions, guidance by electro-magnets, and propulsion by a single-sided LIM.

This engineering design effort would be completed in 9 months and culminate in a proposal for prototype fabrication. If the design and proposal are satisfactory and adequate funding has been appropriated, construction of an advanced concept prototype could be initiated in July 1973. (A separate funding reservation would be prepared for prototype fabrication).

Proposal Response

The proposal for this detailed engineering would be cost reimburseable with a fixed fee and include an overall ceiling price.

The proposal for prototype fabrication submitted at the conclusion of the eighth month of the 9-month design engineering will be based on a target cost, an incentive fee based on the target cost, and total ceiling price.

Scope of Work

The scope of work for this engineering design includes:

- -- Preliminary system studies to determine major subsystem design parameters
- -- Power/Propulsion system design
- -- Magnetic guidance system design
- -- Air cushion system design
- -- Guideway switching design studies
- -- Proposal prototype vehicle fabrication

Schedule

This design engineering would start in August 1972. The design would be completed and cost proposal for prototype construction submitted by 15 May 1973. Prototype fabrication could begin in July 1973 and be completed within thirteen months. Testing could be accomplished at Pueblo at HSCTC or equivalent test site starting in early 1974.

This schedule would permit sufficient test data for the vehicle system to be available to permit competitive bidding by August 1974. This timing would be compatible with all anticipated revenue systems acquisition which would be accomplished through the Capital Grant Program.

Source

Vought Aeronautics Co. is the only known source for this procurement A sole source justification is attached.

Funding

The funding required for this procurement is $600,000. These funds would be reserved from the RD&D budget for FY 1973.

Legal Determination

The Office of the Chief Counsel has reviewed this proposed procurement and has found that it is authorized under Section 6 of the Act.

Labor Determination

The labor protection of Section 13(c) of the Act is not applicable to the proposed procurement since no revenue operations are involved.

Environmental Protection

Pursuant to the requirements of Section 14 of the Act, policy and procedures pertaining thereto, review of statements and comments pursuant to the National Environmental Policy Act of 1969 and such additional information and analysis as deemed necessary, I am satisfied that this procurement will not have a significant impact on the environment.

Recommendation

For the reasons contained herein, this project will contribute toward improved urban mass transportation service, and the contribution of such service toward meeting total urban transportation needs at minimum cost.

This design procurement and the follow-on fabrication will insure the existence of a viable second source for vehicle procurements in a capital grant

program. Moreover, it will incorporate those innovative features to insure a competitive UTACV revenue system. I recommend approval of this request.

B. E. Blood/for
H. W. Merritt

I have reviewed this request.

Robert A. Hemmes
Robert A. Hemmes
Associate Administrator
Office of Research, Development
and Demonstration

I have reserved $600,000 for this procurement.

Harriet Hawkins
Harriet Hawkins, UAD-10

Approved:

C. C. Villarreal
C. C. Villarreal
Administrator, UMTA 18 AUG 1972

UNITED STATES GOVERNMENT

Memorandum

34030707

DEPARTMENT OF TRANSPORTATION

URBAN MASS TRANSPORTATION ADMINISTRATION

URD-1

DATE:

In reply refer to: CO-06-0005

SUBJECT: UMTA/FRA Interagency Agreement
UTACV Test Site Guard Services

FROM : Administrator

TO : Administrator, Federal Railroad Administration

Phase III, test and evaluation, of the UTACV project will be conducted at the HSGTC, Pueblo, Colorado. In order to conduct the testing it is necessary to approve and implement this interagency agreement. The funds are for special guard services for the test site during tests for a period of one year while the UTACV is being tested.

FRA will provide both financial and progress reports on a regular basis, as noted in the agreement.

Upon your signature of the attached documents and their return to me, I will agree to allocate $15,000 for use by the Federal Railroad Administration to award a contract before the present FRA contract expires in January 1973.

C. C. Villarreal

C. C. Villarreal

Attachments

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE:

In reply refer to: CO-06-0005

SUBJECT: Fund Reservation for UMTA/FRA Interagency Agreement: UTACV Test Site Guard Services

FROM : Director, Special Projects

TO : Administrator

Background

As a result of the UTACV presentation to Secretary Volpe, the decision was made to conduct the Phase III test and evaluation program at HSGTC, Pueblo. With the announcement on 11 February 1972 of Rohr Industries, Inc. as the Phase II contractor, site engineering at Pueblo to accommodate the Rohr prototype UTACV was initiated. While the costs of primary electrification, and test site maintenance will be borne by FRA out of their operating budget, the cost of guard services to maintain safe guideway conditions during installation and test operations of the UTACV are an UMTA funding responsibility.

Scope of Work

The scope of this effort is to provide special guard services during installation and tests of the UTACV. These services have been estimated to be approximately 20 hours per week for two men during the year. The total manhours is approximately 2000, at a cost of about $15,000 for the period of one year.

Schedule

The present FRA contract for guard services expires in January 1973. It is desired that the new contract be awarded before the present contract expires.

Funding

Funds for this reservation are included in the allocation of the FY '73 RD&D Budget. An interagency agreement covering this funding is attached.

Legal Considerations

The Office of the Chief Counsel has reviewed this agreement and found it to be consistent with the relevant legal requirements under Section 6 of the Act.

Legal Determination

The labor protection provisions of Section 13(c) of the Act are not applicable to the proposed contract, since no operations are involved.

Environmental Protection

Pursuant to the requirements of the Urban Mass Transportation Act of 1964, and policy and procedures pertaining thereto, review of statements and comments pursuant to the National Environmental Policy Act of 1969, and such additional information and analysis as deemed necessary, I am satisfied that this project will not have a significant impact on the environment.

Recommendation

This procurement, like all other procurements in the UTACV Project, will assist in the reduction of urban transportation needs, improve mass transportation services, and make a contribution toward the meeting of total urban transportation needs at minimum cost. It is recommended that this interagency agreement be approved.

Upon approval, the interagency agreement will be executed.

H. W. Merritt

I have reviewed this request.

/s/ original signed by

Robert A. Hemmes, Assistant Administrator, Office of Research, Development and Demonstration

I have reserved $15,000 for this procurement.

/s/ original signed by

Harriet Hawkins, UAD-10

Approved:

C. C. Villarreal

C. C. Villarreal, Administrator, UMTA

Date 18 DEC 1972

Department of Transportation

REIMBURSABLE AGREEMENT

2. Parties to the Agreement

a. Reimbursing Organization	b. Organization to be Reimbursed
Urban Mass Transportation Administration Department of Transportation Project Number CO-06-0005	Federal Railroad Administration Department of Transportation

3. Effective Date	4. Cost (Estimate)		5. Appropriation Chargeable
	a. F.Y.	b. Amount	
1 January 1973	1973	$15,000	33.01.10.00 69X4119(07)

6. Summary (If additional space is required, use other side or attached sheet)

Pursuant to the provisions of Section 6(a) of the Urban Mass Transportation Act of 1964, as amended, for the purposes described herein, the Urban Mass Transportation Administration agrees to allocate $15,000 for use of FRA to accomplish the following task:

-- TASK - The FRA shall provide special guard services for a period of one year during the installation and testing of the UTACV at the HSGTC, Pueblo, Colorado.

Reimbursement and Adjustment - should total project costs be less than the estimated amount, FRA promptly will reimburse UMTA in proportion to the reduction. Should cost exceed the estimate, UMTA participation will be limited to the planned amount, except to the degree that special features requested by UMTA subsequent to contract award may tend to increase cost.

- Representatives

FRA - M. B. Mitchell - RA-43
UMTA - H. W. Merritt - UOA-20

- Modification - This agreement may be modified by letter subsequent to the agreement of both parties.

continued -

7. Authorized Approvals

a. For Reimbursing Organization	b. For Organization to be Reimbursed
Signature C. C. Villarreal C. C. Villarreal	Signature /s/ original signed by John W. Ingram
Title Administrator, UMTA	Title Administrator, FRA
Date 18 DEC 1972	Date 12 JAN 197[illegible]

Form DOT F 2300.1 (6-69)

- Financial Reports

1. Monthly: The following reports are to be provided UMTA by the 10th day of the month following the month for which the report is submitted.

   a. Standard Forms 224, 225 and 133
   b. Contract Status Report agreement to be prepared in accordance with instructions provided by UMTA.

2. A quarterly projection of cash needs (outlays) for the ensuing quarter must be received in UMTA on the first day of each quarter.

3. FRA agrees to include the above provisions as an explicit part of any agreement entered into with a third party for the performance of the defined tasks, in whole or in part.

-- Payment Technique

A transfer will be made by SF 1151 to account 69 x 4119 (07)

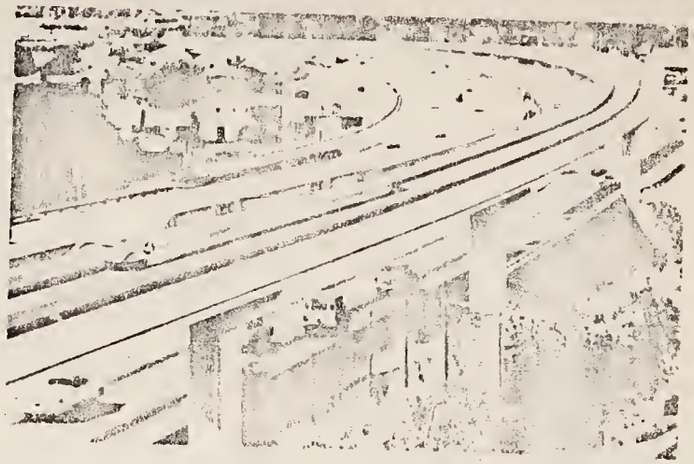
-- Position Resources

This allocation does not provide for position resources.

URBAN TACV DEMONSTRATION PROGRAM

PURPOSE: DEVELOP, TEST, AND DEMONSTRATE A NEW POLLUTION-FREE URBAN MASS TRANSPORTATION CONCEPT FOR

- AIRPORT ACCESS
- AIRPORT TO AIRPORT INTERCHANGE
- NEW COMMUNITY ACCESS
- CONTIGUOUS URBAN COMPLEXES



IMPACT:

- NEW OPTION TO EXISTING URBAN TRANSPORTATION
- EXPLOIT AEROSPACE TECHNOLOGY & RESOURCES
- REASSERT U.S. LEADERSHIP IN INNOVATIVE TRANSPORTATION CONCEPTS

CONTRACTORS:

ROHR CORP.

VOUGHT AERONAUTICS CO.

