

**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**

**P R O G R E S S R E P O R T N O . 4**

**FOR THE PROJECT PERIOD JANUARY TO MARCH 1997**

**APRIL 1997**

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

in association with

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

**PHØNIX  
Pavement Consultants  
Vejen / Denmark**

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Directorate General I A  
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Tacis IA/C/7

Attn. Mr. D. Stroobants

Ref:

Koblenz

243/Wei-ns/2369

23.04.1997

Dear Sir,

***TRACECA Project: Implementation of Pavement Management Systems  
Project Number. TELREG 9305  
Progress Report No. 4***

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We take pleasure in submitting to you the progress report no. 4 for the period January to March 1997. The report includes data and information about the activities for

- (i) Implementation of Pavement Management Systems in the 8 recipient states
- (ii) Addendum No. 1
  - Transit Roads - Armenia, Azerbaijan & Georgia
  - Tedjen - Mary Road Improvement in Turkmenistan
  - Purchase of Equipment and Training (PMS/BMS)

The report is submitted in six copies, five bound and one loose leaf. An advance copy has been forwarded by E-Mail to the Tacis Coordinating Units in the eight recipient states as well as to the Tacis Monitoring & Evaluation Central Asia in Almaty.

The Russian version is presently under translation and will be submitted together with the diskette as soon as completed.

Yours faithfully

KOCKS CONSULT GMBH  
Consulting Engineers



Werher P. Weiler

**Copies to: Tacis CU, all 8 recipient states**

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PROGRESS REPORT NO. 4

**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 |
|----------------|---------------|

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## COVER PAGE 2

PROGRESS REPORT NO. 4

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|                |   |  |
|----------------|---|--|
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PROGRESS REPORT NO. 4

| Local Operator | EC Consultant |
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PROGRESS REPORT NO. 4

| Local Operator | EC Consultant |
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|                |                                   |  |
|----------------|-----------------------------------|--|
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PROGRESS REPORT NO. 4

Date of report : 23. April 1997

Reporting period : January 1997 to March 1997

Author of report: Ulrich Willems, Highway Engineer & Team Leader (Kocks Consult GmbH)

|                                |        |             |        |
|--------------------------------|--------|-------------|--------|
| EC M & E Team                  |        |             |        |
|                                | (name) | (signature) | (date) |
| EC Delegation                  |        |             |        |
|                                | (name) | (signature) | (date) |
| TACIS Bureau<br>(Task Manager) |        |             |        |
|                                | (name) | (signature) | (date) |

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| CV Eleftherios Chrissochou   |             |



## 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                   |

### **(i) Implementation of Pavement Management Systems**

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 on and review of bitumen bound products, road safety and road design aspects
  - Study of the cost and financing of road usage
  - Study tour to Western Europe
- Project activities since start :
- Project Preparation, co-ordinating meetings with TACIS/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, comprehensive training of counterparts including data entry, preparation of data base and data evaluation .
  - Collection and evaluation of road surface/road pavement and bridge condition data together with counterparts (on-the-job training)
  - Collection of transport economic, road use cost data incl. traffic counts, axle load survey, study and analysis
  - Seminars on and review of
    - bitumen bound materials and related technology (pavement design, quality control, recycling techniques).
    - road safety and road design aspects (road geometry, signalisation, winter maintenance).
    - study tour to Western Europe in November 1996.

**(ii) Addendum No. 1**

- Component 1: Transit Roads - Armenia, Azerbaijan & Georgia
- TA-AR, Armenia, technical assistance for road and bridge maintenance  
 FS-AZ, Azerbaijan, feasibility study for rehabilitation of transit roads  
 FS-GE, Georgia, feasibility study for rehabilitation of transit roads
- Component 2: TM-TM, Turkmenistan, Preparation of a road improvement project, Ashgabat to Mary (Section Tedjen to Mary)
- Component 3: PMS, Purchase of road testing equipment and training (PMS/BMS)

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

Project duration : 12 months + 9 months (Addendum 1) = 21 months

## **2. SUMMARY OF PROJECT PROGRESS SINCE START**

### **2.1 Commencement of Services**

#### **(i) Implementation of Pavement Management Systems**

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 previous reports the commencement of the consultancy services was delayed to middle of March 1996 due to the cold winter weather in the southern CIS states.

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. In order to catch up the lost time a second/additional group of specialists commenced in the Caucasus area middle of April 1996.

#### **(ii) Addendum No. 1**

##### TM - TM

The project activities for the Tedjen - Mary road in Turkmenistan commenced with the arrival of the Consultant's staff in Ashgabat on 12 November 1996. After setting up the logistics the consultancy services commenced in co-operation with the Concern Turkmenautoellari and the Institute Turkmendorproyekt. Details of the preparations and commencement are summarised in the Inception Report (TM-TM) of January 1997.

##### FS-AZ

Middle of December 1996 commencement meetings in Baku were held to prepare the activities for the feasibility study and consequently activities started in co-operation with Azeravtoyul in beginning of January 1997. Details of the preparations and commencement are described in the Inception Report (FS-AZ) of March 1997.

