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NATIONAL RESEARCH COUNCIL  
COMMISSION ON SOCIOTECHNICAL SYSTEMS

2101 Constitution Avenue Washington, D. C. 20418

TRANSPORTATION RESEARCH BOARD

Transportation Technology Support  
for Developing Countries

January 5, 1979

QUARTERLY REPORT NUMBER 5  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
NEGOTIATED CONTRACT NO. AID/otr-C-1591

CONTRACT FOR: Transportation Technology Support

Mr. John P. Zedalis  
Chief, Transportation Branch  
Office of Engineering  
U.S. Agency for International Development  
Washington, D.C. 20523

Dear Sir:

This report covers the quarter ending December 31, 1978.

A. ACTIVITIES AND ACCOMPLISHMENTS

1. Meetings Held

- a) A meeting of the Synthesis subcommittee for Labor-Intensive Intermediate Technology for Construction and Maintenance was held on October 5 in Room 500C of the Joseph Henry Building, 2100 Pennsylvania Avenue, Washington D.C. Two TRB staff members attended. Attachment 1 is the Agenda of this meeting.
- b) Conference meetings with individual members of the following compendium subcommittees by visit and by phone as follows:
  - Compendium 3 - Small Drainage Structures  
between October 25 and 27
  - Compendium 4 - Low-Cost Water Crossings  
between October 10 and November 8
  - Compendium 5 - Roadside Drainage  
between October 25 and November 6
- c) Conference meetings were held by phone with all three synthesis subcommittees and consultants continually throughout the quarter. All three consultants also visited TRB one or more times during this quarter.

- d) A meeting between 3 members of the Ghana Highway Department training division, Mr. Ball of Roy Jorgensen Associates and 5 TRB staff members was held between 9:30 AM and 12:00 noon in Room 200B, 2100 Pennsylvania Avenue, Washington, D.C. on October 30. This project was the subject of the meeting.
- e) A meeting between Jerry Wilson, Paul Irick and Lloyd Crowther was held on November 1 to discuss the project participation in the IRF conference in Kenya in January, 1980.
- f) A round table discussion was held at the AID engineering office in Roslyn between 9:30 AM and noon on December 7, 1979. The purpose was to discuss the synthesis on Stage Construction. The consultant, E. Davidson, met with USAID representatives John Zedalis, Jim Gardner, Palmer Sterns and Tony Tummarello. One TRB staff member was present.
- g) Meetings with project correspondents visiting Washington were held on October 3 with Mr. Richards, Secretary for Works and Supplies, Malawi and on October 25 with P.A. Caballero, Ministry of Public Highways, Republic of the Philippines.

## 2. Travel

Mr. Crowther attended the "International Workshop on the Planning, Construction and Maintenance of Rural Roads" sponsored by the Mexican Government and held in Oaxaca, Mexico from October 15 to October 21, 1978. Attachment 2 is a copy of the letter which reports the results of this trip to the Steering Committee. As a further result of this meeting, complimentary copies of Compendium 1 and 2 were sent to the representative of the People's Republic of China who has given Mr. Crowther his personal copy of the book "Design, Construction and Maintenance of County and Commune Highways of the People's Republic of China" during the conference. TRB has also sent information about the services and membership aspects of our organization to the Chinese representative.

## 3. Status of Compendium Development

- a) Compendium 2, Drainage and Geological Considerations in Highway Location, was distributed by airmail in October, 1978.
- b) Compendium 3, Small Drainage Structures, received preliminary subcommittee approval on October 27, 1978, was translated by November 30, 1978 and the final galley proofs were sent to the subcommittee for sign-off on December 27, 1978.

- c) Compendium 4, Low-Cost Water Crossings, received preliminary subcommittee approval November 11, 1978, was translated by December 13 and is currently in the hands of the production staff.
- d) Compendium 5, Roadside Drainage, received preliminary subcommittee approval November 5, 1978 and is currently being translated.
- e) Compendium 6, Inventory and Development of Material Resources, was submitted to the subcommittee for discussion, comment and review on December 13, 1978 with the request that acknowledgement of receipt be made by phone. No response has yet been received.
- f) Compendium 7, Properties of Surface Gravels, is in the process of text selection. Subcommittee members Irwin and Morin have been contacted to make recommendations concerning specific texts.
- g) Compendium 8, Inexpensive Soil Modification with Local Material, has been processed by the TRB library staff and is awaiting the final selection of texts for Compendium 7.

#### 4. Status of Synthesis Development

- a) The Synthesis, Stage Construction, has been approved in outline form. The first two chapters have been written in draft form and typed by this office. No formal submission of this material has been made however.
- b) The Synthesis, Maintenance of Unpaved Roads, has been approved in outline form. The first two chapters have been written in draft form and typed by this office. No formal submission of this material has been made however.
- c) The third synthesis has tentatively been renamed Labor-Based Construction and Maintenance of Low-Volume Roads. It was approved in outline form in late November but after extensive discussions between the consultant and the staff and subcommittee members, including correspondence with Mr. Edmonds, the consultant submitted a more comprehensive draft which was received on December 18 and forwarded to the subcommittee for informational purposes.

#### 5. Status of Correspondent List

- a) During October a follow-up letter was prepared for each correspondent. This letter was translated and sent out throughout the month of November. The letter, signed by Mr. Crowther, either thanked the correspondent for accepting or asked the correspondent if he would respond to Mr. Carey's original offer. In some cases of acceptance, the official TRB appointment certificate was enclosed.

- b) On October 19, 1978, a letter was sent to the Steering Committee with their copy of Compendium 2. This is enclosed as Attachment 3. It describes the materials which were transmitted to each correspondent with the official distribution of Compendium 2.
- c) The country of Papua, New Guinea was added to the recipients of this project.
- d) The current correspondent list consists of 67 countries with 196 regular correspondents and 12 review correspondents. Of these 208 correspondents, 92 correspondents from 50 countries or 44.2% have accepted their appointments and 82 have been issued certificates. See Attachment 4. This percentage of acceptance was further broken down to determine if there was some particular language or area that was presenting a problem. The summary is as follows:

<u>CATEGORY</u>	<u>ACCEPTANCE PERCENTAGE</u>
1. Number of countries .....	74.6%
2. Language used in letters to correspondents:	
English .....	49.1%
French .....	39.1%
Spanish .....	38.6%
3. Major geographical areas:	
Central America .....	48.4%
Asia .....	47.6%
South America .....	41.9%
Africa .....	41.8%
Oceania .....	20.0%

- e) Compendium 2 was sent to all correspondents on October 19.

6. Project News Release

- a) The 6th news release publication for Transportation Research News Number 78 (September-October) was sent to all correspondents with Mr. Crowther's follow-up letter to the correspondents mentioned above.
- b) The 7th news release which appeared in T.R.N. Number 79 (November-December) will be sent out with Compendium 3. Two hundred copies have been sent to AID for their distribution however.

7. Identification of Students from Developing Countries

The final tally of identified LDC students in University transportation curriculums throughout the country stands at 105. Each of these students was sent notification of the colloquium to be held on January 14. See Attachment 5.

8. Development of Feedback Procedures

- a) Attachment 3 contains feedback data for Compendium 1 as submitted by eight Steering Committee members.
- b) Feedback forms for both compendiums were sent out with Mr. Crowther's November follow-up letter to all correspondents mentioned above. At this time so few have been returned that the results are insignificant.
- c) A computer storage and retrieval system is currently under development to assist in the analysis of these review form responses.

9. Preparation for Steering Committee meeting on January 18, 1979

- a) First notification of the date of this meeting was sent to the Steering Committee on October 19. See Attachment 3.
- b) The second communication with the Steering Committee took place on November 14, 1978 (see Attachment 6) when the staff sent out a request for nominations for topics for consideration at the annual meeting.
- c) On December 29, 1978 a packet of data concerning the meeting was sent to all the Steering Committee members (see Attachment 7). It included a cover letter, a meeting agenda, a description of the ballot to be used and the method of tallying to be employed, a sample ballot containing 38 topics, and 14 pages consisting of reproductions of each of the 78 nominations submitted by the 17 people who responded to the request for nominations. These nominations had been consolidated and titled by the staff.

**B. FINANCIAL STATUS**

Accounting statements for the month of December, 1978 have not yet been received. Based on actual expenses through November, 1978 it is estimated that the total expenses for the first five quarters of this project (i.e. from October 1, 1977 through December 31, 1978) will be approximately \$220,000.00 This leaves an estimated \$210,000.00 balance for the original appropriation of \$430,000.00.

During December, 1978 revised budgets were prepared for the second and

third year of the project. Upon approval, the revised budgets will become the basis for future financial reports on the project.

C. PLANS FOR NEXT QUARTER

1. Steering Committee meeting

- a) Exhibits for the meeting will be prepared by January 12.
- b) A verbal report of the student meeting on January 14 will be presented but can not be prepared until the group meets.
- c) Balloting will be conducted at the end of the meeting.
- d) The tabulation of ballots will take place during the week of January 22 and the Steering Committee will be notified of the results by letter before the minutes of the meeting are submitted.
- e) The minutes of the meeting will be prepared and distributed.

2. Compendiums

- a) Compendium 3 will be distributed in January. That distribution will include a feedback form and the current T.R.B. News reprint. It will be the last airmail distribution.
- b) Compendium 4 will be distributed in March. It will be distributed by surface mail with the exception of the copies to the review correspondents who will continue to receive their review copies by air.
- c) Compendium 5 will be in the press by the end of the quarter.
- d) Compendium 6 will hopefully be accepted in draft form by the end of the quarter.
- e) Compendium 7 should be in the hands of the subcommittee by the end of the quarter.
- f) Compendium 8 should be in the overview preparation stage by the end of the quarter.

3. Syntheses

All three syntheses should be nearly completed in draft form by the end of the quarter.

Mr. John P. Zedalis  
January 5, 1979  
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4. Travel

- a) No international travel is anticipated during the next quarter.
- b) The project engineer will visit various members of the compendium subcommittees as necessary to conduct product reviews.

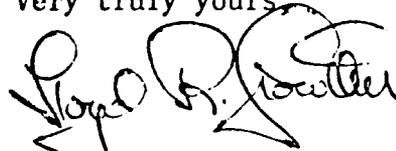
5. Project News Releases

Transportation Research News articles will be prepared for Number 80 in January and Number 81 in February.

6. Correspondent Mailing List

- a) The mailing list will continue to be revised as responses to the November mailing are received.
- b) Copies of each compendium will be sent to each correspondent, whether they have formally accepted the position or not, until TRB is notified of a contrary policy by AID.

Very truly yours,



Lloyd R. Crowther  
Project Engineer

Attachments

NATIONAL RESEARCH COUNCIL  
COMMISSION ON SOCIOTECHNICAL SYSTEMS

2101 Constitution Avenue Washington, D. C. 20418

TRANSPORTATION RESEARCH BOARD

September 14, 1978

To: Messrs. Edmonds, Harral, Mack, Thormann, and Ms. Rossow

This is to confirm that the initial meeting of the subcommittee for the TTSDC synthesis on Labor-Intensive Intermediate Technology for Construction and Maintenance will be held on Tuesday, October 3 in Room 500C of the Joseph Henry Building, 2100 Pennsylvania Avenue, Washington, D.C., beginning at 9:00 AM. We estimate that the meeting will be adjourned by no later than 12:00 Noon.