FUNDING:

	(MILLIONS)
PRE-FY 72	$3.7
FY 72	8.1 - 13.1 (2 DESIGNS)
FY 73	27.0 - 53.0
POST-FY 73	1.5 - 3.0

SCHEDULE:

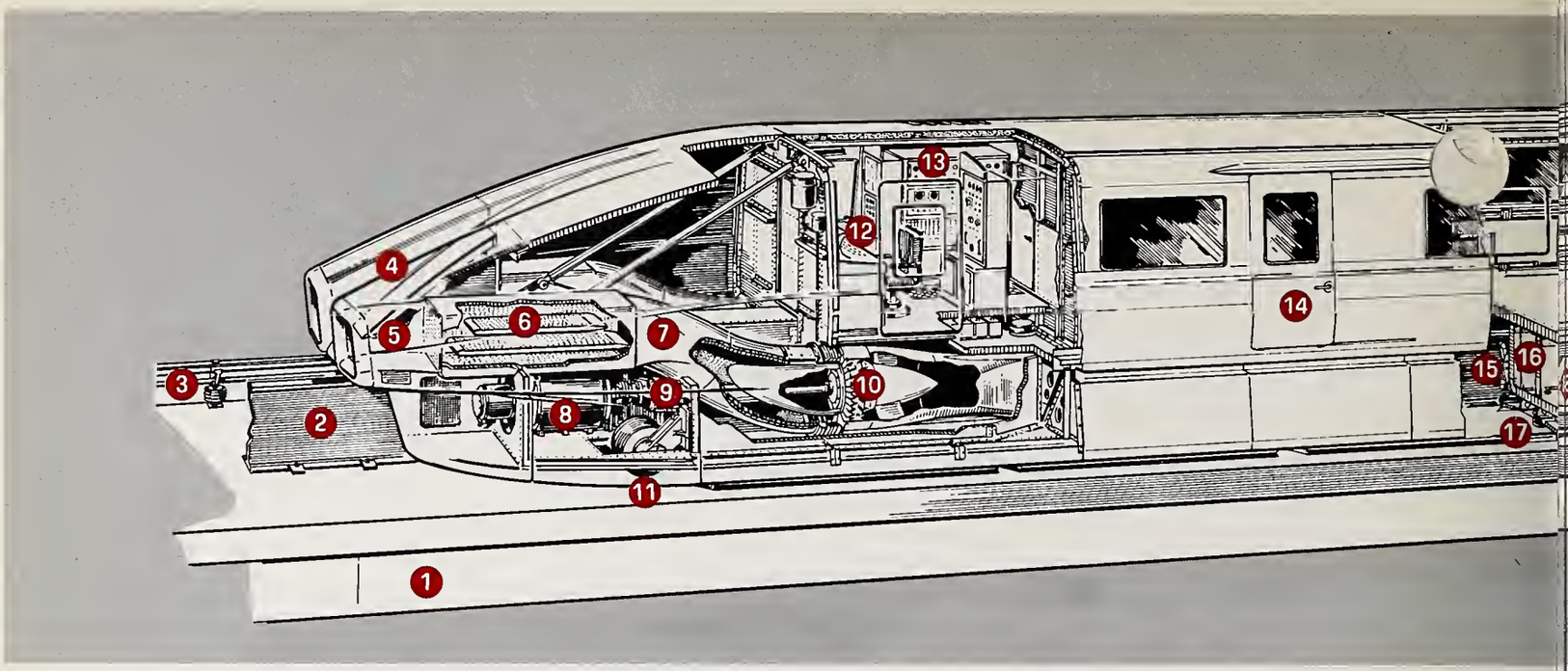
DESIGN	JULY 71- JAN 72
PROTO-FABRICATION	JAN 72 - JAN 73
TEST	JAN 73 - JAN 74
PUBLIC DEMONSTRATION	JAN 74 - JULY 75

Tomorrow's Transportation... Available Today

AEROTRAIN

TRACKED AIR CUSHION VEHICLE

ROHR INDUSTRIES, INC.



1. PRESTRESSED CONCRETE GUIDEWAY BEAMS
2. ALUMINUM REACTION RAIL WITH INTEGRAL SAFETY CABLE
3. 3-PHASE WAYSIDE POWER DISTRIBUTION SYSTEM
4. FRANGIBLE SAFETY FOREBODY
5. SUSPENSION AIR INLET
6. SOUND SUPPRESSOR
7. INLET AIR DUCTING
8. COMPRESSOR MOTOR
9. COMPRESSOR SPEED REDUCTION
10. LIFT COMPRESSOR
11. AUXILIARY DRIVE WHEELS
12. AUTOMATIC TRAIN CONTROL CONSOLE
13. EMERGENCY STOP BY-PASS DOORS
14. FLUSH PASSENGER DOORS
15. GUIDANCE AIR CUSHIONS
16. SUSPENSION AIR DISTRIBUTION DUCTS

The Aerotrain is a tracked air-cushion vehicle (TACV) that was developed by Societe de l'Aerotrain and Bertin et Cie. Rohr Industries, Inc. has advanced the concept for application in the U.S. A TACV program is now underway which will utilize this technology and provide high speed service in heavily traveled urban areas.

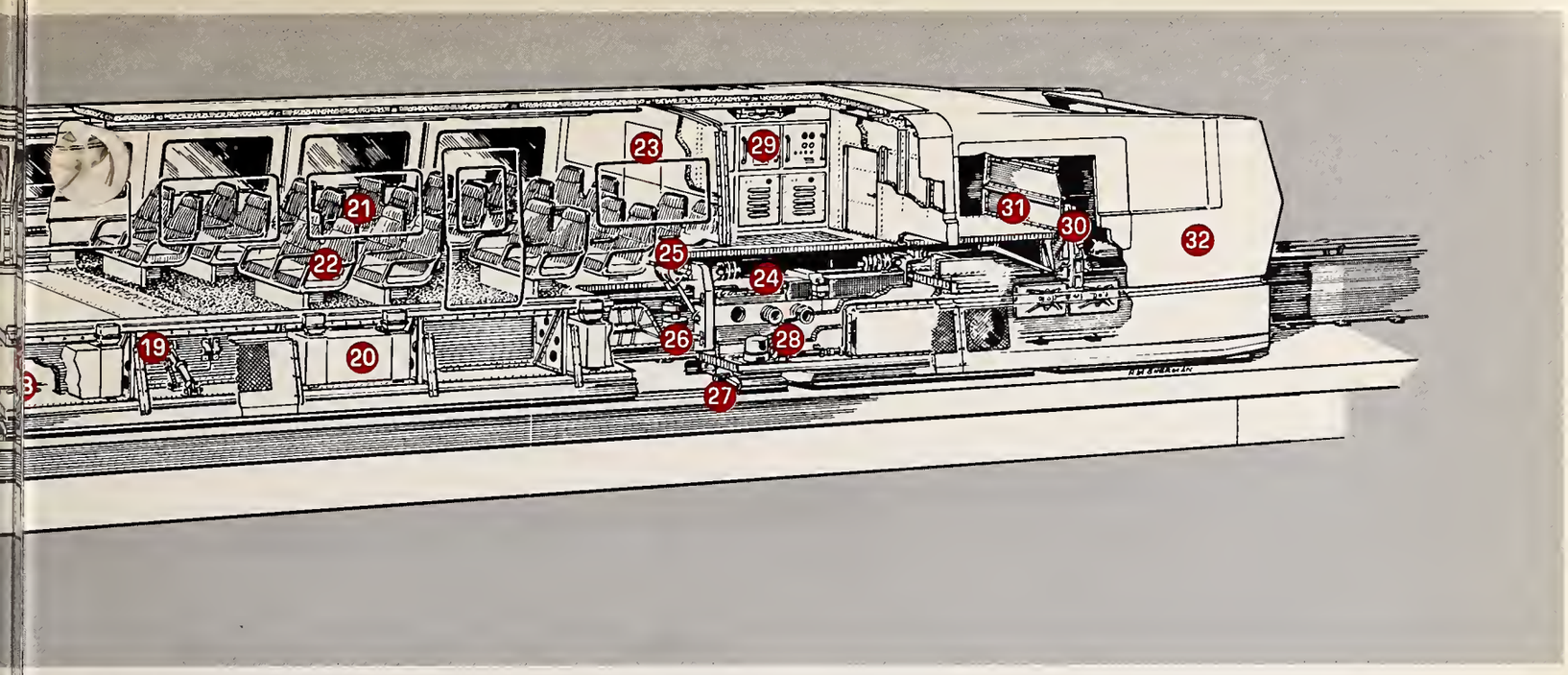
Aerotrain, unlike any other train, has no wheels. Instead, it is suspended above its guideway on a thin cushion of air. This cushion eliminates friction with the guideway, thus requiring relatively little driving power. High rates of acceleration and deceleration are achieveable without concern for sliding wheels. Above all, air cushion suspension gives the passenger a smoother ride.

A new means to drive the vehicle was needed since it has no contact with the guideway. Therefore, a linear induction motor (LIM) powered from wayside rails was part of Aerotrain prototype development. All of these features have been successfully demonstrated and are ready for operational service.

VEHICLE — The Aerotrain vehicle (illustrated above) features a 60-passenger cabin of lightweight aircraft type construction. Two passenger access doors are located conveniently on one side of the vehicle at platform height. Smooth aerodynamic design provides fairing down to the air cushions. Exterior noise is maintained below 73 dB(A) measured at 50 feet distance during cruise.

PASSENGER CABIN — First class appointments are evident in comfortable two-and-two seating, 22-inch wide seats, carpeting throughout, and controlled lighting level. Uniform air conditioning maintains a comfortable environment in hot or cold weather. Interior noise is held below 65 dB(A) to add to passenger comfort. Safety belts secure the passengers for high speed service. A baggage compartment, particularly useful on airport runs, is available behind the passenger compartment.

GUIDEWAY — The guideway is shaped as an inverted "T." The horizontal slab ca[illegible] poured-in-place concrete or prest[illegible] beams. The vehicle support air cushions react



17 LIFT AIR CUSHIONS
18 AIR DISTRIBUTION ORIFICES
19 AUXILIARY TRAIN EQUIPMENT
20 AIR-CONDITIONING UNITS
21 PASSENGER COMPARTMENT
22 AIRCRAFT QUALITY SEATS
23 EMERGENCY EXIT DOORS
24 LINEAR INDUCTION MOTOR
25 LIM SUPPORT SYSTEM
26 LIM GUIDANCE WHEELS
27 AUXILIARY SUPPORT SKIS
28 PROPULSION COOLING DUCTS
29 PROPULSION CONTROL BAY
30 MECHANICAL BRAKE
31 BAGGAGE COMPARTMENT (OPTIONAL)
32 FRANGIBLE SAFETY AFTERBODY

against the horizontal member. The vertical element in the center of the guideway is made of aluminum and acts both as the motor reaction rail as well as the lateral guidance member.

POWER COLLECTION — Power for the linear motor, the air cushion fans, and vehicle auxiliaries is collected by the vehicle from three-phase power rails along the wayside. Collection is accomplished by sliding contact with the rails through a follower mechanism attached to the vehicle. Safety covers will shield the rails from inadvertent intrusion.

PROPULSION — A polyphase linear induction motor (LIM) provides the thrust required to accelerate, cruise, and dynamically brake the vehicle. The motor windings (primary) are mounted toward the rear of the vehicle. The motor reaction rail (secondary) is the aluminum vertical member fixed to the center of the guideway. The motor primary is guided at close tolerance with the secondary by pinch wheels. Various control auxiliaries limit jerk, supply direct-current power for dynamic braking, and provide static power correction.

BRAKING — LIM dynamic braking reduces vehicle speed to approximately 20 mph; then hydraulic controls blend in friction braking on the reaction rail for stopping. For emergencies, the air cushions can be vented to lower the vehicle onto braking skids.

AIR CUSHIONS — A low pressure air cushion suspension system levitates the vehicle from the guideway providing relatively friction-free motion. The air supply system has air inlets with sound suppression, two compressors, air supply ducts, and cushion supply scoops. Two constant-speed, three-phase induction motors drive the compressor units.

