SMART CITIES

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ABOUT UITP?

› A passionate champion of sustainable urban mobility, Internationally recognised in the development of this critical policy agenda.

› A long history since 1885, only worldwide network to bring together all public transport stakeholders and all sustainable transport modes.

› 1,300 member organisations from 92 countries.

› Our members are public transport authorities and operators, policy decision-makers, research institutes and the public transport supply and service industry.
ABOUT UITP?

Our vision

- We are working to enhance quality of life and economic well-being by supporting and promoting sustainable transport in urban areas worldwide.

Our missions

- Every day we make a difference for our members and for the wider sustainable transport community.
ABOUT UITP?

We engage with decision-makers, international organisations and other key stakeholders to promote and mainstream public transport and sustainable mobility solutions.

We inspire excellence and innovation by generating and sharing cutting-edge knowledge and expertise.

We bring people together to exchange ideas, find solutions and forge mutually beneficial business partnerships.
1. The what & why of Smart Cities

2. Smart Transport Management
The what & why of Smart Cities

Reference Paper: Smart Cities: Opportunities for the UK
THE CENTURY OF CITIES

- 80% of the world economic output is concentrated in cities (50% in cities of 750k+)
- Paris accounts for 35% of GDP of France and Tokyo even for 40% of the national GDP of Japan
- Until **2025**, the share of world urban population will increase from 53% to 60%.
- In India, it will increase from 32% to 37%.
- India’s urban population will reach 590 million by 2030 - 60 cities with a million plus population
- Economic growth and urban sprawl mean more and longer trips in cities.

% of population living in cities

<table>
<thead>
<tr>
<th>Year</th>
<th>1800</th>
<th>1950</th>
<th>2008</th>
<th>2040</th>
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<tbody>
<tr>
<td></td>
<td>3%</td>
<td>29%</td>
<td>50%</td>
<td>65%</td>
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WHAT IS SMART CITIES?

A city that collects and analyzes data to monitor, measure and manage the complex systems that facilitate life in urban environments.

By using this information cities can optimize their operations, individually or collectively.

It brings together the cities, industry and citizens to improve urban life through more sustainable integrated solutions. This includes applied innovation, better planning, a more participatory approach, higher energy efficiency, new business models, better transport solutions and intelligent use of information and communication technologies (ICT).
IBM refers "Smart City" as cities of the future where computing technology will be used to improve efficiency of infrastructure and public services.

Future cities will run completely on technology—be it for electricity, water, sanitation or recycling; ensuring 24/7 water supply, traffic and transport systems that use data analytics to provide efficient solutions to ease commuting, automated building security and surveillance systems, requiring minimal human intervention, and Wi-Fi-powered open spaces and houses that ensure always-on, high-speed connectivity.
SMART CITIES – INTEGRATION OF DATA IS KEY

To make this a technical reality you need to gather and fuse data from multiple systems that today sits in separate silos. This will help cities to optimise their operations both individually and collectively.

Not just a technical challenge to do this - it will be necessary to transform local governance models, build effective partnerships, develop new business models and finance, standards, data, procurement, policy, knowledge sharing, planning, engagement etc.
There must be an evolution **from isolated technology projects towards** a model that addresses new city challenges from a comprehensive perspective and with an **integrated focus**.
SMART CITIES AT A GLANCE

A smart city is a developed urban area that creates sustainable economic development and high quality of life by excelling in key city functions that can be done through strong ICT infrastructure:

- Smart Energy Management
- Smart Water Management
- Smart Waste Management
- Smart Assisted Living
- Smart Transport Management

The aim of smart cities is to make our cities more sustainable.
SMART ENERGY MANAGEMENT

Technology that makes use of data or information to improve the management of energy. This is sometimes closely tied to, but is distinct from technology which generates renewable or sustainable energy.

- Energy systems are facing increasing maintenance and upgrade costs to keep up with exploding energy demand.
- Need to improve energy management to drive up energy efficiency and resilience by:
  - Forecasting and manage loads better
  - Reducing the need for costly infrastructure expansion

E.g. using electric infrastructure of rail networks in the DC grid
E.g. Transport remains the fastest growing energy consumer in the urban environment with expensive fossil fuel (in foreign currencies) …
SMART WATER MANAGEMENT

Smart water management solutions are a means by which water companies use technology to optimise performance, minimise disruptions and conserve water.

The demand for water and the cost of treating water are increasing, while a reducing supply of water means most cities are now facing huge challenges in managing and delivering safe supplies of water to those living and working in cities. The United Nations predicts that global water demand will rise by 40% between now and 2020 and that this will be 50% higher in developing countries.

e.g. The more complex the urban environment becomes the more interaction between water and transport infrastructure takes place, impact of flooding due to metro constructions, etc
A smart Transport System enables people to take more control through informed choice of how and when they access transport, enabling the transport user to better manage their time, spend less time in traffic or waiting for public transport.

