Procurement Systems
2012 Study Tour Key Topics

1. Long life pavements
   - Experience, design systems, use, durability & performance

2. High performance asphalt & binders
   - High modulus asphalt (EME, HiMA), modifiers

3. Sustainability
   - RAP/WMA, bitumen substitutes, carbon calculators & energy analysis
     climate change impacts, societal concerns

4. Health & Safety
   - Construction of road works, health considerations for bitumen
     and asphalt products

5. Procurement Systems
   - Proprietary products (Avis Technique, HAPAS, etc.), “green” procurement,
     REACH, responsible sourcing, PPP and contract models

www.aapa.asn.au
Overview of reasons

- Australia has tried to set up systems like Avis Technique & HAPAS but have been unsuccessful.
- The benefits of innovation and declining skills in the road authorities point to its greater use.
- Lessons learnt, benefits of the systems used, changes to purchasing to accommodate and implications for road authority expertise is sought.
- Use of the systems to promote innovation and product development in new areas such as CO₂ reduction, energy efficiency, nose reduction etc.
- The use of procurement systems from PPP, Alliancing, DBOM, ECI including normal contracts, long & short term contract maintenance systems.
  - What key performance characteristics over time?
  - How to retain the culture of stewardship in the contracting agency?
  - How to retain expertise on the road authority to manage / ensure value-for-money?
Report contents

1. Innovation and product certification systems
   - Avis Technique
   - Charte d’Innovation
   - HAPAS
   - ETA – Award approval

2. New tools for sustainable procurement
   - asPECT
   - SEVE
   - DuboCalc & CO$_2$ progressionladder
   - Netherlands “Innovation Test Centre”
3. Procurement system options
   o United Kingdom – Highways Agency
   o Netherlands
Basis of innovation systems

1. Innovation by industry, client encourages with performance outcome needs

2. Proof of performance on functional tests from bodies formed through mutual cooperation between client & industry

3. Product acceptance covers:
   *Field of application, performance characteristics, practical experience*
1. Innovation and product certification systems

- **Avis Technique**
  - Long history, many products, most copied system
  - Controlled by committee of industry and road agency
  - Accepts product & performance submission (where used)
  - Committee provides “advice” on how to be used, design input, comparison to standard products.

- **Charte d’Innovation**
  - Client invitation (road map)
  - Contractors propose
    - Description of product, system
    - Description of application method
    - Results of tests and trials
    - The price
    - Reference to works that have been executed with the product
Client driven innovation

Public ceremony and award for innovations
1. Innovation and product certification systems

○ HAPAS

  • Follows Avis Technique approach
  • Run by British Board of Agreement
  • HiTAC technical advisory committee: *with wide range of industry, associations, HA and Local Government*
  • Has 10 specialist groups covering:
    ○ *high friction surfacing, crack sealing, thin surfacing, modified bitumen for bitumen surfacing, microsurfacing, bridge deck waterproofing, permanent cold lay materials, coloured surface treatments, anti-corrosive paints*
  • Each specialist group has experts from industry but assessment and evaluation done by BBA staff
    ○ Process requires over two years including trials

○ ETA – Award approval
BBA HAPAS
Product Approval Scheme
2. New tools for sustainable procurement