The major purpose of this meeting is to draw up general guidelines for the synthesis work, particularly that to be performed by our consultant, Ms. Rossow. We believe the items listed below should be discussed, though not necessarily independently nor in the order listed.

1. Identification of tasks and tentative schedule for the synthesis work.
2. Subject scope in terms of chapter and topic headings.
3. Relative emphasis that should be placed on the various topics, in terms of number of pages for each topic or chapter.
4. Recommendations for existing documents, or types of documents, that are relevant to specific parts of the subject scope.
5. Recommendations for individuals, or types of individuals that should be interviewed because of their special knowledge on specific parts of the subject scope.
6. Recommendations for presentation style and format.

It will be most useful if you can give these items some thought and present your views at the meeting. We look forward to seeing you on October 3.

Very truly yours,

*Paul E. Irick*

Paul E. Irick  
Assistant Director for  
Special Technical Activities

*Lloyd R. Crowther*

Lloyd R. Crowther  
Project Engineer

cc: Mr. Kermit Bergstralh

**NATIONAL RESEARCH COUNCIL  
COMMISSION ON SOCIOTECHNICAL SYSTEMS**

2101 Constitution Avenue Washington, D. C. 20418

**TRANSPORTATION RESEARCH BOARD**

**Transportation Technology Support  
for Developing Countries**

November 2, 1978

To Members of the Steering Committee  
and Consultants

I had the pleasure of attending the "International Workshop on the Planning, Construction and Maintenance of Rural Roads" sponsored by the Mexican Government and held in Oaxaca, Mexico from October 15 to October 21, 1978.

Attached are the initial summaries of the ten sessions held. The official publication of the summaries and papers will be available later. I am distributing this preliminary information, some of which was translated by TRB staff members, so that the personnel involved in this project can get some "feel" of what took place.

There were 29 countries present at the workshop. Of these countries, 24 are included in our list of recipients. I was able to discuss the project at length with the delegations from 22 of these countries, thanks to the Mexican government's thoughtfulness in housing me with the participants rather than separately with most of the observers.

The country breakdown is as follows:

- A. Countries with whom I discussed the project: Bangladesh, Bolivia, Burundi, Chad, Colombia, Dominican Republic, Ethiopia, Haiti, Honduras, India, Kenya, Malawi, Mali, Mexico, Nepal, Panama, Peru, Philippines, Tanzania, Thailand, Upper Volta and Zaire.
- B. Countries on our list that I did not talk to were Costa Rica and Guatemala.
- C. The other countries represented at the workshop were Canada, China (Red), France, Madagascar and U.S.A.

Included in the group I spoke to were 13 actual correspondents including 5 Review correspondents. I was able to go over the duties of each of these people and show them an advance copy of compendium 2. That copy of compendium 2 was also shown to many of the other attendees who seemed very impressed.

Furthermore, the people who had already received and read compendium 1 were very helpful in "talking it up" to the other delegates who had not yet received a copy via the trickle down processes. I gave the names of the correspondents in the individual countries to those delegates who had not seen compendium 1 and advised them to request access to that book from a correspondent in their own country.

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Intl. Workshop on Planning, Constr.&  
Maint. of Rural Rds., Mexico (cont'd)

While I was in Mexico, Clark Oglesby was in Costa Rica. He prepared a report which has not yet been officially released but he got permission for us to have a draft copy for use by our maintenance synthesis consultant. It is another current inside view of a rural road system in a developing country and I feel is of general interest to all participants of the project, so I have also included it in this mailing.

Please treat all of the enclosed material as confidential since none of it has yet been released for public consumption and any general dissemination of the contents may jeopardize the relationships Clark and I have developed with the people who so very kindly permitted TRB preliminary access to this information.

Thank you.

Very truly yours,



Lloyd R. Crowther  
Special Projects Engineer

enclosures.

**NATIONAL RESEARCH COUNCIL  
COMMISSION ON SOCIOTECHNICAL SYSTEMS**

2101 Constitution Avenue Washington, D. C. 20418

**TRANSPORTATION RESEARCH BOARD**

October 19, 1978

To the TTSDC  
Steering Committee

This is to transmit your personal copy of Compendium 2. In the front of the book we have inserted a review form for your optional review response.

Other enclosures are the latest reprint from Transportation Research News and a TRB news release on the Ames conference. Both of these items are also being distributed to the developing country correspondents. We now have received about 80 acceptances from nearly 50 different countries. Nearly all the acceptance letters indicate enthusiasm for the project and a sincere desire to carry out the correspondent responsibilities.

Finally we enclose a reduced review form that summarizes Compendium 1 reviews we have now received from eight members of the Steering Committee. Verbal comments are listed on the second page and are keyed to the seven sections of the review form. We appreciate the responses we have received and trust that we will continue to receive Steering Committee reviews from members who wish to make these useful contributions to the project work.

The time and place of the next Steering Committee meeting have now been set for 2:00 - 5:00 pm on Thursday, January 18 in the Holmes Room of the Sheraton-Park Hotel. The TRB Low-Volume Roads Committee will hold its meeting during the morning of that day.

Thank you very much for your past and continued cooperation.

Very truly yours,



Paul E. Irick  
Assistant Director for  
Special Technical Activities



Lloyd R. Crowther  
Special Projects Engineer

enclosures.

# Developing Countries Visited in Transportation Technology Support Project

An important part of TRB's project on Transportation Technology Support for Developing Countries is to make semiannual visits to countries that will receive the project publications. Visits are arranged with the assistance and cooperation of the Washington staff and field mission staff of the U.S. Agency for International Development (AID). General objectives for each visit are to contact project correspondents, to inform local users about the project, and to solicit comments and suggestions on how the project and its products can be improved.

From June 24 to July 8, 1978, Project Engineer Lloyd Crowther made the project's first field visit to three African countries: Liberia, Ivory Coast, and Kenya.

In Monrovia, a roundtable conference was held with about 15 officials of the Liberian government and AID/Liberia officials. In Abidjan, Ivory Coast, contacts were made with engineers from the AID Regional Economic Development Services Office (REDSO) for West Africa and, in Nairobi, Mr. Crowther had individual discussions with Kenyan officials, with AID/Kenya officials, and with engineers from AID/REDSO for East Africa.

Several points were made remarkably consistently throughout this first field visit:

1. The conference format and the one-on-one format each have certain advantages, and it is expected that both formats will be used in future visits;
2. The concepts and methods of the project received universal approval;
3. The selection of the initial compendium and synthesis topics was considered to be excellent;
4. The major highway problems in Africa today include soils, drainage, and equipment maintenance and use;
5. Field visits will include many opportunities to observe technical problems and to provide engineering advice on these problems;
6. Project publications should be distributed in greater numbers than had been planned; and
7. The field visit was well received, and the discussions were substantive and useful.

After leaving Nairobi, Mr. Crowther visited the Transport and Road Research Laboratory (TRRL) in England. Staff of the TRRL Overseas Unit have direct interest in the project and were very cooperative.

Tentative plans for the future include a visit to certain Latin American countries in December 1978 and an initial visit to Asian countries in the spring of 1979.

## Correspondent Network

William N. Carey, Jr., Executive Director of TRB, has sent letters of invitation to more than 200 prospective correspondents in about 65 developing countries. One correspondent in each of 12 countries has been invited to serve as a review correspondent and thereby respond to specific questions that will be transmitted with each project publication. The review correspondent is expected to turn over each publication and associated questions to the person who is most appropriate for evaluating the publication with respect to local needs.

All correspondents will have responsibility for ensuring that the publications are made available to people whose work is directly related to the contents of the respective publications. TRB will of course rely on the judgment of each correspondent on how best to provide local access to the project publications.

In addition to the publications, each correspondent will receive reprints of these articles in *Transportation Research News*, will be listed in the *TRB Directory*, and will receive a certificate of recognition for the valuable assistance that is being provided.

It is expected that there will be opportunities for personal discussions between project staff and many of the

**Shimeles Asfaw, Senior Supervising Engineer for Planning, Ministry of Works, Kenya, discussing project with TRB's Lloyd Crowther.**



correspondents, not only in the course of staff field visits but also in the course of correspondents' business visits to Washington. For example, on July 19, 1978, the staff was visited by a prospective review correspondent, Mr. R. P. Sikka of the Ministry of Transport in New Delhi, India.

### Steering Committee Holds Third Meeting

The third meeting of the project steering committee was held in Washington on July 27, 1978. Wilbur Morin of Lyon Associates, Inc., served as chairman pro tempore. Agenda for the meeting included progress reports and discussions of future plans for field visits, the correspondent network, compendium development, and synthesis development. Highlights of these reports and discussions are given below.

It was agreed that the project will be responsible for one session of the Second International Conference on Low-Volume Roads, to be held at Ames, Iowa, August 20-23, 1979. This conference session will be a forum on the project work; it is expected that developing countries will be represented by panelists.

The fourth meeting of the steering committee will be held at TRB's Fifty-eighth Annual Meeting in January 1979.

### Synthesis Development

As was reported in an earlier article in this series, the steering committee has selected three topics for which synthesis publications will be prepared. These topics are maintenance operations for unpaved roads, labor-intensive intermediate technology for construction and mainte-

nance, and staged construction. For each topic, a subcommittee of the steering committee has been appointed to provide direction and to perform review functions. Potential consultants have been identified to review and synthesize existing information on the respective topics.

The starting point for each synthesis is a meeting of the subcommittee, consultant, and staff to develop the scope, outline, timetable, and guidelines for preparation of the synthesis. During subsequent weeks, the consultant will develop an initial draft for review and discussion at a second meeting. The consultant's work is complete when the final draft has been approved by the subcommittee. It is expected that initial meetings for all three syntheses will be held in early September 1978 and that the publications will be ready for distribution in the spring of 1979.

### Compendium Development

The first two compendiums have now been published; details for their contents were given in issue no. 77 of *Transportation Research News*. A single photograph is used in wraparound style as background for the front and back covers of each compendium. Each cover photograph depicts a low-volume road in a developing country and is related to the compendium topic. The cover photograph for Compendium 1 appeared in the *News* article about the project in issue no. 76, and the picture accompanying this article is the cover photograph for Compendium 2.

The initial draft for Compendium 3, *Small Drainage Structures*, has been reviewed and is now in the publication stage. Material is being selected for the initial drafts of compendiums on low-cost water crossings and on roadside drainage maintenance.

### Student Colloquium

Plans are under way to hold an initial colloquium of U.S. university students who have come from developing countries and are majoring in transportation subjects. Objectives for the colloquium are to inform all participants on the project activities and to collect firsthand views on how the project activities and products can be enhanced.

