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Research Implications of Proposed Changes in the UMTA Section 15 Reporting System

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ABSTRACT

An intensive effort started in 1983 to review the Urban Mass Transportation Act (UMTA) Section 15 reporting system for transit statistics. Although many transit industry professionals have been involved, few researchers are aware of the ways in which proposed changes would alter the national data base. A summary of the efforts to date is presented, and the implications of the proposed changes for those who have been routinely relying on Section 15 data for the conduct of research on U.S. transit systems are highlighted.

In 1974 Section 15 of the Urban Mass Transportation Act of 1964 was amended to require that transit agencies receiving federal formula grant funds submit a uniform report on their financial and operational characteristics each year (1). The requirement grew out of a large-scale study that examined transit industry accounting practices in detail. The result was a series of forms and manuals documenting accounting definitions that would be used for the required annual reports (2). The standards laid the framework for upgrading the management information systems in the industry as a whole. The nonfinancial data did not receive as much careful study in the early days and have continued to cause some problems, especially now that certain of those data have been incorporated into the new Section 9 transit block grant formula program (3).

Although transit industry representatives were actively involved in the work leading to the adoption of the Section 15 standards, some problems in the reporting system appeared only after the first few years of implementation (FY 1978-1979, 1979-1980 and 1980-1981). A massive amount of information is

involved, from a few hundred data elements for the lowest level of required reporting to a few thousand elements for the larger multimodal systems. Inaccuracies in reporting, misunderstanding of definitions, inconsistencies within reports, and difficulties in quality control joined with some instances of outright refusal to cooperate. The result was a national data base with serious limitations. At the 1984 Transportation Research Board Annual Meeting, several presentations were made on transit performance analysis using Section 15 data. All illustrated the many problems inherent in the data that required either elaborate cleaning procedures or simply the exclusion of whole sets of agency reports. Fielding et al. (4,5) reported on the difficulties in organizing the magnetic tape version of the FY 1980 data for statistical analysis. Of 304 agencies that reported that year, 106 had missing data that prevented their being used in the performance analysis work. Vaziri and Deacon (6) similarly used the FY 1980 data base and had to work around problems caused by missing data. Hobeika et al. (7) found so much missing data on the items of

interest that the analysis was done only for systems with fewer than 100 revenue vehicles. Patton (8) used only 17 systems from the FY 1981 data base for exploratory analysis. All of these researchers tried to look for regularities in a variety of performance measures within a single year's Section 15 data. All were at least partly stymied by data problems and none could use data from several years for time-series comparisons.

Beginning in 1983 several groups began actively examining the shortcomings in the current system of reporting. The TRB Committee on Transit Performance and Management formed a subcommittee to look at the analytical uses of the data. The American Institute of Certified Public Accountants (AICPA) formed a group to examine the new requirements under Section 9 to certify the nonfinancial as well as financial data. The American Association of State Highway and Transportation Officials (AASHTO) formed a committee to examine how state transportation departments use Section 15 and how changes might affect them. The American Public Transit Association (APTA) formed its committee, including several individuals who had participated in the development of the Section 15 system, to look broadly at the present problems and future prospects for national transit reporting. Finally, the Urban Mass Transportation Administration (UMTA) took the unusual step of appointing a special advisory committee, the first UMTA has ever had, to examine all aspects of Section 15 policy and practices. (46 C.F.R. 43352 established the committee for its first term, September 1, 1981 to September 1, 1983; 48 C.F.R. 41124 extended the committee's charter to September 1, 1985.)

The UMTA committee, which is staffed by UMTA and meets quarterly, receives input from all interested parties. Typically, the APTA committee or other parties have prepared recommendations for consideration by the UMTA committee, which then acts by resolution. Consultants to UMTA have also assisted the committee's deliberations by preparing background papers. One paper, for example, presented the results of asking the analysts responsible for checking the validity of the Section 15 data to assess its reliability. The assessment covered 233 data items in the 100, 200, and 400 series of reporting forms (excluding the 300 series detailed financial data). Of those items, 98 (42 percent) were rated as either inconsistently accurate or generally inaccurate or missing (9). Fortunately, there is some overlap in the membership of the groups and a direction for reforming Section 15 is beginning to appear. In the remainder of this paper the efforts to date, focusing on the APTA committee, and the potential benefits and problems such changes would present to researchers who now depend on the data are described.

