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An Annotated Bibliography of Commuter/Regional Rail

February 1981

Prepared by
Division of Transportation Planning
California Department of Transportation

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Department of Transportation

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Introduction

This bibliography was compiled as a training tool as well as an information source for the California Department of Transportation (Caltrans). Caltrans, like many other state DOTs, as well as other governmental agencies, has recently become more involved in rail passenger services. This work is not intended to cover LRT or HRT systems, although several categories (i.e., Passenger Operations/Stations and Terminals) contain many citations which are common to all rail passenger services.

This is the product of the work of a number of people as well as the Caltrans staff. Important input was obtained from the staff of the Transportation Research Board as well as several members of the Board's committees on Rail Transit Systems and State Role in Rail Transport. Valuable comments and suggestions were received from a variety of operating agencies, government sources, universities, and consultants. The editing was done on a volunteer basis by Benita H. Gray.

The Caltrans Transportation Library under the able direction of Phyllis Newton did an excellent job in locating referenced materials. The Word Processing section under Marj Wiley had the thankless task of getting all the information in the correct format. They did very well.

Caltrans would welcome any comments or suggestions from the users. Our prime hope is that this proves to be a useful, if not valuable, tool in efforts to upgrade and expand rail passenger services.

George E. Gray
Chief, Research and Development
Division of Transportation Planning
California Department of Transportation

Acknowledgements

The abstracts in this bibliography have been obtained from various sources. An acknowledgement below the abstract indicates the copyright holder of the abstract. An alphabetical list of these copyright holders follows. All other abstracts were obtained from either the Railroad Research Information Service (RRIS) or the Highway Research Information Service (HRIS) or were written by the editor and are not under copyright.

American Railway Engineering Association
200 L Street, N.W.
Washington, DC 20036

ASCE
American Society of Civil Engineers
345 East 47th Street
New York, NY 10017

ASME
American Society of Mechanical Engineers
345 East 47th Street
New York, NY 10017

Canadian National Railways
Canadian National
Dechief Library
P. O. Box 8100
Montreal, Quebec H3C 3N4, Canada

Carnegie - Mellon University
Rail Systems Center
Carnegie - Mellon University
Pittsburgh, PA 15213

EI
Engineering Index, Inc.
345 East 47th Street
New York, NY 10017

FRA
Federal Railroad Administration
400 7th Street, S.W.
Washington, DC 20590

General Accounting Office
441 G Street, N.W.
Washington, DC 20548

High Speed Ground Transportation Journal
Journal of Advanced Transportation
1410 Duke University Road
Durham, NC 27701

IEEE
The Institute of Electrical and Electronics Engineers, Inc.
345 East 47th Street
New York, NY 10017

Illinois Department of Transportation
2300 S. Dirksen Parkway
Springfield, IL 62705

International Union of Railways
Union Internationale des Chemins de Fer
14, rue Jean Rey
75015 - Paris, France

Japanese Railway Engineering
Japanese Railway Engineers Association
Nihon Tetsudo Gijutsu Kyokai
2-5-18 Ote-machi, Chiyoda-ku
Tokyo 100, Japan

Journal of Transport Economics and Policy
London School of Economics and Political Science
Houghton Street
London, WC2A 2AE, England

National Transportation Safety Board
800 Independence Avenue, S.W.
Washington, DC 20594

NTIS
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161

Progressive Railroading
Murphy - Richter Publishing Company
20 North Wacker Drive
Chicago, IL 60606

Rail Engineering International
Broadfield (Technical Publishers) Limited
Little Leighs
Chelmsford, Essex CM3 1PF, England

Railway Age
Simmons - Boardman Publishing Corporation
350 Broadway
New York, NY 10013

Railway Technical Research Institute
Japanese National Railways
Kunitachi, P. O. Box No. 9
Tokyo, Japan

Southern California Association of Governments
600 S. Commonwealth Avenue
Los Angeles, CA 90005

SRI International
333 Ravenswood Avenue
Menlo Park, CA 94025

Texas A&M University
Texas Transportation Institute
College Station, TX 77843

The MIT Press
28 Carleton Street
Cambridge, MA 02142

Transportation (Netherlands)
Elsevier Scientific Publishing Company
Jan van Galenstraat 335
P. O. Box 330
1000 A H Amsterdam, The Netherlands

TRB
Transportation Research Board
2101 Constitution Avenue, N.W.
Washington, DC 20418

TRRL
Transport and Road Research Laboratory
Department of the Environment
Department of Transport
Old Wokingham Road
Crowthorne, Berkshire RG11 6AU, England

UMTA
Urban Mass Transportation Administration
400 7th Street, S.W.
Washington, DC 20590

GENERAL REFERENCES

American Railway Engineering Association, Manual for Railway Engineering (Fixed Properties). Chicago: American Railway Engineering Association, 1979. v.p., Tabs., Figs.

The AREA Manual for Railway Engineering contains principles, data, specifications, plans and economics pertaining to the engineering, design and construction of the fixed plant of railways (except signals and communications), and allied services and facilities. This material is developed by AREA technical committees, is published in the AREA Bulletin for comments and then is approved for publication in the Manual by the Association's Board of Direction.

Designated as Recommended Practice, the contents of the Manual are published as a guide to railways in establishing their individual policies and practices relative to the subjects, activities and facilities covered in the Manual, with the aim of assisting them to engineer and construct a railway plant which will have inherent qualities of safe and economical operation as well as low maintenance cost.

The AREA Manual is not a maintenance manual per se since the development of standards or criteria for the maintenance of railway roadway, track and structures has always been considered to be the prerogative of the individual railways based on the nature and characteristics of their plant and operations and the specific characteristics of the geographical region or regions through which they operate.

The above statements also apply to the AREA Portfolio of Trackwork Plans, which is a companion volume to the AREA Manual. The plans in the Portfolio relate to the design, details, materials and workmanship for frogs, switches, crossings and other special trackwork and are prepared and maintained by Committee 5--Track, in addition to its Manual Chapter.

Acknowledgement:
American Railway Engineering Association

GENERAL REFERENCES

Armstrong, John H., The Railroad--What It Is, What It Does: The Introduction to Railroading. Omaha, Neb: Simmons-Boardman Publishing Corp., 1978. 250 pp., Figs., Photos., Refs.

The objective of this book is to serve as a reference text for any railroad training program or university transportation course. Chapter subjects include railroad technology, the route system, the track, the locomotive, the railroad car, the train, signals and communication, railroad operation, car types and carloadings, car ownership and distribution, terminal operations, classification and blocking, line-haul operations, unit-train operations, intermodal traffic, special services and operations, LCL/forwarder/consolidator, passenger traffic, railroad organization, administration, law, accounting, operations, transportation, engineering, and equipment.

Cockle, George R., ed., Car and Locomotive Cyclopedia of American Practices, 3rd ed., compiled and edited for the Association of American Railroads, Mechanical Division. New York: Simmons-Boardman Publishing Corporation, 1974. v.p., Figs., Photos., Glossary.

This book contains definitions and illustrations of railroad cars and locomotives and their components built for domestic and export service. It includes shop practices and electrical fundamentals. A dictionary of car and locomotive terms is also included.

Fruin, John J., Pedestrian Planning and Design. New York: Metropolitan Association of Urban Designers and Environmental Planners, Inc., 1971. 216 pp., Tabs., Figs., Photos., Refs.

This book established the importance of walking in urban design, and the problems of pedestrians. The human physiological and psychological factors that affect the planning and design of pedestrian spaces are discussed. Traffic and space characteristics of pedestrians are developed sufficiently for an understanding of pedestrian traffic relationships. Written and pictorial descriptions of pedestrian traffic interactions provide a useful aid for evaluating the environmental design quality of pedestrian building

and street spaces. The objectives of pedestrian planning programs, study procedures, and methods of plan implementation are discussed and illustrated.

Gray, George E., and Lester A. Hoel, eds., Public Transportation: Planning, Operations, and Management. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1979. 767 pp., Tabs., Figs., Photos., Refs.

This book is presented in five parts which include a total of 35 chapters. The first part covers the historical development of public transportation in the U.S. The chapters (the development of public transportation in the city; the decline of transit; the decision-making environment) are in chronological order and tie the actual events to causes and effects. The second part (systems and technologies) exposes readers to the attributes of the various modes used presently to provide public transportation service and shows how the modes interrelate. Part III (comparing transit modes) concentrates on the factors to be considered in alternatives analysis studies of transportation systems. Part IV (planning public transportation systems) covers the vital planning area, including the historical development of planning, significant current issues regarding the planning process, the newest planning tool--the TSM, planning for small systems as found in rural areas, and how system planning for public transportation differs from transportation planning per se. The fifth part deals with the management and operation of public transit systems. Part VI (policy considerations) goes into the specifics of various factors that influence public transit services and provides a good perspective of the factors to consider when establishing goals. Part VII looks at the future from several viewpoints including the improvement of existing facilities as well as new technology.

HRIS 12 308645

Harper, Donald V., Transportation in America: Users, Carriers, Government. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1978. 620 pp., Tabs., Figs., Refs.

GENERAL REFERENCES

The purpose of this book is to acquaint the reader with the domestic freight and passenger transportation system of the United States with an emphasis on domestic intercity freight and passenger service. The roles of the users (shippers, receivers, and passengers), providers (carriers), and government (Federal, state, and local) are discussed, as is the decision making by each of the three groups. Other subjects discussed include the makeup of the system; economic and service characteristics; and trends and problems in traffic, revenue, and other areas.

Hay, William W., Railroad Engineering, Vol. 1. New York: John Wiley & Sons, Inc., 1953. 493 pp., Tabs., Figs., Photos., Refs.

This book remains the basic text for railroad engineering. It covers those fundamentals which the railway civil engineer requires for location, construction, and maintenance of a railroad. A major part of the book is concerned with maintenance.

Hazard, John L., Transportation: Management-Economics-Policy. Cambridge, Md.: Cornell Maritime Press, Inc., 1977. 607 pp., Tabs., Figs., Photos., Refs.

This book covers all of the principal passenger and freight modes. It includes transportation in national development; systems supplying transportation services; functional analysis of the modes; essential characteristics, problems, and the future of the American railroad system; pipeline problems; essential characteristics, variables, problems, and the future of air transportation; waterborne transport systems; essential characteristics, problems, and the future of highway transportation; urban and intermodal transportation issues and problems; and government policy and plans.

Hlasnick, Marie T., ed., (Proceedings of the Carnegie-Mellon Conference on) Improved Passenger Train Service, held by the Transportation Research Institute in Pittsburgh, Pa., December 2-4, 1975. Pittsburgh, Pa.: Carnegie-Mellon University, 1976. 358 pp., Tabs., Figs., Photos.

GENERAL REFERENCES

These proceedings comprise a report of a conference on Improved Passenger Train Service sponsored by FRA and Carnegie-Mellon University. The objective was appraisal of current rail passenger service with a view towards improved service in the future. Part A contains papers presented at each of the five sessions--Overview; Technological and Economic Problems; Research Areas of High Potential; Proposed Passenger Train Concepts and National Passenger System Development; and Implementation and Acceptance. All sessions were built out of four basic transport aspects: Planning, Technology, Operation and Financing; Part B contains addresses by guest speakers.

Acknowledgement: RRIS 23 131224
Carnegie-Mellon University

Proceedings of the Conference on Rail-Passenger Renaissance for California, held by the Institute of Transportation Studies in San Diego, Calif., on May 21-22, 1976. Berkeley, Calif.: University of California, March 1977. 467 pp., Tabs., Figs., Refs.

The proceedings include papers on the Canadian rail experience; a marketing outlook on California rail passenger service; the Amtrak experience; passenger rail cars; the design, use, and exploitation of railroad stations and terminals; stations and terminals--operational considerations; and a legislative view of rail passenger transportation.

UCB-ITS-P-77-1

Pushkarev, Boris S., and Jeffrey M. Zupan, Urban Space for Pedestrians: A Report of the Regional Plan Association. Cambridge, Mass.: The MIT Press, 1975. 224 pp., Tabs., Figs., Photos., Refs.

The book opens with a chapter on the various forms of urban space and then defines the issue of pedestrian space in particular, relating walkway space to buildings. The second chapter presents two analytical models, a "Conventional Travel Demand Analysis,"

and a "Direct Estimation of Pedestrian Density," as well as a discussion of the costs of walking and the prices paid to avoid walking. This is followed by an examination of pedestrian space requirements in terms of standing and walking room, service levels, the platoon effect, and such configurations as stairways, escalators, moving walks, and signalized intersections. A final chapter presents design implications and includes recommendations on sidewalk width, auto-free zones, grade separation, underground spaces, and amenities.

Acknowledgement:
The MIT Press

Raymond, William G., Henry E. Riggs, and Walter C. Sadler, Elements of Railroad Engineering, 6th ed. New York: John Wiley & Sons, Inc., 1947. 452 pp., Tabs., Figs., Photos., Refs., App.

This basic textbook is divided into four parts: the railroad industry, the permanent way, the locomotive and its work, and the railroad location, construction, and betterment surveys. Included in the discussion of the railroad industry are the growth of the American railroad system and the development of regulations. Competing transportation agencies and interior waterway transportation are also discussed. Other chapters include the character of high-speed streamlined railway service, present-day (1947) transportation problems, organization and administration of the railroads, and railroad valuation. The section on permanent way includes chapters on all subsystems, yards, and signals and signaling. Chapters on streamlined motive power, the diesel-electric locomotive, the steam locomotive, the work of the locomotive, the locomotive and grade problems, railroad expenditures, effect of the number of trains on operating expenses, and the effect of alignment on train-mile cost comprise the section on the locomotive. The final section deals with surveys.

Sassone, Peter G., and William A. Schaffer, Cost-Benefit Analysis: A Handbook. New York: Academic Press, Inc., 1978. 200 pp., Tabs., Figs., Refs.

GENERAL REFERENCES

This book is addressed to practicing cost-benefit analysts; to government officials who commission, oversee, and use cost-benefit studies; to citizens who wish to understand the workings of an analysis; and to students in such courses as environmental economics, engineering economics, public sector decision making, and cost-benefit analysis. Included are a brief history and the economic basis of cost-benefit analysis. Other areas addressed are the structure of decision problems and the choice of criteria, the identification and quantification of costs and benefits, shadow pricing, the discount rate, social and environmental impact analysis, and sensitivity analysis. The final chapter is a step-by-step design for performing a cost-benefit analysis.

GLOSSARIES

American Railway Engineering Association, Manual for Railway Engineering (Fixed Properties), Vol. I, pp. 1-38 -- see General References.

Archdeacon, H. C., ed., The Track Cyclopedia, pp. i-xxx -- see Track and Structures.

Christensen, David (L.), Photo Survey of Development and Activities in the Vicinity of BART Stations: Technical Report, pp. 27, 28 -- see Passenger Operations/Stations and Terminals.

Cockle, George R., ed., Car and Locomotive Cyclopedia of American Practices, pp. S1-1 to S1-26 -- see General References.

Congressional Budget Office, Urban Transportation and Energy: The Potential Savings of Different Modes, p. XIV -- see Energy.

_____, Urban Transportation and Energy: The Potential Savings of Different Modes, Hearing..., p. 14 -- see Energy.

Dunton, W. H., and P. R. Norton, Guideline Specification for Urban Rail Cars, pp. 20-1 to 20-9 -- see Rail Vehicles and Components: Cars and Equipment.

Isaac, Lawrence, New York City Transit Authority (Design) Guidelines, Station Planning, pp. SP-1-1 to SP-1-4 -- see Passenger Operations/Stations and Terminals.

National Transportation Policy Study Commission, National Transportation Policies Through the Year 2000, pp. 497-503 -- see Government Policy, Planning, and Regulation.

The Railroad Dictionary of Car and Locomotive Terms. Omaha, Neb.: Simmons-Boardman Publishing Corporation, 1980. 170 pp.

Guide to those words most commonly used in the railroad industry for car and locomotive purposes.

GLOSSARIES

Robinette, Gary O., Access to the Environment, Volume 3: (Appendices), pp. 643-45 -- see Human Factors.

Southern California Association of Governments, Transit Safety and Security: A Design Framework, pp. 160-61 -- see Safety.

Transportation Research Board, Glossary of Urban Public Transportation Terms, Special Report 179. Washington, D.C.: Transportation Research Board, 1978. 41 pp.

> This glossary attempts to serve as a basic reference for persons interested in urban transit planning. It is designed to assist transit system operators to understand the analytical language of urban planners and the latter to understand the operational language of transit system operators. The glossary organizes and to some extent standardizes terms related to urban public transportation. The definitions are organized alphabetically by term. Acronyms and abbreviations are presented at the beginning of each alphabetical section.
>
> HRIS 11 185409

Virkler, Mark R., Michael J. Demetsky, and Lester A. Hoel, Transit Station Design: Case Studies of a Planning and Design Method, pp. 189-91 -- see Passenger Operations/Stations and Terminals.

Webber, Margo B., and Paul J. McGinley, Recycling Historic Railroad Stations: A Citizen's Manual, p. 125 -- see Industry Structure and Company Management.

Williams, John, and George Pipas, Northeast Corridor High Speed Rail Passenger Service Improvement Project. Task 4A. Signaling and Communications, pp. V, VI -- see Signals, Control, and Communication.

Wyckoff, D. Daryl, Railroad Management, pp. 177-81 -- see Industry Structure and Company Management.

PERIODICALS

To keep abreast of current activities in commuter railroads, we suggest the following periodicals.

Modern Railways. Skybooks International Inc., 48 East 50th Street, New York, N.Y. 10022. Annual subscription, $18.50.

MR Modern Railroads Rail Transit. Modern Railroads, 270 St. Paul Street, Denver, Colo. 80206. Annual subscription, $30.00.

Progressive Railroading. 20 N. Wacker Drive, Chicago, Ill. 60606. Annual subscription, $20.00.

Railway Age. Subscription Department, Railway Age, P. O. Box 530, Bristol, Conn. 06010. Annual subscription, $10.00.

Railway Gazette International. Railway Gazette Subscriptions, Oakfield House, Perrymount Road, Haywards Heath Sussex RH16 3BR, Great Britain. Annual subscription, $31.20.

18 ECONOMICS

(See also Energy and Passenger Operations/Cost)

Arnlund, R. C., and others, Northeast Corridor High-Speed Rail Passenger Service Improvement Program. Task 18-Support Services: Engineering, Economics and Cost Estimating, Final Report, prepared by Bechtel Incorporated and Urban Pathfinders, Inc., for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, July 1976. 456 pp., Tabs., Figs., Refs., 14 App.

The report is a summary of analyses and refinements, where applicable, of the available track alignment data in the Northeast Corridor, track realignment, unit costs, minor realignment costs, lateral track shifts, vehicle costs, and train performance calculations for the purpose of further defining curve realignments and vehicle characteristics. The report deals with these topics based on both the 150 mph system, defined in previous NEC reports, and the 120 mph system.

Acknowledgement:
NTIS
PB 261542

RRIS 18 147392
FRA/ONECD-76/18
DOT-FR-66005

European Conference of Ministers of Transport, Scope for Railway Transport in Urban Areas, Report of the Forty-Seventh Round Table on Transport Economics held in Hamburg, June 25-26, 1979. Paris: European Conference of Ministers of Transport, 1980.

Fourteen European urban districts are examined in case studies. These studies include typological description of the district; volume of traffic, modal split, and importance of rail transport in local public transport; form and organization of transport undertakings; financing of investment and maintenance of infrastructure vehicles; economic situation of transport undertakings; and macro-economic aspects. A synthesis points out the similarities and differences of the districts. A case is made for coordinated and integrated transport systems making full use of existing rail transport and extending it where appropriate.

Gladstone Associates, Innovative Financing Techniques: A Catalog and Annotated Bibliography, prepared for the Urban Mass Transportation Administration and the Office of the Secretary, U.S. Department of Transportation. Washington, D.C.: U.S. Government Printing Office, January 1978. v.p., Tabs., Figs., Refs., Glossary, 1 App.

This report reviews innovative financing techniques, including joint development and value capture. It evaluates the financing potential of these techniques, their institutional feasibility, and apparent promise for widespread application in the transit field. The catalog concentrates on increasing revenues from new sources (e.g., special benefit assessments, lease or sale of air rights acquired in the course of transit construction). Since innovative techniques tend to involve private investment on land around transit facilities, this report focuses on fixed guideway systems.

Hensher, David A., Urban Transport Economics. Cambridge: Cambridge University Press, 1977. 285 pp., Tabs., Figs., Refs.

The essays in this collection have all been specially written to provide a systematic and thorough examination of current thinking in the key areas of urban transport economics, which include pricing and investment theory and their applications, demand and supply of passenger and freight transport, interactions between land use and transport, and the relationship between economic theory, sociology, and institutions. The emphasis of the book is on the application of theory in the real world and the examples are taken from many different countries.

HRIS 84 163110

Institute of Public Administration, Financing Transit: Alternatives for Local Government, Executive Summary, prepared for the Urban Mass Transportation Administration and the Office of the Secretary, U.S. Department of Transportation. Washington, D.C.: U.S. Government Printing Office, 1980 (report dated July 1979). 81 pp., Tabs., Figs., Refs. See abstract of full report.

_____, Financing Transit: Alternatives for Local Government, Final Report, prepared for the Urban Mass Transportation Administration and the Office of the Secretary, U.S. Department of Transportation. Washington, D.C.: U.S. Government Printing Office, 1980 (report dated July 1979). 355 pp., Tabs., Figs., Refs., Glossary, 5 App.

The theme of this book is how to think about transit financing. The most crucial question, at least for the largest cities, is whether to invest in new rail transit systems, which not only cost unpredictably large amounts but also disrupt communities physically and politically while under construction. A second major consideration, which confronts all cities, is whether transit should be regarded as a consumer good like other utility services--to be paid for primarily by charges--or a public good--to be paid for by taxes. It is concluded that the financial pressures on transit agencies and services can be expected to continue and increase, regardless of the looming energy crisis. The principal resource still available to transit is greater financial and operating efficiency, which entails an increase in the quantity and quality of services rendered with a less than proportionate increase in real costs. Achieving efficiency is quite uncommon largely because transit regulation historically has concentrated on preserving existing schedules and fare structures, and on the overall financial condition of transit properties, rather than on developmental objectives and service improvements. Modern transit management, on the other hand, must continually scrutinize patronage and costs of each segment of transit service with the requirement that each segment justify itself by a favorable ratio of benefits and costs.

Acknowledgment:
NTIS
PB 80 129331

HRIS 14 308843
DOT-I-79-16

Interstate Commerce Commission, "Standards of Determining Commuter Rail Service Continuation Subsidies" -- see Government Policy, Planning, and Regulation.

_____, "Standards for Determining Commuter Rail Service Continuation Subsidies and Emergency Operating Payments" -- see Government Policy, Planning, and Regulation.

Jacobsen, Thomas R., "Limitations of Regression Analysis in Railroad Cost Analysis, A Case Study," Proceedings: Twentieth Annual Meeting of The Transportation Research Forum, "Transportation Alternatives in a Changing Environment," 20, no. 1 (1979), 198-204. Oxford, Ind.: The Richard B. Cross Company. Tabs., Refs.

This paper raises some questions about the difficulty in utilizing regression analysis for cost finding in certain situations and shows how those obstacles were overcome in one case through use of a functional approach to case measurement. The study was made for the Southeastern Pennsylvania Transportation Authority (SEPTA) on maintenance costs charged to ICC Account 249, Signals and Interlockers, attributable to SEPTA commuter trains operating over Conrail and Amtrak. It was found that there are useful alternatives to statistical approaches; the method described does have its own shortcomings but did prove useful.

RRIS 18 302348

Locklin, D. Phillip, Economics of Transportation, 7th ed. Homewood, Ill.: Richard D. Irwin, Inc., 1972. 925 pp., Tabs., Figs., Refs.

This seventh edition attempts to bring factual material up to date, especially recent legislation and regulatory and court decisions. Although, in general, the organization of the earlier editions has been followed, there are some changes, and, of course, additions and deletions of material throughout the book. A final chapter is added dealing with recent trends in transport policy and the future possibilities. The fact that water transportation is treated in two chapters, highway transport in four, air transport in three, and pipelines in one, while many chapters have been devoted to railroad transportation and its regulation, should not lead to the inference that railroad transportation is over-emphasized and that the other modes of

transport are slighted. When the student has acquired an understanding of railway rate theory and of railway rate structures and rate-making practices, has studied the evolution of the regulatory system as it was first developed for railroads, and has studied some of the major problems of railroad regulation and the policies worked out by regulatory agencies, the other modes of transport can be treated more briefly and with a minimum amount of repetition. Attention can be called briefly to similarities between these modes of transport and the railroads; significant differences can be stressed; and emphasis can be put on the problems peculiar to the mode of transport under consideration. In like manner, differences in regulatory statutes and regulatory policy can be brought out, and particular attention can be given to the regulatory problems peculiar to each mode of transport. This is the plan that has been followed in the present volume.

Northwestern Indiana Regional Planning Commission, Economic Adjustment Study: Chicago South Shore and South Bend Railroad Corridor: Appendices, prepared for the Economic Development Administration and the Northern Indiana Commuter Transportation District. Highland, Ind.: Northwestern Indiana Regional Planning Commission, March 1980. 278 pp., Tabs., Figs., 6 App.

The document presents an assessment of the marketing potentialities, an identification of requirements at each station site and the development of an overall investment strategy for stations along the South Shore line. This is a sketch planning technique. A separate description of problems and potentialities is presented for each station site along the line, including all of those that now exist and several that have been proposed for new station development.

Acknowledgment:
NTIS
PB 80-193527

_____, Economic Adjustment Study: Chicago South Shore and South Bend Railroad Corridor: Executive Summary, prepared for the Economic Development Administration and the Northern Indiana

Commuter Transportation District. Highland, Ind.: Northwestern Indiana Regional Planning Commission, March 1980. 12 pp.

Various aspects of the South Shore corridor economic adjustment investigations are described. The investigations examine the economic adjustment problems that would attend demise of the South Shore as a carrier in northern Indiana, and identify steps that can be taken by public authorities to save the railroad. The objectives have been to identify service, marketing and investment requirements for effective restoration of financial health to the South Shore, and changes of organization structure that would assure the railroad's continuing future success.

Acknowledgment:
NTIS
PB 80-193519

_____, Economic Adjustment Study: Chicago South Shore and South Bend Railroad Corridor: Final Report, prepared for the Economic Development Administration and the Northern Indiana Commuter Transportation District. Highland, Ind.: Northwestern Indiana Regional Planning Commission, March 1980. 80 pp., Tabs.

Out of concern for the harm that could follow loss of the South Shore service, the United States Economic Development Administration has provided a grant of funds for an investigation. The purpose of these investigations has been to prepare an economic adjustment strategy setting forth steps that can be taken to preserve the South Shore services.

Acknowledgment:
NTIS
PB 80-193501

Perritt, Henry H., "Development of a Railroad Cost Function," Proceedings: Twentieth Annual Meeting of The Transportation Research Forum, "Transportation Alternatives in a Changing Environment," 20, no. 1 (1979), 416-23. Oxford, Ind.: The Richard B. Cross Company. Figs.

18 ECONOMICS

This paper develops a labor cost function which can be used by anlysis to estimate the effect of changes in operating practices on labor costs and also to assess the sensitivity of labor costs to possible changes in collectively bargained basis of pay and certain work rules, such as train crew size. Much of analysis concentrates on crews operating through freight trains as they tend to be the ones most affected by the complexities of the rules of pay. It is also applicable to crews in local freight and switching service. With modification it can be applied to passenger service.

RRIS 18 302361

Price Waterhouse & Co., Report on Special Review of Commute Operations, 4 vols. San Francisco: Price Waterhouse & Co., August 15, 1975. v.p., Tabs.

The primary objective of this report is to review the reasonableness of the revenues and expenses recorded by the Southern Pacific Transportation Company's commute operations. Vol. I, Report Summary, includes a discussion of the review objectives, the scope of work undertaken, and findings and conclusions. Vol. II, Financial Information, is a statement of revenues and expenses from commute operations for the year ended December 31, 1974 and related notes thereto. Vol. III, Supplementary Financial Information, consists of a statement of net investment in certain commute assets, return on investment analysis, methods for allocating common costs, and an overview of principal commute costs and revenues. Vol. IV is comprised of three Appendices: a comparative analysis of 1974 and 1973 commute operations and accounting, individual account analyses, and recommendations to improve accounting for commute operations.

Segelhorst, Elbert William, "Fare Structure of Commuter Railroads and Traffic Congestion in the Central City" (unpublished Doctor's thesis, Columbia University, 1963).

This study applies the theory of marginal cost pricing to railroad commutation service, thereby

demonstrating that an improved fare structure could improve the welfare of both passengers and owners. The study develops analytical models, including those for the cases of constant, increasing, and decreasing cost in conjunction with firm and shifting peak demand conditions. It is shown that fares differentiated according to the marginal cost of peak and slack period passengers are necessary to achieve optimal utilization of suburban rail, as well as all other modes of urban transportation. The eight commuter railroads serving metropolitan New York are studied. Comparative analyses of Philadelphia and St. Louis area railroad commutation are included.

Sheehan, Michael F., Land Speculation, California's Interurban Railways and the Current Crisis, Working Paper 22, Institute of Urban and Regional Research. Iowa City, Iowa: The University of Iowa, May 1980. 18 pp., Figs., Refs.

This paper describes and explains the forces which created and destroyed the Pacific Electric Red Car trolley lines, and those which promoted the freeways, automobiles, and rapid and disorganized housing development. It first develops a theory of speculation. It then correlates the development of southern California's interurban transportation with the designs of financiers around Henry Huntington. It describes the end of the Red Car system and the rise of speculators and developers reliant on the automobile. The impact of energy and fiscal crises on speculators and the public is explained. Finally, it deals with an analysis of the likely public impacts and possible responses to the collapse in the rapid expansion of the automobile transit margin.

Transportation Research Board, Urban Transportation Economics, Special Report 181. Washington, D.C.: Transportation Research Board, 1978. 266 pp., Tabs., Figs., Refs.

An attempt has been made to examine long-term forces in the urban transportation market that generate chronic transit deficits and to evaluate alternative courses of action to improve economic efficiency and

financial viability at the local level. This report synthesizes theory and practice to produce a practical working program for planning, implementing and administering programs at the local, state, and Federal levels. The study focuses on the financial difficulties that contribute to the deterioration of services, the causes of deficits, alternative programs to assist cities to reduce their dependence on Federal financial assistance, the development of a framework to assist different levels of government to evaluate urban transportation costs versus revenues, and the summarizing of the state of the art in this area. The proceedings are presented of five 2- to 3-day workshops. The workshop on urban transportation pricing considered several aspects of various alternatives. The workshop on economic regulation of urban public transportation considered how current regulations may be amended to facilitate more efficient workable public transportation. The workshop on labor relations issues was designed to identify problems and alternatives to current labor practices, explore increased labor involvement, as well as other aspects of labor relations. The workshop on measuring the effectiveness of transit marketing considered how public transportation may be managed, planned, and operated to provide the desired service and be financially healthy. The workshop on government responsibilities for financing efficient transportation examined the means available to local government to bring about the changes recommended in earlier workshops.