##### FS-GE

After commencement meetings in January 1997 the start of the Consultant's activities and the field works respectively were delayed by winter conditions. Details are summarized in the Inception Report (FS-GE) of March 1997.

##### TA-AR

Technical assistance is provided to the Armenian Road Directorate (ARD), for preservation of the Armenian road network. The technical assistance is closely linked to a loan package from the World Bank. The Bank had expressed interest in the preparation of the TA, and a meeting was held in Jerewan on 18.03.1997 in the ARD, to harmonise the TOR with present requirements. A task description will be submitted for comment by all partners.

## 2.2 Activities and Project Progress

### (i) **Implementation of Pavement Management Systems**

The project part for implementation of the PMS/BMS has been completed except for some field works in Tadjikistan and the handing over of the road testing equipment.

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
- 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 and programme system each was delivered to the 8 recipient states
- optimisation (HDM IV modules, Windows '95) and translation into Russian of the PMS/BMS programme system
- seminars for introduction of PMS/BMS followed by comprehensive training

#### ***Transport Economics and Road Use Cost Aspects***

- 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 and road design aspects
- study tour to Europe in November 1996

#### ***Equipment***

- one axle weigh bridge was handed over to the recipient institute in Turkmenistan

### (ii) **Addendum No. 1**

#### **TM - TM**

Field works including topographical survey, geotechnical investigations, Falling Weight Deflectometer (FWD) survey, traffic survey, road surface/pavement and bridge condition survey were completed. Equipment for the soils & materials laboratory equipment was purchased and laboratory testing including on-the-job training of local staff commenced. The evaluation of data continued, the Consultant's CARD (**C**omputer **A**ided **R**oad **D**esign) system was installed and road designs commenced. Further details of the progress are described in the project progress reports.

FS-AZ, FS-GE

The activities commenced in January 1997, with collection of data, consultations, traffic surveys, road condition and bridge condition surveys, geotechnical surveys. These field works were interrupted several times by inclement weather, frost and snow. On several occasions, the field teams had to abandon works to return to the office because of snow, which also caused closure of the main road from Azerbaijan to Georgia. Frosty and snowy conditions lasted into early April. It was therefore not possible to conduct the Falling Weight Deflectometer Survey before April 10, because the ground temperature in the pavement layers must be above 5°C. The FWD survey commenced on 10 April, and measurement in Azerbaijan was completed on 20 April 1997, and the survey continued in Georgia on 21. April 1997. By 20 April all field surveys in Azerbaijan were completed. Testing of soils and pavement samples continues.

In order to expedite the service to make-up from time lost due to inclement weather, we enforced the field team by delegating one additional geotechnical expert to Georgia during the month of April 1997. Mr. Chrissochou has planned the geotechnical field testing, sampling, and laboratory testing, and carried out the services together with the national counterpart team. The CV of Mr. Chrissochou is attached with request for approval.

In Azerbaijan, the EBRD expressed interest in financing the Kazi Magomet - Kurdemir road section (80 km) on the Ashgabat - Georgian border transit road. Upon request by the coordinator of the Azerbaijan Government and by the EBRD, we cooperate directly with the EBRD's requests for fulfilling their requirements. In particular, a detail environmental audit is presently being carried out. The schedule of measures will be discussed with the EBRD and the Azeravtoyul.

TA-AR

The task description for roads maintenance by contract experts will be drawn up and submitted to the ARD for comment and approval. As soon as agreed, the experts will be delegated to Jerewan.

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

#### **(i) Implementation of Pavement Management Systems**

In Tadjikistan the field works and one seminar which could not be carried out due to the described constraints in 1996 are planned to be completed in the next reporting period. The field works will include Falling Weight Deflectometer (FWD), roughness measurements and surface distress recording of the existing pavement for the 30 km pilot road section.

On advise of Tacis the road testing equipment (FWD, bump integrator, tripmeter) will be handed over to the final recipient.

Upon final comments on the draft final report of the STUDY OF THE COST AND FINANCING OF ROAD USAGE the final study report will be prepared. After completion of the field works and data collection the final project report will be prepared.

#### **(ii) Addendum No. 1**

##### TM - TM

Detailed engineering designs and tender documents for improvement of the 145 km Tedjen - Mary road will be completed and submitted. Procurement services will be provided for tendering and bid evaluation. Technical assistance to Turkmenautoellari will be provided for strengthening road maintenance capability.

##### FS-AZ and FS-GE

Field works and data collection will be completed for 450 km and 465 km transit roads in Azerbaijan and Georgia respectively. For the feasibility studies the engineering/technical solutions for rehabilitation of the transit roads will be studied and determined and their economic feasibility will be evaluated.

##### TA-AR

The present system for execution of road and bridge maintenance in Armenia will be reviewed including the organisational set up, the equipment, standards for implementation and the financing. After review and evaluation proposals/recommendation for improvement will be prepared including possibilities for privatisation.

##### PMS

One additional set of road testing equipment complying with the requirements of the previously introduced software of the PMS will be provided and handed over to the final recipient.

Further training in data collection and the use of the PMS and BMS programme system will be provided to the TRACECA states.

