

From Silos to Systems: Enabling Sustainable Futures

Systems Capacity Building - Infrastructure Industry Summit



Why Infrastructure needs a Systems approach. Why it's needed Urgently



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***Purpose: To set the context for transformative change
(to systems) and the need for collaboration***

- Why a Systems Approach Matters
- Why it's Urgent in Infrastructure Services Now
- The Need to Operate across Boundaries & Silos
- The Need for Systems Advocates to be Change Leaders

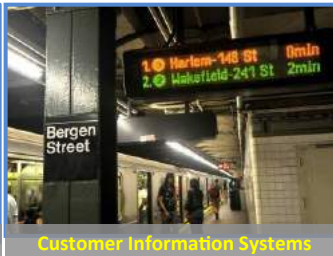


**Assessing current context for
infrastructure sectors**

Proliferation of Digitization, Automation and Technology



Rapidly increasing technology dependence



Significantly raising complexity



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Shift in type and number of interfaces

- Formerly predominantly physical, minimal in number



New approaches and tools required to manage these interfaces



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Technology greatly expands solution system options

- Less clear or obvious solutions
- Many alternative features, functionality and performance options



Greater need for project definition to understand Operational context, needs, constraints



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Deploying increasingly integrated systems

- Exceedingly difficult to deliver integrated system when Owners don't fully describe it!



- Difficult to manage risks without the tools, systems practices

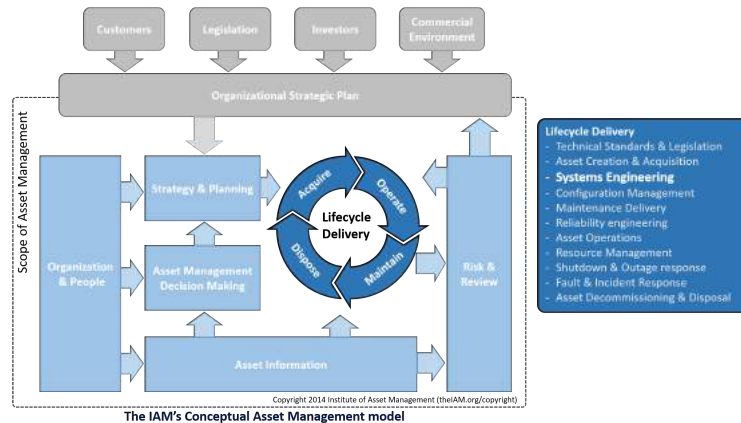


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Asset lifecycle management emphasis

Adopting whole system, “whole of life” approaches to maximize value for money



Emphasis on planning and design for full lifecycle; whole life costing

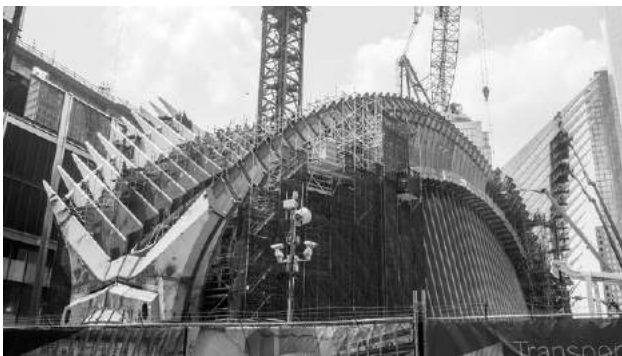
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Programs forced to rush to implementation

- Lengthy, onerous, politicized funding cycles for major projects – generate undue pressure to advance implementation



The World Trade Center PATH hub under construction in July 2014. ([Eric / Flickr](#))

Owners forced to neglect early strategy phase –

- Inadequately define priorities, outcomes, capabilities
- Teams lack unifying, overarching direction
- Operational context, needs, constraints left unexplored

Programs must identify their Purpose

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Need to operate across boundaries and silos.



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Mobility ecosystem view

Connecting silos:

- Multiple modes delivering efficient **end-to-end journeys**
- Ride-sharing services complete **last mile** + public transit
- Public transportation enables ACCESS – jobs, education, health



TCRP J-11/Task 21. Shared Mobility and Public Transit Transformation: Research Analysis. March 2016. http://sharedusemobilitycenter.org/wp-content/uploads/2016/04/Final_TOPT_DigitalPagesNL.pdf

Emphasis on Interconnectivity; Interfaces; End-to-end journeys



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Cross infrastructure interdependencies and interactions

Autonomous Vehicles → likely EVs

- Fleets of EVs support shared ownership models, mobility as a service
- When not in use, serve as power source



<http://www.telegraph.co.uk/business/energy-efficiency/business-benefits-electric-vehicles/>



<http://www.electric-vehiclenews.com/2016/12/sydney-airport-launch-new-electric-bus.html>



Langham_Place_Public_Open_Space_201307. By Wing1990hk (Own work) [CC BY 3.0 (<http://creativecommons.org/licenses/by/3.0/>)], via Wikimedia Commons

Allows open space reconsiderations

- Reduce urban heat pockets
- Manage run-off
- Reduce energy

13



Infrastructure for Smart Cities - livable and sustainable cities

Opportunities to redefine Purpose:

- Deliver urban planning, economic growth and sustainability goals
- Funding, planning and expansion of one set of infrastructure (mobility) becoming interlinked to others



Image from World Economic Forum_April 2012 Industry Agenda_Sustainable Transportation Ecosystem

***Strategic, purposeful integrative planning across silos;
Understanding of and balancing community needs.***



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14

We collectively face a paradigm shift that demands new set of skills, and transformative change to our traditional practices and approaches

As recognition grows across multiple infrastructure sectors, how will we ensure requisite capabilities are in place for individuals, teams, and leaders?



Our role as Systems Advocates: to become Change Leaders.



Identifying change levers.

Scale of transformation needed requires **Collaboration** and **Amplification**.



Need Collaborators. Allies. Executive sponsors.



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https://commons.wikimedia.org/wiki/File:3A8inoe_-_in_rail.jpg By Jun from JAPAN (Flickr) [CC BY 2.0 (<http://creativecommons.org/licenses/by/2.0/>)], via Wikimedia Commons

17

Advice for changing paradigms...

Donella Meadows paraphrasing Thomas Kuhn:

You keep pointing at the anomalies and failures in the old paradigm, you keep speaking louder and with assurance from the new one, you insert people with the new paradigm in places of public visibility and power.

You don't waste time with the reactionaries; rather you work with active change agents and with the vast middle group of people who are open minded.

Thinking in Systems, Donella H. Meadows (Chelsea Green Publishing, 2008).

