

Transportation Workshop for Minority Institution Faculty

ROBERT E. PAASWELL, LOUIS J. PIGNATARO, NATHANIEL JASPER, JOHN FALCOCCHIO, AND ROGER ROESS

A summer workshop to train faculty from minority institutions in various aspects of transportation research was held in the summers of 1980 and 1981. The purpose of the workshop was to generate a greater response from transportation faculty in such institutions to UMTA research programs. Faculty at minority institutions have a number of institutional constraints that hinder full participation in research programs. The workshop was designed to help faculty deal with those constraints and also approach the complexities of grant and contract research. A rigorous selection process culminated in the choice of 15 participants in 1980 and 12 in 1981. The majority of the participants were from historically black colleges. Seven weeks of the workshop were spent in carrying out the various phases of a research project—from a grant application through a final report. One week of the workshop was held in New York City, where the participants had extensive lectures on and tours of New York's complex transit system. The success of the workshop was measured by both postworkshop evaluation and the continuing transportation work of the participants. The workshop was influential in the establishment of a new working network.

In September 1979, the Office of Policy Research of UMTA issued an invitation for applications to host a workshop in research skills for minority institution faculty. This workshop, a precedent-setting example on the training of research skills in urban transportation problems, was consistent with the policies of the U.S. Department of Transportation and the department's attempt to ensure that faculty from minority institutions were fully involved in its overall research and development effort.

For a number of reasons faculty from minority institutions had a low level of participation in urban transportation research.

1. Minority faculty have interest, but lack technical expertise, in specific research program issues;

2. A critical mass is often lacking at a minority institution, so that full capability in a particular subject area (e.g., fare policy, paratransit, and planning methodology) cannot be developed;

3. U.S. Department of Transportation programs are perceived as highly technical and engineering oriented; however, faculty talents may not lie in engineering or the sciences;

4. Minority institution faculty are not part of an old buddy network and faculty find entry level access to the state of the art in the problem area difficult;

5. Minority institutions are often overshadowed by other institutions in their region and find cooperation with these institutions, or local or state connections made by these institutions, difficult;

6. The time available for faculty at many minority institutions to devote to research is small and resources available to conduct research at larger institutions (e.g., fully stocked libraries) may not be available or sufficient; and

7. Many minority institutions have not developed the administrative capability to conduct research programs.

In response to the UMTA invitation, an application to hold the 1980 UMTA Summer Faculty Workshop for Minority Institution Faculty was submitted by a team representing two universities within New York State. This team, The Center for Transportation Studies and Research of the State University of New York (SUNY) located at Buffalo, and the Transportation Training and Research Center of the Polytechnic Institute of New York (PINY), designed a workshop that would have two major objectives:

1. To involve the participants in a meaningful, practical, applied research project dealing with one or more significant, but appropriately scaled, urban transportation issues; and

2. To develop in the participants research management skills that will make them better able to cope with constraints at their institutions that detract from the conduct of research.

To meet these objectives, the workshop was designed to immerse the participants in eight weeks of transportation analysis, research, and learning, with emphasis on research into current, topical urban transportation issues. This eight-week term would have two components:

Phase 1—Conduct an intense research program at SUNY at Buffalo for seven weeks and

Phase 2—Study the complexities of a major urban transportation system, that of New York City, carried out at PINY in Brooklyn, N.Y.

To meet the objectives of the workshop, the overall project effort was organized into three phases:

1. Workshop preparation,
2. Conduct of the workshop, and
3. Workshop evaluation.

WORKSHOP PREPARATION

Because of the short lead time, a number of tasks had to be accomplished during the first few months of the project. These included

1. Preparation and mailing of workshop announcements to the widest possible audience,
2. Development of criteria for selecting the participants from among the applicants,
3. Selection and notification of participants,
4. Development of the daily schedule for the workshop, and
5. Preparation of the sites.

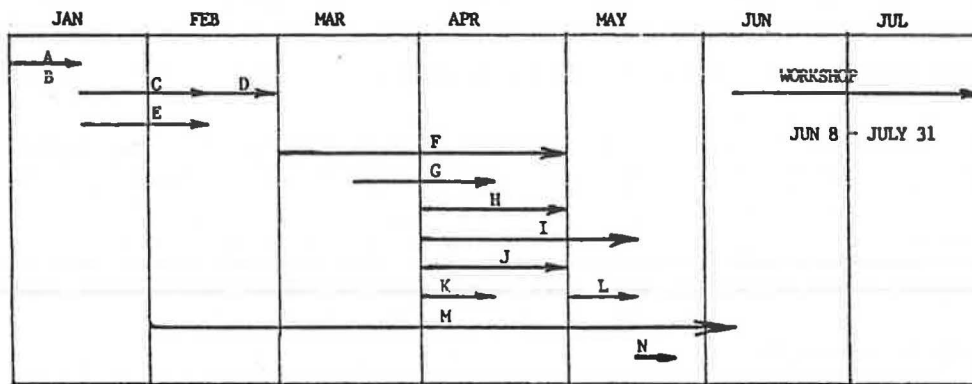
A timetable for the project is shown in Figure 1.

