

E U R O P E A N U N I O N - T A C I S

**Technical Assistance to the Southern Republics of the CIS
and Georgia - TRACECA**

TRADE AND TRANSPORT SECTORS

IMPLEMENTATION OF PAVEMENT MANAGEMENT SYSTEMS

PROJECT NO.: TELREG 9305

PROGRESS REPORT NO. 2

FOR THE PROJECT PERIOD JULY TO SEPTEMBER 1996

OCTOBER 1996

**KOCKS CONSULT GMBH
Consulting Engineers
Koblenz / Germany**

in association with

**TECNECON, Economic
and Transport Consultants
London / U. K.**

**PHØNIX
Pavement Consultants
Vejen / Denmark**

REPORT COVER PAGES

Project Title	:	Traceca Project - Implementation of Pavement Management Systems
Project Number	:	TELREG 9305
Country	:	The Southern Republics of the CIS and Georgia

	Local Operator	EC Consultant
--	----------------	---------------

Name	:	Concern UZAVTOYUL	KOCKS CONSULT GMBH Consulting Engineers
Address	:	68 'a' Pushkin Street 700000 Tashkent UZBEKISTAN	Stegemannstraße 32 - 38 56068 Koblenz GERMANY
Tel. number	:	(3712) 682526 and 361595	xx49 - 261 - 1302-0 (operat.) xx49 - 261 - 1302-143 (direct)
Fax number	:	(3712) 682711	xx49 - 261 - 1302 - 152
Telex number	:	--	862807
Contact person	:	Vohid Normatovich Azamov, State Road Inspector	Werner P. Weiler
Signatures	:		

Name	:	Ministry of Transport (MoT), State Institute of Road Design KYRGYZDORTRANSPROJEKT (K)	KOCKS CONSULT GMBH Consulting Engineers
Address	:	42 Isanov Street (MoT) Bishkek 720079 KYRGYZSTAN	
Tel. number	:	(3312) 216674 (MoT) or 444187 (K)	
Fax number	:	(3312) 213667 (MoT) or 444193 (K)	
Telex number	:	--	
Contact person	:	Akunov Kuwan Akunowitsch, Head of Roads Department (MoT) Levan M. Alibegashvili, Director (K)	
Signatures	:		

COVER PAGE 2

Local Operator	EC Consultant
----------------	---------------

Name	: Ministry of Transport & Communications, Department of Highways (DoH), Joint-stock company KAZDORNII (K)	KOCKS CONSULT GMBH Consulting Engineers
Address	: 9 Emtsov Street Almaty, 480061 KAZAKHSTAN	
Tel. number	: (3272) 324769 (DoH) or 400447 (K)	
Fax number	: (3272) 324449 (DoH) or 400819 (K)	
Telex number	: --	
Contact person	: Amangeldy N. Yelgonov, Dept. Director (DoH) Oleg A. Krasikov, Deputy Director (K)	
Signatures	:	

Name	: Ministry of Economy, Department of Transport and Communication (DoT&C) State Concern AZERAVTOYOL (A)	KOCKS CONSULT GMBH Consulting Engineers
Address	: 72 A, Hadjihekov Street 370010 Baku AZERBAIJAN	
Tel. number	: (8922) 933556 (A)	
Fax number	: (8922) 930045 (A)	
Telex number	: 142272 YOL	
Contact person	: Iqram M. Sadykhov, Head of Department of Transport and Communication (DoT&C) Shahin H. Hasanov, Vice President and Project Manager for TRACECA-PMS (A)	
Signatures	:	

COVER PAGE 3

Local Operator	EC Consultant
----------------	---------------

Name	: Concern TUKMENAUTOELLARI	KOCKS CONSULT GMBH Consulting Engineers
Address	: 744000 Ashgabat TURKMENISTAN	
Tel. number	: (3632) 245487	
Fax number	: (3632) 255379 and 511678	
Telex number	: --	
Contact person	: Vladimir Volodin, Vice President	
Signatures	:	

Name	: State Concern of Roads, SAKAVTOGSA	KOCKS CONSULT GMBH Consulting Engineers
Address	: 29a Gagarin Street 380060 Tbilisi GEORGIA	
Tel. number	: (99532) 376604	
Fax number	: (99532) 376458	
Telex number	: 212189	
Contact person	: Taniel Mdivnishvili, Deputy Chairman	
Signatures	:	

COVER PAGE 4

Local Operator	EC Consultant
----------------	---------------

Name	: Armenian Road Directorate (ARD)	KOCKS CONSULT GMBH Consulting Engineers
Address	: Yerevan ARMENIA	
Tel. number	: (3742) 586601	
Fax number	: (3742) 151876 or 151830	
Telex number	: 212189	
Contact person	: Nikolai Elarian, Director (ARD)	
Signatures	:	

Name	: Ministry of Transport and Roads TAJIKGIPROTRANSSTROY	KOCKS CONSULT GMBH Consulting Engineers
Address	: Ayni Street 14 734042 Dushanbe TADJIKISTAN	
Tel. number	: (3772) 215380 or 212020	
Fax number	: (3772) 212003	
Telex number	:	
Contact person	: Mirzoev Timur Dodojenovia	
Signatures	:	

COVER PAGE 5

Date of report : 02.October 1996

Reporting period : 01.07.1996 to 30.09.1996

Author of report: U. Willems, Project Team Leader (Kocks Consult GmbH)

EC M & E Team			
	(name)	(signature)	(date)
EC Delegation			
	(name)	(signature)	(date)
TACIS Bureau (Task Manager)			
	(name)	(signature)	(date)

TABLE OF CONTENTS

	<u>Page</u>
<u>1. PROJECT SYNOPSIS</u>	2
<u>2. SUMMARY OF PROJECT PROGRESS SINCE START</u>	4
2.1 Commencement of Services	4
2.2 Activities and Project Progress	4
<u>3. SUMMARY OF PROJECT PLANNING FOR THE REMAINDER OF THE PROJECT</u>	5
<u>4. PROJECT PROGRESS IN REPORTING PERIOD</u>	6
4.1 Introduction	6
4.2 Mobilisation	9
4.3 Activities during the Reporting Period July to September 1996	13
4.4 Implementation of the PMS/BMS	
4.5 Tables	20
<u>5. PROJECT PLANNING FOR NEXT REPORTING PERIOD</u>	32
5.1 Planned Activities	32
5.2 Tables	32
 <u>APPENDIX</u>	
1: CV Zimmermann, CV Poitzsch	
2: Road Condition Data, Pavement Data	
3: Axle Load Survey	
4: Seminars	

1. PROJECT SYNOPSIS

Project Title	:	Traceca Project - Implementation of Pavement Management Systems
Project Number	:	TELREG 9305
Country	:	The Southern Republics of the CIS and Georgia

Project Objective[s] : The project aims to introduce Regional roads maintenance authorities to the latest Western pavement management techniques. It is to promote a reduction in road maintenance backlogs. The focus of this project will be on international transit routes with the specific objectives under the three main headings.

Technical

- Establishment of database
 - road and bridge conditions
 - traffic intensity/axle-loadings
 - forecasts of future traffic
- Formulation, testing and refining technical pavement maintenance strategies. Establishment of Pavement Management Systems in each Regional state
- Implementation of local authorities in Western road and bridge maintenance techniques and specifications as well as road safety standards
- Review of roads design standards

Economic

Expand the resources available for road maintenance by:

- demonstrating the real costs of road utilisation, by users who at present pay little, and thus reinforce arguments for recurrent collections of revenue by charges (taxes) on users
- Description and economic analysis of road maintenance projects and programmes susceptible to attract IFI interest.

Transfer of Technology

Local personnel will be involved in all project tasks and trained in the techniques introduced with the aim to continue the activities after completion of the project.

- Planned outputs :
- Mobilization and commencement of services
 - Study of existing reports and available road and bridge data
 - Preparation/procurement of equipment
 - Introduction of equipment to counterparts of the recipient States
 - Field works and data collection for establishment of data base including on-the-job training of counterparts
 - Provision of hardware and software for the Pavement Management System (PMS) and Bridge Management System (BMS) and training
 - Seminars about bitumen bound products, road safety and road design aspects.
 - Cost and financing of road usage
 - Study tour to Western Europe

- Project activities since start :
- Project Preparation
 - Co-ordinating meetings with TACIS CU, Brussels
 - Mobilization of Consultant's staff and equipment
 - Commencement meetings with the TACIS CU and the recipient institutions in all 8 recipient states.
 - Arrangement of logistics (accommodation, office, garage for equipment, transport)
 - Seminars for introduction of the equipment
 - Provision of computers and programme system for PMS and BMS
 - Collection and evaluation of road surface and road pavement condition data together with counterparts (on-the-job training)
 - Collection of transport economic, road use cost data through accessing existing data bases and additional surveys under the current project (traffic counts, axle load survey)
 - Collection and evaluation of bridge condition data together with counterparts (on-the-job training)
 - Seminars on bitumen bound materials and related technology: discussion about existing situation, necessary improvements (e. g. pavement design) and proposal for new technologies (e. g. recycling)
 - Seminars on road safety and road design aspects (road geometry, signalisation, winter maintenance).
 - Comprehensive PMS and BMS programme training of counterparts including data entry, preparation of data base and data evaluation .

Project starting date: 20 December 1995, delayed to 12 March 1996 due to winter conditions

Project duration : 12 months

2. SUMMARY OF PROJECT PROGRESS SINCE START

2.1 Commencement of Services

Under the terms of the Contract, the Consultant shall commence the implementation of the tasks within two weeks from the effective date of the contract. The effective date of the Contract was 7 December 1995 and the planned starting date for the provision of the consultancy services was 20 December 1995.

As described in the Consultant's Inception Report of February 1996 the commencement of the consultancy services was delayed to middle of March 1996 due to the cold winter weather in the southern CIS states. However, preparations for the start of the services were carried out by personnel planning, contacting the recipient states' project representatives, obtaining visa, preparation/procurement of equipment etc.

On 13 March 1996 the Consultant's staff arrived in the project area, set up the logistics and commenced with the activities of the field works for road condition survey, pavement deflection measurement and pavement survey which are key activities to be done prior to evaluation, data entry, assessments etc. In order to catch up the lost time a second/additional group of specialists commenced in the Caucasus area middle of April 1996. Up to date the services have commenced or were already completed in 7 of the total 8 recipient states under the Project.

2.2 Activities and Project Progress

All activities were carried out together with the counterparts of the respective recipient states as on-the-job training in addition to seminars and class room training:

Field Works and Data Collection

- seminars for introduction of the equipment
- translations of equipment description into Russian
- preparation of forms and guidelines for the data collection
- collection and evaluation of road surface and road pavement condition data using the equipment provided under the Project
- collection and evaluation of bridge condition data

Computers and PMS/BMS Programme Systems

- one set of computer equipment each was delivered to 7 recipient states
- optimisation (HDM IV modules, Windows '95) and translation into Russian of the PMS/BMS programme system was completed
- seminars for introduction of PMS/BMS followed by comprehensive training

Transport Economics and Road Use Cost Aspects

- available reports were studied
- collection of traffic data and data for estimation of vehicle operating cost
- axle load surveys
- estimation of traffic growth
- collection of information on expenditure on road maintenance and rehabilitation

Seminars

- bitumen bound products
- road safety aspects
- road design standards

3. SUMMARY OF PROJECT PLANNING FOR THE REMAINDER OF THE PROJECT

During the present reporting period consultancy services were provided in Uzbekistan, Kyrgyzstan, Azerbaijan, Kazakhstan, Georgia and Armenia.

The activities for the next reporting period will include:

- (i) Commencement of the services in Tadjikistan and Turkmenistan.
- (ii) Field works and data collection for roads, highways and bridges will be continued and completed respectively.
- (iii) As far as not delivered during the present reporting period all eight recipient countries will receive the computer equipment as well as the PMS/BMS programme system.
- (iv) Training of counterparts in the use of equipment, for collection of road condition data, for collection of bridge condition data and the preparation of data base will continue as well as the use of the PMS/BMS programme system.
- (v) Data collection, estimation of traffic growth and calculation of vehicle operating cost for the transport economics and road use cost will be continued and completed respectively.
- (vi) Seminars will be continued for bitumen bound materials and related technology as well as for road safety and road design aspects.
- (vii) A study tour to Western Europe will be organized comprising seminars, site visits and demonstrations, such as
 - road and bridge maintenance system
 - road and bridge maintenance units (including winter maintenance)
 - bituminous bound materials production plants
 - road surface recycling methods and operation
 - road safety aspects.

4. PROJECT PROGRESS IN REPORTING PERIOD

4.1 Introduction

As described above the commencement of the services for the Project was delayed due to unfavourable weather conditions in the project area and the field works commenced in middle of March 1996. As reported previously in middle of April 1996 the Consultant commenced with a second/additional group of specialists in the Caucasus area in order to catch up the lost time, which successfully has been achieved during the present progress period.

The Consultant's activities from July to September 1996 can be summarised as follows:

(i) Commencement meetings with the recipient institutions in

- Turkmenistan
- Tadjikistan

(ii) Commencement of activities in

- Georgia
- Armenia

(iii) Continuation of activities in

- Azerbaijan
- Uzbekistan

(iv) Completion of activities in

- Kyrgyzstan
- Kazakhstan

During the present progress period the respective administration of the recipient states made available the required number of counterpart staff for each of the activities of the Project and a big and highly interested audience participated in the various seminars and training courses held up to date.

The kind assistance of the Tacis Co-ordinating Units in all administrative and technical questions is gratefully noted.

4.2 Mobilisation

Consultant's Personnel

The Consultant's organisation with two teams, one in the Centralasian and the other in the Caucasus area, proved to be advantageous for all project needs and the decision was made to continue with this set-up even after lost time has been caught up. Meetings of the two team leaders were arranged to harmonise project approaches and to synchronise project activities.

