

# TRANSPORTATION NEEDS SUMMARY

September 1976

Prepared by

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Secretariat  
to the

URBAN CONSORTIUM FOR TECHNOLOGY INITIATIVES

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## PREFACE

This is the first report of the Transportation Task Force of the Urban Consortium for Technology Initiatives. It describes the 58 most urgent needs and problems in transportation as perceived by the member jurisdictions of the Urban Consortium, the Nation's 28 largest cities and 6 major urban counties.

These 58 transportation needs were identified in an extensive need identification and screening process conducted by the cities and counties themselves. This needs identification process also provided the basis for the formation of the nine Task Forces of the Urban Consortium.

The purpose of this report is twofold: 1) to describe the unique needs identification and priority process used by the Urban Consortium for Technology Initiatives; and 2) to provide the "Need Statement Abstracts" for each of the 58 transportation needs identified.

This report, Transportation Needs Summary, is the first in a series of reports by the Transportation Task Force of the Urban Consortium. It will be followed by eight "Information Bulletins" developed on 8 of the 58 Transportation needs which were identified by the Task Force as being of the greatest concern at this time.

Action is also being taken on two of the highest priority needs-- "Preferential and Exclusive Lanes" and "Accelerated Implementation Procedures." The "Preferential and Exclusive Lanes" need is being addressed in the Manual for Planning and Implementing Priority Techniques for High Occupancy Vehicles: Executive Summary; Management Report; Technical Guide currently being prepared by the staff of Public Technology, Inc. A User Design Committee composed of representatives from Consortium jurisdictions is guiding the preparation of this Manual. The Consortium's Steering Committee is considering the policy-oriented issues (such as streamlined grant applications) involved in "Accelerated Implementation Procedures," in consort with similar needs which have surfaced in other Consortium Task Forces. Members of the Transportation Task Force are also working with the Urban Mass Transportation Administration in ensuring that Task Force concerns are addressed in the on-going revisions to UMTA's External Operating Manual.

The series of reports by the Transportation Task Force of the Urban Consortium for Technology Initiatives is listed below:

- Transportation Needs Summary
- Asphalt Improvements
- Institutional Framework for Integrated Transportation Planning
- Integration of Para-Transit with Conventional Transit Systems
- New Standard Bus Equipment
- Traffic Signalization Systems
- Transit System Productivity
- Transportation for Elderly and Handicapped Persons
- Transportation Planning and Impact Forecasting Tools

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## Chapter I

### INTRODUCTION

This report contains the results of the extensive needs identification and screening process conducted by the member cities and counties of the Urban Consortium for Technology Initiatives. Chapter I provides an overview of this unique needs identification process used by the Consortium.

While the needs selection process provided the basis for forming the Task Forces for all nine need areas, this report focuses on the work of the Transportation Task Force. The process by which the Transportation Task Force screened the original 94 transportation needs identified by the Consortium members to its top 10 priority needs is described. Chapter I also contains a status report on Consortium work in four of the top priority need areas.

Chapter II contains the "Need Statement Abstracts" which describe the 58 most important research and development needs in transportation as perceived by the nation's largest urban areas at this time. These 58 needs were derived from the original 94 by consolidation of duplicative need statements. The "Need Statement Abstracts" provided one of the important mechanisms used by the Transportation Task Force in narrowing the needs list from 58 to the top 10 priority needs.

### GENERAL PROCESS OF NEEDS IDENTIFICATION

One of the major promises of the Urban Consortium lies in its unique process of needs identification. Local governmental officials are working cooperatively to identify and then focus on the priority needs of their jurisdictions. In this way, the Consortium assures that resultant research and development efforts are directly responsive to existing or potential local governmental problems. Local participation also helps assure that successful solutions will be applied and used.

The major work of the Urban Consortium is carried out by its nine Task Forces (Community and Economic Development; Criminal Justice; Energy; Environmental Services; Health; Human Resources; Management, Finance and Personnel; Public Works and Public Utilities; and Transportation). These Task Forces were organized as a result of the following generalized needs identification process:

- Between November 1974 and February 1975, 1131 needs were identified by the members of the Urban Consortium in response to an open-ended "Needs Identification Package". Each jurisdiction identified its needs in

different ways--some held public meetings, some circulated the package to department heads, some depended upon key individuals in the chief executive's office, as well as in other ways unique to each particular locality.

- The staff of Public Technology, Inc. organized these original 1131 "Needs Statements" into major categories. This organized list was sent back to all jurisdictions. Each representative was asked for a "yes/no" response as to whether each need was of concern in his or her jurisdiction. An indication of the top 3 priorities in each category was also requested. The chief executive officer of each jurisdiction then certified those priorities.
- The Steering Committee of the Urban Consortium established a Needs Committee to oversee the further development and use of the needs which had been identified. In the Spring of 1975, Task Forces were established for the major categories of needs. The Task Force members were selected according to expressed interest by the jurisdictions. PTI staff specialists in each subject provided a rigorous review of the "Needs Statements" and assisted in the process of establishing priorities within each category.
- The nine Task Forces follow similar procedures in selecting the few high priority needs which should be addressed immediately. The basic features of this process--the background information provided and the evaluation criteria--are discussed in the next section. While that section will focus on work of the Transportation Task Force--the "Need Statement Abstracts", "Information Bulletins" and evaluation criteria are common to the work of all nine Task Forces.

