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**Sustainability Research Subcommittee Meeting – ADD40(2)
Monday, January 12, 2015 1:30-3:15 pm
Marriott Marquis, Congress (M4)**

1. Welcome from Ralph Hall, followed by introductions from meeting attendees. Thirty two (32) people attended the meeting.
2. Presentation by Henrik Gudmundsson – [Building a Meta-framework for Sustainable Transport Indicators – Implications for Creating a Sustainable Transportation Research Framework](#)
 - a. Background: SUSTAIN – study of national sustainable transport planning as it occurs in practice.
 - b. Discussed the range of indicators that need to be used to measure impacts, demand, activity, condition of infrastructure, and governance.
 - c. Asked why a meta-framework is needed?
 - i. Sustainability is becoming widely accepted, but context matters for how to address it.
 - ii. No agreed set of standards for how to measure transportation sustainability.
 - iii. Need to understand and guide the development of the existing system by creating a context-specific indicator framework.
 - iv. Need to create a common set of criteria for frameworks rather than identify “standard indicators.”
 - d. Process of building a meta-framework.
 - i. Conducted a theoretical review on the notion of “frameworks” and an in-depth review of the literature on “sustainable transportation indicator frameworks.”
 - e. Performance functions of frameworks:
 - i. Conceptualization – indicators must be valid and consistent.
 - ii. Operationalization – indicators must be realistic (i.e., useable).
 - iii. Utilization – indicators must be relevant for the governance context.
 - f. The criteria identified for a sustainable transportation framework were broken down by the three above functions, which occasionally overlap. Each group of criteria was discussed.
 - g. Opportunities for using the meta-framework for research?
 - i. The framework can be used to identify the extent to which sustainability aspects are reflected in existing and emerging monitoring and performance measurement strategies.
 - ii. The framework could be used to classify approaches from basic to advanced – e.g., it could be applied to NCHRP 750, Vol. 4, *Sustainability as an Organizing Principle for Transportation Agencies*.
 - iii. The framework could be used to analyze to what extent “frameworks” drive

- strategy development and implementation or to consider how advanced frameworks explain superior performance or transformative action.
- iv. The framework could inform the development of guidance or standards for how to incorporate sustainability in transportation governance.
- h. Implications for creating a sustainable transportation research framework?
 - i. Focus on bigger picture, how things connect or not.
 - ii. Emphasize the governance aspects.
 - iii. Look at knowledge tools from a comprehensive perspective – i.e., from concepts to utilization, and back.
 - iv. Gauge the distance between principles and practice with a view to context as the explaining factor.
 - v. Develop methods and tools to evaluate and classify frameworks and strategies, in addition to rating tools.
 - i. Raised the idea that focusing only on utilization, operationalization, or conceptualization can limit the effectiveness of a framework. The governance challenge is also critical due to the need to reform institutions and social practices.
 - j. Discussion:
 - i. Jim Gillespie – There is a wide array of disciplines attracted to sustainability, which makes it difficult to know where to begin and what to focus on – e.g., equity vs. environmental quality.
 - ii. Adjo A. Amekudzi – It is possible to use a sustainable development framework to track how societies have been successful or not at managing their resources. A comprehensive framework would incorporate both environmental and social factors as system constraints. With regards to equity, it can be viewed as a “commons” problem as well as equitably sharing resources across generations [intergenerational] and countries [intragenerational].
 - iii. Debra Nelson – New York State DOT is testing the ‘maturity model’ presented in NCHRP 750, to see how the agency is performing and to identify the next steps to advancing sustainable transportation.
 - iv. Todd Littman – Sustainability cannot be focused on sustaining what we currently have – e.g., do we really want to sustain poverty? The approach must consider all three dimensions not just environmental or social (equity) factors.
 - v. Ralph Hall – Commented on the paper as being well researched and that it provides a good definition of sustainability and sustainable transportation.
3. Presentation by Ann Xu – [*Education Development in Sustainable Transportation*](#)
 - a. The NCST (National Center for Sustainable Transportation) Education Plan is focused on developing a model curriculum of multidisciplinary courses in sustainable transportation.
 - b. Four courses have been developed for 2014-16; one undergraduate, one graduate, and two professional education courses.
 - c. Each course consists of three 5-week modules – course elements can be mixed and matched, with course materials free to universities.
 - d. The process of creating the new courses consisted of a review of existing courses,