A smart transport system is one which integrates information from different modes of transport, including trains, buses, and tube, but as well walking (and cycling) etc.
SMART WASTE MANAGEMENT

Smart technology employed within the waste management industry focuses on enhancing the efficiency of collection and separation.

The main driver behind these technologies has been cost reduction and the need for many cities to improve their recycling performance. Waste is a by-product of economic activity and the smart management of waste will have economic implications which will influence productivity, government expenditure and the environment.

e.g. A lot of congestion could be avoided if an interaction between the transport system and the waste collection could take place.
Assisted Living for the purposes is a philosophy of care promoting independence and dignity through the use of services and technology including instruments, apparatus, appliances, or materials, including software, necessary to assist people aged above 65, and those who are physically and cognitively impaired, in fulfilling daily activities towards independent lives and an improved quality of life.

e.g. Tools supporting mobility of elderly will dramatically help them to feel and remain included in society and allow to live in autonomy in good conditions
BUT WHY?
THE BIG CITY COMPETITION

The 2008 roster of leading Alpha cities:

1. **Alpha++ world cities**: New York, London
2. **Alpha+ world cities**: Hong Kong, Paris, Singapore, Tokyo, Sydney, Milan, Shanghai, Beijing
3. **Alpha world cities**: Madrid, Moscow, Seoul, Toronto, Brussels, Buenos Aires, **Mumbai**, Kuala Lumpur, Chicago
4. **Alpha− world cities**: Warsaw, São Paulo, Zürich, Amsterdam, Mexico City, Jakarta, Dublin, Bangkok, Taipei, Istanbul, Rome, Lisbon, Frankfurt am Main, Stockholm, Prague, Vienna, Budapest, Athens, Caracas, Los Angeles, Auckland, Santiago

Remark: A Large City or a Mega City is not necessarily a WORLD CITY, which sets the global agenda, serves as the hub of global integration and is the engine for growth of its country or gateway to the resources in its region.

**BUT: A World City has always a good public transport system...**
Smart Transport Management:
‘Economy is MOVING goods & services: from a place where they are affluent to a place where they are scares’

Smart Transportation: Integrating Systems for More Efficient Transportation (IBM Smart Cities)

http://m.youtube.com/watch?feature=plpp&v=bUyourDcWzw&p=PLrLdFD5aTAq7VqbQKRFgnt8lWCbkSaE4I
INTRODUCTION ABOUT EFFECTIVE MOBILITY

Reference: UITP Mobility in Cities Database: www.uitp.org
COMPLEX MOBILITY: PASSENGER TRANSPORTATION WILL FLOW LIKE DATA ON THE INTERNET

As the social and economic systems get more complex quickly, the mobility they require gets more complex:
Megacities: More stop than go

The cost of paralyzed traffic flows in the world’s 30 biggest megacities alone adds up to USD 266 billion

1. Today’s passenger transportation is inefficient. This has both microeconomic and macroeconomic implications. Annoyance on a personal level (wasted time, restricted mobility, inconvenience) is compounded by damage to the economy. In the world’s 30 biggest megacities, paralyzed traffic flows have an annual cost of more than USD 266 billion.

2. This inefficiency is likely to increase. Around the world, 180,000 people a day are moving to big cities. The global population is growing mainly in emerging countries in Asia and Africa. Metropolitan regions are coming under increasing pressure to organize more efficient and environmentally friendly systems of passenger transportation.
SMART TRANSPORT MANAGEMENT?

A smart Transport System enables people to take more control through informed choice of how and when they access transport, enabling the transport user to better manage their time, spend less time in traffic or waiting for public transport.

A smart transport system is one which integrates information from different modes of transport, including trains, buses, and tube, but as well walking (and cycling) etc.
ITS consists of ‘any technology, method or application that provides the traveller/client with added value, guidance, improved safety or efficiency benefits through information collection, storage, manipulation and subsequent dissemination’. By using advanced analytics to predict and adapt in real-time to network perturbations, ITS can:

- Bring greater control and automation to road networks.
- Be used to ease congestion
- Allow for more effective responses to planned and to unplanned incidents.
INTELLIGENT TRANSPORT SYSTEMS (ITS)
TRANSPORT INFORMATION APPLICATION

Are used by transport integrators to reduce congestion, improve quality of life, reduce emission from traffic, improve safety and optimise traffic flow enabling better management of transport systems in cities.

e.g.:

- GIS/traffic management service application model integration and convergence
- GIS based mass traffic information management engine
- Traffic comprehensive information resources integration
- Traffic data centre and traffic flow data survey and analysis
- Traffic data collection, statistical analysis and presentation
INTELLIGENT TRAFFIC FEATURES

Are used to reduce congestion, improve quality of life, reduce emission from traffic, improve safety and optimise traffic flow.

e.g.

