**MINUTES**
**First Meeting of the Concrete Pavement Sustainability Track**
**Leadership Group**

**July 23, 2008 – Chicago IL**

**Leadership Group Members Present:**

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| Gina | Ahlstrom | FHWA | Kevin | Cail | Lafarge |
| George | Crombie | VT-Natural Res | Barry | Descheneaux | Holcim Inc. |
| Jennifer | Distlehorst | Kansas DOT | Jim | Duit | Duit Construction |
| Ben | Franklin | ACAA -Headwaters | Kevin | Gardner | Univ of NH |
| Joep | Meijer | The Right Environment | Kevin | McMullen | WI CPA |
| Tom | Pyle | CALTRANS | Doug | Schwartz | MN DOT |
| Tim | Smith | Cement Assn of Canada | Michael | Sprinkel | VA Trans Res Council |
| Leif | Wathne | ACPA | David | Weber | Slag Cement Association |

**Operations Support Group Members Present:**

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| Dale | Harrington | Snyder & Assoc. | Peter | Taylor | Natl CP Tech Center |
| Tom | Van Dam | APTech Inc | Paul | Wiegand | Natl CP Tech Center |

**Leadership Group Members Not Present:**

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| Erin | Ashley | NRMCA | Ken | Kobetsky | AASHTO |
| Steve | Kosmatka | PCA | Ronald | Landy | EPA |

Introductions

Dale Harrington went over the CP Road Map's background and discussed the definition of sustainability. He laid out what the Operations Support Group (OSG) is proposing for the Sustainability Leadership Group to consider and modify. He explained what the track is not.

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| Leif W | We need to be able to quantify sustainability to the point of being able to compare. We need to include all pavements in the program and apply the same techniques to all. Fill in the gaps in research. |
| Kevin M | We need information to make decisions on which measures to prioritize. We need to get information to compare measures to address economics and quality of life. Kevin addressed coordination of our work with other CP Road Map Tracks. |
| Barry D | We need to further define our mission. Is it a tool or a method? Current practices manual as opposed to Best Practices. |
| Jennifer D | Credible comparisons need to be made. Let's get back to the Road Map discussion. Coordination & leadership (education) should be included. Societal instead of society. Discussion on how to address the risk involved with innovations. Expand the list of areas to quantify benefits. |
| Tom V | Explained Green Roads rating system. We must use universally accepted standards like ISO 9001. Tom explained the draft framing document (discussion items). The Mission Statement-should we add "operations" for such things as fuel usage, lighting, heat, etc. Moving engineering forward to the next level to address sustainable factors. |
| Mike S | We need to address congestion/volumes related to construction related lane closures & |

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| | traffic control delays. |
| Tim S | We need rules on how to use the standards, not to pick and choose as they see that helps their case. |
| Joep M | This group could establish standards that should be used. We need broader scope. Let people know we are here and keep our name and activities out there in front of people by newsletter or website. |
| Tom P | We need to include a tool. A tool must identify what we want. Industry has no understanding of what sustainability for concrete pavements involves or the need to coordinate activities with all agencies. If possible, do not follow California's route of creating sustainable activities through legislative and regulatory enforcement. |
| Gina A | We need more than one tool. |
| George C | Let's get as far as we can to understand how concrete pavements will impact climate & water. |
| Jim D | Include gaps in the briefing document, such as re-use steel as opposed to re-processing. |

Goal/Vision/Mission - Tom Van Dam went over the draft information. Initial thoughts were given and the Administrative Group will rewrite and send out. Low-hanging fruit was discussed based on the need to get the track underway. The initial decision was to proceed with a briefing document - 10 to 12 pages on what is known and agreed upon.

Framework – Peter Taylor led the framework discussion based on the printed packet information. The group went through a brainstorming exercise to identify ideas or concepts that are critical to the concrete pavement sustainability subject. The list, without prioritization, is summarized below:

1. Carbon Dioxide
2. Energy
3. Safety
4. Cost Effectiveness
5. Materials
6. Quality
7. Tradition
8. Innovation
9. Education
10. Leadership
11. Construction Practices
12. Life Cycle
13. Measurement
14. Standards
15. Regulatory Policy
16. Public Perception
17. Specifications
18. Language (jargon)
19. Carbon Trading
20. Water Quality
21. Life Cycle Assessment
22. Social Factors
23. Diverging Intent
24. Implementation
25. Funding
26. Public /Private Partnership
27. International Agreement
28. SCM's-(alternative materials including waste products)
29. Mercury (contaminants)
30. Smoothness/Noise/Acoustics
31. Use of Non-Renewable Resources
32. Land Transformation & Land use
33. Aesthetics
34. Lack of Government Leadership
35. Environmental Justice (lawsuits)
36. Smog Eating Cement
37. Shoulders/Pavement System
38. Traffic Congestion
39. Maintenance ( Preservation)
40. Rehabilitation
41. The Future
42. Longevity
43. Cement Content
44. Local Materials - Transforming Logistics
45. Heat Island Effects
46. Energy Harvesting
47. Self Healing
48. Smart Infrastructure
49. Construction Waste
50. Multi Modal - Vehicle Type
51. Fuel Savings/Operations
52. Design-Joint Spacing/Thickness-Two Lift
53. Composite Pavements
54. Equipment (zero clearance paver on two sides)
55. Information Dissemination
56. Quality Control