○ asPECT
<table>
<thead>
<tr>
<th>Life-cycle stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Raw Material Acquisition</td>
<td>Winning of raw materials from the natural environment with the input of energy</td>
</tr>
<tr>
<td>2  Raw Material Transport</td>
<td>Linking the winning of raw materials to processing of raw materials</td>
</tr>
<tr>
<td>3  Raw Material Processing</td>
<td>Crude oil refining, rock crushing and grading, recycled and secondary material reprocessing</td>
</tr>
<tr>
<td>4  Processed Material Transport</td>
<td>Linking the processing of raw materials to the manufacture of bitumen bound highway components</td>
</tr>
<tr>
<td>5  Road Component Production</td>
<td>Production of bitumen bound mixtures</td>
</tr>
<tr>
<td>6  Material Transport to Site</td>
<td>Delivery of bound materials to site</td>
</tr>
<tr>
<td>7  Site Preparation, Laying and Compacting</td>
<td>Included for new road construction: capping, sub-base, base, binder course, surface course</td>
</tr>
<tr>
<td>8  Scheme Specific Works</td>
<td>Installation of geosystems, traffic management etc.</td>
</tr>
<tr>
<td>9  Maintenance</td>
<td>Interventions to maintain the road. Re-surfacing, surface dressing works, patching, haunching etc.</td>
</tr>
<tr>
<td>10 End of Life</td>
<td>Deconstruction and material management</td>
</tr>
</tbody>
</table>
asPECT stages

Considering the lifetime of the road to give the environmental impacts based on years of service.

Current recycling and future recyclability allows the consideration of savings across multiple lifecycles.

Movement of material, equipment and products is an area prime area for efficiency savings.

Cold and warm mixtures can be included and compared to traditional mixtures and methods.
asPECT product comparison

**Basic scenario** (6.5% PMB SMA; 165°C; av. UK transport)
- Asphalt production: 26.4%
- Transport to plant: 6.5%
- Material extraction and processing: 24.7%

- Total CO₂e/t: 57.5 kg

**Warm mix** (mix temp 130°C; 0.3% zeolite)
- Asphalt production: 20.7%
- Transport to plant: 6.5%
- Material extraction and processing: 28.0%

- Total CO₂e/t: 55.3 kg
  - 4% reduction

**Recycling** (30% RAP)
- Asphalt production: 26.4%
- Transport to plant: 4.9%
- Material extraction and processing: 21.1%

- Total CO₂e/t: 52.3 kg
  - 9% reduction

**Warm & recycled**
- Asphalt production: 20.7%
- Transport to plant: 5.0%
- Material extraction and processing: 24.4%

- Total CO₂e/t: 50.0 kg
  - 13% reduction
2. New tools for sustainable procurement

Special software to compare environmental improvements

*uses LCA including*
- Consumed energy
- Carbon dioxide emissions
- Preservation of natural unrenewable resources
- RAP consumption

![Diagram of asphalt plant and lifecycle impact diagram](image-url)
### Exemple de résultats fournis par le logiciel SEVE®

<table>
<thead>
<tr>
<th>Solution</th>
<th>Matériaux</th>
<th>Transport en amont</th>
<th>Fabrication des mélanges</th>
<th>Transport chantier</th>
<th>Mise en œuvre</th>
<th>Total</th>
<th>Comparaison / Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technique traditionnelle de référence</td>
<td>5,0</td>
<td>1,2</td>
<td>5,1</td>
<td>0,5</td>
<td>0,5</td>
<td>12,7</td>
<td></td>
</tr>
<tr>
<td>Technique TRACO</td>
<td>2,9</td>
<td>0,6</td>
<td>0,2</td>
<td>0,3</td>
<td>1,1</td>
<td>5,0</td>
<td>-50,9%</td>
</tr>
</tbody>
</table>

**COMPARAISON DES ÉMISSIONS TOTALES DE GAZ À EFFET DE SERRE (en t eq CO₂)**

- **Solution de base**
- **Solution éco-environnementale**

Procédure d'inscription

Elle se fait simplement, directement sur le site www.seve-tp.com, par le « référent SEVE » de l'organisme souhaitant s'inscrire.