CONTROLS — The pilot compartment is just aft of the air inlet section. It is fully instrumented to monitor critical equipment operation. Vehicle operation is fully automatic with provision for manual override. Forward visibility is provided by dual periscopes. The operator is simply an attendant to oversee safe operations.

Development of a prototype of this vehicle is sponsored by the Urban Mass Transportation Administration, U. S. Department of Transportation.

SYSTEMS SPECIFICATIONS

VEHICLE
(Illustrated in the Centerfold)

Passenger Capacity 60

DIMENSIONS

Overall Length . . . . . .94.0 ft.
Overall Height . . . . . .10.8 ft.
Overall Width . . . . . .10.7 ft.
Interior Cabin Height . . . . . 6.8 ft.
Interior Cabin Width . . . . . 9.5 ft.

WEIGHT

Net Vehicle Weight . . . . . .46,000 lb.
Passenger and Baggage . . . . . .14,000 lb.
Gross Vehicle Weight . . . . . .60,000 lb.

POWER

LIM Propulsion at 150 mph . . . . . .2,000 KW
Auxiliary Electrical Load . . . . . 700 KW
Total Electrical Load (Cruise) . . . . . .2,700 KW

PERFORMANCE

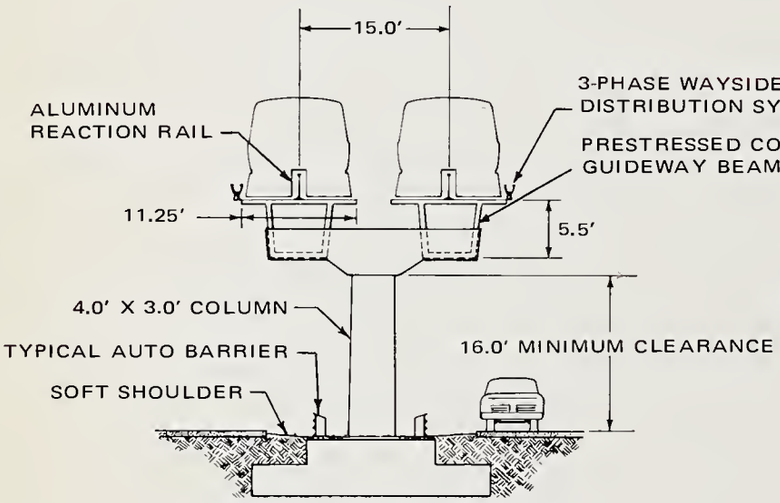
Crusing Speed . . . . . .150 mph
Maximum Speed . . . . . .170 mph
Acceleration Distance to Crusing Speed . . 1.75 mi.
Normal Stopping Distance . . . . . .1.5 mi.
Emergency Stopping Distance . . . . . .0.5 mi.
Allowable Grade at Cruise Speed 5.5%

GUIDEWAY

Aerial Guideway . . . . . .142 in.
Reaction Rail Height (Overall) . . . . . .33 in.
Surface Waviness . . . . . 1/8" in 25'
Minimum Vertical Turn Radius . . . . . .10,000 ft.
Minimum Horizontal Turning Radius . . . 1,500 ft.

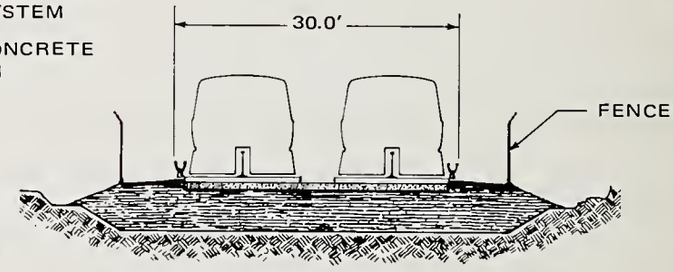
ELECTRIFICATION
(3-Phase AC Power Supplied from Wayside)

Frequency . . . . . .60 Hz
Voltage . . . . . .4,160 volt
Substation Spacing . . . . . .5.0 mi.

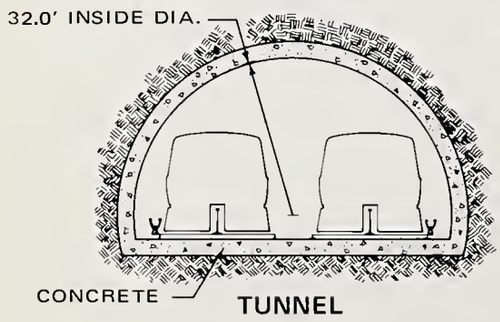


TYPICAL AERIAL GUIDEWAY LOCATED IN FREEWAY MEDIAN.

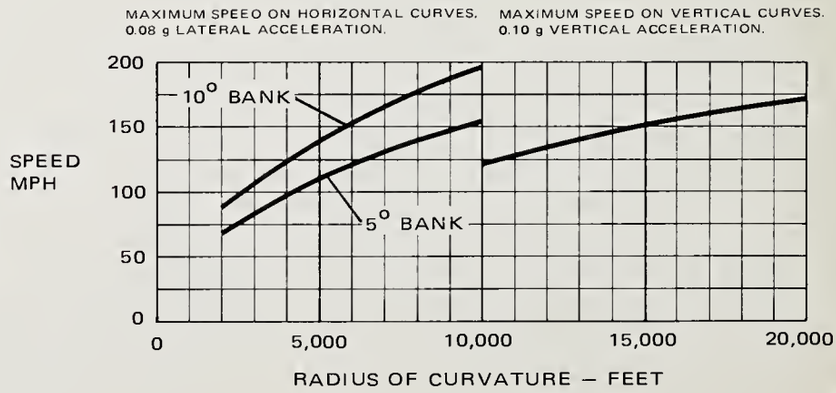
AERIAL



SURFACE



TUNNEL



Aerotrain Systems, Inc, a subsidiary of Rohr Industries, Inc.
P.O. Box 878, Chula Vista, California 92012 (714) 426-7111

UOR-1

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE: Feb. 14, 1972

In reply refer to:

SUBJECT: Urban TACV Phase II Procurement
Prototype Vehicle Fabrication

FROM : Director, Special Projects

TO : Administrator

1. Procurement Status. The firm Phase II proposals for prototype vehicle fabrication were submitted on 1 December 1971 by both Phase I contractors -- Vought Aeronautics Co. and Rohr Industries, Inc. The technical and business management evaluations have been completed for both proposals and the results documented. Competitive negotiations have been conducted with both contractors and their final prices were submitted on 12 January 1972.

2. Work Statement. Execution of the work statement for the Phase II contract will result in the completion of the following tasks and end items:

   -- Fabrication, assembly, acceptance test and delivery of a prototype tracked air cushion vehicle
   -- Drawings and specifications to reflect the "as built" configuration
   -- Revised vehicle engineering and site independent engineering reports
   -- Phase III Engineering Test Plan
   -- Fully documented Phase II Acceptance Test report
   -- System engineering and economic analysis study reports

3. Schedule. A single Phase II award would be made no later than 15 Feburary, 1972. Delivery of the prototype vehicle, "as built" drawings and specifications, and the contract reports will be accomplished within 11 1/2 months, 31 January 1973.

4. Justification. A review of the UTACV program was conducted for Secretary Volpe on 25 January 1972. The review covered:

   -- Program goals and objectives
   -- Urban TACV system characteristics
   -- Comparative economic studies
   -- Test site options
   -- Evaluations of the contract proposals for Phase II

The Secretary advised to proceed with Phase II of the Program and to perform testing at the Pueblo test site.

5. Cost Estimate. The ceiling price for a single Phase II contract award is $5,340,000. This funding would be obligated from the $7,526,000 which has been reserved for the UTACV program from the FY '72 RD&D budget.

6. Legal Determination. The Office of the Chief Counsel finds that the proposed contract, as indicated by the work statement, is authorized under Section 6 of the Act.

7. Labor Determination. The labor protection provisions of Section 13(c) of the Act are not applicable to the proposed design contracts since no operations are involved.

8. Environmental Protection. Pursuant to the requirements of the Urban Mass Transportation Act of 1964, and policy and procedures pertaining thereto, review of statements and comments pursuant to the National Environmental Policy Act of 1969, and such additional information and analysis as deemed necessary, I am satisfied that this project will not have a significant impact on the environment.

9. Recommendation. I recommend approval of$5,34 million from the FY 1972 funds to award one Phase II prototype vehicle fabrication contract.

   I also recommend that the engineering test operations and the public demonstration operations be undertaken with adequate planning and support to determine the practicality of the Urban TACV system as a viable mode for urban transportation. The successful completion of this demonstration project will provide a demonstrated system ready for revenue service which satisfies the needs for express point-to-point, high-speed urban transportation service.

H. W. Merritt

I have included $5.34 million in the RD&D FY '72 funding plan.

Robert A. Hemmes
Assistant Administrator
Office of Research, Development
and Demonstration

I have reserved $5.34 million for this contract.

Harriet Hawkins, UAD-10

Approved:

/s/ C. C. Villarreal
Administrator

C. C. Villarreal, Administrator

Date FEB 14 1972

cc- UMTA File
URD-1
UOA-1(2)
UPP-1
UPO-1
UPA-1
UCC - 1
UAD-20(2)
TAD-45
UAD-30

UOA-20/LANCASTER/mnb
2/9/72

Read Instructions on Reverse — NO CARBON REQUIRED — Page 1 of Pages

PROCUREMENT REQUEST

1. (Check one) ☐ NEW PROCUREMENT ☐ CONTRACT MODIFICATION

2. ORIG. REQN. NO.: DOT-UT-10031

3. DATE: 2-9-72

21. PROCUREMENT REQ. NO.: PRN

4. CROSS REF.: PRN/CON # DOT-UT-10031

22. DATE RECEIVED:

5. NAME (Last name — first name — middle initial): MERRITT, H. W.

5a. PHONE EXT.: 62697

5b. ROUTING SYMB.: UOA-20

7. SECURITY CLASSIFICATION:

23. SET ASIDE ACTION: a. SMALL BUS. b. LABOR SURPLUS

5c. BRANCH/DIVISION: UMTA

6. PROJECT/TASK NO.: INT-RDC-10

8. PROJECT MANAGER: H, W. Merritt

9. APPROP./LIMIT'N/FISCAL PROG./DISTRIB./OBJECT: 69x4119

10. APPROVALS

a. APPROVING OFFICIALS	ROUTING SYMBOL	DATE	b. INTERNAL ROUTING INITIALS	b. INTERNAL ROUTING RTG. SYM.
(1) AUTHORIZED REQUISITIONER: /S/ C. J. Villarreal Administrator Villarreal	UOA-1			
(2) MATERIEL MANAGEMENT OFFICER: H. W. Merritt	UOA-20			
(3) CLEARANCE OFF.—CONTR. COMMODITY/SVC.: Boswell	UAD-1			
(4) ACCOUNTING CERTIFICATION OFFICER: Hoadley	UAD-20			

11. DATE(S) REQUIRED (see instructions)

12. SHIP TO — CONSIGNEE AND DESTINATION

13. 14. DESCRIPTION OF ARTICLES AND/OR SERVICES (Including specifications and other pertinent data) — 15. QUANTITY — 16. UNIT — 17. ESTIMATED COST a. UNIT b. TOTAL

Amend contract to incorporate the Phase II scope of work itemized in the contract, DOT-UT-10031 dated 30 June 1971.
Work accomplished in this phase would include:

-- fabrication, assembly, acceptance test and delivery of a prototype vehicle
-- drawings and specifications to "as built" configuration
-- engineering, acceptance test and analysis reports

$ 5,340,000

18. GOVERNMENT FURNISHED PROPERTY ☐ NO ☐ YES (If "YES" attach list) ESTIMATED VALUE $

AGGREGATE COST $

SUGGESTED SOURCES OF SUPPLY (If known)

FAA Form 4415.1 (12-68) Supersedes FAA Form 4410-1 (12-66)

DEPARTMENT OF TRANSPORTATION NEWS
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20590

FOR IMMEDIATE RELEASE
February 11, 1972

DOT 12-72
Phone: (202) 426-4321

Secretary of Transportation John A. Volpe announced another move today to modernize the Nation's transportation system through research and development to keep it abreast of national needs.