During the course of the Project when requirements of the services were further detailed in meetings with the recipient institutions the Consultant felt obliged to modify his staff. Two positions of the professional staff were changed to provide the most effective transfer of technology:

- the Asphalt Specialist Mr. H. U. Zimmermann became available to the Project and will contribute his detailed knowledge about materials, pavement designs, pavement placing techniques and modern recycling technology. Mr. Zimmermann is very familiar with the materials and quality problems of asphalt works in the project area from his 1 year assignment for the supervision of works for the Tashkent Airport rehabilitation. His curriculum vitae is attached in APPENDIX 1
- the Bridge Engineer is Mr. P. Poitzsch who has several years of experience in the analysis of bridge condition as well as computerised Bridge Management Systems (BMS) and he was responsible for the preparation of the BMS programme system for the Project. From his education and experience in the former GDR Mr. Poitzsch has a wide knowledge of structural systems designs similar to those used in the recipient states. His curriculum vitae is also attached in APPENDIX 1

The Consultant' s personnel in the project area during the progress period included:

Project Manager	Werner P. Weiler	KOCKS CONSULT GMBH
Highway Engineer & Team Leader 1 (Central Asia)	Ulrich Willems	KOCKS CONSULT GMBH
Highway Engineer & Team Leader 2 (Caucasus area)	Carsten Griese	KOCKS CONSULT GMBH
Transport Economist & Traffic Engineer	Robert A. Smith	TECNECON
FWD/PMS Engineer	Kimo Karini	Phønix PPC
PMS/FWD Engineer	Klaus V. Nielsen	Phønix PPC
Asphalt Specialist	Hans U. Zimmermann	KOCKS CONSULT GMBH
Bridge/BMS Engineer	Peter Poitzsch	KOCKS CONSULT GMBH
Structural Engineer	Andris Melecis	KOCKS CONSULT GMBH
Engineering Co-ordinator 1	Johann Rogalski	KOCKS CONSULT GMBH
Engineering Co-ordinator 2	Johannes Ruof	KOCKS CONSULT GMBH

The above mentioned detailing of project services requires also a modification of some of the originally proposed time allocation:

- Due to the special interest of the recipient institutions in the topics of the 'Seminar on Bitumen Bound Products' the assignment of the asphalt specialist had to be extended. The seminar carried out to be of great importance and in direct relation to the implementation of the Pavement Management System. According to the requirements of the recipient institutes topics like laboratory testing and visits of asphalt plants were added.
- Furthermore the preparation for the activities and the commencement meetings respectively in the 8 recipient states carried out to be more time consuming than originally planned.

However, the described modifications can be covered by other more relaxed positions of the Contract and the Consultant will ensure that financial aspects are covered by the available budget.

Local Experts

Local Experts are provided by the recipient institutions and paid for by the Project. For the particular purpose of this project the local expertise is available in the recipient institutions only, with perhaps very few exceptions. The participation of the institution's experts is considered more beneficial to the Project, because the expertise will be available to the PMS/BMS Unit also in the future.

Equipment for Field Works

(i) Road Condition Survey

The one set of equipment provided for the Project during the previous progress period including

- Falling Weight Deflectometer (FWD)
- axle weight bridge incl. dummings pads for weighing up to triple axle trucks
- Bump Integrator Unit
- MERLIN
- longitudinal sensor (tripmeter)
- various small measuring devices and office equipment

was transported to the next recipient state when activities were completed in the one before.

(ii) Bridge Condition Survey

The Consultant used his own measurement/testing equipment for the inspection of bridges including

- concrete test hammer
- rebar locator
- laser distance meter
- crack measuring lens.

Transportation

Locally acquired transport was used to commute between and in the states, vehicles for the field works and data collection respectively were rented through local contracts from the respective recipient department.

4.3 Activities during the Reporting Period July to September 1996

Field Works and Data Collection

The field works and data collection for the project roads continued as detailed in the previous Progress Report No. 1 including

- seminars for introduction of the equipment attended by the counterparts as well as interested participants of other departments and institutes
- preparation of translations into Russian equipment description.
- preparation of forms and guidelines for the data collection
- collection and evaluation of road surface and road pavement condition data

Samples of the data records and evaluation, road surface condition data of a part of the M 39 in Kazakhstan and road surface & road pavement data for 30 km pilot section in Georgia, are attached in APPENDIX 2

Bridge Inspections were carried out for evaluation of possible deficiencies and determination of the bridge condition class. A respective form sheet for inspection and guidelines were developed for collection of data and information to be entered into the Bridge Management System (BMS). The form sheet and the guidelines are enclosed in APPENDIX 2. The equipment used for bridge testing as well as the above form and guidelines were demonstrated on sample bridges, after which the counterparts did own testing and condition evaluation.

Computers and PMS/BMS Programme Systems

The project includes the supply of hardware and software for the Pavement Management System (PMS) and the Bridge Management System (BMS).

Up to the end of the present reporting period computer equipment was delivered and handed over to the recipient institutes in 6 TRACECA states (Uzbekistan, Kyrgyzstan, Kazakhstan, Azerbaijan, Georgia, Armenia). For two states, Tadjikistan and Turkmenistan, the equipment is ready for shipment.

Computer equipment, one set for each of the recipient states, comprises:

- DELL computer (Pentium 133) with colour monitor
- HP Laser Jet 5P printer
- Power source unit (UPS 7001)
- Windows 95 Russian version installed on computer plus installation disks and manuals

The programme system supplied under the TRACECA Project, the Phønix - RoSy - PMS/BMS, was adapted to Windows '95 and received components of HDM IV (economy/VOCs) in order to provide the latest state of art and has been installed in 3 states (Uzbekistan, Kyrgyzstan, Kazakhstan) during the reporting period, followed by a comprehensive training.

The PMS/BMS training programme has covered the following main subjects and has been carried out in 7 steps:

1. Seminar for introduction to RoSy PMS/BMS
2. Input of previously collected data from the pilot road sections (PMS) and the sample bridges (BMS) respectively
3. Set-up parameters for calculations (PMS)
4. Economical calculation of the data (also discussions about theory and philosophy in the PMS programme)
5. Input of data from existing road data base as well as bridge passport
6. Economical calculation of existing data (PMS)
7. Discussion about possibility of using the existing data in PMS, and future use of PMS.

Under Step 3 a wide range of models can be set-up. A standard set-up was made for the 8 TRACECA states and it was discussed and demonstrated how to modify the models individually to each state using individual data (traffic development, road deterioration etc.).

Transport Economics and Road Use Cost Aspects

Fieldwork and data collection was carried out in Azerbaijan, Georgia and Armenia. Some of the data collected has already been analysed and other data are in the process of being analysed including:

- Classified volume count data
- Historical traffic count data, where available
- International truck origin-destination survey data
- Axle load survey data
- Input data for the analysis of vehicle operating costs
- Information on trends in expenditure on road maintenance and rehabilitation
- Road network conditions and road use costs

In addition to the various reports on the study countries produced by the World Bank, EBRD, other international financing agencies and project-specific consultants' reports listed in the previous Progress Report, the following additional documents were studied:

- World Bank staff appraisal reports of transport projects in Armenia and Georgia;
- Asian Development Bank "Economic Review and Bank Operations" in Kazakhstan and
- Asian Development Bank "Economic Review and Bank Operations" in the Kyrgyz Republic.

The results of classified volume counts undertaken by the highway authorities and consultants on the main inter state and intra state roads in Azerbaijan, Armenia and Georgia in recent years have been collected and analysed. In addition, classified volume counts were undertaken at three locations in Georgia where recent traffic count data is somewhat deficient in coverage by comparison with the other TRACECA countries.

As mentioned in the first Progress Report, the classification of truck types used in the classified volume counts undertaken in the study countries is based on gross vehicle weight rather than axle configuration. An exception is Armenia where the axle based configuration used in the 1994 TACIS sponsored "Armenia Highway Survey" has subsequently been adopted. In the other countries, however, the classification of truck

traffic by vehicle type has been changed to an axle configuration basis consistent with the requirements of the HDM-III Vehicle Operating Cost Sub Model.

Further details of vehicle registrations by vehicle type have been collected. In Armenia, however the traffic police refused to release this information without clearance from the Ministry of Internal Affairs and this clearance was not forthcoming. The Consultant will, therefore, have to make an estimate of the size of the Armenian vehicle fleet. In Azerbaijan and Georgia the vehicle classification system used in vehicle registration statistics collected by the traffic police is similar to the classification systems encountered in other TRACECA states.

Axle load surveys of two days duration have been carried out and the results analysed. The locations for these surveys are as follows:

- Azerbaijan - at Km 37 south of Baku on the M3 linking Baku and Astara (at the border with Iran).
- Georgia - at Km 25 west of Tbilisi on the S1 road linking Tbilisi, Kutaisi, Senaki and the west.
- Armenia - on the M4 road south of Yerevan.

These surveys and the accompanying origin-destination surveys of international truck movements were of two days duration. The results of the two axle load surveys in Azerbaijan and Georgia which have been analysed confirm the findings of the earlier surveys in Uzbekistan, Kyrgyzstan and Kazakhstan. These are that traffic loading is significantly lower than is usual in the west or indeed in many developing countries and that international trucks moving on the TRACECA countries' road networks are significantly heavier than the trucks manufactured within the C.I.S. The results of the statistical analysis of the axle load surveys undertaken so far are set out in APPENDIX 3 to this report.

To estimate the traffic growth all available records from historical traffic counts have been analysed. These show that in Azerbaijan and Georgia traffic levels have declined significantly during the 1990s reflecting the sharp contraction in economic activity during the past five years. In Armenia, however, the beginnings of a recovery of economic activity appear to have been accompanied by a very sharp increase in traffic levels since 1994.

The Consultant investigated the possibility to make use of the traffic forecasts to be produced by the TRACECA Regional Traffic Forecasting Project. However, discussions with the W.S. Atkins International, one of the two consulting firms undertaking that project, and reference to its Inception Report revealed that these forecasts will not be available until well into 1997 which is too late for use to the TRACECA PMS project. Traffic forecasts had to be produced from within the resources of the PMS project making use of available information on macro economic growth prospects and traffic forecasts produced in a number of other recent consultancy studies listed in the First Progress Report.

A copy of all the traffic data collected and analysed during the course of this project has been made available to the consultants undertaking the TRACECA Regional Traffic Forecasting Project. The same information has also been supplied to the TRACECA Project via Mr. M. Sims of Tractebel Development.

Most recent estimates of vehicle operating costs in the TRACECA countries have been based on the use of the HDM-III Vehicle Operating Cost Sub Model (VOCM). The same model is being used in this project and the field work has mainly involved updating earlier vehicle operating cost input data.

Estimates of vehicle operating costs for six categories of representative vehicles have been produced including:

- Passenger car
- Utility vehicle (minibus, pickup etc.)
- Large bus
- 2 axle truck
- 3 axle truck
- Truck with more than 3 axles

The output from the HDM-III VOCM is in the form of an equation for each representative vehicle type linking operating cost with pavement roughness. These equations for each vehicle type and country have been entered into the Pavement Management System models applicable for each country.

In the first Progress Report it was stated that the available data on accidents would not be adequate for the quantification of accident costs without a level of research and analysis beyond the scope of this project. Subsequent fieldwork in Trans-Caucasia has confirmed this initial finding. Only Armenia of the countries visited so far has made a start on tackling the road safety problem by commissioning a full scale road safety study.

Information has continued to be collected on the recent levels of expenditure on highway maintenance and rehabilitation. Recent work in Azerbaijan, Armenia and Georgia confirmed the overall pattern of inadequate expenditure on road maintenance and rehabilitation in the TRACECA countries. There has been a sharp drop in such expenditure in real terms since the early 1990s and in no case does it even approach required levels.

The Study of the Cost and Financing of Road Usage is due to be completed eight months after the commencement of work which was in mid-March 1996 and the report is accordingly expected to be delivered in November 1996.

As part of the road use costs and financing study information has been collected on the characteristics and utilisation of the inter-state and more important intra-state road networks in each country. The aim has been to provide a breakdown of road networks in each country by pavement type, design standard (and by deduction pavement strength) and traffic range.

Seminars

Besides the aforementioned seminars for the introduction of equipment seminars were held and site visits were carried out concerning

- Bitumen bound products comprising the main topics
 - Materials: existing situation of bitumen, aggregates, asphalt production and necessary improvements
 - Pavement designs: existing design standards for asphalt concrete (AC) pavements, European and North American standards/design methods
 - Quality control, soils & material laboratory requirements
 - Rehabilitation/reinforcement/strengthening of AC pavements, pavement placing techniques and equipment
 - Recycling techniques and equipment for AC

- road safety and road design aspects comprising the main topics
 - road geometry: horizontal and vertical alignment, cross section (road/lane width), junctions/intersections
 - signalisation: traffic signs, road marking
 - winter maintenance
 - public promotion/information programmes
 - enforcement of regulations

Details of the topics of the above seminars are attached in APPENDIX 4.

Details of the evaluation of relevant standards in the recipient states and comparison with European and other western standards is presently under preparation and will be compiled in a report which is due in November 1996.

4.4 Implementation of the BMS/PMS

The previous Progress Report No. 1 included information about existing organisational/administrative structures and ongoing re-organization for the implementation of PMS/BMS in some of the recipient states.

During the present progress period more detailed information has been collected for six of the recipient states and is listed in the tables below.