Par la suite le référent aura toute autonomie pour créer des comptes utilisateurs en interne.
2. New tools for sustainable procurement

- **DuboCalc & CO$_2$ progressionladder**
  - DuboCalc part 1 of LCA based tool
  - Uses international standards database
  - Eleven environmental effects evaluated
  - Controlled by government & applied on contracts
  - Analysis is project specific
  - Results reported as an Economic Cost Indicator expressed in Euros or tonnes of CO$_2$e
DuboCalc – environmental cost indicator

MilieuKostenIndicator (MKI) Materials and processes

<table>
<thead>
<tr>
<th>Milieueffectcategorie</th>
<th>Items (M/P)</th>
<th>Equivalent unit (kg)</th>
<th>Env. Cost [€/kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate change</td>
<td>5,8</td>
<td>CO₂ eq</td>
<td>€ 0,05</td>
</tr>
<tr>
<td>Effect on ozone layer</td>
<td>etc</td>
<td>CFK-11 eq</td>
<td>€ 30,--</td>
</tr>
<tr>
<td>Human toxicity</td>
<td></td>
<td>1,4-DCB eq</td>
<td>€ 0,09</td>
</tr>
<tr>
<td>Ecological toxicity, sweet water</td>
<td></td>
<td>1,4-DCB eq</td>
<td>€ 0,03</td>
</tr>
<tr>
<td>Ecological toxicity, salt water</td>
<td></td>
<td>1,4-DCB eq</td>
<td>€ 0,0001</td>
</tr>
<tr>
<td>Ecological toxicity, land</td>
<td></td>
<td>1,4-DCB eq</td>
<td>€ 0,06</td>
</tr>
<tr>
<td>Photochemical reactivity Smog)</td>
<td></td>
<td>C₂H₂ eq</td>
<td>€ 2,--</td>
</tr>
<tr>
<td>Acidification</td>
<td></td>
<td>SO₂ eq</td>
<td>€ 4,--</td>
</tr>
<tr>
<td>Over fertilisation</td>
<td></td>
<td>PO₄ eq</td>
<td>€ 9,--</td>
</tr>
<tr>
<td>Depletion of non renewable materials</td>
<td></td>
<td>Sb eq</td>
<td>€ 0,16</td>
</tr>
<tr>
<td>Depletion of fossil fuels</td>
<td></td>
<td>Sb eq</td>
<td>€ 0,16</td>
</tr>
</tbody>
</table>

MKI = XX

DCB = dichloorbenzeen
2. New tools for sustainable procurement

The CO₂-Performanceladder

Level certification plan (outline)

5.
The company has a CO₂ emissions inventory of its most important suppliers. The company can demonstrate that the objectives for levels 3 and 4 have been attained. The company is publicly committed to a government or NGO CO₂ reduction programme, and is able to demonstrate that it is making a relevant contribution to an innovative CO₂ reduction project.

4.
The company has identified its chain emissions in outline terms, and chain analyses have been carried out for two relevant chains. The company has quantitative objectives for its chain emissions. The company is in dialogue with relevant parties (government bodies and social organisations) and can demonstrate its role as the instigator of sector and chain initiatives in the field of CO₂ reductions.

3.
The company has an official CO₂ emissions inventory that has been drawn up in accordance with the ISO (GHG) standard, and which has been verified by an independent organisation. The company has quantitative objectives for its own (scope 1 and 2) CO₂ emissions. It communicates – internally and externally – in relation to its CO₂ footprint on a structural basis and actively participates in at least one sector and chain-based CO₂ reduction initiative.

2.
The company has quantified its energy flows and formulated a qualitative objective for saving energy and using renewable energy. Internally, the company communicates its energy policy on a structural basis and takes a passive role in at least one sector and chain-based CO₂ reduction initiative.

1.
The company has identified its energy flows in qualitative terms and has a list of potential options for saving energy and using renewable energy. Internally, the company communicates its policy in relation to energy-saving and renewable energy on an ad hoc basis and is aware of sector and chain-based CO₂ reduction initiatives.