The Secretary disclosed that the Department of Transportation has awarded a contract for the construction of a prototype of the country's first passenger-carrying vehicle which will run without wheels on a cushion of air. "This is the kind of progress needed to prevent the Nation from falling behind in the critical field of transportation," Secretary Volpe said. "The contract calls for the production within 11 and one-half months of a 60-passenger prototype vehicle known as the TACV (Tracked Air-Cushion Vehicle). It will operate at speeds up to 150 miles per hour. It has no wheels and glides along a concrete guide-way on a thin cushion of air, powered by a pollution-free linear induction (electric) motor."

The TACV is part of a substantially larger $115 million urban transportation R&D program recently sent to Congress by President Nixon, and is a continuation of the engineering design phase of the TACV program announced last July. That phase, said Secretary Volpe, is now complete and work can be started on the construction of the vehicle.

The contract for construction of the TACV was awarded to Rohr Industries, Inc., of Chula Vista, California, by the Transportation Department's Urban Mass Transportation Administration. Cost of the project will be approximately $5 million.

Once the prototype vehicle is completed, it will undergo extensive testing and evaluation at the Department of Transportation Test Center near Pueblo, Colorado. Urban Mass Transportation Administrator Carlos C. Villarreal said the tests will be designed to assess the vehicle's performance, safety and operating costs. He said special emphasis will be given to determining its compatibility with the environment.

-more-

transpo 72 U.S. INTERNATIONAL TRANSPORTATION EXPOSITION
DULLES INTERNATIONAL AIRPORT * MAY 27—JUNE 4, 1972

Secretary Volpe said the TACV project is being carried forward in compliance with the aims of President Nixon to develop and test new technologies for modernizing transportation without harm to the environment.

The TACV will seat 60 passengers with additional space provided for baggage. The 110-foot long vehicle will be equipped for fully automatic operation. Redundant systems provide safe braking. The vehicle/guideway interface prevents derailment at the 150 mph cruise speed by literally capturing the vehicle on the reaction rail. External sound suppression reduces noise levels to less than conventional highways.

For further information, contact Public Affairs Office, UMTA, (202) 426-4043, or Mr. George Ward, Program Manager, Rohr Industries, Inc., Chula Vista, California, (714) 426-7111.

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DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY
Washington, D.C. 20590

Official Business

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DEPARTMENT OF TRANSPORTATION NEWS

URBAN MASS TRANSPORTATION ADMINISTRATION

WASHINGTON, D.C. 20590

FOR IMMEDIATE RELEASE
July 1, 1971

DOT -- 14771
Phone: (202) 426-4043

Secretary of Transportation John A. Volpe announced today the award of two additional contracts in connection with the Transportation Department's program for development of the Tracked Air Cushion Vehicle (TACV).

The two contracts were awarded to the Rohr Corporation of Chula Vista, California, and the Vought Aeronautics Co. of Dallas. The two awards totaled $2,850,000.

Under the contracts the two aerospace firms will produce designs and mock-ups of a 60-passenger vehicle which would be powered by an electric linear induction motor at speeds up to 150 miles per hour. The mock-ups are to be delivered within six and a half months. It is expected that one or more prototypes could be contracted for and built for testing purposes within a year thereafter.

The contracts were awarded by the Department's Urban Mass Transportation Administration (UMTA). Another phase of the TACV development program was covered in a contract issued earlier by the Department's Federal Railroad Administration. This contract, awarded to Grumman Aerospace Corporation in the amount of $3.5 million, called for construction of a research vehicle capable of speeds up to 300 miles per hour.

"I belive in the TACV," Secretary Volpe said in announcing the contracts. "The award of these contracts is further evidence of the Department's commitment to TACV as one means for improving the nation's transportation system.

"Our TACV program is an overall Department effort on several fronts utilizing the capabilities of the Urban Mass Transportation Administration, the Federal Railroad Administration, and others to provide high-speed, point-to-point travel," Secretary Volpe added. "New systems must, however, be what the public wants and be fully compatible with the environment and life around us."

-more-

Carlos C. Villarreal, Administrator, Urban Mass Transportation Administration, said in discussing the awards, "We see the application of an urban TACV in providing a fast transit link to new regional airports and for trips from 10 to 50 miles in metropolitan areas."

Subsequent phases of the UMTA program call for testing and demonstrating the vehicles. The purpose is to measure performance, environmental impact, safety, public acceptance, costs, and other factors. While test and demonstration sites have not been determined, consideration is being given to using the Department's High Speed Test Center at Pueblo, Colorado.

Rohr and Vought are two aerospace manufacturers who have made significant commitments to the field of new ground transportation systems. The two contractors will build vehicles different in several respects, notably in air suspension and guideway design. The purpose of the two awards is to compare design and operating characteristics and determine their suitability for public use in future revenue service.

For two years, demonstration vehicles of this type have been operating in France and plans have recently been announced for a revenue service airport access system near Paris. The British expect to operate a prototype vehicle later this year. The Department of Transportation demonstration project is building on the French and British experience as a necessary step to the development of an acceptable vehicle for revenue service.

The 60-passenger urban TACV will have space for baggage, seats will be of the comfortable aircraft type and much of the control will be automated. It will be the first vehicle in the nation's ground transportation system which will operate without wheels. Instead it will ride on a thin cushion of air along a concrete guideway which can either be built at ground level or elevated above the ground to minimize interference with roadways, walkways and other transportation modes.

For further information, contact Public Affairs Office UMTA, 426-4043, or:

Mr. James Croslin
Vought Aeronautics Company
Dallas, Texas
(214) 266-5384

or

Mr. Russell F. Thielman
Vice President and General Manager of
Aerotrain Systems, Inc.
Rohr Corporation
Chula Vista, California
(714) 426-7111, ext. 2226

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ages
NO.

PLUS

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
Washington, D.C. 20591

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Read Instructions on Reverse — NO CARBON REQUIRED — Page 1 of Pages

PROCUREMENT REQUEST

1. (Check one) ☐ NEW PROCUREMENT ☐ CONTRACT MODIFICATION
2. ORIG. REQN. NO. DOT-UT-10026
3. DATE 2-15-72
4. CROSS REF. PRN/CON # DOT-UT-10026
21. PROCUREMENT REQ. NO. PRN
22. DATE RECEIVED
5. NAME (Last name — first name — middle initial) MERRITT, H. W.
5c. PHONE EXT. 62697
5b. ROUTING SYMB. UOA-20
7. SECURITY CLASSIFICATION
23. SET ASIDE ACTION a. SMALL BUS. b. LABOR SURPLUS
5c. BRANCH/DIVISION UMTA
6. PROJECT/TASK NO. INT-RDC-10
8. PROJECT MANAGER H. W. Merritt
9. APPROP./LIMIT'N/FISCAL PROG./DISTRIB./OBJECT 69x4119

10. APPROVALS

a. APPROVING OFFICIALS	ROUTING SYMBOL	DATE	b. INTERNAL ROUTING INITIALS	b. INTERNAL ROUTING RTG. SYM.
(1) AUTHORIZED REQUISITIONER Villarreal	UOA-1			
(2) MATERIEL MANAGEMENT OFFICER H. W. Merritt	UOA-20			
(3) CLEARANCE OFF.-CONTR. COMMODITY/SVC. Boswell	UAD-1			
(4) ACCOUNTING CERTIFICATION OFFICER Hoadley	UAD-20			

11. DATE(S) REQUIRED (see instructions)

12. SHIP TO — CONSIGNEE AND DESTINATION

13. ITEM NO.	14. DESCRIPTION OF ARTICLES AND/OR SERVICES (Including specifications and other pertinent data)	15. QUANTITY	16. UNIT	17. ESTIMATED COST a. UNIT	17. ESTIMATED COST b. TOTAL
	Amend the reservation for funding for the Phase I TACV project to enable: (1) the Vought contract to increase to the ceiling cost to cover increased subcontract costs, labor rates, engineering hours, and computer services and (2) the Rohr contract to increase the target price by $30,000 to insure adequate response to the Phase I report comments.				$ 150,600

18. GOVERNMENT FURNISHED PROPERTY ☐ NO ☐ YES (If "YES" attach list) ESTIMATED VALUE $

AGGREGATE COST $ 150,000

19. SUGGESTED SOURCES OF SUPPLY (If known)

NAME	ADDRESS

20. REMARKS (See instructions)

I
URB

UNITED STATES GOVERNMENT

Memorandum

URD-1

DEPARTMENT OF TRANSPORTATION

URBAN MASS TRANSPORTATION ADMINISTRATION

DATE: February 14, 1972

In reply refer to:

SUBJECT: Fund Reservation for Phase I, Urban TACV Project

FROM: Director, Special Projects

TO: Administrator

Background

On 5 May 1971 you approved a fund reservation and Procurement Request No. DOT-UT-10026 for $3,000,000. This reservation covered the engineering design and construction of mock-ups for two tracked air cushion vehicles. On 18 October 1971 you approved an additional fund reservation and an amendment to the procurement request for $500,000. This additional funding was to cover an alternate power and propulsion system under the Vought contract.

The present target costs and ceilings for the Phase I contracts are as follows:

	Target Cost	Ceiling
Vought	$ 1,473,862	$ 1,780,600
Rohr	1,840,000	2,173,000
Total	$ 3,313,862	$ 3,953,600

Vought has notified the Department that they expect their costs to reach their ceiling. Rohr has informally advised that they expect to exceed their target cost by about $30,000.

The total costs for the Phase I contracts are projected to be $3,650,000, or $150,600 above the present fund reservation. The cause of the cost increases are discussed below.

Vought

The increases in Vought's costs are attributed to the following factors:

(1) Vought's subcontractors definitized at higher prices than were quoted in the definitized prime contract which are summarized as follows:

Subcontractor		Projected Phase I Cost		Definitized Phase I Cost
Garrett		$ 224,860		$ 182,023
GRS		50,876		12,125
Raymond		50,116		55,514
WDTA		25,000		0
		$ 350,852		$ 249,662
G&A	(11.8%)	41,400	(10.4%)	25,965
Sub-total		$ 392,252		$ 275,627
		Cost Difference		$ 116,625

(2) The actual direct labor rates for engineering and logistics departments' hours were 14.2% higher and 3.5% lower than the definitized prime contract. The increase in engineering labor rates was necessitated by the use of a higher level of professional talent to resolve unexpected technical problems on the air cushion and propulsion systems. Including the effects on overhead and G&A, this corresponded to an increase of $58,154 summarized as follows:

	Projected Phase I Cost	Definitized Phase I Cost
Labor	$268,600	$ 239,463
Overhead	218,212	199,952
G& A	56,456	45,699
	$543,268	$ 485,114
	Cost Difference	$ 58,154

(3) The engineering hours increased by 5,900 hours or 18 percent. This increase was due to:

(a) Additional design and testing effort on the air cushion configuration.
(b) A major effort on Vought's part to resolve deficiencies in Garrett's design of the power control equipment
(c) An expanded effort in preparing designs and construction methods for a low-cost guideway.