## TRANSPORTATION NEEDS SELECTION PROCESS

The Transportation Task Force of the Urban Consortium for Technology Initiatives was formally organized in August 1975. The Task Force is comprised of 12 representatives appointed by the Steering Committee of the Urban Consortium. Public Technology, Inc. (PTI) provided the necessary staff support to organize and develop a functioning Transportation Task Force. The following process was used:

- Of the 1131 needs which were initially identified by the members of the Urban Consortium, 94 related to transportation. The 94 needs were reduced to 58 by PTI through consolidation of duplicative "Needs Statements." These 58 were then grouped into four

major categories--Highways, Transportation Systems Management, Mass Transit, and Aviation.

- "Need Statement Abstracts", based on the original needs identification packages, were then developed on each of the 58 needs by the PTI staff. These "Need Statement Abstracts" provided the Task Force members with a one-page, basic definition and overall perspective of the problem. (See Chapter II of this report).
- At a meeting in February 1976, the Transportation Task Force met to determine priorities among the 58 needs. The following four common Task Force criteria were used:
  - + Commonality - the extent to which a need exists in many jurisdictions.
  - + Magnitude - the importance, scope and urgency of the need.
  - + Community Impact - the extent to which solutions to the need will affect the citizens and community as a whole.
  - + Financial Impact - the monetary effect (costs, savings and revenues) which a solution to the need will have on a city or county.
- Through an iterative evaluation process using the criteria listed above and a rating scheme, the 58 needs were rank ordered. The following top 10 needs, listed in alphabetical order, were selected for further attention:
  - Accelerated Implementation Procedures
  - Asphalt Improvements
  - Institutional Framework for Integrated Transportation Planning
  - Integration of Para-Transit with Conventional Transit Systems
  - New Standard Bus Equipment
  - Preferential and Exclusive Lanes
  - Traffic Signalization Systems
  - Transit System Productivity
  - Transportation for Elderly and Handicapped Persons
  - Transportation Planning and Impact Forecasting Tools
- Two of the top priorities, "Preferential and Exclusive Lanes" and "Accelerated Implementation Procedures," received immediate action by the Transportation Task Force. The Manual for Planning and Implementing

Priority Techniques for High Occupancy Vehicles: Executive Summary; Management Report; Technical Guide is currently being developed by the PTI staff through a specific task under U.S. Department of Transportation funding. An User Design Committee composed of representatives from Consortium jurisdictions is guiding the preparation of this Manual. The Consortium's Steering Committee is considering the policy-oriented issues (such as streamlined grant applications) involved in "Accelerated Implementation Procedures", in consort with similar needs which have surfaced in other Consortium Task Forces. Members of the Transportation Task Force are also working with the Urban Mass Transportation Administration in ensuring that Task Force concerns are addressed in the on-going revisions to UMTA's External Operating Manual.

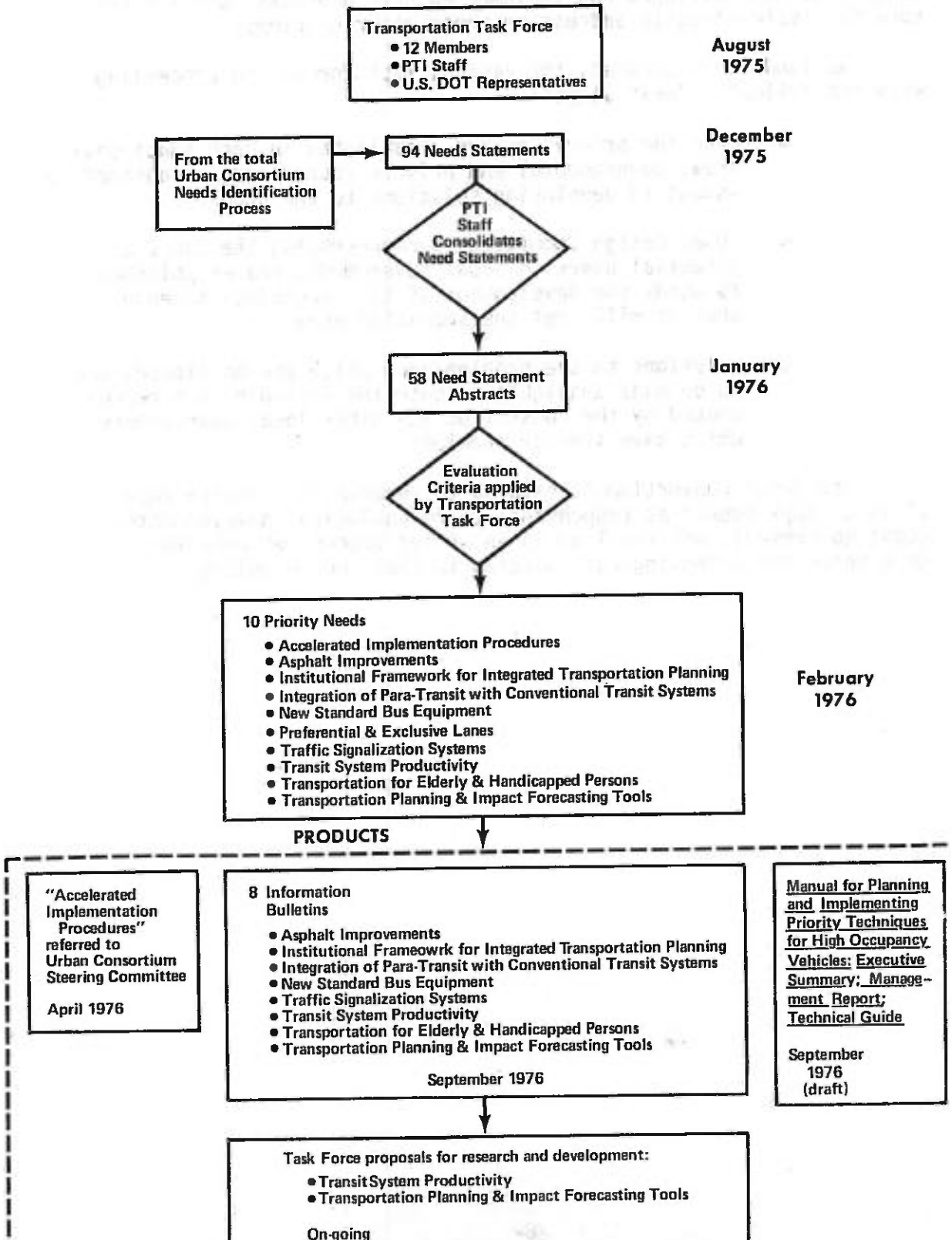
- Information Bulletins were then developed by PTI staff on the 8 other priority needs. The "Information Bulletins", ranging from 10-20 pages, provided more detailed information on each need. These Bulletins provided the information base from which the Transportation Task Force selected other needs for future actions. Localities can also use these "Information Bulletins" to begin to develop solutions. As stated in the Preface, the eight "Information Bulletins" developed for the Transportation Task Force will be published as a continuing series to this first report.
- At its second meeting in June 1976, the Transportation Task Force voted to concentrate its next efforts on "Transit System Productivity" and "Transportation Impact Forecasting." The Task Force is in the process of encouraging federal and private support for further research and development in these two areas.