USE OF SECTION 15 DATA IN RESEARCH

There appear to be several principal research uses of Section 15 data. Perhaps the most widespread use is the most difficult to document. That is the routine use of Section 15 data, especially in the form of the published annual report, as an encyclopedic reference, as if it were the transit equivalent of census data. When a researcher wants a national summary statistic on transit or a particular statistic on an individual agency, the book is there to provide the numbers. Although much of the data is straightforward, there are many underlying limitations that the casual user of the data could not be expected to know about. The most common situation is that circumstances affecting the data were not documented in the report. Unusual weather, service dis-

ruptions caused by labor disputes, major service changes, or fare changes could greatly affect an agency's data in comparison either with other agencies' or with the same agency's data from prior years. Unless the user of the data either knows enough about the data to tell if a number looks suspicious or takes the trouble to contact the agency to confirm the numbers, there are possibilities of misinterpretation. This has been one of the sorest points with transit agencies. The format of lengthy tables of raw data and ratios, listing each agency in fleet-size groups, encouraged such comparisons but had few cautions to the user.

A further and more subtle limitation on using the published data for routine reference needs is that some numbers are not what they appear to be because of the way individual agencies collect the data. Some discrepancies are matters of local policy, such as standing capacity on vehicles. Some are the results of estimates, such as scheduled versus actual vehicle-miles of revenue service provided, which depend on the local agency's ability and willingness to provide accurate information. Other data leave out key elements due to local institutional arrangements. For example, when a transit agency is part of a state, city, or county government, certain services, such as purchasing or personnel, may be provided to the transit agency. The full amount of these expenses may not be reflected in the transit agency's budget, with the result that the "true" operating expenses are underrepresented in comparison with an independent agency that must provide all of its own services. Again, only prior knowledge or checking with each agency would prevent misinterpretation or misuse of the data. It is likely that few casual users have the time or inclination to double check the published figures, and even less likely that they know they need to be concerned about the data at all.

In addition to using the published Section 15 data for simple reference work, researchers have worked with the entire set of published data or have gone to the much more detailed computer tapes to conduct analyses that might be categorized by the purpose of the research and the style or method of analysis used. The principal purposes, judging from papers such as those presented at the 1984 TRB Annual Meeting and others, are (a) the development and testing of statistical tools to aid transit managers in analyzing performance and (b) the analysis of the data to answer particular national policy questions. In both cases the emphasis is on cross-sectional comparisons of "similar" operators, with the bulk of the research effort devoted to defining the dimension of similarity. Researchers have expressed interest in longitudinal analysis as well, but they generally have found that the quality of the data over time has not been sufficient to the task. Thanks to increasingly sophisticated data validation by UMTA, the accuracy of the FY 1982 report was greatly improved, and recommendations by the UMTA advisory committee to further improve the data have been adopted or are being considered by UMTA. In time, these improvements should allow meaningful time-series analysis.

A particular focus of Section 15 research efforts has been on statistically determining a summary set of descriptive performance measures on the basis of which an operator may be compared to the "average" performance of a group of similar operators. These "peer groups" have been a controversial aspect of this type of research. Many transit managers readily admit that they compare their performance with that of other systems, but they also bring to such comparisons some direct knowledge of the operational, institutional, and managerial character of the se-

lected agencies. Managers have some misgivings about surrendering the selection process to a statistical procedure less able to capture such qualitative distinctions and with which they may be technically unfamiliar. Proponents of such research efforts, however, point out that the purely qualitative selection of peers invites comparisons designed to be favorable to the agency making the selection. Another school of thought is that any such cross-sectional comparisons of operator performance are of little real use to managers and what is needed instead is analysis of an individual agency's performance indicators over time. Regardless of where one stands in this debate, more consistent, accurate, and reliable Section 15 data are essential for any meaningful research.

ISSUES IN REVIEWING SECTION 15

Both the APTA and UMTA committees set ambitious goals for their review. Among the issues identified for study were the following:

- Administrative and procedural issues
 - Certification and audit requirements,
 - Definition of reporting period,
 - Quality and availability of Section 15 instructions, and
 - Treatment of overdue reports.
- Policy questions
 - Should very small systems be exempt?
 - How should purchased transportation be treated?
 - How should private, noncontract service be reported?
- Specific areas for improvement
 - Section 9 formula factor definitions,
 - Urbanized area definitions,
 - Commuter rail,
 - Sampling for service-consumed data,
 - Fleet inventory data,
 - Safety and accident data, and
 - Maintenance data.
- Changes in the published report
 - Format and content of tables,
 - Addition of explanatory material to aid interpretation,
 - Performance indicators, if any, to be used,
 - Graphic summaries, and
 - Groupings, if any, by size or other "peer" categories.
- What shall be reported?
 - What should be reported at the national level?
 - Mandatory versus voluntary levels of reporting,
 - Amount of detail required versus need at national level,
 - Need for cross-classification of expenses by function and object by mode, and
 - Modal versus system data.