Proceedings of five workshops on Pricing Alternatives, Economic Regulations, Labor Issues, Marketing, and Government Financing Responsibilities held by Transportation Research Board. Sponsored by Office of the Secretary, Federal Highway Administration and Urban Mass Transportation of DOT; Environmental Protection Agency and Federal Energy Administration.

HRIS 15 176300

Young, David, "Commuter Railroad Ridership: Coming and Going," MASS TRANSIT, 5, no. 3 (March 1978), 40-43, 48. Photo.

18 ECONOMICS

This article describes the successes and failures among Chicago's eight commuter railroads with special attention to the impact of freeway construction, fares, competition, social and economic change, and capital improvements.

13 ELECTRIFICATION

(See also Track and Structures)

Decker, Harold D., ed., Proceedings: Seminar on the Use of Composite Third Rail in Electrified Transit and Commuter Rail System, held at Cambridge, Mass., September 14-15, 1977, prepared by Pacific Consultants (previously Ahmed Associates) for the Transportation Systems Center and the Urban Mass Transportation Administration. Washington, D.C.: U.S. Government Printing Office, November 1978. 217 pp., Tabs., Figs., Photos., 6 App.

The seminar was organized at the request of UMTA to disseminate accurate information on, and experience with, composite (aluminum and steel) third, or contact rail, in wayside power distribution systems of electrified urban rail properties. The seminar provided the opportunity for the exchange of pertinent information among the suppliers, using properties, consultants and designers, potential users, and government agencies. This document contains the transcripts of the presentations made to the seminar participants, as well as the question-and-answer sessions which followed each presentation and the round table discussion of Thursday, September 15, 1977. Information pertinent to the seminar, but not available in detail at the time of the conference, is presented in a series of four appendixes, namely: A--Third Rail-Deicing; B--Welding Composite Rail on BART; C--Maintenance of Rails on BART; and D--Relative Costs of Composite and Steel Third Rail Installations. This document also provides a list of all participants and their addresses as of September 14, 1977, as well as a list of Electrified Transit Properties.

Acknowledgement:
NTIS
PB 293317

RRIS 13 191730
DOT-TSC-UMTA-78-31
UMTA-MA-06-0025-78-13
DOT-TSC-1289

Nelson-Smith, George, "Lighting for the Great Northern Suburban Railway Electrification" -- see Right-of-Way.

Siemens, Werner H., Railroad Electrification System Design, IEEE Technical Paper presented to the Joint ASME/IEEE/AAR Railroad

Conference held at Colorado Springs, Colo., April 12-14, 1979, pp. 54-59. n.p.: Institute of Electrical and Electronics Engineers, 1979. Tabs., Figs., Refs.

Railroad electrification is one of our alternatives to a diesel-electric operation. The selection of the voltage has a large economic impact on capital investment, especially affecting the catenary system design and the electric supply system. Modern designs and new components such as synthetic insulators are today available to keep the initial capital cost and future operating cost of an electrified railroad as economical as possible.

Acknowledgement: RRIS 13 194635
IEEE 79CH1454-8 IA

16 ENERGY

(See also Passenger Operations/Planning and specific topics)

Congressional Budget Office, Urban Transportation and Energy: The Potential Savings of Different Modes, Committee Print, 95th Congress, 1st Session, prepared for the Committee on Environment and Public Works, U.S. Senate. Washington, D.C.: U.S. Government Printing Office, 1977. 81 pp., Tabs., Figs., Refs., Glossary, 3 App.

Transportation in cities consumes about 10 percent of all the nation's fuel. Potential savings through shifts in urban transportation policies have generated interest in Congress and elsewhere. This paper describes the energy requirements of alternative urban transport technologies and assesses the effects on urban transport fuel consumption of various programs Congress might consider in order to save fuel. This analysis presents several measures of energy use, ranging from a narrow index of propulsion needs to a broad index of program energy savings. Attempts are made to consider energy needed to build and maintain roads and tracks, vehicles, stations and other facilities. Considered are vanpool, carpool, bus, automobile, rapid transit, light rail transit and commuter railroad. The authors conclude that rapid transit offers little to aid the nation's efforts to save fuel. This is based on such assumptions as the use of automobiles to reach the rapid transit station by most riders, and circuitous routings of fixed-guideway systems.

RRIS 16 168020

_____, Urban Transportation and Energy: The Potential Savings of Different Modes, Hearing Before the Subcommittee on Environment and Public Works, U.S. Senate, 95th Congress, 1st Session, October 5, 1977, Serial No. 95-H39. Washington, D.C.: U.S. Government Printing Office, 1977. 334 pp., Figs., Refs., Glossary.

Statements were made by Senators Lloyd Bentsen and Jennings Randolph. Witnesses for the Congressional Budget Office were Drs. Alice M. Rivlin, Damian Kulash, and Richard Mudge. Witnesses for the American Public Transit Association were B. R. Stokes and Louis Gambaccini. Comments for the record were

made by Representative Robert W. Edgar; Margaret F. Fels and G. Pierce Williams (Princeton University); Massachusetts Bay Transportation Authority; Commonwealth of Massachusetts; Metropolitan Atlanta Rapid Transit Authority; New York Metropolitan Transportation Authority; New York City Transit Authority; Port Authority Transit Corporation; New York Regional Plan Association; Chicago Regional Transportation Authority; and Dr. Vukan R. Vuchic (University of Pennsylvania). A brief, "Moving into an Energy Efficient Society," by the Urban Transportation Development Corporation, Ltd., is included.

Henderson, Clark, Energy Study of Rail Passenger Transportation, Vol. I: Executive Summary, prepared by SRI International, for the U.S. Department of Energy. Menlo Park, Calif.: SRI International, March 1978 or Washington, D.C.: U.S. Government Printing Office, 1980 (report dated August 1979). 43 pp., Tabs.

The results and conclusions of the study by SRI treats the following topics: physical assets and services of rail passenger systems; energy demands and intensities; roles of local institutions; the industry future; and the role of the Federal government. Data reported were collected in 1976 and 1977, and in most cases, cover calendar year 1975.

Acknowledgment: EY-76-C-03-1176
NTIS
SAN-1176-T2

_____, Energy Study of Rail Passenger Transportation, Vol. III: Institutions, prepared by SRI International for the U.S. Department of Energy. Menlo Park, Calif.: SRI International, March 1978 or Washington, D.C.: U.S. Government Printing Office, 1980 (report dated August 1979). 28 pp.

The institutional structures of most rail passenger systems have undergone major changes during the past decade because of the decline in private ownership and control and the increase in responsibilities of numerous public agencies--both long established and newly created. These shifts in ownership and control are described and some of the institution related problems that Federal agencies may encounter in

planning and executing future programs for energy conservation in rail passenger transportation are discussed. The principal private companies and public agencies participating in rail passenger transportation are briefly discussed.

Acknowledgment: EY-76-C-03-1176
NTIS
SAN-1176-T2

Henderson, Clark, and Hazel Ellis, Energy Study of the San Diego-Los Angeles Passenger Trains, SRI Project Number 1502, prepared by SRI International for the California Department of Transportation. Menlo Park, Calif.: SRI International, August 1980. 14 pp., Tabs., Refs.

This report is an energy study of the "San Diegan" rail passenger trains operating between San Diego and Los Angeles. The focus is on the system as it is now and as it is expected to remain during the near future years. Information for Amtrak's fiscal year ending September 30, 1979 was used. The objective is to describe a "base alternative," which can be used to compare the existing system with new alternatives of various kinds. However, studies of such alternatives were not undertaken in this phase of research.

Acknowledgment:
SRI International

Henderson, Clark, Hazel T. Ellis, and James P. Wilhelm, Energy Study of Rail Passenger Transportation, Vol. II: Description of Operating Systems, Final Report, prepared by SRI International for the U.S. Department of Energy. Menlo Park, Calif.: SRI International, March 1978 or Washington, D.C.: U.S. Government Printing Office, 1980 (report dated August 1979). 171 pp.

The report describes the rail passenger systems of the U.S. in terms of selected physical, operating, and economic characteristics, and relates services rendered to energy usage and costs. Rail passenger transportation exists in 4 distinct forms: intercity railroads, suburban railroads, heavy rail transit,

and light rail transit. Each form varies in technical equipment, design of facilities, operating practices, size of systems. Specific data for the national rail passenger network and the Boston, Chicago, Cleveland, New York, Philadelphia, Pittsburgh, and San Francisco regions and the Washington Metropolitan area transit authority are presented.

Acknowledgment: EY-76-C-03-1176
NTIS
SAN-1176-T2

Henderson, Clark, and James P. Wilhelm, Energy Study of Rail Passenger Transportation, Vol. IV: Efficiency Improvements and Industry Future, Final Report, prepared by SRI International for the U.S. Department of Energy. Menlo Park, Calif.: SRI International, March 1978 or Washington, D.C.: U.S. Government Printing Office, 1980 (report dated August 1979). 63 pp.

Measures that offer promise of efficiency improvements or economy in energy usage in rail passenger transportation are identified and described; the future of rail passenger transportation in the U.S. is discussed; and possible future roles of Federal agencies are discussed.

Acknowledgment: EY-76-C-03-1176
NTIS
SAN-1176-T2

Hopkins, John B., Railroads and the Environment--Estimation of Fuel Consumption in Rail Transportation: Volume I-Analytical Model, Final Report, prepared by the Transportation Systems Center for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, May 1975. 84 pp., Tabs., Figs., Refs., 1 App.

The report describes an analytical approach to estimation of fuel consumption in rail transportation, and provides sample computer calculations suggesting the sensitivity of fuel usage to various parameters. The model used is based upon careful delineation of the relevant physical mechanisms of energy dissipation under steady-state conditions-rolling and aerodynamic resistance (using the Davis equations),

braking, idling, and locomotive power generation and conversion losses. Both simple and more complex formulations are applied as appropriate. Several classes of service are considered: branch line freight, intercity freight, conventional and high-speed passenger, and commuter. Numerous graphs illustrate typical results for specific fuel consumption as a function of speed, grade, power/weight, load factor, weight per seat, etc.

Acknowledgment:
NTIS
PB 244150

RRIS 16 092310
DOT-TSC-FRA-75-16-1
FRA/ORD-75/74

Ichniowski, Tom, "The Storm Over the CBO Report," Railway Age, 178, no. 21 (November 14, 1977), 32-35. Photos.

Rebuttal is given to the Congressional Budget Office report, "Urban Transportation and Energy: The Potential Savings of Different Modes." Administration spokesmen, industry officials, state transportation officers and members of the academic community refute the allegations that new rail-transit systems rate poorly in terms of energy efficiency.

Acknowledgment:
Railway Age

RRIS 16 167922

Lockwood, Stephen C. and Warren D. Weber, "Multimodal Intercity Corridor Study: The Sacramento-Stockton-San Francisco Bay Area Corridor" -- see Passenger Operations/Intermodal Integration.

Penner, Peter S., The Dollar, Energy and Labor Intensity of an Electric Commuter Railroad, CAC Technical Memorandum No. 24. Urbana, Ill.: University of Illinois at Urbana-Champaign, Center for Advanced Computation, September 1974. 14 pp., Tabs., Refs., 4 App.

This memo is directed at finding the 1971 total energy intensity of the all-electric commuter railroad operated by the Port Authority Trans-Hudson Corporation. This particular system has a high energy intensity due to a conversion efficiency of only 28%.

Sokolsky, S., Energy Savings Resulting from Modal Shifts to Corridorrail, prepared by The Aerospace Corporation for the Transportation Systems Center and the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, July 8, 1975. 34 pp., Tabs., Figs.

A high speed passenger rail service between Washington and Boston was called for in the Regional Rail Reorganization Act of 1973. Planning for the service has been conducted by the Office of Northeast Corridor Development in the Federal Railroad Administration. Engineering studies were undertaken to develop detailed plans and costs for the required facilities improvements. This report examines train resistance, train performance, train energy consumption, and area energy use characteristics.

Acknowledgment:
NTIS
PB 257409

RRIS 16 143963
FRA-NECPO-76/15
DOT-TSC-936

Transportation Research Board, Energy Effects, Efficiencies, and Prospects for Various Modes of Transportation, NCHRP Synthesis of Highway Practice No. 43. Washington, D.C.: Transportation Research Board, 1977. 63 pp., Tabs., Figs., Refs., 2 App.

Conservation of energy used for transportation is of vital concern to the nation. This report of the Transportation Research Board details the efficiencies of various vehicles and modes for both passengers and freight under various conditions. Modes considered include highway, bus, rail, air, water, bicycle, and pipelines. The potential impacts of alternative energy-conservation options are evaluated, and research needs are identified. /Author/

NCHRP Project 20-5 FY 75 (Topic 7-05) sponsored by the American Association of State Highway and Transportation Officials in cooperation with the Federal Highway Administration.

Acknowledgment:
TRB

RRIS 16 170820

16 ENERGY

Walbridge, Edward W., "Energy Consumption, Pollutant Production, and Dollar Cost of Diesel Suburban Commuter Trains," Transportation (Netherlands), 5, no. 3 (September 1976), 285-307. Tabs., Figs., Refs.

The results presented in this report are based on data obtained from Chicago's three largest diesel commuter railroads. Those aspects of their operations that relate to energy and pollution are described. Service characteristics, such as average occupancy and average trip distance, are presented. Energy consumption results are presented and discussed. With energy efficiency measured in passenger-miles per Btu, it is found that trips by diesel commuter train are 3.5 times more energy efficient than Chicago Central Area auto trips. The total trip from home to suburban station, then by train to a downtown terminal, is found to be 2.2 times more energy efficient than Chicago Central Area auto trips. Pollutant production rates are presented for five pollutants. For every pollutant except sulfur oxides, trains are found to be less polluting per passenger-mile than autos. Per passenger-mile pollutant emissions from trains are, overall, less damaging by a factor of 5.5 than the per passenger-mile emissions from autos. Travel on these diesel commuter trains is less costly to society than auto travel (1972 suburban-based autos). This is the case whether one compares the train trip alone with an auto trip or the home-to-suburban-station-then-to-a-downtown-terminal trip with a home-to-downtown auto trip.

Acknowledgment: Transportation (Netherlands)

RRIS 16-141579

_____, Per Passenger-Mile Energy Consumption and Costs for Suburban Commuter Service Diesel Trains, Final Report, prepared for the Urban Mass Transportation Administration. Chicago: University of Illinois at Chicago Circle, August 1974. 65 pp., Tabs., Fig., Photos., Refs., 1 App.

Results presented in this report are based on data obtained from Chicago, Illinois' three diesel commuter railroads. Operations and equipment are

described, particularly in terms of energy consumption and pollutant productions. Service characteristics, such as average occupancy and average trip distance, and energy consumption results are presented and discussed.

Acknowledgment:
NTIS
PB 242232

RRIS 16 092024
RR-12
UMTA-IL-11-0006-74-1

10 ENVIRONMENTAL PROTECTION

(See also Passenger Operations/Planning and specific topics)

Appleyard, Donald, BART-I: Traveler Behavior Studies. Part II (Traveler Study) Volume II. BART Traveler Environment: Environmental Assessment Methods for Stations, Lines, and Equipment, BART Impact Studies, Final Report Series, by the Institute of Urban and Regional Development, University of California for the Metropolitan Transportation Commission and the U.S. Department of Housing and Urban Development. Berkeley, Calif.: University of California Institute of Urban and Regional Development, May 31, 1973. 154 pp., Tabs., Figs., Refs., 1 App.

> The report concentrates on the development of methods for describing and assessing the BART travelers' environment--the stations, systemwide components, cars, and lines--in a form that can be validated by the travelers' response. Chapters include environmental qualities (station indicators), station assessments, a line assessment system, automatic fare-collection assessment, and assessment of the BART car.

Acknowledgment:
NTIS
PB 236738

RRIS 23 081196
DOT-OS-90023

Brownell, John E., and others, Rhode Island State Rail Plan -- see Government Policy, Planning, and Regulation.

Christensen, David (L.), Photo Survey of Development and Activities in the Vicinity of BART Stations: Technical Report -- Passenger Operations/Stations and Terminals.

Gelick, Michael S., Robert J. Orseske, and Marshall L. Silver, Design Criteria for Elevated Transportation Structures and Modal Exchange Facilities -- see Passenger Operations/Stations and Terminals.

Hopkins, John B., Railroads and the Environment--Estimation of Fuel Consumption in Rail Transportation: Volume I-Analytical Model -- see Energy.

Kaukas, Bernard, "Completing the Environmental Package," Railway Gazette International, 135, no. 9 (September 1979), 809-12. Photos.

> While intercity travel has been transformed with new equipment and high-speed service in Britain over the past two decades, British Railways is looking at the attractiveness of not just its trains but of its stations and wayside. Railways must be good neighbors because political support depends crucially on public perception of their very real social and environmental benefits. Station construction, reconstruction, cleaning and the maintenance of right of way are all coming in for attention.

RRIS 10 301820

Lee, Douglass, B., Jr., "How To Do a Transit Station Land-Use Impact Study" -- see Passenger Operations/Stations and Terminals.

Lockwood, Stephen C., and Warren D. Weber, "Multimodal Intercity Corridor Study: The Sacramento-Stockton-San Francisco Bay Area Corridor" -- see Passenger Operations/Intermodal Integration.

Morse, Stephen I., and Larry K. Taylor, Improvement of (Improving) San Francisco Peninsula Rail Transit Service: Noise Impact, prepared by the Environmental Branch, District 04, California Department of Transportation. Sacramento, Calif.: California Department of Transportation, May 1974. 62 pp., Tabs., Figs., Refs., 3 App.

> This is a quantitative noise impact report for possible improvement of rail transit service on the San Francisco Peninsula. This report discusses the relative noise impacts upon the community of various alternatives of improving Peninsula rail service. Considered in the analyses were upgrading the existing Southern Pacific Railroad, adding an extension of BARTD service, and other possible alternatives. The relative magnitudes and impacts of each service were discussed along with possible noise attenuation measures and procedures.

10 ENVIRONMENTAL PROTECTION

Simpson & Curtin, a Division of Booz-Allen & Hamilton Inc.; Gruen Associates, Inc.; and Bolt Beranek & Newman, Inc.; Transportation Facility Proximity Impact Assessment; Final Report, prepared for the California Department of Transportation and the Federal Highway Administration. Sacramento, Calif.: California Department of Transportation, March 1976. 296 pp., Tabs., Figs., Refs., App. (15-page Executive Summary also available.)

This study provides techniques for the assessment of proximity impacts related to transportation facilities. The examination of proximity impacts included those related to highways and freeways, busways, and special operational improvements, transit, and new modes of transit. Proximity impacts are those direct and indirect effects which represent a significant change from existing or future community conditions. A two-stage evaluation was developed for the assessment of the following impact indicators: noise, air quality, traffic volume and accident experience, parking availability, pedestrian safety, land use, local fiscal effects, aesthetics, access/barrier, and neighborhood/community disruption. The report also includes an illustrative application of the assessment procedures to a candidate transportation project.

Acknowledgment:
NTIS
PB 264160

RRIS 10 151766
BAH-GA-BBN-76-01

Spruill, Susan E., Eric L. Bers, and Glend D. Bottoms, Final Environmental Impact Statement. Finance Docket 28611 -- (Petition of) Southern Pacific Transportation Company for Discontinuance of All Passenger Train Service Between San Francisco and San Jose and Intermediate Points, prepared by the Section of Energy and Environment, Office of Proceedings, Interstate Commerce Commission. Washington, D.C.: Interstate Commerce Commission, October 30, 1978. v.p., Tabs., Figs., Photos., Refs., 6 App.

Discontinuance of commuter service on the 47-mile Southern Pacific line between San Francisco and San Jose would displace about 7,500 riders daily, at least 61 percent of which are estimated to be diverted to automobiles. Adverse environmental and

socioeconomic impacts are discussed in this report, a part of the ICC-prescribed service abandonment procedure.

RRIS 10 188078

United States Environmental Protection Agency, Office of Noise Abatement Control, Background Document for Final Interstate Rail Carrier Noise Emission Regulation: Source Standards. Washington, D.C.: U.S. Government Printing Office, December 1979. v.p., Tabs., Figs., 15 App.

This background document details the scope, context and breadth of the work conducted in support of the regulation. Section 2 characterizes the railroad industry from a physical and economic perspective. Section 3 identifies and classifies the railroad equipment and facilities studied, including railroad yard operations and activities. Baseline noise levels corresponding to specific railroad yard noise sources are described in Section 4. The "best available technology" to reduce noise emissions from the specified noise sources is also described in Section 4. Section 5 describes and details the results of the railroad yard noise propagation model and the potential health and welfare benefits associated with various noise control measures. Section 6 describes the costs attendant to noise control methods to achieve various regulatory study levels, and details the possible economic impacts. An analysis of comments submitted to the docket during the comment period is provided in Section 7.

_____, Background Document for Railroad Noise Emission(s) Standards, Final Report. Washington, D.C.: U.S. Environmental Protection Agency, December 1975. 618 pp., Tabs., Figs., Photos., 18 App.

This document contains the technical, economic, health and welfare analyses and other pertinent data and information utilized by the Environmental Protection Agency in the development of the final Interstate Rail Carrier Noise Emission Regulation.

RRIS 10 134296
EPA-550/9-76-004
(005 on title page)

10 ENVIRONMENTAL PROTECTION

Walbridge, Edward W., "Energy Consumption, Pollutant Production, and Dollar Cost of Diesel Suburban Commuter Trains" -- see Energy.

_____, Per Passenger-Mile Energy Consumption and Costs for Suburban Commuter Service Diesel Trains -- see Energy.

Wiltsee, Kenneth W., Jr., Shashi B. Khanna, and James C. Hanson, Assessment of Railroad Fuel Use and Emissions for the Regional Air Pollution Study, Task Order 2, prepared by the Walden Research Division of Abcor, Inc., for the Environmental Protection Agency and the Transportation Systems Center. Research Triangle Park, N.C.: U.S. Environmental Protection Agency, April 1977. 95 pp., Tabs., Figs., Refs., 3 App.

A methodology has been developed for calculating and reporting fuel use and air pollutant emissions from railroad locomotive activity. The procedure uses automated techniques to report rail activity on a variable-sized grid system. Separate methodologies were developed for the two major types of rail activity--road or line-haul operation and activity within switch yards. The methodology for road locomotives uses a line source concept and synthesizes the rail network by a series of links connecting a system of node points within the study area. The methodology for switch yard operation uses an area source concept. Both methodologies use as a basic unit locomotive horsepower-hours and were programmed to provide an analysis of fuel use and emissions for five criteria pollutants on a grid-by-grid basis as well a for the entire study area. See report dated May 1974, PB-235 736.

Acknowledgment:
NTIS
PB 271887

RRIS 10 167136
EPA-450/3-77-025

25 GOVERNMENT POLICY, PLANNING, AND REGULATION

(See also Passenger Operations/Planning)

Brownell, John E., and others, Rhode Island State Rail Plan, Rhode Island Statewide Planning Program Report 27. Providence, R.I.: Rhode Island Statewide Planning Program, December 1975. v.p., Tabs., Figs., Refs., 4 App.

This study outlines a safe, efficient rail system to serve present and future needs of Rhode Island. It includes details of a rail freight network which will service present industries and reach areas designated for future economic development; indicates how a commuter rail system could be developed on the east and west shores of Narragansett Bay; and has details of the high-speed rail passenger route of the Northeast Corridor. The goals would be efficient rail service, reduced total energy consumption in the state, relief of peak-hour passenger vehicle pressure on the major highways, and improvement of air quality in urbanized areas.

RRIS 25 128996

Interstate Commerce Commission, "Part 1127 - Standards for Determining Commuter Rail Service Continuation Subsidies," Federal Register, 44, no. 54 (Monday, March 19, 1979), 16411-23. Tabs., 3 App.

These standards include definitions, purpose and scope, the subsidy agreement, and interpretations of the standards. They cover access to records, audit, and inspection; revenues attributable to commuter rail service; avoidable costs of providing service; valuation of rail properties; reasonable return on the value of the properties; and additional rail passenger service. The appendices address the subsidy estimate, the financial status report, and the speed factored gross tons formula.

_____, "Part 1127 - Standards for Determining Commuter Rail Service Continuation Subsidies and Emergency Operating Payments: Report and Order," Federal Register, 41, no. 150 (Tuesday, August 3, 1976), 32546-54. Proposed Part 1127 would fall under Title 49, Chap. X, Subchapter B.

25 GOVERNMENT POLICY, PLANNING, AND REGULATION

This report summarizes the legislative mandate, proposed rules, and discussion of the issues. The issues involved include application of the standards, avoidable costs-rationale, and usage terminology. ConRail-Amtrak negotiations, commuter service common revenues and costs, value of the properties, reasonable return, other costs related to property values, and emergency operating assistance are also discussed.

Locklin, D. Philip, Economics of Transportation -- see Economics.

National Transportation Policy Study Commission, National Transportation Policies Through the Year 2000, Final Report. Washington, D.C.: U.S. Government Printing Office, June 1979. 536 pp., Tabs., Figs., Refs., Glossary, 4 App.

This report analyzes and forecasts passenger and freight transportation needs for both domestic and international markets. Based on these analyses and in compliance with Public Law 94-280 (1976), 80 policy recommendations are made; 33 of these are summarized in the accompanying Executive Summary. The chapters are transportation functions, institutions and activity in the U.S.; Federal transportation policy and programs; state and local transportation policies and programs; general social and economic forecasts to the year 2000; comparative transportation policies in other countries; technological trends in transportation and communications; transportation and externalities; transportation and energy; forecasts of future transportation activity; capital requirements for the transportation forecasts; the relative price of transportation to the year 2000; emerging transportation issues; policy recommendations; impacts of the policy recommendations; staging policy changes; summary and conclusions.

RRIS 25 196571

Robinette, Gary O., Access to the Environment -- see Human Factors.

25 GOVERNMENT POLICY, PLANNING, AND REGULATION

Sheehan, Michael F., Land Speculation, California's Interurban Railways and the Current Crisis -- see Economics.

19 HISTORY

Dorin, Patrick C., Commuter Railroads: A Pictorial Review of the Most Travelled Railroads -- see Passenger Operations/Rail Cars and Equipment.

Due, John F., Railroads: An Endangered Species and the Possibility of a Fatal Mistake, Working Paper 24, Institute of Urban and Regional Research. Iowa City, Iowa: The University of Iowa, July 1980. 36 pp., Tabs., Fig., Refs.

> This paper discusses the financial position of the railroad industry, especially in the light of the lack of a consistent overall national transportation policy. The point is made that, since policy changes relating to the railroads have been piecemeal and limited, there is grave danger of a mistake that may cause drastic loss in economic efficiency. The historic background is reviewed and evidence presented that the industry is necessary. The events that have produced a pattern of losses are described. Proposed solutions are discussed, as is the development of a rational national policy.

Lutin, Jerome M., "Rehabilitation of Suburban Rail Stations" -- see Passenger Operations/Stations and Terminals.

Olmsted, Robert P., and Joe McMillan, The 5:10 to Suburbia, Chicago's Suburban Railroads: 1960-1975. Woodridge, Ill.: McMillan Pubn., 1975. Photos.

> This book documents in words and photographs the significant changes which have occurred in the Chicago suburban railway service during the period 1960-1975.

Stonier, Charles Edward, "The Long Island Railroad: A Case Study in the Problems of Public Transit" (unpublished Doctor's thesis, University of Pennsylvania, 1955). Tabs., Figs., Refs.

> This thesis analyzes the Long Island Railroad (LIRR) problem. After presenting general background information, it describes the LIRR's freight and passenger

business and other factors influencing its earnings. A review of proposals for solving the LIRR's problem is followed by an appraisal of the fare problem in terms of pricing principles. Finally, an institutional approach to the fare problem is presented with conclusions and recommendations.

United States General Accounting Office, Proposed Project to Renovate Nashville's Historic Train Station Building Needs to Be Reevaluated, prepared by the Logistics and Communication Division. Washington, D.C.: U.S. General Accounting Office, April 27, 1979. 35 pp., 1 App.

The report discusses the need to reevaluate the General Services Administration's proposed project to renovate a historic train station building in Nashville, Tennessee.

Acknowledgment:
NTIS
PB 295309

RRIS 19 198597
LCD-79-308

Webber, Margo B., and Paul J. McGinley, Recycling Historic Railroad Stations: A Citizen's Manual -- see Industry Structure and Company Management.

_____, Recycling Historic Railroad Stations: A Technical Supplement -- see Industry Structure and Company Management.

07 HUMAN FACTORS

(See also Passenger Operations/Stations and Terminals)

Dougherty, Edmond J., and John A. De Benedictis, A Study on Making Transportation Facilities Accessible to the Handicapped and Elderly, Technical Report, prepared by the Franklin Institute Research Laboratories for the Urban Mass Transportation Administration. Philadelphia, Pa.: Franklin Institute Research Laboratories, June 1975. 106 pp., Tabs., Figs., Refs., 2 App.

The study presents a classification scheme for vertical circulation devices, a classification scheme for fixed facilities, a station questionnaire for recording barriers and a transit user scenario which considers psychological as well as physical barriers. Vertical circulation devices currently used in transportation facilities, their assets and shortcomings are detailed. New concepts of vertical circulation are grouped into ramp, stair, escalator and elevator devices. The concepts are designed to stimulate creative design approaches to the problem. Conclusions center around the applicability of existing circulation devices, the aspect of human engineering, problems related to various devices, and improvements concerning escalators and elevators.

Acknowledgment:
NTIS
PB 248597

RRIS 07 094016
FIRL-F-C3956-1
UMTA-PA-06-0031-75-2

Galer, I. A. R., "The Role of Psychology in the Design and Evaluation of Transport Systems," Ergonomics, 22, no. 2 (February 1979), 129-33. Refs.

The aim of this paper is to make some observations, practical and theoretical, on the role of psychology in the design and evaluation of transport systems. "Transport systems" is taken to mean not only the hardware of vehicle components, passenger terminals and the environment in which the system is to operate, but also the practices and procedures demanded of vehicle operators and passengers. It is suggested that the psychologist's knowledge of, say, the perceptual and motor performance of human beings and of the practical aspects of survey methodology are at a level rigorous enough to make valuable

contributions in man-machine systems design and evaluation. Nevertheless the precise prediction and measurement of, for example, affective states and of information-processing and decision-making performance seems beyond the scope of current theory. This limits the quantitative power and hence the usefulness of psychology to transport system designers at present. Some reasons are offered for these limitations and the future role of psychology in the design and evaluation of transport systems is discussed.

