

# Use of 'Big Data'

- London 2012 Olympics, subsequent developments and Opportunities for Tokyo 2020

Yoshie Muramatsu  
Senior Consultant (Cities)  
Arup

# ‘New Technology’ used in London 2012

- Bluetooth: crowd numbers & flows
- Mobile phone data and information push to users including social medias.
- Mobile spectator journey planner
- Olympic Family vehicle location tracking and run-time monitoring
- Games Lane and general highway performance management & control
- Customised satellite navigation systems for freight and Games vehicles



# Advances in Transport Planning & Analytics since London 2012

Advances in **Modelling  
Capabilities**

Advances in **Machine  
Processing Speed**

Advances in **real-time monitoring  
and dynamic digital control**

Advances in **Data Exports  
and Interfaces**

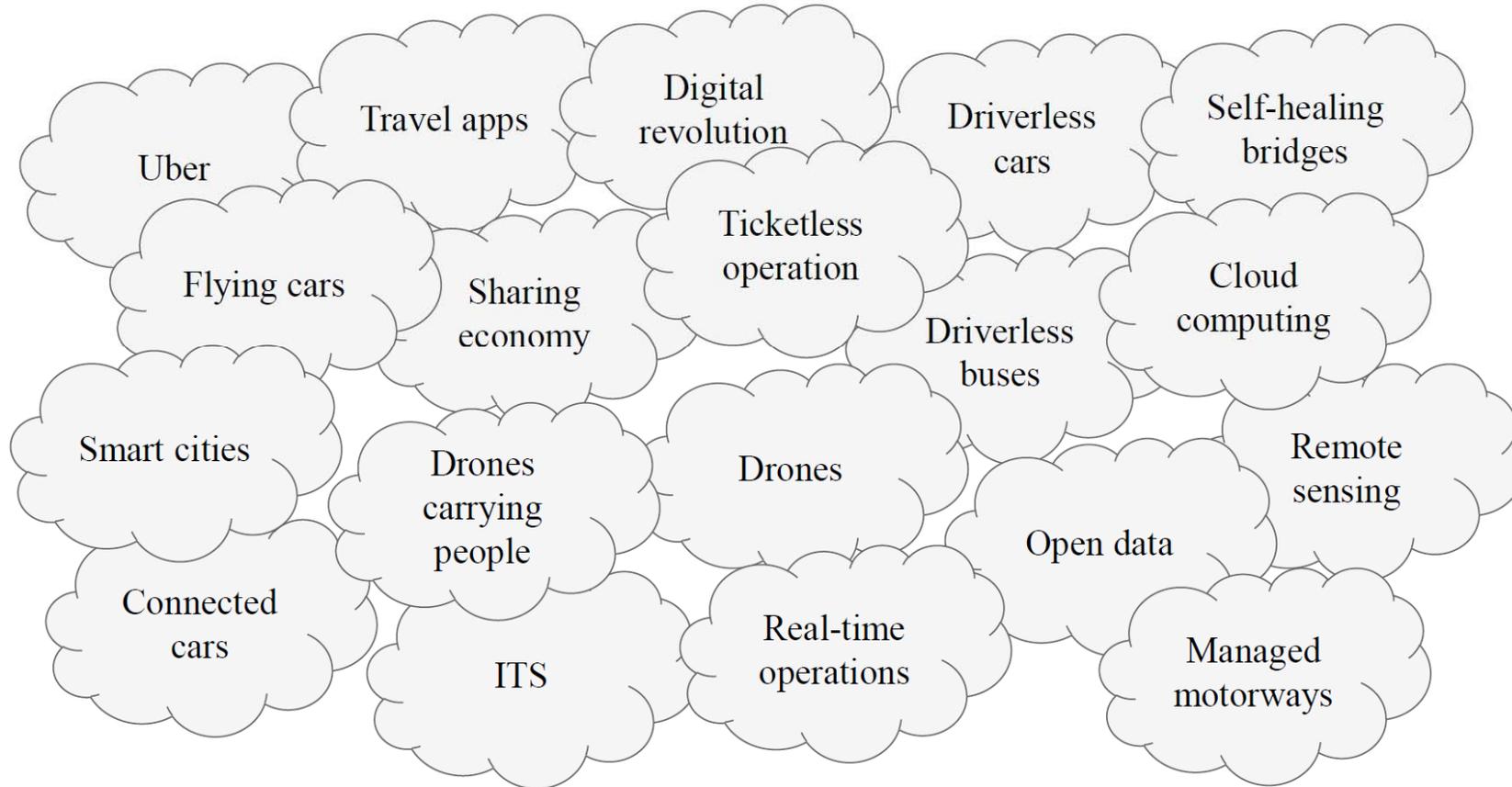
Advances in **Data  
Collection and Richness**