## **4. PROJECT PROGRESS IN REPORTING PERIOD**

### **4.1 Introduction**

#### **4.1.1 Implementation of Pavement Management Systems**

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. One month later in middle of April 1996 a second/additional group of the Consultant's specialists commenced activities in the Caucasus area and the lost time has been caught up and according to the contract schedule the consultancy services were substantially completed until end of December 1996 with the exception of some activities in Tadjikistan which had to be postponed due to the described constraints.

#### **4.1.2 Addendum No. 1**

The contract for the Addendum No. 1 was notified on 21 October 1996 and included a 9 months increase of the duration of the contract resulting in a total duration of 21 months.

The Consultant's activities commenced for the Tedjen - Mary road improvement project in Turkmenistan (TM-TM) on 12 November 1996.

Middle of December 1996 commencement meetings were held with the recipient institute in Baku/Azerbaijan and the activities for the feasibility study of transit roads (FS-AZ) commenced in January 1997.

In February 1997 heavy snowfall hampered the start of the Consultant's activities and the field works respectively for the feasibility study of transit roads in Georgia (FS-GE). However, efforts were made to overcome this initial difficulties and no delays in the project schedule arose.

### **4.2 Mobilisation**

#### **4.2.1 Implementation of Pavement Management Systems**

##### ***Consultant's Personnel***

Upon completion of their activities for this project part several of the Consultant's personnel continued activities in the project components of the Addendum and other team members returned to the Consultant's head office to complete the compilation of field data, to prepare project reports as well as to co-ordinate and to back-up the activities of the project components of the Addendum.

### ***Equipment for Field Works***

According to the consultancy agreement the equipment for the field works was further used for the project components of the Addendum.

#### **(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. dunning 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.

After completion of axle load surveys and approval of Tacis/Brussels the axle weigh bridge was handed over to the recipient institute in Turkmenistan. Turkmenistan was recommended because on the one hand the axle weigh bridge provided with the funds of the Project should remain in Central Asia (one axle weigh bridge provided by another project is available in the Caucasus area) and on the other hand most of the international traffic which goes to the northern TRACECA states (Uzbekistan, Kazakhstan, Kyrgyzstan) passes through Turkmenistan as the traffic surveys proved. Therefore an effective control and monitoring can be carried out by locating the equipment in Turkmenistan.

### **4.2.2 Addendum No. 1**

Details of the mobilisation in Turkmenistan are summarised in the Inception Report (TM-TM) of January 1997, which was submitted to Turkmenautoellari in Ashgabat and the European Bank for Reconstruction and Development (EBRD) in London according to the Terms of Reference. Further complementary copies were forwarded to Tacis/Brussels as well as to Tacis CU in Ashgabat.

The activities in Azerbaijan are described in an Inception Report (FS-AZ) of March 1997.

An Inception Report (FS-GE) dated March 1997 summarized the mobilisation for the feasibility study in Georgia.



### **4.3 Activities during the Reporting Period January to March 1997**

#### **4.3.1 Implementation of Pavement Management Systems**

During the last reporting period field works and data collection was completed with the exception of some activities in Tadjikistan as described in Progress Report No. 3.

The main activities during the present reporting period from January to March 1997 comprised field surveys and collection and compilation of data and reporting.

In beginning of January 1997 the report on REVIEW OF ROAD DESIGN STANDARDS was submitted and distributed in the English and Russian versions. The report included the two main topics

- (i) Bituminous Bound Materials
- (ii) Road Design

Under this two headings an analysis of existing design procedures and practices in the TRACECA states with comparison to Western European design procedures and practices was prepared as well as recommendation for improvement of those in the TRACECA states.

First comments on the STUDY OF THE COST AND FINANCING OF ROAD USAGE were received and in response further details and explanations were prepared and forwarded.

### **4.4 Tables**

Since the activities for the project part 'Implementation of Pavement Management Systems' were substantially completed during the previous progress period and as described above during the present project period the main activities comprised the compilation of data and reporting this Progress Report No. 4 does not include the tables 'PROJECT PROGRESS REPORT', form 2.2. All other information is summarised in the tables (forms 2.3 and 2.4) below.