Acknowledgment: RRIS 07 301832
EI

Hammett, Van Buren O., "Commuter Psychology," (an address given at the Delaware Valley Regional Transportation Conference, September 15, 1970). 8 pp.

Dr. Hammett offers a psychologically oriented definition of a commuter, i.e., "anyone whose home is far enough away from his work to cause the getting to-and-from to constitute a third dimension in his life." He discusses why there are commuters and their choice of method for commuting. He suggests how to make public transportation appealing to the more active and individualistic type of commuter.

Robinette, Gary O., Access to the Environment. Volume 3: (Appendices) Domestic and International Examples of Legislation, Guidelines, Standards and Criteria, Bibliography, Listing of People and Organizations Contacted, Locations of Barrier Free Sites and Glossary of Terms, prepared by the (U.S.) American Society of Landscape Architects Foundation for the U.S. Department of Housing and Urban Development and the Architectural and Transportation Barriers Compliance Board. Washington, D.C.: U.S. Government Printing Office, 1978 (report dated July 1976). 651 pp., Tabs., Figs., Photos., Refs., Glossary.

This third volume in a series of three reference documents for landscape architects and designers presents domestic and international examples of legislation, guidelines, standards and criteria for constructing and redesigning buildings to make them barrier free and therefore accessible to handicapped

and disabled persons. Examples are included of Federal, state, and local laws and guidelines, as well as British, Canadian and Dutch legislation and standards. Specifications for doorways, walkways, sign levels, ramps, rails, elevators, restroom facilities, public telephones, lighting, floor surfaces, parking areas, buses and trains, and drinking fountains are presented. A list of people and organizations contacted in composing the volumes is provided, as well as a list of locations of barrier-free sites that were discussed in Volume 2. A bibliography and glossary of terms is appended. Also available in set of 3 reports PC E13, PB-290 800-SET.

Acknowledgment:
NTIS
PB 290803

RRIS 07 192056
HUD-H-2002-R

United States Department of Transportation, Urban Mass Transportation Administration, An Evaluation of Making Rail Transit Systems Accessible to Handicapped Persons: A National Summary of Cost Estimates and Comments on Desirability. Washington, D.C.: U.S. Department of Transportation, April 1980. 67+ pp., Tabs., 6 App.

This report summarizes the Department's studies of Section 321 of the Surface Transportation Assistance Act of 1978, "Rail Retrofit Evaluation." Section 321(a) requires operators of fixed-guideway public mass transportation systems to develop detailed estimates of the cost to make their systems accessible to and usable by handicapped persons. Section 321(b) requires that the Department evaluate light rail and commuter rail systems to determine ways to make, and the desirability of making these modes accessible to handicapped persons. The objectives of the studies are to develop estimates of all costs (capital and operating over a 50-year period) of making all inaccessible urban rail transit systems funded by UMTA accessible; to develop solutions to accessibility problems of light and commuter rail modes in sufficient detail to estimate associated costs, and to determine their technical and operational feasibility; and to estimate the transportation demand for accessible light and commuter rail

services, and the resultant benefits of these services to handicapped and other persons in sufficient detail to assess the desirability of making them accessible.

24 INDUSTRY STRUCTURE AND COMPANY MANAGEMENT

Adams, Gerald H., Railroad Management and Planning, Vol. 1, 1964-1973 (A Bibliography with Abstracts), prepared by the National Technical Information Service, U.S. Department of Commerce. Springfield, Va.,: National Technical Information Service, March 1976. 144 pp.

Many aspects of railroad management and planning are presented in a two volume bibliography. Studies of government and regional planning, intermodal operations and comparisons, cost engineering, area operations such as the Northeast Corridor and several specific cities, and railway terminals are cited. Also discussed are safety, fire hazards, community and environmental relations, high speed transit, railroad abandonment, and crossings. Other topics are track-train dynamics, wheel-rail noise control, state-of-the-art and test cars, electrical energy, demand, commuting, and transportation models. Freight transportation and accident investigations are omitted. (This updated bibliography contains 139 abstracts, none of which are new entries to the previous edition.) See also NTIS/PS-76/0169, Railroad Freight Transportation.

Acknowledgement: RRIS 26 097321
NTIS
PS 760170

De Leuw, Cather and Co. and STV, Inc., Northeast Corridor High Speed Rail Passenger Service Improvement Project: Task 7B-Shops and Yard Facilities, Final Report, prepared for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, September 1975. 242 pp., Tabs., Figs., Photos.

The purpose of the report is to formulate functional design criteria for 'CorridorRail' revenue vehicle inspection, servicing, maintenance and repair for locomotives, cars and right-of-way maintenance equipment including signal and communication equipment. The purpose is to assure that the development of maintenance and servicing techniques for the 'CorridorRail' has the full benefit of technology developed in the past as well as that currently being developed for railroad passenger service.

Efficient operation of an intercity railroad passenger service requires the availability of a completely reliable service fleet of clean revenue cars sufficient to maintain advertised schedule service, while minimizing the total number of cars required. In order to accomplish this goal, the philosophy of planned maintenance is to perform all rebuild and heavy repair at Washington Terminal, the southern terminal point of the corridor and perform service, inspection and limited repair at Philadelphia, New York and Boston. See also PB-242 444.

Acknowledgement:
NTIS
PB 247918

RRIS 24 093935
FRA/ONECD-75/78
DOT-FR-40026

European Conference of Ministers of Transport, Effect of Productivity and Technological Progress on Transport Workers, Report of the 26th Round Table on Transport Economics. Paris: European Conference of Ministers of Transport, 1975. 104 pp., Tabs., Figs.

The report involves the analysis of the use of manpower resources in transport. Three introductory reports cover the conventional sectors of inland transport - road, rail and inland waterway. The review of road transport includes definitions of productivity and gives figures on productivity development. Consideration is then given to the industry's labor force and new developments in road haulage. The technological programme for inland water transport is described and mention made of the situation in Germany. The effects on crews are considered and trends and policy requirements outlined. The review of rail transport covers aspects including shunting, freight terminals, parcels, passenger stations and repair of rolling stock. A summary is given of the discussion which followed, the main topics of which are recruitment and stability of employment, the maintenance of job flexibility and the measures required.

Acknowledgement:
TRRL

RRIS 24 137696

24 INDUSTRY STRUCTURE AND COMPANY MANAGEMENT

Gil, Hagi, David Shlay, and George M. Smerk, "The South Shore Railroad: Preserving and Improving Commuter Service in Indiana," Indiana Business Review, 53, July-August 1978, 25-28.

This article chronicles the activities related to the South Shore Railroad commuter service between 1976 and 1978. Included is a review of the findings of the corridor study, The Transportation Corridor in Northwest Indiana, which projects to the year 2000. The formation of the Northern Indiana Commuter Transportation District and its subsequent actions are also described.

Gravallese, A., P. Albin, and R. Di Luzio, Northeast Corridor Improvement Program. Task 1: Management Survey Summary Report, Final Report, prepared by Dynatrend, Incorporated for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, December 1975. 155 pp., Tabs., Figs., 9 App.

The summary report presents an overview of the organizational structure and construction management function of several, largely transportation oriented, construction projects. The nine organizations surveyed were: (1) Alyeska Pipeline Service Company, (2) Bay Area Rapid Transit District, (3) Chicago Transit Authority/Chicago Urban Transportation District, (4) Dallas-Fort Worth Regional Airport, (5) Federal Highway Administration/New York State Department of Transportation, (6) Metropolitan Atlanta Rapid Transit Authority, (7) Massachusetts Bay Transportation Authority (8) Naval Facilities Engineering Command/Trident Project, and (9) Washington Metropolitan Area Transit Authority. The data reported focus on six major topics for each organization. They are: (1) project and organization background and overview, (2) funding and budgeting considerations, (3) project management and project monitoring, (4) construction project management, including cost and schedule controls, (5) management information systems, and (6) institutional considerations. Also available in set of 3 reports PC-E09, PB-259983-SET.

Acknowledgement:
NTIS
PB 259984

RRIS 24 146512
NEC-PAA-75-194
FRA/NECPO-76/1
DOT-FR-56007

Howell, R. P., and others, Northeast Corridor High-Speed Rail Passenger Service Improvement Project: Task 11N - Detailed Physical Plant Improvements and Estimated Costs (New Haven, CT. to Boston, MA.), Volume II, Final Report, prepared by De Leuw, Cather/STV for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, September 1975. 96 pp., Figs., Photos.

Using information developed in other tasks of this study, a detailed time-phased, cost improvement plan to accomplish improved high-speed rail passenger service in the NEC is formulated. A complete description of an upgraded NEC facility is developed on a mile-by-mile basis. Dollar costs, time savings and schedules are presented by milepost segments. Criteria are developed for time phasing track improvements, bridge and tunnel improvements, electrification, signaling and facilities to relieve traffic congestion. Estimated cost of the facility improvements between New Haven and Boston is $680,034,000. These improvements could be implemented over a four-year phased period. Portions of this document are not fully legible. See also Volume 1, PB-247 917.

Acknowledgement:
NTIS
PB 248729

RRIS 24 094032
FRA/ONECD-75/11
2503-15
DOT-FR-40026

Kenton, Edith, Railroad Management Planning: 1974-June 1980 (A Bibliography with Abstracts), prepared by the National Technical Information Service, U.S. Department of Commerce. Springfield, Va.: National Technical Information Service, 1980. 161 pp.

Studies are presented of railroad planning concerning operating costs, yard operations, intermodal systems, railway abandonment and consolidation,

efficiency in operations and services, freight car utilization systems, forecasting future railroad freight and passenger market and the potential of energy conservation in railroad transportation. (This updated bibliography contains 156 abstracts, 44 of which are new entries to the previous edition.) See also RRIS 26 181235; Bulletin 7901.

Acknowledgement: RRIS 26 198838
NTIS
PB 80-812753

Malone, Frank, "Chicago: Rail Renaissance in the Making," Railway Age, 179, no. 9 (May 8, 1978), 28-31. Tab., Fig., Photo.

This article describes the present status and proposed future programs of the Chicago Regional Transportation Authority.

Price Waterhouse & Co., Report on Special Review of Commute Operations -- see Economics.

Reiner, Martin Allen, "Three Types of Institutional Arrangements That Are Improving Commuter Railroad Passenger Service" (unpublished Doctor's thesis, Syracuse University, 1973).

It is the aim of this dissertation to try to determine whether or not there is a discernible difference in the service provided to the public by different railroads that can be attributed to the organizational structures of those carriers. A detailed examination of three railroads (the Long Island Rail Road, the Chicago and North Western, and the Reading) with different types of institutional organizations is undertaken as well as an investigation of the concept of service.

Richardson Associates, Northeast Corridor High Speed Rail Passenger (Service) Improvement Program. Materials and Equipment Demand/Supply Study, Final Report, prepared for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, June 1976. 70 pp., Executive Summary, Tabs., Figs., 1 App.

The report presents the results of a demand/supply analysis of the major materials and equipment required by the Northeast Corridor rail passenger service improvement program. The purpose of the study is to identify those items (1) where design and specifications, and production lead-times may have a major impact on delivery and price, and (2) where development.of long-term procurement arrangements with suppliers is essential to assure continuity of supplies during the 1976-82 time period because of the possible emergence of capacity bottlenecks. This study is also intended to assist in the development of alternatives to de facto cost plus pricing proposals by suppliers of materials and equipment, especially those involving long lead-times.

Acknowledgement:
NTIS
PB 254881

RRIS 24 137410
FRA/NECPO-76/06
DOT-FR-56010

Sawyer, Kenneth T., "DOT Ready to Get Moving on $1.9-Billion Corridor Upgrading," Railway Age, 177, no. 19 (October 11, 1976), 32, 33, 41. Tab.

The Northeast Corridor traverses 8 states having 20% of the U.S. population at densities of 1000 people per square mile. Under the Railroad Revitalization and Regulatory Reform Act of 1976, $1.75 billion of Federal funding is to produce 2-2/3 hour schedules between Washington and New York and 3-2/3 hour schedules between New York and Boston by 1981. Additional funding with matching state input will rebuild passenger stations. Studies have shown the rail improvement program the most economical and environmentally acceptable solution to easing increasing congestion of the highway and air modes in the Corridor. The $1.9 billion will include $244 million for track improvements, $326 million for realignments, $345 million for bridges, $35 million for tunnels, $245 million for electrification, $170 million for signaling/communications, $120 million for shops, $315 million for stations and $100 million for fencing.

RRIS 24 141691

24 INDUSTRY STRUCTURE AND COMPANY MANAGEMENT

Tross, Arthur J., Stanley H. Barriger, and Herbert O. Whitten. Report on Rail Wage and Employee Statistics, Final Report, prepared by Herbert O. Whitten and Associates for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, June 27, 1975. 210 pp., Tabs., 5 App.

> The report reviews two principal sources of railroad wage and employee statistics presently available on computer tape. It analyzes each of the records for adequacy and presents recommendations for use of the data. In addition, other sources for wage statistics and related data are discussed. Portions of this document are not fully legible.

Acknowledgement:
NTIS
PB 248782

RRIS 24 094039
FRA-63504
DOT-FR-55097

Webber, Margo B., and Paul J. McGinley, Recycling Historic Railroad Stations: A Citizen's Manual, prepared by Anderson Notter Finegold, Inc., for the U.S. Department of Transportation. Washington, D.C.: U.S. Government Printing Office, November 1978. 83 pp., Tabs., Figs., Photos., Refs.

> This manual is to assist individuals and local governments interested in undertaking railroad station recycling in their own communities through reports on eight historic stations which have been preserved. The publication discusses basic guidelines for successful projects, and feasibility. The manual raises issues which must be resolved during the reuse process and poses possible solutions to these as they apply to particular types of projects. Potential is also addressed for the inclusion of intermodal transportation centers in recycled stations.

Acknowledgement:
NTIS
PB 80-201163

RRIS 24 196541

_____, Recycling Historic Railroad Stations: A Technical Supplement to the Citizen's Manual (Reuse of Historically and Architecturally Significant Railroad Stations for Transportation and Other Community Needs: Documentation, Analysis, and

Evaluation), Technical Report, prepared by Anderson Notter Finegold, Inc., for the U.S. Department of Transportation. Washington, D.C.: U.S. Government Printing Office, November 1978. 126 pp., Tabs., Figs., Photos., Glossary.

This report provides detailed documentation, analysis and evaluation of eight historic and architecturally significant railroad stations which have been adaptively reused and recycled for transportation and other community uses. Over 20,000 vacant or underutilized railroad stations represent a vast potential for economically viable adaptive reuse projects. This report is a companion to the manual, Recycling Historic Railroad Stations: A Citizen's Manual, and is intended as a technical supplement to the manual. This report is for use by preservationists, architects, developers, planners, government officials and citizen groups who are seriously interested in undertaking railroad station recycling in their own communities. A case study approach is used to present the technical information on the eight reuse examples. Data was collected through a series of extensive on-site visits and interviews with project participants and local officials. Four major areas of study are developed in the report: architectural and rehabilitation design analysis; market and financial strategies; transportation planning; urban revitalization and community participation. The report emphasizes the economic feasibility of adaptive reuse of historic stations while raising issues which must be resolved during the reuse process and posing possible solutions to these issues as they apply to a particular type of project. Potential for inclusion of intermodal transportation centers in recycled stations is also addressed. The report offers many lessons in successful station reuse, including the need for sound financing, sensitive rehabilitation, and local support.

Acknowledgement:
NTIS
PB 80-201171

RRIS 24 196542
DOT-OST-77-002

Wyckoff, D. Daryl, Railroad Management. Lexington, Mass.: Lexington Books, a division of D. C. Heath and Company, 1976. 212 pp., Tabs., Figs., Refs., Glossary.

24 INDUSTRY STRUCTURE AND COMPANY MANAGEMENT

Railroads were the first great organizational innovators of the 19th Century. The adaptive thinking and organizational creativity of that period were the first examples of contingency management theory. Stagnation saw an end of organizational adaptiveness in the first quarter of the 20th Century. The failure of railroad management is more with the system of development and organization than with the managers. Disparity between individual functional groups on railroads has led to a lack of perception of the need for improved coordination between operating and commercial functions. The great need is to redirect many top managers' attitudes to promote integration rather than condone functional jealousy. The author says conventional railroad organization is not particularly suitable for managing a large number of transactions over a geographically dispersed system. Only on lines with long line haul has the problem been concealed. Attempts to use the computer to centralize control have been less than successful and could better be performed by good local managers aided by better information systems. Railroads must be concerned with the transactional nature of their business.

RRIS 24 145135

23 PASSENGER OPERATIONS
COSTS

(See also Economics and specific topics)

Baker, H. S., and M. O. Laughlin, Financial Analysis of the Northeast Corridor Development Project, Volume I: Main Text and Appendixes A Through D, Final Report, prepared by Peat, Marwick, Mitchell & Co. for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, June 1976. 194 pp. including Executive Summary, Tabs., Figs., Exhibits, 4 App.

A high speed passenger rail service between Washington, D.C., and Boston was called for in the Regional Rail Reorganization Act of 1973. Planning for the service has been conducted by the Office of Northeast Corridor Development in the Federal Railroad Administration. Engineering studies were undertaken to develop detailed plans and costs for the required facilities improvements. The report described the development of financial projections for the service. Operating unit costs were estimated. The operating cost estimates were combined with capital costs based on the engineering studies, and with proposed organizational and funding arrangements to develop financial projections. A computer model was developed to produce pro forma cash flow statements, income statements, and balance sheets for future years. Several organization and funding arrangements were tested. The results were measured in net present value and return on investment. Sensitivity analysis was performed.

Acknowledgement:
NTIS
PB 255616

RRIS 23 143017
DOT-TSC-FRA-NCD-7631
DOT-TSC-936

Dyer, T. K., and others, Rail Transit System Cost Study, Final Report, prepared by Thomas K. Dyer, Inc., for the Urban Mass Transportation Administration and the Transportation Systems Center. Washington, D.C.: U.S. Department of Transportation, January 1976. 117 pp., Tabs., Fig., 2 App.

The Transportation Systems Center serves as Systems Manager for the Rail Supporting Technology Program of the Urban Mass Transportation Administration. One task under this program has been to assess the costs of constructing, operating and maintaining

three kinds of urban rail systems: light rail, rapid rail and commuter rail. Cost data from several North American and European transit authorities were collected and analyzed. These data, together with the recent experience of the Consultant in several transit construction projects, served as the basis of the cost projections. Factors influencing appreciable cost variations in construction and operations were reviewed and included as criteria for cost projections.

Acknowledgment:
NTIS
PB 254627

RRIS 23 137313
TA-MA-06-0025-76-3
DOT-TSC-808

Howell, R. P., and others, Northeast Corridor High-Speed Rail Passenger Service Improvement Project: Task 11N - Detailed Physical Plant Improvements and Estimated Costs -- see Industry Structure and Company Management.

Tennyson, Edson L., "Economic Relationships Among Urban Transit Modes," Rail Transit Development, Transportation Research Record 552, pp. 19-30. Tabs., Figs., Refs.

Economic relationships among demand-actuated, scheduled-route, and rapid transit services are examined to determine where the operating economy justifies intensive capital investment in permanent facilities. Analysis of national experience in the more heavily populated urban areas discloses that per capita ridership is much greater in areas served by rapid transit than in areas served only by street transit service, which in turn generates far higher levels of per capita ridership than demand-actuated service. The relationships cover common situations. Unique situations (e.g., New York's unusual costs and densities and San Francisco's experimental technology) are not included. Public acceptance is measured by comparing paid ridership with population and by reference to census data on the percentage of work trips made by transit. A general similarity between the two sources is evident, but rapid transit ridership outside New York is understated because of policies involving free transfers from buses and streetcars to rail transit. This does not

impair city totals, however, in which transfers are not counted as additional trips. Costs are measured by financial records based on the number of vehicles operated. The usual denominator of vehicle miles (kilometers) varies based on speed or slowness, and hourly values vastly understate the cost of service provided only during peak hours when employees must be guaranteed pay for 40 hours/week. The results are empirical but appear to be realistic.

Acknowledgement: RRIS 23 130415
TRB

Wells, John D., and others, Economic Characteristics of the Urban Public Transportation Industry, prepared by the Institute for Defense Analyses for the U.S. Department of Transportation. Washington, D.C.: U.S. Government Printing Office, February 1972. 440 pp., Tabs., Figs., Refs., v. App.

In addition to presenting an overview of the economic conditions in the urban public transit industry as a whole, this project incorporated four papers that investigated separately the economic characteristics of the urban bus, rail rapid, commuter rail, and taxicab industries. Also included were three papers in which an econometric model of urban bus transit was developed, regulatory constraints and their implications were reviewed, and external effects of urban transit operations such as air and noise pollution and accident were analyzed. The analyses tended to be rather general, concluding that demand deficiency, especially for bus transit, was the main cause of the economic difficulties of urban transit systems.

Acknowledgement: RRIS 23 154772
NTIS DOT-OS-10017
PB 265325 DOT/TPI/10-77/09

23 PASSENGER OPERATIONS
FARES AND REVENUE COLLECTION

Brodie, Mary, Automatic Fare Collection, GLC Research Bibliography 94. London: Greater London Council, April 1978. 10 pp., Refs.

This short bibliography provides a selective listing of literature relating to automatic fare, or revenue collection in public transport operations. The arrangement of the data is as follows: general transport operations, buses, rail (general, France, Japan, USA), and the United Kingdom. /TRRL

Acknowledgment:
TRRL (IRRD-236339)

RRIS 23 188324

Diebel, Lawrence, and others, Self-Service Fare Collection, Volume I: Review and Summary, prepared by The Mitre Corporation for the Urban Mass Transportation Administration. Washington, D.C.: U.S. Government Printing Office, 1980 (report date August 1979). 100 pp., Tabs., Refs., 2 App.

Interest in the European system of fare collection for urban transit broadly known as Self-Service Fare Collection (SSFC) has been growing in the U.S. The European experience indicates the SSFC promotes greater operating efficiency and improved service delivery. The common features of SSFC -- self-monitoring, fare payment, receipts, ticket inspection and penalties -- represent substantial departures from the current operating procedures and existing legal powers of U.S. transit systems. This 4-volume study, sponsored by the Urban Mass Transportation Administration, discusses the European SSFC system and the relative merits of the alternative approaches to self-service with respect to their application in the United States. Volume 1 of this study describes the European approach to and rationale for self-service fare collection; documents the experience European transit systems have had with using and enforcing these procedures; and discusses the relative merits of the alternative approaches to self-service with respect to their application in the United States. Volume II summarizes the information obtained from eleven European transit properties and one Canadian property. Volume III describes the equipment commonly used to support self-service operations in Europe and

discusses the policy and design options which are presented during the selection and specification of equipment for self-service operations. Volume IV summarizes the legal issues of self-service operations in the U.S. transit environment; it also addresses labor, economic, liability, and accessibility issues of self-service in U.S. applications. (FHWA)

The 4 volumes of the Self-Service Fare Collection Study are titled, sequentially: Review and Summary (UMTA-VA-06-0049-79-1); Survey of European Transit Properties (UMTA-VA-06-0049-79-3); Hardware Considerations (UMTA-VA-06-0049-79-4); and Legal and Labor Issues (UMTA-VA-06-0049-79-5).

Acknowledgment:
NTIS
PB 80 132244

RRIS 12 309526
MTR-79W0087 01
UMTA-VA-06-0049-79-2
DOT-UT-800047

Eisele, Donald O., "Zone Theory of Suburban Rail Transit Operations: Revisited," Traffic Quarterly, 32, no. 1 (January 1978), 5-22. Tabs., Figs., Refs.

Zone theory discussed deals primarily with the scheduling of trains. In combination the zone train schedules and zone fares affect most aspects of railroad operations and planning, including crew schedules and the use of railroad equipment, track, and manpower. The zonal concept of train operations applies to highly patronized suburban transit systems operated over the multitracked route of a heavy-duty main-line railroad. The basic theory has been tested and found to produce improvements.

Acknowledgment:
EI

RRIS 23 177165

Maruyama, Hiroshi, and Nobuo Kageyama, "Ticket Issuing and Inspection System in JNR," Railway Technical Research Institute Quarterly Reports, 17, no. 2 (1976), 49-53. Tab., Fig., Photos.

23 PASSENGER OPERATIONS
FARES AND REVENUE COLLECTION

RTRI of JNR has developed various types of ticket issuing and inspection machines, such as ticket vending machine, printing/issuing machine, data collecting machine and automatic ticket inspection gate. For the automatic ticket inspection system, RTRI also developed a standard ticket testing device which is very useful not only for JNR but also for private railways. These developments must, in parallel with technological progress, reflect the trends of human society and must adapt to new kinds of software.

Acknowledgment: RRIS 23 142258
Railway Technical Research Institute

Segelhorst, Elbert William, "Fare Structure of Commuter Railroads and Traffic Congestion in the Central City" -- see Economics.

23 PASSENGER OPERATIONS
INTERMODAL INTEGRATION

(See also Passenger Operations/Planning/Stations and Terminals)

Bailey, S. Stuart, and Harry T. Dimitriou, "The Commuter and 'Park and Ride'," Traffic Quarterly, 26, no. 4 (October 1972), 561-73. Tabs., Figs., Refs.

Intermodal transfer at a railway station for the trip to work originated when the vehicle was not a car but a horse. However, it is only in the last few years that park-and-ride accomodations have figured in modal split models. Six such models are reviewed from the standpoint of how they provide for park-and-ride as elements of the two most important factors in determining modal choice, viz., relative travel costs and relative travel time. In sum, it is suggested that the choice of park-and-ride over the car is a function of six variables: a time advantage over car use, a minimum of excess travel time, a cost advantage over car use, an acceptable level of comfort, a level of accessibility to the central area at least as good as that of the car, and adequate parking provision at associated interchange stations. In addition, a comparative analysis is reported of park-and-ride schemes in Chicago, Cleveland, Boston, Toronto, Copenhagen, London, and Glasgow. The stations studied exemplify three cases: park-and-ride has developed incidentally to an existing station and constitutes a small fraction of the ridership, it has developed incidentally and forms a large percentage of patrons, and it has been planned for in station development.

RRIS 23 050893

Bates, Edward G., Jr., "A Study of Passenger Transfer Facilities," (Abridgement), Planning and Design of Rapid Transit Facilities, Transportation Research Record 662, pp. 23-25. Washington, D.C.: Transportation Research Board, 1978. Tab.

Throughout the country, a considerable effort is being made to improve public transit. However, one element of the total transit system which has not been studied at any level of detail and which has not improved to any great extent is the passenger transfer facility. The success of transit is going

to depend on improvements made to all segments of the system, including safe, convenient transfer facilities. This study includes an inventory of facilities in some larger communities in New England, and a classification of facilities by size of area served and extent of system. According to an attitude survey, transit operators see a need for improved transfer facilities, minimized transfer times, and provision of shelters. The survey showed that pulsating systems had the highest number of transfers, averaging 27 percent; while transfers on nonpulsating systems generally averaged about 6 percent. The study concludes that transfer facilities must be improved to make transit more efficient and to encourage usage. /Author/

Acknowledgment: RRIS 23 178746
TRB

Howard, W. T., "GO Transit: A New Approach to Urban Transportation," Mass Transportation: Application of Current Technology, Highway Research Record 415, pp. 1-3. Washington, D.C.: Highway Research Board, 1972.

This paper describes the three-phase introduction of GO transit in the Toronto metropolitan region ("GO" stands for government of Ontario). The Metropolitan Toronto and Region Transportation Study considered using existing regional rail facilities to supplement highways, particularly for commuter traffic. In 1965 the provincial government approved commuter rail service between Oakville and Pickering. Canadian National Railways agreed to run the day-to-day operations, while the government specified the type of service, fares, schedules, and other policies; supplied the capital; paid the operating costs; and received the revenues. Phase I service began in May 1967 with 54 streamlined aluminum coaches, nine self-propelled commuter cars, and eight 3,000 hp diesel-electric locomotives. The 85-foot long cars seat 94 passengers. An extensive promotional campaign was largely responsible for the immediate success of the system, which in less than a year exceeded its estimate daily patronage of 15,000 passengers by 5,000. The 12 stations have 4,400 free parking spaces, which quickly became overcrowded,

leading to Phase II, in which an experimental dial-a-ride feeder bus service was inaugurated in a well-defined community with no previous bus service. The many-to-one system began in July 1970, with arrival and departure patterns geared to the daily, Sunday peak, and off-peak schedules of the rail line. A many-to-many service was initiated in February 1971.

RRIS 23 050898

Leake, G. R., and M. Read, "The Potential of Feeder Bus Sytems Serving Commuter Rail Stations," Traffic Engineering and Control, 20, no.2 (February 1979), 52-58. Tabs., Figs., Refs.

The authors conclude that feeder bus services to railway stations are capable of making a useful contribution to the efficiency of the transport system in travel corridors such as Crosby-Central Liverpool. Most of the benefits to travellers can be achieved at low cost, and thus the results suggest that feeder bus services may be expected to provide an effective short-term measure for reducing congestion on the major arteries into large conurbations and improving the efficiency of public transport operations, particularly when supplemented by increased restraint on car usage through higher parking charges.(a) /TRRL/

Acknowledgment:
TRRL

RRIS 23 194867

Lockwood, Stephen C., and Warren D. Weber, "Multimodal Intercity Corridor Study: The Sacramento-Stockton-San Francisco Bay Area Corridor," High Speed Ground Transportation Journal, 9, no. 3 (Fall 1975), 115-50. Tabs., Figs.

Intercity travel is a growing problem in California. In the face of rising energy costs, congestion and environmental impacts associated with highway-dominated regional growth, the need for a service alternative to the automobile is apparent. The Sacramento-Stockton-San Francisco Bay Area Corridor Study is searching for a viable intercity public transportation improvement program sensitive to the

transportation, economic, and environmental characteristics of the study area. Conventional and advanced technologies were examined which combined modal alternatives with routes, stops, feeder-distribution service, and variable operating and pricing policies. These combinations were evaluated in respect to potential demand, capital and operating costs, level of service, revenue, and nonuser impacts under a variety of fare, service, and subsidy assumptions. Improved express bus service, closely integrated with local transit, offers immediate action opportunities. A staged program of rail-based improvements, starting with operating conventional equipment on existing tracks mixed with freight and evolving into a turbine train operation on new track, offers a middle range possibility with a higher level of service at a moderate cost. Short-haul air service with improved airport access will also have a role in the corridor. Its full potential requires a demonstration program. Extending Bay Area Rapid Transit at a high cost offers no major advantage over cheaper rail solutions. Tracked Levitated Vehicle technology is not available for decision-making; however, future options should be preserved. Major findings indicate the importance of close ties to existing local urban transit for feeder/distribution service. New demand-responsive local feeder service will have an even more dramatic effect on patronage in the long-run. The increasing attractiveness of intercity transit service is directly related to increasing gas prices and lower highway speed limits as well as moderate fares and a high frequency of transit service. Denser development patterns also improve transit viability. The energy utilization and pollution output of each alternative was compared with their automobile equivalent with results substantially favoring the transit alternatives. Noise and visual disruption to communities was also studied, as well as the ecological impacts associated with construction. Using existing transportation rights-of-way for the new alternatives has kept these impacts to a minimum.