The Leadership Group was then broken into four working groups to prioritize the topics into short-term (3-5 years) and long-term (>5 years) issues. The groups were as follows:

**Group 1**
Gina Ahlstrom
Kevin Cail
Michael Sprinkel
Joep Meijer

**Group 2**
Barry Descheneaux
Tim Smith
Tom Pyle
George Crombie

**Group 3**
Jennifer Distlehorst
Leif Wathne
Ben Franklin
Jim Duit

**Group 4**
David Weber
Doug Schwartz
Kevin Gardner
Kevin McMullen

The results from each group are as follows:

Group 1:

- Research: develop a methodology to measure the impact on sustainability
    - prioritized topics: pick some, finish them, pick new ones
    - first environment then social
    - within environment
        - CO2
        - Energy
        - …
        - Later
- Showcases:
    - recycling
    - clinker content reduction
- Tech transfer: apply to the other tracks; advice / services to the other tracks; evaluate options
- Evaluate best practices to guide long term prioritizing
- National average 80:20 database
- Knowledge transfer: elaborate on stakeholders for concrete and sustainability and their interests / needs, it is not just the technical community, outside the scope of the tracks
- Communication: showing leadership / being out there - language/education/promotion: for example; 4 times per year newsletter/website/blog; include other tracks

Group 2:
Triangle graphic-economics; societal; environmental:

- $CO_2$ & energy are critical elements
- Must deal with specs/standards-life cycle assessment (LCA), all documents must include
- Don't forget mercury "pollution"-cement production being fined.

Group 3:
(3 to 5 years)

- What's out there right now? Defined & measured.
- Develop tools and best solution for a particular project, set criteria.
- Carbon economy calculation on concrete to get ahead of the carbon credit proposals, lead the involvement.
- Optimize use of energy from existing pavements.
- Develop measurement system.
- Priority placed on in-place recycling (paradigm system).
- Get information out about concrete pavement sustainability.
    - US scan
    - Feature green projects at $NC^2$
    - Web site
- >5 - Fill the gaps in knowledge.

Group 4:
*Short-term*

- Robust life cycle analysis for roadway systems. Develop briefing document for LCA on roads – collect published literature and tools that exist. Enable.
- Develop framework for incorporating benefits (in cost-benefit), social impacts, user costs in decision making. Moving toward LCC with explicit incorporation of LCIA, social impacts, etc.
- To expand the usage of SCMs in concrete mixtures through education – better properties, recycling, replacing higher impact material. Part of this is quantifying benefits associated with this practice.
- Quantification of heat island? Or critical synthesis of heat island studies/data. Maybe add lighting evaluation to this objective.
- Develop a current practices document.
- Reduce cementitious content in mixes. Move to performance spec., can quickly move to lower cementitious content. Needs to move to specs and standards. (Mix design track?)

*Long-term*

- Identifying/developing/evaluating alternative cementitious materials for more durable, cost-effective pavement.
- Evaluation of larger limestone additions – cost, process complication,
- constructability, effect on mixture.
- Environmental impact of design changes – M-E design guide, lane widths, any other design changes.
- Fast-setting cements and continuous paving for improving constructability of CP. Process simplification in general.
- Water demand issue?

**Wrap-Up**

Peter Taylor then presented the following list of common points from the individual groups.

- Measurement including tools, evaluation, LCA, …
- Education
    - Define terms and jargon
    - Current practices document
    - Best practices recommendations
    - Specifications(must get technical people involved vs. politicians)
- Get more efficient with materials (cut emissions, energy, non-renewable materials)
- Other environmental elements (lighting/heat/noise/etc)

**Final Comments**
Include LCA in briefing document. Send out email on requesting bibliographies of resources, dealing with sustainability in transportation and sustainability studies.

Piggyback with ACI meeting in November for the Leadership Group's next meeting.

The track work team will deal with the following items:

1. Revised vision and mission statement – week to 10 days
2. Outline the framework - 1st part of October
3. Face to face meeting - 1st part of November
4. Complete briefing document - January 1, 2009