The two most critical concerns that had to be addressed in the preparation phases of the workshop were the selection of 15 participants who would most likely be motivated to respond to UMTA's research and development programs and the design of a program to meet the overall objectives of the workshop. The number of participants was based on maximum support available for the participants from UMTA.

Selection of Participants

A comprehensive set of names was developed to which announcements would be mailed. This set included representatives from historically black colleges, women's colleges, colleges that have a high percentage of Spanish-speaking students, and colleges that have a high percentage of native-born Americans. However, specific faculty who would most likely respond could not be identified unless they had participated in a previous U.S. Department of Transportation program. Thus, mailings went to administrators, pertinent department heads, and some faculty. The workshop was not designed for administrators but for young faculty members. Thus an

Figure 1. Schedule of workshop preparation.



- A. Review of the workshop agenda
- B. Review of the workshop preparation timetable
- C. Update set of institutions and individuals for notification of workshop
- D. Review of criteria for selection of participants
- E. Preparation and distribution of program announcement
- F. Development of detailed (day-to-day) agenda
- G. Development of research problem statements
- H. Compilation of conference resource material
- I. Confirmation of workshop staff appointments
- J. Selection of participants
- K. Survey of participants
- L. Simultaneous to the tasks above: site preparation
- M. Final printing of agenda and resource material
- N. Mailing resource and site information to participants

announcement and accompanying letter stated explicitly that administrators should convey the nature of the workshop to the appropriate faculty. Telephone follow-up and discussions with faculty at these institutions revealed that this was not always done. This is a major problem that has yet to be solved. However, by using the participants and applicants as the start of a network, we believe this problem can be overcome within a few years.

The applicants represented a wide range of disciplines and research and transportation experiences. This is shown in Figure 2. Applications came predominantly from the Southern and mid-Southwestern schools, which is a reflection of the national distribution of minority institutions. The closing date was indicated as March 15; however, 75 percent of the applications arrived after that date. Requests for applications continued to arrive until early June.

The selection process had to be based on information submitted on the workshop application. In addition to personal information concerning the applicant and a brief essay by the applicant discussing why he or she wished to attend, a letter of commitment from an institution official to assist the faculty member in the conduct of transportation research was required. This was a necessary document, considered to be an important step in overcoming the institutional obstacles noted earlier. Although a personal interview was ideally necessary for the selection, funds were not available for such interviews.

The evaluation form for selection used these documents and established the following criteria for evaluation:

1. Interest,
2. Intellectual ability,
3. Academic credentials,
4. Experience, and
5. Institutional commitment.

Selection Teams

Three selection teams, each with a SUNY staff member, a PINY staff member, and an UMTA or other U.S. Department of Transportation official selected the 15 participants. Each of the applications was scored based on the preceding weighted criteria. The top 22 candidates were discussed by the committee of the whole to make a final selection. Table 1 gives the final selection. All selected agreed to participate in the workshop.

Thus, a mailing of more than 700 notices resulted in 40 applications and the selection of 15 participants. With greater effort to reach faculty and overcome administrative roadblocks, many more applications would be forthcoming.

Design of Program

The program was designed to lead the participants through every aspect of an urban transportation research project. This included

1. Introduction to application or proposal preparation and actual preparation of an application for a grant,
2. Development of a management program,
3. Gaining of familiarity with the literature,
4. Gathering of field data, and
5. Actual conduct of research, including the issuance of research, interim, and final reports.

The workshop was to be held at the Amherst Campus of SUNY at Buffalo, in a unique collegiate setting believed conducive to a major group work effort. Arrangements for housing and meals were made on the campus and designed so that the day could be structured around workshop activities. Program materials, schedules, and a notebook with a daily agenda for the eight weeks were prepared for distribution at the start of the workshop.

CONDUCT OF WORKSHOP

The primary objective of the 1980 summer workshop for faculty from minority institutions was to involve the faculty participants in UMTA's research programs. The intent of the workshop, therefore, was to expose the workshop participants to the full process involved in learning about obtaining, con-

ducting, and reporting on contract research. The basic research experience of the participants was enriched through exposure to the problems and issues currently of concern to UMTA and to the public transportation field in general.

General Structure of Workshop

The workshop consisted of four component elements,

Figure 2. Profile of applicants and participants—1980 UMTA summer faculty workshop for minority institution faculty.