**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 : 01/1997 - 03/1997   |  | Prepared on : 04/1997          |                                | 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               |                    |  |
| <b>PERSONNEL</b>  |  |                                |                                |   |                                       |                    |  |
| Project Manager   | 20 man-days                                  | 0 man-days                     | 0 man-days                     | 20 man-days   | 0 man-days                            |                    |  |
| Team-Leader<br>(Central Asia + Caucasus)                                      | 10.18 man-months                             | 0 man-months                   | 0 man-months                   | 12.68 man-months  | - 2.5 man-months                      |                    |  |
| Transport Economist   | 8.00 man-months                              | 0 man-months                   | 0 man-months                   | 8.00 man-months   | 0 man-months                          |                    |  |
| Traffic Engineer  | 15 man-days                                  | 0 man-days                     | 0 man-days                     | 0 man-days  | 15 man-days                           |                    |  |
| FWD and PMS/BMS Specialists   | 9.82 man-months<br>(7.27 months + 56 days)   | 0 man-months                   | 0 man-months                   | 9.50 man-months   | 0.32 man-months                       |                    |  |
| Engineering Coordinator   | 10.18 man-months                             | 0 man-months                   | 0 man-months                   | 10.18 man-months  | 0 man-months                          |                    |  |
| Structural Engineer and Bridge Specialist                                     | 12.00 man-months<br>(10.18 months + 40 days) | 0 man-months                   | 0 man-months                   | 7.35 man-months   | 4.65 man-months                       |                    |  |
| Asphalt Specialist  | 24 man-days                                  | 0 man-days                     | 0 man-days                     | 39 man-days<br>+ 1.75 man-months                        | -15 man-days and<br>- 1.75 man-months |                    |  |
| PMS/BMS Home Office Support   | 24 man-days                                  | 0 man-days                     | 0 man-days                     | 24 man-days   | 0 man-days                            |                    |  |
| PMS/BMS Programmer Software   | 88 man-days                                  | 0 man-days                     | 0 man-days                     | 88 man-days   | 0 man-days                            |                    |  |
| Sub-total   | 50.18 man-months and<br>171 man-days         | 0 man-months and<br>0 man-days | 0 man-months and<br>0 man-days | 49.46 man-months and<br>171 man-days                    | 0.72 man-months and<br>0 man-days     |                    |  |
| <b>EQUIPMENT AND MATERIAL</b>   |  |                                |                                |   |                                       |                    |  |
| Phoenix Falling Weight Deflectometer  | 1  | 0                              | 0                              | 1   | 0                                     |                    |  |
| Portable Axle Weighbridge System  | 1  | 0                              | 0                              | 1   | 0                                     |                    |  |
| Bump Integrator   | 1  | 0                              | 0                              | 2   | 0                                     |                    |  |
| Tripmeter   | 1  | 0                              | 0                              | 2   | 0                                     |                    |  |
| Personnel Computers incl. Ancillaries   | 8  | 0                              | 0                              | 8   | 0                                     |                    |  |
| Laser Printers incl. Ancillaries  | 8  | 0                              | 0                              | 8   | 0                                     |                    |  |
| Software „Windows 95“ package   | 8  | 0                              | 0                              | 8   | 0                                     |                    |  |
| Software „RoSy - PMS/BMS“   | 8  | 0                              | 0                              | 8   | 0                                     |                    |  |
| Sub-total   | 36   | 0                              | 0                              | 38  | 0                                     |                    |  |
| <b>OTHER INPUTS</b>   |  |                                |                                |   |                                       |                    |  |
| MERLIN  | --   | --                             | 0                              | 1   | 0                                     |                    |  |
| Bridge Testing Equipment  | --   | --                             | 0 set                          | 1 set   | 0                                     |                    |  |
| Sub-total   | --   | --                             | 0                              | 2   | 0                                     |                    |  |
| <b>TOTAL</b>  |  |                                |                                |   |                                       |                    |  |

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**OUTPUT PERFORMANCE REPORT**

| Project title : Traceca Project - Implementation of Pavement Management Systems<br>Prepared on: 04/1997  | Project number: TELREG 9305  | Country : The Southern Republics of the CIS and Georgia<br>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><b>REGION: CENTRAL ASIA</b></p>   |  |   |                                     |
| <p><b>STATE 1, UZBEKISTAN</b></p> <p><b>(i) Implementation of PMS/BMS</b><br/>                     Pavement Condition Survey<br/>                     Assessment of Traffic<br/>                     Economic Evaluation and VOC's<br/>                     Bridge Condition Survey<br/>                     Install and Adoption PMS + BMS<br/>                     Recommend Improvements<br/>                     Training and Seminars<br/>                     Provision of PMS + BMS hardware and software<br/>                     Study Tour to Europe</p> | <p>COMPLETED<br/>                     COMPLETED<br/>                     COMPLETED<br/>                     COMPLETED<br/>                     COMPLETED<br/>                     COMPLETED<br/>                     COMPLETED<br/>                     COMPLETED</p> <p>COMPLETED</p> |   |                                     |
| <p><b>(ii) Addendum 1</b><br/>Training</p>   | <p>ON SCHEDULE</p>   |   |                                     |
| <p><b>STATE 2, KYRGYZSTAN</b></p> <p><b>(i) Implementation of PMS/BMS</b><br/>                     Pavement Condition Survey<br/>                     Assessment of Traffic<br/>                     Economic Evaluation and VOC's<br/>                     Bridge Condition Survey<br/>                     Install and Adoption PMS + BMS<br/>                     Recommend Improvements<br/>                     Training and Seminars<br/>                     Provision of PMS + BMS hardware and software<br/>                     Study Tour to Europe</p> | <p>COMPLETED<br/>                     COMPLETED<br/>                     COMPLETED<br/>                     COMPLETED<br/>                     COMPLETED<br/>                     COMPLETED<br/>                     COMPLETED<br/>                     COMPLETED</p> <p>COMPLETED</p> |   |                                     |
| <p><b>(ii) Addendum 1</b><br/>Training</p>   | <p>ON SCHEDULE</p>   |   |                                     |