It is likely that the first colloquium will be held on Sunday afternoon of the week of TRB's Fifty-eighth Annual Meeting. Approximately 150 university representatives of TRB have been asked to assist in the identification of potential participants in the colloquium. Although the project budget does not provide for travel assistance, it is hoped that a number of the students will find means to attend the colloquium and other sessions of the Annual Meeting.

Landslide problem near the Beni River, Bolivia.





TRANSPORTATION  
RESEARCH BOARD

TRANSPORTATION PROGRESS THROUGH RESEARCH

2101 Constitution Avenue • Washington, D.C. 20418

For further information call:

202/389-6334

FOR IMMEDIATE RELEASE

LOW-VOLUME ROAD CONFERENCE  
PLANNED FOR IOWA IN 1979

The Second International Conference on Low-Volume Roads will be held August 20-23, 1979, at the Scheman Continuing Education Building, Iowa State University, Ames, Iowa. The purpose of this conference is to facilitate the exchange of information on the practical aspects of design, construction, and operation of low-volume roads. Current practices and problems will be discussed, and needed research identified. The conference will be of interest to researchers and practitioners alike. The primary focus will be on practical aspects, particularly the aspect of cost.

The conference is being planned and will be conducted by the Transportation Research Board and sponsored by the United States Agency for International Development and the Federal Highway Administration in cooperation with: the American Association of State Highway and Transportation Officials, The American Road and Transportation Builders Association; the International Bank for Reconstruction and Development; the National Association of County Engineers; the National Association of County Officials; the National Science Foundation; U.S. Army Engineers, Waterways Experiment Station; U.S. Forest Service; Iowa State University; Iowa Department of Transportation; Iowa Association of County Engineers; and the International Road Federation.

Approximately 25 international and 50 national papers are being reviewed and will make up the majority of the program, supplemented by discussion sessions.

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The papers cover low-volume roads in relation to planning, operations, design, maintenance, construction, pavements, soils, aggregates, and structures.

Conference registration forms and information on accommodation will be mailed along with the tentative program in May 1979. Registration will begin at noon on August 19, 1979, and the conference will be formally opened at 9.00 a.m. on Monday, August 20, 1979, concluding at noon on Thursday, August 23, 1979.

Those wishing to be put on the waiting list to receive the program and registration information in May, 1979, please write to Mr. John Guinnee, Second International Conference on Low-Volume Roads, Transportation Research Board, 2101 Constitution Avenue, N.W., Washington, D.C., 20418.

The Transportation Research Board was organized in 1920 and is a cooperative organization of professionals from government, the academic world, and industry. The Board's purpose is to advance knowledge of the nature and performance of transportation systems and their interaction with society through the stimulation of research and the dissemination of information resulting from research.

The Board operates within the Commission on Sociotechnical Systems of the National Research Council, which serves both the National Academy of Sciences and the National Academy of Engineering.

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<p>TRANSPORTATION TECHNOLOGY SUPPORT FOR DEVELOPING COUNTRIES</p> <p>Transportation Research Board</p> <p>COMPENDIUM REVIEW FORM</p>	<p>COMPENDIUM REVIEWED</p> <p>No. 1.</p> <p>October 19, 1978</p>	<p>REVIEW CORRESPONDENT</p> <p>Summary of review forms received from eight members of the Steering Committee.</p>
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COMPENDIUM PART	STATEMENTS TO BE COMPLETED BY MARKING APPROPRIATE BOXES OR BY FILLING IN BLANKS	SPACE FOR WRITING COMMENTS AND SUGGESTIONS FOR IMPROVEMENTS
<p><b>FRONT MATTER</b></p> <p><i>includes covers, Contents, Project Description, Foreword</i></p> <p>(PART A)</p>	<p>1. The general format and contents of the front matter are</p> <p>7 Good      1 Acceptable      0 Inadequate</p> <hr/> <p>2. Needs for improvements in the front matter are</p> <p>5 None      3 Minor      0 Major</p>	<p>See comments AB AA AB AB AB AC AB AD</p>
<p><b>OVERVIEW</b></p> <p><i>includes Background and Scope, Rationale and Discussion of Selected Texts</i></p> <p>(PART B)</p>	<p>3. The discussion of background and scope is</p> <p>7 Good      1 Acceptable      0 Inadequate</p> <hr/> <p>4. The discussion of rationale for the compendium is</p> <p>7 Good      1 Acceptable      0 Inadequate</p> <hr/> <p>5. The discussion of selected texts is</p> <p>7 Good      0 Acceptable      1 Inadequate</p> <hr/> <p>6. The level at which the overview is presented is</p> <p>0 Too complex      8 Acceptable      0 Too simple</p>	<p>See comments BA AA BB AA BB AB BB AC BB AD</p>
<p><b>SELECTED TEXTS</b></p> <p><i>includes explanation, Text 1, Text 2, etc.</i></p> <p>(PART C)</p>	<p>7. Needs for improvements in the explanation are</p> <p>6 None      2 Minor      0 Major</p> <hr/> <p>8. Coverage of topic scope by the selected texts is</p> <p>7 Good      1 Acceptable      0 Inadequate</p> <hr/> <p>9. The most useful selected texts are those numbered</p> <p>1 No.1; 3 No.2; 3 No.3; 2 No.4; 5 No.5; 3 No.6; 1 No.7; 1 No.10</p> <hr/> <p>10. The least useful selected texts are those numbered</p> <p>2 No.1; 2 No.2; 1 No.3; 1 No.5; 1 No.6; 3 No.7; 1 No.8; 1 No.10</p>	<p>See comments CA AA CA AB CA AC CA AD CB AA CB AB CB AC</p>
<p><b>BIBLIOGRAPHY</b></p> <p><i>includes explanations, Text References, and Additional References</i></p> <p>(PART D)</p>	<p>11. Needs for improvements in the explanation are</p> <p>7 None      1 Minor      0 Major</p> <hr/> <p>12. Information presented in individual references is</p> <p>7 Good      1 Acceptable      0 Inadequate</p> <hr/> <p>13. The usefulness of the additional references is</p> <p>5 High      3 Medium      0 Low</p>	<p>See comment DB AA</p>
<p><b>INDEX</b></p> <p><i>includes explanation and alphabetical list</i></p> <p>(PART E)</p>	<p>14. Needs for improvements in the explanation are</p> <p>6 None      2 Minor      0 Major</p> <hr/> <p>15. Presentation of individual entries is</p> <p>7 Good      1 Acceptable      0 Inadequate</p> <hr/> <p>16. The usefulness of the index is</p> <p>7 High      1 Medium      0 Low</p>	<p>See comments EB AA EB AB</p>
<p><b>TRANSLATIONS</b></p> <p><i>includes front matter, Overview, and explanations for Texts, Bibliography, and Index</i></p> <p>(PART F)</p>	<p>17. (Optional)</p> <p>a. The Spanish translations are</p> <p>1 Good      0 Acceptable      0 Inadequate</p> <hr/> <p>b. The French translations are</p> <p>2 Good      0 Acceptable      0 Inadequate</p>	<p>See comment FA AA</p>
<p><b>OVERALL COMPENDIUM</b></p> <p>(PART G)</p>	<p>18. I estimate that the usefulness of this compendium in my country will be</p> <p>4 High      1 Medium      0 Low</p>	<p>See comments GA AA      GA AC      GA AE GA AB      GA AD</p>

Comments on Compendium 1 by Eight Members of  
the Steering Committee, October 19, 1978

PART A. FRONT MATTER

- AB AA: "Add organization affiliation to subcommittee names in acknowledgement section"
- AB AB: "A schedule of published and planned publications should be given on the inside cover."
- AB AC: "Selected Text 6 in Contents Table should say University of California after ITTE."
- AB AD: "Project description implies that content concerns roads with less than 100 vpd. Should be changed."

PART B. OVERVIEW

- BA AA: "I believe the overview level is acceptable for most potential readers and users."
- BB AA: "The overview could use more details, examples and philosophy."
- BB AB: "Overview should give a fuller expansion of the contents and particular significance of each selected text."
- BB AC: "Overview should have more distinctive type for translations, say, heavier and larger size letters."
- BB AD: "Three languages per page is irritating and hampers the rapid reader in scanning the contents."

PART 3. SELECTED TEXTS

- CA AA: "All texts selected for Compendium 1 are good."
- CA AB: "All texts in Compendium 1 are most useful."
- CA AC: "No text in Compendium 1 is least useful."
- CA AD: "Many of the selected texts are quite ancient but there have been very few changes in the last few years in the technology covered by this compendium."
- CB AA: "Text 6 seems quite practical and more oriented to unpaved roads. Most other references appear to assume bituminous surfaced pavements."
- CB AB: "Text 10 is good for inspiration but probably would be little used in most countries. Most usefulness is for 30% to 50% slopes."
- CB AC: "Possibly too much information, leaving the user baffled as to what to do."

PART 4. BIBLIOGRAPHY

- DB AA: "Cost information on referenced documents would be helpful to recipients."

PART E INDEX

EB AA "I don't care personally for the index type."

EB AB "Readers will quickly find their own favorites among the few quoted texts. They will put in their own markers. A thumb index in the margin might be helpful."

PART F TRANSLATIONS

FA AA "French translations are good for the few samples I looked at."

PART G OVERALL COMPENDIUM

GA AA "Compendium 1 is an excellent job."

GA AB "Compendium 1 is a good job well done."

GA AC "Compendium 1 is very good. My office is ordering several copies."

GA AD "I think Compendium 1 covers the material adequately and is satisfactory as is."

GA AE "Compendium 1 will certainly be very useful to engineers in developing countries."

H REVIEW FORM

HB AA "An improvement to the review form would be to distinguish more clearly between form and content. It might be useful to ask directly, 'Whether the publication provides answers to the more important questions, and if not, what are the omissions and what relevant sources do you know about?'"