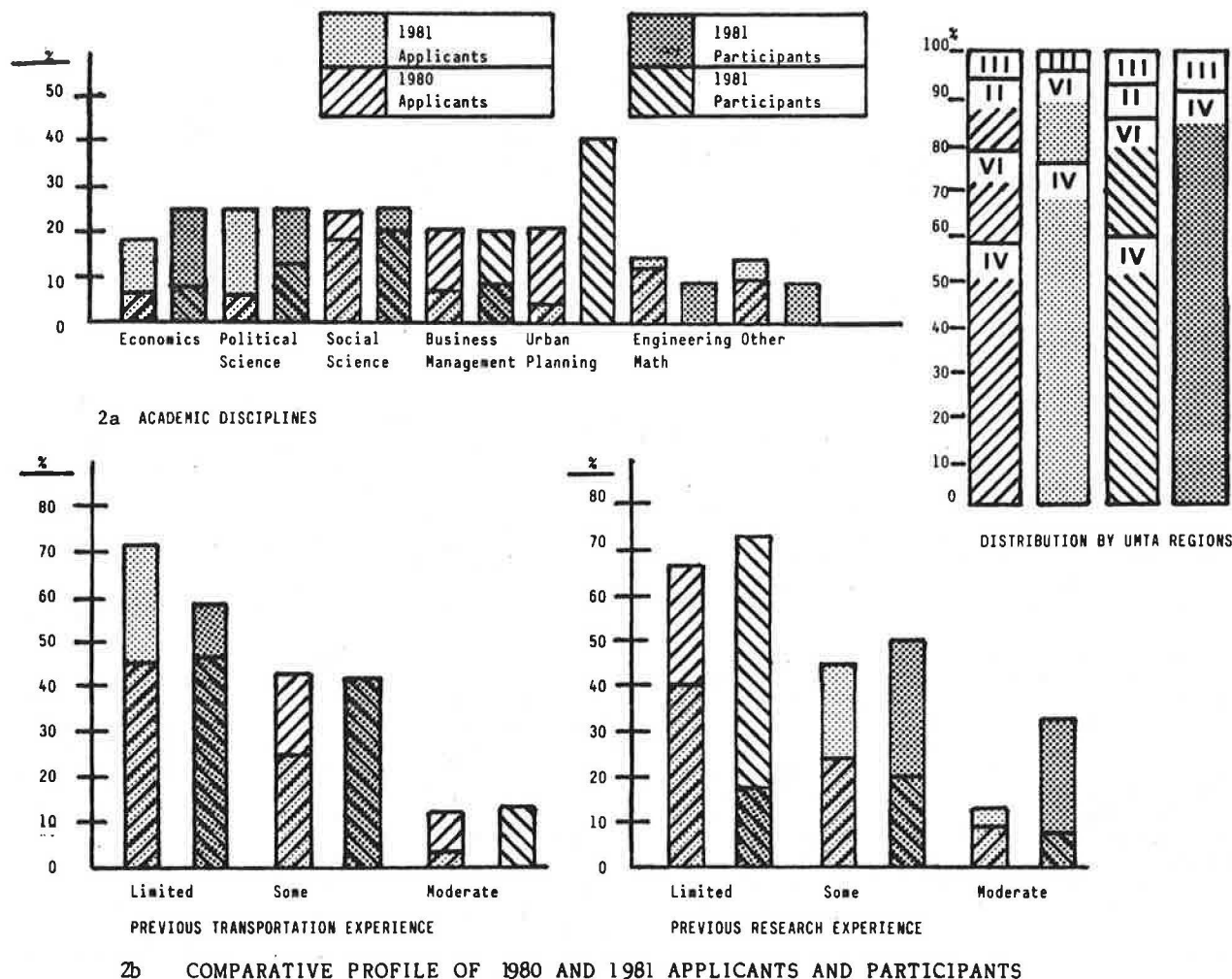


Table 1. Final selection of applicants.

1980			1981		
Institution	State	Discipline	Institution	State	Discipline
Alabama A&M University	Alabama	Planning	Albany State College	Georgia	Political Science
Bethune-Cookman College	Florida	Social Science	Atlanta University	Georgia	Marketing
Dillard University	Louisiana	Business	Benedict College	South Carolina	Economics
Elizabeth City University	North Carolina	Geography	Bethune-Cookman College	Florida	Sociology
Jackson State University	Mississippi	Economics	Coppin State College	Maryland	Sociology
Morris Brown College	Georgia	Education	Fayetteville State University	North Carolina	Math
New Mexico State University	New Mexico	Geography	Florida A&M University	Florida	Political Science
N.C. A&T State University	North Carolina	Business	Fort Valley State College	Georgia	Political Science
North Carolina University	North Carolina	Law	Fort Valley State College	Georgia	Sociology
Philander Smith College	Arkansas	Sociology	N.C. A&T State University	North Carolina	Business
Savannah State College	Georgia	Political Science	N.C. A&T State University	North Carolina	Engineering
St. Augustine's College	North Carolina	Business	Winston-Salem State University	North Carolina	Political Science
Texas Southern University	Texas	Urban Resources			
University of District of Columbia	District of Columbia	Urban Planning			
University of Puerto Rico	Puerto Rico	Planning			

Table 2. Agenda for summer minority institution faculty workshop.