Aspects:

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insight</td>
<td>Reduction (ambition) in CO₂ emissions</td>
<td>Transparency (internal and external)</td>
<td>Participation in CO₂ initiatives</td>
</tr>
<tr>
<td>Description</td>
<td>From</td>
<td>Maximale rungs</td>
<td>Aftrek per rung</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>----------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Prestatiecontracten, Variabel Onderhoud en Renovatie projecten Complex project, variable maintenance &amp; rehabilitation</td>
<td>1 augustus 2011</td>
<td>3</td>
<td>1%</td>
</tr>
<tr>
<td>Prestatiecontracten, Variabel Onderhoud en Renovatie projecten</td>
<td>1 januari 2013</td>
<td>5</td>
<td>1%</td>
</tr>
<tr>
<td>Aanleg &gt; M€ 35 Construction / addition</td>
<td>1 augustus 2012</td>
<td>5</td>
<td>1%</td>
</tr>
<tr>
<td>Aanleg &gt; M€ 1,5 en &lt; M€ 35 Construction / addition</td>
<td>1 augustus 2012</td>
<td>3</td>
<td>1%</td>
</tr>
<tr>
<td>Aanleg &gt; M€ 1,5 en &lt; M€ 35 Construction / addition</td>
<td>1 januari 2013</td>
<td>5</td>
<td>1%</td>
</tr>
<tr>
<td>Ingenieursdiensten &gt; k€ 130 Engineering service</td>
<td>15 augustus 2012</td>
<td>5</td>
<td>1%</td>
</tr>
</tbody>
</table>
2. New tools for sustainable procurement

- Netherlands “Innovation Test Centre”
Value of Innovation Test Centre

- Knowledge of market possibilities
- Client’s knowledge is shared
- Mutual acceptance of the validation plan
- Test and demonstration projects
- Performance is known
- Entrepreneur determines price in a competitive market
- Client can make justified decision on tender award
3. Procurement system options

- United Kingdom – Highways Agency
3. Procurement system options

- United Kingdom – Highways Agency
  - Use a similar range of contract models to Australia
  - Have 13 large PPP contracts running on DBFO
<table>
<thead>
<tr>
<th><strong>M25 Orbital</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Located In</strong></td>
<td>Area 5</td>
</tr>
<tr>
<td><strong>Scheme Type</strong></td>
<td>Design, Build, Finance, Operate</td>
</tr>
<tr>
<td><strong>Length of Project Road</strong></td>
<td>102 km (63.4 miles) (400km/248.5 miles includes operational &amp; maintenance)</td>
</tr>
<tr>
<td></td>
<td>2761.034 Lane Kilometres</td>
</tr>
<tr>
<td></td>
<td>248.6 Miles</td>
</tr>
<tr>
<td></td>
<td>400 kilometres</td>
</tr>
<tr>
<td><strong>Estimated Construction Cost</strong></td>
<td>6.2 billion (includes operational &amp; maintenance)</td>
</tr>
<tr>
<td><strong>Contract Award</strong></td>
<td>20 May 2009</td>
</tr>
<tr>
<td><strong>First Opened to Traffic</strong></td>
<td>Spring 2012</td>
</tr>
<tr>
<td><strong>End of Contract Period</strong></td>
<td>May 2039</td>
</tr>
<tr>
<td><strong>Type of Road</strong></td>
<td>Motorway</td>
</tr>
<tr>
<td><strong>DBFO Co</strong></td>
<td>Connect Plus</td>
</tr>
<tr>
<td><strong>Shareholders</strong></td>
<td>Balfour Beatty 40%, Skanska 40%, WS Atkins 10% &amp; Egis projects 10%</td>
</tr>
<tr>
<td><strong>Contractors</strong></td>
<td>Balfour Beatty, Skanska, WS Atkins, Egis Projects</td>
</tr>
</tbody>
</table>
The widening of the M25 under a Design, Build, Finance and Operate (DBFO) contract commenced on 9 July 2009. Approximately 102 kilometres of the M25 will be widened by adding a lane in each direction, making the majority of it a 4-lane motorway. The widening is to be undertaken around the north side of London between Juncions 16 (M40) and 30 (A13 Interchange) and between Juncions 5 (M26) and 7 (M23) around south-east London.
3. Procurement system options

- United Kingdom – Highways Agency

Public Private Partnership – motivation → DBFO

- to ensure that the project road is designed, maintained and operated safely and satisfactorily so as to minimise any adverse impact on the environment and maximise benefit to road users;
- to transfer the appropriate level of risk to the private sector;
- to promote innovation, not only in technical and operational matters, but also in financial and commercial arrangements;
- to foster the development of a private sector road-operating industry in the UK; and
- to minimise the financial contribution required from the public sector.