CORRESPONDENT LIST AS OF DECEMBER 31, 1978 INCLUDING ACCEPTANCES

CORRESPONDENTS								CORRESPONDENTS							
No.	LOCATION	LANG.	Repts	Revis	Acpt	Cont.		LOCATION	LANG.	Repts	Revis	Acpt	Cont.		
1.	AFGHANISTAN	Asia	4✓	0	0	0		36.	LIBERIA	Africa	4✓	0	2✓	2✓	
2.	PANGLADESH	Asia	2✓	0	2 <sup>d)</sup>	1✓		37.	MALAWI	Africa	2✓	0	1✓	1✓	
3.	BENIN	Africa	3✓	0	0	0		38.	MALI	Africa	2✓	0	1✓	1✓	
4.	BOZANIA	S.A.	3✓	1✓	2 <sup>d)</sup>	2✓		39.	MAURITANIA	Africa	2✓	0	0	0	
5.	BOTSWANA	Africa	2✓	0	1✓	1✓		40.	MEXICO	N.A.	3✓	1✓	2 <sup>d)</sup>	2✓	
6.	BRAZIL	S.A.	4✓	1✓	3 <sup>b)</sup>	3✓		41.	MOROCCO	Africa	3✓	0	2✓	1✓	
7.	BURUNDI	Africa	2✓	0	1✓	1✓		42.	NEPAL	Asia	4✓	0	2✓	2✓	
8.	CAMEROON	Africa	4✓	0	3 <sup>d)</sup>	3✓		43.	NICARAGUA	C.A.	4✓	0	3✓	3✓	
9.	CENTRAL AFRICAN EMPIRE	Africa	1✓	0	0	0		44.	NIGER	Africa	2✓	0	0	0	
10.	CHAD	Africa	2✓	0	0	0		45.	NIGERIA	Africa	3✓	0	1✓	1✓	
11.	CHILE	S.A.	4✓	0	3 <sup>b)</sup>	3✓		46.	PAKISTAN	Asia	4✓	0	1✓	1✓	
12.	COLUMBIA	S.A.	4✓	0	2✓	1✓		47.	PANAMA	C.A.	4✓	0	1✓	1✓	
13.	COSTA RICA	C.A.	4✓	0	2✓	2✓		48.	PAPUA, NEW GUINEA	Oceania	1 <sup>e)</sup>	0	0	0	
14.	CUBAN REPUBLIC	C.A.	3 <sup>d)</sup>	0	0	0		49.	PARAGUAY	S.A.	5✓	0	0	0	
15.	ECUADOR	S.A.	4✓	0	1✓	1✓		50.	PERU	S.A.	4✓	0	0	0	
16.	EGYPT	Africa	3✓	1✓	1 <sup>b)</sup>	0		51.	PHILIPPINES	Asia	1✓	1✓	2 <sup>d)</sup>	2✓	
17.	EL SALVADOR	C.A.	3✓	0	3✓	2✓		52.	PORTUGAL	Europe	3✓	0	2 <sup>d)</sup>	2✓	
18.	ETHIOPIA	Africa	3✓	0	2✓	2✓		53.	RWANDA	Africa	2✓	0	2✓	1✓	
19.	GABON	Africa	1✓	0	0	0		54.	SENEGAL	Africa	3✓	0	2 <sup>d)</sup>	2✓	
20.	THE GAMBIA	Africa	1✓	0	0	0		55.	SIERRA LEONE	Africa	4✓	0	3 <sup>d)</sup>	2 <sup>d)</sup>	
21.	GHANA	Africa	3✓	1✓	2✓	2✓		56.	SRI LANKA	Asia	4✓	0	2✓	2✓	
22.	GUATEMALA	C.A.	4✓	0	2✓	2✓		57.	SUDAN	Africa	4✓	0	1✓	1✓	
23.	GUINEA-BISSAU	Africa	1✓	0	1✓	1✓		58.	SWAZILAND	Africa	2✓	0	0	0	
24.	GUJANA	S.A.	5✓	0	3✓	2✓		59.	SYRIA	Asia	3✓	0	1✓	1✓	
25.	HAITI	C.A.	3✓	0	0	0		60.	TANZANIA	Africa	4✓	0	0	0	
26.	HONDURAS	C.A.	2✓	1✓	2✓	2✓		61.	THAILAND	Asia	4✓	1✓	2 <sup>d)</sup>	2✓	
27.	INDIA	Asia	3✓	1✓	4 <sup>b)</sup>	4✓		62.	TUNISIA	Africa	4✓	0	2✓	2✓	
28.	INDONESIA	Oceania	3✓	1✓	1✓	1✓		63.	TURKEY	Europe	1✓	0	1✓	1✓	
29.	IVORY COAST	Africa	2✓	1✓	2 <sup>d)</sup>	2✓		64.	UPPER VOLTA	Africa	2✓	0	0	0	
30.	JAMAICA	C.A.	3✓	0	2✓	2✓		65.	URUGUAY	S.A.	3✓	0	1✓	1✓	
31.	JORDAN	Asia	4✓	0	2✓	2✓		66.	YEMEN	Asia	0 <sup>d)</sup>	0	0	0	
32.	KENYA	Africa	4✓	1✓	2✓	2✓		67.	ZAIRE	Africa	2✓	0	2✓	2✓	
33.	KOREA	Asia	3✓	0	1✓	1✓									
34.	LEBANON	Asia	3✓	0	1✓	1✓									
35.	LESOTHO	Africa	3✓	0	2 <sup>d)</sup>	1✓									

TOTALS: 196✓    12✓    92✓    81✓  
 (% Acceptance)    (62%)    (66%)

a) one acceptance awaiting Gov approval    d) record complete change of government    g) handled thru AVO mission  
 b) includes revised correspondence    e) added 12/18/78  
 c) only MACTRA has not accepted    f) University accepted but no individual name

NATIONAL RESEARCH COUNCIL  
COMMISSION ON SOCIOTECHNICAL SYSTEMS

2101 Constitution Avenue Washington, D. C. 20418

TRANSPORTATION RESEARCH BOARD

December 1, 1978

Dear :

This is to invite you to participate in a student colloquium that will be held from 3:00PM to 5:00PM on Sunday afternoon, January 13, 1979, in the Senate Room of the Sheraton-Park Hotel, Washington, D.C. As you may know, that date is the Sunday preceding the 58th Annual Meeting of the Transportation Research Board (TRB) in the same hotel during January 15-19.

The colloquium is one feature of a TRB project on Transportation Technology Support for Developing Countries, sponsored by the U.S. Agency for International Development (AID). If you have access to our bimonthly publication Transportation Research News, you may have read one or more of the regular news articles about the project. The enclosed reprints of all articles published to date provide a comprehensive description of the project activities to date.

The colloquium will be comprised of project staff and students from countries that are currently receiving the project publications. Objectives for the colloquium are to inform the students about the project activities and to elicit the students' views on how the project work might be improved for the benefit of their respective countries.

To the extent that time permits, each student in attendance will have the opportunity to speak to the status of low-volume rural roads in his country, to describe associated needs for technical knowledge, and to express views on how these needs might be met.

**Page 2**  
**December 1, 1978**

**We regret that funds are not available to assist with your travel or subsistence expenses, but we hope it may be possible for you to attend the colloquium and perhaps other sessions of the TRB Annual Meeting.**

**Please check and return at your earliest convenience the enclosed post card so that we may know whether to expect your attendance.**

**Very truly yours,**

**Paul E. Irick**  
**Assistant Director for**  
**Special Technical Activities**

**Lloyd R. Crowther**  
**Project Engineer**

**Enclosures**

Check one

I will attend the TRB Student Colloquium on January 13, 1979.

I will not be able to attend the colloquium.

I am uncertain at the present time.

Signed \_\_\_\_\_

School \_\_\_\_\_

32-3066-001



**BUSINESS REPLY CARD**  
First Class Permit No. 5311, Washington, D.C.

Transportation Research Board  
National Academy of Sciences  
2101 Constitution Avenue, N.W.  
Washington, D.C. 20418



NATIONAL RESEARCH COUNCIL  
COMMISSION ON SOCIOTECHNICAL SYSTEMS

2101 Constitution Avenue Washington, D. C. 20418

TRANSPORTATION RESEARCH BOARD

January 2, 1979

NOTICE

To Invited Participants in the Student Colloquium  
on Transportation Technology Support for Developing Countries

Subject: Date Correction

Please correct date of student colloquium on invitation sent to you. The colloquium is to be held on Sunday, January 14, 1979, from 3:00PM to 5:00PM in the Senate Room of the Sheraton-Park Hotel in Washington, D.C. This is the day preceding the opening of the Transportation Research Board's Annual Meeting, January 15.

If you plan to attend and have not responded, please do so as soon as possible. In your response, please print your name and the name of your School.

NATIONAL RESEARCH COUNCIL  
COMMISSION ON SOCIOTECHNICAL SYSTEMS

2101 Constitution Avenue Washington, D. C. 20418

TRANSPORTATION RESEARCH BOARD

November 14, 1978

To the TTSDC Project  
Steering Committee

The time has come to consider the second group of topics for compendiums and syntheses. The selection of the subject matter for these publications will probably use up more than half of the time scheduled for our January Meeting.

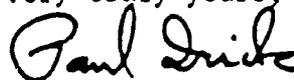
In order to expedite this year's selection procedure we request your nominations for topic subjects. For your convenience we have enclosed page 15 of Exhibit 2A, from last year's Topic Rating Evaluation. Topics that were selected for 1978 are preceded by asterisks. Please feel free to re-nominate any topic that was not a 1978 selection and to nominate any new topic.

You will also find enclosed a topic nomination form. You may wish to photocopy the form or to request more forms.

Please fill in all of the requested information. This includes a proposed title for the publication and a check mark to indicate whether you feel the topic should be treated by a compendium or a synthesis. Six lines are provided to describe the topic in enough detail to make clear what is meant by the topic title.

All nominations received in this office by December 11, 1978 will be summarized for distribution before the January Meeting. When we submit the summarized topic nominations we will also propose a selection procedure for your consideration at the January Meeting.