Week	Morning	Afternoon
1	Introduction to transportation research problems; proposal preparation	Preparation of management plan; initial research
2	Research and site visits ^a	Research; quarterly letter report
3	Research and site visits ^a	Research; preparation of proper report
4	New York City	New York City; quarterly letter report
5	Research	Research
6	Research and site visits ^a	Research; quarterly letter report
7	Research	Research
8	Preparation of final reports	Presentation of final reports

^a Site visits to be scheduled at appropriate times during conduct of research.

orchestrated in a cohesive fashion to provide for a total learning environment. Each of the elements contributes either to the provision of background information on techniques and problems in the transportation field or directly to the research experience. The four main elements are as follows:

1. A research problem capable of being solved within the time frame of the workshop (8 weeks), yet relevant and meaningful both in terms of the participants' experience and in terms of a potential problem solution;
2. Comprehensive on-site investigations of various transit facilities and agencies;
3. Special seminars on transit issues and problems (particularly those relevant to the research problem being investigated) by outside lecturers, transit operators, planning organizations, consultants, public officials, and others; and
4. Expository lectures concerning special skills that would be needed or potentially needed to address the research project.

The term of the workshop was eight weeks; seven weeks of which were conducted on the campus of SUNY at Buffalo, where the main activity was the performance of a research project and expository lectures as well as a limited number of on-site tours and seminars specific to the research problem being addressed. One week of the program took place in New York City, hosted by PINY. This week featured a variety of on-site tours of transit facilities. The New York City week exposed participants to New York City's large transit operations and planning activities, as well as to several special seminars conducted by various officials of the transit industry in the New York City region.

Workshop Staff

During the conduct of the workshop, particularly the 7-week period in which the research problem was executed, members of the project team were available on a continuous basis to workshop participants. This included the project director, Professor Paaswell and Professor Mulder of SUNY at Buffalo, and either Professor Falcocchio or Professor Roess of PINY. Also available at all times was Stephen Kirsch, a graduate assistant, who played a major part in the day-to-day organization of the workshop.

The workshop staff viewed its role as supportive, in terms of both substance and organization of the research effort. The intent, however, was to allow the workshop participants to address the research problem as they saw fit and to have a strong voice in the way they organized themselves for this effort. The organization of the research effort by the participants themselves was one major part of the research experience to which they were exposed.

Workshop Process

The workshop began on Monday morning, June 9, 1980, with a series of orientation lectures, presentations, and general discussion of what the workshop experience would entail. Each participant was given a workshop notebook containing descriptions of the project, tentative schedules, reference materials, and other general information useful to the participant in the workshop. As the workshop progressed additional material was distributed that could be placed in the looseleaf-style notebook. In this way, participants could compile a complete record of all activities.

Research Problem

The research problem selected for study was entitled, Capital Planning for Public Transit: A Case Study of the Decision Process. The Buffalo light rail transit system was used as a case study. Workshop participants were to investigate the planning process with respect to two key issues:

1. Were the general travel needs of the population well met by the system? and
2. Were the specific needs of minority groups well met by the system.

The intent was not to reexamine the particular decision made to implement a light rail system in Buffalo but rather to examine the process by which that decision was made and to identify how the needs of specific population groups and of the general public had been considered by that process. The end result was expected to be a series of recommendations for changes in the planning process itself, which would guarantee that such needs were not overlooked in the future. The topic was general enough for the workshop participants to exercise some free thought and novel approaches. Yet, a significant data base existed for the topic and a significant amount of information could be made available to the workshop participants, including access to sites and to planning and public officials who are involved in the decision-making process for the light rail system.

General Workshop Schedule

As part of the participants' workshop notebook, each participant was given a detailed schedule for anticipated progress throughout the 8-week period of the workshop (see general schedule, Table 2). This included a schedule of working sessions and due dates for various aspects of the material, as well as tentative schedules for lectures, seminars, site trips, and other aspects of the program. Obviously, during the course of the workshop, minor adjustments and changes were made on a daily basis to fine tune the progress being made by participants. Approximately 60 percent of the total 8-week period was devoted to working sessions; i.e., sessions in which the participants are directly involved in the conduct of the research problem or in presentations or discussions of their findings, progress, or results of that effort. The remaining time was divided among the other portions of the workshop program: lectures, seminars, and field trips of one kind or another.

The intent of the workshop was to expose the participants to the full range of the research activity—from the proposal or application for funding through the final report. The schedule also indicated the expectation of regular progress reports by the research groups.

Organization of Workshop Participants

A 15-member research team was considered unwieldy, partly because of the considerable breadth and variability of academic backgrounds and experience of the participants. For the initial effort in the writing of grant applications, five groups of three persons each were formed. For the research effort itself the workshop group was divided into three teams of five persons each. The groups were established by members of the workshop staff based on an evaluation of the academic backgrounds and experience of the participants. This was done with the intention of providing, insofar as was possible, teams with a balance of both different academic backgrounds and actual research experience.

Three-member teams were deemed appropriate for the application for funding process, as this was to be a relatively brief document prepared in a short period of time. Working groups larger than three would have been difficult under these circumstances. The research effort itself was a more substantial effort and larger working groups were judged to be more workable in this setting. Each of the three research groups elected its own group leader, and a project director was selected from among the three initial group leaders. Later in the process the project director came to believe that he should not double as a group leader, and that person's group selected another individual to serve that function.