Shadow Tolling used in UK
3. Procurement system options

- United Kingdom – Highways Agency
  - Maintenance - Term Service Contracts
  - Major Contracts
    - Prequalification of contractors
    - Restricted Procedure for tenders
      - asset, capability, technical capability, financial, H&S
    - Most Economically Advantageous Tender (MEAT?)
      - price / quality ratio 50:50 to 20:80
      - 6 criteria: product, service, right first time, cost & time, H&S, sustainability
      - specific project changes emphasis of each criteria
  - HA retains and collects information to remain as and informed client & asset manager
3. Procurement system options

- Netherlands
  - Four main type of Functional Contracts
    - Performance contracts
    - Engineering and construct (E&C) contracts
    - Design and construct (D&C) contracts
    - Design, build, finance and maintain (DBFM) contracts
  - State retains the “what” is wanted and moves the “how” it is done to the private sector
  - Functional specification & contracts promote innovative solutions
### 3. Procurement system options - Netherlands

- Engineering & Construct (E&C) contracts

---

#### Performance assessment during warranty period

<table>
<thead>
<tr>
<th>Property</th>
<th>Assessment method</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skid resistance</td>
<td>86% slip trailer</td>
<td>$&gt; 0.38$</td>
</tr>
<tr>
<td>Transversal evenness</td>
<td>ARAN laser rut depth measurement</td>
<td>Rut depth $&lt; 18 \text{ mm}$</td>
</tr>
<tr>
<td>Longitudinal evenness</td>
<td>ARAN IRI - measurement (D&amp;C)</td>
<td>IRI - value $&lt; 3 \text{ m/km}$</td>
</tr>
<tr>
<td>Transversal slope</td>
<td>Aran slope measurement (D&amp;C)</td>
<td>No uniform criteria</td>
</tr>
<tr>
<td>Raveling</td>
<td>Visual inspection</td>
<td>$&lt; 20%$ stone loss/$\text{m}^2$; $&lt; 25\text{ m/100m}$ with 11-20% stone loss/$\text{m}^2$; No loss of deeper stones</td>
</tr>
<tr>
<td>Cracking</td>
<td>Visual inspection</td>
<td>Crack width $&lt; 21 \text{ mm}$; $\Delta h$ over crack $&lt; 11 \text{ mm}$; Less than 7 transversal cracks per 100m; Less than 30m longitudinal cracks per 100m; Connected cracks may not contain loose elements</td>
</tr>
<tr>
<td>Combined damage</td>
<td>Visual inspection</td>
<td>Moderate raveling + cracking may not have great extent</td>
</tr>
</tbody>
</table>
### 3. Procurement system options - Netherlands

- Engineering & Construct (E&C) contracts

#### Performance assessment during warranty period

<table>
<thead>
<tr>
<th>Property</th>
<th>Assessment method</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skid resistance</td>
<td>86% slip trailer</td>
<td>$\geq 0.38$</td>
</tr>
<tr>
<td>Transversal evenness</td>
<td>ARAN laser rut depth measurement</td>
<td>Rut depth $&lt; 18$ mm</td>
</tr>
<tr>
<td>Longitudinal evenness</td>
<td>ARAN IRI - measurement (D&amp;C)</td>
<td>IRI - value $\leq 3$ m/km</td>
</tr>
<tr>
<td>Transversal slope</td>
<td>Aran slope measurement (D&amp;C)</td>
<td>No uniform criteria</td>
</tr>
<tr>
<td>Raveling</td>
<td>Visual inspection</td>
<td>$&lt; 20%$ stone loss/m$^2$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$&lt; 25$m/100m with 11-20% stone loss/m$^2$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No loss of deeper stones</td>
</tr>
<tr>
<td>Cracking</td>
<td>Visual inspection</td>
<td>Crack width $&lt; 21$ mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$\Delta h$ over crack $&lt; 11$ mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Less than 7 transversal cracks per 100m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Less than 30m longitudinal cracks per 100m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Connected cracks may not contain loose elements</td>
</tr>
<tr>
<td>Combined damage</td>
<td>Visual inspection</td>
<td>Moderate raveling + cracking may not have great extent</td>
</tr>
</tbody>
</table>
### 3. Procurement system options - Netherlands