The Task Force emphasized the importance of the other six priority needs and will pursue solutions as resources become available. The "Information Bulletins" will continue to provide the basis for decision-making on such efforts.

The work of the Transportation Task Force to date is graphically displayed in Figure 1. The general process reflected in Figure 1 is common to all nine Consortium Task Forces. Each Task Force is proceeding on its own schedule in this process. The Transportation Task Force along with the other Task Forces will continue their work as described below.

FIGURE 1

## GENERALIZED NEEDS IDENTIFICATION PROCESS OF THE TRANSPORTATION TASK FORCE



## THE NEXT STEP

The Urban Consortium for Technology Initiatives has begun to identify what the nation's largest cities and counties perceive as their most urgent research and development needs and problems. The Consortium has developed and implemented both a process and a structure for systematically addressing these major problems.

As funding is secured, the various Task Forces are proceeding with the following "next steps":

- Once the priorities are established in each functional area, governmental and private sources are encouraged to invest in developing solutions to the problem.
- "User Design Committees", representing the range of potential users in local government, are established to guide the development of the technology to ensure that it will meet the specified need.
- Solutions to the problem/need which are developed, are to be made available to both the jurisdictions represented by the Consortium and other local governments which have similar problems.

The Urban Consortium is helping to reverse the passive role of local governments as respondents to technological developments. Local governments are involved in an active process whereby they help shape the technological solution to their own problems.

## Chapter II

### NEED STATEMENT ABSTRACTS

As described in Chapter I, the "Need Statement Abstracts" were used to provide the Transportation Task Force members with a brief definition and overall perspective of the needs which had been identified by member jurisdictions of the Urban Consortium. The "Need Statement Abstracts" used by the Transportation Task Force are summarized in this chapter and indexed below.

It should be noted that the numbering system in the list below relates to the overall needs selection process of the Urban Consortium and does not represent a priority listing. The numbers are repeated here for reference purposes.

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#### NEED STATEMENT ABSTRACTS

Each "Need Statement Abstract" has a title and identification number. A "problem statement" and "solution considerations" are given for each. The problem statement provides a specific definition for each need. The solution considerations reflect possible solutions as proposed by member jurisdictions.

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811 HIGHWAYS-FINANCE AND ADMINISTRATION

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No. 811-1  
VEHICLE LICENSE TRANSACTIONS

Problem Statement: Present practices for handling state license applications on the local level are cumbersome, requiring much manual processing with a considerable time lag before computer print-outs of license information are ready.

Solution Considerations:

1. A procedure should be developed to immediately record the transaction in a central data bank.
2. The system should be able to handle specially coded renewal cards and have typing capability for new and revised transactions.

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812 HIGHWAYS-DESIGN

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No. 812-1  
UTILITY CLEARANCE REQUIREMENTS

Problem Statement: The Federal Highway Administration requires a thirty foot width of clear area from the edge of pavement to utility poles or other structures or facilities. This results in acquisition of large amounts of land for rights-of-way, which is often very costly. In many cases, the land is simply unavailable.

Solution Considerations: A study of utility clearance requirements should be done and revised guidelines established.

---

No. 812-2  
LOCATION OF SIDEWALKS

Problem Statement: Revised guidelines for location and design of sidewalks are needed.

Solution Considerations: Guidelines should consider the type of street, location and type of parking, location of activity centers and travel speeds.

---

No. 813-1  
ASPHALT IMPROVEMENTS

Problem Statement: Because of rising oil prices, the cost of asphalt paving and patching has increased significantly. This has resulted in lower maintenance levels due to budget constraints. However, tons of asphalt are removed from road surfaces each year with no presently available techniques for recycling.

Solution Considerations:

1. A review of the state-of-the-art and state-of-the-practice with regard to asphalt paving, patching, removal and recycling is needed.
2. An anti-skid paving material is needed.
3. Air and noise pollution regulations regarding heater-planers and pneumatic drills should be investigated.