By the end of 1983 some of these issues had been discussed thoroughly, some superficially, and few conclusively. Both the APTA and UMTA committees decided that it would be most appropriate to focus their efforts on the cluster of issues under the rubric of "What shall be reported?" When the principles were established, it was thought, there would be a firmer basis for discussing all other issues. The remainder of 1984 was spent developing a framework for considering "What shall be reported?" Both the APTA and UMTA committees are scheduled to meet in early 1985 to consider these recommendations.

SECTION 15 REVISION OBJECTIVES AND PROPOSALS

Assumptions

The APTA committee began with several working assumptions. Each is subject to further discussion and revision, but together they establish a springboard for the debate. There were four major assumptions. First, certain problems in the data are the result of the entire reporting system's being too cumbersome. With so many data items required and so many different forms to complete, errors and inaccuracies are inevitable. Therefore, simplification through reduction in the sheer number of discrete data elements should be a goal. Second, part of the reason for noncomparability of data items across operators comes from basic problems in data definitions and difficulties in obtaining the data from typical operator information systems. Therefore, the feasibility of accurately and efficiently collecting the desired information should temper demands for data. Third, if the data are not useful to a transit manager, they probably are of little use to national policy makers or researchers. National reporting should be no more than summary reporting on an annual basis of much more detailed data the transit agency must itself keep on an ongoing basis to manage its own operations. (A notable exception may be data required for the formula grant program.) Fourth, multiple levels of mandatory and voluntary reporting contradict the need for comparability of data items across all operating systems. A single, required level of reporting is desirable, but a two-tiered system of more detailed reports for larger systems and less detailed reports for smaller systems should be considered.

Criteria

With this as a basis, the committee developed three types of recommendations: (a) restructuring existing data items, (b) reducing the existing data items by consolidating them, or (c) eliminating data items. For the financial reporting forms, the approach taken was to examine each of the functional, line item (object), and revenue categories, irrespective of the current reporting format. When the categories and grouping of categories had been set out in principle, issues involving specific definitions and forms design could be addressed. Each nonfinancial reporting form was examined on its own merits. The committee developed the following criteria for screening out unnecessary data items:

- Is the information required for the Section 9 formula?
- Is the information useful for the purposes defined by Section 15 (i.e., federal, state, and local policy decisions, information for the public and for transit agencies)?
- Is the information comparable from operator to operator? Similar data should be collected for each mode. Voluntary reporting of selected data should be discouraged. Contracted services and directly provided services should be clearly separated.
- Is it feasible to collect the information so that it is comparable, statistically valid, clear, simple, and easy to understand? Data should flow from the operator's regular reporting system, with no special collection procedures or excessive costs required. Data should only be reported if they will be suitable for annual publication by UMTA (i.e., if data will not be readily accessible to most users, they should not be required).

Application of these criteria resulted in recommendations for a substantial reduction in the number of data items required currently under the voluntary levels and some reduction or slight increase in the number of items for the required level. The specific recommendations for the financial data items are described next.

Recommendations

Revenue Classes

The revenue classes recommended for national reporting are in place of the 80 under the most detailed voluntary (A) level and the 15 under the current required (R) level:

1. Operating revenue
 - Passenger fares (currently item 401);
 - Other transportation revenue (currently items 402, 403, 404, 405, and 406); and
 - Nontransportation revenue (currently item 407).
2. Other revenue
 - Contributed services (currently item 430) and
 - Subsidy from other sectors of operation (currently item 440).

It is proposed that these revenue items be combined on the form that presents operating assistance by source and type. This is intended to reduce duplication and ensure internal consistency in reporting.

Functional Classes

The committee recommended that there be only 12 functional categories, compared to the current level A number of 44. The 12 collapse into the same four functions currently used at the lowest (required) level of reporting:

1. Transportation/operations
 - Administration (currently item 011);
 - Revenue-vehicle operation (currently item 031); and
 - All other transportation/operations (currently items 012, 021, 151, and 161).
2. Vehicle maintenance
 - Administration (currently item 041);
 - Revenue-vehicle maintenance (currently items 061, 062, and 071); and
 - Non-revenue-vehicle maintenance (currently items 051, 081, and 091).
3. Nonvehicle maintenance
 - Administration (currently item 042);
 - Track/roadway (currently item 121);
 - Other structures/grounds (currently items 122, 123, 124, and 125); and
 - All other nonvehicle maintenance (currently items 101, 111, 126, and 141).
4. General administration
 - General support functions (currently items 165, 166, 167, 168, 169, 170, 171, 172, 174, 175, 176, and 181); and
 - Planning and public information (currently items 145, 162, 163, 164, 173, and 177).

The committee has also recommended certain changes in the classification of expense items to improve the usefulness and comparability of the data. These include showing purchased transportation expenses as to total amount unassigned to functions;

shifting passenger security, ticketing, and fare collection to the operations function; and requiring all expenses to be allocated to modes (i.e., no unallocated "joint expenses"). These recommendations are all under further study.