- Engineering & Construct (E&C) contracts

#### Performance assessment after construction

<table>
<thead>
<tr>
<th>property</th>
<th>assessment method</th>
<th>criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transversal slope</td>
<td>geodetical survey</td>
<td>according to:</td>
</tr>
<tr>
<td>Longitudinal evenness</td>
<td>Viagraph</td>
<td>C5 - value &lt; 3%</td>
</tr>
<tr>
<td>Skid resistance</td>
<td>86% slip trailer</td>
<td>≥ 0.40</td>
</tr>
<tr>
<td>Brake deceleration</td>
<td>Instrumented test vehicle</td>
<td>≥ 5.2m/s²</td>
</tr>
<tr>
<td>• Δh over seams</td>
<td>• straight edge</td>
<td>Δh &lt; 5mm</td>
</tr>
<tr>
<td>• Δh at pavement edges</td>
<td>• straight edge</td>
<td>Δh &lt; 70mm</td>
</tr>
<tr>
<td>layer thicknesses</td>
<td>cores</td>
<td>according to:</td>
</tr>
<tr>
<td>noise</td>
<td></td>
<td>design (D&amp;C)</td>
</tr>
<tr>
<td>• single layer PA</td>
<td></td>
<td>specifications (E&amp;C)</td>
</tr>
<tr>
<td>• twin layer PA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• thin wearing courses and thin inlays</td>
<td></td>
<td></td>
</tr>
<tr>
<td>raveling</td>
<td>visual inspection</td>
<td>no raveling</td>
</tr>
<tr>
<td>cracking</td>
<td>visual inspection</td>
<td>no cracking</td>
</tr>
</tbody>
</table>
### 3. Procurement system options - Netherlands

- Engineering & Construct (E&C) contracts

#### Performance assessment after construction

<table>
<thead>
<tr>
<th>property</th>
<th>assessment method</th>
<th>criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transversal slope</td>
<td>geodetical survey</td>
<td>according to:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• design (D&amp;C)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• specifications (E&amp;C)</td>
</tr>
<tr>
<td>Longitudinal evenness</td>
<td>Viagraph</td>
<td>C5 - value &lt; 3%</td>
</tr>
<tr>
<td>Skid resistance</td>
<td>86% slip trailer</td>
<td>≥ 0.40</td>
</tr>
<tr>
<td>Brake deceleration</td>
<td>Instrumented test vehicle</td>
<td>≥ 5.2 m/s²</td>
</tr>
<tr>
<td>• Δh over seams</td>
<td>• straight edge</td>
<td>• Δh &lt; 5mm</td>
</tr>
<tr>
<td>• Δh at pavement edges</td>
<td>• straight edge</td>
<td>• Δh &lt; 70mm</td>
</tr>
<tr>
<td>layer thicknesses</td>
<td>cores</td>
<td>according to:</td>
</tr>
<tr>
<td>noise</td>
<td></td>
<td>• design (D&amp;C)</td>
</tr>
<tr>
<td>• single layer PA</td>
<td>• void content &amp; layer thickness</td>
<td>• ≥ 20% &amp; ≥50mm</td>
</tr>
<tr>
<td>• twin layer PA</td>
<td>• permeability test (Becker apparatus)</td>
<td>• drainage time ≤ 20 sec</td>
</tr>
<tr>
<td>• thin wearing courses and thin inlays</td>
<td>• verification of composition, compaction and layer thickness</td>
<td>• according to product specifications</td>
</tr>
<tr>
<td>raveling</td>
<td>visual inspection</td>
<td>no raveling</td>
</tr>
<tr>
<td>cracking</td>
<td>visual inspection</td>
<td>no cracking</td>
</tr>
</tbody>
</table>
3. Procurement system options