Region: Central Asia State 1, Uzbekistan			
	REQUIREMENT	ASSESSMENT	RECOMMENDATION
1. Institutional Issues	<p>1.1 Decision by administration for implementation of PMS/BMS</p> <p>1.2 Definition of responsible institute/department</p> <p>1.3 Organizational structure for data collection and maintenance of centralized data base</p> <p>1.4 Provision of budget for PMS/BMS unit</p>	<p>1.1 Confirmed by the Cabinet of Ministers</p> <p>1.2 Formation of a PMS/BMS unit in Concern UZAVTOYUL</p> <p>1.3 Since independence decentralized system, presently reorganization ongoing to the requirements of PMS/BMS</p> <p>1.4 Budget available and as in 1.3 above presently reorganized</p>	<p>1.1 adequate</p> <p>1.2 adequate</p> <p>1.3 Not yet adequate, technical assistance for institutional strengthening recommended</p> <p>1.4 as 1.3 above</p>
2. Staff Issues	<p>2.1 Provision of qualified staff</p> <p>2.2 Training in data collection, data evaluation and PMS/BMS programme system</p> <p>2.3 Personnel Development</p>	<p>2.1 PMS/BMS unit with 3 to 5 Engineers</p> <p>2.2 Training in all aspects has been provided under the present TRACECA project</p> <p>2.3 In the course of the above mentioned reorganization the oblasts (districts) are also included.</p>	<p>2.1 adequate</p> <p>2.2 Further training for improvement of data collection system + maintaining of data base, optimization of programme system and preparation of maintenance recommendation is recommended.</p> <p>2.3 The training described under 2.2 above should be extended to train a group of specialists to become trainer for training other specialists in the oblasts.</p>
3. Technical Issues	<p>3.1 Provision of office accommodation for PMS/BMS unit</p> <p>3.2 Hardware and software for PMS/BMS</p> <p>3.3 Transport for field works and data collection</p> <p>3.4 Equipment for road and pavement condition survey</p>	<p>3.1 In the building of UZAVTOYUL</p> <p>3.2 Has been provided under the present TRACECA project</p> <p>3.3 Few vehicles available, but ongoing re-organization</p> <p>3.4 No equipment available (only 1 set of equipment under the present TRACECA project for all 8 recipient states)</p>	<p>3.1 adequate</p> <p>3.2 adequate</p> <p>3.3 Not yet adequate, but improvements expected during ongoing re-organization, further monitoring recommended</p> <p>3.4 Provision of equipment after completion of re-organization (item 1.3 and 1.4 above)</p>

Region: Central Asia State 2, Kyrgyzstan			
	REQUIREMENT	ASSESSMENT	RECOMMENDATION
1. Institutional Issues	<p>1.1 Decision by administration for implementation of PMS/BMS</p> <p>1.2 Definition of responsible institute/department</p> <p>1.3 Organizational structure for data collection and maintenance of centralized data base</p> <p>1.4 Provision of budget for PMS/BMS unit</p>	<p>1.1 Confirmed by the Ministry of Transport (MoT)</p> <p>1.2 Formation of a PMS/BMS unit in the State Institute KYRGYZDOR-TRANSPROJEKT</p> <p>1.3 Presently re-organization ongoing to requirements of PMS/BMS. In middle of October meeting of the institutes/departments with MoT for proposal of further improvements</p> <p>1.4 Little budget available only and as in 1.3 above further improvements planned</p>	<p>1.1 adequate</p> <p>1.2 adequate</p> <p>1.3 Not yet adequate, technical assistance for institutional strengthening strongly recommended</p> <p>1.4 as 1.3 above</p>
2. Staff Issues	<p>2.1 Provision of qualified staff</p> <p>2.2 Training in data collection, data evaluation and PMS/BMS programme system</p>	<p>2.1 PMS/BMS unit with 3 to 5 Engineers</p> <p>2.2 Training in all aspects has been provided under the present TRACECA project</p>	<p>2.1 adequate</p> <p>2.2 Training for setting up of data, collection system + maintaining of data base, optimization of programme system and preparation of maintenance recommendation is recommended</p> <p>2.3 Further monitoring recommended</p>
3. Technical Issues	<p>2.3 Personnel Development</p> <p>3.1 Provision of office accommodation for PMS/BMS unit</p> <p>3.2 Hardware and software for PMS/BMS</p> <p>3.3 Transport for field works and data collection</p> <p>3.4 Equipment for road and pavement condition survey</p>	<p>2.3 No information available</p> <p>3.1 KYRGYZDORTRANSPROJEKT is moving into a different building where office room(s) are reserved for the TRACECA PMS/BMS unit</p> <p>3.2 Has been provided under the present TRACECA project</p> <p>3.3 No vehicles available</p> <p>3.4 No equipment available (only 1 set of equipment under the present TRACECA project for all 8 recipient states)</p>	<p>3.1 adequate</p> <p>3.2 adequate</p> <p>3.3 Financing recommended when recommendation 3.4 below will be implemented</p> <p>3.4 Provision of equipment after completion of re-organization (item 1.3 and 1.4 above)</p>

Region: Central Asia State 3, Kazakhstan			
	REQUIREMENT	ASSESSMENT	RECOMMENDATION
1. Institutional Issues	<p>1.1 Decision by administration for implementation of PMS/BMS</p> <p>1.2 Definition of responsible institute/department</p> <p>1.3 Organizational structure for data collection and maintenance of centralized data base</p> <p>1.4 Provision of budget for PMS/BMS unit</p>	<p>1.1 Confirmed by the Ministry of Transport & Communications</p> <p>1.2 Existing unit of KAZDORNII for PMS/BMS</p> <p>1.3 Existing centralized data base and data collection system</p> <p>1.4 Budget available</p>	<p>1.1 adequate</p> <p>1.2 adequate</p> <p>1.3 adequate</p> <p>1.4 adequate</p>
2. Staff Issues	<p>2.1 Provision of qualified staff</p> <p>2.2 Training in data collection, data evaluation and PMS/BMS programme system</p> <p>2.3 Personnel Development</p>	<p>2.1 PMS/BMS unit with 3 to 5 Engineers</p> <p>2.2 Training in all aspects has been provided under the present TRACECA project</p> <p>2.3 Centralized system functioning</p>	<p>2.1 adequate</p> <p>2.2 Further training for optimization of programme system and preparation of maintenance recommendation is recommended.</p> <p>2.3 adequate</p>
3. Technical Issues	<p>3.1 Provision of office accommodation for PMS/BMS unit</p> <p>3.2 Hardware and software for PMS/BMS</p> <p>3.3 Transport for field works and data collection</p> <p>3.4 Equipment for road and pavement condition survey</p>	<p>3.1 In the building of KAZDORNII</p> <p>3.2 Has been provided under the present TRACECA project</p> <p>3.3 Vehicles available</p> <p>3.4 Equipment available but not all suitable for PMS/BMS requirement and also partly at end of service life (only 1 set of equipment under the present TRACECA project for all 8 recipient states)</p>	<p>3.1 adequate</p> <p>3.2 adequate</p> <p>3.3 adequate</p> <p>3.4 Provision of equipment as soon as possible recommended</p>

Region: Caucasus State 1, Azerbaijan			
	REQUIREMENT	ASSESSMENT	RECOMMENDATION
1. Institutional Issues	<p>1.1 Decision by administration for implementation of PMS/BMS</p> <p>1.2 Definition of responsible institute/department</p> <p>1.3 Organizational structure for data collection and maintenance of centralized data base</p> <p>1.4 Provision of budget for PMS/BMS unit</p>	<p>1.1 Confirmed by the Ministry of Economy and AZERAVTOYOL</p> <p>1.2 Formation of a PMS/BMS unit in state Concern AZERAVTOYUL</p> <p>1.3 Centralized data collection system is existing. No indications yet for improvement of organization to the requirements of PMS/BMS</p> <p>1.4 Budget for traffic counting available, but not for road surveys</p>	<p>1.1 adequate</p> <p>1.2 adequate</p> <p>1.3 Not yet adequate technical assistance for institutional strengthening recommended</p> <p>1.4 as 1.3 above</p>
2. Staff Issues	<p>2.1 Provision of qualified staff</p> <p>2.2 Training in data collection, data evaluation and PMS/BMS programme system</p> <p>2.3 Personnel Development</p>	<p>2.1 PMS/BMS unit with 3 to 5 Engineers</p> <p>2.2 Training in all aspects will be provided under the present TRACECA project in October/November 1996</p> <p>2.3 Evaluation after training in October/November 1996</p>	<p>2.1 adequate</p> <p>2.2 Recommendation will be made after training in October/November 1996.</p> <p>2.3 as 2.2 above</p>
3. Technical Issues	<p>3.1 Provision of office accommodation for PMS/BMS unit</p> <p>3.2 Hardware and software for PMS/BMS</p> <p>3.3 Transport for field works and data collection</p> <p>3.4 Equipment for road and pavement condition survey</p>	<p>3.1 In the building of AZERAVTOYUL</p> <p>3.2 Has been provided under the present TRACECA project</p> <p>3.3 Few vehicles available, but mostly at the end of service life.</p> <p>3.4 No equipment available (only 1 set of equipment under the present TRACECA project for all 8 recipient states)</p>	<p>3.1 adequate</p> <p>3.2 adequate</p> <p>3.3 Financing recommended when implemented</p> <p>3.4 Provision of equipment after completion of re-organization</p>

Region: Caucasus State 2, Georgia			
	REQUIREMENT	ASSESSMENT	RECOMMENDATION
1. Institutional Issues	1.1 Decision by administration for implementation of PMS/BMS	1.1 Confirmed by the Ministry of Economy and SAKAVTOGSA	1.1 adequate
	1.2 Definition of responsible institute/department	1.2 Formation of a PMS/BMS unit in the State Concern of Roads SAKAVTOGSA	1.2 adequate
	1.3 Organizational structure for data collection and maintenance of centralized data base	1.3 Existing data base was lost and organizational structure suffered from war. Some activities for re-organization on-going	1.3 Not yet adequate, technical assistance for institutional strengthening strongly recommended
	1.4 Provision of budget for PMS/BMS unit	1.4 Little budget available only, improvements planned	1.4 as 1.3 above
2. Staff Issues	2.1 Provision of qualified staff	2.1 PMS/BMS unit with 3 to 5 Engineers	2.1 adequate
	2.2 Training in data collection, data evaluation and PMS/BMS programme system	2.2 Training in all aspects has been/will be provided under the present TRACECA project	2.2 Training for setting up of data, collection system + maintaining of data base, optimization of programme system and preparation of maintenance recommendation is recommended
3. Technical Issues	2.3 Personnel Development	2.3 No information available	2.3 Further monitoring recommended
	3.1 Provision of office accommodation for PMS/BMS unit	3.1 SAKAVTOGSA is moving into a different building where office room(s) are reserved for the TRACECA PMS/BMS unit	3.1 adequate
	3.2 Hardware and software for PMS/BMS	3.2 Has been provided under the present TRACECA project	3.2 adequate
	3.3 Transport for field works and data collection	3.3 No vehicles available	3.3 Financing recommended when recommendation 3.4 below will be implemented
	3.4 Equipment for road and pavement condition survey	3.4 No equipment available (only 1 set of equipment under the present TRACECA project for all 8 recipient states)	3.4 Provision of equipment after completion of re-organization

Region: Caucasus State 3, Armenia			
	REQUIREMENT	ASSESSMENT	RECOMMENDATION
1. Institutional Issues	<p>1.1 Decision by administration for implementation of PMS/BMS</p> <p>1.2 Definition of responsible institute/department</p> <p>1.3 Organizational structure for data collection and maintenance of centralized data base</p> <p>1.4 Provision of budget for PMS/BMS unit</p>	<p>1.1 Confirmed by the Ministry of Transport</p> <p>1.2 Existing unit of Armenian Road Directorate (ARD) for PMS/BMS</p> <p>1.3 Existing centralized data base and data collection system</p> <p>1.4 Budget available through other IFI projects</p>	<p>1.1 adequate</p> <p>1.2 adequate</p> <p>1.3 adequate</p> <p>1.4 presently adequate</p>
2. Staff Issues	<p>2.1 Provision of qualified staff</p> <p>2.2 Training in data collection, data evaluation and PMS/BMS programme system</p> <p>2.3 Personnel Development</p>	<p>2.1 PMS/BMS unit with 3 to 5 Engineers</p> <p>2.2 Training in all aspects has been/will be provided under the present TRACECA project</p> <p>2.3 Centralized system functioning</p>	<p>2.1 adequate</p> <p>2.2 Further training for optimization of programme system and preparation of maintenance recommendation is recommended.</p> <p>2.3 adequate</p>
3. Technical Issues	<p>3.1 Provision of office accommodation for PMS/BMS unit</p> <p>3.2 Hardware and software for PMS/BMS</p> <p>3.3 Transport for field works and data collection</p> <p>3.4 Equipment for road and pavement condition survey</p>	<p>3.1 In the building of ARD</p> <p>3.2 Has been provided under the present TRACECA project</p> <p>3.3 Vehicles available</p> <p>3.4 Equipment available but not all suitable for PMS/BMS requirement and also partly at end of service life (only 1 set of equipment under the present TRACECA project for all 8 recipient states)</p>	<p>3.1 adequate</p> <p>3.2 adequate</p> <p>3.3 adequate</p> <p>3.4 Provision of equipment as soon as possible recommended</p>

4.5 Tables

The achieved progress in the states under the Project is summarised in the tables (forms 2.2, 2.3 and 2.4) below. All activities were carried out as on-the-job training by the counterparts together with the Consultant's specialists and/or on individual tasks after training.

- 21 -
PROJECT PROGRESS REPORT

Project title: Traceca Project - Implementation of Pavement Management Systems		Project number: TELREG 9305		Country: The Southern Republics of the CIS and Georgia		Form 2.2, Page: 1				
Planning period: 07/1996 - 09/1996		Prepared on: 10/1996		EC Consultant: KOCKS CONSULT GMBH, Koblenz / Germany						
Project objectives: Implementation of Pavement and Bridge Management Systems										
No	ACTIVITIES IMPLEMENTED	TIME FRAME 1996						INPUTS		
		(for the project period July 1996 to September 1996)						EQUIPMENT AND MATERIAL		
		Months								
		7	8	9	Planned	Utilised	Planned	Utilised	Planned	Utilised
6.	FWD Survey + Evaluation				1 week	1 week	1 week	1 week		
6.2	Measure + store FWD survey data	X X			0.5 wks	0.5 wks	0.5 wks	0.5 wks		
6.3	Pavement analysis	X X								
9.	VOCs (HDM)				1 week	1 week				
9.3	Calculation of VOCs	X X								
10.	Bridge Cond. Survey + Stand.Def				0.5 wks	0.5 wks	1 week	1 week		
10.1	Collect bridge data			X	0.5 wks	0.5 wks	3 weeks	3 weeks		
10.2	Inspect bridges			X	0.5 wks	0.5 wks	1 week	1 week		
10.3	Establish existing bridge standard									
11.	Bridge Maintenance Strategy				1 week	1 week	1 week	1 week		
11.1	Assess exist. maintenance methods			X	0.5 wks	0.5 wks	0.5 wks	0.5 wks		
11.2	Discussion of mainten. methods			X	0.5 wks	0.5 wks	0.5 wks	0.5 wks		
11.3	Evaluate maintenance + repair costs			X						
12.	Adoption PMS + BMS				0.5 wks	0.5 wks	0.5 wks	0.5 wks		
12.1	Install the system				1.5 wks	1.5 wks	1.5 wks	1.5 wks		
12.2	Enter relevant data into PMS/BMS				1 week	1 week	2 weeks	2 weeks		
13.	PMS Model Optimization		X X							
14.	Training + Seminars				1 week	1 week	1 week	1 week		
14.3	Training + Seminar PMS/BMS		X		0.5 wks	0.5 wks	0.5 wks	0.5 wks		
14.4	Seminar bridge maintenance tech.		X							
				TOTAL	10.5	10.5	14.0	14.0		