The three research groups did not work in parallel. Each group studied and reported on particular aspects of the problem. The project final report was the sum total of the three groups' efforts. An alternative to this organization would have been to allow each research group to independently produce an entire project report and have all three groups essentially working in parallel on the total problem. In retrospect this latter idea may have been more effective, as the coordination of 15 individuals toward a single product was often difficult and consumed an inordinate amount of time.

The workshop effort began with each of five application groups preparing an application in response to a standard-format UMTA invitation to submit. Each group submitted a written application and presented it orally before the full workshop. The workshop staff evaluated each application, selected a winner, and used it as the basis for an overall group work plan, which formed the basis for the actual conduct of research.

Salient points from other applications were added to the winning application. The group was then assembled to establish working tasks and schedules and the research tasks were divided among the three research groups. This process turned out to be a most difficult one, and almost as much time was spent discussing how the various groups would interact with one another as was spent actually discussing the research project.

To assist the workshop participants in the conduct of their research, the workshop notebook was also distributed. The notebook provided hints on how to conduct the various tasks involved in the research, from literature reviews through the formulation of recommendations.

Reporting and Monitoring

Each group was required to report weekly on its progress. The reports were given orally before all three groups, the workshop faculty, and staff. Reports followed a prescribed format and focused on the kind of progress made and difficulties encountered rather than on technical detail.

Periodic interim reports of greater detail were also required. These were also delivered orally to all participants, the faculty, and staff. The interim reports focused more on substantive findings and progress during the particular reporting period. Often the interim reports were accompanied by detailed write-ups of a particular task, which were reviewed in detail by the workshop faculty and staff and then returned to participants with specific comments. The reporting process was found to be most useful, although the specifics involved in the organization of interim reports, weekly reports, and other discussion forms were at times time-consuming. The constant interchange of ideas, thoughts, problems, and progress among the participants themselves, between and among the research groups, and between the workshop faculty and staff and the participants made for a rich working environment and resulted in a more meaningful end result.

Lectures, Guest Speakers, and Field Trips

The research project was the focus of the workshop; however, the workshop incorporated a number of other aspects that supported the total learning experience. These included special lectures, seminars, and various field studies.

In general these served a dual purpose:

1. Exposure of workshop participants to a wide variety of transit-oriented problems, agencies, and operations to impart a better understanding of the field in which they are expected to do future research; and
2. Exposure of workshop participants to the subject of their research project (i.e., the case study involving the Buffalo light rail rapid transit system).

During the 7 weeks of the course at the SUNY Buffalo campus the program consisted of a number of special lectures given by members of the workshop faculty and a number of seminars given by various officials of local, state, and federal transportation agencies, many of whom had been directly involved in the decision to implement the light rail transit system in Buffalo. During the 7-week Buffalo portion of the workshop, participants also went on a number of field trips to local planning agencies and to various sites along the route of the light rail transit system now under construction.

These lectures, seminars, and field trips were scattered throughout the 7-week Buffalo program to achieve maximum benefit to the participants. The seminars were scheduled to impart particular pieces of information at a time when they would be most useful to the conduct of the research project. These other activities were also used to help break up the tension of the torrid pace of work required to complete the research effort within the 7-week time frame.

Participants were brought to New York City on Sunday, July 6th for a week of tours, field trips, and special seminars. These included tours of a New York City Transit Museum, the Coney Island Rail Rapid Transit maintenance facilities (the largest such facilities in the world), a bus maintenance and dispatching facility, rail and bus control center operations, and the main offices of the New York City Transit Authority and the Metropolitan Transit Authority. Special lectures included those given by several high-ranking officials in a number of metropolitan-area transportation agencies. The week proved to be a most useful experience and provided the broad exposure that had been planned.

WORKSHOP EVALUATION

A number of evaluations of the workshop were carried out. These included

1. A midworkshop and final assessment by the participants,
2. A New York City trip assessment by the participants,
3. A postworkshop follow-up assessment by the participants, and
4. An evaluation of the workshop by the staff.

Participant Evaluation

Participants were interviewed to obtain information about their expectations for the workshop and reactions to the organization and process of the workshop. The interviews were started toward the end of the second week and continued through the fourth week. Four sets of open-ended questions were asked:

1. Were the purposes of the workshop clearly stated in the announcement brochure? What did you believe those purposes to be? What were your own reasons for applying to attend the workshop?
2. Are there any significant differences in your present perceptions of the workshop's purposes as compared with your preworkshop perceptions? How compatible are your own purposes for attending the workshop with its purposes as you perceive them now?
3. What is your opinion about the workshop process as selected to its organization and structure? How do you feel about the workshop in terms of the interactions of the participants with one another?
4. Do you have any suggestions for modifications or changes in relation to the workshop's format or process?

Four structured questions were asked to assess what the participants thought about the progress of the workshop:

1. How do you feel about the attainment of your own, personal objectives for the workshop so far?
2. How do you feel about the attainment of the workshop's objectives so far?
3. How do you feel about your own interactions with other participants at the workshop?
4. How do you feel about the participants' interactions as a group?