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**OUTPUT PERFORMANCE REPORT**

|  |   |   |                                     |
|--|---|---|-------------------------------------|
| Project title : Traceca Project - Implementation of Pavement Management Systems<br>Prepared on: 04/1997  | Project number: TELREG 9305   | Country : The Southern Republics of the CIS and Georgia<br>EC Consultant: KOCKS CONSULT GMBH, Koblenz/Germany | Form 2.4, Page : 2                  |
| Output results   | Deviation original plan<br>+ or - %   | Reason for deviation  | Comment on constrains & assumptions |
| <p><b>REGION: CENTRAL ASIA</b></p> <p><b>STATE 3, KAZAKHSTAN</b></p> <p><b>(i) Implementation of PMS/BMS</b><br/>Pavement Condition Survey<br/>Assessment of Traffic<br/>Economic Evaluation and VOC's<br/>Bridge Condition Survey<br/>Install and Adoption PMS + BMS<br/>Recommend Improvements<br/>Training and Seminars<br/>Provision of PMS + BMS hardware and software<br/>Study Tour to Europe</p> <p><b>(ii) Addendum 1</b><br/>Definition of Interface</p> <p><b>STATE 4, TURKMENISTAN</b></p> <p><b>(i) Implementation of PMS/BMS</b><br/>Pavement Condition Survey<br/>Assessment of Traffic<br/>Economic Evaluation and VOC's<br/>Bridge Condition Survey<br/>Install and Adoption PMS + BMS<br/>Recommend Improvements<br/>Training and Seminars<br/>Provision of PMS + BMS hardware and software<br/>Study Tour to Europe</p> <p><b>(ii) Addendum 1</b><br/>Tedjen - Mary Road Improvement<br/>Training</p> | <p>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED</p> <p>COMPLETED</p> <p>ON SCHEDULE</p> <p>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED</p> <p>COMPLETED</p> <p>ON SCHEDULE<br/>ON SCHEDULE</p> |   |                                     |

**OUTPUT PERFORMANCE REPORT**

| Project title : Traceca Project - Implementation of Pavement Management Systems<br>Prepared on: 04/1997   | Project number: TELREG 9305  | Country : The Southern Republics of the CIS and Georgia<br>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><b>REGION: CENTRAL ASIA</b><br/><b>STATE 5, TADJIKISTAN</b><br/><b>(i) Implementation of PMS/BMS</b><br/>Pavement Condition Survey<br/>Assessment of Traffic<br/>Economic Evaluation and VOC's<br/>Bridge Condition Survey<br/>Install and Adoption PMS + BMS<br/>Recommend Improvements<br/>Training and Seminars</p>   | <p>- 40 %<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED</p>                                | <p>Problem at Uzbekistan border post</p>  | <p>FWD and roughness measurement in June 1997</p>                  |
| <p>Provision of PMS + BMS hardware and software<br/>Study Tour to Europe</p>  | <p>COMPLETED</p>   | <p>Problem at Uzbekistan border post</p>  | <p>Seminar on road design and road safety aspects in June 1997</p> |
| <p><b>(ii) Addendum 1</b><br/>Training</p>  | <p>COMPLETED</p>   |   |  |
| <p><b>REGION CAUCASUS</b><br/><b>STATE 1, AZERBAIJAN</b><br/><b>(i) Implementation of PMS/BMS</b><br/>Pavement Condition Survey<br/>Assessment of Traffic<br/>Economic Evaluation and VOC's<br/>Bridge Condition Survey<br/>Install and Adoption PMS + BMS<br/>Recommend Improvements<br/>Training and Seminars<br/>Provision of PMS + BMS hardware and software<br/>Study Tour</p> | <p>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED</p> |   |  |
| <p><b>(ii) Addendum 1</b><br/>Feasibility Study for Rehabilitation of Transit Roads<br/>Training</p>  | <p>ON SCHEDULE<br/>ON SCHEDULE</p>   |   |  |

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**OUTPUT PERFORMANCE REPORT**

| Project title : Traceca Project - Implementation of Pavement Management Systems<br>Prepared on: 04/1997   | Project number: TELREG 9305  | Country : The Southern Republics of the CIS and Georgia<br>EC Consultant: KOCKS CONSULT GMBH, Koblenz/Germany | Form 2.4, Page : 4                  |
|---|--|---|-------------------------------------|
| Output results  | Deviation original plan<br>+ or - %  | Reason for deviation  | Comment on constrains & assumptions |
| <p><b>REGION: CAUCASUS</b><br/><b>STATE 2, GEORGIA</b><br/><b>(i) Implementation of PMS/BMS</b><br/>Pavement Condition Survey<br/>Assessment of Traffic<br/>Economic Evaluation and VOC's<br/>Bridge Condition Survey<br/>Install and Adoption PMS + BMS<br/>Recommend Improvements<br/>Training and Seminars<br/>Provision of PMS + BMS hardware and software<br/>Study Tour to Europe</p> | <p>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED</p> |   |                                     |
| <p><b>(ii) Addendum 1</b><br/>Feasibility Study for Rehabilitation of Transit Roads<br/>Training</p>  | <p>ON SCHEDULE<br/>ON SCHEDULE</p>   |   |                                     |
| <p><b>STATE 3, ARMENIA</b><br/><b>(i) Implementation of PMS/BMS</b><br/>Pavement Condition Survey<br/>Assessment of Traffic<br/>Economic Evaluation and VOC's<br/>Bridge Condition Survey<br/>Install and Adoption PMS + BMS<br/>Recommend Improvements<br/>Training and Seminars<br/>Provision of PMS + BMS hardware and software<br/>Study Tour to Europe</p>                             | <p>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED<br/>COMPLETED</p> |   |                                     |
| <p><b>(ii) Addendum 1</b><br/>Technical Assistance for Road and Bridge Maintenance<br/>Training</p>   | <p>ON SCHEDULE<br/>ON SCHEDULE</p>   |   |                                     |