- 22 -
PROJECT PROGRESS REPORT

Project title: Traceca Project - Implementation of Pavement Management Systems		Project number: TELREG 9305		Country: The Southern Republics of the CIS and Georgia		Form 2.2, Page: 2					
Planning period: 07/1996 - 09/1996		Prepared on: 10/1996		EC Consultant: KOCKS CONSULT GMBH, Koblenz / Germany							
Project objectives: Implementation of Pavement and Bridge Management Systems											
No	ACTIVITIES IMPLEMENTED	TIME FRAME 1996						INPUTS			
		(for the project period July 1996 to September 1996)						EQUIPMENT AND MATERIAL			
		Months									
		7	8	9	PERSONNEL EC Consultant		PERSONNEL Counterpart		OTHER		
				Planned		Utilised		Planned		Utilised	
23.	Region: Central Asia				1 week	1 week					
23.3	State 2, Kyrgyzstan				0.5 wks	0.5 wks	1 week	1 week			
	VOC's (HDM)				2 weeks	2 weeks	3 weeks	3 weeks			
	Calculation of VOCs				0.5 wks	0.5 wks	1 week	1 week			
24.	Bridge Cond. Survey+Stand.Def			X							
24.1	Collect bridge data			X							
24.2	Inspect bridges			X							
24.3	Establish existing bridge standard										
25.	Bridge Maintenance Strategy			X							
25.1	Assess exist. maintenance methods			X							
25.2	Discussion of mainten. methods			X							
25.3	Evaluate maintenance + repair costs			X							
26.	Adoption PMS + BMS										
26.1	Install the system				0.5 wks	0.5 wks	0.5 wks	0.5 wks			
26.2	Enter relevant data into PMS/BMS				1.5 wks	1.5 wks	1.5 wks	1.5 wks			
27.	PMS Model Optimization										
		X X			1 week	1 week	2 weeks	2 weeks			
28.	Training + Seminars										
28.2	Seminar road safety and design			X	0.2 wks	0.2 wks	0.2 wks	0.2 wks			
28.3	Training + Seminar PMS/BMS			X X	1 week	1 week	1 week	1 week			
28.4	Seminar bridge maintenance tech.			X	0.5 wks	0.5 wks	0.5 wks	0.5 wks			
TOTAL					10.7	10.7	12.7	12.7			

- 23 -
PROJECT PROGRESS REPORT

Project title: Traceca Project - Implementation of Pavement Management Systems		Project number: TELREG 9305		Country: The Southern Republics of the CIS and Georgia		Form 2.2, Page: 3				
Planning period: 07/1996 - 09/1996		Prepared on: 10/1996		EC Consultant: KOCKS CONSULT GMBH, Koblenz / Germany						
Project objectives: Implementation of Pavement and Bridge Management Systems										
No	ACTIVITIES IMPLEMENTED	TIME FRAME 1996 (for the project period July 1996 to September 1996)						INPUTS		
		Months						EQUIPMENT AND MATERIAL		
		7	8	9	Planned	Utilised	Planned	Utilised	Planned	Utilised
	Region: Central Asia									
	State 3, Kazakhstan									
32.	Road Cond.Survey+Standard Def	X X X		X	1.5 wks	1.5 wks	1.5 wks	1.5 wks	Bump Intergrator	Bump Intergrator
32.1	Rough. measurement+ cond. survey				0.5 wks	0.5 wks	0.5 wks	0.5 wks	Tripmeter, Car	Tripmeter, Car,
32.2	Establish existing design standards					--			MERLIN	MERLIN
36.	Road + Usage Costing		X		0.2 wks	0.2 wks	0.2 wks	0.2 wks		
36.1	Evaluate maintenance costs					1 week		1 week		
37.	VOC's (HDM)				1.5 wks	1.5 wks	1.5 wks	1.5 wks		
37.3	Calculation of VOCs	X X								
38.	Bridge Cond. Survey+Stand.Def				0.5 wks	0.5 wks	0.5 wks	0.5 wks		
38.1	Collect bridge data			X	2 weeks	2 weeks	2 weeks	2 weeks		
38.2	Inspect bridges			X	0.5 wks	0.5 wks	0.5 wks	0.5 wks		
38.3	Establish existing bridge stand.				1 week	1 week	1 week	1 week	Bridge Testing	Bridge Testing
39.	Bridge Maintenance Strategy				1 week	1 week	1 week	1 week		
39.1	Assess exist. maintenance method			X	0.5 wks	0.5 wks	0.5 wks	0.5 wks		
39.2	Discussion of mainten. methods			X	0.5 wks	0.5 wks	0.5 wks	0.5 wks		
39.3	Evaluate maintenance + repair cost				0.5 wks	0.5 wks	0.5 wks	0.5 wks		
40.	Adoption PMS + BMS				0.5 wks	0.5 wks	0.5 wks	0.5 wks	PMS/BMS	PMS/BMS
40.1	Install the system			X	1.5 wks	1.5 wks	1.5 wks	1.5 wks	software	software
40.2	Enter relevant data into PMS/MBS			X	1 week	1 week	1 week	1 week		
41.	Model Optimization				0.2 wks	0.2 wks	0.2 wks	0.2 wks	Teaching mat.	Teaching mat.
42.	Training + Seminars			X	1 week	1 week	1 week	1 week		
42.2	Seminar road safety			X	0.5 wks	0.5 wks	0.5 wks	0.5 wks		
42.3	Training + Seminar PMS/BMS			X	0.5 wks	0.5 wks	0.5 wks	0.5 wks		
42.4	Seminar bridge maintenance tech.			X	0.5 wks	0.5 wks	0.5 wks	0.5 wks		
				TOTAL	13.4	13.4	15.2	15.7		

- 24 -
PROJECT PROGRESS REPORT

Project title: Traceca Project - Implementation of Pavement Management Systems		Project number: TELREG 9305		Country: The Southern Republics of the CIS and Georgia		Form 2.2, Page: 4				
Planning period: 07/1996 - 09/1996		Prepared on: 10/1996		EC Consultant: KOCKS CONSULT GMBH, Koblenz / Germany						
Project objectives: Implementation of Pavement and Bridge Management Systems										
No	ACTIVITIES IMPLEMENTED	TIME FRAME 1996 (for the project period July 1996 to September 1996)			INPUTS					
		Months			PERSONNEL EC Consultant		PERSONNEL Counterpart		EQUIPMENT AND MATERIAL	
		7	8	9	Planned	Utilised	Planned	Utilised	Planned	Utilised
43.	Region: Central Asia State 4, Turkmenistan Commencement Meeting	X			0.5 wks	0.5 wks				
44.	State 5, Tadjikistan Commencement Meeting			X	1 week	1 week				
	Region: Caucasus State 1, Azerbaijan									
75.	Traffic Survey + Evaluation				0.5 wks	1 week	1 week			
75.2	Traffic survey + axle weighing		X X X		1.5 wks	1.0 wks			Axle Weighbrid.	
75.3	Traffic forecast		X X X							
76.	FWD Survey + Evaluation				0.5 wks	0.5 wks	0.5 wks		FWD	
76.1	Select representative road sections		X		1 week	1 week	1 week			
76.2	Measure + store FWD survey data		X X X	X	0.5 wks	0.5 wks	0.5 wks			
76.3	Pavement analysis									
77.	Maintenance Strategy				0.5 wks	0.5 wks	0.5 wks			
77.1	Establish exist. maintenance proced.	X			0.5 wks	0.5 wks	0.5 wks			
77.2	Propose maintenance strategy	X			0.5 wks	0.5 wks	0.5 wks			
79.	VOCs (HDM)				0.5 wks	0.5 wks	1 week			
79.1	Vehicle classification to suit HDM		X		1.5 wks	1.5 wks	2 weeks			
79.2	Economic + financial cost of VOCs		X X X		0.2 wks	0.2 wks	0.2 wks			
79.3	Calculation of VOCs		X							
		TOTAL			8.2	8.2	7.0	7.0		

- 25 -
PROJECT PROGRESS REPORT

Project title: Traceca Project - Implementation of Pavement Management Systems		Project number: TELREG 9305		Country: The Southern Republics of the CIS and Georgia		Form 2.2, Page: 5		
Planning period: 07/1996 - 09/1996		Prepared on: 10/1996		EC Consultant: KOCKS CONSULT GMBH, Koblenz / Germany				
Project objectives: Implementation of Pavement and Bridge Management Systems								
No	ACTIVITIES IMPLEMENTED	TIME FRAME 1996			INPUTS			
		(for the project period July 1996 to September 1996)			EQUIPMENT AND MATERIAL			
		Months			PERSONNEL Counterpart		OTHER	
		7	8	9	Planned	Utilised	Planned	Utilised
86.	Logistics, Data Collection							
86.1	Arranging local expertise, office, etc.	X			0.5 wks	0.5 wks		
86.2	Review existing data bases	X X X			1 week	2 weeks		
87.	Road Network Location		X		0.5 wks	0.5 wks		
88.	Road Cond.Survey+Standard Def				4 weeks	4 weeks		
88.1	Rough. measurement+cond. survey		X X X X X	X X	1 week	1 week		
88.2	Establish existing design standards	X X					Bump Integrator Tripmeter, Car MERLIN	
89.	Traffic Survey + Evaluation				1 week	2 weeks		
89.1	Analysis of existing traffic data		X X X	X	0.5 wks	1 week		
89.2	Traffic survey + axle weighing		X	X X	1.5 wks	1 week		
89.3	Traffic forecast			X X			Axle Weighbrid.	
90.	FWD Survey + Evaluation				0.5 wks	0.5 wks		
90.1	Select representative road sections		X X		1 week	1 week		
90.2	Measure + store FWD survey data			X X X	0.5 wks	0.5 wks		
90.3	Pavement analysis				0.5 wks	0.5 wks	FWD	
91.	Maintenance Strategy				0.5 wks	0.5 wks		
91.1	Establish exist. maintenance proced.		X X		0.5 wks	0.5 wks		
91.2	Propose maintenance strategy		X X		0.5 wks	0.5 wks		
92.	Road + Usage Costing				0.2 wks	0.2 wks		
92.1	Evaluate maintenance costs	X				1 week		
93.	VOCs (HDM)				0.5 wks	0.5 wks		
93.1	Vehicle classification to suit HDM		X		1.5 wks	1.5 wks		
93.2	Economic + financial cost of VOCs			X X	1 week	2 weeks		
93.3	Calculation of VOCs			X X	1 week	1 week		
		TOTAL			16.2	16.2	16.5	17.5

- 26 -
PROJECT PROGRESS REPORT

Project title: Traceca Project - Implementation of Pavement Management Systems		Project number: TELREG 9305		Country: The Southern Republics of the CIS and Georgia		Form 2.2, Page: 6										
Planning period: 07/1996 - 09/1996		Prepared on: 10/1996		EC Consultant: KOCKS CONSULT GMBH, Koblenz / Germany												
Project objectives: Implementation of Pavement and Bridge Management Systems																
No	ACTIVITIES IMPLEMENTED	TIME FRAME 1996						INPUTS								
		(for the project period July 1996 to September 1996)						EQUIPMENT AND MATERIAL		OTHER						
		Months						PERSONNEL Counterpart		PERSONNEL Counterpart		EQUIPMENT AND MATERIAL		OTHER		
		7	8	9				Planned	Utilised	Planned	Utilised	Planned	Utilised	Planned	Utilised	
99.	Commencement Meeting	X X														
100.	Logistics, Data Collection															
100.1	Arranging local expertise, office, etc.															
100.2	Review existing data bases															
101.	Road Network Location															
102.	Road Cond.Survey+Standard Def															
102.1	Rough. measurement+cond. survey															
103.	Traffic Survey + Evaluation															
103.1	Analysis of existing traffic data															
103.2	Traffic survey + axle weighing															
103.3	Traffic forecast															
104.	FWD Survey + Evaluation															
104.1	Select representative road sections															
104.2	Measure + store FWD survey data															
104.3	Pavement analysis															
105.	Maintenance Strategy															
105.1	Establish exist. maintenance proced.															
TOTAL																
		10.5	9.5	9.0	10.0											

- 27 -
RESOURCE UTILISATION REPORT

Project title : Implementation of Pavement Management Systems		Project number : TELREG 9305		Country : The Southern Republics of the CIS and Georgia		Form 2.3, Page : 1	
Planning period : 07/1996 - 09/1996		Prepared on : 10/1996		EC Consultant : KOCKS CONSULT GMBH, Koblenz/Germany			
Project objectives : Implementation of Pavement and Bridge Management Systems							
RESOURCES/INPUTS	TOTAL PLANNED	PERIOD PLANNED	PERIOD REALISED	TOTAL REALISED	AVAILABLE FOR REMAINDER		
PERSONNEL							
Project Manager	20 man days	5 man days	5 man days	15 man days	5 man days		
Team-Leader (Central Asia + Caucasus)	10.18 man-months	4.00 man-months	4.00 man-months	10.00 man-months	0.18 man-months		
Transport Economist	8.00 man-months	3.00 man months	3.00 man months	6.50 man months	1.50 man months		
Traffic Engineer	15 man days	10 man days	10 man days	10 man days	5 man days		
FWD and PMS/BMS Specialists	9.82 man-months (7.27 months + 56 days)	4.00 man-months	4.00 man-months	8.00 man-months	1.82 man-months		
Engineering Coordinator	10.18 man-months	3.50 man months	3.80 man months	7.30 man months	2.88 man months		
Structural Engineer and Bridge Specialist	12.00 man-months (10.18 months + 40 days)	4.00 man-months	3.50 man months	3.50 man-months	8.50 man-months (10.18 months + 40 days)		
Asphalt Specialist	24 man-days	12 man-days	24 man-days	40 man-days	0 man-days		
PMS/BMS Home Office Support	24 man-days	8 man-days	8 man-days	20 man-days	4 man-days		
PMS/BMS Programmer Software	88 man-days	33 man-days	88 man-days	33 man-days	0 man-days		
Sub-total	50.18 man-months and 156 man-days	18.50 man-months and 68 man-days	18.30 man-months and 80 man-days	35.30 man-months and 173 man-days	14.88 man-months and 14 man-days		
EQUIPMENT AND MATERIAL							
Phoenix Falling Weight Deflectometer	1	1	1	1	0		
Portable Axle Weighbridge System	1	1	1	1	0		
Bump Integrator	1	1	2	2	0		
Tripmeter	1	1	2	2	0		
Personnel Computers incl. Ancillaries	8	3	3	6	2		
Laser Printers incl. Ancillaries	8	3	3	6	2		
Software „Windows 95“ package	8	3	3	6	2		
Software „RoSy - PMS/BMS“	8	3	3	3	5		
Sub-total	36	16	18	27	11		
OTHER INPUTS							
MERLIN	--	--	1	1	0		
Bridge Testing Equipment	--	--	1 set	1 set	0		
Sub-total	--	--	2	2	0		
TOTAL							