• Dynamic traffic information acquisition, integration, processing, forecast and distribution
• Electronic toll collection
• Intelligent parking guidance system
• Vehicle licence plate automatic identification
• Traffic event automatic detection
• GPS monitoring/dispatching and information service
• But today as well the individual mobile devices of travellers
SMART MOBILITY CONCEPTS
FOR PUBLIC TRANSPORT
IT MEANS MOVING AWAY FROM:
MASS TRANSIT...
TO:
A DOOR-TO-DOOR INTEGRATED TRANSPORT SOLUTION
FOR PUBLIC TRANSPORT, IT MEANS INTEGRATED "DOOR-TO-DOOR" MOBILITY CHAINS
SUSTAINABLE MOBILITY BENEFITS FOR ALL

<table>
<thead>
<tr>
<th>City/Public Authorities</th>
<th>Mobility Providers</th>
<th>Travellers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimized transport infrastructure &amp; planning</td>
<td>Cost reduction</td>
<td>Convenient multi-modal travel</td>
</tr>
<tr>
<td>Compliance with emission regulations</td>
<td>Value-added services</td>
<td>Stress-free switching from one mode to another</td>
</tr>
<tr>
<td>Communication with the travelling public</td>
<td>Additional sales channels through partners</td>
<td>Transparent travelling information</td>
</tr>
<tr>
<td>Increased control of traffic management</td>
<td>Increase in revenue</td>
<td>Customized individual mobility packages</td>
</tr>
<tr>
<td>Information about transport needs</td>
<td>Improved utilization</td>
<td>Greater choice of mobility offerings</td>
</tr>
<tr>
<td>Attractive city</td>
<td>Better understanding of customers</td>
<td>Attractive prices and bonus programs</td>
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</tbody>
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Source: Siemens

2nd BRT Conference
29th September, 2014, Ahmedabad
FINAL REMARKS: CITY LEADERS TODAY CAN:

- Collect and analyze data to monitor, measure and manage the complex systems that facilitate life in urban environments, because our cities are awash in data,
- Understand how transportation, water and energy systems interact, and optimize their operations, individually or collectively through advanced analytics (of structured or unstructured data),
- Predict the impact of changes to the public safety system on adjacent systems, such as education, healthcare and social services.

→ They can make confident, informed decisions that will reduce costs and improve living conditions citywide.
FINAL REMARKS

• Involving citizens and more collaborative ways of doing things (social media)
• Re-evaluating rules, finances and legislation (it is not just a technological challenge)
• A more standardised approach to data collection (open data)
• Becoming a smarter city is not an overnight transformation (shift of thinking; holistic assessment; identification of hot spots), but the created efficiency will free time and resources and drive economic development
• Due to its efficient land use and structural mobility capacity public transport is the backbone for smart mobility
SO WHAT`S NEW?

We had ITS before, we even had IPTS before its just a new Buzzword, at best its just a nice philosophy

YES!

BUT
- In 2020, expect more than 50 billion connected devices and the numbers of cars on our roads to have doubled.

- Big data can be managed today thanks to the changed technologies & India has all to leapfrog over the traditional applications and features.
MORE THAN A PHILOSOPHY

Even if the philosophy is accepted, there is still work:

- The lead needs to come from integrators at the level of the city and breaking through the silos requires dramatic changes in the governance structures.

- Public Transport Operators and Transport Organising Authorities have to break through the silos too and transform to become the multimodal and multifunctional integrators in the city beyond the stand-alone modes of Rail, BRT, road, walking, cycling, etc.

... if they want smart cities to happen.
GROW with PUBLIC TRANSPORT
THANK YOU!!
BONUS SLIDES:
GLOBAL SMART CITY – SINGAPORE CASE STUDY
Singapore is an example of a vertical smart city. It is an Island country without natural resources and has transformed itself into a Smart Island.

- The country has already connected most of its households with super-fast 1 Gbps service.
- The country has launched the Smart Nation plan (SNP) to build a smart nation: enabling safer, cleaner and greener urban living, more transport options, better care for the elderly at home; more responsive public services and more opportunities for citizen engagement.
SINGAPORE – SMART NATION PLAN (SNP)

- Under SNP program, the government will focus on 3 areas - connect, collect, and comprehend.
- All government agencies will be connected to a single platform which will enable essential data, captured and collected via sensors placed around Singapore, to be anonymized, secured, managed, and shared.
JURONG LAKE DISTRICT (JLD) - A RESIDENTIAL-BUSINESS ESTATE
Jurong Lake District is a district of Singapore. It consists of two zones, namely Jurong Gateway and Lakeside. It is 360 hectares in size and served by two major expressways and three MRT stations.

- The city will be developed as Integrated Township – Residential and Business Estate, bringing jobs closer to where people live.
- The city will have more than 1,000 sensors deployed to control and monitor traffic, street lights and crowded buses.
- Other innovations include Traffic light timings that adjust automatically, phone applications that will help residents find sheltered walkways, parks’ lighting that adjust based on time of the day and motion detection.