Very truly yours,



Paul E. Irick  
Assistant Director for  
Special Technical Activities



Lloyd R. Crowther  
Project Engineer

Enclosures

TOPIC RATING EVALUATION

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
II-K - Inexpensive soil modification with local materials	1	1	1	1	5	1	1	1	1	S
III-P - Maintenance operations for unpaved roads; drainage, blading, gravel loss, washboarding	2	2	11	3	9	2	2	2	3	S
II-I - Hydraulics, drainage, culverts, etc.	18	6	20	8	1	2	4	3	2	C
II-T - Inventory and development of materials resources	19	3	3	3	15	4	3	4	4	C
II-O - Labor intensive intermediate technology for construction and maintenance	2	4	1	2	33	5	5	5	6	S
II-G - Low-cost water crossings	9	7	3	5	20	6	7	7	7	TS
II-S - Geology and drainage considerations in highway locations	5	4	23	7	6	7	6	6	5	C
II-DD - Materials quality control system for LVR, simple and practical	22	7	7	6	23	8	8	8	9	C
II-V - Materials specifications	22	13	12	10	3	9	9	9	8	C
II-A - Geometric design for unpaved roads	14	9	16	10	9	10	10	10	10	C
III-K - Maintenance practices for roadside drainage	9	11	19	14	14	11	11	11	11	C
I-C - Inventories and evaluation of system condition and effectiveness	31	21	26	23	2	12	13	14	13	C
II-D - Properties of surface gravel	9	21	6	13	20	13	14	12	12	C
III-H - Pavement maintenance procedures and techniques	18	10	37	20	6	14	12	13	16	C
I-T - Earth construction	9	16	20	18	23	15	14	14	14	S
II-SG - Control of erosion	6	19	13	19	13	13	17	17	14	TS
II-L - Mechanical stabilization of soils without machines	6	14	3	9	42	17	16	16	17	C
I-A - Decision methodology for maintenance and upgrading (investment models)	22	21	24	22	15	17	19	19	19	C
I-D - Methods, costs, and materials for training & information transfer	2	26	30	15	9	19	23	22	19	C
II-Z - Thickness design in unpaved roads	27	14	13	14	36	20	19	18	19	TS
II-X - Paved and unpaved breakpoints; earth and gravel breakpoint	6	16	9	12	42	20	21	19	21	S
II-M - Low-cost methods for slope stabilization	18	27	16	24	15	20	25	24	21	C
I-B - Optimization of roadway location, project screening procedures	31	19	43	29	6	23	22	23	22	C
II-Q - Criteria and standards for road strengthening	18	11	34	20	30	24	18	21	23	C
III-D - Performance criteria for unpaved roads	22	16	15	16	30	15	14	15	13	C
I-G - Methodology for cost-benefit studies, including user costs	27	38	24	34	4	25	28	29	27	C
II-E - Standards for grades, curvature, and shoulders	27	27	39	32	9	27	27	27	25	C
I-R - Costs & benefits for all year, all weather roads vs. partial year operations	14	25	7	17	51	28	26	26	22	S
II-C - Design for one-way, one-lane roads and bridges	31	36	9	27	28	28	29	23	25	C
III-B - Dust control measures	37	34	27	34	23	30	32	31	30	C
I-P - Assessment of transport needs and socioeconomic impacts	37	34	38	37	15	31	33	33	33	C
II-B - Design for multipurpose roads (Pedestrians, vehicles, animals)	37	32	13	26	46	32	30	30	31	C
III-C - Bridge inspection and maintenance	37	33	45	32	15	33	33	33	33	C
II-F - Surface treatment specifications	37	41	39	41	9	34	39	39	32	C
I-H - Performance Standards	59	27	27	30	48	35	30	32	39	C
I-O - Contracting; qualifying, awarding, supervising	31	40	30	30	27	36	40	40	35	C
II-EE - Level cost design	31	30	34	36	31	37	38	37	33	C
II-FP - Decision criteria for selecting single lane or double lane	9	31	16	27	57	38	37	33	37	C
III-J - Criteria for paving aggregate roads	14	27	30	31	51	38	35	32	35	TS
III-A - System maintenance for investment protection; levels and priorities	47	46	43	33	46	40	36	39	40	C
I-Q - National and Local Road Financing Methods	22	41	45	42	36	41	41	43	46	C
I-K - Road/ridge condition inventories	-	46	42	45	33	42	44	44	41	C
I-L - Traffic census methods	47	48	56	50	20	42	45	45	41	C
II-U - Location of low-volume roads	44	38	54	43	42	44	41	41	43	C
II-P - Standards for heavy equipment and seasonal closures	31	41	30	40	56	44	42	42	44	C
II-J - Low-cost technology for brick and PCC pavements	44	46	27	46	40	46	47	46	44	C
I-J - Feeder road spacing for agricultural penetration	47	44	45	44	51	47	45	47	46	C
I-I - Analysis of rural roads network configurations	53	47	48	47	46	48	49	49	49	C
III-E - Warrants and standards for traffic signs	53	57	39	52	31	49	51	50	47	C
I-M - Same as A plus "selection standards"	53	45	56	47	54	50	49	48	49	C
I-E - Definition of administrative responsibility & liability	47	51	59	53	35	50	52	51	47	C
II-AA - Safety standards	59	54	50	54	40	52	52	53	52	C
II-EE - Turnout frequency	44	52	34	49	58	53	52	52	52	C
I-P - Information Systems, Technical and Management	37	53	59	55	42	54	55	55	55	C
II-N - Construction equipment for steep grades and slopes	47	59	48	57	30	55	57	50	53	C
I-S - Cost of Maintenance Construction versus design vehicles	37	48	53	51	60	56	54	54	57	C
III-G - Pollution measurements and control	53	54	63	59	36	57	56	57	55	C
II-D - Standards for bridge railings and grade crossings	59	60	60	62	29	58	59	58	55	C
II-R - Impact of vehicle suspensions on maintenance and operations costs	47	57	54	56	61	59	58	58	60	C
III-F - Road closure criteria	27	57	61	58	62	60	60	60	60	C
II-CC - Side resistance statistics for low volume roads	53	60	50	60	59	61	61	61	59	C
II-B - Measures for vehicle control and roadside recovery	59	63	62	63	55	62	63	62	62	C
II-P - Vehicle design for low volume roads	53	60	56	61	63	63	62	63	63	C

Transportation Research Board  
November 13, 1978

TTSDC Topic Nominations for Compendiums & Syntheses

Name \_\_\_\_\_ Date \_\_\_\_\_

Proposed Topic \_\_\_\_\_ Compendium \_\_\_\_\_ Synthesis \_\_\_\_\_

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Proposed Topic \_\_\_\_\_ Compendium \_\_\_\_\_ Synthesis \_\_\_\_\_

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Proposed Topic \_\_\_\_\_ Compendium \_\_\_\_\_ Synthesis \_\_\_\_\_

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NATIONAL RESEARCH COUNCIL  
COMMISSION ON SOCIOTECHNICAL SYSTEMS

2161 Constitution Avenue Washington, D. C. 20418

TRANSPORTATION RESEARCH BOARD

December 29, 1978

To the TTSPC  
Steering Committee

On behalf of Chairman Bergstrahl we hereby transmit agenda for our next meeting on January 18, 1979, beginning at 2:00 p.m. in the Holmes Room of the Sheraton-Park Hotel.

Agenda Item 2 includes reports on each of seven major aspects of the project. Exhibits for four of these reports will be prepared for handout at the meeting. No exhibits will be prepared for the remaining three reports. It is expected that the presentations and discussions of these reports will average ten minutes each.

The second half of the meeting will be devoted to the very important business of selecting synthesis and compendium topics for 1979-1980 production. It is now agreed between TRB and U.S.AID that the project will have produced a total of 18 compendiums and a total of five synthesis by the end of September, 1980. Since the initial selection provided eleven compendium and three synthesis topics, seven compendium topics and two synthesis topics remain to be selected. The basis for the selections is given in the enclosed Exhibit 3a. We trust you will find time to study this exhibit and come prepared to discuss and select topics

Please drop us a note or give us a call if you cannot attend the January 18 meeting. Thank you very much for your past and continued cooperation.

Very truly yours,

*Paul E. Irick*

Paul E. Irick  
Assistant Director for  
Special Technical Activities

*Lloyd R. Crowther*

Lloyd R. Crowther  
Project Engineer

Enclosure

TRANSPORTATION RESEARCH BOARD  
TRANSPORTATION TECHNOLOGY SUPPORT  
FOR DEVELOPING COUNTRIES

Fourth Meeting of the Steering Committee  
Thursday, January 18, 1979  
Holmes Room, Sheraton-Park Hotel  
Washington, D.C.

COMMITTEESTAFF

K. L. Bergstralh (Chairman)	R. Millard	P. E. Irick
G. A. Edmonds	W. J. Morin	L. R. Crowther
C. G. Harral	C. H. Oglesby	H. S. Schofer
W. G. Harrington	A. Pelzner	J. W. Guinnee
R. G. Hicks	G. W. Ring, III	T. L. Copas
W. R. Hudson	E. C. Sullivan	A. R. Sweeney
L. H. Irwin	P. H. Thormann	V. Rabinowitch (NRC)
W. C. LaBaugh, Jr.	W. G. Wilson	
M. B. Larsen	E. J. Yoder	
V. G. Mack	J. P. Zedalis	

AGENDA

- 2:00PM 1. Opening Remarks (Chairman Bergstralh)
- a. Welcome and Introductions
  - b. Discussion of Agenda
2. Status Reports and Discussion on Project Activities
- a. Correspondent Network (Exhibit 2a)
  - b. Compendium Production (Exhibit 2b)
  - c. Compendium Feedback (Exhibit 2c)
  - d. Synthesis Production (Exhibit 2d)
  - e. Report in First Colloquium
  - f. Field Visit Plans
  - g. International Workshop Plans
- 3:30PM 3. Selection of Compendium and Synthesis Topics for 1979-1980
- a. Explanation of Nominated Topics and Selection Procedures (Exhibit 3a)
  - b. Discussion
  - c. Topic Selection
- 5:00PM 4. Closing Business (10-15 minutes)
- a. Next Meeting
  - b. Other Business
  - c. Adjournment

BALLOT FOR TOPIC SELECTION (Round 2)

The accompanying ballot lists 38 topics that have been nominated for future syntheses and compendiums. Each topic is numbered, has a staff proposed title and two columns containing boxes for recording synthesis and compendium rankings.

Each member is requested to vote for two syntheses by entering 1 for first choice and 2 for second choice in the synthesis ranking column. Each member is requested to vote for seven compendiums by entering 1 for first choice, 2 for second choice, .... and 7 for seventh choice in the ranking column. The same topic may be ranked in both columns by any member who so chooses.

Votes will be tallied by awarding points in inverse order of preferences. Thus a first choice synthesis vote will receive 2 points and a second choice synthesis vote will receive 1 point. A first choice compendium vote will receive 7 points, a second choice compendium vote will receive 6 points, etc. If, however, any ballot contains less than two synthesis rankings or less than seven compendium rankings, the number of missing votes will be subtracted from the number of points that would normally be awarded to the remaining rankings. For example, if only five compendium preferences are indicated, two compendium votes are missing so the first compendium choice will be awarded only five points and the fifth compendium choice will be awarded one point.

Synthesis and compendium production for 1979-1980 will be scheduled for the two syntheses and for the seven compendiums that receive the highest number of points. If the same topic is selected as both a synthesis and a compendium, it will be treated as a synthesis. The rest of the compendiums, in order of points, will be advanced in rank. Staff discretion will be used for the order in which winning topics are implemented.

The official balloting will take place at the annual meeting after the steering committee has had an opportunity to further discuss the descriptions of the nominated topics.

BALLOT - TOPIC SELECTION, 2nd. ROUND

		Synthesis Rank 1-2	Compendium Rank 1-7
1. Roadway Structural Thickness Design	(1)		
2. Criteria for Paving Aggregate Roads	(2)		
3. Criteria and Standards for Road Strengthening	(3)		
4. Surface Treatment	(4)		
5. Seasonal or All Weather Roads	(5)		
6. Single or Two Lane Roads	(6)		
7. Decision Criteria for Selection of Road Type	(7)		
8. Construction by Contract or Force Account	(8)		
9. Construction Contracting Procedures	(9)		
10. Slope Stabilization	(10)		
11. Road Inventories, Preparation and Use	(11)		
12. Material Specifications	(12)		
13. Low-Volume Road Administration	(13)		
14. Bridge Inspection and Maintenance	(14)		
15. Simple Concrete Bridges	(15)		
16. Cost Estimating	(16)		
17. Tropical Soils	(17)		
18. Subsurface Drainage	(18)		
19. Training and Information Transfer	(19)		
20. Paving Maintenance Procedures and Techniques	(20)		
21. Road Maintenance Procedures	(21)		
22. Design of Unpaved Roads	(22)		
23. Geometric Standards for Paved Roads	(23)		
24. Labor Based Maintenance Methods	(24)		
25. Labor Based Construction Methods	(25)		
26. Chemical and Fabric Stabilization of Subgrades	(26)		
27. Hydrology in Road Engineering	(27)		
28. Computer Investment Model Usage	(28)		
29. Dust Control	(29)		
30. Traffic Census Methods	(30)		
31. Road-making Machinery	(31)		
32. Mechanical Stabilization of Soils Without Machines	(32)		
33. Performance Criteria for Unpaved Roads	(33)		
34. Optimization of Roadway Location	(34)		
35. Methodology for Cost-Benefit Studies	(35)		
36. System Maintenance for Investment Protection	(36)		
37. Design for Multipurpose Roads	(37)		
38. Low-cost Technology for Brick and PCC Pavements	(38)		

TOPIC NOMINATIONS AS SUBMITTED  
BY STEERING COMMITTEE MEMBERS

1. ROADWAY STRUCTURAL THICKNESS DESIGN

Proposed Topic Thickness Design in Unpaved Roads Compendium Synthesis

It is probable that the most prevalent surfacing materials for low volume roads are aggregate and gravel. Such surfacing materials are probably the single most costly element of a low volume road. A compendium that documents existing knowledge and procedures for designing the thickness of aggregate and gravel surfaced roads would be very useful.