## **5. PROJECT PLANNING FOR NEXT REPORTING PERIOD**

### **5.1 Planned Activities**

The main activities for the next reporting period from April to June 1997 will be

- completion of the remaining field works in Tadjikistan
- completion of the final design and tender documents for the Tedjen - Mary road improvement project in Turkmenistan (TM-TM)
- continuation of the feasibility study for rehabilitation of transit roads in Azerbaijan (FS-AZ)
- continuation of the feasibility study for rehabilitation of transit roads in Georgia (FS-GE)
- commencement of the technical assistance for road and bridge maintenance in Armenia (TA-AR)
- provision of one further set of road testing equipment and commencement of further/advanced training for PMS/BMS

### **5.2 Tables**

The proposed activities for the next progress period are shown for each of the eight recipient states in the tables (form 1.6) 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: 04/1997 - 06/1997   |   | EC Consultant: KOCKS CONSULT GMBH, Koblenz/Germany |     |  |               |                   |                                 |       |
| Project objectives: Implementation of Pavement and Bridge Management Systems   |   |  |     |  |               |                   |                                 |       |
| No.  | ACTIVITIES  | TIME FRAME   |     |  | INPUTS        |                   |                                 |       |
|  |   | 1997 Months  |     |  | PERSONNEL     |                   |                                 |       |
|  |   | 04   | 05  | 06   | EC Consultant | Counterpart       | EQUIPMENT AND MATERIAL          | OTHER |
|  | <b>Region: Central Asia</b>   |  |     |  |               |                   |                                 |       |
|  | <b>State 1, Uzbekistan</b>  |  |     |  |               |                   |                                 |       |
| 14.  | Training + Seminars   |  |     |  |               |                   |                                 |       |
| 14.6   | PMS/BMS Training (Addendum 1)   |  |     |  | 4.5 weeks     | 4.5 weeks         | FWD, Tripmeter, Bump Integrator |       |
|  | <b>State 2, Kyrgyzstan</b>  |  |     |  |               |                   |                                 |       |
| 28.  | Training + Seminars   |  |     |  |               |                   |                                 |       |
| 28.6   | PMS/BMS Training (Addendum 1)   |  |     |  | 4.5 weeks     | 4.5 weeks         | FWD, Tripmeter, Bump Integrator |       |
|  | <b>State 3, Kazakhstan</b>  |  |     |  |               |                   |                                 |       |
| 41.  | Model Optimization  |  |     |  |               |                   |                                 |       |
| 41.1   | Definition of interface (Addendum 1)  | X X X  | X   |  | 3 weeks       | 3 weeks           |                                 |       |
|  | <b>State 4, Turkmenistan</b>  |  |     |  |               |                   |                                 |       |
| TM-TM  | Preparation of a Road Improvement Project 'Ashgabat to Mary Road, Section Tedjen - Mary' (Addendum 1) | X X X  | X X | X X  | X X           | X X               |                                 |       |
|  | <b>TOTAL</b>  |  |     |  | 12 weeks      | 12 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: 04/1997 - 06/1997   |  | Prepared on: 04/1997        |  |       |  |                        |                                    |
| Project objectives: Implementation of Pavement and Bridge Management Systems   |  |                             |  |       |  |                        |                                    |
| No.  | ACTIVITIES   | TIME FRAME                  |  |       | INPUTS   |                        |                                    |
|  |  | 1997 Months                 |  |       | PERSONNEL  | EQUIPMENT AND MATERIAL | OTHER                              |
|  |  | 04                          | 05   | 06    | EC Consultant  | Counterpart            |                                    |
| <b>Region: Central Asia</b>  |  |                             |  |       |  |                        |                                    |
| <b>State 5, Tadjikistan</b>  |  |                             |  |       |  |                        |                                    |
| 60.1   | Road Cond. Survey + Stand. Def. Roughness measurement              | X X                         |  |       | 1 week   | 1 week                 | Bump Integrator, MERLIN, Tripmeter |
| 62.1   | FWD Survey + Evaluation  | X                           |  |       | 0.5 weeks  | 0.5 weeks              | FWD                                |
| 62.2   | Select representative road sections                                | X X                         |  |       | 1 week   | 1 week                 |                                    |
| 62.3   | Measure + store FWD survey data                                    | X                           |  |       | 0.5 weeks  | 0.5 weeks              |                                    |
| 62.3   | Pavement analysis  |                             |  |       |  |                        |                                    |
| 70.1   | Training + Seminars  |                             |  |       |  |                        |                                    |
| 70.2   | Seminar road safety and design                                     |                             |  | X     | 0.2 weeks  | 0.2 weeks              |                                    |
| 70.6   | PMS/BMS Training (Addendum 1)                                      |                             |  |       | 2 weeks  | 2 weeks                |                                    |
| <b>Region: Caucasus</b>  |  |                             |  |       |  |                        |                                    |
| <b>State 1, Azerbaijan</b>   |  |                             |  |       |  |                        |                                    |
| FS-AZ  | Feasibility study for rehabilitation of transit roads (Addendum 1) | X X X                       | X X X  | X X X | Details are included in the particular project reports |                        |                                    |
| <b>State 2, Georgia</b>  |  |                             |  |       |  |                        |                                    |
| FS-GE  | Feasibility study for rehabilitation of transit roads (Addendum 1) | X                           | X X X  | X X X | Details are included in the particular project reports |                        |                                    |
| <b>State 3, Armenia</b>  |  |                             |  |       |  |                        |                                    |
| TA-AR  | Technical assistance for road and bridge Maintenance (Addendum 1)  |                             |  |       | Details are included in the particular project reports |                        |                                    |
| <b>TOTAL</b>   |  |                             |  |       | <b>5.2 weeks</b>                                       | <b>5.2 weeks</b>       |                                    |



