Southern African Transport Conference
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ISWIM
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3rd International Seminar on Weigh-In-Motion
Optimising Road Freight Transport using WIM Data

A Hybrid WIM Implementation Strategy

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Background

1. Visible signs of effects of overloading

2. Limited information on traffic (over-)loading
   - Traffic counters
   - Road side controls

3. Limited funds for investments

4. How and where to start?

Background

First questions when starting with WIM:

1. What are the cheapest sensors?
2. What is the best technology?
3. Where to place the WIM systems?

Background

First questions when starting with WIM:

1. What are the cheapest sensors?
2. What is the best technology?
3. Where to put the WIM systems?

Not too fast!

1. What is the purpose of the WIM?
   - Statistics on traffic loading
   - Overload/Weight enforcement

Implementation Strategy

Main purpose: Weight Enforcement

Step 1:

Nature of the Overloading problem?

- Existing measurements of actual (over-)loading?
- Where: (Inter-)national transport routes or local roads
- What: Type of transport; bulk, containers, logging, ...
- When: Day/night, weekend, (havest) season, ...

Implementation Strategy

Main purpose: Weight Enforcement

Step 3:

Negative effect of Overloading?

- Increased damages to pavements and bridges
- Shorter lifespan, more maintenance, higher costs
- Increased traffic unsafety
- Unfair competition
- Expressed in $, €, ZAR, ...

Implementation Strategy

Main purpose: Weight Enforcement

Step 4:

Weight Enforcement approach?

- What are the goals? (increased compliance, fines)
- What organizations are involved?
- What enforcement methods?
  - Statistics, Pre-selection, Company Profiling, Direct Enforcement
- Describe applications and required output of WIM

Implementation Strategy

Main purpose: Weight Enforcement

Step 4:

Implementation of WIM systems?

- Set performance and operational requirements
- Choose locations for installations
- Prepare TOR and choose supplier (and technology)
- Organize operation of WIM including DQM

Implementation Strategy

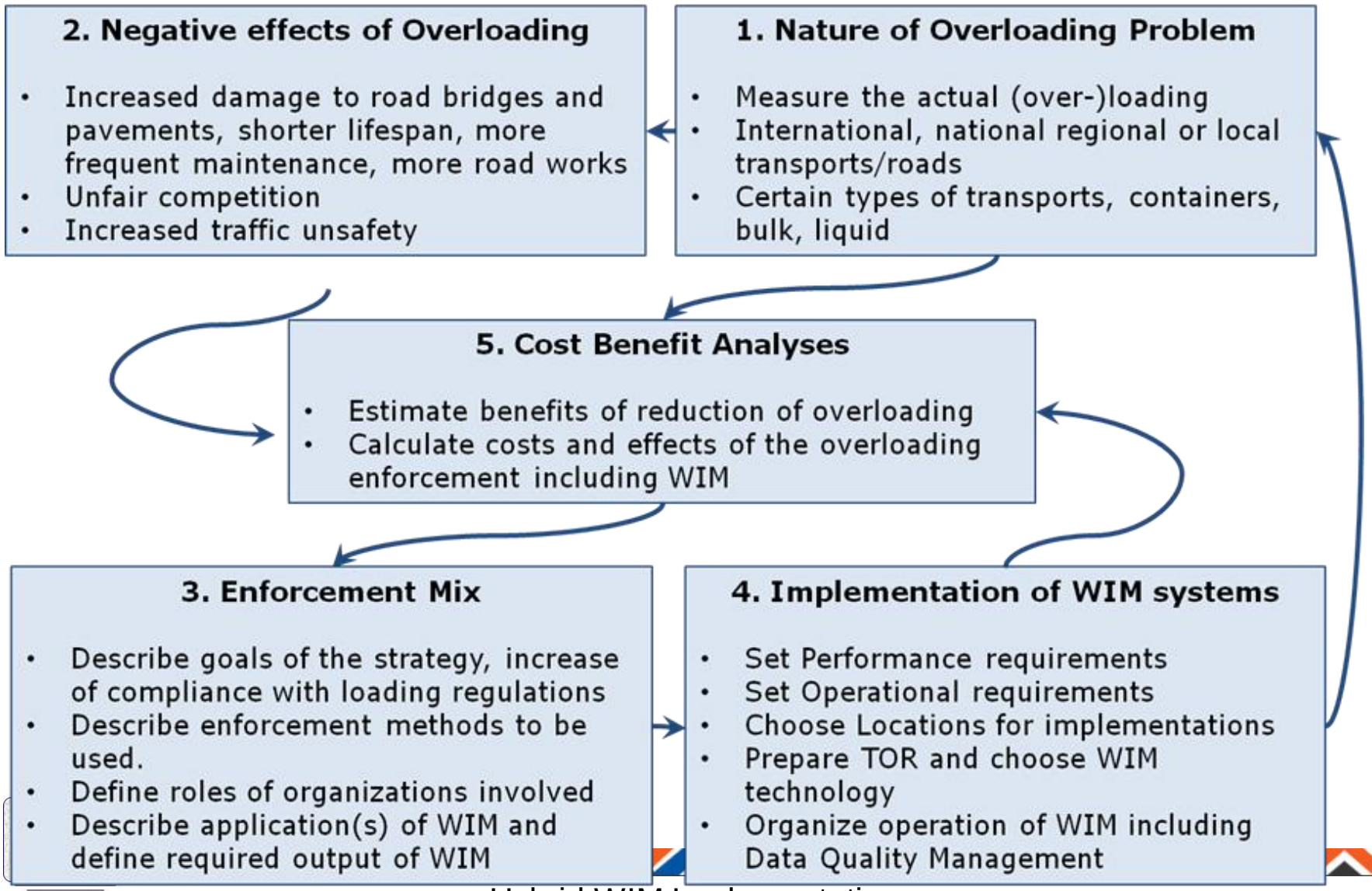
Main purpose: Weight Enforcement

Step 5:

Cost Benefit Analysis?