Proposed Topic Thickness Design for Unpaved Roads Compendium Synthesis

*(MINIMUM/CHIEF CRITERIA)*  
Topic should discuss design considerations for low volume roads with very high axle loadings-Load distribution of macadam-type (large stone vs. small stone) and gravel roads - and traffic/load limitations for all three types.

Proposed Topic <sup>Pavement</sup> Thickness Design for Low Volume Roads Compendium  Synthesis

*Include both paved and unpaved roads*

II-Z Thickness Design for Unpaved Roads C

*Data on design criteria of unpaved roads*

II-Z Thickness Design in Unpaved Roads, Synthesis

2. CRITERIA FOR PAVING AGGREGATE ROADS

Proposed Topic II-Z & II-X (Renomination) Compendium X Synthesis

Combine "Thickness design in unpaved roads" and "Paved and unpaved breakpoint; earth and gravel breakpoint"

Proposed Topic PAVING ROADWAY SURFACES <sup>II - U</sup> Compendium \_\_\_\_\_ Synthesis X

As traffic frequencies increase, there is a corresponding loss of material from the surface of unsealed roadways (dust), greater tendency to washboard, and more <sup>damage from</sup> ruts during critical periods of soft conditions. Eventually, it becomes more economical to apply a surficial treatment on higher type surface. This synthesis should be aimed at developing decision criteria on when to pave.

Proposed Topic II-X Criteria for Change in Surface Type Compendium \_\_\_\_\_ Synthesis X

Criteria, data & methods to determine when and under what conditions there is need for (economically & service wise) change of surface type: from earth to gravel; from gravel to paved.

Proposed Topic Criteria for Paving Aggregate Roads Compendium \_\_\_\_\_ Synthesis X

This particular topic should include methods of evaluating gravel roads to determine whether or not they may be surfaced without deterioration of the road. Rapid means of detecting weak spots in gravel roads and in evaluating the gravel itself should be included.

II-X Paved and unpaved breakpoint; earth and gravel breakpoint—Synthesis;

### 3. CRITERIA AND STANDARDS FOR ROAD STRENGTHENING

**NOT AVAILABLE DOCUMENT**

Proposed Topic II-Q (Renomination) Compendium \_\_\_\_\_ Synthesis X

"Criteria and standards for road strengthening"

It may be possible to combine all three. (II-Z, II-X & II-Q) etc

Proposed Topic (II-Q) Criteria & standards for road strengthening Compendium \_\_\_\_\_ Synthesis \_\_\_\_\_

In many developing countries, money could be saved by strengthening pavements before they fall to pieces under traffic loads. There is now a technology for determining when and by how much roads need to be strengthened, based mainly on the use of Mr. Benkelman's marvelous machine and developed further for use in developing countries by England and France.

Proposed Topic Criteria & Standards for Road Strengthening Compendium \_\_\_\_\_ Synthesis X

This topic would largely be a redirection of syntheses already prepared by the Board on pavement evaluation and overlay design. It would be directed however to low volume roads and to minimum standards.

## 4. SURFACE TREATMENT

Proposed Topic Surface Treatment Compendium \_\_\_\_\_ Synthesis \_\_\_\_\_

This subject should be limited to priming, single surface treatment, and chip sealing in accordance with the adopted definition for the project.

Specifications and application methods in common usage should be described.

Proposed Topic Surface treatment (II-Y) Compendium ? Synthesis \_\_\_\_\_

I believe synonymous with seal coat II-BB in the vernacular. Developing countries are failing to profit from this cheap and effective method of maintaining asphalt pavements.

There is certainly a value in reviewing current specifications. It would be even better to determine why seal coats are not being used or are being used badly, and to suggest how matters might be improved.

Proposed Topic Surface treatments Compendium X Synthesis \_\_\_\_\_

A consolidation of topics II-Y, II-BB, II-CC and III-J, and possibly also II-Z (but I don't think so). It would bring together info on decisions whether to build seal coats, and how to build them properly. MS-13 of The Asphalt Institute is a good basic reference, as are 2 papers: RAPT<sub>2</sub> by McLeod.

I-Y Surface Treatment Specifications, (Combined with II-BB Seal Coat Design), Synthesis

II-Y Surface treatment specifications

## 5. SEASONAL OR ALL WEATHER ROADS

Proposed Topic Costs & Benefits for All Year, All Weather Roads vs Partial Year Operations Compendium Synthesis \_\_\_\_\_  
Whether a road is designed for all year or partial year operation is an

important economic decision. If a road could be closed to traffic during those periods of the year when the weather is bad (i.e., rainy season, monsoon, etc.)

then a less cost road could be designed and built. On the other hand, such

a road does not provide all year, all weather service. The methodologies used by others in making such analyses and comparisons should be documented.

Proposed Topic Costs-benefits of all-year vs. partial year <sup>operations</sup> Compendium      Synthesis x

~~This is topic 1-r of the old list. Lack of known references and potential economic payoff leads me to suggest treatment of this material as a synthesis. Again (as above) case studies should be emphasized, with some additional material covering needed economic analysis.~~

Proposed Topic (IR redefined) Decision criteria for Compendium x Synthesis       
all-rear, all weather operation vs partial-year operation.

Many factors underlie a rational decision on this topic, and these need to be defined and illustrated. Among the possibilities to be explored are strategies for relocating people now living along such roads so that they can be closed part or all the time.

Proposed Topic Costs & benefits for all year Compendium      Synthesis ✓  
all weather roads vs. partial year operations (by phone etc)

## 6. SINGLE OR TWO LANE ROADS

Proposed Topic Decision Criteria for Selecting Single Compendium Synthesis:  
Lane or Double Lane Roads

Planners and designers need to be knowledgeable in the criteria to be used in deciding whether a road should be single lane or double lane. This is an important decision that has short range and long range implications. A compendium documenting existing criteria and experience would be extremely useful.

Proposed Topic Decision Criteria for Selecting Single Lane Compendium x Synthesis       
or Double Lane Roads

A review of criteria presently in use on a world-wide basis relative to selecting the number of lanes on a low volume road should be considered.

II-FP Decision criteria for selecting single lone or double lane—Compendium;

## 7. DECISION CRITERIA FOR SELECTION OF ROAD TYPE

Proposed Topic Decision Criteria in the Compendium      Synthesis ?  
Selection of LV Road Type

(All weather vs. seasonal roads) (one lane vs. two lane)  
Topic should treat benefit/cost relationship, tradeoffs; social-economic conditions, safety and traffic considerations.

Proposed Topic Decision Criteria for Road Width and Surface Compendium X Synthesis \_\_\_\_\_

This topic combines II-x and II-ff of the old list. The compendium should summarize the state of the art in systematically choosing among single, 1 and 2 lane or double lane roads, on the one hand, and among earth, gravel or paved surface types, on the other. The compendium should emphasize what has been done in practice, as well as contain some "how it should be done" concepts, stressing economic and safety considerations.

Proposed Topic Limited Design Compendium ✓ Synthesis \_\_\_\_\_

Should include cost/benefits for all year-all weather roads vs partial year/season operation; design criteria for one-way, one-lane roads and bridges; multipurpose roads (pedestrians, animals and vehic); multipurpose roads (airplane landings); standards for heavy equipment and seasonal load limits (animal drawn as well as large heavy vehicles)

## 8. CONSTRUCTION BY CONTRACT OR FORCE ACCOUNT

Proposed Topic Contracting vs. Force Account Compendium \_\_\_\_\_ Synthesis /

The benefits and disadvantages of each plus the paper work necessary. A detailed discussion of the various parts of a contract and what they really mean.

Proposed Topic Contracting, qualifying, awarding, supervising <sup>or</sup> Compendium \_\_\_\_\_ Synthesis X

This synthesis would provide lists of caveats and alternative guidelines for successful utilization of outside contractors for low volume road work. One key point that should be addressed is the pros and cons of contracting for services, versus developing in-house capability.

## 9. CONSTRUCTION CONTRACTING PROCEDURES

Proposed Topic "CONTRACTING PROCEDURES" (I-O) Compendium X Synthesis \_\_\_\_\_

Although the theme of TTSDC Project is to help developing countries in becoming self-sufficient, especially by <sup>by</sup> hiring labor introduce methods, there are some areas where the <sup>economic and</sup> most efficient use of funds will be through hiring of contractors. For example, many local road agencies in the U.S. contract for snow removal to supplement existing agency manpower and equipment, etc.

## 10. SLOPE STABILIZATION

Proposed Topic STABILIZATION OF SLOPES Compendium  Synthesis

This compendium is distinct from "Erosion Control" in that it will deal with prevention and correction of landslides, rockfalls, mudflows etc. Low cost retaining walls, control of water, and reduction of slopes to natural grades are included, as well as other economical methods identified in the literature. The <sup>scope of this</sup> topic should be distinct from the proposed distribution on "Landslides".

Proposed Topic Low Cost Methods for Slope Stabilization Compendium  Synthesis

This topic should be a little bit more inclusive than as indicated by the title in that it should also consider design considerations. The topic should also include cost trade-offs of slope stability and landslides as opposed to building flat slopes in mountainous terrain.

Proposed Topic Low-Cost Methods for Slope Stabilization Compendium  Synthesis

II-M Low-cost methods for slope stabilization—Compendium;

## 11. ROAD INVENTORIES, PREPARATION AND USE

Proposed Topic SYSTEM INVENTORY OF CONDITION AND EFFECTIVENESS " (I-C) Compendium  Synthesis

An inventory of the existing roads is a prerequisite to planning for both maintenance and capital improvement budgeting. The compendium should provide examples of how to establish an inventory, items to be included, and procedures for periodic updating.

Proposed Topic Road & Bridge Condition Inventories Compendium  Synthesis

This title would be similar to those already indicated in this list but would deal further with priority evaluation and setting of maintenance standards and criteria. It should deal largely with "where" should the work be done and how the information can be kept up on a yearly basis.