**CURRICULUM VITAE**

- 1. PROPOSED POSITION** : Senior Soils and Materials Engineer
- 2. NAME** : Eleftherios CHRISSOCHOU
- 3. DATE OF BIRTH** : 08. December 1940
- 4. NATIONALITY** : Greek
- 5. EDUCATION** :
- FROM 1964 : TO 1966  
Ewald-Kohle AG, Oberraden, Germany  
Apprenticeship in coal mining, underground practise
- FROM 1966 : TO 1969  
Engineering College for Mining, Bochum, Germany
- 1969 : Graduation to Dipl.-Ing. (Mining Engineer, B. Sc.)
- FROM 1974 : TO 1976  
Civil Engineering College, Konstanz, Germany
- 1976 : Graduation to Dipl.-Ing. (Civil Engineer, B. Sc.)
- 6. OTHER TRAINING** :
- 7. LANGUAGES & DEGREE OF PROFICIENCY** :
- |            | Speak     | Read      | Write     |
|------------|-----------|-----------|-----------|
| German     | excellent | excellent | excellent |
| Greek      | excellent | excellent | excellent |
| English    | very good | very good | very good |
| French     | good      | good      | good      |
| Indonesian | some      | some      | some      |
- 8. MEMBERSHIP OF PROFESSIONAL SOCIETIES** :
- 9. COUNTRIES OF WORK EXPERIENCE** : Benin, Botswana, Gabon, Germany, Grenada, Indonesia, Malawi, Sudan, Tanzania, Togo, Uganda, U. A. E., Yemen

**10. EMPLOYMENT RECORD**

|   |   |  |
|---|---|--|
| 1993                                    | : |  |
| EMPLOYER                                | : | Dr. Ing. Walter, Consulting Engineers, Essen, Germany  |
| POSITION HELD AND DESCRIPTION OF DUTIES | : | <p><u>Senior Soils and Materials Engineer</u> for:</p> <p><b>Tanzania</b><br/>         Road Maintenance Project in the Kilimanjaro Region. Responsible for investigations, laboratory testing and training of local staff.</p> <p><b>Grenada</b><br/>         The Coastal Erosion, Sea Defences and Roads Rehabilitation Studies. Responsible for materials prospection and testing, pavement design and ground stability studies.</p> |
| 1992                                    | : |  |
| EMPLOYER                                | : | Haas Consult GmbH, Hannover, Germany   |
| POSITION HELD AND DESCRIPTION OF DUTIES | : | <p><b>Botswana</b><br/> <u>Geotechnical Engineer</u> for the review of design and tender documents for the 158 km Sekoma - Kang road section of the Transkalahari highway, preparation of new material specifications and working methods for pedogenic material 'calcrete'.</p>   |
| FROM 1988                               | : | TO 1991  |
| EMPLOYER                                | : | Dr. Ing. Walter, Consulting Engineers, Essen, Germany  |
| POSITION HELD AND DESCRIPTION OF DUTIES | : |  |
| 1991                                    | : | <p><b>Yemen</b><br/> <u>Senior Materials Engineer</u> for the supervision of construction of the Al Mahweet, Shibam - Kawkaban roads (80 km).</p>  |
| 1990                                    | : | <p><b>United Arab Emirates</b><br/> <u>Senior Materials Engineer</u> for the supervision of the rehabilitation works of the Musaffah bridge (Abu Dhabi) and construction of 3 km highway (dual carriageway).</p>   |
| FROM 1988 TO 1989                       | : | <p><b>Indonesia</b><br/>         As <u>Geotechnical Engineer</u> responsible for field investigations, preparation of rehabilitation methods, design of retaining structures, cost estimate and supervision of construction of the 142 km West Pasaman road rehabilitation project (KfW).</p>  |

1988 : As Senior Soils and Materials Engineer responsible for investigations, pavement designs and specifications for:

**Uganda**

detailed engineering of the Kampala city roads rehabilitation project (38 km), EC financed.