---

No. 813-2  
ASPHALT REMOVAL

Problem Statement: Air pollution requirements have eliminated the use of asphalt surface heaters for street repaving. There is a need, then, for an economical, efficient, clean method to remove the top asphalt layer preparatory to street resurfacing.

Solution Considerations:

1. The cost should not exceed present (1/23/75) cost of 8¢/square foot for removal and \$32,000 for equipment.
2. The efficiency should be comparable to present heater hoods which are 8'x12' and move 3 to 10 feet/minute.
3. The method should conform to air quality and Occupational Safety and Health Administration standards
4. A new paving material that could be chemically removed could be developed.

No. 813-3  
ASPHALT AND CONCRETE REPAIR

Problem Statement: Petroleum prices have skyrocketed, making petroleum-based repair materials quite expensive. Present concrete repair materials also take considerable time to prepare and set up.

Solution Considerations: Repair materials should:

- a) be competitive in cost
- b) have high load strength
- c) set up in less than 5 minutes
- d) be environmentally acceptable
- e) be easily stored
- f) be used with minimum preparation.

---

No. 813-4  
CONCRETE REMOVAL

Problem Statement: The present method of removing concrete for repaving requires a large, truck-mounted "stomper" to break up the existing concrete. This is cumbersome for use in small areas.

Solution Considerations: An efficient device to quietly disintegrate the pavement should:

- a) not exceed allowable decibel ratings and meet Occupational Safety and Health Administration standards
- b) be easily portable and operable by one individual
- c) be pneumatic or electrically powered
- d) not exceed present (1/23/75) cost of 35¢/sq/ft. including labor and equipment, for disintegration and haulaway.

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No. 813-5  
CONCRETE STRENGTH MEASUREMENT

Problem Statement: A testing procedure or device to determine concrete strength immediately after pouring is needed.

Solution Considerations:

1. The test must be fast enough so that results are obtained before pouring is complete.

2. The test should be usable in all types of weather.

No. 813-6  
ANTI-SKID PAVING MATERIAL

Problem Statement: Skidding vehicles are a serious safety problem. An anti-skid paving material is one solution.

Solution Considerations:

1. The material should be durable enough to withstand heavy traffic.
2. The material should be low-cost for large-scale deployment, but if expensive, could be used only at intersections.

---

No. 813-7  
SOIL STABILIZERS

Problem Statement: At present, one must rely on a fragmented system of publications and manufacturers' representations for information on soil stabilizing agents for low-cost, surfaced roads. Guidelines collecting currently published information and clearly indicating the kind of agent appropriate for particular soil types, with rough cost data, would be very helpful. Particular attention should be given to use of indigenous materials as a sub-base and to improved dirt road stabilization material.

Solution Considerations:

1. Thorough research should be done to evaluate present road specifications and stabilizer performance.
2. Evaluation of stabilizers should be done by use testing.

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No. 813-8  
SOIL COMPACTION TECHNIQUES

Problem Statement: Problems are caused by the settlement of back-fill materials used in the excavated or fill area next to bridge abutments and retaining and foundation walls. Settlement still occurs even with use of the best compaction techniques and recommended back-fill material presently available. A floating slab placed on this fill, therefore, also settles. The resulting differential in elevation between a supported slab and a slab placed on fill causes an undesirable, and in some instances, dangerous condition for both vehicles and pedestrians.

Solution Considerations: A new compaction technique should reduce settlement so that roadways maintain smooth riding surfaces for motor vehicles and that sidewalks maintain smooth surfaces for the ease and safety of pedestrians.

---

No. 813-9  
NON-CORRODING BRIDGE MATERIALS

Problem Statement: There is a fairly rapid deterioration of steel and concrete bridges due to moisture, salting and freeze-thaw cycles. The problem is significant nation-wide, with the cost of repair and replacement of bridges quite high.

Solution Considerations:

1. A national investigation into the severity of problem is required.
2. It should be possible to solve the problem without having to replace the deck or close the bridge to traffic for long periods.
3. An epoxy or sealer for concrete and protective paint for exposed steel may be a solution.

---

814 HIGHWAYS-MAINTENANCE

---

No. 814-1  
ALTERNATIVES TO PRESENT PAINTS

Problem Statement: Present traffic paints require a drying period, and thus the placement of traffic cones with concomitant traffic disruption. Paint on airport runways requires both mixing and thinning and absorbs contaminants. Both roadways and runways require frequent repainting.

Solution Considerations: Paint should:

- a) dry on contact (15 minutes or less)
- b) meet standard paint specifications and be available on the open market
- c) be able to be sprayed at temperatures from 40<sup>0</sup> to 110<sup>0</sup>F
- d) work on asphalt and concrete
- e) not need complicated mixing and thinning.

---

No. 814-2  
INCREASED LANE LINE REFLECTIVITY

Problem Statement: All roadway lane lines tend to blend in with the surface of wet pavement in the dark. This constitutes a safety hazard.

Solution Considerations: A durable pavement marking with increased reflectivity, particularly under dark, wet conditions, is needed.

---

No. 814-3  
TRAFFIC PAINT REMOVAL

Problem Statement: It is sometimes necessary to remove existing traffic striping painted on roadway surfaces. The present method of covering it with black paint is problematic because it often wears away or becomes flossy.

Solution Considerations:

1. A chemical that will dissolve paint but not asphalt.
  2. A cover paint that does not wear off easily.
- 

No. 814-4  
PLANT GROWTH RETARDANT

Problem Statement: Roadside and drainage ditch maintenance is complicated by the fact that maintenance crews have to devote a great deal of time to trimming back the surrounding foliage and grasses. However, since the plants help prevent erosion, it is undesirable to remove them completely.

