PLANNING, PAVEMENT DESIGN & OVERLOADING PREVENTION WORKSHOP

11th & 12th November 2004
Meeting Hall
Ministry of Rural Development

TECHNICAL ASSISTANCE BY

NRDP
IRAP Component

SUPPORTED BY

Briefing Paper 1
1. Infrastructure Planning, Vehicle Overloading and Road Deterioration

Cambodia’s road network is developing and expanding rapidly with investments in national, secondary and rural roads through a number of programmes and partner projects. The MPWT, responsible for National, Secondary National and Provincial Roads and MRD, responsible for rural roads, face challenges to plan, initiate and manage the road sector development. They are also responsible for the task of maintaining the road investments. A major factor that is affecting the road network nowadays is the critical issue of vehicle overloading, leading to accelerated road deterioration. There are three interrelated challenges that both Ministries face, which are to meet the identified needs for:

- An appropriate infrastructure planning tool
- An economic strategy for road and bridge design
- A cost-effective strategy against overloading

Concerning the planning, the MRD has adopted IRAP (Integrated Rural Accessibility Planning) as a standard planning tool as mentioned in the Second Five Year Socio-Economic Development Plan (SEDP II). Special mention of IRAP was made by Prime Minister Hun Sen. He stated that the MRD has: "the responsibility to prepare local plans aimed at addressing the delivery and management of rural infrastructure through improved accessibility using the methodology of integrated rural accessibility planning as a survey instrument." (Closing speech at the annual conference at MRD, February 28 2001). IRAP provides insight in the location of local resources as well as a classification and prioritisation of the road network and is currently being mainstreamed throughout Cambodia.

Concerning axle loading there is very little information available regarding situation on the road network in Cambodia. It is however evident that overloading is common with examples of survey weighing on main roads of over 20 ESA¹ per two or three axle trucks (a legally loaded three axle truck would have a maximum axle load equivalence of 3 ESA).

Investigations under the PRIP² preparation phase and the Puok Market Low Cost Surfacing Trials have since shown the overloading problem to be serious and wide spread on the Cambodia road network. Truck loading of up to two and half times the legal limit have been recorded.

This level of loading, especially related to construction materials haulage and logging traffic is well beyond the limits of research knowledge of pavement damage by vehicular traffic and established pavement deterioration relationships based on fatigue. The excessive stresses induced in most pavements and foundations by this level of overloading will cause serious problems and asset destruction on the Cambodian road network, costing the country millions of dollars. The risk of deterioration caused by overloaded vehicles will inevitably be higher for

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1  ESA : Equivalent Standard Axle (80 kN)
2  PRIP : Provincial and Rural Infrastructure Project
secondary and tertiary roads, designed and constructed with lighter duty paving if compared to heavy duty national or provincial roads.

There is now recognition of the problem of the chronic deterioration cycle and unsustainable maintenance burden of laterite surfacing in many locations, due to the particular set of conditions and circumstances experienced in Cambodia. Because of this, there will many secondary national, provincial and rural roads that are being, or going to be, upgraded or rehabilitated with light pavement structures regarding low traffic volume. But with the widespread vehicle overloading, there is a risk that those roads will be quickly destroyed or suffer considerably reduced serviceable life and significantly increased maintenance costs. This would give a strong negative image to the economic and social benefits of paved roads and may discourage further public investment in providing a sustainable surfacing to low volume sealed roads. It would also damage the credibility of the Government institutions involved.

It is clear from the Puok Trials and experience elsewhere that some types of paving are better able to resist overloading.

Overloading also causes serious problems to bridges and other structures. There are a number of instances of recent collapses of bridges due to overloaded vehicles. This has major economic and social, as well as asset destruction cost implications.

A Cambodian Road Law is currently being drafted. However, review of the latest version of the document shows that there is no recognition of the current axle loading situation and consequences for road pavement and bridge damage. There is no effective provision for rational monitoring, control, penalisation and deterrence of axle overloading.

The following conclusions are drawn from investigation to date:

- Overloading is common on all categories of road in Cambodia.
- Light or sub-standard road pavements can be quickly destroyed by overloaded trucks. Bridges are also vulnerable to serious damage and collapse by overloaded trucks.
- Pavement design processes in Cambodia do not take adequate account of serious axle overloading situation and Cambodia-specific conditions.
- Some types of paving are able to better resist overloading.
- Currently there is no effective control of overloading in Cambodia.
- Experiences from other developing countries suggest that axle load control is extremely difficult to achieve.
- The proposed regional axle loading regulations will reduce the allowable vehicle loading in Cambodia on main roads. However, they will have very little effect on the actual loading situation and road pavement damage in Cambodia.
- The draft proposed Cambodian Road Law does not recognise the serious axle overloading situation, or provide for an adequate framework to control axle loading.