The structured responses that the participants could make were very positive, positive, neutral, negative, or very negative.

About 2 months after completion of the workshop all but two of the participants were interviewed by telephone. The interviewees were asked to give their general reactions to the workshop and to indicate whether their perceptions had changed since the end of the workshop. They were also asked what transportation research activities they had undertaken or were planning to initiate. Finally, they were asked for any suggestions for future workshops.

The reaction of the participants was generally quite favorable. They were particularly impressed with the preparation that preceded the workshop and with its overall organization. Nearly all indicated that they were achieving their goals and that they thought the workshop was worthwhile. The participants had difficulties with the group dynamics processes related to timely completion of the workshop tasks. Specifically, problems existed in resolving conflicting interpretations and ideas about the tasks. However, the tasks were completed on schedule and were carried out competently.

The results of the interviews suggest that future workshops can be strengthened in three ways. First, additional emphasis can be placed on structuring expectations to increase clarity about the workshop's purposes and conditions. Second, group leadership roles can be defined more strongly and earlier to facilitate participant task interactions. And, third, the instructional format of the workshop can include a more structured lecture-seminar format in the early stages of the training. Modest changes in these three areas can provide significant additional benefits to the participants as follows.

Although participants were on the whole quite well informed about the workshop's purposes, and they considered themselves as such, the interviews showed that their expectations differed in some important respects. The main differences among participants' expectations pertain to the degree of emphasis they thought would be placed on substantive transportation problems versus research methodologies and techniques. They tended to be surprised about the diversity in backgrounds among themselves and, therefore, did not consider that a broad, balanced content would be presented.

Some participants thought that a background in transportation would be assumed so that the workshop would cover more advanced research techniques. Others expected that research knowledge was assumed, and that more emphasis would be placed on solving substantive transportation problems. The participants' comments make clear that the content of the workshop was well-balanced, but that participants' perceptions should be modified to expect a varied group of individuals who have different backgrounds and needs. This point can be addressed in informational brochures and at the start of the workshop.

A seemingly minor issue that, nevertheless, had a measurable impact on participants' perceptions concerns the workshop's facilities and amenities. Participants were informed that they would be staying in college dormitory facilities and that they had the option to obtain other accommodations. However, the relevance of this information was forgotten or did not register as important until several weeks had passed. As the demands of the workshop tasks increased, the lack of amenities in the dormitory setting became more frustrating. Perhaps if the participants would be made aware of the drawbacks of the facilities as compared with the life-style they were accustomed to, they could be more accepting or choose to stay elsewhere.

The first day of the workshop the faculty informed the participants that they were free to establish their own leadership roles within the task organization of three research teams and a project director. The development of a leadership structure proved to be considerably more difficult than anticipated and hampered the smooth functioning of the work groups. A large amount of time was devoted to the resolution of conflicts, which frequently involved relatively minor issues. The group was able to overcome the resulting difficulties in group dynamics, but at a certain cost in frustration and time. More structured leadership functions may be useful at a future workshop to find out if the group process will improve.

A number of participants indicated that they benefited from the speakers and lectures. Several expressed some regret that certain lectures were not scheduled earlier in the training so that they could better apply their learning in the research tasks they were carrying out. The interviews indicate a consensus that a fuller and more rigorous schedule of lectures in the first 2 or 3 weeks of training would be more beneficial. It was also pointed out that the speakers as well as the participants should

Figure 3. Final analysis of workshop by participants.

	YES	NO	UNDECIDED
Do you intend to pursue research in trans.	12		1
Do you intend to apply for support:	12		1
To UMTA	12		1
To RSPA	7	5	1
Other DOT Administration	6	6	1
Other	6	6	1
Do you intend to contact other participants in the workshop with respect to the discussion of research ideas?	12	1	
To participate in research projects	9	3	1

Most Rewarding Experience from the Workshop

1. Contacts
2. Exposure to Transportation Research
3. Opportunity to work with colleagues with diverse background
4. UMTA Procedures
5. Working in a different region of the country

Least Rewarding Experience from the Workshop

1. Living conditions
2. Speakers
3. Time Constraint
4. Group Tasks
5. Lack of Counseling
6. Being away from family

make every effort to develop a professional seminar atmosphere.

The final series of follow-up interviews, conducted more than 1 month after completion of the workshop, showed that the faculty participants were satisfied with the workshop results. They thought that they had benefited significantly from the experience and that they would incorporate the material they had learned in their future work. Nearly all indicated that they had already started projects related to transportation research and had approached various individuals and organizations to express their interests in certain transportation problems. Figure 3 summarizes these findings. A large percentage of the workshop's participants seem to have been influenced to become active in transportation research.

Summary Evaluation

The workshop can be evaluated in a number of ways. An overall evaluation can be established by comparing the conduct of the workshop and the follow-up work of the participants with the expectations of the sponsor (UMTA), the staff (SUNY and PINY), and the participants.