These additional engineering hours, including Overhead and G&A, are expected to add $97,726 to the cost.

(4) The computer costs increased by $23,059 and additional manufacturing labor expenses of $11,174 were incurred in analyzing and verifying by testing, the new cushion panel designs.

Rohr

Though Rohr's costs to date are below target, they are now incorporating DOT's comments in their Phase I final reports. To insure adequate response to these comments, Rohr has estimated that actual costs will exceed the target by $30,000.

Summary

Vought	
Subcontracts	$ 116,625
Labor Rates	58,154
Engineering Hours	97,726
Computer Costs	34,233
Sub-total	$ 306,738
Rohr	
Final Report	30,000
Total Projected Increase	336,738
Present Fund Reservation	3,500,000
Target Cost	3,313,862
Balance	$ 186,138
Total Projected Increase	$ 336,738
Less Balance	186,138
Increased Fund Reservation	$ 150,600

Funding

Funds for this increased reservation are included in the allocation of the FY '72 RD&D Budget as presented in my Memorandum of 8 February 1972. A Procurement Request covering this increased funding is attached.

Legal Considerations

The Office of the Chief Counsel has reviewed this requirement of additional funds and finds that the increase is within the scope, ceiling and original budget estimates for the project, and is therefore consistent with the relevant legal requirements under Section 6 of the Act.

Legal Determination

The labor protection provisions of Section 13(c) of the Act are not applicable to the proposed contract, since no operations are involved.

Environmental Protection

Pursuant to the requirements of the Urban Mass Transportation Act of 1964, and policy and procedures pertaining thereto, review of statements and comments pursuant to the National Environmental Policy Act of 1969, and such additional information and analysis as deemed necessary, I am satisfied that this project will not have a significant impact on the environment.

Upon approval of the attached Procurement Request, the Contracting Officer will amend the contracts to provide for the additional costs.

H. W. Merritt

I have reserved $150,600 under the FY 1972 RD&D Budget.

Robert A. Hemmes, Assistant Administrator
Office of Research, Development and
Demonstration

I have reserved an additional $150,600 for this project.

_____
Harriet Hawkins, UAD-10

Approved:

_____
C. C. Villarreal, Administrator

Date: _____

CC - UMTA File
URD-1
UOA-1
UOA-20 (2)
UPA-1
UCC-1
TAD-45
UAD-30

UOA-20/MERRITT/mnb
2/14/72

UCD-1

Urban TACV Phase II Procurement
Prototype Vehicle Fabrication

Director, Special Projects

Administrator

1. Procurement Status. The firm Phase II proposals for prototype vehicle fabrication were submitted on 1 December 1971 by both Phase I contractors -- Vought Aeronautics Co. and Rohr Industries, Inc. The technical and business management evaluations have been completed for both proposals and the results documented. Competitive negotiations have been conducted with both contractors and their final prices were submitted on 12 January 1972.

2. Work Statement. Execution of the work statement for the Phase II contract will result in the completion of the following tasks and end items:

   -- Fabrication, assembly, acceptance test and delivery of a prototype tracked air cushion vehicle
   -- Drawings and specifications to reflect the "as built" configuration
   -- Revised vehicle engineering and site independent engineering reports
   -- Phase III Engineering Test Plan
   -- Fully documented Phase II Acceptance Test report
   -- System engineering and economic analysis study reports

3. Schedule. A single Phase II award would be made no later than 15 February, 1972. Delivery of the prototype vehicle, "as built" drawings and specifications, and the contract reports will be accomplished within 11 1/2 months, 31 January 1973.

4. Justification. A review of the UTACV program was conducted for Secretary Volpe on 25 January 1972. The review covered:

   -- Program goals and objectives
   -- Urban TACV system characteristics
   -- Comparative economic studies
   -- Test site options
   -- Evaluations of the contract proposals for Phase II

   The Secretary advised to proceed with Phase II of the Program and to perform testing at the Pueblo test site.

Commence 1 July 1972.

5. [illegible] Pub[illegible] [illegible] the [illegible] is [illegible] a [illegible] [illegible] contract [illegible] 0,00[illegible] This funding [illegible] the 97,326,[illegible] [illegible] reserve for the [illegible] from the [illegible] '72 [illegible] contract.

6. [illegible] [illegible] the Office of the Chief Counsel [illegible] that [illegible] [illegible], as indicated by the [illegible] statements, is [illegible] under section 6 of the act.

7. [illegible] [illegible] labor protection conditions of section 13(c) [illegible] [illegible] applicable to the proposed design contracts since [illegible] [illegible].

8. [illegible] [illegible] [illegible] the [illegible] [illegible] [illegible]

Funds are in RD+D Funding Plan

cc - UMTA File
URD-1
UOA-1 (2)
UPP - 1
UPO-1
UFA - (3)
UCC - 1
UAD-20
UOA-20 (2)
TAD-45
UAD-30

UOA-20/LANCASTER/mnb 2/4/72

Read Instructions on Reverse

NO. [illegible] REQUISITION

PAGE 1 OF [illegible]

PROCUREMENT REQUEST	1. (Check one) ☐ NEW PROCUREMENT ☐ CONTRACT MODIFICATION	2. PURS. REQUN. NO. DOT-UT-10026	3. DATE 1-17-22	4. PROCUREMENT REQ. NO. PR[illegible]
		4. CROSS REF. PRN/GON# DOT-UT-10026		5. DATE RECEIVED
5. PURC. (Last name — First name — Middle initial) MERRITT, H. W.		[illegible] 62697	[illegible] UMTA	[illegible] CLASSIFICATION
6a. BRANCH/DIVISION UOA-20	6c. PROJECT/TASK NO. JNT-RDC-10			7. [illegible] ACTION a. SMALL BUS. b. LABOR SURPLUS
6d. PROJECT MANAGER H. W. Merritt	6e. APPROP./LIMIT./FISCAL PROG./DISTRIB./OBJECT 69x4119			

10. APPROVALS	a. APPROVING OFFICIALS	ROUTING SYMBOL	DATE	b. INTERNAL ROUTING: INITIALS	RTG. SYM.
	(1) AUTHORIZED REQUISITIONER Villarreal	UOA-1			
	(2) MATERIEL MANAGEMENT OFFICER ~~Howard~~	URD-1			
	(3) CLEARANCE OFF.—CONTR. COMMODITY/SVC. Boswell	UAD-1			
	(4) ACCOUNTING CERTIFICATION OFFICER Hoadley	UAD-20			

11. DATA(S) REQUIRED (See instructions)

12. SHIP TO — CONSIGNEE AND DESTINATION

13. ITEM NO.	14. DESCRIPTION OF ARTICLES AND/OR SERVICES (Including specifications on reverse, attachments, etc.)	15. QUANTITY	16. UNIT	17. ESTIMATED COST a. UNIT	b. TOTAL
	Amend contract to incorporate the Phase II scope of work itemized in the Request for Proposal, DOT-UT-10026 dated 12 May 1971. Work accomplished in this phase would include: -- fabrication, assembly, acceptance test and delivery of a prototype vehicle -- drawings and specifications to "as built" configuration -- engineering, acceptance test and analysis reports				$5,340,000

18. GOVERNMENT FURNISHED PROPERTY ☐ NO ☐ YES (If "YES" attach list) ESTIMATED VALUE $

AGGREGATE COST $5,340,000

19. SUGGESTED SOURCES OF SUPPLY (If known)

NAME	ADDRESS

20. REMARKS (See instructions)

URD 1

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE:

In reply refer to:

SUBJECT: Fund Reservation for Shipment of UTACV Mockups to TRANSPO '72

FROM : Director, Special Projects

TO : Administrator

Since there will be no formal UMTA exhibit at TRANSPO, UMTA has established a policy which will pay the shipping costs for hardware developed under UMTA contracts to and from TRANSPO. At TRANSPO the equipment would be displayed as part of the appropriate industry exhibit. All other exhibit costs associated with UMTA-developed hardware would be provided by the particular industry.

Accordingly, UMTA will pay for the shipment of the mockups developed under the UTACV Project by both Rohr and Vought. The costs covering round-trip shipment to the TRANSPO site for each mockup are summarized as follows:

Rohr	.....	$ 41,307
Vought	.....	32,505
		$ 73,812

Funding

Funds for this reservation are to be allocated from the FY '72 RD&D budget. A procurement request covering this funding is attached.

Legal Considerations

The Office of the Chief Counsel has reviewed this reservation and has found that it is consistent with the relevant legal requirements under Section 6 of the Act.

Legal Determination

The labor protection provisions of Section 13(c) of the Act are not applicable to the proposed contract since no operations are involved.

Environmental Protection

Pursuant to the requirements of the Urban Mass Transportation Act of 1964, and policy and procedures pertaining thereto, review of statements and comments pursuant to the National Environmental Policy Act of 1969, and such additional information and analysis as deemed necessary, this project will not have a significant impact on the environment.

Upon approval of the attached Procurement Request, the Contracting Officer will amend the contracts with Rohr and Vought to provide for shipment of the mockups.

H. W. Merritt

I have reserved $73,812 under the FY 1972 RD&D Budget.

/s/ Robert A. Hemmes

Robert A. Hemmes, Associate Administrator
Office of Research, Development and Demonstration

I have reserved $73,812 for this project.

Harriet Hawkins, UAD-10

Approved:
/s/ C. C. Villarreal

C. C. Villarreal

Date 31 MAR 1972

Read Instructions on Reverse — NO CARBON REQUIRED — Page 1 of Pages

PROCUREMENT REQUEST

1. (Check one) ☐ NEW PROCUREMENT ☐ CONTRACT MODIFICATION

2. ORIG. REQN. NO.

3. DATE

21. PROCUREMENT REQ. NO. PRN

4. CROSS REF. PRN/CON # DOT-UT-10026 and DOT-UT-10031

22. DATE RECEIVED

5. NAME (Last name — First name — middle initial): MERRITT, H. W.

5a. PHONE EXT.: 62697

5b. ROUTING SYMB.: UOA-20

7. SECURITY CLASSIFICATION

23. SET ASIDE ACTION: a. SMALL BUS. b. LABOR SURPLUS

5c. BRANCH/DIVISION: UMTA

6. PROJECT/TASK NO.: INT-RDC-10

8. PROJECT MANAGER: Merritt, H. W.

9. APPROP./LIMIT'N/FISCAL PROG./DISTRIB./OBJECT: 69x4119

10. APPROVALS

a. APPROVING OFFICIALS	ROUTING SYMBOL	DATE	b. INTERNAL ROUTING: INITIALS	RTG. SYM.
(1) AUTHORIZED REQUISITIONER /s/ C. C. Villarreal C. C. Villarreal	UOA-1	31 MAR 1972		
(2) MATERIEL MANAGEMENT OFFICER /s/ H. W. Merritt signed for	UOA-20	3/13		
(3) CLEARANCE OFF.—CONTR. COMMODITY/SVC. /s/ T. E. Hoadley signed for	UAD-20	3/24		
(4) ACCOUNTING CERTIFICATION OFFICER				

11. DATE(S) REQUIRED (see instructions)

12. SHIP TO — CONSIGNEE AND DESTINATION

13. ITEM NO.	14. DESCRIPTION OF ARTICLES AND/OR SERVICES (Including specifications and other pertinent data)	15. QUANTITY	16. UNIT	17. ESTIMATED COST a. UNIT	b. TOTAL
	Amend the Phase I TACV contracts to provide for the shipment of the mockups to TRANSPO				
	(1) Vought Contract DOT-UT-10026			$	32,505
	(2) Rohr Contract DOT-UT-10031				41,307

18. GOVERNMENT FURNISHED PROPERTY ☐ NO ☐ YES (If "YES" attach list) ESTIMATED VALUE $

AGGREGATE COST $73,812

19. SUGGESTED SOURCES OF SUPPLY (If known)

20. REMARKS (See instructions)

34030700

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE: July 30, 1971

In reply refer to:

SUBJECT: FY 1972 RD&D Budget for the Urban TACV Project

FROM : Director, Special Projects

TO : Assistant Administrator for Program Demonstrations

Your 28 July Funding Plan shows $9,013,000 for the Urban TACV Prototype (Project INT-RDC-10). This level of funding is not sufficient to carry out the intended purpose of the project. Furthermore, the level of reduction from the $75-million request to the $62-million proposed level for the total program would not seem to warrant such a reduction in this one item.