Solution Considerations: A chemical that:

- a) is easily dispersed
  - b) has low toxicity to man, animal, and fish
  - c) retards and/or inhibits the growth of leaves and stalks of grasses and plants, but does not affect the root system
  - d) need not be identical for all types of plants
  - e) is cost effective.
- 

No. 814-5  
CURB, GUTTER AND SIDEWALK REPAIR

Problem Statement: At present, a sidewalk, curb or gutter can be repaired only by removing the entire area around the broken section and replacing it.

Solution Considerations:

1. Repair methods should be economically feasible.
  2. Repair materials should set up quickly to minimize traffic disruption.
-

No. 814-6  
STREET LIGHT MAINTENANCE

Problem Statement: At present, maintenance of street lights (lamp replacement and cleaning of luminaires) is done on a non-systematic basis, through either group replacement of lamps or individual servicing based on notification of the problem by the public.

Solution Considerations: Guidelines for an improved maintenance program should be:

- a) cost effective
  - b) easily implemented
  - c) politically acceptable
  - d) reduce street light outages.
- 

No. 814-7  
STREET FACILITIES INVENTORY

Problem Statement: It is very difficult to manually keep track of traffic control devices, signs, lights, curbs, street furniture and other street facilities. Data collection on both underground and above ground facilities is a problem. A geographically coded, computerized inventory of street facilities could be programmed to interface with a computerized maintenance system or budget forecasting system.

Solution Considerations:

1. Photo-logging techniques to reduce labor requirements for setting up the system could be used.
  2. The system should be compatible with existing EDP systems.
  3. Consideration should be given to making systems uniform for data comparability.
  4. System output should be easily readable.
  5. System update should be very easy.
-



No. 821-1  
VEHICLE DETECTION DEVICES

Problem Statement: Current methods for installing and maintaining traffic sensor loops require road cutting and refilling and do not provide sufficient protection for wires. Fault-finding mechanisms are cumbersome and expensive to operate.

Solution Considerations: The system should:

- a) provide mechanical electrical protection from damaging forces
- b) be economical to install
- c) be modularly designed to:
  1. accommodate various loop configurations
  2. ease location of faults
  3. ease partial repair
- d) maintain the inductive quality of the loop system.

---

No. 821-2  
TRAFFIC SIGNALIZATION SYSTEMS

Problem Statement: Pedestrian activity, major parking facility ingress and egress and local vehicular circulation coupled with through traffic on a grid network of closely-spaced streets (with a high density of signalized locations) can result in serious interruptions to pedestrian and vehicular flow. Progressive signal system logic for single arterials is available, but tentative results from the logic employed in moving traffic on a grid network leave much to be desired.

Solution Considerations:

1. A relatively detailed, comprehensive analysis of efforts to-date to obtain a better understanding of the nature and scope of the problem is needed.
2. Criteria for determining the effectiveness of a system and capital/operating costs to explore cost-effectiveness of various systems should be examined.
3. Management techniques used with existing programs should be investigated.
4. Systems operating in dense, heavily-travelled grids needs refinement.

No. 821-3  
TRAFFIC FLOW MONITORING DEVICES

Problem Statement: The precise cause for and location of traffic impediments is difficult to quickly determine so that emergency vehicles can be dispatched and traffic re-routed.

Solution Considerations: The system should:

- a) provide instant readouts of traffic conditions
- b) pinpoint the location and cause of impediments.

---

No. 821-4  
VARIABLE MESSAGE SIGNS

Problem Statement: Current signs are sometimes inconsistent, inappropriate and inflexible. Changing conditions require the ability to vary messages for traffic direction and control and enforcement purposes.

Solution Considerations: The system should be:

- a) electronically and/or manually controlled
- b) clearly visible (illuminated)
- c) dynamic and flexible.

---

No. 821-5  
STREET LIGHTING

Problem Statement: There is a need to determine the affect of street lighting on personal safety, both statistically and from the standpoint of community perception. Adequate levels should be suggested. Current street lights are also costly to operate, alternatives are needed.

Solution Considerations:

1. Improved street lights should be energy conserving.
2. Community perceptions of the effects of street lights on personal safety are important.

No. 821-6  
TEMPORARY BARRICADES

Problem Statement: Present, temporary channelization devices (concrete bumper blocks, 55 gallon drums and others) are unwieldy to transport and difficult to see.

Solution Considerations: Barricade devices should be:

- a) highly visible
- b) easy to transport
- c) vandal resistant
- d) pre-fabricated or in kit-form
- e) low cost
- f) resilient.

---

No. 821-7  
RESILIENT SIGN POSTS

Problem Statement: Current, rigid sign posts can cause injury and/or damage vehicle and occupants when struck. They are expensive in terms of materials and labor to replace and create hazardous situations until replacement.

Solution Considerations: New signs should be:

- a) resilient
- b) easy to install
- c) economical.

---

No. 821-8  
SPEED LIMIT SIGN IMPACT STUDIES

Problem Statement: The signs are costly to install and maintain. The effect on driver's behavior is currently unclear.

Solution Considerations: A determination of the cost-effectiveness of sign installation is needed. Criteria should be established.

No. 821-9  
TURN-LANE SPACING

Problem Statement: The lack of uniform standards for turn-lane spacing leads to confusing, unsafe traffic patterns.

Solution Consideration: Guidelines should reflect varying traffic conditions and uses.

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822 TRANSPORTATION SYSTEMS MANAGEMENT-INTERMODAL INTEGRATION

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No. 822-1  
COMPUTERIZED TRAFFIC VOLUME DATA

Problem Statement: Non-uniform data collection requires manual inspection and is often not available or useful on an inter-agency basis.