**Yemen**

detailed design of the Shibam - Al Mahweet, Shibam - Kawkaban Roads (80 km), KfW financed.

FROM 1986 : TO 1987

EMPLOYER : Gitec Consult Consult GmbH, Düsseldorf, Germany

POSITION HELD AND DESCRIPTION OF DUTIES :

**Tanzania and Malawi**

As Senior Soils and Materials Engineer for the 'Northern Corridor Project' responsible for all field exploratory work, including off-shore borings on the transshipment points (Lake Malawi) and pile foundation investigations for storage facilities. Preparation of pavement designs for container stocking areas and access roads.

1986 :

EMPLOYER : Dr. Ing. Walter, Consulting Engineers, Essen, Germany

POSITION HELD AND DESCRIPTION OF DUTIES :

**Yemen**

Senior Soils and Materials Engineer for the feasibility study of the Shibam - Al Mahweet, Shibam - Kawkaban Roads (80 km), KfW financed.

FROM 1978 : TO 1985

EMPLOYER : Gitec Consult GmbH, Düsseldorf, Germany

POSITION HELD AND DESCRIPTION OF DUTIES :

1985 :

**Malawi**

Assistant Resident Engineer for the supervision of construction of the 35 km Nsanama - Nselema Road (KfW).

1984 :

**Sudan**

Senior Materials Engineer for the regravelling and maintenance of the Juba - Maridi Road including design and construction of preventative erosion measures at the Louri Bridge.

- 1983 : **Malawi**  
 As Senior Soils and Materials Engineer responsible for field investigations, preparation of pavement design and specifications for the upgrading of the 35 km Nsanama - Nselema Road (KfW).
- FROM 1981 TO 1983 : **Indonesia**  
Senior Soils and Materials Engineer for the construction of the Sangkulirang - Muara Wahau Road (158 km) in East Kalimantan; road to be built on 'direct labour' by the Highway Authority (BINA MARGA). Responsible for field investigations, quality control and training.
- 1980 : As Senior Soils and Materials Engineer responsible for
- Yemen**  
 field and laboratory investigations for the foundation of pump stations for the Hodeida Water Supply and Sewage Project.
- Germany**  
 research on flexible pavement design for roads in developing countries for optimization of investment costs.
- Tanzania**  
 field investigations including sampling and laboratory testing for the Mbezi Industrial Estate near Dar-es-Salaam.
- Sudan**
- foundation engineering incl. drilling, sampling and laboratory testing, for the Busseri Bridge near Wau,
  - field investigations for the upgrading of the Maridi - Tambura Road (400 km) and the Maridi - Yei Road (200 km). (GTZ)
- 1979 : **Malawi**  
Soils and Materials Engineer for the supervision of construction of the Kacheche - Chiweta Road (71 km). Responsible for quality control of earth works, pavement layers, gabion and reinforced earth retaining walls. (KfW)
- 1978 TO 1979 : **Botswana**  
Soils and Materials Engineer for the supervision of construction of the 80 km Francistown - Serule Road (KfW).
- FROM 1977 : TO 1978
- EMPLOYER : H. P. Gauff, Consulting Engineers, Frankfurt, Germany
- POSITION HELD AND DESCRIPTION OF DUTIES : **Gabon**  
Soils and Materials Engineer for a 30 km section of Chemin de Fer Transgabonaise. Responsible for field investigations (prospection for construction materials, sampling, borings at bridge sites), foundation engineering, slope stability study.

- FROM 1976 : TO 1977
- EMPLOYER : Dorsch Consult Ingenieurgesellschaft, München, Germany
- POSITION HELD AND DESCRIPTION OF DUTIES : **Benin**  
Soils and Materials Engineer for the supervision of construction of the 350 km Parakou - Malanville Road.
- FROM 1970 : TO 1974
- EMPLOYER : Uranerzbergbau GmbH, Bonn, Germany
- POSITION HELD AND DESCRIPTION OF DUTIES : **Togo**  
As Leader of an Uranium Prospection Team, responsible for geological, radiometric and geotechnical field and laboratory tests.
- FROM 1969 : TO 1970
- EMPLOYER : F. Krupp Rohstoffe GmbH, Rheinhausen, Germany
- POSITION HELD AND DESCRIPTION OF DUTIES : **Germany**  
Mining Engineer in uranium prospection, responsible for laboratory tests and designs for open-cast mining.
- 1969 :
- EMPLOYER : Deilmann-Haniel GmbH, Dortmund, Germany
- POSITION HELD AND DESCRIPTION OF DUTIES : **Germany**  
Mining Engineer for the supervision of driving and safety operations of underground mining.