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TC D2 – WG1 : REDUCTION OF CONSTRUCTION TIME AND COST

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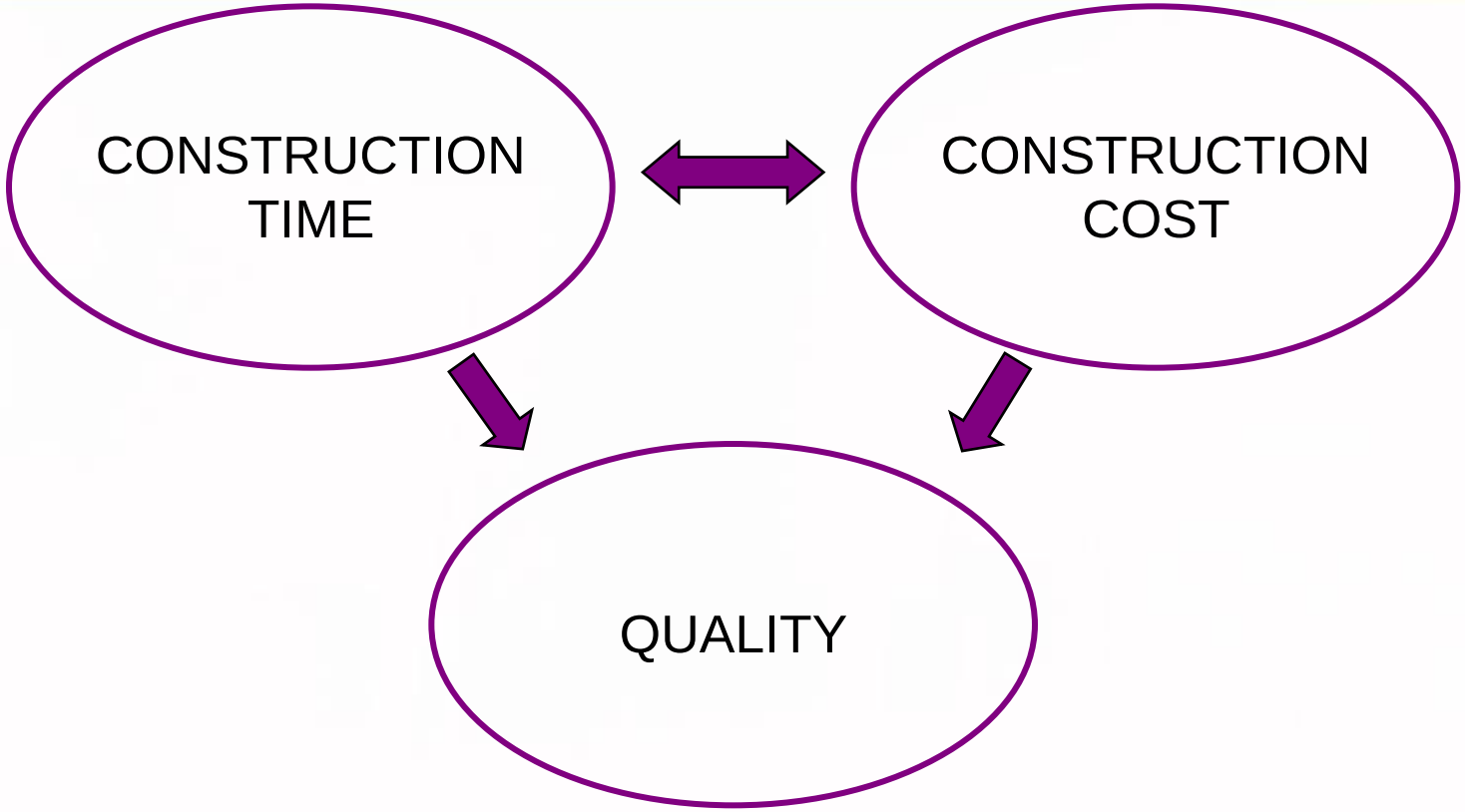
HOW LONG WILL IT TAKE ?

HOW MUCH WILL IT COST ?

- Limited budget – lowest bid
- Traffic flow – road availability – minimum disruption
- Image
- Private companies : maximize benefit
- Ensure mobility for economy
- Reduce traffic jams – fuel consumption – air pollution

INTRODUCTION



INTRODUCTION

IDENTIFY METHODS FOR REDUCING THE TIME AND COST OF CONSTRUCTION FOR DIFFERENT TYPES OF ROAD PAVEMENTS WITHOUT AFFECTING THE QUALITY

+ NO NEGATIVE ENVIRONMENTAL IMPACT OR RATHER IMPROVED LCA

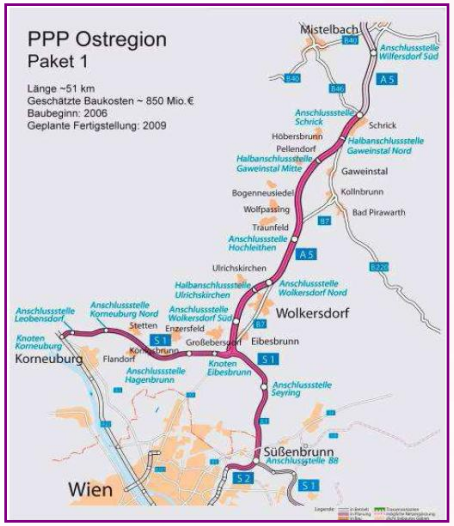
INVENTORY AND ANALYSIS OF METHODS TO REDUCE CONSTRUCTION TIME AND COST

SUBDIVIDED IN THREE DOMAINS :