Solution Considerations: A data collection system should be:

- a) based on uniform data storage formats
- b) accessible to many agencies.

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No. 822-2  
COMPUTERIZED TRAFFIC ACCIDENT DATA

Problem Statement: Substantial manual effort is required to summarize accident statistics for consideration in planning roadway improvements.

Solution Consideration: The types and severity of accidents should be included in the output of any system.

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INSTITUTIONAL FRAMEWORK FOR INTEGRATED TRANSPORTATION PLANNING

Problem Statement: Lack of coordination in planning and implementing transportation programs leads to overlaps, delays, unnecessary expense and sometimes cross-cutting policies. Inconsistent criteria are often used in evaluation of transportation proposals.

Solution Considerations: The following tools should be considered:

1. A handbook or interpretation of potential areas for coordination.
  2. A hybrid planning tool which combines highway and transit models.
  3. A guide to parking policy analysis of siting, charging, zoning, access and other areas.
  4. A guide to coordination of bikeways and walkways with other modes.
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ACCELERATED IMPLEMENTATION PROCEDURES

Problem Statement: Varying government agency funding requirements cause duplication, delay and other problems.

Solution Considerations: There is a need to standardize application procedures, cut "red tape" and develop a partnership between cities and the federal agencies.

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TRANSIT PATRONAGE PREDICTORS

Problem Statement: A set of predictive techniques to do micro-level demand estimations, which could be used by persons without special mathematical background, is not presently available.

Solution Considerations:

1. The techniques should have an 80% confidence level.
  2. Data base requirements should be simple: socio-economic data as available from Census, transit travel time, distance from destination and others.
  3. Hardware requirements: should be able to use standard office calculators.
  4. The techniques should be suitable for calculation of demand for new transit routes (short-range, micro-level).
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No. 822-6  
TRANSPORTATION PLANNING AND IMPACT FORECASTING TCOLS

Problem Statement: Rapid, reliable, policy-sensitive models and techniques for predicting the relationship between transportation and community development are needed. Such techniques need not be computerized.

Solution Considerations:

1. Forecasting techniques are not now very policy-sensitive.
2. Relationships between transportation and land use are not clear.
3. The problem of latent demand is not well understood.
4. Data base requirements are often unmanageable.
5. Flexible, short and long-term modelling techniques are needed.

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No. 822-7  
TRAFFIC PERFORMANCE MEASUREMENT

Problem Statement: A methodology for the quantitative evaluation of traffic operations is needed.

Solution Considerations: The system should:

- a) not require permanent sensors
- b) identify vehicle number and travel times within specified networks.

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823 TRANSPORTATION SYSTEMS MANAGEMENT-PRIORITY TREATMENT FOR HIGH OCCUPANCY VEHICLES

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No. 823-1  
PREFERENTIAL & EXCLUSIVE LANES

Problem Statement: Local government often cannot afford the major capital investments necessary to provide better transit services. One effective interim step appears to be the provision of preferential and/or exclusive lanes for high occupancy vehicles. Local decision-makers need more information on existing experiments, as well as an assessment of potential applications.

Solution Considerations: Planning procedures and guidelines for different types of treatments, based on actual experiences, are needed. The emphasis should be on institutional arrangements, as well as on technical considerations.

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No. 823-2  
RAMP TREATMENTS

Problem Statement: In an effort to increase freeway capacities, some cities and states have experimented with controlling the flow of traffic entering freeways. This may be accomplished through special lanes for high occupancy vehicles or through ramp metering. Results of these experiments need to be catalogued for general distribution.

Solution Considerations: Documentation should include before and after data on traffic flow, lane capacities and occupancy, capacity and use of adjacent arterials and travel times. Diagrams should indicate special lane configurations.

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No. 823-3  
SIGNAL PRE-EMPTION

Problem Statement: To attract the commuter to mass transit, it is necessary to show some advantage to transit use to compensate for its lack of convenience vis-a-vis the auto (or to at least minimize disadvantages). Travel time savings could be achieved by the use of signal pre-emption equipment on buses. Such pre-emption devices could also be used by emergency vehicles to reduce accidents and to speed their trip.

Solution Considerations: A good solution would seem to be a device for communicating directly with individual signals which:

- a) would hold an existing green or change red to green
- b) would return the signal to normal timing after the pre-emptive vehicle has passed
- c) should be relatively durable and easy to maintain
- d) would be compatible with computerized signal systems.

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No. 823-4  
FRINGE PARKING AND EXPRESS BUSES

Problem Statement: Guidelines for designing fringe parking, express bus projects and other mode-mixer facilities are needed.

Solution Considerations:

1. Such facilities should result in decreased vehicle miles traveled (VMT) within the core area, without significantly increasing VMT outside the core, thus improving air quality and reducing energy consumption.
  2. Transit operations should:
    - a) coordinate with existing routes
    - b) optimize load factors within acceptable waiting times and number of required transfers.
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824 TRANSPORTATION SYSTEMS MANAGEMENT-AUTOMOBILE DISINCENTIVES

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No. 824-1  
AUTO USE RESTRICTIONS

Problem Statement: The new joint UMTA-FHWA planning regulations require consideration of transportation systems management improvements such as auto use restrictions in congested areas. Information on existing projects, new ideas and evaluation measures are needed.

Solution Considerations:

1. The relationship between land development and auto restrictions should be recognized.
2. The public information aspects of implementing any auto use restriction must be considered.