- programs, textbooks, reference books, tools, and frameworks.
- e. Themes in *existing* NCST courses ranged from policy and planning, design and construction, O&M and end-of-life, across economic, environmental, and social dimensions. The target audience consists of students and practitioners.
 - f. A review of tools for advancing sustainable transportation (such as INVEST, GreenRoads, GreenLITES, etc.) was also undertaken. The analysis of tools revealed less gaps in the overarching framework, when compared to the review of existing NCST courses.
 - g. Job announcements from DOTs with sustainability programs were also reviewed, which created a word cloud that looked very different from course-related word cloud. The words of public, experience, green, policy, and infrastructure were more important.
 - h. A survey of transportation experts was also conducted, but there was a low response rate. The survey will be opened up again.
 - i. Conclusion: There is a need for new courses that focus on social and economic areas and integrated approaches. There is also a potential gap between education and practice, e.g., there is a current lack of the quantitative skills that are needed in practice.
 - j. Discussion:
 - i. Silvana Croope – The words strategy and resilience were not prominent in the analysis of existing courses. Resilience may be a better path for selling sustainability than climate change. DOTs also have data, but limited ways of assembling and analyzing it, which means there is likely to be a significant demand for these skills.
 - ii. Emily Parkany – Described two existing courses in Delaware focused on providing an overview of, and managing the impacts from, sea level rise on infrastructure. Other courses are planned.
 - iii. Another comment was that graduates would need to be adaptable because needs are changing over time.
 - iv. Ralph Hall – Asked if the ADD40 committee could list the papers that were found as part of the course review process on the committee’s website. New sustainable transportation papers can be tweeted to @sustranspapers.
4. Cameron Gordon – [*Can transport system resilience and sustainability be economically efficient?*](#)
- a. Climate science is quite clear. We are locked into a 2 degree temperature change and are now trying to avoid a 4-5 degree change.
 - b. Australia is on the front line for climate impacts – currently fires and floods.
 - c. Relevance of resilience:
 - i. Infrastructure needs to be designed to withstand anticipated impacts. It is typical for people to refer to this objective as returning a system to its original state following an event.
 - ii. We need to aim higher, to return the system to a better (i.e., more resilient and sustainable) state than the original.
 - d. Adaptation – Paul Guilding’s book, the Great Disruption – humans get it together when they have to. However, we need to think *now* since we may not have time in the

- future to adapt.
- e. Benefit-Cost Analysis (BCA) is a conceptual framework built on the notion of economic efficiency; sustainability and economic efficiency can go together if the analysis is framed more broadly.
 - f. There are some actions that are “no regrets” in that there is benefit even if there is no truly adverse impact.
 - g. Phasing of works might be possible for expensive infrastructure, e.g., Thames barriers.
 - h. How efficient is the status quo? There are many problems with existing markets and economic theories.
 - i. At the core of the economic efficiency idea are consumer preferences which are taken as given and not explained. In a real sense economic efficiency is very changeable according to consumer wants. If these wants change towards more ‘sustainable’ choices, then the conflict between resilience/sustainability and efficiency is eliminated. However while policies to change preferences might be useful one should not define them away.
 - j. Discussion:
 - i. What can this committee do?
 - ii. Identify examples of sustainable and resilient transportation systems.
 - iii. Help guide change in traditional methodologies, e.g., economic analysis that does not currently accommodate sustainability considerations.
5. Susan Handy – *Update on the research being undertaken by the Nation Center for Sustainable Transportation* ([NCST](#))
- a. UC Davis is leading a partnership with five other universities (California State University, Long Beach; University of California at Riverside; University of Southern California; Georgia Tech, and the University of Vermont) to create the National Center for Sustainable Transportation.
 - b. The goal of the National Center is to enhance the environmental sustainability of the United States’ transportation system through reduction in fossil fuel consumption and greenhouse gas emissions.
 - c. Current activities are focused on education and are concentrated on the development of curricula.
 - d. The NCST is also focused on undertaking research and disseminating the results to policy makers.
 - e. Research is focused on climate change, which is influenced by California’s legislative actions – see research themes on the NCST website: <http://ncst.ucdavis.edu/research/research-themes/>.
 - f. Institutional change is also a necessary component of their work.
 - g. The NCST is developing a series of white papers (<http://ncst.ucdavis.edu/research/white-papers/>), and may require external reviewers to help advance this process.
 - h. Discussion:
 - i. Silvana Croope – Based on NASA research, it looks like adapting the transportation system to climate change will be necessary. How can adaptation be addressed without being caught in climate change politics?

ii. Adaptation is a focus of NCST.

6. Open discussion:

- a. Ralph Hall is looking for volunteers to help craft research needs statements.
- b. Ann Hartell (ADD20) discussed a circular being developed on “Mobility and Accessibility for Post-Disaster Recovery: Social and Economic Resilience for Disadvantaged and Dislocated Populations.” ADD20 plans to hold a workshop on this subject during the 2016 TRB Annual Meeting, so are looking for committees that are interested in supporting (co-sponsoring) this effort. Also, Ann is looking for content providers for the circular.
- c. Debra Nelson discussed NCHRP 25-25 that provides flexible, ongoing, quick-response research on environmental issues in transportation for the AASHTO Standing Committee on Environment (SCOE). ADD40 could help develop ideas for the SCOE database that would appeal to state DOTs.
- d. Ralph Hall – We have an opportunity to connect with AHB10 Regional Transportation Systems Management and Operations (RTSMO), to explore how sustainable transportation can be included in operations research. Contact: Keith McCabe (*KAM Futures*).

7. Meeting adjourned: 3:15pm.