- Tendering conditions
- Organisation of the worksite
- Adequate technical choices, related to :
  - General aspects
  - Concrete pavements
  - Asphalt pavements

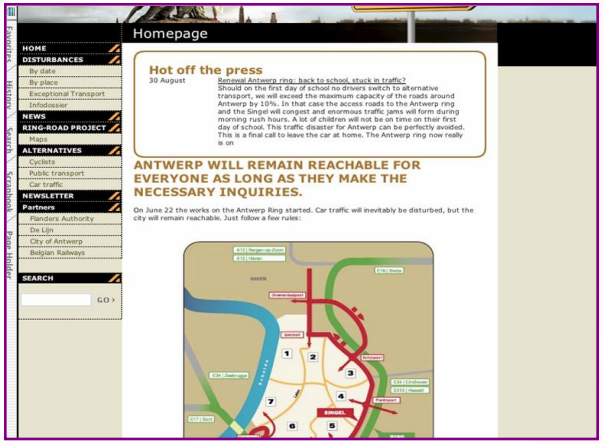
INVENTORY AND ANALYSIS OF METHODS TO REDUCE CONSTRUCTION TIME AND COST

- Tendering conditions
  - Bonus – penalties
  - Reduction of construction time by the bidder
  - Performance based specifications
  - Public Private Partnership
  - Subcontracting : specialised craftsmen or equipment
  - Technical suggestions by the bidder
  - Evaluation criteria (references – capacity - …)
  - Lane rental …



INVENTORY AND ANALYSIS OF METHODS TO REDUCE CONSTRUCTION TIME AND COST

- Organisation of the worksite
  - Traffic management
  - Quality plan – quality control
  - Night work
  - 24/24
  - Weekend work – 7/7
  - Public awareness and communication
  - Space management on the worksite
  - …



INVENTORY AND ANALYSIS OF METHODS TO REDUCE CONSTRUCTION TIME AND COST

- Adequate technical choices
  - General aspects
    - Design optimisation
    - Overlay – inlay (concrete, asphalt)
    - On site recycling
  - Concrete pavements
    - Rapid hardening concrete
    - Equipment (DBI – wireless paving - …)
    - Modular techniques
  - Asphalt pavements
    - Compact asphalt
    - Warm mix asphalt

INVENTORY AND ANALYSIS OF METHODS TO REDUCE CONSTRUCTION TIME AND COST

Analysis of the selected methods in order to define their strengths and weaknesses. Indicators will relate to the final goals (cost – time – quality) but also to the aspects of sustainable construction.

- *Cost-benefit analysis*
- *Initial cost*
- *Life-cycle cost*
- *User delay costs*
- *Construction time*
- *Hindrance to road users*
- *Hindrance to residents*
- *Service life of the pavement*
- *Acceptance by the public*
- *Traffic flow*
- *Environmental impact*
- *Impact on health and security for the workers*
- *Universality of solution*

INVENTORY AND ANALYSIS OF METHODS TO REDUCE CONSTRUCTION TIME AND COST

Examples :

METHOD	*STRENGTH*	*WEAKNESS*
Bonus & Penalty System	*Can be very effective when related to a shorter construction time, depending on the amounts allocated*	*Contractor will be focused on bonus (shorter construction time) but not on quality.* *Adverse effect on the overall price of the work (sum for bonus or included risk for penalty)*

INVENTORY AND ANALYSIS OF METHODS TO REDUCE CONSTRUCTION TIME AND COST

Examples :

METHOD	*STRENGTH*	*WEAKNESS*
Working 24/24 – 7/7	*Shortened construction time*	*Extra costs for irregular hours.* *Increased social pressure on the workers (family life, health)*

CASE-HISTORIES

19 brief descriptions of worksites or projects

14 : concrete - 5 : asphalt/bitumen

3 : presented :

- Tendering conditions & Organisation of the worksite

  J.J. Orozco - Mexico : reconstruction Mexico-Queretaro highway
- Adequate technical choices - Concrete pavements

  S. Vanikar - U.S.A : rapid intersection repair
- Adequate technical choices - Asphalt pavements

  Kamiya - Japan : warm mix asphalt

CONCLUSIONS

- A number of tools are available to influence construction time and cost
- Other decision-support tools can help (LCA – LCCA)
- Cradle to cradle – including usage phase
- Long-term behaviour of the pavement and long-term environmental impact are to be considered
- Encourage long-life pavements

CONCLUSIONS

- REDUCING → OPTIMISING
- OBJECTIVE = WELL-BALANCED SOLUTION
- MULTI-CRITERION ANALYSIS for « Best Solution »
  - Cost – Time – Quality – Environment -…
- EACH PARTY HAS TO TAKE ITS RESPONSIBLITY IN THE CONSTRUCTION PROCESS

YOU MAKE THE DIFFERENCE

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Thank you for your kind attention