- 28 -
OUTPUT PERFORMANCE REPORT

Project title : Traceca Project - Implementation of Pavement Management Systems Prepared on: 10/1996	Project number: TELREG 9305	Country : The Southern Republics of the CIS and Georgia EC Consultant: KOCKS CONSULT GMBH, Koblenz/Germany	Form 2.4, Page : 1
Output results	Deviation original plan + or - %	Reason for deviation	Comment on constrains & assumptions
<p>Region: Central Asia</p> <p>State 1, Uzbekistan</p> <p>Pavement Condition Survey</p> <p>Assessment of Traffic</p> <p>Economic Evaluation and VOC's</p> <p>Bridge Condition Survey</p> <p>Install and Adoption PMS + BMS</p> <p>Recommend Improvements</p> <p>Training and Seminars</p> <p>Provision of PMS + BMS hardware and software</p>	<p style="text-align: center;">- 30%</p> <p>COMPLETED ON SCHEDULE COMPLETED COMPLETED ON SCHEDULE ON SCHEDULE COMPLETED</p>	<p>Roads in the southern part of the country will be investigated in 10/1996</p>	
<p>State 2, Kyrgyzstan</p> <p>Pavement Condition Survey</p> <p>Assessment of Traffic</p> <p>Economic Evaluation and VOC's</p> <p>Bridge Condition Survey</p> <p>Install and Adoption PMS + BMS</p> <p>Recommend Improvements</p> <p>Training and Seminars</p> <p>Provision of PMS + BMS hardware and software</p>	<p>COMPLETED COMPLETED ON SCHEDULE COMPLETED COMPLETED ON SCHEDULE COMPLETED</p>		

- 29 -
OUTPUT PERFORMANCE REPORT

Project title : Traceca Project - Implementation of Pavement Management Systems Prepared on: 10/1996	Project number: TELREG 9305	Country : The Southern Republics of the CIS and Georgia EC Consultant: KOCKS CONSULT GMBH, Koblenz/Germany	Form 2.4, Page : 2
Output results	Deviation original plan + or - %	Reason for deviation	Comment on constrains & assumptions
<p>Region: Central Asia</p> <p>State 3, Kazakhstan</p> <p>Pavement Condition Survey Assessment of Traffic Economic Evaluation and VOC's Bridge Condition Survey Install and Adoption PMS + BMS Recommend Improvements Training and Seminars Provision of PMS + BMS hardware and software</p>	<p>COMPLETED ON SCHEDULE ON SCHEDULE COMPLETED COMPLETED ON SCHEDULE COMPLETED</p>		
<p>State 4, Turkmenistan</p> <p>Pavement Condition Survey Assessment of Traffic Economic Evaluation and VOC's Bridge Condition Survey Install and Adoption PMS + BMS Recommend Improvements Training and Seminars Provision of PMS + BMS hardware and software</p>	<p>ON SCHEDULE ON SCHEDULE ON SCHEDULE ON SCHEDULE ON SCHEDULE ON SCHEDULE ON SCHEDULE</p>		

- 30 -
OUTPUT PERFORMANCE REPORT

Project title : Traceca Project - Implementation of Pavement Management Systems Prepared on: 10/1996	Project number: TELREG 9305	Country : The Southern Republics of the CIS and Georgia EC Consultant: KOCKS CONSULT GMBH, Koblenz/Germany	Form 2.4, Page : 3
Output results	Deviation original plan + or - %	Reason for deviation	Comment on constrains & assumptions
<p>Region: Central Asia</p> <p>State 5, Tadjikistan</p> <p>Pavement Condition Survey Assessment of Traffic Economic Evaluation and VOC's Bridge Condition Survey Install and Adoption PMS + BMS Recommend Improvements Training and Seminars Provision of PMS + BMS hardware and software</p>	<p>ON SCHEDULE ON SCHEDULE ON SCHEDULE ON SCHEDULE ON SCHEDULE ON SCHEDULE ON SCHEDULE ON SCHEDULE</p>		
<p>Region Caucasus</p> <p>State 1, Azerbaijan</p> <p>Pavement Condition Survey Assessment of Traffic Economic Evaluation and VOC's Bridge Condition Survey Install and Adoption PMS + BMS Recommend Improvements Training and Seminars Provision of PMS + BMS hardware and software</p>	<p>COMPLETED COMPLETED ON SCHEDULE ON SCHEDULE ON SCHEDULE ON SCHEDULE ON SCHEDULE ON SCHEDULE</p>		

CV Poitzsch

13. Specific Eastern Countries Experience

Country	Date

14. Professional Experience Record:

Date:	1990 - 1996
Location:	Germany
Company:	Verkehrs- und Ingenieurbau Consult GmbH
Position:	Bridge Design Engineer/Project Leader
Description:	<ul style="list-style-type: none"> - Preliminary and final design for the rehabilitation of a steel truss framed bridge on the route of the B 273 (in Lehnitz) with a 48 m span over the river Havel. - Preliminary and final design for rehabilitation and widening of a composite single span bridge on the A 4 motorway. - 'Nedlitzer Nordbrücke' - inspection of a historical 3 span arched bridge (built in 1852) on the route of the B 2 federal road near Potsdam for assessment of rehabilitation and replacement of components in line with preservation requirements (40 m span) - Wustermark Bridge - preliminary and final design for rehabilitation of a 2 span reinforced concrete bridge on the route of the B 5 federal road spanning the 'Havel Kanal' - Preliminary and final design for rehabilitation and maintenance of several bridges with pre-cast components (span 10 m) for BTC and BTB - Preliminary design for rehabilitation upgrading and strengthening of two natural stone arched bridges on the S 314 in Zwickau (arch widths 10 m) - Preliminary design of the Havel Bridge in Brandenburg on the route of the B 1 federal road - new construction of a 3 span pre-stressed concrete bridge with a total span of 93 m - Crimmitschau Bridge - preliminary design for rehabilitation and upgrading of a 4 span 37 m reinforced concrete bridge over a railway line on the route of the S 290.

5. PROJECT PLANNING FOR NEXT REPORTING PERIOD

5.1 Planned Activities

During the present reporting period consultancy services were provided in six of the eight recipient states. For the next reporting period the Consultant will commence the activities in the two remaining recipient states Turkmenistan and Tadjikistan

The activities for the field works and data collection for roads/highways and bridges, as described in the chapters above, will be continued and completed respectively comprising the main items

- seminars for introduction of the equipment
- collection and evaluation of road surface and road pavement condition data
- collection and evaluation of bridge condition data

As reported computer equipment was delivered to six recipient states and programme systems to three states. During the next reporting period all eight recipient countries will have received the computer equipment as well as the RoSy-PMS/BMS programme system.

As far as not completed the training of counterparts will continue as described in the chapters above comprising

- use of the equipment
- collection of road condition data
- preparation of data base
- collection of bridge condition data
- use of the PMS/BMS programme system

The Consultant's activities for the transport economics and road use cost will continue for the described activities

- data collection (traffic, axle loads)
- estimation of traffic growth
- calculation of vehicle operating cost (VOC)
- road use costs

Seminars will be continued for bitumen bound materials and related technology as well as for road safety and road design aspects.

The study tour to Western Europe will be in beginning of November 1996.

5.2 Tables

The proposed activities for the next progress period are shown for each of the eight recipient states in the tables below.

PLAN OF OPERATIONS FOR THE NEXT PERIOD (Work programme)

Project title: Traceca Project - Implementation of Pavement Management Systems		Project number: TELREG 9305		Country: The Southern Republics of the CIS and Georgia		Form 1.6, Page: 1	
Planning period: 10/1996 - 12/1996		Prepared on: 10/1996		EC Consultant: KOCKS CONSULT GMBH, Koblenz/Germany			
Project objectives: Implementation of Pavement and Bridge Management Systems							
No.	ACTIVITIES	TIME FRAME			INPUTS		
		10	11	12	PERSONNEL	EQUIPMENT AND MATERIAL	OTHER
Region: Central Asia							
State 1, Uzbekistan							
4.	Road Cond. Survey + Stand. Def.	X			EC Consultant	Counterpart	
4.1	Rough. measurement + cond. survey	X			1 week	1 week	
14.	Training + Seminars	X			0.2 weeks	0.2 weeks	Teaching Material
14.2	Road safety and design		X		1 week	1 week	
14.5	Study Tour						
State 2, Kyrgyzstan							
28.	Training + Seminars		X		1 week	1 week	
28.5	Study Tour						
State 3, Kazakhstan							
42.	Training + Seminars		X		1 week	1 week	
42.5	Study Tour						
TOTAL					4.2 weeks	4.2 weeks	

PLAN OF OPERATIONS FOR THE NEXT PERIOD (Work programme)

Project title: Traceca Project - Implementation of Pavement Management Systems		Project number: TELREG 9305		Country: The Southern Republics of the CIS and Georgia		Form 1.6, Page: 2		
Planning period: 10/1996 - 12/1996		Prepared on: 10/1996						
Project objectives: Implementation of Pavement and Bridge Management Systems								
No.	ACTIVITIES	TIME FRAME			INPUTS			
		1996 Months			PERSONNEL		EQUIPMENT AND MATERIAL	OTHER
		10	11	12	EC Consultant	Counterpart		
Region: Central Asia								
State 4, Turkmenistan								
44.	Logistics, Data Collection	X X			1.5 weeks	2 weeks		
45.	Road Network Location	X			0.5 weeks	0.5 weeks		
46.	Road Cond. Survey + Stand. Def.		X X X X		4 weeks	3 weeks	Bump Integrator, MERLIN, Tripmeter	
47.	Traffic Survey + Evaluation	X X X			3 weeks	3 weeks	Weighbridge	
48.	FWD Survey + Evaluation		X X		2 weeks	2 weeks	FWD, printer, computer	
49.	Maintenance Strategy			X	1 week	1 week		
50.	Road + usage Costing	X			1 week	1 week		
51.	VOCs (HDM)	X X X			3 weeks	3 weeks		
52.	Bridge Cond. Survey + Stand. Def.		X X	X	3 weeks	3 weeks		
53.	Bridge Maintenance Strategy			X X	2 weeks	2 weeks		
54.	Adoption PMS + BMS			X X	2 weeks	2 weeks	PMS/BMS software	
55.	Model Optimization		X		1 week	2 weeks		
56.	Training + Seminars	X	X X		3 weeks	3 weeks	teaching mat.	
TOTAL					27 weeks	27.5 weeks		

PLAN OF OPERATIONS FOR THE NEXT PERIOD (Work programme)

Project title: Traceca Project - Implementation of Pavement Management Systems		Project number: TELREG 9305		Country: The Southern Republics of the CIS and Georgia		Form 1.6, Page: 3			
Planning period: 10/1996 - 12/1996		Prepared on: 10/1996		EC Consultant: KOCKS CONSULT GMBH, Koblenz/Germany					
Project objectives: Implementation of Pavement and Bridge Management Systems									
No.	ACTIVITIES	TIME FRAME			PERSONNEL			INPUTS	
		10	11	12	EC Consultant	Counterpart	EQUIPMENT AND MATERIAL	OTHER	
Region: Central Asia									
State 5, Tadjikistan									
58.	Logistics, Data Collection	X X			1.5 weeks	2 weeks			
59.	Road Network Location	X			0.5 weeks	0.5 weeks			
60.	Road Cond. Survey + Stand. Def.	X X X X			4 weeks	3 weeks	Bump Integrator, MERLIN, Tripmeter		
61.	Traffic Survey + Evaluation	X X X			3 weeks	3 weeks	Weighbridge		
62.	FWD Survey + Evaluation		X X		2 weeks	2 weeks	FWD, printer, computer		
63.	Maintenance Strategy			X	1 week	1 week			
64.	Road + usage Costing	X			1 week	1 week			
65.	VOCs (HDM)	X X X			3 weeks	3 weeks			
66.	Bridge Cond. Survey + Stand. Def.	X X X			3 weeks	3 weeks			
67.	Bridge Maintenance Strategy	X X X			2 weeks	2 weeks			
68.	Adoption PMS + BMS	X X			2 weeks	2 weeks	PMS/BMS software		
69.	Model Optimization	X			1 week	2 weeks			
70.	Training + Seminars	X X X	X		3 weeks	3 weeks	teaching mat.		
TOTAL								27 weeks	28.5 weeks

PLAN OF OPERATIONS FOR THE NEXT PERIOD (Work programme)

Project title: Traceca Project - Implementation of Pavement Management Systems		Project number: TELREG 9305		Country: The Southern Republics of the CIS and Georgia		Form 1.6, Page: 4		
Planning period: 10/1996 - 12/1996		Prepared on: 10/1996						
Project objectives: Implementation of Pavement and Bridge Management Systems								
No.	ACTIVITIES	TIME FRAME			INPUTS			
		1996 Months			PERSONNEL			
		10	11	12	EC Consultant	Counterpart	EQUIPMENT AND MATERIAL	OTHER
Region: Caucasus								
State 1, Azerbaijan								
78.	Road Usage + Costing	X			0.2 weeks	1 week		
78.1	Evaluate maintenance costs							
80.	Bridge Cond. Survey + Stand. Def.	X	X		0.5 weeks	1 week		
80.1	Collect bridge data		X		2 weeks	3 weeks	Bridge Testing Equipment	
80.2	Inspect bridges		X		0.5 weeks	1 week		
80.3	Establish existing bridge stand.		X					
81.	Bridge Maintenance Strategy				1 week	1 week		
81.1	Assess exist. maintenance method		X		0.5 weeks	0.5 weeks		
81.2	Discussion of mainten. methods		X		0.5 weeks	0.5 weeks		
81.3	Evaluate maintenance + repair cost		X					
82.	Adoption PMS + BMS				0.5 weeks	0.5 weeks	PMS/BMS software	
82.1	Install the system	X			1.5 weeks	1.5 weeks		
82.2	Enter relevant data into PMS/BMS	X	X					
83.	Model Optimization		X		1 week	2 weeks		
84.	Training + Seminars						teaching mat.	
84.1	Seminar bit bound products tech.	X			1 week	1 week		
84.2	Seminar road safety and design	X			0.2 weeks	0.2 weeks		
84.3	Training + Seminar PMS/BMS	X	X		1 week	1 week		
84.4	Seminar bridge maintenance tech.	X	X		0.5 weeks	0.5 weeks		
84.5	Study Tour	X	X		1 week	1 week		
TOTAL					11.9 weeks	15.7 weeks		