The purpose of the Urban TACV Project is to resolve the technical, economic and operational differences between the channel and inverted "T" configurations of a TACV system. This was to be accomplished through the fabrication, testing, and demonstration of prototypes typical of each of the two configurations. Contracts have been awarded for the engineering design of two vehicles. These contracts provide for options to fabricate the vehicles, provided engineering designs are satisfactory and funds are available. Both contractors have offered firm fixed-price proposals for target costs that are within the original $10-million budget. In addition to the vehicle fabrication, $2-million was budgeted for construction of the test track. An additional $987,000 for TSC support is retained in your funding plan under TRD-98. Reduction of the funding level below the $13-million originally planned will defeat the primary purpose of the project.

In the past, the RD&D Program has been criticized for being too diffused over too many small projects. Fewer projects of a size to make a significant impact have been repeatedly recommended. A view of the 28 July Funding Plan shows 50 projects (exclusive of service development) are proposed. This fractionation can only continue the problems of managing the RD&D Program without achieving the significant impacts intended. The Urban TACV Project budgeted at $13-million can achieve the visibility and impact intended. Rather than dilute this project, I feel the program reduction from $75 to $62-million should be achieved by consolidating or elimninating many other smaller projects.

H. W. Merritt

cc - Deputy Administrator

PROJECT NUMBER: INT-RDC-9

APPROVED:

Estimated Project Cost: $22,000,000
Federal Cost--UMTA: 22,000,000

AMOUNT OF UMTA SHARE FUNDED

Prior to FY 71	FY 71	FY 72	FY 73	FY 74	FY 75
0	9,300,000	13,000,000	1,500,00 (estimate)	-	-

Project summary: This project involves a 13.5-mile demonstration project to install a TACV system along the median of the Dulles Airport Access Road. It was also determined that the most equitable way to procure the system within the time limits imposed is to enter into a feasibility study contract with each of three contractors. Results of these feasibility studies will be used as the basis for determining the award for the demonstration project contract.

Phase I. This phase covers the immediate procurement action. Under a maximum $100,000 cost contract, with no fee, the three contractors are to:

-- Complete a systems definition and feasibility study covering the construction of a 13.5-mile system along the Dulles Airport Access Road by 1 May 1972.

-- Prepare a technical and cost proposal for designing, fabricating, constructing, installing, testing and operating the system in accordance with the attached specifications.

-- Prepare a contract and cost proposal for testing, operating and maintaining the system for 18 months after 1 July 1972.

-- Prepare a work plan and project schedule for constructing the system by 1 May 1972 and implementing the system on 19 May 1972.

Phase II. Based on an evaluation of Phase I results, one contract will be awarded by 1 April 1971 covering design, construction, fabrication, and installation of the system. Phase II covers operations of the system commencing 19 May 1972. [illegible] the International Transportation [illegible]

Phase III. [illegible] a contract for testing and operating the system for [illegible] commence 1 July 1972.

DEPARTMENT OF TRANSPORTATION

NEWS

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20590

FOR RELEASE SATURDAY, A. M.
February 20, 1971

DOT -- 3071
Phone: (202) 426-4321

Secretary of Transportation John A. Volpe announced today the award of the first contracts, initiating the program for installation of a tracked air cushion vehicle (TACV) line along the Dulles Airport access road.

The contracts were awarded to the LTV Aerospace Corporation of Dallas and the Rohr Corporation of Chula Vista, California. Each contract, in an amount not to exceed $100,000 calls for the preparation of proposals for the system, a timetable for completion and a firm project cost. Negotiations for a similar contract with Grumman Aerospace Corporation of Bethpage, New York, are continuing.

Work to be performed under the contracts is described as Phase I of the TACV project. The contracts were awarded by the Transportation Department's Urban Mass Transportation Administration. They will be followed by Phase II contracts under which successful bidders will complete the TACV design, construct the guideway, fabricate the vehicle and install and operate the system during the U.S. International Transportation Exposition to be held at Dulles May 27 through June 4, 1972. There will be a Phase III period during which the TACV line will be operated for 18 months for evaluation and testing.

The decision to proceed with the TACV project was announced by Secretary Volpe in a speech before the Washington Area Council of Governments February 16. In announcing the award of the contracts today the Secretary said, "This action means that we are moving ahead promptly with this project and that we fully expect to have it in operation in time for the 1972 International Transportation Exposition. We hope it will provide a major contribution to the development of new modes of transportation for the future."

-more-

The TACV, which will run 13.5 miles from Dulles to McLean, Virginia, will be powered by an electric linear induction motor (LIM) which is virtually silent and pollution free. Both the TACV and the LIM have been developed under contracts awarded by the Deparment's Federal Railroad Administration. Urban Mass Transportation Administrator Carlos Villarreal said "this project will demonstrate the technical feasibility of combining the tracked air cushion vehicle with the linear induction motor and applying them to urban mass transportation."

##########

U.S. DEPARTMENT OF TRANSPORTATION

TRANSPORTATION SYSTEMS CENTER
55 BROADWAY
CAMBRIDGE, MASSACHUSETTS 02142

DATE: DEC 2 1971

REPLY TO ATTN OF: AMP

SUBJECT: FY72 PPA UM201
Revision #1

Received
DEC 7 1971
U.T.

Mr. Robert Hemmes, URD-1
Urban Mass Transportation Administration
400 Seventh Street, S.W.
Washington, D.C. 20591

Forwarded herewith for your approval and signature is FY72 PPA UM201-1. This revision constitutes a change in Block 10, Resource Requirements, which increased Major Equipment from .0K to 15.3K and decreased In-House Services from 48.3K to 33.0K.

After signature, the enclosure should be forwarded to the Assistant Secretary for Systems Development and Technology (TST-1) for final approval.

James B. Cahalane
Director of Administration

Enclosure

cc: (w/o enclosure)
TST-1

URD 12/8

DEPARTMENT OF TRANSPORTATION

TRANSPORTATION SYSTEMS CENTER

CAMBRIDGE, MASS.

PROJECT PLAN AGREEMENT

1. GWA NO.	2. PPA NO.	REV. NO.	AFFECTS PAGES	3. DATE:
72-UM	UM201	1	1	November 22, 1971

4. TITLE:
Urban TACV Demonstration Project

5. SPONSOR:	7. TASK MANAGER:
Harold W. Merritt, URD-1 DOT/UMTA 9315 Nassif Building Washington, D.C. 20590 (202) 426-2967	Richard R. John, TM/Acting for PE DOT/Transportation Systems Center 55 Broadway Cambridge, Massachusetts 02142 (617) 494-2235
6. SPONSOR NO.:	8. RELATED PPAS:

9. BRIEF TECHNICAL SUMMARY: Through previous studies and evaluation of many concepts for improved urban transportation, UMTA has determined the need for testing and demonstrating several systems which show near-term technological promise. One of these systems is the tracked air cushion vehicle (TACV) for application to such needs as new community development and airport access. TSC is to furnish technical assistance and also develop an in-house support capability for the Urban TACV Demonstration Project. This technical assistance will include specification preparation, design review, monitoring of acceptance tests and the system demonstration, and other related engineering tasks. In-house support capability will be developed in the areas of Urban TACV System Application and for selected critical sub-system technologies including environmental control, e.g., noise abatement, as well as guideway engineering, power collection and processing, propulsion, reliability and safety.

10. RESOURCE REQUIREMENTS:

	FY	FY 72	FY
DIRECT MANYEARS		15.0	
SALARIES & BENEFITS $K		280.3	
MAJOR EQUIPMENT		15.3	
RESEARCH CONTRACTS		377.0	
IN-HOUSE SERVICES & OTHER		33.0	
INDIRECT		308.4	
TOTAL		1014.0*	

(*Includes $27K of unexpended FY71 funds)

11. APPROVALS:	TSC	SPONSOR	TST
BY:	[signature]		
TITLE:	Director of Transportation Systems Development		
DATE:	12/2/71		

12. Description of Work

Establishing demonstration programs for new and advanced forms of public transportation is one of UMTA's primary functions. Advanced transportation systems encompass new concepts in guideways, power and propulsion systems, communication and control, maintenance engineering, passenger and baggage handling, and other elemental technologies. Actual demonstration projects are generally carried out by local authorities. UMTA must ascertain that these projects are part of a logical demonstration program, that they are technically sound and safe, and that the projects are designed to provide information of national benefit. To carry out this responsibility each element of the system must be scrutinized during the conceptual, design, and testing stages. The interrelationships of these elements within the overall system concept must also be thoroughly understood. The test and evaluation programs must be carefully designed and monitored to insure that the appropriate performance requirements are achieved and that variances from performance goals are understood and can be adjusted during actual demonstration of the system.

One specific system which is being considered for demonstration is a tracked air cushion vehicle with linear-electric-motor propulsion operating on a special guideway. UMTA currently has defined two tracked air cushion vehicle projects: one involves a test system that would run from the Los Angeles International Airport to the junction of the Golden State and San Diego Freeways; the other is aimed at the demonstration of a TACV system at a site to be selected.

In the Los Angeles TACV Project, initial engineering studies of the route have been completed. Contracts have been completed on economic feasibility studies and market analyses. A work statement covering the overall system procurement has been prepared and will be released upon the completion of funding arrangements.

The schedule for the Urban TACV Demonstration Project is shown in Figure 1. The Project is currently planned as a four-phase program: Phase I; Engineering Design: Phase II, Vehicle Fabrication; Phase III, Test Operations; Phase IV, System Demonstration. As shown in Figure 1, Phase I will be of 6 1/2 months duration and include the engineering design of a passenger prototype-vehicle and the design of the site-independent aspects of facilities for a complete system. Phase I also includes the delivery of a full scale vehicle mock-up. Phase II includes the fabrication of a prototype vehicle and the preliminary acceptance tests of this vehicle on a section of guideway at the contractors plant. Phase II will extend for 11 1/2 months after Phase II contract award. Phase III Vehicle Test Operations will consist of the vehicle acceptance and system tests at a site to be selected by DOT and this phase is currently contemplated to cover a period of from six to twelve months. Phase IV, Vehicle System Demonstration, will be of from twelve to twenty-four months duration. At the conclusion of Phase IV the following would be delivered:

A demonstration line ready to be put into revenue service.