Acknowledgment: RRIS 23 131034
High Speed Ground Transportation Journal

Tri-State Transportation Commission, Park and Ride Rail Service-Jersey Avenue Station, New Brunswick, N.J. (cover -- Park 'N Ride Rail Service: New Brunswick-Newark-New York City). New York: Tri-State Transportation Commission, May 1967. v.p., Tabs., Figs., Photos., Refs., 1 App.

A mass transportation demonstration project at New Brunswick, N.J. was designed to test whether a new railroad station at the outskirts of a developed suburban community would attract new patrons to an existing carrier and, at the same time, divert passengers from the suburban city center station, thereby relieving local vehicular traffic congestion. Results of the experiment revealed that an outlying station with ample parking space will attract new patrons to rail service, but its attraction will be limited by the availability of direct, convenient auto access routes from surrounding residential areas. The extent to which an outlying station, even with free parking, will attract passengers away from the suburban city center station is conditioned by the frequency of train service at the outlying station as contrasted with the center station.

Acknowledgment:
UMTA
PB 174740

RRIS 23 044181
2038-5110-2M

Wirasinghe, S. Chandana, Vanolin F. Hurdle, and Gordon F. Newell, "Optimal Parameters for a Coordinated Rail and Bus Transit System," Transportation Science, 11, no. 4 (November 1977), 359-74. Tabs., Figs., Refs.

To formulate a mathematical model of the system it is assumed that a radiocentric regional highway network centered at the central business district exists. Railroad lines are assumed to be radial. The demand for public transit is assumed to be deterministic and to vary slowly with location. The optimization is accomplished mainly by the use of basic calculus in conjunction with continuum approximations of certain discrete parameters. Approximate, but simple and explicit, formulations for the

optimal railroad interstation spacings, feeder-bus zone boundary and train headways are determined.

Acknowledgment: RRIS 23 180375
EI

Wirasinghe, Sumedha Chandana, "A Model of a Coordinated Rail and Bus Transit System" (unpublished Doctor's thesis, University of California, Berkeley, 1976).

A mathematical model is formulated for a coordinated rail and bus transit system. Assumptions are that a radiocentric regional highway network centers at the CBD, railway lines are radial, and the demand is known, deterministic, and varies slowly with location. Optimal feeder-bus-service zone, railway interstation spacings, bus-service shed areas, and transit vehicle headways are determined and analyzed. Numerical examples are presented, as is the application of a one-dimensional version of the model to the San Francisco Peninsula Commuter Railway service.

23 PASSENGER OPERATIONS
LEVEL OF SERVICE

(See also Passenger Operations/Planning)

Arnlund, R. C., and others, Northeast Corridor High-Speed Rail Passenger Service Improvement Program -- see Economics.

Bergmann, Dietrich R., "Joint Use of Railway Facilities by Freight and Metropolitan Transit Services," Transportation Engineering Journal of ASCE, 103, no. TE1 (January 1977), 157-71. Tabs., Figs., Refs., 1 App.

The use of existing railway trackage by prospective metropolitan rail transit services involves a much lower construction cost than required when the public transportation services are to be operated on new trackage, even when the new rail transit trackage occupies the right-of-way on which the existing trackage is situated. Several operational problems associated with joint usage of existing railway trackage on the San Francisco Peninsula by both freight and public transportation services are identified. The procedures that are suggested for their resolution could be applied in other metropolitan areas as well.

Acknowledgment: ASCE

RRIS 23 149377

Charles River Associates Incorporated, Operator Guidelines for Transfer Policy Design, Final Report, prepared for the Transportation Systems Center. Boston, Mass.: Charles River Associates Incorporated, June 1980. 115 pp., Tabs.

This report offers guidelines to aid transit operators in the design of transfer policies. Transfer policies involve vehicle routing and scheduling, transfer charges, information for passengers, and terminal facilities affecting the movement of passengers between transit vehicles (bus and/or rail) as part of a continuing trip. Various policy options are introduced. These include routing, scheduling, pricing, and information options. The demand-side consequences of these options is

addressed, as are the cost consequences. The final chapter covers the transfer policy design itself.

CRA #388.02
UMTA-MA-06-0049-80-12

_____, State of the Art of Current Practices for Transit Transfers, Final Report, prepared for the Transportation Systems Center. Boston, Mass.: Charles River Associates Incorporated, June 1980. 291 pp., Tabs., Figs., Refs., 1 App.

This study deals with the cost, ridership, revenue, and user satisfaction consequences of alternative transit transfer policies. Transfer policies involve vehicle routing and scheduling, transfer charges, information for passengers, and terminal facilities affecting the movement of passengers between transit vehicles (bus and/or rail) as part of a continuing trip. The study describes and summarizes the transfer policies currently in use on U.S. transit properties, identifies why particular policies are used or not used, determines the consequences of alternative policies in different settings, and determines settings in which particular policies can be beneficial.

CRA #388.02
UMTA-MA-06-0049-80-13

Eisele, Donald O., "Zone Theory of Suburban Rail Transit Operations: Revisited," -- see Passenger Operations/Fares and Revenue Collection.

Koffman, J. L., "Determining Train Performance," Rail Engineering International, 3, no. 8 (October 1973) 350-53. Figs., Refs.

Rapid evaluation and determination of train performance reliability is more than ever important with tight headways and intensive operation of train services in peak hours. Taking into consideration weight of rolling stock, acceleration and stopping

distances, output is mathematically assessed against a practical operating background.

Acknowledgment: RRIS 21 050885
Rail Engineering International

Reiner, Martin Allen, "Three Types of Institutional Arrangements That Are Improving Commuter Railroad Passenger Service" -- see Industry Structure and Company Management.

Tri-State Regional Planning Commission, Reliability Characteristics of Rail Service in the Tri-State Region, Interim Technical Report 2126. New York: Tri-State Regional Planning Commission, October 1978.

Investigation and averaging of the available data shows that rail service reliability can be adequately quantified utilizing on-time performance annullment rates. Average on-time performance has improved in recent years in the Tri-State region. Reliability is subject to seasonal variations. Analysis of data seems to indicate penalties may tend to improve performance. Continuous monitoring of regional rail system reliability is feasible and should be incorporated into Tri-State's program.

Wycoff, D. Daryl, Railroad Management -- see Industry Structure and Company Management.

23 PASSENGER OPERATIONS
MARKETING

Aminian, Hamid, and Dennis Lynch, Commuter Rail Improvement Program -- Passenger Needs Survey Results, CTPS Technical Report 4, prepared by the Central Transportation Planning Staff for the U.S. Department of Transportation. Boston, Mass.: Central Transportation Planning Staff, June 1978. 37 pp., Tabs., Figs., 5 App.

A November 1976 survey of all 28,500 Boston rail commuters produced a 54 percent response. The purposes were development of travel forecast projections along all commuter rail corridors and to identify socioeconomic characteristics of current commuter rail users in the study area.

RRIS 23 188170

California Department of Transportation, Division of Mass Transportation, Amtrak San Diegan Passenger Survey. Sacramento, Calif.: California Department of Transportation, June 1979. 41 pp., Tabs., Figs., 3 App.

This report presents the results of an on-board passenger survey taken on the Amtrak San Diegans during the week of June 7-13, 1979. The purpose of this survey was to expand the ridership data base and allow for comparative analysis with earlier passenger surveys. The findings in this report are consistent with other surveys that have been conducted for marketing purposes in this rail corridor. Consistency with earlier studies suggests the data has a certain degree of reliability. The report is a summary of the more obvious highlights gleaned from various cross tabulations (comparisons) of survey data and an appendix containing a complete documentation of findings.

_____, Market Study for an Upgraded Peninsula Rail Service from San Francisco to South San Jose, Phase I (cover title - Peninsula Commuter Market Characteristics - Appendix, Part 2) Sacramento, Calif.: California Department of Transportation, n.d. 46 pp., Tabs., Figs., Refs., 1 App.

The purpose of this study is to determine the potential market for an upgraded Southern Pacific Peninsula rail service. The study identifies the

potential market and its characteristics through travel characteristics of the entire transportation system, major trip attractors and generators, population concentrations, and peaking characteristics of the existing transportation system.

_____, The San Diegans: An Analysis of Passenger Rail Service Between Los Angeles and San Diego (cover title - The San Diegan Service: An Analysis of Passenger Rail Service Between Los Angeles & San Diego), DMT 056. Sacramento, Calif.: California Department of Transportation, January 1980. 38 pp., Tabs., Figs., 1 App.

Item 161 of the 1979-80 California State Budget requires the Department to report on the San Diego-Los Angeles rail passenger services. This report responds to that requirement and includes as much of the detailed analyses as was possible. The report contains a comparison of the San Diegans to other Amtrak trains using Fiscal Year 1977 Amtrak data.

Colman, Steven B., and Mark (T.) Weinberger, San Diegan Passenger Profile: A Study of the Demographic and Travel Characteristics of Rail Passengers, Technical Report, prepared by Colman-Friedman Associates for the Division of Mass Transportation, California Department of Transportation. Sacramento, Calif.: California Department of Transportation, July 1977. 41 pp., Tabs., Figs., 4 App.

This report presents the results of a survey of railroad passengers using the intercity service in the San Diego/Los Angeles corridor. The survey was administered in April 1977 and covers the demographic and travel characteristics of passengers. Among the major findings were that the general market area served by the San Diegan trains has expanded since the inception of additional service sponsored by Caltrans. There are indications that passengers are relatively more sensitive to service frequency than to line-haul time. "Word of mouth" advertising played a very important role in getting new passengers to try the train, while those having an unfavorable first trip appear unlikely to use

the train again. In general, passengers have a very favorable opinion of the rail service in the corridor.

Drossler Research Corporation, SP Market Survey (cover title - Peninsula Commuter Opinion Survey, Appendix, Part 3), prepared for Caltrans (California Department of Transportation). San Francisco: Drossler Research Corp., July/August 1978. 48 pp., Tabs., 2 App.

This study reports on a survey addressing the attitudes of persons that are currently the heart of SP's potential commuter market -- workers travelling northbound (en route to the job) 10 miles or farther living in areas within five miles or less of an SP station.

Eberle, William R., "System Optimization with Differing Demands for Service," High Speed Ground Transportation Journal, 9, no. 1 (Spring 1975), 407-16. Tab., Figs., Refs.

For a given objective function which can be used for a system serving a single demand point, this paper defines a technique by which that objective function can be used to define an aggregate objective function for optimizing a system which is required to serve several different demand points. The objective function is defined for conditions under which demand is inelastic and all costs incurred by a group of users representing a single demand point must be paid by that group of users. The second condition is the same as the first, but with elastic demand. For the third condition, the problem of cross-subsidization among various users of the system is considered. The demand is considered to be elastic. Examples of the use of the technique for a commuter railroad are presented. In the examples, the objective function is the user cost where the cost includes fare, travel time, and the cost of inconvenience due to lack of service frequency.

Acknowledgment: RRIS 23 095252
EI

Eisele, Donald O., Discussion of "Schedule Planning and Timetable Construction for Commuter Railroad Operations," by Edward K. Morlock and Hugo L. Vandersypen (August 1973), Transportation Engineering Journal of ASCE, 100, no. TE3 (August 1974), 785-87. Refs.

See abstract under Morlock, Edward K., and Hugo L. Vandersypen.

Hensher, David A., "The Value of Commuter Travel Time Savings," Journal of Transport Economics and Policy, 10, no. 2 (May 1976), 167-76. Tabs., Fig., Refs.

The author attempts to define the value attached to savings in travel time by travellers at the marginal moment when this savings compels them to change their usual mode of transport. From statistical data collected in Sydney in 1971, he prepares tables giving the hourly values of the time saved, calculated by means of a mathematical model for several trip lengths, amounts of time saved and annual incomes. He recognises that this value decreases with the time saved and the trip length; he introduces a notion of thresh-hold, under which the amount of time saved is not felt and discusses these results.

Acknowledgments: RRIS 23 148611
International Union of Railways and
Journal of Transport Economics and Policy

McDonough, Carol C., "The Demand for Commuter Rail Transport," Journal of Transport Economics and Policy, 7, no. 2 (May 1973), 134-43. Tabs., Refs.

The study focuses on the short-run market demand for commuter rail service. In the short run, the total market demand for transport can be assumed constant, because there is insufficient time to adjust locational factors such as employment and residence that determine one's transport needs. Empirical evidence was obtained from the Boston area. Methodologically: (1) a theory of consumer demand for commuter

rail transport is developed; (2) a model of market demand is developed; and (3) the results of least squares regression estimation of the parameters of the demand equation are presented and evaluated. The strong significance of the income and relative travel time variables suggests that rail demand is most sensitive to changes in time cost, whether these changes result from changes in travel time or in the opportunity cost of this time. Moreover, commuters tend to place greater emphasis on time-minimization for peak-hour trips, which are generally work trips, than on the more occasional, leisure-oriented, off-peak trip. Evidences of this are the signs on the income coefficients, which suggest a higher opportunity cost for peak time, and the comparatively greater magnitudes of the peak relative travel time coefficients. Thus attempts to divert auto commuters to rail transport by decreasing rail travel time should have a higher probability of success during the peak period, when in fact there is greater traffic congestion. Within the higher income range, where presumably private transport is used for the home-station trip, higher income levels are associated with increased rail demand. The middle-income commuter may opt for auto commutation, not because he judges rail transport to be unsatisfactory, but because, given his valuation of time, auto transport has a comparatively low total cost. If this interpretation is correct, the reduction of home-station travel time through the provision of efficient public transit to and from suburban rail stations should tend to increase rail demand.

Acknowledgment: RRIS 23 054760
Journal of Transport Economics and Policy

Morlock, Edward K., and Hugo L. Vandersypen, "Schedule Planning and Timetable Construction for Commuter Railroad Operation," Transportation Engineering Journal of ASCE, 99, no. TE3 (August 1973), 627-36. Figs., Refs.

This paper describes a set of techniques developed to assist in planning the operations of a commuter railroad and similar types of public transport.

Computer models are used for generating information and processing data with the planner making the value judgment decisions regarding the degree to which various objectives are achieved. The method attempts to balance the objectives of the user (travel time and comfort), the system operator (operating cost), and the owner-financier (capital investment). The first portion of the method deals with schedule planning, in which the overall trade offs between quality of service and costs are addressed, and the general plan of operations (such as whether or not to include express service) is developed. Once the general plan has been (tentatively) set, then the detailed construction of a specific timetable, including equipment and crew assignments, is addressed.

Acknowledgment: RRIS 23 071767
ASCE

Northwestern Indiana Regional Planning Commission, Economic Adjustment Study: Chicago South Shore and South Bend Railroad Corridor -- see Economics.

O'Donahoe G. Gerald, and Barbara L. Kemp, Market Research and the Northeast Corridor Program, prepared by Harbridge House, Inc., for the Transportation Systems Center. Washington, D.C.: U.S. Department of Transportation, March 1975. 69 pp., Refs., 1 App.

The report presents a review of selected sources of market research data on intercity passenger transportation in the Northeast Corridor. Available data are reviewed in terms of their usefulness in forecasting patronage of improved rail passenger services, and understanding rail ridership and the process of change in rail ridership. Recommendations are made with respect to use, further analysis, and presentation of existing data, as well as the need for additional, new market research.

Acknowledgment: RRIS 23 143965
NTIS FRA/NECPO-76/17
PB 257411 DOT-TSC-937

23 PASSENGER OPERATIONS
MARKETING

Prokopy, J. C., and D. E. Ruina, Demand Projections for the Northeast Corridor: Financial Analysis, Final Report, prepared by Peat, Marwick, Mitchell & Co. for the Transportation Systems Center and the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, June 1976. 84 pp., Tabs., Figs., Refs., 3 App.

The report describes the development and results of intercity travel demand projections by city-pair prepared for the Northeast Corridor financial analysis. In addition associated analyses of projected passenger volumes by station and of selected alternative station sites are included. The report first presents the methodology used both to develop projections of total travel by all modes for each city-pair and to assess the rail share of the total. Next, the development of the travel and socioeconomic data base is discussed. The assumptions and sources used for calibration and projection data sets are given, including travel patterns, travel impedances, and population and income information for each city-pair. Two basic rail alternatives were analyzed: rail service would remain unchanged for 1974 service levels; and the Northeast Corridor Development Program would be implemented by 1982. Finally, the potential benefits of additional service to new or additional suburban station sites north of Philadelphia and New York City are examined.

Acknowledgment:
NTIS
PB 255851

RRIS 23 143189
DOT-TSC-FRA-NCD-76-4
DOT-TSC-936

Rosenbluh, Arnold, "Travel Patterns of Suburban Rail Users," CATS Research News, 15, no. 4 (December 1973), 8-21. Figs.

This is the Chicago Area Transportation Study 230.

RRIS 052110

Salzborn, Franz J. M., "Timetables for a Suburban Rail Transit System," Transportation Science, 3, no. 4 (November 1969), 297-316. Tabs., Figs., Refs.

A scientific method for the construction of timetables for a suburban railroad line without branches is developed. It is shown that such timetables are largely determined by stop-schedules. Two criteria for stopschedules have been considered -- the number of intermediate passenger stops and the number of carriage miles. A mathematical formulation is presented and it is shown that the problems of finding optimal stop-schedules can be solved with dynamic programming. Zone-stop-schedules have received special attention.

Acknowledgment: RRIS 23 037161
EI

Sokolsky, S., Northeast Corridor High Speed Rail System Patronage Analysis, Final Report on First Phase, prepared by The Aerospace Corporation for the Transportation Systems Center and the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, April 1975. 70 pp., Tabs., Figs.

A high speed passenger rail service between Washington, D.C., and Boston was called for in the Regional Rail Reorganization Act of 1973. Planning for the service has been conducted by the Office of Northeast Corridor Development in the Federal Railroad Administration. Engineering studies were undertaken to develop detailed plans and costs for the required facilities improvements. This report provides a program overview, an arena description, a high speed rail system patronage, Northeast Corridor improvement options, high speed rail system improvement options, patronage elasticities, and projections for 1982 and 1990.

Acknowledgment: RRIS 23 143964
NTIS FRA/NECPO-76/16
PB 257410 DOT-TSC-936

Southeastern Pennsylvania Transportation Authority, Commuter Railroad Service Improvements for a Metropolitan Area -- SEPACT I, Final Report, prepared for the Urban Mass Transportation Administration. Philadelphia, Pa.: Southeastern

23 PASSENGER OPERATIONS
MARKETING

Pennsylvania Transportation Authority, April 1, 1969. 146 pp., Tabs., Figs., Photos., Refs.

The objectives were to: (1) produce transportation findings applicable to other metropolitan areas faced with similar problems; (2) demonstrate the effectiveness of improved service and reduced fares in reversing the ridership decline on commuter railroads; (3) relieve traffic congestion on parts of the regions's highway network; (4) demonstrate the efficiency of a regional approach to common problems. Sepact I encompassed a combined program of improved service and reduced fares on the Reading Company's North Penn-Hatboro lines and that portion to and from Levittown, of the Pennsylvania Railroad's Philadelphia-New York mainline. The program ran for three years and cost approximately 4.7 million dollars. The program included increased service, fare reductions, new equipment, parking improvements, bus-train transfers, and promotion, publicity and information. The project planning and implementation point out the allocation of responsibilities and special problems affecting the demonstration project. The demonstration helped the southeastern Pennsylvania region retain and improve service on a significant portion of its vital commuter rail network, and brought tangible benefits to commuters in a large portion of the Philadelphia market area.

Acknowledgment:
UMTA
PB 197346

RRIS 23 044193
PA-MTD-1
UMTA-PA-MTD-1-69

_____, SEPACT III Final Report: Operation Reading, Final Report, prepared for the Urban Mass Transportation Administration. Philadelphia, Pa.: Southeastern Pennsylvania Transportation Authority, June 1971. 105 pp., Tabs., Figs., Photos., Refs.

The project was designed to develop and test techniques for the restructuring of commuter railroad service in the Philadelphia metropolitan area. Each phase of the experiment tested the relationship between various levels of service, fare structures, and ridership. In some cases off-peak service was increased, in others the total number of trains was

reduced. These fluctuations were accompanied by variations in fares, the provision of special passes, and heavy promotional campaigns. Comprehensive surveys were conducted to measure ridership preferences, trip characteristics, and volume. Four general conclusions were yielded by the analysis: (1) Increased service and higher fares were more effective in reducing operating deficits than decreased service and lower fares. (2) Where service was substantially improved, new ridership was attracted and paid higher fares as well. (3) Greater equipment efficiency resulted in significant reductions in operating cost, thus recommending greater emphasis on capital improvement. (4) The general market for rail service, including commuters, varied substantially over time. It is concluded that rail commuter service was demonstrated to be a viable and integral part of urban transportation, and that, further, levels of service and passenger fares could be provided to ensure profitable operation.

Acknowledgment:
UMTA
PB 204065

RRIS 23 044191
PA-MTD-5
UMTA-PA-MTD-5-71-1

_____, SEPACT II Final Report: A Study of the 1975 Commuter Railroad System in the Southeastern Pennsylvania Metropolitan Region, Final Report, prepared for the Urban Mass Transportation Administration. Philadelphia, Pa.: Southeastern Pennsylvania Transportation Authority, January 1971. 133 pps., Tabs., Figs., Refs., 6 App.

Present commuter railroad lines are operated by the Penn Central Company and the Reading Company under agreements with the Southeastern Pennsylvania Tranportation Authority. The general terms of the agreements between SEPTA and each railroad cover: (1) fare structure, (2) on-time performance, (3) equipment availability and utilization, (4) car cleanliness, (5) station maintenance and cleanliness, (6) parking facility maintenance, (7) management computer operations, and (8) advertising and public relations. An action program is developed to maximize rail patronage, principally by increasing the attractions of commuter rail travel compared to

automobile travel and thereby increasing the absolute number and the proportion of trips made by rail. To the extent that the number of peak period trains permits, zone scheduling is recommended. This concept involves division of a particular line into zones or groups of consecutive stations, with each train serving substantially only one zone. Direct service between downtown Philadelphia and each zone would thus be provided.

Acknowledgment:
UMTA
PB 200133

RRIS 23 044192
PA-MTD-4
UMTA-PA-MTD-4-71

Transmark, Northeast Corridor High Speed Rail Passenger Service Improvement Program. Final Marketing Report for the Northeast Corridor Rail Passenger Demonstration-Technical Appendix, Final Report, prepared for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, April 1976. 68 pp., Tabs., Figs.,

The report evaluates the likely passenger market affected by the offering of improved rail service in the Northeast Corridor, and develops recommendations for marketing strategies intended to enhance patronage growth. See also PB-255017.

Acknowledgment:
NTIS
PB 255018

RRIS 23 137369
FRA/NECPO-76/07-2
DOT-FR-55048

Tri-State Transportation Commission, Suburban Service Adjustment Experiment (Harlem Divison -- New York Central Railroad. Westchester and Putnam Counties), Final Report, prepared for the Mass Transportation Demonstration Grant Project, U.S. Department of Housing and Urban Development. New York: Tri-State Transportation Commission, November 1967. 75 pp., Tabs., Figs., Photos., 4 App.

The effectiveness of commuter rail line changes (faster scheduling, more frequent service, and expanded parking facilities) is analyzed for a mass transportation demonstration project in New York State.

Acknowledgment:
NTIS
PB 210929

RRIS 23 037114
6407-6610

Whitten, H. O., Northeast Corridor Travel Survey: 1968-1971, Final Report, prepared by Herbert O. Whitten & Associates for the Transportation Systems Center and the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, January 1974. 252 pp., Tabs., Figs.

The Northeast Corridor Travel Survey was conducted by the U.S. Census Bureau for the Federal Railroad Administration to determine the impact of High Speed Rail Demonstration Projects operated between Washington-New York and New York-Boston. This report publishes data from that survey on travel by members of households residing in the Northeast Corridor for the years 1968-1971. Profiles and indices were prepared which compare person-trip information within the Northeast Corridor. Specific travel markets within the corridor were analyzed for growth trends and shifts resulting from the improved high speed rail transportation. Data were summarized, analyzed, and displayed in appropriate tables within this report.

Acknowledgment:
FRA
PB 229668

RRIS 23 071937
DOT-TSC-FRA-73-14
DOT-TSC-725

Yates, Winnie, Amtrak San Diegan Passenger Survey, DMT 052, prepared by the Marketing Branch, Division of Mass Transportation, California Department of Transportation. Sacramento, Calif.: California Department of Transportation, February 1979. 51 pp., Tabs., Figs., 2 App.

This document reports the results of a survey of passengers on the "San Diegans," passenger train service between San Diego and Los Angeles. The purpose of the survey was to develop data on which to recommend improvements for the service.

_____, Southern Pacific Transportation Company - Train User Study (cover title - Peninsula Commuter On-Board Survey:

23 PASSENGER OPERATIONS
MARKETING

Appendix, Part 1 or User Survey: San Francisco - San Jose Rail Commute Service), prepared by the Marketing Branch, Division of Mass Transportation, California Department of Transportation and the California Public Utilities Commission. Sacramento, Calif.: California Department of Transportation, April 1978. 25 pp., Tabs., Figs., 1 App.

On May 9, 1977 the Southern Pacific Transportation Company filed an application with the California Public Utilities Commission seeking authority to discontinue all operation of passenger trains between San Francisco and San Jose and intermediate points. By memorandum of September 20, 1977 from the Public Utilities Commission to the Department of Transportation (Caltrans), Caltrans was requested to provide assistance in the preparation of an origin and destination census of the San Jose-San Francisco commute service train riders. The purpose of the survey was to assist the Public Utilities Commission in developing recommended service improvements for the commute operation.

23 PASSENGER OPERATIONS PLANNING

(See also Government Policy, Planning, and Regulation; Passenger Operations/Marketing; and specific areas of interest)

The Aerospace Corporation, Energy and Transportation Division, Northeast Corridor Passenger Rail System Options, prepared for the Transportation Systems Center and the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, December 5 or 15, 1975. 40 pp., Tabs., Figs.

A high speed passenger rail service between Washington, D.C. and Boston was called for in the Regional Rail Reorganization Act of 1973. Planning for the service has been conducted by the Office of Northeast Corridor Development in the Federal Railroad Administration. Engineering studies were undertaken to develop detailed plans and costs for the required facilities improvements. This report identifies rail system options in an unimproved NEC Arena, projects patronage of selected alternatives, studies model transportation in 12 NEC city-pairs as projected to 1982, considers fare and scheduling variations, utilizes newly developed modal split computer program for selected city-pairs, estimates arena-wide patronage by means of developed expansion factors, and evaluates sensitivity to fare level and schedule patterns.

Acknowledgement:
NTIS
PB 257408

RRIS 23 143962
FRA/NECPO-76/14
DOT-TSC-936

_____, Northeast Corridor Passenger Transportation Data Study, Final Report, prepared for the Transportation Systems Center and the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, August, 1976. 111 pp., Tabs., Figs., Refs., 3 App.

Fourteen measures of performance are recommended for use in Northeast Corridor rail system evaluation and multimodal comparisons. These include performance measures in the categories of system configuration (e.g., daily available-seat miles by vehicle and segment), system performance (e.g., load factor by vehicle and segment) and system economics (e.g., cost per revenue-passenger mile by vehicle and segment). Although current data reported by

certificated air carriers and participating passenger railroads are not entirely consistent, sufficient data exist to permit effective intra- and inter-modal evaluation and comparison. Certain disaggregation or allocation algorithms are recommended in some cases, however, to obtain travel segment data at the suggested aggregation level and frequency. (Portions of this document are not fully legible.) See also PB-258179.

Acknowledgement:
NTIS
PB 259264

RRIS 23 145554
FRA/NECPO-76/09
DOT-TSC-FRA-76-20
DOT-TJC-FRA-76-22

Baecker, Ronald M., and Thomas R. Horsley, "Computer-Animated Simulation Models: A Tool for Transportation Planning," Mode-Change Facilities, Transportation Research Record 557, pp. 33-44. Washington, D.C.: Transportation Research Board, 1975. Figs., Refs.

The role of computer animation in visualizing the behavior of simulation models of complex processes and systems is described. The results of a demonstration project applying this technique to transportation planning are reported and analyzed. The study involved the modeling and display of passenger flow in a subway station. It was carried out by using SIMULOGO, a new discrete-event simulation language, and ZAPP, a new computer animation system, which are discussed in the paper. Planned extensions and elaborations of these facilities to provide a comprehensive and responsive environment for transportation systems modeling are outlined.

Acknowledgement:
TRB

RRIS 23 130770

Barker, William G., A Simulation of Commuter Rail Possibilities, Informal Paper Series 3. Arlington, Tex.: North Central Texas Council of Governments, July 1977. 32 pp., Figs., Refs.

A simple model of commuter rail line supply and demand characteristics is discussed. By varying assumptions and the nature of the rail service pro-

posed, the resulting energy cost, and travel time impacts can be analyzed. The model is also useful in exploring fare structures and other policies. An existing rail line in the North Central Texas region is used as a case study.

Direct request to Transportation Librarian, North Central Texas Council of Governments. Prepared for the Institute of Management Sciences/Operations Research Society of America (TIMS/ORSA) Joint National Meeting in San Francisco, California, May 10, 1977.

RRIS 23 180073

Barton-Aschman Associates, Inc., and Peat, Marwick, Mitchell & Company, San Diego-Los Angeles Rail Passenger Service Engineering Feasibility Study, Final Report for SB 2267, prepared for the California Department of Transportation, the Southern California Association of Governments and the Comprehensive Planning Organization of the San Diego Region. Sacramento, Calif.: California Department of Transportation, December 1975. 218 pp., Tabs., Figs., Refs., 5 App.

The report presents a series of long-range improvement options for intercity rail passenger service. Alternative measures are considered for improving line-haul speed, including a wide range of track and alignment improvement options, as well as various equipment alternatives. An analysis of both capital and operating costs is given for each of the different improvement levels. Capital costs include right-of-way fencing, signal improvements, track improvements, extended sidings, grade separations, locomotives, stations (refurbishing), and station parking. Operating cost components which are considered included track and facilities maintenance, train crew and dispatching, switching, station personnel, and market-promotion. Finally, short-range recommendations and implementation strategies which could lead to a demonstration project are presented. A series of 17 short-range improvements is recommended for first priority implementation. These improvements fall into five areas: stations, track upgrading, equipment, scheduling, and marketing.