PLAN OF OPERATIONS FOR THE NEXT PERIOD (Work programme)

Project title: Traceca Project - Implementation of Pavement Management Systems		Project number: TELREG 9305		Country: The Southern Republics of the CIS and Georgia		Form 1.6, Page: 5			
Planning period: 10/1996 - 12/1996		Prepared on: 10/1996		EC Consultant: KOCKS CONSULT GMBH, Koblenz/Germany					
Project objectives: Implementation of Pavement and Bridge Management Systems									
No.	ACTIVITIES	TIME FRAME			PERSONNEL			INPUTS	
		10	11	12	EC Consultant	Counterpart	EQUIPMENT AND MATERIAL	OTHER	
Region: Caucasus									
State 2, Georgia									
94.	Bridge Cond. Survey + Stand. Def.	X X X			3 weeks	3 weeks			
95.	Bridge Maintenance Strategy	X X			2 weeks	2 weeks			
96.	Adoption PMS + BMS	X			0.5 weeks	0.5 weeks		PMS/BMS software	
96.1	Install the system	X X	X		1.5 weeks	1.5 weeks			
96.2	Enter relevant data into PMS/BMS				1 week	2 weeks			
97.	Model Optimization	X X			1 week	1 week		teaching mat.	
98.	Training + Seminars				1 week	1 week			
98.1	Seminar bit. bound products tech.	X			0.2 weeks	0.2 weeks			
98.2	Seminar road safety and design	X			1 week	1 week			
98.3	Training + Seminar PMS/BMS	X X			0.5 weeks	0.5 weeks			
98.4	Seminar bridge maintenance tech.		X		1 week	1 week			
98.5	Study Tour			X					
TOTAL					11.7 weeks	12.7 weeks			

PLAN OF OPERATIONS FOR THE NEXT PERIOD (Work programme)

Project title: Traceca Project - Implementation of Pavement Management Systems		Project number: TELREG 9305		Country: The Southern Republics of the CIS and Georgia		Form 1.6, Page: 6		
Planning period: 10/1996 - 12/1996		Prepared on: 10/1996		EC Consultant: KOCKS CONSULT GMBH, Koblenz/Germany				
Project objectives: Implementation of Pavement and Bridge Management Systems								
No.	ACTIVITIES	TIME FRAME			INPUTS			
		1996 Months			PERSONNEL			
		10	11	12	EC Consultant	Counterpart	EQUIPMENT AND MATERIAL	OTHER
Region: Caucasus								
State 3, Armenia								
102.	Road Cond. Survey + Stand. Def.							
102.1	Establish exist. design standards	X			1 week	1 week		
105.	Maintenance Strategy							
105.2	Propose maintenance strategy	X			0.5 weeks	0.5 weeks		
106.	Road + Usage Costing							
106.1	Evaluate maintenance costs	X			0.2 weeks	1 week		
107.	VOCs (HDM)							
107.1	Vehicle classification to suit HDM	X			0.5 weeks	1 week		
107.2	Economic + financial cost of VOCs	X			1.5 weeks	2 weeks		
107.3	Calculation of VOCs	X	X		1 week			
108.	Bridge Cond. Survey + Stand. Def.							
109.	Bridge Maintenance Strategy		X	X	3 weeks	3 weeks		
110.	Adoption PMS + BMS		X	X	2 weeks	2 weeks		
110.1	Install the system	X			0.5 weeks	0.5 weeks	PMS/BMS software	
110.2	Enter relevant data into PMS/BMS	X	X		1.5 weeks	1.5 weeks		
111.	Model Optimization		X		1 week	2 weeks		
112.	Training + Seminars							
112.1	Seminar bit. bound products tech.	X			1 week	1 week	teaching mat.	
112.2	Seminar road safety and design	X			0.2 weeks	0.2 weeks		
112.3	Training + Seminar PMS/BMS	X	X		1.5 weeks	1.5 weeks		
112.4	Seminar bridge maintenance tech.		X		0.5 weeks	0.5 weeks		
98.5	Study Tour		X		1 week	1 week		
TOTAL					16.9 weeks	18.7 weeks		

APPENDIX 1

- CV Zimmermann
- CV Poitzsch

CV Zimmermann

CURRICULUM VITAE

Position in the Project: Asphalt Specialist

- 1. Family Name: Zimmermann
- 2. First Names: Hans-Ulrich
- 3. Date of Birth: September 16, 1949
- 4. Nationality: German
- 5. Civil Status: Single
- 6. Education:

Institution:	State Engineering College, Lübeck, Germany
Date:	1969 - 1971 1973 - 1979
Degree(s) or Diploma(s) obtained:	Dipl.-Ing. FH (Civil Engineer B. Sc.) Dipl.-Ing. (Civil Engineer M. Sc.)

7. Language Skills: (Mark 1 to 5 for Competence)

Language	Reading	Speaking	Writing
German	5	5	5
English	4	4	4
French	3	3	3
Russian	2	2	2

- 8. Membership of Professional Bodies:
- 9. Other Skills: (e. g. Computer Literacy, etc.) experienced in programming languages FORTRAN, BASIC,PASCAL and in microsoft office
- 10. Present Position: Senior Geotechnical Engineer
- 11. Years within the Firm: 2
- 12. Key Qualifications: (Relevant to the Programme)

Mr. Zimmermann has 19 years of professional experience gained in Germany and abroad, primarily for roads and airports. He is a geotechnical engineer and pavement specialist with extensive practical experience in field investigations, laboratory testing, pavement and foundation design, quality control and supervision of construction. He also has experience in transfer of technology and training of local staff.

CV Zimmermann

13. Specific Eastern Countries Experience

Country	Date
Uzbekistan	1995 - 1996

14. Professional Experience Record:

<p>Date: 1995 - 1996</p> <p>Location: Uzbekistan</p> <p>Company: KOCKS CONSULT GMBH</p> <p>Position: Senior Materials and Quality Control Engineer</p> <p>Description: Tashkent Airport rehabilitation project responsible for supervision and testing of asphalt concrete pavement works for the 440,000 m² overlay on two runways.</p>
<p>Date: 1991 - 1995</p> <p>Location: Germany</p> <p>Company: Harres Pickel GmbH</p> <p>Position: Chief Geotechnical Engineer</p> <p>Description: Responsible for soils & materials investigations, laboratory testing, pavement and bridge foundation designs for infrastructure projects (roads, highways, motorways, railways)</p>
<p>Date: 1990 - 1991</p> <p>Location: Zaire</p> <p>Company: Strabag International</p> <p>Position: Senior Geotechnical Engineer</p> <p>Description: 120 km Oso - Osokari road construction. Responsible for investigations and laboratory testing of soils and construction materials, pavement design (asphalt concrete), foundation design for 8 bridges and supervision of the quarry works.</p>
<p>Date: 1989 - 1990</p> <p>Location: Germany</p> <p>Company: IGB Consulting Engineers</p> <p>Position: Senior Geotechnical Engineer</p> <p>Description: Design of landfill areas including location surveys, soils investigation and laboratory testing, preparation of materials specification and supervision of works.</p>

CV Zimmermann

Date:	1988 - 1989
Location:	Germany
Company:	Institute for Environmental Protection (IUP)
Position:	
Description:	Training course for environmental protection measures associated to structural and geotechnical designs as well as during construction and site supervision (protective measures for ground- and surface water, development/implementation of environmental friendly extraction measures, erosion protection, materials recycling).
Date:	1984 - 1987
Location:	Saudi Arabia
Company:	GTZ GmbH
Position:	Chief Geotechnical and Laboratory Engineer
Description:	Transfer of technology and training of the national laboratory staff in field investigations, laboratory testing, foundation design and quality control.
Date:	1981 - 1983
Location:	Saudi Arabia
Company:	Kling Consult
Position:	Geotechnical and Structural Engineer
Description:	Steel Complex Al-Jubail. Responsible for the supervision of construction of foundations and steel structures.
Date:	1980 - 1981
Location:	Germany
Company:	Baugrund GmbH Dr. Schwarz
Position:	Civil Engineer
Description:	Responsible for geotechnical field investigations and laboratory testing for road and highway projects as well as for structural design of sheet pile walls.
Date:	1972 - 1973
Location:	Germany
Company:	Heuer and Löffler Consulting Engineers
Position:	Civil Engineer
Description:	Responsible for structural designs and stress analysis for multi-storied buildings.

CV Poitzsch

CURRICULUM VITAE

Position in the Project: Bridge/BMS Engineer

1. Family Name: POITZSCH
2. First Names: Peter
3. Date of Birth: December 24, 1962
4. Nationality: German
5. Civil Status: Married
6. Education:

Institution:	Civil Engineering Insitute, Cottbus, Germany
Date:	1985 - 1989
Degree(s) or Diploma(s) obtained:	Dipl.-Ing. FH (Civil Engineer B. Sc.)

7. Language Skills: (Mark 1 to 5 for Competence)

Language	Reading	Speaking	Writing
German	5	5	5
English	4	4	4
Russian	3	3	2

8. Membership of Professional Bodies:

9. Other Skills: (e. g. Computer Literacy, etc.)
 - CADdy - CAD System
 - Bridge Management Systems (BMS)
 - R-STAB - Structures design programme
 - PCAE - RC design programme
 - Windows, Winword, Corel

10. Present Position: Bridge Design and Maintenance Engineer

11. Years within the Firm: 6

12. Key Qualifications: (Relevant to the Programme)

Structural Engineer with experience in bridges design, rehabilitation and maintenance techniques. Experienced in surveys, assessments and evaluation of bridges condition as well as studies for maintenance, repairs and rehabilitation for various bridge systems using computerised Bridge Management Systems (BMS).

CV Poitzsch

13. Specific Eastern Countries Experience

Country	Date

14. Professional Experience Record:

Date:	1990 - 1996
Location:	Germany
Company:	Verkehrs- und Ingenieurbau Consult GmbH
Position:	Bridge Design Engineer/Project Leader
Description:	<ul style="list-style-type: none"> - Preliminary and final design for the rehabilitation of a steel truss framed bridge on the route of the B 273 (in Lehnitz) with a 48 m span over the river Havel. - Preliminary and final design for rehabilitation and widening of a composite single span bridge on the A 4 motorway. - 'Nedlitzer Nordbrücke' - inspection of a historical 3 span arched bridge (built in 1852) on the route of the B 2 federal road near Potsdam for assessment of rehabilitation and replacement of components in line with preservation requirements (40 m span) - Wustermark Bridge - preliminary and final design for rehabilitation of a 2 span reinforced concrete bridge on the route of the B 5 federal road spanning the 'Havel Kanal' - Preliminary and final design for rehabilitation and maintenance of several bridges with pre-cast components (span 10 m) for BTC and BTB - Preliminary design for rehabilitation upgrading and strengthening of two natural stone arched bridges on the S 314 in Zwickau (arch widths 10 m) - Preliminary design of the Havel Bridge in Brandenburg on the route of the B 1 federal road - new construction of a 3 span pre-stressed concrete bridge with a total span of 93 m - Crimmitschau Bridge - preliminary design for rehabilitation and upgrading of a 4 span 37 m reinforced concrete bridge over a railway line on the route of the S 290.

CV Poitzsch

	<ul style="list-style-type: none">- Preliminary design for upgrading the A 10 to a six lane motorway in a trough structure with a total length of 1,600 m.- Inspection and maintenance programme for 10 reinforced concrete and steel bridges with spans ranging from 30 - 70 m in south Sachsen and Brandenburg using BMS.- Preparation of final acceptance certificate and corresponding data base for BMS for 16 newly constructed reinforced and pre-stressed concrete bridges on the route of the B 93 federal road Zwickau-Meerane, with total bridge lengths up to 220 m and a tunnel with a length of 430 m.
Date:	1989 - 1990
Location:	Germany
Company:	VEB Autobahnkombinat
Position:	Structural Engineer
Description:	Assessment and documentation for general bridge inspection and maintenance in accordance with Ri-EBW-Prüf 88 using computer software 'Bauwerke' and 'Bw-Prüf' for implementation of a bridge management system (BMS).