2. Objective and Scope of the Workshop

Concerning overloading and road deterioration there is an urgent need for a national workshop on infrastructure planning, axle loading and pavement design strategy. This will allow national and international experts in this field to exchange experiences and views and identify options for action, and the needs for further development and research.
The immediate objective will be to inform participants in the fields of infrastructure planning, pavement design and vehicle loading regulations. The long term objective is to assist the Government of Cambodia to develop a pragmatic and economic strategy for road selection, road & bridge design, and management of vehicle loading on the Cambodian road networks. The issues related to road policy, axle load control, management and technical issues of accessibility planning and engineering design of the road pavement will be addressed. The workshop will also identify any further initiatives required. This may be expected to include dimensions of pavement design, traffic restrictions and vehicle/axle load control relating to road category and route purpose.

This important event will bring together the road authorities (MRD, MPWT), provincial and local government, development and funding agencies, NGOs, donors, consultants, road users, road engineers and practitioners, researchers and other key stakeholders both national and international. The Workshop will discuss the key topics relating to Road Planning, and for tackling the Axle Loading problem specific to each category of road. The intention will be to define a strategy for road pavement planning, design and management, and to identify any further investigations and support required.

3. Workshop Themes

The Workshop will cover the following themes:

- Integrated Rural Accessibility Planning
- Local resource identification
- Identification of roads susceptible to overloading
- Cases of Overloading damaged road pavements and bridges on the Cambodian road networks in the past.
- Cost of overloading to transport infrastructure and road users.
- Experiences of overloading control on rural Cambodian network. Are the measures legal?
- Success experiences from other developing countries in controlling axle loads.
- The current overload control management and system in Cambodia.
- Policies regarding axle loading restriction and enforcement for different road classes.
- Who should be involved for effective Monitoring and Controlling of overloaded vehicles for specific road classes.
- Measurement of traffic load and prediction of overloading.
- How to design a pavement with an overloading environment.

4. Call for papers

Authors are invited to offer papers on any of the workshop themes. The workshop languages will be Khmer and English. Abstracts of approximately 250 words and full paper must be submitted electronically or hard copy to the Workshop’s Secretariat. An abstract form (following) should be used to submit the abstracts. The deadline for abstracts and other keys date are given in the Workshop Deadline schedule below. A prize of US$200 will be awarded to the author of the best paper accepted and judged by the Advisory Committee.
5. **Workshop deadlines**

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<th>Date</th>
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<tr>
<td>4 October 2004</td>
<td>1st Announcement and Call for paper</td>
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<td>11 October 2004</td>
<td>Submission of abstracts</td>
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<td>15 October 2004</td>
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<td>31 October 2004</td>
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<td>5 October 2004</td>
<td>Deadline for registration and circulation of workshop programme</td>
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<td>11-12 November 2004</td>
<td>Workshop</td>
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6. **Workshop format and programme**

The Workshop will include general session with paper presentations by authors. There will also be group discussions sessions related to key topics.

According to the workshop deadlines, the programme will be announced/circulated by the workshop's secretariat.

7. **Workshop Venue:**

Meeting Hall at the MRD Headquarters, Phnom Penh.

8. **Exhibition and Poster Display**

Indoor and outdoor space close to the workshop hall will be available for commercial displays and larger exhibits of equipment, literature and poster displays etc. This will provide an excellent opportunity to display and demonstrate new products and equipment to a national audience of transport practitioners.

9. **Workshop secretariat**

The address for the secretariat is:

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<tr>
<td>Ministry of Rural Development</td>
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### 10. Organizing committee

The organizing committee consists of the following persons:

| Chairman | H.E. Suos Kong, PEng, ASEAN Eng, MBA  
| Secretary of State, MRD  
| National Coordinator of DFID-SEACAP Programme  
| Chairman of International Focus Group on Rural Road Engineering  
| Chairman of CNCTP  
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| Secretariat |
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| 1 | Mr. Heng Kackada, Bsc CEng, MSc Transport Infra,  
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Key words relevant to your paper
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