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PLANNING

California Department of Transportation, Division of Mass Transportation, Rail Passenger Development Plan - 1980 Through 1982 Fiscal Years, DMT 054. Sacramento, Calif.: California Department of Transportation, January 1, 1980. 88 pp., Tabs., Figs., Refs., 4 App.

This Rail Passenger Development Plan includes the Department's plans for the implementation of capital investment in rail passenger equipment, track, and related facilities.

_____, (Report on) The Feasibility of (an) Intracounty Commuter-Railway in Santa Clara County, DMT 022. Sacramento, Calif.: California Department of Transportation, July 1, 1977. 80 pp., Tabs., Figs., 3 App.

This report addresses the following issues: the feasibility and cost of upgrading and utilizing existing tracks, merits of alternate routes, and suggested sources of any necessary funding to implement suggested service.

Carter, M. M., and others, Transit Corridor Analysis: A Manual Sketch Planning Technique, Final Report, prepared by Comsis Corporation; De Leuw, Cather & Company; Alan M. Voorhees & Associates, Inc.; and R. H. Pratt Associates, Inc., for the Urban Mass Transportation Administration. Wheaton, Md.: Comsis Corporation, April 1979. 207 pp., Tabs., Figs., 7 App.

This is a user's handbook. It describes a sketch planning technique for quick first evaluations of urban transportation planning proposals--a manual technique which does not require computers. It presents the technique's computational steps, which rely heavily on graphic aids, in an orderly manner and minute detail. The technique is useful in the analysis of short- and long-range plans for urban line-haul transit systems. The manual technique does not provide a single, definitive solution, but it can provide, for each system, alternative measures of demand, performance (cost and travel times), and impact to help local decision making. The technique has three modular phases: demand estimate, cost analysis, and impact analysis. It is

also modular within the phases, since the user is free at many points to substitute his own data or analytical techniques and to substitute local estimates for the default values supplied. This book has four divisions. The introduction describes the purposes and uses of the technique. The second chapter, an overview, discusses general parameters and assumptions, and identifies those situations in which the technique can be applied. The third chapter describes the method and computation procedures and gives examples of each step of the procedures as applied to a sample problem. The appendices contain nomographs and blank work sheets which can, at the user's option, be used to make some of the calculations.

Acknowledgement:
NTIS
PB 301378

RRIS 23 304720
UMTA-MD-06-0046-79-1
MD-06-0046

Cherian, Varghese, and Michael A. Sargious, "A Multinomial Logit Approach for Multimodal Choice of Work Trips," Canadian Journal of Civil Engineering, 4, no. 1 (March 1977), 10-17. Tabs., Fig., Refs.

This paper reports the results of an explorative study on the possibility of using a multinomial logit model to replicate and predict multimodal choice for work trips in a Canadian urban context. Modal choice data from Toronto, where a multimodal choice situation exists in the line-haul portion of the work trip, are used to develop the model. The developed model is evaluated in terms of statistical criteria and resonableness tests. It is further examined for its predictive ability by the results with the published ones in this area. The study shows that disaggregate models can provide reasonable results when used in forecasting the modal choice between various modes.

Acknowledgement:
EI

RRIS 23 159487

Christiansen, Dennis L., Douglas S. Grady, and A. V. Fitzgerald, Considerations Influencing the Feasibility of Commuter Rail

23 PASSENGER OPERATIONS PLANNING

Service: Passenger Service Evaluation (Texas Rail System Evaluation, Preliminary Report), Technical Report 6, prepared by the Texas Transportation Institute. College Station, Tex.: Texas A&M University System, January 1977. 37 pp., Tabs., Figs., Refs.

This report addresses the feasibility of commuter rail operations designed to serve workday urban travel demands. This report does not provide a detailed evaluation of the potential for commuter rail service in any specific corridor; rather, it provides an overview of issues and problems that should be realized in evaluating the desirability of a commuter rail operation in any corridor. This report is divided into five sections. The first section describes the travel problems that exist which create an interest in the commuter rail alternative. The second section presents operating considerations that would be associated with a commuter rail system in Texas. Following this, a preliminary estimate of the market for commuter service in illustrative travel corridors is provided. The fourth section identifies the general magnitude of revenue and cost that might be generated by a commuter rail system. Finally, a synopsis of the major findings is presented.

Acknowledgment:
Texas A&M University

RRIS 23 174047

De Leuw, Cather & Company, with contributions from The Urban Institute, Characteristics of Urban Transportation Systems. A Handbook For Transportation Planners, prepared for the Urban Mass Transportation Administration. n.p.: De Leuw, Cather & Company, May 1975. 193 pp., Tabs., Refs., 7 App.

The objective of the handbook specifically for use by transportation planners in the evaluation of alternative systems, is to provide a single simplified reference source which characterizes the most important (from the standpoint of evaluation) performance characteristics of the following contemporary urban transportation systems: (1) rail (commuter, rapid, and light); (2) local bus and bus rapid transit; (3) automobile-highway system (automobiles

and other vehicles); (4) pedestrian assistance systems; and (5) activity center systems---people mover systems that have been installed at airports, zoos, amusement parks, etc. The handbook assesses the supply or performance aspect of urban transportation dealing with passenger demand implicitly. Seven supply parameters studied are: speed, capacity (service volume), operating cost (vehicle), energy consumption (vehicle or source), pollution, capital cost, and accident frequency. Supersedes PB-233 580.

RRIS 23 093375
UMTA-IT- 06-0049-75-1

Dewees, D. N., "Urban Express Bus and Railroad Performance: Some Toronto Simulations," Journal of Transport Economics and Policy, 10, no. 1 (January 1976), 16-25. Tabs., Fig., Refs.

The relative performance of traditional local transport modes with a proposed investment in a commuter railroad or in express bus operations was appraised by a computer simulation which determined travel time, waiting time, walking time and monetary costs involved for each mode for complete trips from a suburban area to the central business district four miles away. In this rather narrow situation the commuter railroad is completely dominated in cost and time performance by express bus systems. If the distance between the suburban and downtown areas were increased, relative performance by buses would decline. The author suggests the express bus must be considered as a rail alternative and in any commuter system an integrated downtown distribution with several stops can greatly enhance system performance.

Acknowledgment:
Journal of Transport Economics and Policy

RRIS 23 130987

Englund, Carl R., Jr., Commuter Railroad Feasibility Study on Selected Lines in the Los Angeles Metropolitan Area, Final Report, prepared for the Southern California Association of Governments and the Urban Mass Transportation Administration. Los Angeles: Southern California Association of Governments,

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PLANNING

January 15, 1974. 65 pp., Tabs., Figs., photos., 6 App.

The objective of this study was to explore the feasibility of installing and operating a limited scope rail commuter service over one Southern Pacific and two Santa Fe routes into Los Angeles. Various facets of the problems previously have been treated but they have not been pulled together in a single presentation. This report will provide as complete a package as is possible of data on the operational and physical characteristics of the rail lines under consideration plus the requisite statistical data. This approach will enable the SCAG staff to better work both with the railroads and the portion of the public sector interested in developing a rail commuter service.

Acknowledgment: RRIS 23 051948
Southern California Association of Governments

_____, Washington Metropolitan Area Rail Commuter Feasibility Study, Final Report, prepared for the Urban Mass Transportation Administration. Washington, D.C.: U.S. Department of Transportation, May 1971. 99 pp., Tabs., Figs., Photos.

A restructured commuter rail service, embracing three important routes in the Washington metropolitan area, could be operated on weekdays under conditions requiring only a very modest level of support payments after service is well underway. The estimated expenses of operation annualized would be on the order of $2.74 million while revenues are estimated at $2.37 million. The acquisition of rehabilitated main line rail equipment would set the capital needs at approximately nine million dollars. A new concept for operation is suggested which, from an experimental standpoint, would be a first in the nation. Commuter trains and crews running on the B&O Brunswick line and the RF&P Quantico line would be "interlined." They would proceed from their terminal at one end of the two-route commuter zone to the other and then turn back. This mode of operation would substantially reduce capital outlays for equipment, and at the same time, provide excellent cross-metropolitan area schedules for an expanded rider base by linking Washington's central business district and the southwest employment centers with

such suburban employment complexes as Crystal City, Virginia and Rockville, Maryland. The Baltimore area rider origins, which represent about half of the total ridership, should be consolidated into an improved Penn Central Baltimore-Washington service. The First Street tunnel should be electrified in order to provide a through service link for Penn Central. Operation of electrified trains by Penn Central would be less expensive than the use of diesel or turbine propelled trains.

Acknowledgment:
UMTA
PB 200103

RRIS 23 044212
UMTA-TRD-101-71-1

Hayman, Donna L., Francis Mulvey, and G. Gerald O'Donahoe, The Northeast Corridor High-Speed Rail System: Selected Impacts on Alternative Modes, Final Report, prepared by Harbridge House, Inc., for the Transportation Systems Center. Washington, D.C.: U.S. Department of Transportation, September 1975. 75 pp., Tabs., Figs., Refs.

This report assesses several impacts of improved High-Speed Rail Service in the Northeast Corridor on alternative intercity passenger transportation modes. The impacts are the loss of taxes and toll revenues, loss of passenger revenues to the common carriers, reduction in operating costs and capital needs, and changes in air and highway levels of congestion. The report suggests that the impacts, both favorable and unfavorable, of HSRS on the alternative modes will be limited.

Acknowledgment:
NTIS
PB 257412

RRIS 12 143966
FRA/NECPO-76-18
TSC/230-0064-6F
DOT-TSC-936

Hintzman, K. W., and others, Rail Transit Criteria for System Review and Preliminary Design, Final Report, prepared by the Office of Planning and Design for the Division of Mass Transportation. Sacramento, Calif.: California Department of Transportation, December 1979. 360 pp., Tabs., Figs., Refs., 2 App.

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This report is a manual intended to assist in evaluating rail transit proposals and to provide information for preliminary design of trackways and to serve as a guide to the acquisition and use of data required for the final design of a specific system. The standards and characteristics of a number of operating and proposed systems were analyzed and organized to produce this manual. The first three chapters describe and contrast light and heavy rail systems, outline the system planning process, and discuss the implications of choices within systems. These chapters also describe vehicle and facility characteristics and requirements that affect trackway location and design. Finally, they discuss system operational factors and the magnitude and range of major cost elements. The last chapter contains principles, conventions and criteria for trackwork and for the preliminary design of trackways.

Acknowledgment:
NTIS
PB 80-135312

UMTA-CA-09-8001, 8002
UMTA/CA/PD-78/1

Hitz, John W., Performance Analyses of Intercity Ground Passenger Transportation Systems, Final Report, prepared for the Federal Railroad Administration. Cambridge, Mass.: Transportation Systems Center, April 1976. 192 pp.

This report documents the development of analytical techniques and their use for investigating the performance of intercity ground passenger transportation systems. The purpose of the study is twofold: (1) to provide a capability of evaluating new passenger train systems and (2) to provide information that assists in the formulation of development policies for new systems, thus, investigations evaluate the physical performance (average velocity, system capacity, mode split) of train systems with various design characteristics operating in a range of application conditions. Based on these analyses, conclusions are made regarding the potential performance effectiveness of train systems. The analyses cover design cruise speed, acceleration and braking

rates, train length, seat density and lateral acceleration limits. Application characteristics considered include station spacing, dwell time, curve length, spacing and speed, switch concepts and train control strategies.

Acknowledgment:
NTIS
PB 261950

RRIS 23 148591
DOT-TSC-FRA-75-25
FRA-OR&D-76-248

Johnson, Chris, and others, "A Time-Series Analysis of the Impact of Mass Competition on Commuter Rail Ridership," Proceedings: Seventeenth Annual Meeting of the Transportation Research Forum, "Beyond the Bicentennial: The Transportation Challenge," pp. 211-20, held in Boston, Mass., October 28-30, 1976. Oxford, Ind.: Richard B. Cross Company, 1976. Tab, Figs., Refs.

Extension of the Chicago Transit Authority Kennedy rapid transit line into the close-in suburban territory served by the Chicago and North Western's Northwest commuter line has been studied. There was an assessment of effects on ridership, an evaluation of the effect of rail fare increases in the presence of a competing mass transit mode, a study of the time interval of the impact and its geographic range, and an assessment of the impact of the energy crisis on commuter rail usage. This paper gives the background, the methods of study and analysis, and the results with their policy and planning significance.

RRIS 23 142938

Kingham, R. Ian, "An Application of Mode-Choice Methodologies to Infrequent Commuter-Rail Service," Passenger Travel Demand Forecasting, Transportation Research Record 610, pp. 30-36. Washington, D.C.: Transportation Research Board, 1976. Tabs., Figs., Refs.

The feasibility of commuter-rail transit in the southwest Baltimore corridor was studied by a variety of passenger estimation methodologies. The methodologies selected were required to be applicable to the corridor scale, to be run manually, and

to be capable of quick response. They were also required to be responsive to the addition of one or two trains per peak period, changes in station location and accessibility, and changes in costs such as parking charges and gasoline costs associated with the automobile. No one methodology met all of the above requirements. However, two methodologies were adapted to consideration of infrequent rail service (one or two trains per peak period) and applied to the corridor. The first methodology involved the application of a simple graphical technique that related mode split to station distance from the CBD; the second involved the application of a marginal utility model to corridor census tracts. The infrequent service capability was added, in the case of the graphical approach, by applying experience factors, and in the computational approach by relating automobile captivity to the number of trains per peak period. Both methodologies were transferable, without reestimation of coefficients, to the southwest Baltimore corridor. Both approaches could be applied manually in a person-week or less; the need for any greater sophistication than the graphical methodology is seriously questioned. (Author)

Acknowledgment: RRIS 23 157826
TRB

Lynch, Dennis M., and others, Plan Refinement Study (for the) Commuter Rail Improvement Program, Final Report, prepared by the Central Transportation Planning Staff for the Boston Metropolitan Area Planning District and the Urban Mass Transportation Administration. Boston, Mass.: Central Transportation Planning Staff, January 1979. 127 pp., Tabs., Figs., Refs.

This study provides a thorough analysis of commuter rail and other feasible alternatives for transit service to Boston's suburbs, indicating the best alternative for each commuter rail corridor and whether and in what form the Commuter Rail Improvement Program (CRIP) should be continued. Impacts of each alternative on operating costs, capital costs,

ridership, revenues, traffic flow and regional economic considerations have been estimated.

RRIS 23 188169
MA-09-0001

Mohr, Eric, The Feasibility of Upgrading Peninsula Passenger Rail Service, Final Report. Berkeley, Calif.: Metropolitan Transportation Commission, 1975. 287 pp., Tabs., Figs., Photos., Refs.

The feasibility of increasing use of Southern Pacific commuter services over the 47 mile Peninsula line between San Jose and San Francisco, Calif., was studied under a grant from UMTA. Among potential means for increasing usage would be improved access, all-day transit-type operation, better connection with transit, and extension to a new San Francisco terminal. The experience of a private operator could be combined with the resources of public agencies to produce a staged expansion of service in response to changes in demand. Such steps should be part of an overall transportation plan for the Westbay Corridor.

This Final Report, financed in part by UMTA/U.S. DOT, contains 4 parts: Summary; Legal Considerations; Operations, Marketing and Costs; and Reference Supplement.

RRIS 23 163226
UMTA-CA-09-0025

Moon, Albert E., and others, Guidebook for Planning to Alleviate Urban Railroad Problems, Vol. 3, Final Report, prepared by the Stanford Research Institute, Federal Highway Administration, TOPS On-Line Service, Gruen Associates, and Kaiser Engineers. Washington D.C.: U.S. Department of Transportation, August 1974. 327 pp., Tabs., Figs., Worksheets, 4 App.

This report is the third of four volumes reporting the results of a project to analyze the nationwide magnitude of the urban railroad relocation and to prepare methodology for future relocation studies.

Volume 1 is an executive summary; Volume 2 is a community guide for preliminary assessment of the potential for planning to alleviate urban railroad conflicts; and Volume 4 presents a nationwide estimate of the nature and magnitude of urban railroad relocation. The purposes of Volume 3 are to suggest an appropriate approach to planning for community policy makers, to outline analytical processes to be used by technical specialists, and to provide supporting data.

Acknowledgment:
NTIS
PB 240676

HRIS 15 090559
DOT-FR-20037

Nelson, Robert A., and others, Northeast Corridor Transportation Project Report. Washington, D.C.: U.S. Department of Transportation, April 1970. 242 pp., Executive Summary, Tabs., Figs., Refs., 5 App.

The Northeast Corridor Transportation Project was charged to determine the intercity transportation facility requirements of the Northeast Corridor through 1980. This report contains the following: a comparative analysis of the transportation alternatives as to their technical feasibility, economic costs and benefits and other impacts in the year 1975; a discussion of the actions required to implement the transportation alternatives; an examination of possible financing and management of new modes included in the alternatives; advantages and disadvantages of various organizational alternatives; population growth patterns and the corridor transportation system; methodology; description of the alternative systems; and exploratory studies and sensitivity tests. (Author)

Acknowledgment:
NTIS
PB 190929

RRIS 23 039179
NECTP-209

New Jersey Department of Transportation, New Jersey Transportation Plan: Surface Passenger Transportation Element (Draft). Trenton, N.J.: New Jersey Department of Transportation, September 1979. 174 pp.+, Tabs., Figs.

This report includes descriptions of major issues, future growth and development, goals and objectives, and program policy statements.

New Jersey Senate Transportation and Communications Committee, Public Hearing Before Senate Transportation and Communications Committee on Commuter Rail Service in New Jesey Held in Trenton, New Jersey on October 11, 1977. Trenton, N.J.: New Jersey Senate, 1977. 70 pp.

The Committee examined what is being done to improve commuter rail service and performance. Examined were issues as regards progress on the electrification project for the North Jersey Coast Train, formerly known as the New York and Long Branch and the reasons for the proposed closings of grade crossings in Monmouth and Ocean counties and the process through which these closings are determined. It is well known that the performance of commuter rail service in New Jersey is inadequate. Riders of Amtrak are faced with proposed service cutbacks. The Committee has invited representatives from the state, Federal government, Conrail, Amtrak, counties, labor organizations, and the riding public to examine commuter rail service and to discuss ways of improving it. The document contains statements from the Department of Transportation as well as statements from Amtrak and Conrail. (Portions of this document are not fully legible)

Acknowledgment: RRIS 23 181789
NTIS
PB 282108

Northwestern Indiana Regional Planning Commission, Economic Adjustment Study: Chicago South Shore and South Bend Railroad Corridor -- see Economics.

Permut, Howard, An Alternatives Analysis of the Rock Island Commuter Rail Service, Technical Report Series. Chicago: Regional Transportation Authority (Northeastern Illinois), June 1976. 78 pp., Tabs., Figs., Refs., 7 App.

23 PASSENGER OPERATIONS PLANNING

This is a case study of a major alternatives analysis evaluation. Alternatives are evaluated in terms of capital cost, operating deficit, user cost, social impact, environmental impact, and operational feasibility. An empirical analysis of the tradeoffs between commuter rail and bus service is made. It recommends rehabilitation of the railroad and a changing of the downtown terminal.

Prachakvej, Suppamas, "Prediction Models for Commuter Rail Services" (unpublished Doctor's thesis, University of Missouri-Rolla, 1977).

The models developed in this dissertation estimate average daily commuter ridership in terms of socio-economic characteristics of the residents in the commutershed along four commuter lines running between Chicago and its suburbs. The general model containing dummy variables gave better estimations than the general model without dummy variables. However, the model which was developed from data collected along a particular commuter line gave even better estimations than the same data which were applied to the general model.

Pratt, Richard H., Neil J. Pedersen, and Joseph J. Mather, Traveler Response to Transportation System Changes - A Handbook for Transportation Planners, Final Report, prepared by R. H. Pratt Associates, Inc., for the Federal Highway Administration. Washington, D.C.: U.S. Government Printing Office, February 1977. 292 pp., Tabs., Refs.

Transportation planners and decisionmakers need an understanding of how travelers respond to changes in the urban transportation system if they are to correctly identify the most favorable opportunities to maximize beneficial use of highways and transit operations. This Handbook seeks to bring under one cover a compendium of knowledge based on past observation and estimation of traveler responses to different types of transportation system change. It is intended to aid transportation planners and decisionmakers by providing familiarization with results obtained elsewhere and by providing insight pertinent to planning decisions concerning urban transportation options.

Traveler response to the following 10 types of transportation change are investigated: pool/bus priority lanes, variable work hours, carpooling encouragement activities, buspools/vanpools, area auto restraints, auto facility pricing, transit scheduling/frequency, bus routing/coverage, transit fare changes, and transit marketing/amenities.

Within this Handbook, Chapter I is an executive introduction. Chapter II provides a user's guide to its application. Chapter III is comprised of topical summaries addressing the 10 types of transportation system change. Each topical summary includes a digest of state-of-the-art information on how travelers respond to the system change in question, and also reviews of papers and documented case studies relevant to the subject. Chapter IV consists of alphabetical bibliography with cross-reference lists, covering the 10 plus 14 additional types of transportation system change.

Acknowledgment: DOT-FH-11-8479
NTIS
PB 265830

Public Technology, Inc., (Proceedings of the) Joint Development Marketplace, held in Washington, D.C., June 25-27, 1978, with the cooperation of the Urban Consortium and the Urban Land Institute for the Urban Mass Transportation Administration and the Office of the Secretary, U.S. Department of Transportation. Washington, D.C.: U.S. Government Printing Office, 1980. 229 pp., Tabs., Figs., 2 App.

This document contains a summary of the Joint Development Marketplace; a developer's, a Federal, and two mayoral perspectives on joint development; two success stories and two evolving projects; a summary of the Federal and financial panels; a series of background papers prepared for the use of the conferees; a summary of the workshops; a site marketing information summary and sheets; and a list of attendees.

Pushkarev, Boris S., and Jeffrey M. Zupan, Urban Densities for Public Transportation, Final Report, prepared by the Tri-State

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PLANNING

Regional Planning Commission for the Urban Mass Transportation Administration. Washington, D.C.: U.S. Government Printing Office, May 1976. 318 pp., Tabs., Figs., Refs., App.

The report develops relationships to show the suitability of different urban density arrangements to eight modes of public transportation: the taxicab, dial-a-bus, local bus, express bus, light rail, light guideway transit, rapid transit and commuter rail. Differences in transit ridership among urban areas are largely explained by areawide density, downtown size measured in nonresidential floorspace and the existence of rail transit. Operating and capital costs of the eight modes are examined. At any particular residential density, the demand level will vary depending on the area's distance from a nonresident concentration, and on the size and character of that concentration. For a minimum cost per passenger, downtowns of about 10, 15, and 35 million square feet of nonresidential floorspace provide minimum, intermediate, and frequent service, respectively. Express buses to which passengers walk must be confined to large cities, and can only operate at very low frequencies. Park-and-ride express bus service can provide low and intermediate service frequencies to downtowns in the 20 to 50 million square foot range or larger. Light rail is promising for downtowns in the 35 to 50 million square foot range. The present generation of automated light guideway transit is limited to special applications, not to line-haul use with its high peaks. Rapid transit to a downtown of 50 million square feet of total nonresidential floorspace appears to be possible, if favorable construction conditions exist. Residential densities as low as 1 to 2 dwellings per acre can support commuter rail if the route connects to a very large downtown.

Acknowledgment:
NTIS
PB 256636

RRIS 23 143216
UMTA-IT-09-0023-76-1
IT-09-0023/31

Rice, Phillip, "A Queueing Theory Approach to Railway Capacity in Urban Commuter Railways," INFAC/IFIP/IFORS International Symposium: Control in Transportation Systems, held at Columbus, Ohio, August 9-13, 1976, pp. 267-76. Figs.

The method proposed is a mixture of stochastic and diffusion type mathematical approximations to describe the queue length, delay and relaxation times found in the operation of the section. It is the perturbations in the times between trains and in the station stop times that give rise to queueing and the delays on the trains. The traffic intensity and a queue growth factor are key parameters in determining the practical capacity which is related to the deterministic or basic capacity, a concept derived entirely from the signaling characteristics of the station layout.

Acknowledgment: RRIS 23 159482
EI

Shlay, David, Hagi Gil, and Carolyn J. Mullins, Transportation Corridor in Northwest Indiana, Final Report, prepared by The Institute for Urban Transportation for the Urban Mass Transportation Administration. Bloomington, Ind.: Indiana University at Bloomington, July 1978. 232 pp., Tabs., Figs., 13 App.

This report describes a study of passenger transportation service in Northwestern Indiana, South Bend to Chicago. The objective of the study was to determine the appropriate transportation service that would meet the travel needs of the residents of Northwestern Indiana including St. Joseph, La Porte, Porter and Lake counties. The transportation corridor is defined by existing public transportation and highway facilities in the area from South Bend, Indiana, to Chicago, Illinois. A summary of the history of commuter transportation in the corridor is presented herein. Estimates of the number of railroad and other trips that would be made in the corridor in 1980, 1990, and the year 2000 are made. Nine options for providing commuter transportation in the corridor were presented and evaluated in the terms of environmental criteria, quality of service, economic and financial factors, and special factors. The study recommends that the Chicago, South Shore and South Bend passenger service be continued. The study found that the South Shore is the most energy efficient, the safest, and fastest, and the least

costly mode of commuter transportation in the corridor. In addition, it does not increase the congestion of highways or parking problems in downtown Chicago. It has positive economic effects on and is essential to the efforts to decrease air pollution in the heavily industralized area. Finally, the study found that the continuation of the South Shore would have positive effects on recreation at the National Lakeshore Park and the proposed multimodal terminal at St. Joseph County airport.

Acknowledgment:
UMTA
PB 259994

HRIS 12 196056
UMTA-IT-09-0062-79-1

Smith, Arthur J., Commuter Railroad Service in the National Capital Region, Final Report, prepared by the Consortium of Universities, Urban Transportation Center for the Urban Mass Transportation Administration. Washington, D.C.: U.S. Department of Transportation, August 1970. 114 pp., Tabs., Figs.

The experiences of four cities (Chicago, Boston, Philadelphia, and New York) in which rail is still a principal commuter mode are discussed. Ridership decline has become a national phenomenon. The basic problems are (1) public preference for the private transportation mode; (2) unbalanced public assistance to transportation programs which emphasize highway construction; (3) decentralization of the metropolitan core; (4) difficulty of adjusting rail services in response to changing patterns of urban growth; (5) peaking of ridership demand, which creates uneconomical utilization of equipment and manpower; (6) fare structures which do not adequately reflect costs; (7) unreasonable rules for union labor, which inflate operating costs; (8) deterioration of existing equipment; and (9) insufficient private capital for investment in service improvement programs. The history of a commuter rail operations in Washington is one of steady erosion. At present, fewer than 20 trains continue to serve the nation's capital, carrying only approximately 1,100 riders daily. In addition, these few remaining services are threatened by rising fees at Union Station, restrictive labor work rules, terminal location, and aging rolling stock. An analysis of

existing plans for regional rail service notes that during the 1960's area planning agencies envisioned a combination of regular commuter trains and rapid transit. Under the current planning arrangements, three railroad commuter systems would be coordinated with various segments of metro. However, management, labor, and financing problems may threaten realization of these plans, and all railroad commuter service may be abandoned before completion of the rapid transit. A viable rail system is possible and desirable, given sufficient support by government agencies and potential customers.

Acknowledgment:
UMTA
PB 194104

RRIS 23 044208
UTC-12
UMTA-URT-11-(69)-12

Soot, Sim A., Ashish Sen, and Efi Pagitsas, A Modal Split Model for High Density Urban Corridors, Final Report, prepared by the Urban Systems Laboratory, University of Illinois at Chicago Circle for the Urban Mass Transportation Administration. Washington, D.C.: U.S. Department of Transportation, March 1978. 179 pp., Tabs., Figs., Refs., 4 App.

The objective of the study was to develop a modal split model that would be relatively simple, require little lead time, use readily available data, and be sensitive to policy alternatives. The model is designed to contribute to the evaluation of such policy options as station closing, new route alternatives, addition of park and ride facilities, skip-stop policies, and increasing capacity. This study produces modal split models specifically for high density urban corridors. In a two stage process, splits are established between the automobile and public transportation and then bus and rapid transit. The aggregate, trip interchange models are calibrated using weighted least squares, with modal disutility functions, service characteristics, and trip end densities as independent variables. The background for the modeling procedure is established by producing a multitude of computer generated maps displaying the modal split patterns and by graphing the socioeconomic correlates of modal split in the Chicago area. Special attention was given to a

thorough application of the model to Howard Corridor with Chicago Transit Authority rail rapid transit service. The application estimated the effects of closing selected peak period reverse commuting platforms to expedite service. In the process the model was improved.

Acknowledgment:
NTIS
PB 284745

RRIS 23 182023
UMTA-I1-11-0008-78-2

Thomas, Garold R., and Robert L. Winestone, West Coast Corridor Study Interim Report, January 1976. Prepared in Response to Section 13 of the Amtrak Improvement Act of 1974, prepared by the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, March 15, 1976. 43 pp., Tabs., Figs., Refs.

The report was prepared in response to the High Speed Ground Transportation Act as amended by Section 13 of the Amtrak Improvement Act of 1974 providing an early and realistic understanding of the magnitude and scope of the intercity transportation needs of the West Coast states. The findings include the following: (1) the problems are primarily state and local in character and are largely confined by differing demographic, geographic and travel characteristics to three distinct segments: the southern one-third of the corridor from Tijuana, Mexico to Sacramento, California, the northern one-third from Eugene, Oregon to Vancouver, Canada, and the middle one-third between Sacramento, California and Eugene, Oregon; (2) statewide intermodal transportation planning should be encouraged to achieve a balanced transportation system in the area, and conserve energy resources; (3) the tentative economic, social, and environmental costs of advanced technology rail passenger systems outweigh the benefits to be achieved based upon population growth rates and the location of that growth.

Acknowledgment:
NTIS
PB 258440

RRIS 23 145598
FRA/RFA-1-76-02

23 PASSENGER OPERATIONS
PLANNING

United States Department of Transportation, Federal Railroad Administration, Rail Planning Manual: Preliminary Bibliography. Washington, D.C.: U.S. Department of Transportation, December 1976. 54 pp.

This bibliography contains general references, data sources, and legislation and regulation.

United States General Accounting Office, Should Amtrak Develop High-Speed Corridor Service Outside the Northeast? Report to the Congress of the United States. Washington, D.C.: U.S. General Accounting Office, April 5, 1978. 45 pp., Tabs., Refs., 2 App.

Amtrak's (National Railroad Passenger Corporation's) current extension plans focus on the Chicago-Detroit and Los Angeles-San Diego corridors. Its long-range goals provide for extending the Northeast development concept to 16 other potential corridors. Amtrak believes corridors provide greater speed, better on-time performance, lower air pollution, greater energy efficiency, more safety, and lower deficits because of increased ridership. GAO concludes that the (1) benefits Amtrak anticipates may not be available or worth the cost and (2) substantial increases in ridership cannot be expected unless one of the other transportation modes is disrupted. The report lists a number of choices the Congress can make regarding Federal subsidy for Amtrak's corridor development plan.