APPENDIX 2

- Road Condition Data
- Pavement Data

PAVEMENT CONDITION DATA
Road Roughness/Surface Condition (K A Z A K H S T A N)

Callibrationfactor ; C = 3.44

M 39: Border Kyrgyzstan (North of Bishkek) - Almaty

Location km - Post etc.	Measured Length (m)	Bump Int. (Impulse)	Road Roug. BI (mm/km)	Road Chainage (km)	IRI (m/km)	Condition Category (Visual)	Section Length (km)
1412	53,740			1412.41		3	0.34
	54,500			1413.17		3	0.76
	56,050			1414.72		2 A	1.55
	60,400			1419.07		1 A	4.35
	60,830			1419.50		2 A	0.43
	66,500			1425.17		2 A	5.67
	67,000			1425.67		2 A	0.50
	69,240			1427.91		3	2.24
	69,500			1428.17		2 A	0.26
BEGIN FWD PILOT SECTION 2							
1428	0			1428.00		3	0.24
1429	1,000			1429.00		4	1.00
1430	2,000	223	6935	1430.00	8.4	3	1.00
	2,500			1430.50		4	0.50
1431	2,968			1430.97		4	0.47
	3,000	294	9143	1431.00	10.7	4	0.03
1432	3,959			1431.96		4	0.96
	4,000	331	10294	1432.00	11.9	4	0.04
1433	4,931			1432.93		4	0.93
	5,000	349	10854	1433.00	12.5	4	0.07
1434	5,911			1433.91		4	0.91
	6,000	313	9734	1434.00	11.3	4	0.09
END FWD PILOT SECTION 2							
	76,500			1434.45		3	0.45
	77,500			1435.45		4	1.00
	77,900			1435.85		4	0.40
	78,770			1436.72		3	0.87
	79,000			1436.95		2 A	0.23
	80,550			1438.50		2 A	1.55
1439	81,180			1439.00		3	0.50
1441	180			1441.00		2 B	2.00
1442	1,107			1442.00		1 B	1.00
	1,180	125	4294	1442.07	5.5	1 B	0.07
	2,180	125	4294	1443.07	5.5	1 B	1.00
1443	2,192			1443.09		1 B	0.01
	3,180	121	4156	1444.07	5.3	1 B	0.99
1444	3,203			1444.10		1 B	0.02
	4,180	130	4466	1445.07	5.7	1 B	0.98
1445	4,223			1445.12		1 B	0.04
	5,180	125	4294	1446.07	5.5	1 B	0.96
1446	5,249			1446.14		2 B	0.07
	6,180	156	5359	1447.07	6.7	2 B	0.93
1447	6,275			1447.17		5	0.10
	7,180	310	10649	1448.07	12.3	5	0.90
1448	7,282			1448.18		5	0.10
	8,180	390	13397	1449.07	15.1	5	0.90

PAVEMENT CONDITION DATA

Location km - Post etc.	Measured Length (m)	Bump Int. (Impulse)	Road Roug. BI (mm/km)	Road Chainage (km)	IRI (m/km)	Condition Category (Visual)	Section Length (km)
1449	8,305			1449.20		5	0.13
	9,180	548	18824	1450.07	20.4	5	0.88
1450	9,308			1450.20		2 B	0.13
	10,180	186	6389	1451.07	7.8	2 B	0.87
1451	10,250			1451.14		1 B	0.07
	11,180	122	4191	1452.07	5.4	1 B	0.93
1452	11,310			1452.20		1 B	0.13
	12,180	100	3435	1453.07	4.5	1 B	0.87
1453	12,330			1453.22		1 B	0.15
	13,180	134	4603	1454.07	5.8	1 B	0.85
	14,180	92	3160	1455.07	4.2	1 B	1.00
1455	14,360			1455.25		3	0.18
	15,000			1455.89		3	0.64
1456	15,440			1456.33		3	0.44
	16,180	264	7685	1457.07	9.2	3	0.74
	17,180	133	4569	1458.07	5.8	1 A	1.00
1458	17,490			1458.38		2 A	0.31
	18,180	182	6252	1459.07	7.6	2 A	0.69
1459	18,480			1459.37		2 A	0.30
	19,180	146	5015	1460.07	6.3	2 A	0.70
1460	19,380			1460.27		1 B	0.20
	20,180	126	4328	1461.07	5.5	1 B	0.80
	21,180	135	4637	1462.07	5.9	1 B	1.00
1462	21,570			1462.46		2 B	0.39
	22,180	167	5736	1463.07	7.1	2 B	0.61
1463	22,620			1463.51		2 B	0.44
	23,180	167	5736	1464.07	7.1	2 B	0.56
1464	23,630			1464.52		3	0.45
	24,180	252	8656	1465.07	10.2	3	0.55
1465	24,640			1465.53		2 B	0.46
	25,180	166	5702	1466.07	7.0	2 B	0.54
1466	25,660			1466.55		2 B	0.48
	26,180	181	6217	1467.07	7.6	2 B	0.52
1467	26,670			1467.56		3	0.49
	27,180	227	7797	1468.07	9.3	3	0.51
1468	27,670			1468.56		2 B	0.49
	28,180	185	6355	1469.07	7.8	2 B	0.51
1469	28,690			1469.58		2 B	0.51
	29,180	170	5840	1470.07	7.2	2 B	0.49
1470	29,750			1470.64		2 B	0.57
	30,180	168	5771	1471.07	7.1	2 B	0.43
	31,180	189	6492	1472.07	7.9	2 A	1.00
1472	31,780			1472.67		2 A	0.60
	32,180	196	6733	1473.07	8.2	2 A	0.40
1473	32,730			1473.62		2 B	0.55
	33,180	162	5565	1474.07	6.9	2 B	0.45
	34,180			1475.07		2 B	1.00
Town sign	34,440			1475.33		2 B	0.26
ALMATY							
1475	34,770			1475.66		2 B	0.33

PAVEMENT DATA

TRACECA - PMS

PILOT SECTIONS FOR PAVEMENT MANAGEMENT SYSTEMS

G E O R G I A

Section 1

S 1 (M 1), Tbilisi - Khashuri / Poti

Length of Section 11.5 km, Chainage km 28.2 to 39.7

GEO - 1.1 Thickness of Pavement Layers

Ch. km 29.2	Ch. km 33.7	Ch. km 38.4
40 mm Asphalt (1st layer)	30 mm Asphalt (1st layer)	30 mm Asphalt (1st layer)
110 mm Asphalt (2nd layer)	120 mm Asphalt (2nd layer)	50 mm Asphalt (2nd layer)
250 mm Gravel	100 mm Gravel	120 mm Gravel
Subsoil: Sandy - Clay	100 mm Asphalt	70 mm Asphalt
	50 mm Gravel	80 mm Gravel
	20 mm Asphalt	Subsoil: Sandy - Clay
	130 mm Gravel	
	Subsoil: Sandy - Clay	

GEO - 1.2 Roughness

Chainage [km]	IRI [m/km]
28.20 - 28.65	11.9
28.65 - 29.42	9.2
29.42 - 29.96	11.1
29.96 - 31.16	13.2
31.16 - 32.04	9.0
32.04 - 33.45	10.7
33.45 - 34.50	10.8
34.50 - 35.13	10.6
35.13 - 36.00	11.5
36.00 - 37.28	12.0
37.28 - 38.06	12.2
38.06 - 39.11	11.1
39.11 - 39.70	11.7

PAVEMENT DATA

Section 2

S 4 (M 4), Tbilisi - Azerbaijan Border

Length of Section 12 km, Chainage km 15 (km Post 3 - old numbering) to 27

GEO - 2.1 Thickness of Pavement Layers

Ch. km 23.3	Ch. km 25.9	Ch. km 29.8
50 mm Asphalt (1st layer) 70 mm Asphalt (2nd layer) 430 mm Gravel Subsoil: Sandy - Clay	50 mm Asphalt (1st layer) 30 mm Asphalt (2nd layer) 100 mm Asphalt (old layer) 100 mm Gravel Subsoil: Sandy - Clay	120 mm Asphalt 400 mm Gravel 130 mm Asphalt 50 mm Gravel Subsoil: Sandy - Clay

GEO - 2.2 Roughness

Chainage [km]	IRI [m/km]
15.00 - 15.50	6.1
15.50 - 16.50	8.1
16.50 - 17.50	8.0
17.50 - 18.60	10.5
18.60 - 19.60	9.7
19.60 - 21.00	9.2
21.00 - 22.30	8.5
22.30 - 22.54	19.2
22.54 - 22.85	14.1
22.85 - 23.02	15.3
23.02 - 23.70	15.9
23.70 - 24.15	21.4
24.15 - 25.20	14.1
25.20 - 26.34	13.1
26.34 - 27.00	14.6

PAVEMENT DATA

Section 3

S 6 (M 6), Tbilisi - Marneuli / Armenian Border

Length of Section 12 km, Chainage km 3 (km Post) to 15

GEO - 3.1 Thickness of Pavement Layers

Ch. km 3.6	Ch. km 8.65	Ch. km 12.8
50 mm Asphalt (1st layer) 110 mm Asphalt (2nd layer) 300 mm Gravel Subsoil: Sandy - Clay	150 mm Asphalt 430 mm Gravel Subsoil: Sandy - Clay	45 mm Asphalt 130 mm Asphalt 500 mm Gravel Subsoil: Sandy - Clay

GEO - 3.2 Roughness

Chainage [km]	IRI [m/km]
3.00 - 3.40	7.3
3.40 - 4.40	6.5
4.40 - 5.34	6.2
5.34 - 6.30	12.9
6.30 - 7.00	15.5
7.00 - 7.80	5.2
7.80 - 8.44	7.1
8.44 - 9.18	4.7
9.18 - 9.67	14.4
9.67 - 10.80	7.5
10.80 - 11.90	12.6
11.90 - 13.10	11.2
13.10 - 14.00	5.4
14.00 - 14.28	5.2
14.28 - 15.00	19.8

Т Р А С Е К А : Инспекция моста - Регистрация повреждений
(T R A S E C A : Bridge inspection - Registration of damages)

Номер моста..... Вид:..... Дата инспекции:.....

Страница:.....

№ No	Структурный компонент Structural component	Материал Material	Описание повреждения Kind of damage	Объем Amount	Нахождение повреждения Location	Фот №	Замечания Remarks

TRACECA - IMPLEMENTATION OF BRIDGE MANAGEMENT SYSTEM (BMS)

BRIDGE CONDITION RATING

GUIDELINES FOR THE EVALUATION OF BRIDGE DEFICIENCIES AND DETERMINATION OF BRIDGE CONDITION CLASSES (MARKS OF CONDITION)

Description of Condition	Mark of Condition	Remedial Works
<p>The structure has no or minor, hardly visible damages only.</p> <p>The deficiencies restrict neither separately, nor in summary the stability and/or the traffic safety and/or the durability of the structure.</p> <p>Examples for typical deficiencies:</p> <ul style="list-style-type: none"> • dirty facing areas not allowing visual inspection • minor unevenness/rutting of wearing surfaces (carriageway, walkways etc.) • dirty deck joints (expansion joints), bearings and areas around the bearings, joints of steel structures and walkable interiors of structures • not planned vegetation at/on structure • minor alluviated material and/or scouring • dirty/unlegible traffic signs 	1	Routine maintenance
<p>The structure has clearly visible damages which do not yet affect the stability. Traffic safety is slightly affected.</p> <p>The existing condition of the structure does not fulfil long term requirements on durability.</p> <p>Examples for typical deficiencies:</p> <ul style="list-style-type: none"> • minor damages on the bridge furniture and/or it's corrosion protection (railing, guard rails, marker posts, road lights etc.) • bridge furniture in operational condition, but not in accordance with actual standard requirements (out of date) • minor damages on the invert and slope stabilisation, slope stairs, bridge drainage, deck joints (expansion joints), joint sealings • minor damages on the corrosion protection of structural steel units • medium unevenness/rutting of wearing surfaces (carriageway, walkways etc.) 	2	Routine and period maintenance and/or repair

Description of Condition	Mark of Condition	Remedial Works
<p>The structure has significant damages, which in short term may result separately or in summary in a reduction of stability and/or of traffic safety requiring restriction of use (load restriction, one lane traffic by sign posts/barriers etc.).</p> <p>The existing damages are reducing the durability of the structure.</p> <p>Examples for typical deficiencies:</p> <ul style="list-style-type: none"> • significant damages on railings and covering plates • significant damages on the wearing surfaces of carriageway and walkways • significant unevenness/rutting in the wearing surfaces • significant damages on the corrosion protection and the coating of structural steel units • erosion and corrosion on the superstructure and the substructure with starting reduction of the cross section area of load bearing components • damages on sealings, joint sealings, drainage of bridge and sealing, erosion/scour protection, hindered bearing movement, which may cause considerable other damages • corrosion with reduction of the cross section area of the reinforcement and load bearing steel components • damages, which are the result of partial failure under load (deformation, cracking, deformed structural elements) • railing, safety furniture, wearing surfaces and other units of the bridge furniture are damaged • cable housings are visible, cable housings without grouting, corroded tendons • longitudinal cracks parallel to tendons 	3	Major repairs and/or rehabilitation
<p>The structure has severe damages , which separately and/or in summary reduce the stability and/or restrict the traffic safety.</p> <p>The durability of the structure is considerably reduced.</p> <p>An immediate restriction of use (load restriction, one lane traffic by sign posts/barriers etc.) and/or an immediate removal of the dangers for the restoration of the traffic safety is required.</p> <p>Examples for typical deficiencies:</p> <ul style="list-style-type: none"> • failure of tendons • significant damages on main load bearing components which are the result of partial failure under load (deformation, cracking in the area of coupling joints, significant cracks parallel to tendons, deformed fastener) • railing, safety furniture, wearing surfaces and other units of the bridge furniture have damages affecting their function considerably • structural units have damages, which cause an acute danger for the traffic (e.g. reduction of the clearance, parts of the structure which may fall on the road) 	4	Rehabilitation or reconstruction