Object Classes

Finally, recommendations on expense object classes (line items) would reduce the 54 most detailed categories to 25. The least detailed level now includes 21 categories; items 4, 9, 14, and 17 in the following list would be in addition to those current categories:

1. Operators' salaries and wages (currently 501.01);
2. Other salaries and wages (currently 501.02);
3. Fringe benefit costs (currently 502.15);
4. Contract maintenance costs (currently 503.05);
5. Other services (currently 503.01-503.04 and 503.06-503.99);
6. Fuel, including fuel taxes (currently 504.01 and 507.05);
7. Tires and tubes (currently 504.02);
8. Other materials and supplies (currently 504.99);
9. Propulsion power (currently 505.01);
10. Other utilities (currently 505.02);
11. Casualty costs (currently 506.01-506.10);
12. All taxes other than fuel (currently 507.01-507.04, 507.06, and 507.99);
13. Purchased transportation (currently 508.01);
14. Advertising and promotion (currently 509.08);
15. All other miscellaneous expenses (currently 509.01-509.07 and 509.99);
16. Expense transfer reclassifications (currently 510.01 and 510.02);
17. Capitalization of nonoperating costs (currently 510.03); and
18. Reconciling items (to remain the same, 511-516).

This set of proposals was extensively reviewed by transit agencies during the summer and fall of 1984. A consensus was reached on this set of function, object, and revenue categories, and general recommendations were prepared on how these categories would be represented on forms.

Nonfinancial Data Forms

Although the committee developed detailed recommendations on the nonfinancial data forms as well, many issues remained unresolved pending further analysis of specific items, such as maintenance and accident reporting. In every case, however, the same criteria were applied to screening nonfinancial data. The principal recommendations have been to reduce the number of items on the service supplied/consumed forms (406 and 407) and delete or substantially revise other items that have suffered from inconsistent reporting. Definitions of "roadcalls," for instance, are notoriously inconsistent across operators and provide misleading indications of maintenance performance. On the 406/407 forms, capacity miles and all service personnel reporting would be deleted, but other items by time period would be preserved.

Recommendations

As the APTA committee continues to develop recommendations, they will be forwarded to the UMTA commit-

tee for consideration. Depending on the outcome of those deliberations, certain recommendations will be made to UMTA, which then must decide how to respond to its advisory committee. Even though there is a long lead-time to change the reporting system substantially (including both internal UMTA review and Office of Management and Budget review), UMTA staff have already taken many actions to improve some of the early recommendations of its committee, including the following:

- Incorporating summary graphics in the FY 1982 National Report,
- Adding guidance on use of the data in FY 1982 Report,
- Revising and reducing the number of reporting forms for added clarity,
- Consolidating reference manuals into a single document,
- Conducting workshops for transit agency personnel on how to fill out the required forms, and
- Formalizing the data validation process for reporting agencies to verify any changes before publishing the annual report.

The positive response to date by UMTA staff augurs well for the future treatment of committee recommendations.

IMPLICATIONS FOR RESEARCHERS

For researchers who have relied only on the published reports, the proposed changes should improve the quality of much of the summary data that currently appear there. For those who have delved into the detailed data tapes or have gone back to the voluntary level source documents, the loss of detail will be more noticeable. The major loss in data would be in the financial items, but few systems reported consistently at the voluntary levels in the past. The primary additional item requested by researchers has been identification of fare revenue by mode. This is now included in UMTA's latest forms revision as a voluntary, optional item. Response to the voluntary item may provide clues to the feasibility of making the item mandatory in the future, but difficulties with multimodal systems, especially those with a high level of multiride pass use, must be resolved first. Researchers might want to pay attention to the practical aspects of collecting such data items because the accuracy of the data is directly tied to the ease of collection or estimation at the source.

Researchers and policy makers alike will benefit from a streamlined national reporting system. Such a system will better ensure consistent, accurate data over time for the variety of research purposes of interest. No matter what recommendations for simplifying the reporting system are eventually implemented, the burden will always be on the individual researcher to make certain that the data are not used blindly. It is the rare number that truly speaks for itself. More frequently, the number only takes on meaning when placed in an appropriate con-

text and it will remain for the researcher to determine what that context should be.

The development of recommendations for substantially reducing the number of data items reported nationally may alarm some researchers. It is essential that the research community develop its own recommendations on Section 15 reform to provide a balance to what may have started out as an overly eager effort to cut back. Researchers must, however, be prepared to defend the necessity of data items they wish to have preserved or added. There is common ground among researchers, managers, and policy makers in wanting to improve the quality of information on U.S. transit systems. Interested researchers should make their voices heard as the various review groups develop recommendations that may affect the national transit data base for years to come.

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