- Netherlands
  - Design and construct (D&C) contracts
    - Similar assessment to (E&C) contracts
    - New designs, reconstruction, widening
    - Attempt to have 7 to 10 year warranty
    - For structures & pavements a design verification substitutes for warranty
  - Design, construct, finance & maintain
    - Contractor has full responsibility to deliver
    - 20 to 30 years of performance risk
    - Paid on availability fee, bonus, improvements
High Durability Porous Asphalt

- Condition
- Intervention level
- Condition below intervention level
- Years
- 7 years
- No bonus, no penalty
- Penalty
- Renewal, lane rental and penalty
Summary

• Similar complexity of procurement systems
• Decades of experience in product certification systems – promotes cost reductions / innovation
• Greenhouse gas calculators being used to change behaviour and promote sustainability
• Increasing use of functional specification and contract models – outcomes & performance
• Significant DBFM/O projects (PPP) – long term, funding streams differ, most 20 to 30 years
Whole-Brain thinking for the 21st C

Goals Driven: Analytical Intelligence
Vision Driven: Creative Intelligence
Results Driven: Operational Intelligence
People Driven: Relational Intelligence

Adapted from HBDI
© CreativityatWork.com
Recommendations

1. Promote, and seek methods of establishing, a national system to support innovation in cost reducing road products and systems and their commercialization.

2. Support and motivate for the transfer to functional specifications and contracts.

3. Evaluate the Australian greenhouse gas calculators in comparison to the European tools to assess their value in comparing industry products and systems.
Topic 5: Procurement Systems

Questions

• Systems
  o Avis-Technique systems – are they working / cost effective?
  o Lessons learnt, still promoting innovation?
  o How are underperforming products addressed?

• Functional and performance requirements
  o Are performance based specifications used?
  o What test methods used to measure performance / proprietary?
  o Functional specifications and fitness-for-purpose assessed over time – how is this done?
  o How are environmental / traffic loading changes included in the assessment?
  o Define what a “warrantee” means, for how long, end state?
  o Can proprietary product systems replace performance-based specs?
  o Can “green procurement requirements fit into the system (C02, energy)
Topic 5: Procurement Systems

Questions

• Product sourcing and life cycle assessment
  o Has REACH impacted on the product selection and use in Europe, are their benefits?
  o Are their any “responsible sourcing” influences on product selection?
  o What methodologies and inputs are used to assess WOLC for pavements?

• Contract & procurement models
  o Are PPP widely used to fund and deliver European road projects?
  o Do PPP affect the products chosen and warranties required?
  o What are the dominant contract models for services, construction & proprietary products? Are there case studies showing cost differences?
  o Are non-price criteria used in assessing tender submissions –and how?
  o On contracted maintenance:
    • How is culture of ownership or stewardship for the network retained?
    • How do road authorities retain skills to be an informed client?
2012 Study Tour Key Topics

1. Long life pavements
   - Experience, design systems, use, durability & performance

2. High performance asphalt & binders
   - High modulus asphalt (EME, HiMA), modifiers

3. Sustainability
   - RAP/WMA, bitumen substitutes, carbon calculators & energy analysis
     climate change impacts, societal concerns

4. Health & Safety
   - Construction of road works, health considerations for bitumen
     and asphalt products

5. Procurement Systems
   - Proprietary products (Avis Technique, HAPAS, etc.), “green” procurement,
     REACH, responsible sourcing, PPP and contract models