The results of the project in reports covering passenger reaction to the system, operating costs based on system performance, market analyses of the system--all as an aid to transportation planners and local government officials.

Data and plans for system maintenance personnel training, operations, logistics, etc.

The objectives of TSC on this and any subsequent Urban-TACV Demonstration Project are to provide UMTA with the necessary in-depth technical assistance and the engineering support necessary to assure a successful program. There are two main areas of activity in meeting these objectives. The first is to develop the in-house expertise at TSC required to give systems engineering support to UMTA; the second, and equally important area, is the direct support of the UMTA/TACV Demonstration Project. Initial emphasis will be concentrated on the Urban-TACV Demonstration Project.

Task 1.0 Vehicle Design and Fabrication

Under the direction of the UMTA Project-Manager and with the technical direction of OHSGT, TSC will assist UMTA in Monitoring the Urban-TACV design and system fabrication activities of the prime contractor or contractors. TSC will form an engineering team to be assigned to the program as long as needed. The program's progress will be monitored in the general areas listed below.

Task 1.1, Urban-TACV Subsystems

1. Configurations/Structure
2. Air Cushions/Suspension
3. Power/Propulsion
4. Control/Communication
5. Instrumentation
6. Noise Abatement

Task 1.2, Reliability, Maintainability, and Safety Engineering

Task 1.3, Urban-TACV Support Facilities

1. Guideway
2. Wayside Power
3. Wayside Control
4. Passenger/Baggage Handling
5. Maintenance/Support Equipment

Task 1.4, Acceptance Tests and Quality Assurance

In accordance with this list, one or two TSC men will be assigned to each of the major sub-tasks, e.g., guideway, suspension, etc. In this fashion TSC will develop and provide a team of experts to support and monitor the activity. Each of the experts will be assigned to the corresponding supporting technology sub-tasks outlined under Task 3. The individual members of the team will, therefore, work on in-house Urban TACV technology efforts as well as monitor the progress of the prime contractors. At this time it is planned that an

average of 4.2 men will be assigned to the monitoring program. Their efforts will be augmented by the in-house Urban TACV technology effort and by outside contractors and consultants.

Integral to the TSC program will be the identification and organization of a team of outside contractors and consultants to serve as back-up in case of significant technical, cost, or scheduling problems (See Task 3).

TSC personnel in combination with this team and other contractors currently under consideration will basically serve as a "shadow" program team to serve as backup to the selected system contractor.

Task 2.0 Urban TACV System Applications

Under this task TSC will under the guidance of the UMTA Project Manager, and with technical assistance as required from OHSGT, carry out studies on the application of an Urban TACV System to an urban environment. This task will include preparation of an environmental impact statement for the system; site selection and planning for Phase III, Test Operations, and Phase IV, Systems Demonstration; systems engineering designs, system cost analysis; and trade-off studies.

Task 2.1 Environmental Impact Statement

During the course of the effort, TSC will, based on independent analyses of the contractors' designs and hardware and on the TSC in-house supporting technology program, prepare and update an environmental impact statement for the Urban TACV System. The impact statement will include but not be limited to noise including ground vibrations, air and electromagnetic pollution, and system visual impact. As part of this task estimates would be made of the environmental impact of noise, air, and electromagnetic interference along Urban TACV routes examined under Task 2.2.

Task 2.2 Site Selection and Planning for Phase III, Test Operations and Phase IV, System Demonstration

TSC will under the guidance of the UMTA Program Manager develop a strategy and program for the selection of a site for system test and demonstration. The studies will include a comparison of the benefits of test operations at the DOT Test Center at Pueblo and a subsequent systems demonstration at a separate urban location with the benefits accruing to test and demonstration at a single urban site. Selection of a test and/or demonstration site will include consideration of social-economic as well as technical factors. Ideally the demonstration system will be part of an overall local transportation system. In this case the demonstration system may eventually be expanded and be made available for an UMTA grant. This situation is, of course, contingent on the ability of the local community to finance their portion of the project.

Apart from site selections, which must be complete in the first six months of the program, TSC will prepare detailed plans for Phases III and IV of the program. Emphasis will be on the development of techniques to extrapolate the results obtained from Test Operations and System Demonstration to other similar urban environments.

Task 2.3 System Cost Analyses and Trade-Off Studies

TSC will perform system cost and trade-off studies to establish potential system capital and operating costs. This task will be closely coordinated with Task 2.4, system engineering design trade-off studies, and with Task 3, supporting technology. For example, assuming a given TACV system and acceptable financial structure, parameter studies will be performed to establish maximum tolerable costs for the guideway, vehicle and stations, etc. The cost trade-off studies will include consideration of acceptable fare levels for the different proposed demonstration sites. Consideration will also be given to maintenance costs.

Task 2.4 System Engineering Design Trade-Off Studies

The system engineering design studies will identify critical subsystem technology which is essential to total system operation. After the critical subsystem techniques have been identified they will be examined under Task 3. Potentially critical areas include double ended vehicles, vehicle switching and vehicle coupling.

Contractor assistance will be used to augment the TSC in-house capability in the general areas of Urban TACV System Application.

Task 3.0 Supporting Technology

A key element in the TSC program is the development of an in-house expertise in the detailed technology of TACV systems. The Urban TACV supporting technology activity will be carried out with technical direction from OHSGT, and coordinate with the OHSGT development activities in this area. An overall TSC expertise is needed in this area to undertake the efforts and support the efforts and verify the results of other tasks. Further, in establishing this expertise, an extensive study of critical techniques will provide a basis for the accurate engineering judgments essential to the success of the total project.

The critical techniques to be covered include the items indicated below.

Task 3.1 Environmental Impact

Supporting studies will be conducted out in the areas of noise abatement and passenger comfort criteria.

3.1.1 Noise Abatement

The five major noise sources for the Urban TACV are (1) air cushions, (2) linear electric motor, (3) current collection (4) compressors, (5) turbulent boundary layers.

Studies will be performed to determine the dependence of air cushion noise on (1) flow velocity, (2) guideway roughness, and (3) the effect of inverted T or channel guideway.

Preliminary studies of the Aerotrain TACV at Gomez indicate that LIM noise is a potential problem under certain conditions. The reaction rail rings at 800 Hz with a level of 82 dB at 20 feet. (This corresponds to 74-78 dB at 50 feet) A further investigation is planned.

Noise and vibration associated with current collection will be estimated from results on the French Aerotrain and by extrapolation of results from transit cars.

Compressor noise is estimated to be the highest of all sources considered. It is, however, also among the most amenable to control as the parameters of specific compressor installations become available it will be possible to estimate compressor noise levels and attenuation requirements more accurately. Contractor assistance will be used to augment the TSC in-house capability in the general area of noise abatement.

3.1.2 Passenger Comfort Criteria

A critical study will be performed on the existing liturature to establish standard techniques for measuring passenger comfort criteria during the test operations and demonstration phases of the program.

Task 3.2 Guideway Engineering

An essential feature of the complete Urban TACV System is the cost and installation of the guideway. TSC will supplement its in-house expertise in this area by means of outside contractors. Trade-off studies will be performed for at-grade and elevated guideway structures, and for the different guideway profiles, e.g. channel, tee, box. Guideway costs are a sensitive function of guideway route. This task, in support of Task 2.2, Site Selections, will include engineering studies of potential Urban TACV sites. The studies will consider traditional as well as new and innovative guideway engineering.

Task 3.3 Reliability, Safety, and Maintainability Engineering

In-house reliability and safety analysis will be carried out on the contractors' vehicle design. These studies will be carried out independent of the contractor's efforts in this area. Estimates will be made of the potential maintenance costs for the Urban TACV system and techniques will be examined for reducing these costs.

Task 3.4 Power and Propulsion

The major activity in this area will be the critical evaluation and exploratory development of solid state variable voltage, constant frequency power processing equipment for the control if the on board linear electric motor. This activity will complement the advanced development work on variable frequency power processing equipment currently underway at TSC for OHSGT.

Task 4.0 Project Management

The Urban-TACV program will be managed by the Ground Systems Programs Division at TSC. Management effort will extend throughout the course of the

program. This task will involve the coordination, scheduling, and financial control of all TSC in-house and contractor activities. The TSC Project Manager will be the primary interface with the UMTA Project Office, OHSGT, and all in-house activities on the Urban-TACV programs.

13. Interfaces

Appropriate TSC staff members will interface with the prime contractors in the various technical areas as regulated and requested by UMTA and OHSGT management personnel. These interfaces will include scheduled design review meetings, tests, and demonstrations.

14. Schedules

Figure 2 shows the major milestones of the TSC efforts in fiscal year 1972.

15. Procurement

The following list gives the planned contracts needed to support the TSC work as described in Item 12.

Area: Assist TSC in Urban TACV System Applications
Possible Contractors:
Estimated Amount: $127,000

Area: Environmental Impact and Control
Possible Contractors: Bolt, Beranek and Newman and others
Estimated Amount: $75,000

Area: Guideway Civil Engineering
Possible Contractors: (One contractor on traditional techniques and another on new or innovative methods)
Estimated Amount: $75,000

Area: Suspension Systems
Possible Contractors: Prof. D. Wormley, MIT (consultant)
Estimated Amount: $10,000

Area: Power Processing
Possible Contractors:
Estimated Amount: $75,000

Area: Safety Engineering
Possible Contractors: H. Weihmiller (consultant)
Estimated Amount: $15,000

The total estimated amount of the contracts is $377,000.

16. Management

The TSC work on the Urban TACV Demonstration will be conducted on a project basis and be managed by the Groud Programs Division (PE).

17. Review and Reports

Monthly progress reports will be provided. Additional detail on reporting is shown in Figure 2.

18. Controls

N/A.