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825 TRANSPORTATION SYSTEMS MANAGEMENT-SPECIAL FACILITIES

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No. 825-1  
PARKING

Problem Statement: The development and placement of parking facilities does not always reflect transportation goals. Provision for parking facilities should relate to transit use and availability.

Solution Considerations: Development of parking facilities should be:

- a) integrated with transit and traffic management
- b) responsive to local conditions.

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No. 825-2  
BIKEWAYS AND WALKWAYS

Problem Statement: The design and location of commuter bikeways is very haphazard; little practical research seems to have been conducted. Better planning guidelines and improved methods of forecasting the true demand for such facilities are needed.

Solution Considerations: Planning guidelines should relate to planning, development, maintenance and promotion.

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No. 831-1  
COORDINATION OF CITY-SUBURBAN TRANSIT

Problem Statement: Transportation is a regional concern. To adequately serve the metropolitan areas, there must be close cooperation between city and suburban transit systems, integrating fares, routes and other services.

Solution Considerations: A state-of-the-art document illustrating the procedures that have been followed in leading-edge jurisdictions.

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No. 831-2  
PUBLIC INFORMATION SERVICES

Problem Statement: There is a need to display transit information such as schedules and route maps in public places.

Solution Considerations: Transit information displays should be:

- a) small enough to fit by a bus stop
  - b) easily understandable
  - c) attractive
  - d) easily maintained and updated.
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No. 831-3  
COLLECTION-DISTRIBUTION SYSTEMS

Problem Statement: There is a need to improve the collection-distribution process, particularly in high density areas. The present approach of having to rely on presentations by manufacturers of each technology is not a reliable indicator of relative merit.

Solution Considerations:

1. A catalogue of state-of-the-art in people mover technologies is needed.
  2. Some basis for comparison among technologies should be provided.
  3. Coordination with line-haul transit and regional land use and transportation plans should be addressed.
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No. 832-1  
FLEET AND DRIVER SCHEDULING

Problem Statement: Scheduling drivers and buses of a large fleet by manual techniques is extremely time-consuming and has a high potential for error. Due to complex labor agreements, the vast number of schedule constraints and other items, a less than optimal (least cost) solution results.

Solution Considerations:

1. Flexibility in entering new routes, schedules, fleet and driver requirements is needed.
2. Rapid responses to questions regarding schedules and driver or equipment changes are needed.
3. Any system must be compatible with union requirements.

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No. 832-2  
TRANSIT SYSTEM PRODUCTIVITY

Problem Statement: A very high percentage of the cost of running a transit system consists of salaries. Techniques to increase labor productivity are crucial in the face of rising transit deficits.

Solution Considerations:

1. Investigate use of on-board and off-board automated fare collections such as:
  - a) European fare collection devices (Gerald Fox-deLeuw Cather)
  - b) articulated buses
  - c) pre-paid passes (Boston, Pittsburgh, San Francisco Muni-Cauthen)
2. The following measures to reduce non-revenue miles should be researched:
  - a) better run-cutting and scheduling to reduce non-productive driver time-RUCUS-Hallman
  - b) a system for locating satellite facilities to reduce dead-heading
  - c) use of new standard reporting procedures from UMTA to get measures of efficiency
  - d) the extent of split shifts, "extra board" surplus and others.
3. Information on increased maintenance efficiency is needed.
  - a) what is maintenance efficiency
  - b) maintenance systems-SIMS

No. 832-3  
REVENUE PROCESSING AND ACCOUNTING

Problem Statement: Local government administrators are under increasing pressure to improve transit system productivity. They face a major impediment: there is no uniform system of accounts for collecting and processing operating data. Without uniform accounting techniques, it is impossible to establish national comparisons of operating productivity or to evaluate service levels vis-a-vis operating costs and revenues.

Solution Considerations: An uniform transit accounting system, which will provide a data base for national comparisons, yet will be sufficient flexible to permit local variations in operating procedures is needed. It should be assured that the UMTA effort to develop standardized accounting procedures (Financial and Reporting Elements-FARE) is responsive to local government concerns.

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No. 832-4  
PERSONNEL ISSUES

Problem Statement: Labor costs account for up to 80-85% of transit operating costs. Personnel policies and labor negotiations are, therefore, of utmost importance to mass transit operators. Local governmental labor relations are subject to federal standards, such as Section 13(c) of the Urban Mass Transportation Act of 1964. The impact of these standards is not clearly understood.

Solution Considerations: Federal labor standards which affect local governmental transit operations should be clearly identified. Various interpretations of these standards should be documented. An assessment of their impacts is needed.

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No. 832-5  
EQUIPMENT MANAGEMENT

Problem Statement: Transit operations generally include a fleet of maintenance and inspection vehicles as well as bus or rail equipment. Maintenance and deployment of these vehicles is a major operating element. Transit managers need a system which would assure that these activities are efficiently operated.

Solution Considerations: There is a need for a computer based system for recording maintenance and vehicle deployment needs.

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No. 832-6  
PORTABLE, COMPUTER-LINKED ROUTE INDICATOR

Problem Statement: Most attempts at establishing demand-responsive transit systems have experienced very low vehicle productivity with concomitant high per-mile cost. One reason for this low productivity was reliance upon manual routing from a central dispatching point.

Solution Considerations: A computer-linked route indicator which would take the pick up and destination points given by callers to the central dispatch point as inputs. The indicator could then make real-time route changes in response to new service requests.

