Session 6 - Road sites and operations on networks

Paper :
Impact of road construction and maintenance activities on road users and the adjacent land use

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IMPACT OF ROAD CONSTRUCTION AND MAINTENANCE ACTIVITIES ON ROAD USERS AND THE ADJACENT LAND USE

World Road Association (PIARC)
Committee TC 4.3 on Road Pavements

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INTRODUCTION

PIARC Technical Committee TC 4.3 has established a working group to synthesize information on techniques to reduce the impact of pavement construction, rehabilitation and maintenance activities on road users (driving public and construction workers) and the adjacent land use (homeowners, businesses, etc.). The primary issues are:

- Noise
- Safety (User, Construction Worker)
- Environmental Pollution (air, water, soil)
- Vibration
- Availability of the road (capacity of the road, user costs, permitted working hours, etc)
- Local Properties Impact (access, aesthetics, safety, , odors), etc.

The study is only concerned with the impact of the above items during work activities such as initial construction, rehabilitation and maintenance. All of these items are of particular importance for the urban road environment.

The study included a survey to collect agency information and to summarize and draw conclusions on the impact of road construction and maintenance activities on road users (driving public and construction workers) and the surrounding land use. It is the purpose of this project to exchange knowledge between countries. Typically, the more developed a country, the higher the level of focus on issues such as noise, safety, vibration etc. By exchanging and publishing knowledge and procedures gained from these more developed countries, other countries can learn from these experiences, thus making the transition easier aiming at reducing the impact of road works.

Information being collected as a part of the study includes cost data (e.g. contract costs to improve user or construction worker safety), regulations (e.g. requirements for construction work to take place during weekends or nights), environmental considerations (e.g. dust control), quality/performance (contractor incentives to complete a project earlier to reduce the impact on road users) or special treatments to ensure that local traffic is not adversely impacted by construction activities, etc.

PRELIMINARY SURVEY

In the fall of 2005, a preliminary survey was sent to the representative members of PIARC committee TC 4.3 asking the members about the importance and availability of country and agency information on noise, safety, environmental pollution, availability and nuisances due to road work.

Specifically, the survey asked for specific documentation on regulations, guidelines, best practices and codes of practices. Agencies were asked to describe their regulations and guidelines, if they were prescriptive (method based), end result based or performance based and what they do to measure compliance with the requirements. Agencies were also asked how their current approach was developed, what was done in the past, if it was changed, how it was changed, etc. A key aspect of the survey relates to innovation in the impact of road work and how innovations have been implemented in the past, who was responsible for innovation, e.g. agency or contractor and what future innovations are anticipated.

The respondents rated in importance of each item on a scale of 1 (not important) to 5 (important). A summary of the results of the preliminary information survey are given in Table 1.

Table 1. Summary of Importance of the Impact of Road Work during Various Phases of Design and Construction

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Item	Planning	Design	Production	Transportation	Placement	Maintenance
1) Noise	4	4	3	3	4	4
2) Safety						
User	5	5	5	5	5	5
Worker	4	4	5	5	5	5
3) Pollution						
Air	3	3	5	4	4	4
Water	4	3	4	4	4	4
Soil	3	3	4	4	4	4
4) Vibration	3	3	3	3	3	3
5) Availability						
Capacity	4	4	3	4	4	4
Working Hours	4	4	3	4	4	4
6) Nuisances						
Access	4	4	3	4	4	4
Aesthetics	3	3	2	2	2	2
Lighting	2	2	2	2	4	3
Odors	2	2	2	2	2	2

From the survey, it was noted that safety of both the user and construction workers is of the highest priority in all phases of road design and construction. Lighting, odors and aesthetics are of lower importance.

CASE STUDIES

In order to gain a better understanding on how individual agencies address the impact of pavement construction, rehabilitation and maintenance on road users, agencies were asked to provide examples on how the agency/country would address situations similar to the following case studies.

Case Study 1

The construction project is in a metropolitan city with population of about 500,000 and is 10 km long. It is a major access to the city and has 4 lanes (2 each direction) with at grade access from adjacent roadways. A temporary asphalt and concrete plant will be located in a vacant land just off the project site. The project site is primarily residential but passes by a hospital, an elementary school and a shopping centre. Surface drainage for the roadway is controlled with city storm sewer system.

Case Study 2

The construction project involves the rehabilitation of a two lane roadway. The rehabilitation consists of the in-place pulverization of the existing badly cracked pavement, improvements to the ditching on both sides of the highway, regarding of the pulverized asphalt/granular base material and the placement of two lifts of new asphalt concrete. The roadway passes through a national park that is very heavily used in the summer. The national park is a UNESCO World Heritage site and home to significant species of wildlife.

The agencies/country was asked to describe what actions would be taken to minimize any harmful effects or inconveniences and weather and if this action is mandatory (by law or regulations) or just considered "good practice" in the following areas:

- Noise
- Safety (User, Construction Worker)
- Environmental Pollution (air, water, soil)
- Vibration

SURVEY RESULTS

Detailed responses to the request for information are being received over the summer of 2005. A summary of the key findings of the surveys received is as follows:

Noise

Most agencies have specific regulations and guidelines to limit noise during roadway construction activities. Guidelines and regulations range from the use of a maximum noise limit for all road activities to complex matrices providing maximum noise levels by roadway/highway functional class and day versus night conditions.

Driver Safety

Driver safety during roadway construction is typically governed by guidelines for traffic and workzone safety.

Worker Safety

Worker safety for most jurisdictions is governed by law. Many agencies have specific documentation and guidelines to protect workers during construction.

Air Pollution

Most road authorities include environmental protection clauses in their specifications. Most require a contractor to produce an Environmental Management Plan for a construction job.

Water Pollution

Most agencies have very strict laws, rules and guidelines with regard to water pollution and runoff from construction worksites.

Soil Pollution

Most agencies have very strict laws, rules and guidelines with regard to soil pollution. Many agencies are turning to recycling activities to help eliminate the need to disturb the soil during pavement rehabilitation projects.

Aesthetics

The majority of agencies do not consider aesthetics in the design and construction of pavement projects.

Lighting

Lighting is not generally considered during road work other than the need to have adequate lighting during nighttime construction work. Several agencies indicated that construction lighting can be an issue for homeowners adjacent to construction work zones but is only usually considered when a specific complaint is received.

Odors

Agencies typically cover odors under air pollution regulations and guidelines. Most agencies indicated that odors are not considered for construction and rehabilitation projects.

Evolvement of the Current Approach

Most of the agencies surveyed indicated that their current approach to detailing with the impact of road construction and rehabilitation on the adjacent land use have evolved through rules and regulations as a result of pressure from land and homeowners.

Past Innovation

There is a wide range in the way agencies treat innovation and the impact of road construction on the surrounding land use. Some agencies sponsor innovation projects as a result of a real or perceived need. Many agencies sponsor contractor innovation proposals.

Future Innovation

Efforts are needed to develop more effective systems/measures/materials/tools for traffic regulation during construction works and also lessen the number/time of construction work. There is likely to be further tightening of requirements to minimize impacts primarily driven by higher community expectations.