

1 PURPOSE

To promote the development and tailored application of Systems Engineering (SE) best practices to ground transportation systems: with emphasis on roadways, rail, bus and metro, and including public and private interests and seamless inter-modal interfaces.

Our mission is to “To improve the state of the art and practice of Systems Engineering in transportation”

Our vision is “The right transportation services – on time and to cost”

2 GOAL

The group has the following goals:

- **More and better use of Systems Engineering in transportation.** This is the primary objective. For those doing SE we want better SE, for the rest we want them to start.
- **More and better transportation Systems Engineers.** Systems Engineering is about people. Without the raw recruits, we will never have a sustainable capability. Of course the recruits are the base of a pyramid – moving up is as important
- **Increased engagement of transportation Systems Engineers in core INCOSE activities.** If we are to influence the rest of INCOSE, we need people producing papers, presenting keynote addresses, contributing to other groups. We need to be at the point where people say “ ... that’s OK but you need a transportation perspective”
- **Clearer transportation Systems Engineering language and processes** The transportation language is different from traditional SE domains. While transportation SE is not very different from other domains, there is often a subtlety different focus.
- **Stronger community of transportation Systems Engineers** As well as developing stuff, we need to support each other. This is about a community spirit, people to have a drink (and listen to blues) with, putting your arm round someone's shoulder when it is all getting too hard.

3 SCOPE

Systems Engineering as it relates to transportation. Initial scope will focus on ground transportation. There may be a long-term potential to expand to include air and maritime, however this would need to be carefully considered once the maturity level of SE implementation in ground transportation has advanced significantly.

The application of Systems Engineering at all levels of transportation

- Socio-economic – improving sustainability, quality of life, sustaining societies and our cities

- Transportation businesses – delivering transportation services to passengers
- Transportation systems – vehicles (rolling stock - buses, subway rail cars), control systems, roadways and railways
- Sub-systems and services – communication systems, ventilation systems, passenger-information systems, technical consultancy services

4 SKILLS AND EXPERTISE REQUIRED

The group requires members who are:

- Active as Systems Engineers within transportation
- Willing to share their organizations' experience
- Able to work as team members in virtual teams
- Representative of supply chain (since agencies drive the supply chain, it is critical to have active participation of agencies) and must recognize the global supply chain
- Representative of diverse geographic locations where ground transportation exists.

No specific outside skills are needed

5 MEMBERS, ROLES AND RESPONSIBILITIES

Co-Chair: Duncan Kemp, Department for Transport (UK)

Co-Chair: Anne O'Neil, MTA New York City Transit (USA)

Corresponding Secretary: Alex Finlayson, Atkins

Steering Committee: To advise co-chairs and assume active role in advancing WG initiatives (Approximately 1 year term, set at discretion of co-chairs)

Further Roles described in section 6.

6 OUTCOMES (PRODUCTS/SERVICES)

6.1 MORE AND BETTER USE OF SYSTEMS ENGINEERING IN TRANSPORTATION

Key tasks:

- Develop assessment model (Duncan Kemp)
- Continually assess the state of the practice in transportation SE (i.e. benchmarking) (All/Transportation Agencies)
- Individual members share area that they are good at with each other (All)
- Refocus the strategy and plan when needed (Duncan Kemp / Anne O'Neil)

- Develop library of Transportation SE case studies (Bruce Elliott/Jon Hulse/Kevin Fehon)

Potential measures:

- Number of organizations assessing state of the practice
- Average score for process assessment and people assessment
- Number of people assessed

6.2 MORE AND BETTER TRANSPORTATION SYSTEMS ENGINEERS

Key tasks:

- Outreach to new members (Simon Smith/Jon Elphick/Anne O'Neil)
- Outreach to new employers (Simon Smith/Jon Elphick/Anne O'Neil)
- Outreach to America Public Transit Administration (Anne O'Neil)
- Outreach to IET (Bruce Elliott)
- Mentor members in writing and presenting papers (Duncan Kemp)
- Increase awareness & guidance for importance of & development of Soft skills/behaviours (Joyce van den Hoek Ostende)

Measures:

- Number of Transportation WG members; Retention of WG members
- Number of awareness and induction sessions
- Number of education and training events
- Number of papers, panels, keynote addresses

6.3 INCREASED ENGAGEMENT OF TRANSPORTATION SYSTEMS ENGINEERS IN CORE INCOSE ACTIVITIES

Key tasks:

- Develop Transportation program for IS and IW (co-chairs)
- Participate in INCOSE Commercial Steering Board (Anne O'Neil)

- Transportation input to the In Service Systems WG (Bruce Elliott)
- Transportation input to the UK Capability WG (Duncan Kemp) & INCOSE capability WG (Joyce van den Hoek Ostende, Rogier Uges)
- Transportation input to the Infrastructure WG (Alan Knott/Kevin Fehon)
- Transportation input to BKCASE (Duncan Kemp/Bruce Elliott/Michael Krueger)

Potential measures:

- Number of groups/boards with transportation input

6.4 CLEARER TRANSPORTATION SYSTEMS ENGINEERING LANGUAGE AND PROCESSES

Key tasks:

- Develop best practices transportation SE requirements guide (Lori Colangelo/Lori Katzman/Tom McPharlin/Ron Birkelbach)
- Embed and govern TRAK architecture framework (transportation Enterprise Architecting) (Duncan Kemp/Colin Wood)
- SE to reduce costs guide (Bruce Elliott)

Potential measures:

- Number of products produced

6.5 STRONGER COMMUNITY OF TRANSPORTATION SYSTEMS ENGINEERS

Key tasks:

- Ensure events include a social side (Anne/Duncan)
- Create and promote a Transportation WG LinkedIn site (Simon Smith)

Potential measures:

- Number of social events
- Number of linked-in site members (active and total)

7 APPROACH

High level work-streams based around the five objectives

- A clear lead(s) for each work-stream
- A clear delivery process
- Two delivery periods a year
- Covering both people and product development

Clear delivery process

- Agree activities to be delivered in the next six months
- Appoint activity lead and members for each activity
- No more than six people on any one task
- Agree requirements and expected benefits with lead
- Activity lead responsible for planning and delivery
- Products delivered and then subject to WG review (where required)
- Activity team disbanded on delivery *or after six (four) months*
- Complex tasks split into multiple phases

8 MEASURES OF SUCCESS

Covered in section 6

9 RESOURCE REQUIREMENTS

- Members' effort.
- LiveMeeting.
- Video conferencing capability may be required to facilitate international WG member exchanges.
- Outreach funding and marketing production support to facilitate outreach efforts across the transportation industry

10 DURATION

No end date

11 SIGNATURES

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Date

1st Level of Approval



Technical Director, INCOSE

Date August 2011

2nd Level of Approval (Note this will be added by the INCOSE Technical Director when deemed appropriate.)

Chairman, INCOSE Board of Directors

Date



Revision History

| <u>Date</u> | <u>Revision</u> | <u>Description</u> | <u>Author</u> |
|---------------|-----------------|--------------------|-----------------------------|
| April 8, 2011 | 1.0 | Initial Draft. | Duncan Kemp, Anne O'Neil |
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