Five principles for sustainable mobility

Gepubliceerd 10-apr-22 13:20 door Editor dmi

When it comes to discussing urban mobility, Accenture's Steve Zoegall observes how a systems mindset has taken root that is compelling all of us to appreciate it as the massively complex emergent phenomenon it is.

As my presentation or panel at a given industry event gives way to a Q&A, I can be reasonably sure that at least one of the questions will be on sustainable mobility.

It wasn't always like this. A few years ago, the burning topics of the day were more explicitly tech-centric and niche – IoT-infused urban infrastructure, connected and autonomous vehicles (CAVs), drones. While these topics still do come up, it is equally clear to me that a systems mindset has taken root that is compelling all of us to appreciate urban mobility – the movement of people and goods – for the massively complex emergent phenomenon it is. This positions us all to envision and deliver more holistic and impactful evolutions of infrastructure.

> *"Stated bluntly, from build through run, transportation transformation programmes kick up a lot of dust. We need to mitigate local and global environmental impacts while building the net zero mobility networks of the future."*

The other driver of this sharpened interest in sustainable mobility is far less abstract: the tremendous infusion of capital now starting to make its way into the coffers of transportation and transit agencies worldwide. With the Infrastructure and Investment Jobs Act (IIJA) in the US, the Recovery and Resilience Facility (RRF) in Europe and pockets of stimulus funding elsewhere, we are on a generational precipice in which trillions of dollars are being directed specifically to refresh and renew transportation infrastructure.

In counterpoint to this future-oriented narrative of renewal, there are also the increasingly pressing environmental imperatives of the present. Stated bluntly, from build through run, transportation transformation programmes kick up a lot of dust. We will need to mitigate local and global environmental impacts while building the net zero mobility networks of the future.

Here are five principles for sustainable mobility. By design, they are not MECE. Functional and technical convergence in urban mobility defies one aspect being "mutually exclusive", and its complexity and regional variability mean that no list could ever be "collectively

exhaustive". Think of them as success factors that have been reverse engineered from many experiences in reshaping transportation infrastructure.

1. Design inclusively

Imagine a perfectly sustainable transportation network. Zero emissions. Yet use of it comes at a cost that less than half the population can afford for regular trips. Such a network may be sustainable in the purest environmental sense, but is it sustainable in the sense of long-term viability?

We know what happens when inclusiveness is not addressed. Mobility deserts emerge in socioeconomically disadvantaged neighbourhoods. Highways get plunked down and divide communities. Transit systems are selectively accessible for those using wheelchairs.

Infrastructure programme planners can invite community engagement consultants to gather and distill citizen feedback, creating a culture of inclusive engagement particularly in the planning stages.

Digital twin platforms are also helpful as they can ingest and visualise citizen feedback on specific aspects of the project design, and then dynamically tweak the design. Consortia for larger programmes can consider including a citizen board of advisors, reflecting the diversity of the community, as a direct conduit to ongoing feedback.

2. Think convergently

No transportation system is an island. Intracity public transit networks interact with intercity high-speed rail networks. Connected vehicles relay signals with terrestrial and orbital devices. Airports and ports trigger peaks and troughs of traffic in their surrounding cities.

For me, convergent thinking is the cousin of systems thinking, but it applies more directly to the boundary between operational technology and information technology, or OT/IT. Over the last decade, the rapid rate of digital-physical innovation has turned that boundary from sponge into Swiss cheese. Today, virtually all infrastructure projects are born digital, and their operations can be digitally optimised.

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In practice, on the build side of capital programmes, this means that we need to usher in a new age of digitally-enabled sustainability measurement and management capabilities, directly woven into portfolio management applications. On the run side of operations, this means that we need to supercharge our transit networks – the backbones of urban mobility

– with responsive digital intelligence that will enable them to dynamically optimise services, predictively manage assets, and integrate with first/last buses and microtransit.

3. Learn platform-ese

When it comes to smart city mobility platforms, I have noticed that everyone likes to talk about them, yet no one wants to build them. This duality stems from the cold hard facts about such platforms: they are inevitable for any integrated urban mobility system, but they are difficult to design, build and operate successfully.

I was recently talking with some industry experts who were wondering aloud, “which would be better for most cities around the world: a centralised (one supervening agency) or decentralised (multiple agencies) model?” My own take is that, if you have a good cloud-based platform in place to facilitate data sharing and govern transactions, not only can you completely skip that question, you have also – voilà! – just enabled mobility-as-a-service (MaaS).

> *"Believe the hype: cloud-based smart mobility platforms are coming soon to a city near you. Fortunately, we have already moved beyond the hype as many such platforms have already been built."*

True MaaS brings the power to the people, empowering individuals to choose those mobility services that best align with their preferences, constraints and values – including their personal sustainability priorities.

Believe the hype: cloud-based smart mobility platforms are coming soon to a city near you. Fortunately, we have already moved beyond the hype as many such platforms have already been built. Some are even in the process of scaling from the city level to state, regional and national levels. These efforts have much to teach us about the success factors for infrastructure-scale platforms.

4. Know PPCs

Building or rebuilding our mobility systems to be more sustainable is only possible through public-private collaboration. PPCs are the macro-organisms that involve many types of partners to create change.

Virtually all transportation megaprojects – those north of $1bn – and even many smaller projects are being run by consortia of various sizes, but with quite specific roles. Many consortia have been pulling in partners who use digital tools of various kinds to simulate emissions and particulate impacts, and help mitigate both in advance.

5. Smuggle sustainability

What comes to mind when you think of sustainability? For many of us, visions spring up of solar panels and wind turbines. We tend to focus on the supply side, and any gains on the demand side – which can easily outstrip supply gains – remain unrecognised. Likewise with sustainable mobility associations: while electric and hydrogen certainly have their supply-side part to play, there is a vast array of hidden demand-side ways to advance the cause.

> "At least half of the gains we see in sustainability are as the byproducts of other efficiency gains."

For example, take roadside incident management. If the average resolution time of the clearing of a crash on a highway is 15 minutes, imagine that you could somehow cut that time in half. Think about the reduced congestion – and associated emissions – from that saved time. Multiply that by the number of vehicles, and by the number of incidents nationally. You now have some brag-worthy outcomes.

I call this recognition and measurement of demand-side gains “smuggling in sustainability” because these often massive achievements are generally not recognised. And if they stay unrecognised, they don’t get replicated. That would be a shame since at least half of the gains we see in sustainability are as the byproducts of other efficiency gains. We need to overcome this counter-intuitivity and smuggle more sustainability into our transportation transformation programmes.

Source: Steve Zoegall: Global Industry Lead – Cities, Transport & Infrastructure, Accenture

Tags : eng, mobility-platform, smart-city, sustainability, sustainable-mobility