Acknowledgment:
General Accounting Office

RRIS 23 180371
CED-78-67

Vuchic, Vukan R., F. Brian Day, and Richard M. Stanger, "Rail Transit-Characteristics, Innovations, and Trends," Rail Transit Development, Transportation Research Record 552, pp. 1-18. Tabs., Figs., Photos., Refs.

Rail transit, including streetcar, light rail, rapid transit, and regional rail, is a family of transportation modes with a broad range of service, operational, and cost characteristics. Consequently,

these modes may be used efficiently for various conditions. As a result of numerous technological and operational innovations of rail systems during the last two decades, rail transit can be highly automated, reliable, and comfortable and can operate with minimal environmental intrusion. Although several U.S. systems (e.g., Lindenwold Line and Bay Area Rapid Transit) have some advanced features, general knowledge and understanding of rail systems in this country lag behind those of some western European countries and Japan. Based on a comparison of the population characteristics of selected European and U.S. cities, this paper shows that, among cities with similar population size and density, European cities generally have a much greater application of rail transit. Despite extensive research into new technologies, no new mode has emerged with performance and cost characteristics superior or comparable to rail technology. Thus, to achieve more efficient and economical transit systems, information about rail modes must be increased and these modes must be included among the alternatives considered in transit planning.

Acknowledgment: HRIS 84 130414
TRB

Winestone, Robert L., Rail Passenger Statistics in the Northeast Corridor 1974-75, prepared by the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, March 1976. 64 pp., Tabs.

The monthly data for the years 1974 and 1975 reflect different aspects of train ridership on the Northeast Corridor. In 1974 patronage was substantially higher than it was in 1973 due to the fear that there would be no gasoline available when needed during an intercity automobile trip. In 1975 this fear had subsided, and although generally the number of passengers were higher than had been the case in 1973, the patronage figures were lower than the 1974 high.

Acknowledgment: RRIS 23 137414
NTIS
PB 255064

23 PASSENGER OPERATIONS
RAIL CARS AND EQUIPMENT

(See also Propulsion Systems and Rail Vehicles and Components: Cars and Equipment)

Arnlund, R. C., and others, Northeast Corridor High-Speed Rail Passenger Service Improvement Program -- see Economics.

Dorin, Patrick C., Commuter Railroads: A Pictorial Review of the Most Travelled Railroads. Seattle, Wash.: Superior Publishing Company, 1970. 192 pp., Tabs., Figs., Photos., 1 App.

> These are the railroads that cannot die, says author Dorin, yet they cannot continue to exist under present conditions and controls. Commuters to the big cities call them the "Morning Hotshot," "Cannon Ball," "Banker's Special," and economists call them an impossible drain on the public conscience. They are kept running by various financial gymnastics and temporary relief measures... yet as Dorin points out they must be kept running in light of highway congestion and mushrooming city population. The future demands their sound operation because they are the nation's most traveled railroads. Cities covered in "Commuter Railroads" are Boston, New York, Cleveland, Milwaukee, Chicago, Detroit, San Francisco, Baltimore, Washington, Pittsburgh, Montreal and Toronto. Lines covered in "Commuter Railroads" are Long Island, Penn Central, Boston & Maine, Erie & Lackawanna, Reading, Central Railroad of New Jersey, Pennsylvania Reading Seashore, Pittsburgh and Lake Erie, Baltimore & Ohio, Chicago & Northwestern, The Milwaukee Road, Burlington Route, Rock Island, Illinois Central, Chicago South Shore & South Bend, Gulf Mobile & Ohio, Norfolk & Western, Southern Pacific, Canadian Pacific, Canadian National, Government of Ontario Transit, and Grand Trunk Western.
>
> RRIS 23 050673

Fourer, Robert, Models of Railroad Passenger-Car Requirements in the Northeast Corridor. Volume I: Formulation and Results, Volume 2: User's Guide, Final Report, prepared by the Transportation Systems Center for the Federal Railroad Administration. Cambridge, Mass.: National Bureau of Economic Research, September 1976. 138 pp., Tabs., Figs., Refs., 4 App.

23 PASSENGER OPERATIONS
RAIL CARS AND EQUIPMENT

Models and techniques for determining passenger-car requirements in railroad service were developed and applied by a research project of which this is the final report. The report is published in two volumes, as follows: Volume I: Formulation and Results. The first part of this volume considers a general problem of determining optimal passenger-car allocations given a fixed schedule and predetermined demands. Requirements for car movements are modeled as a set of linear constraints having a transshipment structure, and alternative linear objectives are formulated. Various optimization techniques are developed for one or more objectives, and properties of the sets of optimal solutions are demonstrated. The remainder of Volume I shows how the linear model and optimization techniques may be applied to the Northeast Corridor. Derivations of a schedule and demands are explained, and results of a number of optimizations and analyses are displayed. Volume II: User's Guide. The solution and analysis of the Northeast Corridor models required the creation of a number of computer programs of several kinds. These programs are available for the use of others and are described in Volume II of this report.

Acknowledgment:
FRA
PB 268869, 268870

RRIS 23 147581
DOT-TSC-FRA-7626-1 & 2
FRA/NECPO-76/21 & 22
DOT-TSC-1179-1 & 2

Pullman-Standard, a division of Pullman Incorporated, Pilot Specification for the Procurement of Multiple-Unit Railway Commuter Cars, Final Report, prepared for the Urban Mass Transportation Administration. Chicago: Pullman Standard, January 1972. 290 pp., Tabs., Figs., 1 App.

The report was prepared by Pullman-Standard at no cost to the Federal government as an approach to the development of a guideline specification for urban rail commuter cars. This is a pilot specification written for the purpose of outlining the contractual procedures and performance requirements necessary for the procurement, construction, and utilization of passenger-carrying railway commuter cars. (Author)

Acknowledgment:
NTIS
PB 210230

RRIS 23 039849
UMTA-TRD-111-72-1

Rakaczky, John A., Fire and Flammability Characteristics of Materials Used in Rail Passenger Cars. A Literature Survey -- see Safety.

Todes, Daniel, New York City Transit Authority Design Guidelines: Equipment -- see Right-of-Way.

United States Department of Transportation, Revised 1980 Railroad Locomotive Safety Standards and Locomotive Inspection -- see Safety.

Vollmar, J. R., "When to Use Multiple-Unit Cars or Locomotives," ATA Rail Transit Conference Held in San Francisco, California on April 14 and 16, 1974: Car Equipment Session - Papers, Technical Report, pp. 51-75, report dated April 1, 1974 (to be presented April 18, 1974). Washington, D.C.: American Transit Association, August 1974.

The use of electric locomotive-hauled trains vs. electric multiple-unit trains in both commuter and intercity service is analyzed with respect to economic considerations. Available cost factors are presented. Other conditions whose costs must be individually developed are identified. Warning is given that each proposed application must be analyzed in the light of all conditions peculiar to it.

Presented at the Am. Transit Assoc. Rail Transit Conf., San Francisco, Calif., Apr. 14 and 16, 1974, Car Equip. Sess.

PB 234824

ATA/RT-74/1

23 PASSENGER OPERATIONS
STATIONS AND TERMINALS

(See also Human Factors and Right-of-Way)

Appleyard, Donald, BART-I: Traveler Behavior Studies -- see Environmental Protection.

Armstrong, John, "NE Corridor Improvement: '79 Was A Good Year" -- see Track and Structures.

Baecker, Ronald M., and Thomas R. Horsley, "Computer-Animated Simulation Models: A Tool for Transportation Planning" -- see Passenger Operations/Planning.

Bishop, H. L., and others, "Urban Mass Transportation Terminals," Report On Assignment 4, AREA Bulletin, 74, no. 639 (September-October 1972), 24-28, prepared by Committee 14--Yards and Terminals. Chicago: American Railway Engineering Association.

> It is noted in an introductory paragraph that the "GO" system in Toronto has been specifically designed to attract auto users and operates on a $2 million subsidy, which is considerably cheaper than the highways that would have to be built to carry the same number of persons. However, the fare revenues are generally expected to meet the operating and maintenance costs. The remainder of the article, which constitutes a report of the association's committee on yards and terminals, deals with service and storage yards for rapid transit passenger cars, stations and terminals (landscaping, general design, interior traffic flow, and waiting room size as parts of a typical station development plan; and site selection factors), vehicular parking at stations, and rail access to airports.
>
> RRIS 23 050897

Bodmer, Luis A., and Martin A. Reiner, "Approach to the Planning and Design of Transit Shelters," Transit Planning and Operations, Transportation Research Record 625, pp. 48-53. Washington, D.C.: Transportation Research Board, 1977. Tab., Figs., Refs.

For a transit patron, the transit shelter is one of the most easily recognizable elements of the transit system, but, at present, this type of transit-interface facility is considered simply for its cosmetic value. This attitude creates a weak link between the transportation system and its users and can threaten the viability of the urban transit system. This paper presents the theses that transit shelters have a more significant role in the community and in the transit system than being just a windbreak or weather-protection device; that they are an interface point with the system and should protect, comfort, inform, and guide the user; that they should blend into the surroundings but still be visible; and that they should not be isolated or passive agents. The paper sets forth an innovative approach to the planning and design of shelters and describes what a shelter facility is versus what it ought to be. It also describes the types of activities that are involved in the development of the transit shelter and the types of functional, social, financial, physical, and user issues that should be considered. The benefits that can be derived through the use of this approach are discussed.

Acknowledgment:
TRB

Braaksma, John P., and W. Jordan Cook, "Human Orientation in Transportation Terminals," Transportation Engineering Journal of ASCE, 106, no. TE2 (March 1980), 189-203. Tabs., Figs., Refs., 2 App.

A method for measuring human orientation in transportation terminals has been developed. Visibility can be measured by the existence or nonexistence of sight lines. These sight lines form the arcs in a graph where the facilities form the nodes. By measuring the connectivity of such graphs, indices for visibility can be determined. Sight line analysis is a simple technique that can be applied to existing terminal layouts and signage systems or to future floor plans of new or expanding terminals. The method will determine the visibility of the terminal as a whole or of any of its subsystems and

components. Changes in layout or signage can now be evaluated in terms of visibility and thus human orientation. The methodology was applied to eight air terminals, one rail terminal, and one bus terminal. The floor plan and signage system of one air terminal was improved to demonstrate how these changes can be measured by changes in the visibility indices.

Acknowledgment: HRIS 12 312131
EI

Cambridge Seven Associates, Inc., Northeast Corridor Rail Stations. Task 13. Prototype Beltway Station Development. Northeast Corridor High Speed Rail Passenger Service Improvement Program, Final Report, prepared for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, May 1976. 185 pp., Tabs., Figs., Photos., Refs.

The Northeast Corridor Project within the Federal Railroad Administration of the Department of Transportation had its foremost objective the development planning, physical design and subsequent implementation of high speed intercity rail passenger service between Washington, D.C. and Boston, Massachusetts. This would include the renovation, expansion, or new construction of 15 stations along the Northeast Corridor. This project was defined to develop planning and design requirements and prepare alternative designs for a prototype beltway (low activity level) intercity rail passenger station, select optimized design and develop a site-specific station work package.

Acknowledgment: RRIS 23 136994
NTIS FRA/ONECD-76/13
PB 253593 DOT-FR-40029

Cantilli, Edmund J., Allocation of Resources for Terminal Improvement, prepared by the Polytechnic Institute of New York for the Urban Mass Transportation Administration. Washington, D.C.: U.S. Department of Transportation, December 1975. 118 pp., Tabs., Figs., Refs.

The report describes the development of a resource-allocation model developed for the improvement of the internal environment of transport terminals. It incorporates considerations of comfort, cost, and patron opinion to allocate resources for maximum effect and efficiency.

Acknowledgment:
NTIS
PB 254811

RRIS 23 137340
UMTA-NY-11-0009-75-2

Carpenter, L. K., and E. M. Whitlock, "Planning Rail Station Parking: Approach and Application," Urban Systems Operations, Transportation Research Record 722, pp. 105-12. Washington, D.C.: Transportation Research Board, 1979. Tabs., Figs.

The efforts of the Northeast Corridor Improvement Project to revitalize passenger railroad service have entailed planning numerous station improvements such as accommodating increased passenger parking requirements. Results of studies of 3 of the 11 stations along the corridor that are being upgraded to high-speed rail requirements are reported in this paper. A compendium of parking characteristics to enable planning officials to better assess the needs of rail passenger parkers is included. Topics covered are parking demand estimates, passenger trip characteristics, and fiscal considerations of providing parking at rail stations. Planning guidelines of 0.28 spaces/daily boarding Amtrak passenger and 0.32/commuter passenger are suggested. The need for subsidization to make planned parking facilities economically feasible is also emphasized.

Acknowledgment:
TRB

HRIS 54 308589

Christensen, David (L.), Photo Survey of Development and Activities in the Vicinity of BART Stations: Technical Report, Final Report, BART Impact Program (short title - Photo Survey Technical Report), prepared in cooperation with the U.S. Department of Transportation and the U.S. Department of Housing and Urban Development. Berkeley, Calif.: Metropolitan Transportation Commission, July 1975. 40 pp., Tabs., Figs., Photos., Refs., Glossary, 2 App.

23 PASSENGER OPERATIONS
STATIONS AND TERMINALS

The Photo Survey is a record of development and activities in the vicinity of BART stations at given points in time. The record consists of three categories of data: ground level photos, aerial photos and supplementary assessor's land use information. The three kinds of data are cross-indexed by map overlays. Additional description of Photo Survey data, as well as detailed instructions for their retrieval and cross referencing may be found in the Photo Survey User's Guide.

Acknowledgment:
NTIS
PB 248313

RRIS 23 093954
FR-5-17-75
DOT-OS-30176

_____, Photo Survey of Development and Activities in the Vicinity of BART Stations: User's Guide, Final Report, BART Impact Program (short title - Photo Survey User's Guide), prepared by the Department of Architecture, University of California, Berkeley. Berkeley, Calif.: Metropolitan Transportation Commission, July 1975. 40 pp., Tabs., Figs., Photos., Glossary.

A general description of BART Impact Program Photo Survey data and basic instructions for their use is given. The Photo Survey is a record of development and activities in the vicinity of BART stations at given points in time. The photos, aerial photos and supplementary assessor's land use information are cross-indexed by map overlays. More detailed technical information concerning procedures used in establishing and maintaining the Photo Survey data area are presented in the Photo Survey Technical Report.

Acknowledgment:
NTIS
PB 247768

RRIS 23 093924
FR-14-17-75
DOT-OS-30176

Cochran, Stephenson, & Donkervoet, Inc., and W. Boulton Kelly, Baltimore Transportation Center Concept Study, Final Report, prepared for the Baltimore City Department of Planning, the Baltimore Regional Planning Council, and the Maryland

Department of Transportation. Baltimore, Md.: Baltimore Planning Commission, October 1975. 162 pp., Tabs., Figs., Photos., Refs., 7 App.

The report established the basic justification for preserving the Baltimore Rail Station as the nucleus in an intermodal transportation center. The proposed transportation center will provide an interface for high-speed intercity rail service, intercity and regional motorcoach service, regional commuter rail service, rapid transit service, local bus service, helicopter service, and the automobile. Two concepts of the intermodal facility are illustrated in this report for further consideration: concept on provides a total comprehensive solution to an expanded transportation center; concept two modifies the direction of concept one by providing a less expensive solution for an expanded complex.

Acknowledgment:
NTIS
PB 248626

RRIS 23 136995
BCDP-BTC-75-101

Cramer, Barton Emmet, Optimum Allocation of Transportation Terminals in Urban Areas, 212 Research Report, prepared by the Department of Civil Engineering, Massachusetts Institute of Technology for the U.S. Department of Commerce. Washington, D.C.: U.S. Department of Commerce, November 1, 1966. 63 pp., Figs., Refs., 2 App.

The report indicates a method of determining the location of a number of transportation terminals in an urban area in such a way that they were most accessible, and thus had the greatest utility from a system customer's point of view. By equating demand distribution with population distribution, and making some straightforward assumptions about travel velocity and path, a simple circular model was constructed. Subsequent theoretical and numerical analyses using a computer program which was developed from the model suggested several important results. There seems good reason to believe that the model, which is based on very modest assumptions and requires vastly less effort to parametrize than

the network approach, will generate solutions which compare favorably with more complex models. /Author/

Acknowledgment:
NTIS
PB 173684

RRIS 23 039016
RR66-60
C-85-65

De Leuw, Cather and Company and STV, Inc., Northeast Corridor High Speed Rail Passenger Service Improvement Project. Task 7A. Terminals, Final Report, prepared for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, May 1975. 515 pp., Executive Summary, Tabs., Figs., Photos., Refs.

An essential element of any intercity passenger transport system is the interface with local transportation -- both public and private. In recognition of this critical interface, a major task was undertaken to recommend a development program for upgrading fourteen major rail passenger handling terminals in the Corridor. The program was designed to meet overall goals and objectives of convenience, capacity, attractiveness and other level-of-service characteristics commensurate with high quality transportation facilities. The report consists of terminal performance standards, inventories of existing terminals and vicinity access/egress facilities, and recommended concept development plans for the terminals, parking facilities and urban transportation infrastructures in which they are located. Preliminary estimates of costs associated with the development plans are also included. See also PB-242 445.

Acknowledgment:
NTIS
PB 242444

RRIS 23 091571
DOT-FR-40026
FRA/ONECD-75-7A

Demetsky, Michael J., and Lester A. Hoel, "Design Criteria and Evaluation of Transportation Interface Facilities," High Speed Ground Transportation Journal, 11, no. 1 (Spring 1977), 75-92. Tabs., Figs., Refs.

The transportation interface facility is considered to be comprised of functional (passenger processing) and environmental systems. Specific components are identified for each category. Each of the physical terminal components is associated with a particular interest group (user, special user and/or operator) to develop a set of planning and design objectives for the general transportation interface facility design problem. The corresponding criteria and performance measures are then classified according to the manner by which they enter the terminal analysis process, i.e., as a result of an initial policy decision or as measures of performance and economic efficiency. A design methodology which uses supply, demand and policy requirements, and designs and measures the performance and cost of alternative terminal facilities is then shown. An evaluation model which operates on policy, performance, and cost measures summarizes the design and evaluation procedures.

Acknowledgment:
High Speed Ground Transportation Journal

Demetsky, Michael J., Lester A., Hoel, and Mark R. Virkler, Methodology for the Design of Urban Transportation Interface Facilities, Final Report, prepared by the Department of Civil Engineering, University of Virginia for the U.S. Department of Transportation Program of University Research. Washington, D.C.: U.S. Government Printing Office, December 1976. 119 pp., Tabs., Figs., Refs., 8 App.

Procedures and techniques are described which determine measures of the performance of transit station designs. Categories of measures are defined according to the manner by which they are treated in the design process; as a result of policy, or as measures of performance and economic efficiency. Policy items considered include concessions, advertising, personal care facilities, telephones, acoustics, construction materials, design flexibility, parking facilities, and provisions for the handicapped. Performance measures are associated with passenger processing, passenger orientation, the physical environment, safety, and security. The

policy and performance considerations along with cost factors are used to specify a systematic transit interchange facility design methodology that is recommended to practitioners. Comprehensive descriptions of appropriate analytical techniques for the evaluation of transit station designs are provided in the appendices to the report.

Acknowledgment:
NTIS
PB 269956

RRIS 23 166453
DOT-TST-77/46
UVA-529036-CE76-102
DOT-OS-50233

_____, A Procedural Guide for the Design of Transit Stations and Terminals, Phase I, Final Report, (cover title - Design of Transportation Interface Facilities: A Procedural Guide), prepared by the Department of Civil Engineering, University of Virginia for the U.S. Department of Transportation Program of University Research. Washington, D.C.: U.S. Government Printing Office, July 1977 (cover date June 1977). 71 pp., Tabs., Figs., Photos., Refs., 1 App.

The guide provides a synthesis of state-of-the-art concepts regarding the planning, design, and evaluation of passenger transportation stations. The enclosed material directs transportation planning teams to search for efficient station designs. The guide describes the important stages and considerations in a comprehensive terminal analysis methodology. When it is used with the two supplementary research reports, the specific details of the various tasks are given. The guide acknowledges that the transit station design process requires contributions from many disciplines and skills. It assists to coordinate station development programs in accommodating inputs from the disciplines. It further highlights the elements of different stations to assure valid comparisons relative to performance and cost criteria. See also report dated Feb. 1976, PB-253 742.

Acknowledgment:
NTIS
PB 272619

RRIS 23 167342
DOT-TST-77/53
UVA-529036-CE77-103
DOT-OS-50233

_____, "A Transit Station Design Process," (Abridgement), Planning and Design of Rapid Transit Facilities, Transportation Research Record 662, pp. 26-28. Washington, D.C.: Transportation Research Board, 1978. Tabs., Fig., Refs.

The state-of-the-art of transit station planning is characterized by a lack of consistency among principles, standards, and techniques. Design standards and design guidelines as developed by transit operating agencies do not address trade-offs among the different station features or design components. In order to provide for consistency among the procedures used by different agencies to design transit stations and to ensure comprehensive treatment in the station design process, a methodology which uses analytical techniques for designating and evaluating alternative transit stations has been developed. The performance of the station must be judged relative to a set of predefined objectives which derive from anticipated interests. Typical station design objectives reflect the points of view of the general user, the special user (the elderly and handicapped), and the operator concerning passenger processing, the station environment, and cost. The design objectives are then translated into a set of performance criteria which serve to define explicit performance measures that are the basis for comparisons among alternative station designs. This paper shows a method for analyzing transit interface facilities. The discussion focuses on the procedures which can be used to establish policy for station features, to provide performance measures for subsystems, and to give cost estimates. /Author/

Acknowledgment: RRIS 23 178747
TRB

Fausch, Peter A., "Sizing Pedestrian Queueing Areas," Man/Transportation Interface, pp. 113-37. A paper presented at the ASCE Specialty Conference May 31-June 1, 1972 in Washington, D.C. New York: American Society of Civil Engineers, 1972. Figs., Refs.

As the emphasis in planning new transportation facilities shifts from machine to man, there is a resulting need for tools to describe and treat the

characteristics of the pedestrian. One of the more powerful tools for this planning is the recently completed work of Dr. John Fruin in "Pedestrian Planning and Design" in which the characteristics and needs of the pedestrian are discussed in detail. This work parallels the Highway Capacity Manual in the impact that it will have in improving the design capabilities of transportation planners and engineers. In his book, Dr. Fruin points out the increasing importance of computer simulation techniques to determine pedestrian area requirements in large pedestrian oriented systems. The passenger elevator system in New York's World Trade Center is one example. Unfortunately many other new facilities have not benefited from these simulation techniques largely because of the lack of a tool for this purpose. The purpose of this paper is to describe a general purpose computer program which can be used to simulate the flow of pedestrians in typical man/transportation interface situations. The paper describes the background and development of the program and examples of its use.

Acknowledgment: RRIS 23 054124
ASCE

Fruin, J., "Traffic and Service Characteristics of Pedestrians in Terminals," Man/Transportation Interface, pp. 91-97. A paper presented at the ASCE Specialty Conference May 31-June 2, 1972 in Washington, D.C. New York: American Society of Civil Engineers, 1972. Figs., Refs.

A passenger terminal is a functional space that is designed to accommodate the physical requirements of the transport modes it serves, as well as the human requirements of its passengers. Although the physical requirements of the transportation modes serving a terminal interface are usually well defined, surprisingly little is understood about the requirements of passenger-pedestrians. Pedestrians require adequate spaces for locomotion and waiting, and enough escalators, doors, turnstiles and other such devices to minimize delay. While there have been numerous studies of the capacity of these types of facilities, there have been few evaluations of the related levels of human comfort and convenience.

Acknowledgment:
ASCE

RRIS 23 054122

Gelick, Michael S., Robert J. Orseske, and Marshall L. Silver, Design Criteria for Elevated Transportation Structures and Modal Exchange Facilities, Research Report 123, prepared by the Departments of Materials Engineering and Architecture, University of Illinois for the U.S. Department of Transportation, Office of the Secretary. Chicago: University of Illinois at Chicago Circle, January 1976. 123 pp., Tabs., Figs., Photos., Refs., 3 App.

Investigations and evaluations of existing elevated transportation systems were made to establish new guidelines and design standards for elevated transportation structures and modal exchange facilities. These criteria may be used to improve the physical condition of existing elevated systems and reduce their negative environmental impact on wayside areas. Prototypical renovations of existing transit structures and station areas are presented showing ways in which the new design standards may be applied to improve existing transit systems. Also, a prototypical elevated structure and a prototypical modal exchange facility are presented to demonstrate an application of the design criteria to hypothetical situations.

Acknowledgment:
NTIS
PB 260875

RRIS 23 147314
DOT-TST-76/46
DOT-OS-30092

Griffiths, John R., Lester A. Hoel, and M. J. Demetsky, Transit Station Renovation: A Case Study of Planning and Design Procedures, Final Report, prepared by the Department of Civil Engineering, University of Virginia for the Department of Transportation, Office of University Research. Washington, D.C.: U.S. Government Printing Office, June 1979. 221 pp., Tabs., Figs., Photos., Refs., 6 App.

The general techniques and procedures for planning and evaluating transit interface facilities are applied comprehensively to the problem of station

renovation. The 69th Street Terminal in Philadelphia is evaluated in terms of its performance in accomplishing its transportation function, its effectiveness in relation to transportation policies, development objectives and costs. The planning procedures are employed to develop possible improvement programs. The report identifies modifications to the transit station that will produce operational conformity with policy guidelines and suggests alternative renovation plans to meet system and user objectives. The alternatives are evaluated and compared using factor profiles. Modifications of the selected plans are suggested, and the methodology is reviewed in terms of its performance in the renovation planning process.

Acknowledgment:
NTIS
PB 298432

RRIS 23 198762
DOT-RSPA-DPB-50-79/14
DOT-OS-50223

Harry Weese and Associates, Ltd., Northeast Corridor High Speed Rail Passenger Service Improvement Program. Task 12.1-Corridor Stations Requirements, Final Report, prepared for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, July 1976. 470 pp., Tabs., Figs., Refs., v. App.

The Railroad Revitalization and Regulatory Reform Act of 1976 authorizes the establishment of regularly scheduled and dependable intercity rail passenger service between Boston, Mass. and Washington, D.C., including appropriate intermediate stops. As a basis for the development of the Federal Railroad Administration design and construction program to significantly improve intercity rail passenger service facilities at selected stations along the Northeast Corridor, this report provides the background material and methodology used in the development of the requirements for the design of the stations. It documents the review of earlier work, the development of performance standards, the evaluation of existing conditions, the development of concept plans, and the evaluation process for selection of recommended plans. Finally, it outlines the format

for subsequent development of schematic plans and breakdown of work units into work elements. See also PB-244 873.

Acknowledgment:
NTIS
PB 258176

RRIS 23 143999
FRA/NECPO-76/12.1
DOT-FR-56014

_____, Northeast Corridor Improvement Program Task 12.15. Corridor Stations Schematic Development: New Haven Station, Final Report, prepared for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, December 1976. 91 pp., Tabs., Figs., Photos., Refs.

The Railroad Revitalization and Regulatory Reform Act of 1976 authorizes the Secretary of Transportation to implement the Northeast Corridor Improvement Program to achieve, within 5 years after date of enactment of the Act, establishment of regularly scheduled and dependable intercity rail passenger service between Boston, Mass. and Washington, D.C., including appropriate intermediate stops. The report is one in a series which defines the scope of work to be undertaken at each station on behalf of the high speed rail system; delineates the physical planning configurations for the station building, vehicular access/egress system, parking, and platform facilities; and identifies preliminary estimates of construction costs to implement the recommended development program. See also Task 12.12, PB-261 441. Microfiche copies only.

Acknowledgment:
NTIS
PB 262381

RRIS 23 151144
FRA/NECPO-76/12.15
DOT-FR-56014

_____, Northeast Corridor High Speed Rail Passenger Service Improvement Program. Task 12.2. Corridor Stations Performance Standards, Final Report, prepared for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, May 1976. 406 pp., Tabs., Figs., Refs., 1 App.

23 PASSENGER OPERATIONS
STATIONS AND TERMINALS

The Railroad Revitalization and Regulatory Reform Act of 1976 authorizes the Secretary of Transportation to implement the Northeast Corridor Improvement Program to achieve, within 5 years after date of enactment of the Act, establishment of regularly scheduled and dependable intercity rail passenger service between Boston, Mass. and Washington, D.C., including appropriate intermediate stops. The Federal Railroad Administration has authorized a number of preliminary programming, planning and engineering tasks to provide the basis for development of final plans for the design and construction work. Performance Standards were developed to serve as the primary source of requirements to be satisfied in the design of the individual stations. The Performance Standards represent a set of generalized planning and design criteria for major functional and operational components of stations and sites documented in terms of quantities, sizes, levels of service and performance characteristics related to 1990 patronage projections. These Performance Standards are to become part of a Work Package for each station that will also include a Station Program, Schematic Design Drawings, Outline Specifications, a Cost Estimate and an Implementation Schedule. See also PB-244 873.

Acknowledgment:
NTIS
PB 257750

RRIS 23 143984
FRA/NECPO-76/12.2
DOT-FR-56014

_____, Northeast Corridor Improvement Program. Task 12.3-Corridor Stations Schematic Development: Summary Report, Final Report, prepared for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, December 1976. 352 pp., Tabs., Figs., Photos.

The Railroad Revitalization and Regulatory Reform Act of 1976 authorizes the Secretary of Transportation to implement the Northeast Corridor Improvement Program to achieve within 5 years after date of enactment of the Act, establishment of regularly scheduled and dependable intercity rail passenger service between Boston, Mass. and Washington, D.C., including appropriate intermediate stops. The

Federal Railroad Administration has authorized a number of preliminary programming, planning and engineering tasks to provide the basis for development of final plans for the design and construction work. This report summarizes the development of schematic plans for all of the 16 station locations studied in Task 12. It provides summary tables of the station development, patronage, parking and costs. It also includes the synopsis and the primary drawings for each station. See also Task 2, PB-259 985. Microfiche copies only.

Acknowledgment:
NTIS
PB 263790

RRIS 23 151719
FRA/NECPO-76/12.3
DOT-FR-56014

Hoel, Lester A., Michael J. Demetsky, and Mark R. Virkler, Criteria for Evaluating Alternative Transit Station Designs, Final (Interim) Report, prepared by the Department of Civil Engineering, University of Virginia for the U.S. Department of Transportation Program of University Research. Washington, D.C.: U.S. Department of Transportation, February 1976. 62 pp., Executive Summary, Tabs., Refs., 1 App.