Proposed Topic ~~Inventories and monitoring of system condition~~ ~~Compendium~~  ~~Compendium~~  ~~Synthesis~~  ~~Synthesis~~

This is topic I-c of the old list. In my view the compendium should give guidance on setting up information systems for stimulating maintenance activities and for recognizing problem situations requiring reconstruction (due to high accident rates, repeated washouts, and so forth). Perhaps half the compendium would be "how to do it" material, the rest might be case study examples.

Proposed Topic Criteria and procedures for dev: ~~and maintaining inventories of low-volume road facilities and their use.~~ ~~Compendium~~  ~~Compendium~~  ~~Synthesis~~  ~~Synthesis~~

Rational decisions for low-volume road planning, construction and maintenance require information on what is there now, the resources needed to construct new facilities, reconstruct present ones, and maintain them. Data also are needed which can be determined. benefits that will result from these expenditures.

I-C Inventories and Evaluation of Systems Condition and Effectiveness, Synthesis

12. MATERIAL SPECIFICATIONS

Proposed Topic Material Specifications (Renomination of II-V) ~~Compendium~~  ~~Compendium~~  ~~Synthesis~~  ~~Synthesis~~

What I believe this should cover is the specifications that should be applied for materials for unpaved roads, for roads that will be paved in the future and paved roads for both materials found in tropical regions as well as those found in temperate regions.

Proposed Topic Material Specifications ~~Compendium~~  ~~Compendium~~  ~~Synthesis~~  ~~Synthesis~~

This would deal with minimum specifications for quality of paving materials and point out differences between the standard AASHTO specifications and those that might be used in various climatic bands and for low volume road construction.

Proposed Topic Materials Specifications for Low Volume Roads ~~Compendium~~  ~~Compendium~~  ~~Synthesis~~  ~~Synthesis~~

Development of specifications for construction materials for low volume roads - not high volume roads

13. LOW-VOLUME ROAD ADMINISTRATION \_\_\_\_\_

Proposed Topic Effective Organization for Administering Compendium \_\_\_\_\_ Synt  
Low-volume roads

Administering a low-volume road system calls for professional organization free to make rational decisions on how to expend the very limited resources that are available. What does this require in terms of legislation so that priorities can be set, and resources allocated and accounted for effectively.

<sup>NEW</sup>  
Proposed Topic \_\_\_\_\_ Compendium \_\_\_\_\_ Synthesis x

"ESTABLISHING A HIGHWAY ORGANIZATION"  
This should be for those countries with  
very road responsibilities but little or no organization. The guide  
will as a guide to improve existing organizations in other countries.  
The guide should show appropriate delegation of responsibilities, budgeting  
needs, utilization of manpower and equipment on annual basis, relating  
manpower and equipment to needs, etc.

14. BRIDGE INSPECTION AND MAINTENANCE \_\_\_\_\_

Proposed Topic Bridge inspection & maintenance (III-C) Compendium \_\_\_\_\_ Synthesis \_\_\_\_\_

A topical problem in many developing countries. What methods are available for assessing the load-carrying capacity and the maintenance needs for old bridges? What are appropriate treatments for corrosion in different environments? What simple methods are available for strengthening bridge decks and for arresting erosion of abutments and river channels?

Proposed Topic Bridge Inspection & Maintenance Compendium \_\_\_\_\_ Synthesis \_\_\_\_\_  
Procedures and information on "how to" - inspect  
and maintain bridges

15. SIMPLE CONCRETE BRIDGES \_\_\_\_\_

Proposed Topic The practical design & construction of simple concrete bridges Compendium \_\_\_\_\_ Synthesis 1

A step by step approach to the design and construction of concrete bridges giving simple explanations of the formulae used and the practical reasons for each step during the construction phase.

16. COST ESTIMATING

Proposed Topic Cost-estimating Compendium / Synthesis

How to determine the unit costs and/or kilometer costs for L.V. Roads where there is not previous experience of bid prices. Use technique that contractors use (i.e. balancing equipment and then determining in detail the transportation costs, P.O.L. costs, spare parts, labor, etc. to determine unit costs and proper time frame)

17. TROPICAL SOILS

Proposed Topic Tropical Soils Compendium / Synthesis

A comprehensive look at tropical soils, their special characteristics, identification, and examples of soils problems and solutions in various tropical countries.

18. SUBSURFACE DRAINAGE

Proposed Topic Subsurface Drainage Compendium X Synthesis

This is a spin-off from the topics given in the proposal produced this year. There was too much information on other aspects of drainage to permit an adequate treatment of subsurface drainage in Compendium III.

19. TRAINING AND INFORMATION TRANSFER

Proposed Topic LD-Training & Information Compendium        Synthesis ✓

Methods, processes, media of training and information transfer

## 20. PAVEMENT MAINTENANCE PROCEDURES AND TECHNIQUES

Proposed Topic Pavement Maintenance Procedures Compendium  Synthesis   
+ Techniques

(i) Types of distress on paved roads (including surface treatments)

(ii) Repair of paved roads - techniques

III-H Pavement Maintenance Procedures and Techniques, Compendium

## 21. ROAD MAINTENANCE PROCEDURES

## 22. DESIGN OF UNPAVED ROADS

Proposed Topic Design of Unpaved Roads Compendium  Synthesis

Should include info on thickness, mechanical stabilization (labor intensive)  
criteria, grade, alignment, curvature, shoulder, measures for passing  
(ie earth-grade treatment; paved/unpaved breakpoint)

## 23. GEOMETRIC STANDARDS FOR PAVED ROADS

Proposed Topic Geometric standards for paved roads (NEW) Compendium  Synthesis

An extension of II-E. Developing countries are always keen to use the design standards  
used as targets in the US. Often the design speeds, width of pavement and shoulder, etc.,

selected are inappropriately large in relation to the supposed benefits in road safety

and reduced journey costs. Mr. Crowther's comments in his Mexico report are very apt.

What can be done?

## 24. LABOR BASED MAINTENANCE METHODS

Proposed Topic Labor Intensive Maintenance methods Compendium X Synthesis    

(if not covered adequately in the Synthesis on subject)

## 25. LABOR BASED CONSTRUCTION METHODS

Proposed Topic Labor Intensive Construction Methods Compendium X Synthesis    

(if not covered adequately in the Synthesis on subject)

## 26. CHEMICAL AND FAB

Proposed Topic Stabilization of Soft Ground  
Utilizing Chemicals/Fabrics Compendium     Synthesis X

Inquiries from LDCs concerning use of chemicals for stabilization for construction and maintenance is especially increasing. Fabrics are new and although good publications (e.g., Report No. FHWA-TS-78-205) now exist a comprehensive state-of-the-art report for LDCs would be useful.

## 27. HYDROLOGY IN ROAD ENGINEERING

Proposed Topic Hydrology in road engineering (NEW) Compendium     Synthesis X

In most developing countries, hydrological data is very sparse, and there are problems in establishing appropriate sizes for bridge openings and the location and size of culverts. There is now a lot of information available on the characteristics of tropical storms and on run-off characteristics which is not generally known—again from English and French sources. Such a review also affects urban drainage systems and the design of water impounding works.

## 28. COMPUTER INVESTMENT MODEL USAGE

Proposed Topic Decision Methodology for Maintenance and X Compendium X <sup>OR</sup> Synthesis  
Upgrading of LV Roads

Investigation of existing investment models such as MIT's Road Investment Analysis Model (RIAM) and TRRL's Model (refinement of RIAM).

## 29. DUST CONTROL

Proposed Topic DUST CONTROL III-B Compendium X Synthesis

When loss of road material from traffic and wind begins to be a problem, but before a weatherproof surface can be justified and funded, control of dust may be feasible for reducing material loss, increasing safety and reducing environmental concerns. This compendium should identify the conditions which justify control of dust, types of appropriate materials, and probable effective life as related to local conditions.

## 30. TRAFFIC CENSUS METHODS

Proposed Topic Traffic Census Methods (I-L) Compendium X Synthesis

This could be part of the previous nominee, but it is of sufficient importance and of potential length that it probably should be treated separately. About 3/4 of the material might deal with the mechanics of how to set up and manage a traffic surveillance program on low volume roads. The rest of the material would be documented case studies emphasizing benefits that different countries feel they obtain from systematic traffic surveillance.

## 31. ROAD-MAKING MACHINERY

Proposed Topic Road-making machinery (NEW) Compendium ? Synthesis

Road building in developing countries is being adversely affected by the increasing sophistication of road-making machinery. Large international contractors can maintain and operate such machinery but how, for instance, does a District Engineer with a simple workshop and crudely trained operators cope with road maintenance machinery? I don't know the answer. But it might be profitable to discuss it.

32. MECHANICAL STABILIZATION OF SOILS WITHOUT MACHINES

Proposed Topic Mechanical Stabilization of Soils Without Machines Compendium X Synth \_\_\_\_\_

II-L Mechanical stabilization of soils without machines—Compendium;

33. PERFORMANCE CRITERIA FOR UNPAVED ROADS

III-D Performance Criteria for Unpaved Roads, Synthesis

III-D Performance criteria for unpaved roads—Compendium;

34. OPTIMIZATION OF ROADWAY LOCATION

Proposed Topic Optimization of roadway location, project screening methods (by phone & RE) Compendium ✓ Synthesis \_\_\_\_\_

I-B Optimization of Roadway Locations, Project Screening Procedures, Compendium

35. METHODOLOGY FOR COST-BENEFIT STUDIES

Proposed Topic Methodology for cost-benefit studies, including user costs (by phone & RE) Compendium ✓ Synthesis \_\_\_\_\_

36. SYSTEM MAINTENANCE FOR INVESTMENT PROTECTION

III-A System maintenance for investment protection; levels and priorities—Compendium.