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No. 832-7  
NEW STANDARD BUS EQUIPMENT

Problem Statement: There are a variety of problems with present transit vehicles, including lack of equipment for the elderly and handicapped, noise, air pollution, energy consumption and a lack of a range of bus sizes. Standardization of vehicle specifications would allow for market aggregation which could make it feasible to approach the private sector on development of new vehicles or modification of the old.

Solution Considerations: A survey process should be devised to:

- a) attempt to identify problems with present vehicles
- b) pre-test the questionnaire on Task Force members
- c) send the questionnaire to Consortium jurisdictions.

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833 MASS TRANSIT-MONITORING AND EVALUATION

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No. 833-1  
ESTABLISHING A MANAGEMENT INFORMATION SYSTEM FOR TRANSIT OPERATIONS

Problem Statement: For years, transit accounting systems were tailored to private operators. As such, micro-level operating data was minimal. Public operations require more elaborated, yet easily understandable record-keeping systems.

Solution Considerations: Guidelines and standards for such a system should be uniform, but sufficiently flexible to allow for local operating variations. The system should operate data on a route-by-route and neighborhood basis, and for various categories of passengers.

No. 834-1

TRANSPORTATION FOR ELDERLY & HANDICAPPED PERSONS

Problem Statement: There is an increasing recognition of the need to improve transportation services to the elderly and handicapped. However, in many cases there is a large gap between goals and implementation.

Solution Considerations:

1. An information exchange to address the following questions among Consortium jurisdictions is needed:
  - a) What definitions of elderly and handicapped are now being used and who certifies them?
  - b) What kind of identification do they carry?
  - c) How do you reach them to describe the transportation services available?
  - d) How do you predict demand for special transportation services?
    - 1) Where do the elderly and handicapped live?
    - 2) Where do they want to go?
    - 3) How many are non-ambulatory?
2. Fragmentation of social services transportation programs is a serious barrier. Have any jurisdictions overcome it?
3. Federal regulations may pose some problems. There is a need to disseminate regulations with brief explanations of their implications.
4. A number of very quick, short-range, federally-sponsored demonstrations on serving the elderly and handicapped are needed.

No. 835-1

PARA-TRANSIT INTEGRATION WITH CONVENTIONAL TRANSIT SERVICES

Problem Statement: How can urban transportation best integrate conventional transit with para-transit options to offer the highest level of mobility to citizens?

Solution Considerations:

1. There is a need to devise planning criteria to effectively integrate both systems.
2. What kinds of licensing controls and regulatory structures are needed?
3. What kind of information systems are required?

No. 836-1  
BOOK VENDING MACHINES ON BUSES

Problem Statement: The attractiveness of riding transit must be improved to make mass transit a viable option to the car for most commuters. One method is by increasing the level of passenger amenities, including the installation of book or newspaper vending machines in transit vehicles or around transit stops. Such actions could be done in conjunction with library outreach programs.

Solution Considerations: Such vending machines:

- a) may or may not be coin operated
- b) should be sturdy and easily maintained
- c) should be compact enough to avoid displacing passengers.

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No. 836-2  
MASS TRANSIT SYSTEM FOR EVACUATION

Problem Statement: In the event of civil emergency, mass transit systems should be able to be used for evacuation.

Solution Considerations: Contingency plans should be drawn up for use of the mass transit system in various types of disasters.

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841 AVIATION-GROUND TRANSPORTATION

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No. 841-1  
ACCESS

Problem Statement: Automobile access to airports is becoming more difficult. Better public transit access is needed.

Solution Considerations: Transit access to airports should:

- a) be convenient to users (pick up points close to activity centers)
- b) strictly adhere to scheduled trip times
- c) provide convenient handling of baggage and passengers
- d) have user charges that are compatible with other ground transportation modes
- e) be capable of providing service during periods of peak demand with reduced capability during off-peaks
- f) be self-supporting.

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No. 841-2  
INTRA-TERMINAL

Problem Statement: Transportation between terminals, garages and parking areas is very difficult due to congestion.

Solution Considerations:

1. A people mover study could help to determine optimal technologies for a relatively low-capacity, medium-speed system.
2. The movement system should be safe, efficient and low-cost.

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842 AVIATION-AIR TRAFFIC CONTROL

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No. 842-1  
AIRCRAFT MONITORING

Problem Statement: Identification of arriving and departing aircraft on a continuing basis is needed to maintain an accurate inventory of aircraft operations, to identify aircraft for purposes of appropriate fee collection, for airworthiness inspection and for other purposes. Present systems of visual observation are not always accurate and are extremely cumbersome and labor intensive.

Solution Considerations: Electronic identification and inventory of aircraft is needed.

No. 842-2  
ELECTRONIC SIGNS FOR TAXIING AIRCRAFT

Problem Statement: During periods of darkness, low visibility and congestion, a system to provide positive directional control is desired for the orderly taxiing of aircraft. The system should also incorporate the capability to transmit individual signals at specific control points, points of caution and points where aircraft should be stopped (i.e., runway clear lines) pending receipt of further instruction to proceed.

Solution Considerations: Electric tones or light signals could be transmitted on a frequency capable of being picked-up on aircraft equipment. Transmitting wires could be buried in the pavement.

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843 AVIATION-GOODS MOVEMENT

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No. 843-1  
BAGGAGE HANDLING SYSTEM

Problem Statement: Handling individual baggage units several times during the passenger's trip has proven to be very costly and time consuming. Container unit systems have limited applicability due to multi-destination points of baggage.

Solution Considerations:

1. Mechanical systems of handling baggage by bulk units to and from aircraft rather than individual baggage units could be used.
  2. The system should not unduly penalize aircraft weight payload performance.
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