Sponsor

UMTA's objectives were to have increased involvement of minority faculty in UMTA research and development programs. Although we recognized at the outset that some time would be needed to fully involve faculty who faced institutional constraints on their ability to generate research, we looked for some signs that such generation would be forthcoming. A number of

results of the workshop indicate that this aspect, the generation of research, was a success.

UMTA received four applications for the FY 1981 invitation to submit to their university research program. An additional application was received, but it was too late. Three faculty members submitted proposals to the Research and Special Programs Administration (RSPA) of the university research program. More than half the participants have engaged in discussions with U.S. Department of Transportation personnel regarding research topics. Two of the participants are active in forming a transportation group in Atlanta, Georgia. They have also taken the lead in making contacts with local professionals. One of the participants has formed a transportation research group in the Southwest and is promoting a new transportation curriculum at his university. Some of the participants have begun to form, through correspondence and meetings, an informal but active network. One of the participants is pursuing transportation interests more actively than she anticipated and is seeking out others at her institution to collaborate with on research problems.

The actual conduct of research is a basic measure to the sponsoring office; however, other benefits also go to UMTA and to the U.S. Department of Transportation from the workshop. Several of the participants have contacted or now work with local planning or transit operating officials. This interaction and the sharing of capabilities at the local level is the basis of an indirect benefit to UMTA. The improvement of local expertise makes it easier for UMTA to deliver technical assistance.

The increased transportation knowledge, coupled with information on where information can be ob-

tained, stimulates course development and student preparation. Minorities are underrepresented as professionals within the overall transportation industry. The opportunities and incentives to pursue such a career can be demonstrated to students through the enthusiasm and depth of knowledge of their professors. Further, the contact that their professors have with UMTA staff, on a personal basis, increases their credibility and respect within the classroom. Finally, the ability to work on funded research becomes a step in professional training.

Workshop Participants

The participants came with a heterogeneous set of objectives. Some wished to learn proposal writing, some to become familiar with transportation literature, and others to learn how to be successful researchers. Some were accomplished researchers; others had not conducted a literature search since their dissertation. This heterogeneity led to several group dynamics problems because the group could not agree on a unanimous set of objectives.

The midworkshop critique indicated a lost in the forest attitude. The participants were working hard and realized that they were learning and absorbing something, but they were not sure of the match between their expectations and what they were learning. The final critique showed that most (77 percent) thought that their expectations had been met and all would recommend it to others.

The postworkshop evaluation showed that concern about living accommodations was less important than indicated on the evaluations. A review of the most rewarding and least rewarding experiences showed that the most rewarding experiences all dealt with professional experience (e.g., contacts, knowledge of UMTA procedures, and transportation research); the least rewarding experiences concerned living conditions and group dynamics. Only in the choice of certain speakers did the group note any dissatisfaction with the workshop itself.

The current activities of the participants indicate the substance they had taken from the workshop. These underline an important point: Whatever their expectations before the workshop, the majority of participants believe incentives exist to conduct transportation research, regardless of institutional barriers, and have set about to do so.

Staff

The workshop staff had the challenge of bringing together UMTA objectives with participant expectations. Further, the staff had to ensure that the living accommodations were reasonably comfortable and did not get in the way of the conduct of the workshop itself. The most satisfying element of the workshop to the staff was the total involvement the participants gave to every aspect of the workshop. The development and production of a comprehensive final report, on schedule, characterized the overall sense of the workshop.

The staff found that their roles were clearly delineated. However, one aspect of the workshop, the group dynamics problems, were not anticipated. Workshop staff often had to resolve small issues. When possible the issues were classified, or restated, and given back to the participants to resolve. The issues were mainly definitional and never arose from an unwillingness to assume a responsibility of workload.

One of the objectives of the staff was to ensure that adequate transportation information would be

available throughout the workshop. The presence of four staff at all times plus a major resource room and guest speakers made it possible for the participants to conduct their work with a minimum amount of hunting for information. A secretary was also made available to the participants and staff for the entire workshop. These last two factors are not real-world conditions. Few research groups at any institution have all resources at their fingertips.

One of the staff objectives was to develop self-confidence in the participants so they could be effective lobbyists for their research. A finding was that the development of self-confidence was not an issue. The workshop group, talented and aggressive, needed to become familiar with the process of lobbying, the contacts to make, and the subject matter. The greatest hindrance to the development of research programs at minority institutions (based on the performance of the participants) was the institutional barriers created at their own colleges. These barriers include

1. Poorly defined chains of command--lack of responsibility for research assignments, contract negotiation, or contract sign-off;
2. Rigorous teaching schedule--no release time for research and inadequate support time; and
3. Lack of commitment of institution administration to academic research.

Again, the single most visible product of the workshop was the proposals and applications submitted to RSPA and UMTA. More important, however, was the intangible product, the active network of transportation activities started by the workshop graduates.

1981 WORKSHOP

Based on the measures of success identified previously UMTA entered into a cooperative agreement with the same team of academic institutions to conduct a workshop during the summer of 1981. Although the aspects of preparation were the same, the format of the 8 weeks changed slightly. A research problem was designed to be completed in 6 weeks. One week was spent in extensive field trips and lectures in New York City. The participants spent the final week developing initial applications and proposals to the U.S. Department of Transportation for the conduct of a research project.