APPENDIX 3

- Axle Load Survey

SUMMARY OF AXLE LOAD SURVEY RESULTS IN SELECTED TRACECA STATES

Vehicle type	Vehicle nationality	Country of survey	Sample size	Mean Weight (tonnes)					GVW	ESA / vehicle
				Axle 1	Axle 2	Axle 3	Axle 4	Axle 5		
Large Bus	C.I.S	Uzbekistan	8	4.27	8.21				12.48	1.0997
Large Bus	C.I.S	Kyrgyzstan	9	3.04	5.05				8.09	0.1660
Large Bus	C.I.S	Kazakhstan	8	3.43	5.57				9.00	0.2481
Large Bus	C.I.S	Azerbaijan	8	4.97	8.35				13.32	1.2341
Large Bus	C.I.S	Georgia	5	4.73	9.54				14.27	1.9811
Large Bus	Other	Georgia	4	5.46	9.23	4.50			19.19	1.9299
Large Bus	All	Georgia	9	5.05	9.40	4.50			18.95	2.0001
Truck 2-axle	C.I.S	Uzbekistan	170	3.00	4.97				7.97	0.1559
Truck 2-axle	Other	Uzbekistan	6	6.14	12.08				18.22	5.1235
Truck 2-axle	All	Uzbekistan	176	3.13	5.25				8.39	0.1930
Truck 2-axle	All	Kyrgyzstan	118	2.28	4.08				6.38	0.0686
Truck 2-axle	All	Kazakhstan	109	2.35	3.61				5.96	0.0453
Truck 2-axle	All	Azerbaijan	121	2.91	4.71				7.62	0.1272
Truck 2-axle	C.I.S	Georgia	105	2.73	4.34				7.07	0.0925
Truck 2-axle	Other	Georgia	3	3.45	6.62				10.07	0.4651
Truck 2-axle	All	Georgia	108	2.75	4.40				7.15	0.0974
Truck 3-axle	C.I.S	Uzbekistan	195	3.74	4.24	4.23			12.19	0.1892
Truck 3-axle	Other	Uzbekistan	2	4.07	2.67	2.66			9.40	0.0846
Truck 3-axle	All	Uzbekistan	197	3.74	4.23	4.22			12.17	0.1879
Truck 3-axle	All	Kyrgyzstan	72	3.76	4.12	3.98			11.87	0.1667
Truck 3-axle	All	Kazakhstan	128	3.68	4.28	4.11			12.07	0.1814
Truck 3-axle	All	Azerbaijan	258	3.62	4.24	4.16			11.99	0.1792
Truck 3-axle	C.I.S	Georgia	116	3.79	4.81	4.84			13.44	0.2910
Truck 3-axle	Other	Georgia	29	4.71	9.56	7.78			22.05	2.8213
Truck 3-axle	All	Georgia	145	3.97	5.76	5.43			15.16	0.5004
Truck 4-axle	C.I.S	Uzbekistan	27	4.27	5.78	3.27	3.69		16.88	0.3943
Truck 4-axle	Other	Uzbekistan	27	5.24	8.51	8.42	7.85		30.02	3.3343
Truck 4-axle	All	Uzbekistan	54	4.75	7.15	5.84	5.81		23.45	1.2237
Truck 4-axle	All	Kyrgyzstan	9	5.41	7.16	5.03	5.23		22.83	1.0991
Truck 4-axle	All	Kazakhstan	8	3.60	4.89	2.98	3.82		15.29	0.2327
Truck 4-axle	All	Azerbaijan	42	4.12	5.31	4.09	4.25		17.77	0.3810
Truck 4-axle	C.I.S	Georgia	11	5.32	7.87	5.33	6.19		24.71	1.5591
Truck 4-axle	Other	Georgia	13	5.54	8.28	7.22	6.90		27.94	2.3967
Truck 4-axle	All	Georgia	24	5.44	8.09	6.36	6.57		26.46	1.9529
Truck 5-axle	C.I.S	Uzbekistan	44	4.09	3.62	3.40	3.34	3.42	17.87	0.1909
Truck 5-axle	Other	Uzbekistan	68	5.13	6.21	5.97	7.19	7.40	31.89	2.0573
Truck 5-axle	All	Uzbekistan	112	4.72	5.19	4.96	5.68	5.84	26.38	0.9092
Truck 5-axle	All	Kyrgyzstan	17	4.23	4.14	4.45	4.30	4.38	21.26	0.3870
Truck 5-axle	All	Kazakhstan	56	4.00	3.70	3.70	3.17	3.17	17.35	0.1882
Truck 5-axle	All	Azerbaijan	92	4.01	4.23	3.97	4.01	4.05	20.28	0.3058
Truck 5-axle	C.I.S	Georgia	23	4.22	4.56	3.73	5.48	4.35	22.34	0.4969
Truck 5-axle	Other	Georgia	18	4.98	6.69	5.19	4.78	4.95	26.59	1.0073
Truck 5-axle	All	Georgia	41	4.55	5.49	4.37	5.17	4.62	24.20	0.6477

Source: Axle load surveys undertaken under Consultants' supervision

Note: Other (non-C.I.S) international trucks are mainly from Turkey or Iran.

GVW - gross vehicle weight

ESA - pavement damage factor based on the fourth power law.

APPENDIX 4

- Seminars

PROJECT TITLE :	Traceca Project - Implementation of Pavement Management Systems
PROJECT NUMBER :	TELREG 9305
COUNTRY :	The Southern Republics of the CIS and Georgia

SEMINAR ON BITUMINOUS BOUND MATERIALS
EVALUATION OF METHODS, TECHNOLOGIES AND RELATED STANDARDS IN THE RECIPIENT STATES AND COMPARISON WITH EUROPEAN AND OTHER WESTERN METHODS, TECHNOLOGIES AND STANDARDS

1. PAVEMENT DESIGN

- design criteria
 - the main aim of the pavement design should be to get a
 - ride comfort acceptable to road users and
 - acceptable and affordable to the economy of the country
 - the surface deflection should be limited
- characterisation of asphalt layers, treated and untreated base course, subbases and subgrade
- design procedures
 - computational procedures
 - empirical procedures
- assessment of existing design technics in comparison with western empirical design procedures
 - acc. Standard of former Soviet Union compared with
 - American (AASHO)
 - Japanese
 - Canadian
 - (German Standard)
- discussion of suggestions and proposals for desirable changes and adaptations to special requirements of the single country

2. MATERIALS

- general requirements for materials as aggregates and bitumen used for asphalt concrete production
- available materials
- asphalt job mix design criteria and laboratory testing
- discussion of existing situation and suggestions for possible improvements

3. QUALITY CONTROL

- aim of quality control
- when, where, why controlling and testing is done by whom
- discussion of existing situation in comparison with quality requirements

4. ASPHALT PRODUCTION and PAVEMENT PLACING TECHNIQS

- asphalt products for road construction
- asphalt mixing plants
- asphalt paving and compaction procedures
- discussion of existing situation

5. REHABILITATION OF ASPHALT PAVEMENT

- technics and methods in relation to the severity of road deterioration

Assessment of road condition

- surface condition
- bearing capacity
- pavement composition
- pavement structure condition

- pavement distress, reasons for the deterioration of roads

- maintenance, repair, replacement and overlays on pavement surfaces

- discussion of present maintenance procedures and suggestions of improvement

6. RECYCLING TECHNIQS and METHODS of ASPHALT CONCRETE

- cold and hot recycling, advantages and disadvantages

- conventional methods

- mix in place recycling

Objectives of this method

- Improvement of load bearing capacity
- Improvement of frost resistance

Advantages of this method

- Avoidance of waste road construction material
- Saving of natural resources
- Reduction of material transports
- Protection of other rural / public roads in the area

- reshape, repave, remix technics

- discussion of existing situation and possibilities of improvement

PROJECT TITLE :	Traceca Project - Implementation of Pavement Management Systems
PROJECT NUMBER :	TELREG 9305
COUNTRY :	The Southern Republics of the CIS and Georgia

**SEMINAR ON ROAD SAFETY AND ROAD DESIGN ASPECTS
EVALUATION OF RELEVANT ROAD SAFETY AND ROAD DESIGN STANDARDS
FOR THE TRACECA ROADS (MAGISTRALE) IN THE RECIPIENT STATES AND
COMPARISON WITH EUROPEAN STANDARDS**

1. ROAD CATEGORIES AND DESIGN SPEEDS

1.1 Soviet Union Road Standard 2.05.02-85, 1986

CATEGORY	DESIGN SPEED [Km/h]		
	NORMAL	WINDING TERRAIN	DIFFICULT TERRAIN
I - a	150	120	80
I - b	120	100	60
II	120	100	60
III	100	80	50
IV	80	60	40
V	60	40	30

1.2 German Standard RAS-Q, 1982

C A T E G O R Y		DESIGN SPEED [km/h]
GROUP CATEGORY	ROAD CATEGORY	
A MAGISTRALE, outside populated areas	A I long distance/international link	90 - 120
	A II regional link	80 - 120
	A III interurban link	60 - 80 (100)
	A IV major infrastructure link	60 - 80
B HIGHWAYS, around or through towns	B II major highway	(60) 70 - 80
	B III main highway	(50) 60 - 70
	B IV highway	50 - 60
C MAJOR URBAN ROADS	C III MAJOR ROAD (highway)	50 (- 70)
	C IV main road	(40) 50 (60)
D URBAN MAIN ROADS	D IV main road	40 - 50
	D V main street	none
E URBAN ACCESS ROADS	E V street	none
	E VI lane	none

Values in (...) = Exceptions

2. DETAILS FOR ROAD CATEGORY 'A' (MAGISTRALE)

2.1 Soviet Union Road Standard 2.05.02-85, 1986

CAT	TRAFFIC VOLUME (ADT) [veh./day]	DESIGN SPEED [Km/h]			LANES		SHOULDER	MEDIAN	TOTAL ROAD WIDTH
		NORM.	WIND.	DIFF.	NO.	WIDTH	TOTAL(PAVED)	TOTAL(PAVED)	
I-a	>14000	150	120	80	8	3.75 m	3.75 m (0.75m)	6.00 m (1.00m)	43.50 m
					6	3.75 m	3.75 m (0.75m)	6.00 m (1.00m)	36.00 m
					4	3.75 m	3.75 m (0.75m)	6.00 m (1.00m)	28.50 m
I-b	>14000	120	100	60	8	3.75 m	3.75 m (0.75m)	5.00 m (1.00m)	42.50 m
					6	3.75 m	3.75 m (0.75m)	5.00 m (1.00m)	35.00 m
					4	3.75 m	3.75 m (0.75m)	5.00 m (1.00m)	27.50 m
II	6000-14000	120	100	60	2	3.75 m	3.75 m (0.75m)	--	15.00 m
III	2000-6000	100	80	50	2	3.50 m	2.50 m (0.50m)	--	12.00 m
IV	200-2000	80	60	40	2	3.00 m	2.00 m (0.50m)	--	10.00 m
V	<200	60	40	30	1	(2.25m)	1.75 m (--)	--	8.00 m

2.2 German Standard RAS-Q, 1982

ROAD CAT.	TRAFFIC VOLUME (ADT) [veh./day]	DESIGN SPEED [km/h]	LANES		SHOULDER	MEDIAN	TOTAL ROAD WIDTH	NOTE
			NO	WIDTH	TOTAL (PAVED)	TOTAL (PAVED)		
A I	45 - 61000	100-120	6	3.75 m	4.50 m (3.00 m)	6.00 m (2x1.00m)	37.50 m	i
	29 - 39000	100-120	4	3.75 m	4.50 m (3.00 m)	5.00 m (2x0.50m)	29.00 m	ii
	14 - 27000	90-100	2	3.75 m	3.25 m (1.75 m)	--	14.00 m	iii
A II	54 - 66000	90-100	6	3.50 m	4.00 m (2.50 m)	4.00 m (2x0.50m)	34.00 m	iii
	35 - 42000	90-100	4	3.50 m	4.00 m (2.50 m)	4.00 m (2x0.50m)	26.00 m	
	22 - 27000	80-100	2	3.75 m	3.25 m (1.75 m)	--	14.00 m	
	14 - 21000	80-100	2	3.75 m	2.25 m (0.25 m)	--	12.00m	
A III	33 - 42000	80 (-100)	4	3.25 m	2.00 m (0.50m)	3.00 m (2x0.50m)	20.00 m	v
	11 - 21000	60-80	2	3.25 m	1.75 m (0.25m)	--	10.00 m	
A IV	11 - 14000	60-80	2	3.00 m	1.50 m (--)	--	9.00 m	v

- NOTES:**
- (i) 1995 (draft) revision of standard for total width of 35.50 m:
 - width of right lane 1 x 3.75 m and left lanes 2 x 3.50 m
 - width of median 5.00 m (2x0.75m paved)
 - (ii) 1995 (draft) revision of standard for total width of 29.50 m:
 - width of shoulder 4.75 m (3.25m paved)
 - width of median 5.00 m (2x0.75m paved)
 - (iii) 1995 (draft) revision of standard for total width of 15.50 m:
 - no. of lanes 3 (2+1 alternating)
 - width of single (1) lane 1 x 3.75 m with shoulder 2.75 m (0.25m paved)
 - width of double (2) lanes 1 x 3.50 m (right) + 1 x 3.25 m (left) with shoulder 1.75 m (0.25m paved)
 - width of "median" 0.50 m (paved)
 - (iv) 1995 (draft) revision of standard for total width of 10.50 m:
 - width of lane 3.50 m
 - width of shoulder 1.75 m (0.25m paved)
 - (v) 1995 (draft) revision of standard for total width of 9.50 m:
 - width of lane 3.00 m
 - width of shoulder 1.75 m (0.25m paved)

3. SELECTED ROAD SAFETY AND ROAD DESIGN ASPECTS

- sequence of radii for horizontal alignment
- size of horizontal curve after straight road section
- junctions incl. approaches and slowing down / acceleration lanes
- road marking (materials, 2+1 lane roads, etc.)
- traffic signs
- safety of pedestrians and road users for town passages of roads with high traffic volume
- emergency escape lanes at extended descends
- winter maintenance
- public promotion / information programmes

4. ENFORCEMENT OF REGULATIONS

4.1 Point System for Violation of Traffic Regulations (Germany)

In addition to fines a central register has been installed for supervising repeated violations. Registration is done for all fines above 55 US\$. Samples of the point system are shown in the table below.

VIOLATION	POINTS	NOTE
Exceeding of speed limit in towns		
21 - 25 km/h	●	
26 - 30 km/h	●●●	
31 - 40 km/h	●●●	
41 - 50 km/h	●●●●●	i
51 - 60 km/h	●●●●●	i
> 60 km/h	●●●●●●	ii
Driving under the influence of alcohol		
0.8 - 1.1 ‰	●●●●	
> 1.1 ‰	●●●●●●	
Exceeding technical vehicle check > 8 months	●●	
Driving without valid driving licence	●●●●●●	
Driving without valid third party insurance	●●●●●●	
Misuse of number plate	●●●●●●	
Bad signalisation of broken down vehicle	●●	
Worn out tyres (< 1.6 mm)	●●●●	
Disappearance of accident site	●●●●●●●	
Dangerous overtaking	●●	
Disregarding NO OVERTAKING sign	●●●●	
Disregarding STOP sign	●●●	
Disregarding RED traffic light	●●●	
Insufficient space to vehicle in front	●●●●	
Aggressive closing up and use of flashing light	●●●●●●●	
Driving without light in fog or heavy rain	●●●	
Turning or reversing on a motorway	●●●●	
Right-hand side overtaking outside towns	●●●	

NOTES: (i) One month confiscation of driving licence in addition
(ii) Two months confiscation of driving licence in addition

Action is taken by the central register department at a

SUM OF 9 POINTS: A warning letter is issued and advise is given to attend a training course, which attendance results in the deletion/reduction of 4 points.

SUM OF 14 POINTS: The theoretical and in some cases the practical examination test for the driving licence has to be repeated.

SUM OF 18 POINTS: A medical - psychological examination is required. Non-appearance is equal to not being qualified for a driving licence, which will then be confiscated.

4.2 Violation of Load Regulations (Germany)

For vehicles with a gross weight of >7.5 tons the following fines apply when the maximum gross weight or the allowable maximum axle load is exceeded.

EXCESS		FINE	
> 5 %			70 US\$
> 10 %			80 US\$
> 15 %			90 US\$
> 20 %			140 US\$
> 25 %			200 US\$
> 30 %			270 US\$

In cases with an excess of >30 % unloading might be required.