- Estimate the costs of overloading
- Estimate the benefits of reduction in overloading
- Calcultate the cost of weight enfocement including WIM

General Weight Enforcement Strategy



WIM Implementation Plan

Where to place the first WIM systems?

1. Locations with highest overloading
2. Some locations are clear
   - Based on available information
     - traffic volume, near a major harbour
3. Remaining locations are not so clear
   - No hard information available
   - Possible evasion of existing control sites
4. Solution: Hybrid WIM Implementation

WIM Implementation Plan

Hybrid WIM Implementation

1. Bridge-WIM
   - Sensors fixed under a bridge
   - Flexible, short term installations
   - Detects variations over the road network
2. Road-WIM
   - Sensors fixed in road pavement
   - Fixed, permanent installations
   - Detects trends over time

WIM Implementation Plan

Advantages

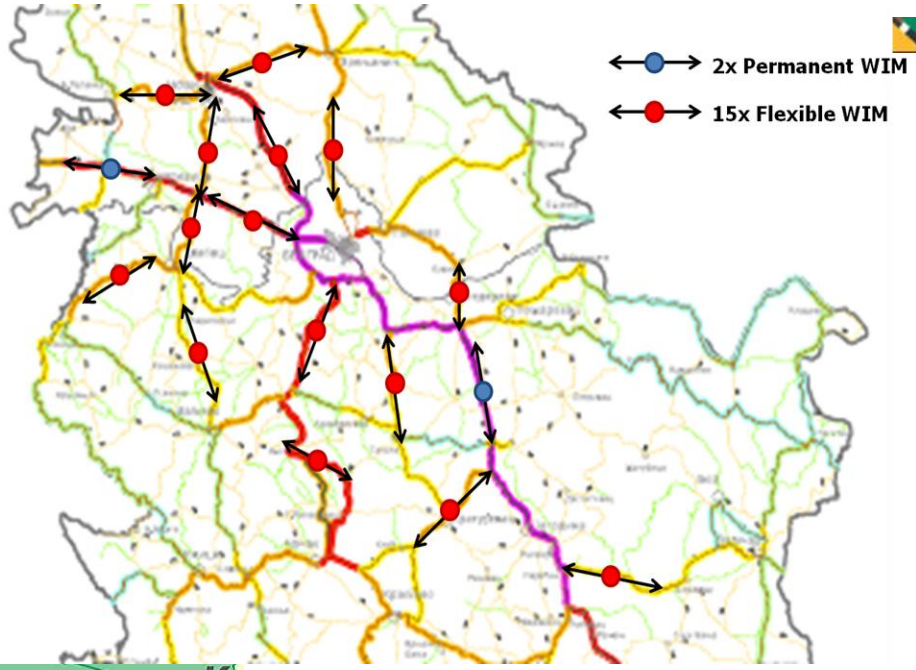
1. Selection of fixed sites:
   - Based on actual measurements
   - With most severe overloading
   - No waste of finances
2. Step by step implementation
   - Bridge WIM measurements on multiple sites
   - Road WIM installation on few sites
   - Bridge WIM measurements on multiple sites
   - Etc, etc, etc, …

Examples of Implementation

Republic of Serbia

Capital: Belgrade

Inhabitants: 7 million



Road Network

Motorways: 925km

State: 15.500km

Examples of Implementation

Republic of Serbia

Client: Public Enterprise Roads of Serbia (PERS)

- Sponsor: Int. Bank for Reconstruction and Development (IBRD)
- Project: Road Rehabilitation and Safety Project (RRSP)

Solution:

- 2 Permanent road-WIM installations (tendered in 2020)
- 15 short term bridge-WIM measurements (done in 2020)

Status:

- Awaiting further funding

Examples of Implementation

Republic of Georgia

Capital: Tbilisi

Inhabitants: 3.7 million

Road Network

Highways: 1.600km

National: 7.000km

Examples of Implementation

Republic of Georgia

Client: Roads Department of Georgia (RDG)

- Sponsor: Asian Development bank
- Project: East-West Highway (EWH) construction

Solution:

- 5 Permanent road-WIM installations (on EWH)
- 10-15 short term bridge-WIM measurements (in 2022)

Status:

- Tender and measurements expected in 2022

Hybrid WIM Implementation

Conclusions:

- A new method for the implementation of WIM systems has been developed;
- It uses a combination of flexible bridge WIM systems and permanent pavement WIM;
- It is intended for road networks with limited information on the actual traffic (over-) loading;
- The method was (partially) implemented in the Republics of Serbia and Georgia in Europe

Questions

Baie dankie

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