### 37. DESIGN FOR MULTIPURPOSE ROADS

II-B Design for multipurpose roads (pedestrians, vehicles, animals)—Compendium;

### 38. LOW-COST TECHNOLOGY FOR BRICK AND PCC PAVEMENTS

II-J Low-cost technology for brick and PCC pavements—Compendium;

TOPIC RATING EVALUATION

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
II-K - Inexpensive soil modification with local materials	1	1	1	1	5	1	1	1	1	1	S
III-P - Maintenance operations for unpaved roads; drainage, blading, gravel loss, washboarding	2	2	11	3	9	2	2	2	3	3	R
II-I - Hydraulics, drainage, culverts, etc.	18	6	20	8	1	2	4	3	2	2	C
II-T - Inventory and development of materials resources	19	3	3	3	15	4	3	4	4	4	C
II-O - Labor intensive intermediate technology for construction and maintenance	2	4	1	2	33	5	5	5	6	5	S
II-G - Low-cost water crossings	9	7	3	5	20	6	7	7	7	7	TTE
II-S - Geology and drainage considerations in highway locations	5	4	23	7	6	7	6	6	5	5	C
II-DD - Materials quality control system for LVR, simple and practical	22	7	7	6	23	8	8	8	9	9	C
II-V - Materials specifications	22	13	12	10	3	9	9	9	8	8	C
II-A - Geometric design for unpaved roads	14	9	16	10	9	10	10	10	10	10	C
III-K - Maintenance practices for roadside drainage	9	11	19	14	14	11	11	11	11	11	C
I-C - Inventories and evaluation of system condition and effectiveness	31	21	26	23	2	12	13	14	13	13	C
II-W - Properties of surface gravel	9	21	6	13	26	13	14	12	12	12	C
III-H - Pavement maintenance procedures and techniques	18	10	37	20	6	14	12	13	16	16	C
I-S - Stage construction	9	16	20	18	23	15	15	14	14	14	S
II-CC - Control of erosion	6	19	10	19	10	15	17	17	14	14	CIE
II-L - Mechanical stabilization of soils without machines	6	14	3	9	42	17	16	16	17	17	C
I-A - Decision methodology for maintenance and upgrading (investment models)	22	21	24	22	15	17	19	19	19	19	C
I-S - Methods, media, and materials for training & information transfer	2	24	30	25	9	19	23	22	19	19	C
II-Z - Thickness design in unpaved roads	27	14	13	14	36	20	19	18	19	19	TTE
II-X - Paved and unpaved breakpoint; earth and gravel breakpoint	6	16	9	12	42	20	21	19	21	21	S
II-M - Low-cost methods for slope stabilization	18	27	16	24	15	20	23	24	22	22	C
I-S - Optimization of roadway location, project screening procedures	31	19	43	29	6	23	22	23	22	22	C
II-Q - Criteria and standards for road strengthening	18	11	34	20	30	24	15	21	23	23	C
III-D - Performance criteria for unpaved roads	22	16	15	16	30	25	24	25	25	25	C
I-G - Methodology for cost-benefit studies, including user costs	27	38	24	34	4	25	23	29	27	27	C
II-E - Standards for grades, curvature, and shoulders	27	27	39	32	9	27	27	27	25	25	C
I-R - Costs & benefits for all year, all weather roads vs. partial year operations	14	25	7	17	51	28	20	20	29	29	S
II-C - Design for one-way, one-lane roads and bridges	31	36	9	27	28	28	29	23	25	25	C
III-H - Dust control measures	37	34	27	34	23	30	32	31	30	30	C
I-W - Assessment of transport needs and socioeconomic impacts	37	34	33	37	15	31	33	33	33	33	C
II-B - Design for multipurpose roads (Pedestrians, vehicles, animals)	37	32	13	26	46	32	30	30	31	31	C
III-C - Bridge inspection and maintenance	37	33	45	39	15	33	33	31	33	33	C
II-Y - Surface treatment specifications	37	41	39	41	9	34	39	39	32	32	C
I-H - Performance Standards	59	27	27	30	48	35	30	32	39	39	C
I-O - Contracting; qualifying, awarding, supervising	31	40	30	38	27	16	40	40	25	25	C
II-SS - Seal coat design	31	30	34	30	31	37	33	37	33	33	C
II-TP - Decision criteria for selecting single lane or double lane	9	31	16	27	57	39	37	33	37	37	C
III-J - Criteria for paving aggregate roads	14	27	30	31	1	38	25	22	26	26	C
III-A - System maintenance for investment protection; levels and priorities	47	20	43	33	40	40	30	30	40	40	C
I-Q - National and Local Road Financing Methods	22	41	45	42	36	41	41	43	46	46	C
I-K - Road/bridge condition inventories	-	46	42	45	37	42	45	44	41	41	C
I-L - Traffic census methods	47	48	50	50	20	42	45	45	42	42	C
II-U - Location of low-volume roads	44	38	54	43	42	44	41	41	43	43	C
II-F - Standards for heavy equipment and seasonal closures	31	41	30	40	26	24	22	22	24	24	C
II-J - Low-cost technology for brick and PCC pavements	44	46	27	46	40	40	47	40	44	44	C
I-J - Feeder road spacing for agricultural penetration	47	44	45	44	51	47	45	47	46	46	C
I-I - Analysis of rural roads network configurations	53	47	48	47	46	48	48	48	48	48	C
III-Z - Warrants and standards for traffic signs	53	57	39	52	31	49	51	50	47	47	C
I-N - Same as A plus "selection standards"	53	45	56	47	54	50	49	48	49	49	C
I-E - Indirecting of administrative responsibility & liability	47	51	59	43	35	50	50	50	50	50	C
II-AA - Safety standards	59	54	50	54	40	52	52	53	52	52	C
II-EE - Turnout frequency	44	52	34	49	58	53	52	52	53	53	C
I-P - Information Systems, Technical and Management	37	53	58	55	42	44	45	45	45	45	C
II-M - Construction equipment for steep grades and slopes	47	59	48	57	30	55	57	50	53	53	C
I-S - Cost of Maintenance Construction versus design vehicles	37	48	53	51	60	56	54	54	57	57	C
III-G - Postness measurements and control	53	54	63	59	36	57	56	57	55	55	C
II-D - Standards for bridge railings and grade crossings	59	60	60	62	28	58	59	58	55	55	C
II-R - Impact of vehicle suspensions on maintenance and operations costs	47	57	54	56	61	59	59	59	60	60	C
III-I - Seal closure criteria	27	57	60	59	60	60	60	60	60	60	C
II-CC - Skid resistance statistics for low volume roads	53	60	50	60	59	61	61	61	59	59	C
II-B - Measures for vehicle control and roadside recovery	59	63	62	63	55	62	63	62	62	62	C
II-P - Vehicle design for low volume roads	53	60	56	61	63	63	62	63	63	63	C

# Transportation Technology Support Project Develops Compendiums on Drainage and Water Crossings for Low-Volume Roads

Major products of the TRB project on Transportation Technology Support for Developing Countries are compendiums that contain previously published information on topics crucial to the planning, design, construction, and maintenance of low-volume roads. Guidelines and procedures for compendium development were given in *Transportation Research News*, No. 76, May-June 1978. In the July-August 1978 issue of *Transportation Research News*, specific contents were listed for Compendium 1 and Compendium 2, both of which have now been published and distributed to project correspondents in developing countries. This article gives a preview of the respective contents of the next three compendiums that are scheduled for publication. Although final selections had not been made when this article was written, it is expected that Compendiums 3, 4, and 5 will be essentially as described below.

## Compendium 3: Small Drainage Structures

This compendium presents information about general

drainage design and includes specific information on the design and installation of culverts. Included are requirements for proper roadway drainage, solutions to problems of road drainage, identification of major components of the total drainage system, and specific treatment of small drainage structures. The following texts are being considered for inclusion in Compendium 3.

1. Chapter 5, "Road Drainage," of *Low-Cost Roads: Design, Construction, and Maintenance*, published by UNESCO in 1971.
2. *Guidelines for the Hydraulic Design of Culverts*, published by AASHTO in 1975.
3. *Drainage Studies From Aerial Surveys*, published in *Photogrammetric Engineering*, September 1961.
4. *Hydraulic Charts for the Selection of Highway Culverts*, published by FHWA in December 1965 as Hydraulic Engineering Circular No. 5.
5. *Debris-Control Structures*, reprinted by FHWA in March 1971 as Hydraulic Engineering Circular No. 9.
6. Excerpts from *Practical Guidance for Design of*

Cable suspension footbridge, Caranavi, Bolivia.



*Lined Channel Expansions at Culvert Outlets*, published by the Hydraulics Laboratory of the U.S. Army Corps of Engineers Waterways Experiment Station in October 1974.

7. *Corrugated Metal Pipe: Structural Design Criteria and Recommended Installation Practice*, published by FHWA in 1966 and revised in 1970.

8. *Reinforced Concrete Pipe Culverts: Criteria for Structural Design and Installation*, published by the Bureau of Public Roads in 1963.

#### **Compendium 4: Low-Cost Water Crossings**

This compendium deals with water crossings for low-volume roads and stresses economic aspects of the crossings. The selected texts include information on fords, dips, submersible bridges, timber bridges, Bailey bridges, Uniflote bridges, and floating bridges. Tentative selections are as follows.

1. *Handbook of Methods and Procedure for Low-Cost Service Roads*, Chapter 2, published by the Texas Highway Department in 1946.

2. *Use of Gambions for Low Water Crossings on Primitive or Secondary Forest Roads*, published in U.S. Forest Service Engineering Technical Information Service Field Notes, May-June 1973.

3. *Design and Construction of Low Water Dips*, published in Texas Highway Department Construction and Maintenance Bulletin No. 6, May 1951.

4. *Causeways or Submersible Bridges*, published in *Journal of the Indian Roads Congress*, April 1952.

5. Excerpts from FM5-34: *Engineer Field Data*, published by the U.S. Army in 1976.

6. *The Bailey and Uniflote Handbook*, published by Acrow Press in 1974.

7. Chapter 7, *Potential Cost Savings in the Design of Water Crossings*, of *Opportunities for Cost Reduction in the Design of Transport Facilities for Developing Regions*, prepared in 1970 for the U.S. Department of Transportation by the Institute of Transportation and Traffic Engineering, University of California, Berkeley.

8. Excerpt from Section 17, *Bridges, Viaducts, and Ramps*, of *Handbook of Highway Engineering*, published by Van Nostrand Reinhold Company in 1975.

#### **Compendium 5: Roadside Drainage**

This compendium concerns the design, construction, and maintenance of roadside drainage channels. It includes information on channel types and purposes, estimation of storm runoff from small drainage areas, the hydraulics of drainage channels, and design procedures based on hydraulic principles. Tentative choices for the compendium are as follows.

1. *Design of Roadside Drainage Channels*, Hydraulic Design Series No. 4, reprinted by FHWA in 1973.

2. Excerpts from *Design Charts for Open-Channel*



*Dual stone box culvert, Bolivia.*

*Flow*, Hydraulic Design Series No. 3, reprinted by FHWA in 1977.

3. Selected tables from *Handbook of Hydraulics*, published by McGraw-Hill in 1954.

4. Excerpts from *Grading Illustrated*, Publication TP549 of the Technical Publications Department of Aveling-Benford Ltd., England, 1974.

5. Excerpts from *Road Maintenance Practice*, published by the National Association of Australian State Road Authorities, 1975.

#### **Synthesis Development**

Initial meetings for defining the scope and content of three syntheses were held in September and early October. Participants in each meeting were members of the Steering Committee subcommittee for the synthesis, the consultant who has been employed to develop the synthesis, and project staff. It is expected that initial drafts of all three syntheses will be completed by February 1979 and that the syntheses will be published in late spring 1979.

Synthesis topics and consultants are (a) Maintenance of Unpaved Roads, Donald Park; (b) Labor-Intensive Intermediate Technology for Construction and Maintenance, Janet Rossow; and (c) Stage Construction, Ernest Davidson.

#### **Correspondent Network**

By mid-October, acceptances had been received from more than one-third of the individuals who have been invited to serve as developing-country correspondents for the project. Forty-eight countries in all parts of the world were represented by these initial responses. The acceptance letters reflect much enthusiasm for the project and a sincere desire to assist in its success.