Twelve faculty from historically black colleges were selected for this workshop. Because of the late date at which U.S. Department of Transportation university solicitations have been issued, it is not possible at the time this paper was written (November 1981) to know the extent of participation of the group in U.S. Department of Transportation programs.

ACKNOWLEDGMENT

The work was carried out under a cooperative agreement with UMTA. Much of the success of the workshop was due to the strong participation of the advisory board. This included Philip Hughes (UMTA), Reginald Diamond (UMTA), Wilber Williams (RSPA), all of U.S. DOT., and William Lobbins of SUNY at Buffalo. In addition, the staff included James Mulder, Stephen Kirsch, and Eileen Hughes of SUNY at Buffalo. The five coauthors served on the advisory board. Nathaniel Jasper was the UMTA project monitor. Jim Mulder conducted much of the evaluation. The great success of the workshop occurred because of the tireless effort, enthusiasm, intelligence, and good

humor of 27 talented faculty members--the participants. They were: M. Alexander, G. Bowser, K. Cook, E. Davis, I. Glover, C. Jones, C. Jordan, E. Leung, D. Lyons, H. Ortiz, W. Porter, C. Smith, J.

Smith, R. Sheck, H. Walton, K. Ankrah, M. Blount, D. Chase, C. Claiborne, K. Dorsett, L. Fitzgerald, C. Harvey, O. Jones, R. Krajick, S. Mahdi, J. Moore, and R. Ward.

Reentry of Women into the Transportation Profession: Program and Potential

ROGER P. ROESS, PAMELA E. KRAMER, AND LOUIS J. PIGNATARO

A National Science Foundation Women in Science program for the retraining of women seeking to reenter the job market in the transportation profession is described and discussed. The suitability of transportation as a reentry field is argued, and reentry students are shown to be a potentially large market of new students for graduate transportation programs.

The transportation profession is unique among the technical disciplines in that it can be entered at the graduate level by those who do not have an extensive technological undergraduate background. Many universities admit students to master's and doctoral programs in transportation without requiring undergraduate engineering degrees; however, sufficient background in mathematics is generally required. The multidisciplinary nature of the transportation profession and the high visibility of transportation to the general public make it an ideal field for college-educated men and women who are underemployed or who have become disillusioned with their original specialties, and who would like to enter a technical profession for the first time.

The term reentry has generally been used to describe women who, after an absence of years from the job market, seek to reenter the job market, often in a career substantially different from the one for which they were originally trained. During the 1960s and early 1970s women were most often encouraged to study education, humanities, social sciences, and other nontechnical subjects. A large number of these women are now unemployed or underemployed, yet well-educated adults, trained in fields for which the job market is declining.

Under the sponsorship of the National Science Foundation Women in Science program, Polytechnic developed and implemented a unique program for the retraining of college-educated women in the transportation profession. The program was initiated in January 1981 and continued through June 1982. The program demonstrated (a) the ability of many women to quickly adapt to a technical profession and (b) such women represent a substantial student market potential.

PROGRAM

The special program designed for reentry women had two primary emphases:

1. Remediation and reorientation to the transportation profession, and
2. Earning graduate credits toward the M.S. degree in transportation planning and engineering.

As most of the program participants would have

nontechnical backgrounds, mathematics remediation was a principal concern. All participants, with the exception of a few who had significant mathematics background, took a remedial mathematics course during their first semester, which was Spring 1981. The course, which met for 4 hr/week over a 20-week period, covered what is traditionally referred to as precalculus (i.e., advanced algebra, analytic geometry, and some trigonometry). This was followed by an applied statistics offering during the Summer 1981 session. During this period, all participants took an introductory transportation course for which they received graduate credit.

During the first semester program participants took all courses together, partly to foster group coherence, and partly to avoid causing early frustrations by placing participants in mixed class sections. During the 1981/82 academic year, however, participants attended regular graduate sections with other students.

The three-semester program also included a number of special seminars and short courses, including

1. Career day--An all-day conference and seminar attended by prominent transportation professionals in the New York City metropolitan area to expose participants to the breadth of opportunities in the profession;
2. Planning approach to problem-solving--A seminar discussion of the technical planning approach to solving transportation problems; a discussion of quantitative versus qualitative analysis;
3. Technical writing--A seminar on technical writing and the preparation of technical presentations, including the use of graphics and displays and public speaking; and
4. Resume writing and job search--A full-day workshop on preparation of technical resumes and on job search and interview techniques.

In addition to these special programs, regular bimonthly meetings were held to discuss any problems that participants might be encountering either with the program or with interactions with faculty, other students, or among themselves. Early in the program some intragroup conflicts arose over the remedial mathematics course--some thought it was too advanced, others, too elementary. As the program progressed, however, few such problems arose.

Throughout the program, participants had available special guidance and counseling from the Polytechnic's women's programs office. This office provided a good deal of assistance to participants in adjusting to a technical education and in becoming an active part of the general student body.