The urban transit interchange facility is described in terms of the important functional facility components and the quality of the station environment. These terminal dimensions are interpreted to establish a list of design objectives which reflect the points of view of the user, the special user (elderly and handicapped) and the operator. The stated objectives are then used to identify criteria for the evaluation of alternative urban transportation interface facility designs. A general evaluation is derived and compared with the basic systems evaluation procedures: effectiveness analysis, benefit-cost analysis, and ranking and rating models. A terminal facility evaluation model with a specific set of measureable criteria is described with respect to three primary areas of application; i.e., a set of mutually exclusive project designs, an iterative design process, and the analysis of a major design strategy (e.g., modular construction).

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STATIONS AND TERMINALS

Acknowledgment:
NTIS
PB 253742

RRIS 23 137038
RLES-CE-4142-101-76
DOT-TST-76/68
DOT-OS-50233

Hoel, Lester A., and Michael J. Demetsky, "Toward a Methodology for Evaluating Alternative Transit Station Designs," Proceedings (of the) Fourth (Annual) Intersociety Conference on Transportation, held in Los Angeles, July 18-23, 1976. New York: The American Society of Mechanical Engineers, 1976. 4 pp., Refs.

The paper describes a comprehensive approach for transit station design that includes criteria development for system users and operators. This approach involves an iterative process wherein a basic design is created and evaluated relative to established criteria and then incrementally modified until all objectives are satisfied. A comprehensive set of criteria for assessing the performance of alternative transit station design configurations is provided and an interest-impact matrix model is recommended for transit station evaluations. The potential of the evaluation framework is in application to numerous terminal design settings. See also RRIS 26 148247.

Acknowledgment:
EI

RRIS 23 148262

Hoel, Lester A., and Ervin S. Roszner, "Planning and Design of Intermodal Transit Facilities," Transit Facility Operations, Transportation Research Record 614, pp. 1-5. Washington, D.C.: Transportation Research Board, 1976. Refs.

This paper presents an analysis of the present state of the art of transit station planning and design. It discusses the design process in terms of (a) design parameters and standards (e.g., stairways, ramps, and passageways; escalators; platforms; fare and exit control; moving walkways and ramps; bus facilities, and parking facilities); (b) design of the station environment (e.g., lighting, ventilation, acoustics, and fire control; passenger information and graphics; passenger security;

commercial activities; and special provision for the handicapped); and (c) design methodology (e.g., deterministic, probabilistic, and impedance models; simulation and validation problems). A classified bibliography is included.

Acknowledgment:
TRB

_____, Transit Station Planning and Design: State of the Art, TRI Research Report No. 8, prepared by the Transportation Research Institute, Carnegie-Mellon University. Pittsburgh, Pa.: Carnegie-Mellon University, April 1976. 186 pp., Tabs., Figs., Refs.

This report contains the conference papers and a summary of the proceedings of the Transportation Facility Workshop held May 22-24, 1974, in New York. The workshop was cosponsored by the TRI, the American Society of Civil Engineers, and the Metropolitan Association of Urban Designers and Environmental Planners. Part I of the report is an extensive review of literature. Part II contains papers that were presented at a session focusing on current practice and experience with planning and designing transit stations and a resource paper for another session dealing with research needs and new transit station design techniques. Part III summarizes the discussions that followed the paper presentations and presents the findings and conclusions.

Acknowledgment:
Carnegie-Mellon University
PB 275279
RRIS 23 167550
NSF/RA-760499
NSF-GI-39223

Isaac, Lawrence, New York City Transit Authority (Design) Guidelines. Station Planning, Technical Report, prepared by the New York City Transit Authority Engineering Department for the Urban Mass Transportation Administration. New York: New York City Transit Authority, March 1975. 72 pp., Refs., Glossary.

The project was designed to develop a revised and updated series of handbooks covering various aspects of the design, construction, and equipment of a modern rail rapid transit system. This volume covers

station planning. Prepared in cooperation with Tri-State Regional Planning Commission, New York. Paper copy also available in set of 12 reports as PB-251641-SET.

Acknowledgment:
NTIS
PB 251643

RRIS 23 133287
UMTA-IT-09-0014-75-2

Kangas, Ronald, and others, Handicapped and Elderly Vertical Movement Assessment Study, Final Report, prepared by the Transportation Systems Center for the Urban Mass Transportation Administration. Washington, D.C.: U.S. Department of Transportation, February 1976. 106 pp., Tabs., Figs., Photos., Refs., 3 App.

The report discusses the selection and assessment of seven types of vertical movement devices for potential use in older types of fixed rail urban mass transit facilities. The potential utilization of these devices is directed toward an increased usage of transit facilities by physically handicapped and elderly persons. The study concentrates on the technical and cost considerations in the implementation and utilization of various standard (e.g., elevators, escalators, moving walks) and nonstandard (e.g., inclined stairlifts, stair climbing wheelchairs) vertical movement devices in providing access and egress for elderly and handicapped persons to three configurations of rapid-rail stations typically found in the older transit systems of the United States. The general conclusion reached in the study is that each station has its own unique access/egress problems which restrict or enhance the implementation of specific types of vertical movement devices. Hence, the determination of the device option which is technically most effective for a given station, must await the results of a detailed architectural study of the individual station under consideration.

Acknowledgment:
NTIS
PB 252516

RRIS 23 133438
DOT-TSC-UMTA-75-25
UMTA-MA-06-0047-75-1

Kaukas, Bernard, "Completing the Environmental Package" -- see Environmental Protection.

Leake, G. R., and J. R. Underwood, "An Inter-City Terminal Access Modal Choice Model," Transportation Planning and Technology, 4, no. 1 (September 1977), 11-21. Tabs., Figs., Refs.

The calibration and testing of a modal split model for access to and egress from airports and centrally located rail terminal was undertaken as part of a detailed analysis of bimodal choice between rail and air for intercity travel in Great Britain.

Acknowledgment:
International Union of Railways

RRIS 23 170081

Lee, Douglass B., Jr., "How To Do a Transit Station Land-Use Impact Study," Transportation System Analysis, Transportation Research Record 677, pp. 28-33. Washington, D.C.: Transportation Research Board, 1978. Tab., Figs., Refs.

Several improvements in the conceptual basis and methodology for studies of land-use impacts have occurred over the past two decades, but the framework is still incomplete because the need to incorporate the policy context into the study design has not been fully recognized. A revised model for impact studies is proposed, and the approach is illustrated by a case study of a planned rail rapid transit station. One of the major differences between this and previous methods is that the method described in this paper acknowledges several possible outcomes or impacts as a function of alternative public policies in addition to the transit station itself. Five categories of impacts are evaluated; public facilities, environment, market, neighborhood, and costs and revenues.

Acknowledgment:
TRB

HRIS 15 195967

Lutin, Jerome M., "Rehabilitation of Suburban Rail Stations," Transit Planning and Operations, Transportation Research

23 PASSENGER OPERATIONS
STATIONS AND TERMINALS

Record 625, pp. 57-63. Washington, D.C.: Transportation Research Board, 1977. Figs., Refs.

This paper reports the results of a study of the feasibility of rehabilitating underused suburban railroad stations. Seventy-seven stations on eight commuter lines in New Jersey were surveyed. Each station was inspected, photographed, and evaluated for its restoration potential by criteria that were developed for the study. The Red Bank station was selected as a case study. The study included the development of community and local government participation, the renovation of the 100-year old depot, the redesign of the passenger facility as an intermodal terminal for bus, rail, and taxi; the redesign of the pedestrian facilities; and an economic analysis. The municipality has now taken possession of the station which is used by 1,500 daily commuters. Preliminary architectural plans have been drawn up, the station has been designated as a historic site, and the building restoration and site work are nearly completed. This study is intended to be a prototype for other restoration projects that could modernize urban transportation facilities while preserving historically valuable structures. The emphasis is on maximizing the economic benefits of the project. /Author/

Acknowledgment:
TRB

RRIS 23 168073

Lutin, Jerome M., and Alain L. Kornhauser, "Role of Simulation Models in the Transit-Station Design Process," Transit Planning and Operations, Transportation Research Record 625, pp. 53-57. Washington, D.C.: Transportation Research Board, 1977. Fig., Refs.

This paper summarizes the ways in which a transit-station simulation model could be developed to function as a more integral part of the design process. It examines in detail the interface of the user with the model. Specific problems dealing with network and spatial representation are discussed, and the

model output is matched with the information needs of the designer at the appropriate stages in the design process. The paper concludes with a discussion of cost-effectiveness of station-simulation models. /Author/

Acknowledgment: RRIS 23 168072
TRB

Moss, A. J., and G. R. Leake, "Some Passenger Access Characteristics to Certain Inter-City Rail Termini in Great Britain," Traffic Engineering and Control, 18, no. 6 (June 1977), 315-18. Tabs., Figs., Refs.

The paper examines some of the characteristics of access to a main terminal for intercity travellers between the centrally located rail termini of Leeds, York and Newcastle, and develops access travel cost and time versus straight-line distance relationships for various access modes. Some of the access travel time relationships have been compared to previous work carried out in London, and this has indicated some degree of comparability between the areas, especially for the road-based access modes.

Acknowledgment: RRIS 23 163878
TRRL

Naka, Yuichiro, "Mechanism of Cross Passenger Flow in Railway Station," Railway Technical Research Institute Quarterly Reports, 20, no.1 (March 1979), 15-21. Figs., Photos.

The study described was conducted to investigate the mechanism and nature of complicated passenger flow. As a first step of the study, the mechanism of cross flow is investigated by the observations at a concourse of a commuting train station in Tokyo, Japan and by a study on a mechanism model on the other hand.

Acknowledgment: RRIS 23 303202
EI

23 PASSENGER OPERATIONS
STATIONS AND TERMINALS

Newman, Oscar, Architectural Design for Crime Prevention -- see Safety.

_____, Design Guidelines for Creating Defensible Space -- see Safety.

Noakes, Edward H., "Architectural Barriers and the Problems of the Handicapped," Man/Transportation Interface, pp. 51-65. A paper presented at the ASCE Specialty Conference May 31-June 2, 1972, in Washington, D.C. New York: American Society of Civil Engineers, 1972.

> To the "average" American, architectural barriers are invisible. Those who enjoy full physical powers seldom realize the difficulties experienced by the physically handicapped when confronted with such simple facts of everyday life as stairs, curbs, or escalators. To an individual on crutches, or in a wheelchair, these structural details become barriers to a normal existence. When built into a transportation complex, such structural details will render the entire system either difficult or impossible to use for the estimated 10 million citizens who suffer temporary or permanent physical handicaps.

Acknowledgment: ASCE

RRIS 23 054120

Northeastern Illinois Planning Commission, Prototype Suburban Transportation Centers, Final Report, prepared for the Village of Skokie and the Urban Mass Transportation Administration. Chicago: Northeastern Illinois Planning Commission, March 1971. 85 pp., Tabs., Figs., 3 App.

> The purpose was to develop criteria for prototype commuter transportation centers at which the interchange of rail passengers to automobile, bus or other rail modes would be facilitated with maximum convenience. Criteria for designing the prototype transportation centers were developed with reference to: (1) the enclosed structure; (2) pedestrian circulation; (3) provision of commercial and other public facilities; (4) parking; (5) loading operations;

and (6) landscaping. Each functional aspect of the efficient rail station is described briefly along with such general planning requirements as the estimated volume of commuter passengers and vehicles. Particular emphasis is focused upon convenience for the transit user as the transit environment may be a principal factor in attracting new ridership. Consequently, such variables as walking distances, pedestrian access, passenger amenities, and functional design are emphasized in the analysis. Three prototype transportation center designs were developed for application in different types of urban and suburban locations. Estimated cost factors for each prototype design are provided. The possible impact of new transit technology on future station configurations is discussed. A final section details implementation procedures for commuter transportation centers. Different sources of financing are examined with reference to local contributions, parking fees, commercial leases or land sales, and participation in relevant federal assistance programs.

RRIS 23 044184
I11-T9-2

Northwestern Indiana Regional Planning Commission, Economic Adjustment Study: Chicago South Shore and South Bend Railroad Corridor -- see Economics.

Perilla, Oscar, "Measuring Service Delivered by Transportation Terminals," Transit Facility Operations, Transportation Research Record 614, pp. 32-34. Washington, D.C.: Transportation Research Board, 1976. Tabs., Refs.

A procedure for deriving an index of the adequacy of a design to provide a particular service is introduced and applied to the evaluation of passenger transportation terminal designs. The concept of the service rendered by a transportation terminal or facility is defined as the rendering of assistance to the users of the facility to satisfy their needs and purposes. The index presented here takes

account of all the movements of a passenger from the moment of arrival at the terminal to his departure. All of the design features and impacts on service flow and organization are reflected in the index. The index combines all these occurrences in a logically and intuitively satisfactory way that may be tested against user valuations and refined until index and valuations consistently agree. The determination of the ratio of number active and number helped, and the calculation of the index of service is detailed.

Acknowledgment:
TRB

RRIS 23 159601

Port Authority Trans-Hudson Corporation, PATH Station Modification and Rehabilitation Technical Study (cover title - REHAB PATH), Final Report, prepared for the Urban Mass Transportation Administration. New York: Port Authority Trans-Hudson Corporation, 1971. 89 pp., Tabs., Figs., Photos.

The study examines the PATH (Port Authority Trans-Hudson Corporation) System. It was determined that this study would be directed not only to the examination of the PATH stations as buildings, but would also concern itself with the urban areas around stations, and with the PATH system as a whole. The three levels analyzed were station level, urban level, and system level. Topics discussed in this report include background, general recommendations, station recommendations (10 stations), and the study processes. /Author/

Acknowledgment:
NTIS
PB 210618

RRIS 23 037117
UMTA-INT-T9-15-71-1
DOT-UT-444

Rardin, Ronald L., and others, "Dade County's Experience with Urban Station Simulation (USS) Procedures," (Abridgement), Transit Development, Transportation Research Record 719, pp. 60-63. Washington, D.C.: Transportation Research Board, 1979. Tabs., Figs., Refs.

Urban Station Simulation (USS) is a transit station simulation computer program developed by the Urban Mass Transportation Administration (UMTA) to analyze the capacities of stations. The geometric configuration of a proposed station and the proposed capacities of its various service facilities are input to the USS program, which simulates the movements of individual passengers through the station and records statistics on how they are distributed along alternate routes and on the delays they encounter in waiting lines (or queues) that develop at various points. This paper is an analysis of a USS program used by the Kaiser Transit Groupt (KTG) to assist analysis of transit stations in the Metropolitan Dade County Transportation Improvement Program. The USS program has been applied to designs for the proposed Douglas Road, South Miami, Dade and North stations in the southern (Dixie Highway) corridor of the stage one Dade County Rapid Transit System. Although the USS program has not been widely released by UMTA -- which has even taken the first steps to produce a new version -- due to many known deficiencies, this paper demonstrates that pedestrian simulations can provide many useful analyses of station design. KTG's simulation results have been well received by the architects who must use them, and more analyses have been requested.

Acknowledgment: HRIS 12 303956
TRB

Richards, Larry G., and Lester A. Hoel, Planning Procedures for Improving Transit Station Security, Final Report, prepared by the Department of Civil Engineering, University of Virginia for the U.S. Department of Transportation Program of University Research. Washington, D.C.: U.S. Department of Transportation, February 1980. 60 pp., Tabs., Figs., Refs.

This document describes the procedures and concerns in designing safe and secure transit stations. The report is divided into five parts. Part I introduces the problem of transit security, distinguishes between safety and security and between objective and perceived security, and presents background information on design issues and security. Part II

reviews the statistics on transit crime--comparing bus versus rail systems, various U.S. cities, and types of crimes. Descriptions of the circumstances and nature of three frequent transit crimes (assault and battery, vandalism, and robbery) were developed; and the criminal's perspective on transit crime is described. Part III describes transit security from the passenger's point of view, the variables affecting perceived security, and the passenger's activities within the transit station and their relationship to security. In Part IV, crime countermeasures appropriate to transit environments are discussed, and the bases for evaluating countermeasures for a particular application are outlined. Finally, Part V describes the security planning procedure for transit station design. This step by step procedure is outlined for use by the transit planner.

Acknowledgment:
NTIS

DOT-RSPA-DPB-50/80/14
UVA-529036-CE80-106
DOT-OS-50233

_____, "Planning Procedures for Transit Station Security," Traffic Quarterly, 34, no. 3 (July 1980), 355-75. Tabs., Fig., Refs.

This article discusses the principal issues of station security. It describes a set of procedures for the design of safe, secure terminal areas. The emphasis is on station design and the built-in security features of a station.

"Safety Stops at Terminals Evaluated" -- see Safety.

Skidmore, Owings, & Merrill, Northeast Corridor High-Speed Rail Passenger Improvement Project, Task 14 Model Intermodal Terminal, Union Station, Phase I: Terminal Requirements Report, Final Report, prepared for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, June 1976. 306 pp., Tabs., Figs.

The study constitutes the first phase of Task 14 of the Northeast Corridor High-Speed Rail Passenger Service Improvement Project and has been prepared

for the Northeast Corridor Project Office of the Federal Railroad Administration. The purpose of Task 14 is to investigate the conceptual alternatives for an Intermodal Terminal at Union Station, Washington, D.C., and to prepare a detailed conceptual design for the preferred alternative. The report identifies characteristics and space requirements of an intermodal terminal at Union Station, sets forth parameters for evaluating alternative terminal plans, and reviews selected prior plans for transportation facilities at Union Station. See also PB-257584. Reports on other stations are also available.

Acknowledgment:
NTIS
PB 257053

RRIS 23 143321
FRA/NEPCO-76-04
DOT-FR-66017

_____, Northeast Corridor High-Speed Rail Passenger Improvement Project, Task 14 Model Intermodal Terminal, Union Station, Phase II: Alternative Concepts Report (cover title - NE Corridor High-Speed Rail Passenger Improvement Project, Task 14 Model Intermodal Terminal, Union Sta., Phase II), Final Report, prepared for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, June 1976. 167 pp., Tabs., Figs., Photos., 1 App.

The study constitutes the second phase of Task 14 of the Northeast Corridor High-Speed Rail Passenger Service Improvement Project and has been prepared for the Northeast Corridor Project Office of the Federal Railroad Administration. The purpose of Task 14 is to investigate the conceptual alternatives for an Intermodal Terminal at Union Station, Washington, D.C., and to prepare a detailed conceptual design for the preferred alternative. The report includes plans and sketches, analysis of traffic impact, and preliminary cost estimates for five final alternatives for the Intermodal Terminal at Union Station. The alternatives are evaluated and a preferred concept recommended which involves the shared use of Union Station by the terminal and the National Visitor Center, as proposed by Alternative B-1. See also PB-257053.

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STATIONS AND TERMINALS

Acknowledgment:
NTIS
PB 257584

RRIS 23 143233
FRA/NEPCO-76-05
DOT-FR-66017

Uehara, Takao, "Planning of Station Building as Viewed from the Standpoint of Passenger Service," Railway Technical Research Institute Quarterly Reports, 16 no. 2 (June 1975), 70-74. Tabs., Figs.

The present study is aimed at establishment of guidelines on the planning of type and scale for railway passenger stations in the future. Through survey of stations past and present and through factorial analysis of their changes, the role, functions and problems of passenger stations to be planned hereafter are discussed. Various data collected on the behaviors of passengers and status of service facilities utilization as fundamental data for designing station buildings as nodal points of traffic are analyzed and, based on the results thereof, several approaches to planning of building space layout and scale are proposed.

RRIS 23 127355

United States General Accounting Office, Proposed Project to Renovate Nashville's Historic Train Station Building Needs to Be Reevaluated -- see History.

Virkler, Mark R., Michael J. Demetsky, and Lester A. Hoel, Transit Station Design: Case Studies of a Planning and Design Method, Final Report, prepared by the Department of Civil Engineering, University of Virginia for the U.S. Department of Transportation Program of University Research. Washington, D.C.: U.S. Department of Transportation, February 1980. 199 pp., Tabs., Figs., Refs., Glossary.

The application of a previously developed and documented transit station design methodology is described. Two example design scenarios, a central area bus terminal and a rail rapid transit station are illustrated. In addition a summary of two further case studies is included to strengthen the conclusions derived concerning the recommended use of

the method by design practitioners. Due to the varying circumstances surrounding any particular transit station and the numerous design options that are available, it is realistic to attempt to make conclusions regarding specific design practices such as advertisements should be permitted in all stations. The experiences with the station design procedures have shown the method to be very useful in selecting and improving upon a station design that compares to the stated design objectives. Technically, many subjective decisions are required even with the formalized method and, thus, objectivity must be stressed in terms of procedure rather than practice. The findings indicate that if the station design is developed using the formal process, the least cost alternative typically prevails.

Acknowledgment: DOT-RSPA-DPB-50/79/14
NTIS DOT-OS-50233

Webber, Margo B., and Paul J. McGinley, Recycling Historic Railroad Stations: A Citizen's Manual -- see Industry Structure and Company Management.

_____, Recycling Historic Railroad Stations: A Technical Supplement -- see Industry Structure and Company Management.

Worrall, R. D., and J. M. Bruggeman, Analysis of the Locations and Functions of the Terminal Interface System, Northeast Corridor Transportation Project, Final Report, prepared by Peat, Marwick, Livingston & Co. for the U.S. Department of Transportation. Boston, Mass.: Peat, Marwick, Livingston & Co., December 1969. 463 pp., Tabs., Figs., Refs., 4 App.

This report summarizes the findings of the first phase of a projected two-phase study of transportation terminal site-selection and design. The research focuses on the interface between intracity and intercity passenger transportation; freight and goods transportation are considered only in so far as they influence the movement of passenger traffic. The Phase I research emphasized development of a methodological framework; therefore, the findings

tend to be methodological, focusing heavily on questions of problem definition and analytical format. Four major topics are addressed: identification of the primary functional and locational tradeoffs associated with site-selection and design, and development of a analytical framework for their measurement and evaluation; review of the status of terminal system technology and evaluation of potential benefits from technological innovation; development of a method for estimating passenger terminal system impedances for inclusion in a network simulation model; and identification of areas for future research and development.

PB 191393 FR-9-0030

04 PROPULSION SYSTEMS

(See also Passenger Operations/Rail Cars and Equipment and Rail Vehicles and Components: Cars and Equipment)

"Milwaukee First to Get New EMD Commuter Locomotives," Railway Age, 175, no. 8 (April 29, 1974), 62. Photo.

The Milwaukee Road is the first railway to receive the newest locomotive design specifically for commuter service; the F40C from General Motors' Electro-Motive Division. These locomotives are 3,200 hp six axle units equipped with an auxiliary power system to provide A.C. power for train lighting, heating and air-conditioning.

Acknowledgment:
Canadian National Railways
Headquarters Library

RRIS 04 054923

08 RAIL-HIGHWAY GRADE CROSSINGS

California Public Utilities Commission, Railroad Operations and Safety Branch, The Effectiveness of Automatic Protection in Reducing Accident Frequency and Severity at Public Grade Crossings in California. San Francisco: California Public Utilities Commission, June 30, 1974 (reprint - Washington, D.C.: U.S. Department of Transportation, August 1975). 205 pp., Tabs., Figs., Refs., 4 App.

To assist the California PUC in performing its duties related to grade crossing regulation, the Office of Traffic Safety sponsored this project to determine the scope of the vehicle-train accident problem in California, to gauge the effectiveness of various types of protective devices and to investigate critically the possible use of warrants or criteria to assist in recommending where money should be spent on railroad-highway crossing protection improvements. A questionnaire was mailed to all cities and counties. The before-and-after accident histories of 1,552 crossings currently protected by automatic devices were examined. The actual and estimated costs of installing automatic devices at 1,296 locations were summarized. The feasibility of criteria to assist in placing grade crossing protection devices was examined. Information on each crossing was used to develop accident rate predictions and hazard indices.

RRIS 08 130988

Kraffmiller, Steve E., William E. Moore, and Robert White, Jr., Northeast Corridor High-Speed Rail Passenger Service Improvement Project. Task 10N Grade Crossings and Fencing, (New Have CT to Boston MA), Final Report, prepared by De Leuw, Cather/STV for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, September 1975. 213 pp., Tabs., Figs.

Recommendations for the eliminations of at-grade crossings and provisions of fencing programs for safety on the Northeast Corridor from New Haven to Boston are developed. Construction and land acquisition cost estimates are included. Each at-grade crossing site is discussed in detail, including alternate proposals which were considered. The

special crossing problem at New London is investigated. Fencing standards are developed. Alternative applications are discussed. Special problem areas such as commuter stations and overhead bridges are investigated. See also PB-243 420

Acknowledgment:
NTIS
PB 248704

RRIS 08 094029
2503-10,2503-11
FRA/ONECD-75-10
DOT-FR-40026

Mengert, Peter, Rail-Highway Crossing Hazard Prediction Research Results, Final Report, prepared by the Transportation Systems Center for the Federal Railroad Administration and the Federal Highway Administration. Washington, D.C.: U.S. Department of Transportation, March 1980. 254 pp., Tabs., Figs., Refs., 8 App.

This document presents techniques for constructing and evaluating railroad grade crossing hazard indexes. Hazard indexes are objective formulas for comparing or ranking crossings according to relative hazard or for calculating absolute hazard (conditional expected frequency of grade crossing accidents) on an individual crossing basis. Relative and absolute hazard indexes are constructed and compared in performance with some hazard indexes in general use. The DOT-AAR crossing inventory for all public crossings in the United States and the FRA accident data base for 1975 are used. Various measures and displays of performance of hazard indexes in predicting the hazard of crossings as functions of their inventory characteristics and as manifest in the U.S. accident experience of 1975 are given. The levels of performance that may be expected of various hazard indexes in various situations are given. Relative and absolute hazard indexes constructed on this project are exhibited which outperform other hazard indexes tested. Means for shaping a relative hazard index into an absolute hazard index are given. An introductory discussion in provided on the use of accident history in hazard indexes. Preliminary estimates are given of some of

the parameters involved in that discussion. Theoretical aspects of this report include some discussions of nonlinear regression and nonlinear discriminant analysis as well as some aspects of empirical Bayesian statistics.

Acknowledgment:
NTIS
PB 80-170749

FRA-RRS-80-02
DOT-TSC-FRA-79-1
RR033/R0301

Olson, Robert M., and others, Railroad-Highway Grade Crossing Handbook, prepared by the Texas Transportation Institute for the Federal Highway Administration. Washington, D.C.: U.S. Government Printing Office, August 1978. 241 pp., Tabs., Figs., Refs.

This handbook briefly describes how growth of railroads and highways resulted in a proliferation of grade crossings and then discusses the variety of methods developed to warn pedestrians and vehicles of approaching trains. It is aimed primarily at providing railroad, state and municipal personnel with information which can help in cooperative efforts to improve grade crossing safety and efficiency. The book describes conditions and requirements at crossings; facilitates understanding of the elements of crossing systems; provides a compendium of existing grade crossing technology; serves as a guideline to aid in implementing improvements to grade crossings; aids in understanding and applying new technology; and serves as a basic text for training programs.

RRIS 08 193342
TS-78-214

Transportation Research Board, Bibliography 57: Railroad-Highway Grade Crossings. Washington, D.C.: Transportation Research Board, 1976. 43 pp.

Designed to provide a comprehensive and convenient reference document for researchers, highway traffic engineers, railroad signal and crossing engineers, officials in public agencies and the private carrier

industry, this bibliography presents 171 selected entries complete with abstracts. The documents cited here are those which are substantive and have made a significant contribution to the state-of-the-art literature in the area of railroad-highway grade crossings. A list of key words is provided which summarizes the subject areas covered. The entries encompass the period from 1950 through mid-1976.

RRIS 08 145008

United States Department of Transportation, Federal Railroad Administration, Office of Safety, Rail-Highway Grade-Crossing Accident/Incident Bulletin, a continuing series. Washington, D.C.: U.S. Government Printing Office.

This series is prepared from reports submitted by the railroads to the Federal Railroad Administration in accordance with Regulation 49 CFR 225. Its purpose is to direct attention to the hazards inherent to public grade crossings, and to provide basic statistical information in support of the overall Department of Transportation program to promote the safety of both rail and highway traffic at crossings. Although all factors leading to rail-highway grade crossing accidents are not identified, the tabular information provides valuable material for use in identifying specific conditions surrounding crossing accidents.

03 RAIL VEHICLES AND COMPONENTS: CARS AND EQUIPMENT

(See also Propulsion Systems and Passenger Operations/Rail Cars and Equipment)

Boeing Company, Vertol Division, Surface Transportation Systems Department, Report on Development of Guideline Specification for Urban Rail Cars, Final Report, prepared for the Urban Mass Transportation Administration. Philadelphia, Pa.: Boeing Company, March 1973. 185 pp., Tabs., 6 App.

The purpose of the report is to present the general methodology, industry coordination and pertinent observations on the development of the Guideline Specification for Urban Rail Commuter Car. The guideline specification was developed in a series of three drafts which were coordinated in meetings with a review committee of UMTA personnel and industry representatives. Basic specification matters under consideration include: scope, system requirements, car body, coupler and draft gear, miscellaneous car body items, door operation and control, heating-cooling-ventilating, lighting auxiliary electrical equipment, power and traction, trucks and suspension systems, friction braking systems, train electronics, emergency systems, system support, management systems, testing, quality assurance, applicable documents and general information. (Modified author abstract).

Acknowledgement:
NTIS
PB 222740

RRIS 03 050731
UMTA-PA-06-0023-71-1
DOT-UT-10010
(inside 10004)
D174-10013-2

Curtis, R. D., New Locomotive Hauled Push-Pull Commuter Cars for Massachusetts Bay Transportation Authority, contributed by the Rail Transportation Division of ASME for presentation at the Joint ASME/IEEE Railroad Conference, Colorado Springs, Colo., April 24-25, 1979. n.p.: American Society of Mechanical Engineers, January 1979. 9 pp., Figs., Photos., Ref.

This paper provides a description of the technical details of locomotive hauled push-pull commuter cars being built by Pullman Standard for the Commuter Rail Division of the Massachusetts Bay Transportation Authority. It also provides a brief review of

where the push-pull concept originated, its advantages, and its development over the past 20 years.

Acknowledgement:
ASME and IEEE

RRIS 03 194641
Conf. paper 79-RT-2

Dunton, W. H., and P. R. Norton, Guideline Specification for Urban Rail Cars, Final Report, prepared by the Boeing Vertol Company, Surface Transportation Systems Department for the Urban Mass Transportation Administration. Washington, D.C.: U.S. Department of Transportation, March 1973. 187 pp., Tabs., Figs., Glossary.

The specification provides guidelines for both commuter and rapid transit rail cars. The purpose of the specification is to establish uniform practices for the preparation of detail procurement specifications for these two types of vehicles to aid in the use and comparative analysis of the specification content. The specification encourages the use of modern technology and innovation by establishing measurable performance objectives rather than specifying existing equipment or equivalent. The specification covers all subsystems of the vehicle applicable to this type of equipment as a class and not unique to one design.