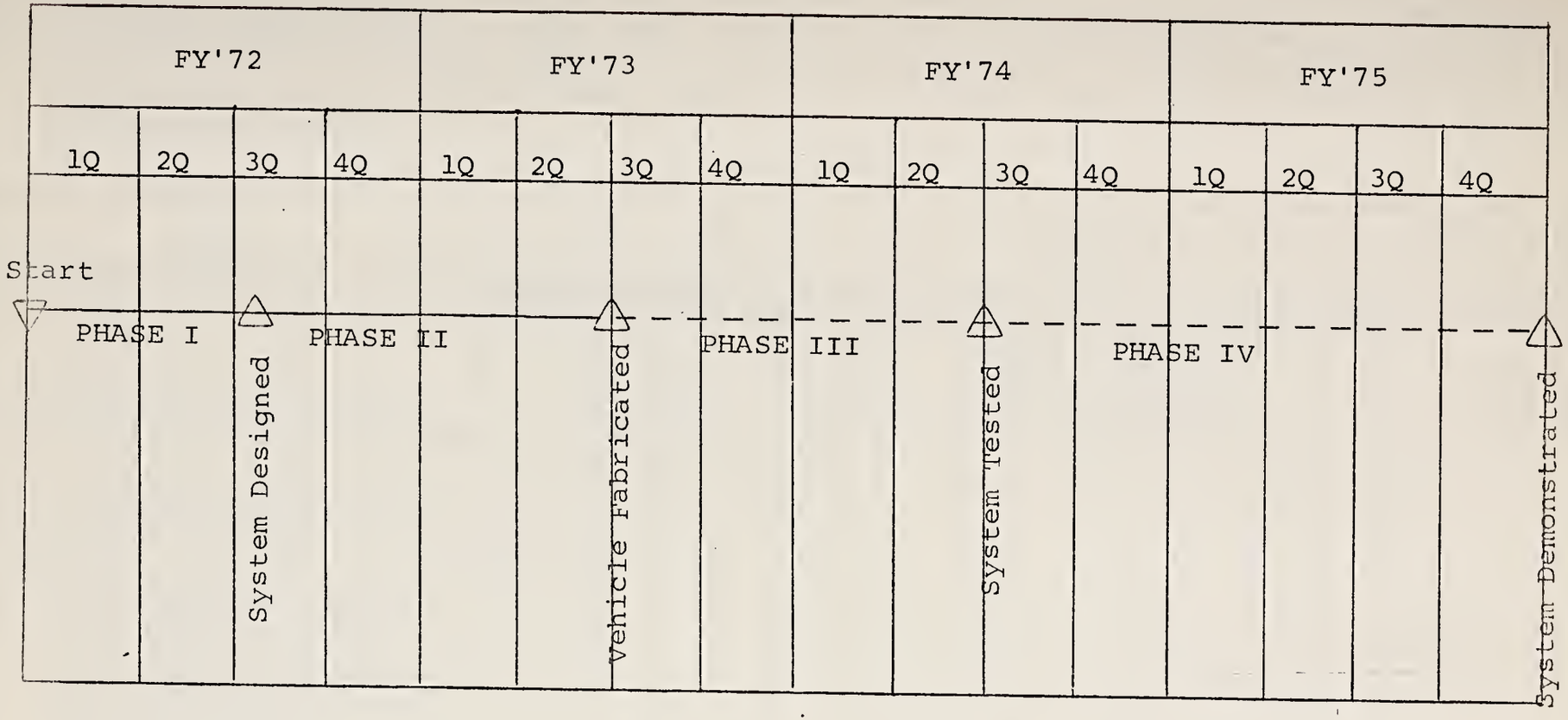

Figure 1 Four-phase Program for the Urban-TACV Demonstration Project

TRANSPORTATION SYSTEMS CENTER

PPA: UM201	FIGURE 2 TITLE: Urban TACV Demonstration Project	FUNDING: $1014K

BRIEF PROJECT DESCRIPTION: An urban TACV system is to be developed and demonstrated under a planned program of four phases: (I) engineering desing, (II) vehicle fabrication, (III) test operations, and (IV) system demonstration. TSC efforts are arranged into four task areas as described below.

TASK	FY'71				FY'72												FY'73			
	1Q	2Q	3Q	4Q	J	A	S	O	N	D	J	F	M	A	M	J	1Q	2Q	3Q	4Q
1.*Support vehicle design and fabrication activities			contractor selection (Phase I)				Prelim. Design Rev.		Final Des. &Accept Rev.		contractor selection (Phase II)							Vehicle Acceptance Test		
2.Assist UMTA in studies on urban-TACV system applications Include: 2.1 Environmental Impact 2.2 Site Selection and Planning for Phase III, Test Operations, and Phase IV, System Demonstration 2.3 System Cost Analyses 2.4 System Engineering Design Trade-off Studies								Demonstration Site Selected			Interim Reports					Detailed Reports				

LEGEND:
- △ SCHEDULED
- ▲ ACCOMPLISHED
- ◇ MILESTONE SLIPPAGE

REMARKS:
*Assistance to UMTA in monitoring of contractors' performance in design and fabrication of the vehicle and support facilities.

TRANSPORTATION SYSTEMS CENTER

PPA: UM201	TITLE: FIGURE 2 (continued) Urban TACV Demonstration Project	FUNDING: $1014K

BRIEF PROJECT DESCRIPTION:

TASK	FY'71				FY'72												FY'73			
	1Q	2Q	3Q	4Q	J	A	S	O	N	D	J	F	M	A	M	J	1Q	2Q	3Q	4Q
3.**Conduct studies of critical technologies Include: 3.1 Environmental Impact 1.Noise Abatement 2.Passenger Comfort Criteria 3.2 Guideway Engineering 3.3 Reliability, Maintainability, and Safety 3.4 Power and Propulsion									Interim Reports							Detailed Technical Reports				
4.***Perform project management and interface with the UMTA Project Office.							Program Implementation Plan (PIP)													

LEGEND:
- △ SCHEDULED
- ▲ ACCOMPLISHED
- ◇ MILESTONE SLIPPAGE

REMARKS:
- **Supports the work under Task 1 and extends the base of TACV technology needed to establish and evaluate competing concepts.
- ***Management and coordination of TSC in-house activities and subcontracts.

3.202

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DATE: MAY 5 1971

In reply refer to:

SUBJECT: Urban TACV Engineering Design Study leading to Prototype Vehicle Fabrication - INT-RDC-10

FROM : Director, Special Projects

TO : Administrator

1. Procurement Request. On Thursday, 22 April 1971, Secretary Volpe agreed to a detailed engineering design study for a 60-passenger Urban Tracked Air Cushion Vehicle. The design study is to be initiated this fiscal year with the selection of two or three contractors to accomplish fixed price engineering designs. For the purpose of evaluating contract proposals, the contractors will also be requested to submit preliminary cost estimates for vehicle fabrication.

As part of the engineering design study, contractors will be required to submit detailed cost estimates for vehicle fabrication, leading to procurement of one or two vehicles in the next fiscal year.

. Work Statement. A work statement for the proposed project is attached.

The bidders will be required to submit a technical and cost proposal for the engineering design of a TACV in accordance with the attached scope of work. The resulting contracts to the successful bidders to be awarded this fiscal year will include:

-- Engineering designs and specifications for a 60-passenger LIM propelled tracked air cushion vehicle;
-- Trade-off analyses of proposed subsystems and components;
-- A system test and check out plan;
-- Fabrication of a full scale mock-up of the vehicle;
-- A firm cost proposal for fabricating the prototype vehicle.

Subsequent contracts will be negotiated for a one or two vehicle procurement.

Sites for testing and demonstrating the vehicle will be determined through internal investigation and analysis.

3. Timing. The RFP will be issued no later than 10 May 1971 with proposal submission due by 10 June 1971. Contracts will be let prior to 30 June, 1971.

3,202

4. Cost Estimate. The engineering design studies and associated requirements will not exceed a total of $3 million. FY 1971 RD&D funds have been identified which would permit the award of two or possibly three engineering design contracts.

   The FY 1972 RD&D budget includes $13 million for an Urban TACV Project. This amount would cover the procurement of two prototype vehicles at approximately $5 million each, the technical support from Transportation Systems Center at $987,000, and test facilities at $2 million.

5. Legal Determination. The Office of the Chief Counsel finds that the proposed contract, as indicated by the work statement, is authorized under Section 6 of the Act.

6. Labor Determination. The labor protection provisions of Section 13(c) of the Act are not applicable to the proposed design contracts since no operations are involved.

7. Environmental Protection. Pursuant to the requirements of the Urban Mass Transportation Act of 1964, and policy and procedures pertaining thereto, review of statements and comments pursuant to the National Environmental Policy Act of 1969, and such additional information and analysis as deemed necessary, I am satisfied that this project will not have a significant impact on the environment.

8. Recommendation. I recommend approval of $3 million from FY 1971 program funds for the engineering design contracts.

   I also recommend, pending the acceptability of the engineering design studies, that vehicle fabrication, test operations, and system demonstration be undertaken with sufficient planning and support to determine the practicality of the TACV system of fulfilling the requirements of urban mass transportation.

   I further recommend that you find that the project activities of the proposed contracts will assist in the reduction of urban transportation needs, the improvement of mass transportation service, and the contribution of such service toward meeting total urban transportation needs at minimum cost.

H. W. Merritt

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DEPARTMENT OF TRANSPORTATION NEWS

URBAN MASS TRANSPORTATION ADMINISTRATION

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Secretary of Transportation John A. Volpe announced today the award of two additional contracts in connection with the Transportation Department's program for development of the Tracked Air Cushion Vehicle (TACV).

The two contracts were awarded to the Rohr Corporation of Chula Vista, California, and the Vought Aeronautics Co. of Dallas. The two awards totaled $2,850,000.

Under the contracts the two aerospace firms will produce designs and mock-ups of a 60-passenger vehicle which would be powered by an electric linear induction motor at speeds up to 150 miles per hour. The mock-ups are to be delivered within six and a half months. It is expected that one or more prototypes could be contracted for and built for testing purposes within a year thereafter.

The contracts were awarded by the Department's Urban Mass Transportation Administration (UMTA). Another phase of the TACV development program was covered in a contract issued earlier by the Department's Federal Railroad Administration. This contract, awarded to Grumman Aerospace Corporation in the amount of $3.5 million, called for construction of a research vehicle capable of speeds up to 300 miles per hour.

"I belive in the TACV," Secretary Volpe said in announcing the contracts. "The award of these contracts is further evidence of the Department's commitment to TACV as one means for improving the nation's transportation system.

"Our TACV program is an overall Department effort on several fronts utilizing the capabilities of the Urban Mass Transportation Administration, the Federal Railroad Administration, and others to provide high-speed, point-to-point travel," Secretary Volpe added. "New systems must, however, be what the public wants and be fully compatible with the environment and life around us."

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Carlos C. Villarreal, Administrator, Urban Mass Transportation Administration, said in discussing the awards, "We see the application of an urban TACV in providing a fast transit link to new regional airports and for trips from 10 to 50 miles in metropolitan areas."

Subsequent phases of the UMTA program call for testing and demonstrating the vehicles. The purpose is to measure performance, environmental impact, safety, public acceptance, costs, and other factors. While test and demonstration sites have not been determined, consideration is being given to using the Department's High Speed Test Center at Pueblo, Colorado.

Rohr and Vought are two aerospace manufacturers who have made significant commitments to the field of new ground transportation systems. The two contractors will build vehicles different in several respects, notably in air suspension and guideway design. The purpose of the two awards is to compare design and operating characteristics and determine their suitability for public use in future revenue service.

For two years, demonstration vehicles of this type have been operating in France and plans have recently been announced for a revenue service airport access system near Paris. The British expect to operate a prototype vehicle later this year. The Department of Transportation demonstration project is building on the French and British experience as a necessary step to the development of an acceptable vehicle for revenue service.

The 60-passenger urban TACV will have space for baggage, seats will be of the comfortable aircraft type and much of the control will be automated. It will be the first vehicle in the nation's ground transportation system which will operate without wheels. Instead it will ride on a thin cushion of air along a concrete guideway which can either be built at ground level or elevated above the ground to minimize interference with roadways, walkways and other transportation modes.

For further information, contact Public Affairs Office UMTA, 426-4043, or:

Mr. James Croslin
Vought Aeronautics Company
Dallas, Texas
(214) 266-5384

or

Mr. Russell F. Thielman
Vice President and General Manager of
Aerotrain Systems, Inc.
Rohr Corporation
Chula Vista, California
(714) 426-7111, ext. 2226

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