Acknowledgement:
NTIS
PB 220678

RRIS 03 047264
D174-10013-1
DOT-UT-10010

"Energy-Minded High Speed Railcar," Progressive Railroading, 21, no. 3 (March 1978), 83-84. Photos.

The SPV-2000, a diesel-torque converter driven rail passenger car, has been introduced as a successor to Budd's Rail Diesel Car. The car body is based on the Amtrak coach design and can be supplied in configurations for intercity or commuter service.

Acknowlegement:
Progressive Railroading

RRIS 03 173375

03 RAIL VEHICLES AND COMPONENTS: CARS AND EQUIPMENT

Louis T. Klauder and Associates, A Study to Accommodate the Elderly and Handicapped on Existing Commuter Rail Coaches, Final Report, prepared in cooperation with the Southeastern Michigan Transportation Authority for the Michigan Department of State Highways and Transportation and the Urban Mass Transportation Administration. Philadelphia, Pa.: Louis T. Klauder and Associates, December 1977. 79 pp., Tabs., Figs., Photos.

The report examines the feasibility of making the existing Detroit-Pontiac commuter rail service more readily accessible by the elderly and handicapped. It examines three types of railroad coaches (1500, 4800, and 9600 series cars) currently owned by the Southeastern Michigan Transportation Authority (SEMTA) as well as existing rail stations in the overall analysis to provide rail service for the elderly and handicapped. The report is definitive toward the methods required to modify the interiors of these cars to accommodate the onboard handicapped passenger (including bathroom facilities). The report also presents innovative concepts to the problem of boarding/unloading the handicapped. Some of the conclusions presented are the following--(1) that present commuter rail facilities are not accessible for ingress/egress by the unassisted elderly and handicapped; and (2) that two of the three types of railcars owned by SEMTA can be modified to accommodate the elderly and handicapped providing that each station platform complement the proposed car modification. The guidelines used as reference material for this study were the Michigan 'General Rules' of the Construction Code Commissions Barrier Free Design Graphics. This report provides numerous diagrams depicting floor arrangements and the proposed modifications to these cars.

Acknowledgement:
NTIS
PB 292765

RRIS 03 191670
UMTA-UTD-30-79-1

Okada, Naoaki, "New Type Coaches for the Modernisation of Local Trains," Japanese Railway Engineering, 18, no. 1 (1978), 22-23. Fig., Photos.

Locomotive-drawn coaches are operated on city suburban services. However, JNR has recently developed a new coach with wider entrances and automatic doors in order to improve the quality of local services. This new series of coaches are used mainly on suburban services and on supplementary medium-distance trains at weekends.

Acknowledgement:
International Union of Railways, BD

RRIS 03 189794

Ronan, William J., "Standardisation of Transit Cars: Progress Towards a Realistic Goal," Railway Gazette International, 129, no. 9 (September 1973), 345-48. Photos.

Efforts to standardize rolling stock designs for suburban and urban services have seldom met with success, but North America provides two outstanding examples of what can be done in the PCC tramcar and the Budd rail diesel car. More recently the MTA has been able to achieve a high level of standardization in ordering new equipment for New York's commuter lines and transit systems, while the U.S. government is trying to raise technical standards for transit cars to a new level through its SOAC and ACT programmes.

RRIS 03 050346

Tachet, Pierre, "New SNCF Double-Deck Coaches for Outer-Suburban Services," Rail Engineering International, 4, no. 2 (February 1974), 58-64. Figs.

Increasing growth of suburbia demands better passenger comfort because of longer daily journeys. To increase capacity SNCF develops a new series of stock with driving trailers for locomotive pull-and-push operation, the passenger in- and out-flow having been made a special study in relation to acceptable station times for train running in outer-suburban areas.

Acknowledgement:
Rail Engineering International

RRIS 03 054285

00 RIGHT-OF-WAY

(See also Track and Structures)

Ahlf, Robert E., "Stabilizing Track Through Station Platforms, Other Ground Structures," Railway Track and Structures, 73, no. 4 (April 1977), 20-23. Fig., Photo.

> To ensure track stability, the top 20 inches of ballast should be kept as dry as possible, keeping the groundwater table low and shedding as much surface water as possible. For these reasons, where no drainage ditch is possible at the foot of the subgrade shoulder, as at station platforms and level crossings, measures must be taken to compensate for interference in the drainage system.

Acknowledgement: RRIS 00 163243
International Union of Railways

Nelson-Smith, George, "Lighting for the Great Northern Suburban Railway Electrification," Light and Lighting and Environmental Design, 71, no. 1 (January/February 1978), 18-23. Photos.

> The various aspects of the lighting programme of the Great Northern Railway electrification scheme are discussed and the lighting solution used and the results achieved are described. The lighting is described for the Hornsey E.M.U. Depot which comprises the following parts: the maintenance complex, the offices, and the overhead line depot. A description is included of the way in which the stations on the northern city line have been illuminated to provide a separate image and to keep costs down. Other aspects covered are tunnel lighting, lighting of Kings Cross station and the station throat, the Kings Cross freight terminal GN suburban station improvements and platform indicators. A brief mention is also made of the interior design of the new rolling stock to be used on the system.

Acknowledgement: RRIS 00 176921
TRRL

Todes, Daniel, New York City Transit Authority Design Guidelines: Equipment (cover -- New York City Transit Authority Engineering Department Guidelines: Equipment), Technical Report,

prepared by the New York City Transit Authority in association with the Tri-State Regional Planning Commission for the Urban Mass Transportation Administration. Brooklyn, N.Y.: New York City Transit Authority, March 1975 (inside -- January 1975). 243 pp., Tabs.

Contents: Equipment guidelines; General criteria; Auxiliary electrical power and lighting; Heating; Ventilation and air cooling; Escalators; Pumps and ejectors; Fire lines; Direct current connections. Prepared in cooperation with Tri-State Regional Planning Commission, New York. Paper copy also available in set of 12 reports as PB-251 641-SET.

Acknowledgement:
NTIS
PB 251649

RRIS 00 133293
UMTA-IT-09-0014-75-8

12 SAFETY

(See also Passenger Operations/Stations and Terminals and Rail-Highway Grade Crossings)

American Public Transit Association, Transit Security Guidelines Manual, prepared with the assistance of the Urban Mass Transportation Administration and the Transit Development Corporation, Inc. Washington, D.C.: American Public Transit Association, February 1979. v.p., Tabs., Figs., Photos., Refs., v. App.

This manual describes security measures and equipment necessary for the protection of transit patrons, employees, and properties in a variety of ways since police/security responsibilities vary considerably between cities. The ideas can be used and adapted to the particular needs of a system. As technological changes and advancements occur, the manual will be updated and expanded.

Bechtel, Incorporated, Northeast Corridor High Speed Rail Passenger Service Improvement Project. Task 6. Risk Analysis of Joint Passenger/Freight Operations, Final Report (inside -- Draft Report), prepared in cooperation with Battelle-Columbus Laboratories for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, August 1975. 99 pp., Tabs., Figs., 5 App.

The objective of Task 6 was the assessment of the risk associated with the operation of a Northeast Corridor passenger system in the proximity of through and local freight. The report identifies two major categories of passenger/freight interaction and contains analyses of these factors as they apply to the various operational scenarios under consideration for the 1990 High Speed Rail Plan.

Acknowledgment:
NTIS
PB 244066

RRIS 12 092221
FRA/ONECD-75/6
DOT-FR-40027

Carnegie-Mellon University, Transportation Research Institute, Security of Patrons on Urban Public Transportation Systems, Research Report. Pittsburgh, Pa.: Carnegie-Mellon University, February 1975. 78 pp., Tabs., Refs., 3 App.

This report presents a wide range of current thinking on the nature of the crime problem on public transit system, its effect on transit patronage, measures taken to meet the problem, projections about what the problem will be in the future, and the kind of research required to meet future needs. The citizen's perception of crime on public transit and its effect on ridership will be an essential factor in the planning and operating of public transportation. These basic crime control strategies are: increase of police manpower including flexible deployment strategies; expansion of electronic devices to complement police patrol; and operational strategies such as the elimination of stops in high crime areas. The application of current knowledge to automated small vehicle systems is discussed. Report on the Workshop on Transit Security, Feb. 24-25, 1975.

Acknowledgment: HRIS 84 128947
Carnegie-Mellon University

Englund, Dean B., An Operational Demonstration of Trailing End Visibility Enhancement Devices for Commuter Railroad Trains, Final Report, prepared by the Illinois Department of Transition for the Federal Railroad Administration. Chicago: Illinois Department of Transportation, June 1976. 131 pp., Tabs., Figs., Refs., 1 App.

This report describes the demonstration which compared under actual operating conditions various means of enhancing the visibility of commuter train ends. The visibility enhancement devices included in the demonstration were: 1) Xenon strobe lights; 2) large and small red marker lights; 3) amber flashing beacons and 4) various patterns of brightly colored paints and fluorescent/reflective tapes on car ends. Data concerning the visibility and other attributes of the above devices was collected by means of a series of questionnaires directed at groups of people considered to be significantly impacted by the devices. The groups surveyed were: 1) train crew members; 2) independent observers; 3) residents along various rail rights-of-way; 4) commuters and 5) motorists. The survey results

are discussed and the conclusions arrived at are used to make recommendations regarding which devices are most appropriate for inclusion in a regulation to govern the visibility enhancement of passenger train ends. In addition, performance specifications and guidelines for the use of these devices are given.

This demonstration was conducted by the Illinois DOT with the support and cooperation of the Federal Railroad Administration and three Chicago area commuter railroads: Burlington Northern, Chicago & Northwestern, Illinois Central Gulf.

Acknowledgement: RRIS 12 141582
Illinois Department of Transportation FRA-ORD-76-292
PB 259901

National Transportation Safety Board, National Transportation Safety Board Safety Recommendations-R-78-42. Washington, D.C.: National Transportation Safety Board, July 10, 1978. 9 pp., 1 App.

In a study of data from 269 accident investigations involving 280 fatalities over a 20-month period, NTSB has developed a profile of the average pedestrian killed by a train. Characteristics of the accident site, time of day and day of week, and of the victims, including use of alcohol, were determined. The recommendation to Federal Railroad Administration was for development of criteria for railroad fencing in built-up areas.

Acknowledgement: RRIS 12 182821
National Transportation Safety Board

Newman, Oscar, Architectural Design for Crime Prevention, prepared for the National Institute of Law Enforcement and Criminal Justice. Washington, D.C.: U.S. Government Printing Office, March 1973. 232 pp., Tabs., Figs., Photos., Refs., 5 App.

This book is a state-of-the-art survey on "defensible space" as practiced in the United States. It is

the result of the first phase of a multiphase project funded by the National Institute of Law Enforcement and Criminal Justice. The design hypotheses for crime prevention are based on information obtained from site visits and a survey of housing authority officials, architects, and law enforcement officials. Professor Newman emphasizes that residential crime can be reduced by designing buildings so that the residents can help survey and control any criminal activity taking place within them.

_____, Design Guidelines for Creating Defensible Space, prepared by the National Institute of Law Enforcement and Criminal Justice with the assistance of the U.S. Department of Housing and Urban Development. Washington, D.C.: U.S. Government Printing Office, April 1976. 233 pp., Tabs., Figs., Photos., Refs., 4 App.

This handbook provides a comprehensive outline for programming and designing new housing developments to reduce vulnerability to crime. It demonstrates how the problems of residential security can be addressed in the initial planning and design stages. The contents includes the pattern of crime in cities and residential areas, evolution of multifamily housing, design guidelines for buildings, site planning design guidelines, and prototypical designs for two housing projects.

Office of Technology Assessment, Working Papers-An Evaluation of Railroad Safety. (An Analysis of Federal Railroad Safety Laws Administered by the Department of Transportation and Related Laws.) Washington, D.C.: Office of Technology Assessment, U.S. Congress, May 1978. 142 pp.

The Federal railroad safety laws are analyzed and the discussions include section-by-section summaries, relevant references to Congressional hearings, reports, and floor debate, and other valuable elements of the public record. Some of the major laws discussed are: the Federal Railroad Safety Act of 1970, the Federal Railroad Safety Authorization Act of 1976, the Transportation Safety Act of 1974, the Rail Service Passenger Act of 1970, and the Noise

Control Act of 1972. (Portions of this document are not fully legible).

Acknowledgement:
NTIS
PB 283209

RRIS 12 181840
OTA-T-64

Rakaczky, John A., Fire and Flammability Characteristics of Materials Used in Rail Passenger Cars. A Literature Survey, prepared by the Aberdeen Proving Ground Ballistics Research Laboratory for the Army Armament Research and Development Command. Aberdeen, Md.: Army Ballistics Research Laboratory, April 1980. 101 pp., Refs.

A literature search was conducted to provide information on the flammability characteristics of materials that are used, or have potential use, in furnishing the interiors of rail passenger cars. Among the characteristics of interest were the ignition temperature, time to reach ignition, the rate of flame spread, the rate of combustion or rate of material loss, rate of heat liberation, heat transfer from flames, the evaluation of smoke, the measurement of smoke density, and the evolution and toxicological effect of the products of combustion. In addition, information was collected on flammability test methods, fire prevention standards or codes, and statistical data concerning accidents involving vehicle fires of interior origin. The information compiled is to be used to assist the Federal Railroad Administration, Department of Transportation (FRA/DOT) in establishing safety standards regarding the flammability of the materials used in the interiors of rail passenger cars. 226 references are given.

AD-A084-028

ARBRL-MR-03009

"Safety Stops at Terminals Evaluated," Railway Engineer, 3, no. 1 (January/February 1978), 34-38. Photos.

London seminar considered friction buffer-stops and sand-drags as a means for preventing trains from overrunning dead-end tracks in stations and yards.

RRIS 12 177031

Simpson & Curtin, Transportation Facility Proximity Impact Assessment -- see Environmental Protection.

Southern California Association of Governments, Transit Safety and Security: A Design Framework, Final Report, prepared for the California Department of Transportation and the U.S. Department of Transportation. Los Angeles: Southern California Association of Governments, April 1976. 170 pp., Tabs., Figs., Photos., Refs., Glossary, 5 App.

The study is an analysis of transit crime data for the Southern California region. It examines safety and security deficiencies in transit design and recommends ways in which they can be ameliorated. The study contains the following: (1) development of security and safety objectives in the operation of major transit systems, (2) assessment of crime patterns and safety problems for selected regional transit corridors, (3) examination of the effectiveness of crime prevention by physical design of transit facilities, and (4) development of a reference document for safety and security design criteria in transit facilities. Some specific design areas examined include the following: park-and-ride facilities, parking structures; site planning and landscaping; illumination levels; passenger boarding safety; subway and elevated systems; station visibility; closure and monitoring; traffic and parking criteria; and the special needs of the elderly and handicapped.

Acknowledgement: NTIS

RRIS 12 143214

United States Department of Transportation, Federal Railroad Administration, Revised 1980 Railroad Locomotive Safety Standards and Locomotive Inspection. Omaha, Neb.: The Railway Educational Bureau, 1980. 59 pp., Tabs., Fig., 3 App.

This booklet cites the minimum Federal safety standards for all locomotives (except steam) including all subsystems. It spells out the required inspections and tests, accident reports, and penalties for infractions.

12 SAFETY

_____, Track Safety Standards. Omaha, Neb.: The Railway Educational Bureau, March 1975. 55 pp., Tabs., Figs., 3 App.

This booklet cites the minimum safety standards for railroad track that is part of the general railroad system of transportation. It includes the roadbed, track geometry, track structure, track appliances, and track-related devices. It spells out the required inspections, classes of track, speed limits, and penalties for infractions.

06 SIGNALS, CONTROL, AND COMMUNICATION

(See also Track and Structures)

Brown, D. G., "Resignalling--A Team Effort," Railway Engineer, 2, no. 3 (May 1977), 11-16. Figs., Photo.

> In the London Bridge resignaling, the interlocking plants were so closely spaced that the entire area has to undergo comprehensive planning. It was necessary to rearrange the track layout, install a complete new signal system and develop a complete new timetable for one of the heaviest passenger traffic sections of the British Railways. The various stages of planning and implementation are outlined, indicating particularly the interdepartmental relationships necessary. The fact that the 1926 signaling was obsolete and the operation of commuter trains at near saturation levels has evolved made the project necessary.

RRIS 06 157667

De Leuw, Cather-Parsons and Associates, Signaling and Traffic Control System Standards. Volume 1 Task 205: Northeast Corridor Improvement Project, Revised Final Report, prepared for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, February 1979. 98 pp., Figs., 1 App.

> This document defines the standards and specifications to be applied to the signaling and traffic control system of the Northeast Corridor Improvement Project. The document is in two volumes. Volume 1 contains the standards and specifications generally applicable to the design of the basic signaling and traffic control system and those specifically associated with the vital portion of the system to be installed on or near the tracks. Typical circuits and drawing format requirements are included. Supersedes PB-283 651.

Acknowledgement:
NTIS
PB 293515

RRIS 06 191738
FRA/NECPO-79/6
DOT-FR-76048

Williams, John, and George Pipas, Northeast Corridor High Speed Rail Passenger Service Improvement Project. Task 4A. Sig-

naling and Communications, Final Report, prepared by Bechtel Incorporated for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, September 1975. 110 pp., Tabs., Figs., Glossary, 3 App.

The report includes description of the present signal systems, recommendations and description of the changes required to support high-speed passenger service, and corresponding cost estimates for the Northeast Corridor (Washington, D.C. to Boston, Massachusetts). Recommendations and descriptions cover the areas of proposed signal systems, track circuit requirements, impedance bonds, hazard protection devices, control systems, communications systems, training devices, installation schedule, and estimates of costs to procure and install such systems. Typical construction and installation specifications are included as an appendix. See also report dated Apr. 1975, PB-243 419.

Acknowledgement:
NTIS
PB 245956

RRIS 06 093378
FRA/ONECD-75/4A
DOT-FR-40027

Yagi, Masao, "Application of ATC to Busy Lines with Commuter Train Traffic," Japanese Railway Engineering, 18, no. 3 (1978), 15-16. Figs., Photo.

The JNR has adopted the ATC system for the Shinkansen line to assure the safety of trains at high speed. On almost all other lines the ATS system has been used. But lately the train safety system has been reviewed and improved. In a selection process, any of three systems can be adopted, depending on the importance of the lines and their traffic density. The systems are the ATC, the new ATS with speed sensing, and the existing ATS. The JNR is in the process of increasing the use of ATC on lines with heavy traffic that serve major cities.

Acknowledgement:
Japanese Railway Engineering

RRIS 06 190317

01 TRACK AND STRUCTURES

(See also Right-of-Way and Signals, Control, and Communication)

Archdeacon, H. C., ed., The Track Cyclopedia, 9th ed., compiled and edited in cooperation with the Association of American Railroads. Omaha, Neb.: Simmons-Boardman Publishing Corp., 1978. v.p., Tabs., Figs., Photos., Glossary.

> This book includes a track contractors' directory and chapters covering roadway stabilization and drainage; excavation grading and grading equipment; ballast and ballast maintenance machinery; track surfacing and alignment; cross and switch ties and concrete ties; rail and continuous welded rail; rail anchors, joints, and accessories; renewal of rail and cross and switch ties; track laying systems; rail maintenance; switches, frogs, and guardrails; crossings and slip switches; rail and trackwork welding; switch stands; derails, bumpers and car stops; highway crossings; snow and ice removal; vegetation control; track tools; railway automotive equipment; cranes and accessories; maintenance and repair of work equipment; mobile housing for employees; FRA safety standards; and a classified buyer's guide.

Armstrong, John, "NE Corridor Improvement: '79 Was a Good Year," Railway Age, 181, no. 1 (January 14, 1980), 24-30. Tabs., Photos.

> After two disappointing work seasons during which goals were never reached, the Northeast Corridor Improvement Project hit its stride in 1979. Amtrak's Track Laying System installed 121 miles on concrete-tie/welded-rail track. The redirection of this project includes new goals for bridge and tunnel reconstruction, track realignment, electrification, communications, signals, fencing, stations and maintenance facilities. These are fitted in the $2.5 billion budget for Corridor rehabilitation to produce a system capable of reliable high-speed train performance.

Acknowledgement: Railway Age

RRIS 01 309892

01 TRACK AND STRUCTURES

Arnlund, R. C., Northeast Corridor High-Speed Rail Passenger Service Improvement Program -- see Economics.

Brownell, David, Track Geometry Measurement System Software Manual, Final Report, prepared by the Transportation Systems Center for the Urban Mass Transportation Administration. Washington, D.C.: U.S. Department of Transportation, April 1978. 110 pp., Tabs., Figs., 9 App.

The Track Geometry Measurement System (TGMS) was developed through the United States Department of Transportation's, Urban Mass Transportation Administration by the Transportation Systems Center in Cambridge, Massachusetts under its Test and Evaluation studies to aid transportation planners and maintenance personnel to better assess the quality of track for rapid rail, light rail, and commuter rail systems. The purpose of this document is to describe the TGMS real-time software and provide operating instructions for its use. The TGMS real-time software collects and stores raw data from the TGMS sensors, processes the raw data to compute track geometry parameters, and records and displays the processed data. All of these functions are performed in real time as the raw data are being collected. The current version of the TGMS real-time software is designated TGM6C.

Acknowledgement:
NTIS
PB 285558

RRIS 01 182076
UMTA-MA-06-0025-78-6
DOT-TSC-UMTA-78-26

De Leuw, Cather-Parsons and Associates, Northeast Corridor Improvement Project Task 202: Concrete Tie Cost and Performance for Track Structures, Final Report, prepared for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, October 1977. 57 pp., Tabs., Refs.

As a result of a survey of the Northeast Corridor, it was determined that 1,100 miles of track require upgrading to meet the trip-time goals set forth in the Railroad Revitalization and Regulatory Reform Act of 1976. As a part of the determination of the best way to meet these requirements, two types of

ties and three methods of reconditioning track were evaluated. A comparative analysis was performed on the three methods of reconditioning track: component replacement of wood-tie track with traditional spike fasteners, complete rebuilding of track with pre-plated wood ties and elastic fasteners, and complete rebuilding of track with concrete ties and elastic fasteners. Differences in the methods were analyzed with regard to productivity rates, cost, and performance.

Acknowledgement:
NTIS
PB 272745

RRIS 01 167348
FRA/NECPO-77/2
F202-37
DOT-FR-76048

Decker, Harold D., Proceedings: Seminar on the Use of Composite Third Rail in Electrified Transit and Commuter Rail System -- see Electrification.

"Energy-Absorbing Bumping Posts," Progressive Railroading, 21, no. 5 (May 1978), 71-72. Photos.

Friction-type bumpers, designed to yield on impact with a progressive rate of retardation, have been tested by the New York City Transit Authority. The German-developed units are of varying designs including models for dead-end passenger terminal tracks.

RRIS 01 177035

Fazio, Alfred E., "Track Maintenance: Management and Planning," Transportation Engineering Journal of ASCE, 106, no. TE6 (November 1980), 705-20. Tabs., Figs., Refs., 2 App.

ABSTRACT: In 1978, excess of 3.4 billion dollars was spent for maintenance and improvements of the fixed plants of American railroads. The lack of an accepted model of track deterioration makes an analytical approach to the planning and control of routine track maintenance difficult. Researchers are presently attempting to formulate a track deterioration model which could be utilized to analytically

predict track maintenance requirements. Railroads cannot afford, however, to wait for the development of such a model to implement improvements to the planning and performance of track maintenance, particularly in the area of routine maintenance. Conrail has developed a Track Maintenance Management System (TMMS), which can be used for the control of routine track maintenance, and has a limited maintenance planning capability. Upon the development of a workable model of track deterioration, it can be integrated into the TMMS to create a Track Maintenance Planning System (TMPS).

Acknowledgement:
ASCE

Hauser, Daniel, Methods for Joining of Rails: Survey Report, Final Report, prepared by Battelle-Columbus Laboratories for the Transportation Systems Center, the Federal Railroad Administration, and the U.S. Department of Defense. Washington, D.C.: U.S. Department of Transportation, July 1977. 164 pp., Tabs., Figs., Photos., Refs., 4 App.

The performance of track structures depends greatly on the integrity of the connections between rail sections. Because the majority of service and detected rail failures occur at joints, particularly conventional bolted joints, this survey was conducted to review existing practices, examine potential joining methods, and identify promising new methods and modifications of joining methods that can provide improved rail performance and lower fabrication cost. Methods for joining rails in the field as well as in plants by both metallurgical methods (welding and brazing processes) and nonmetallurgical methods (mechanical fastening and adhesive bonding) are reviewed. Joining procedures, inspection methods, laboratory and in-track performance, failure modes, adaptability to shop and field fabrication, personnel skills required, and costs are discussed. Joining methods that warrant additional development are identified and developmental efforts are outlined.

Acknowledgement:
NTIS
PB 272066

RRIS 01 167282
DOT-TSC-FRA-77-7
DSA900-74-C-0616

Howell, R. P., and others, Northeast Corridor High-Speed Rail Passenger Service Improvement Project. Task 3-Track and Structures Standards Development, Final Report, prepared by De Leuw, Cather & Co. and STV, Inc., for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, September 1975. 355 pp., Tabs., Figs., Photos., Refs., 18 App.

Track and structure characteristics and problem areas to be encountered in upgrading the Corridor are discussed. Standards considerations and applicability are outlined along with the maintenance history of the Corridor. Track system options for application to 150 MPH High Speed Rail (HSR) service are discussed and performance records examined. Concrete ties, fastener systems and ballastless track (concrete slab) are considered with wood tie track in a structural and cost effective investigation. Factors of type and frequency level of HSR train service and potential joint usage with freight movements are projected for these analyses. With this information, design parameters such as lateral and vertical track stability are investigated and established. On basis of structural integrity, selected track system candidates are costed over a 50 year life cycle of construction and maintenance. All projected maintenance items are described in detail with cycle rationale delineated. See also PB-243 419.

Acknowledgement:
NTIS
PB 245774

RRIS 01 093374
FRA/ONECD-75/3
DOT-FR-40026

_____, Northeast Corridor High Speed Rail Passenger Service Improvement Project. Task 22: Program Plan for Track Development and Demonstration, Final Report, prepared by De Leuw, Cather & Co. and STV, Inc., for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, July 1976. 155 pp., Tabs., Figs., 11 App.

Problems of design, construction, and procurement

for concrete tie track systems, turnout slab foundations, high-speed turnouts, movable frogs, and mitre rails are identified. Design details of the state of the art for and contemporary experience with concrete tie track systems, turnout slabs, high-speed turnouts, and movable points or wing rail frogs are reviewed. High-speed turnouts, frogs, and mitre rail design and recommendations for application to the Northeast Corridor program are designated. Five different concrete ties and three fastener components are identified and quantified. Installation procedures and schedules for the proposed New Brunswick-Trenton stretch are presented. Concrete tie application to and program objectives for the FAST track at Transportation Test Center, Pueblo, Colorado are also described. Turnout slab design details are established and details of an application to FAST are stated. See also report dated July 1976, PB-262 236.

Acknowledgement:
NTIS
PB 272602

RRIS 01 167339
FRA/NECPO-76/08
DOT-FR-66006

Kaiser, W. D., and others, Rail Inspection Systems Analysis and Technology Survey, Final Report, prepared by Battelle Columbus Laboratories for the Federal Railroad Administration and the Transportation Systems Center. Washington, D.C.: U.S. Department of Transportation, September 1977. 229 pp., Tabs., Figs., Refs.

The study was undertaken to identify existing rail inspection system capabilities and methods which might be used to improve these capabilities. Task I was a study to quantify existing inspection parameters and Task II was a cost effectiveness study to utilize the results of Task I in defining the total costs incurred in inspecting and replacing rail and in defining the most cost effective inspection system. Some of the major findings from these studies were that the practices of stopping for hand check and to mark flaws and of manually processing all data were the major factors presently limiting inspection speeds. It was concluded that use of automatic data processing and elimination of the stops would allow speeds to be increased to about

25 mph (40 kmph) and inspection costs would be reduced by about a factor of 2. It was also concluded that with extensive transducer and carriage development, speeds up to 50 mph (80 kmph) were feasible and would further reduce inspection costs from 0 up to a maximum of about 30 percent depending upon usage. A recommendation was made to develop an inspection vehicle with an ultimate speed capability of 50 mph (80 kmph) or higher.

Acknowledgement:
NTIS
PB 272931

RRIS 01 167377
FRA/ORD-77/39
DOT-TSC-FRA-77-13
DOT-TSC-979

"The Long Island Rail Road: Small in Size, Big in M/W Thinking," Railway Track and Structures, 75, no. 9 (September 1979), 20-26. Photos.

This New York railroad with 95% of its 860 daily trains in commuter service presents track maintenance problems. The biggest is getting access to the track so it can be maintained properly; dense population makes night work generally unacceptable. The installation of continuous welded rail is a goal that will not be achieved on light-density lines for years but stone ballast is going under all track now. LI uses Pandrol fasteners on wood ties to produce a stiff track structure and avoid spike killing. Concrete ties would be used only for complete track rebuilding. A track geometry car is an integral of the track maintenance planning. On elevated structures and recently on a newly placed and compacted fill LI is using concrete slab track like that used on BART.

RRIS 01 301817

Ronald, C. C., and others, Northeast Corridor High-Speed Rail Passenger Service Improvement Program. Task 19-Support Services: Dynamics and Computer Program Development, prepared by Bechtel Incorporated and Battelle Columbus Laboratories for the Federal Railroad Administration. Washington, D.C.: U.S. Department of Transportation, July 1976. 279 pp., Tabs., Figs., Refs., 6 App.

The report is a summary of the effect of track curvature and spiral length on high speed train safety and comfort, and the effect of speed and axle load on track stability and wear. In addition, information is presented relating track curvature, spiral length, and train and track dynamics to support system performance and cost studies. See also PB-261 542.

Acknowledgement:
NTIS
PB 262236

RRIS 01 151139
FRA/ONECD-76/19
DOT-FR-66005

Transportation Research Board, Railroad Track and Facilities, Transportation Research Record 744. Washington, D.C.: Transportation Research Board, 1980. 70 pp., Tabs., Figs., Photos., Refs.

Record 744 includes papers on rail research and British rail research, evaluation of rail behavior at the facility for accelerated service testing (FAST) and nondestructive testing of rail, deformation behavior of rail steels, the dilemma of direct-fixation fastening systems and a comparison of performance of wood-tie fasteners at FAST, the development of an analytical approach to track maintenance planning, and gradient simulation for rail hump classification yards. The final paper gives a status report on the conflicts between urban areas and railroads. An addendum includes the remarks made at Session 3 of the 59th Annual Meeting of the TRB, by the session chairman and a participant, regarding FAST.

United States Department of Transportation, Federal Railroad Administration, Track Safety Standards -- see Safety.

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