Advances in **Visualisations  
and Dynamic Reporting**

# Disruptive Technology

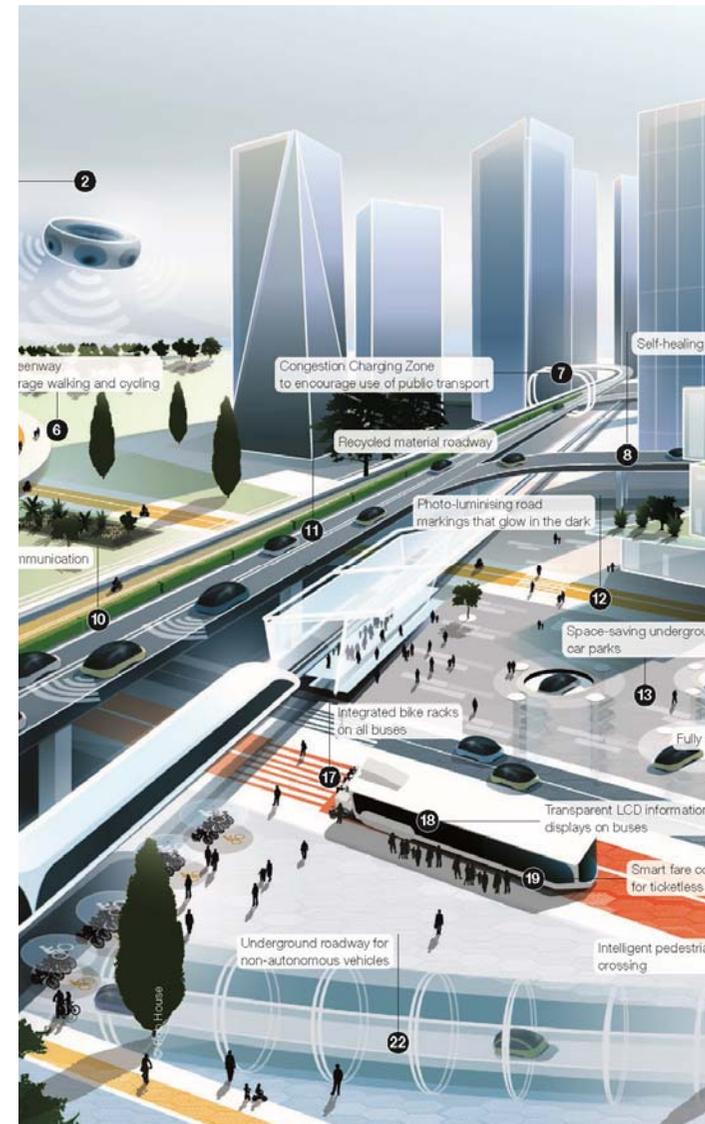
Lots of disruption and change

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# Big discontinuities in road, rail and air transport are imminent and can be used for Tokyo 2020 and beyond

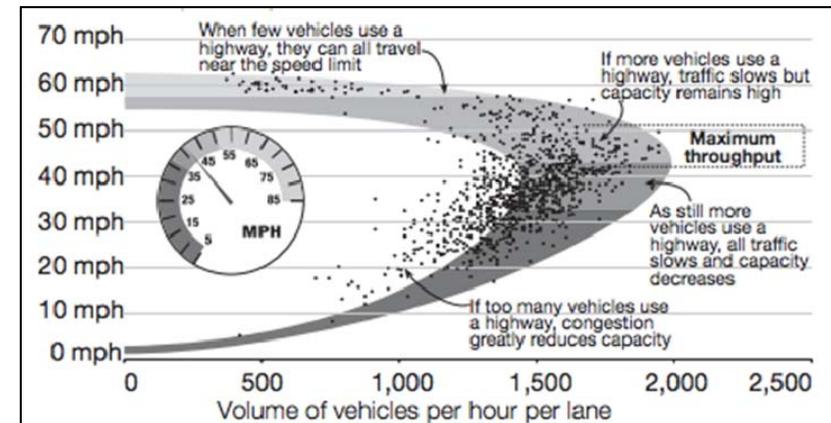
- Energy: efficient power units
- Digital: dynamic control
- Connected: always on
- Big data: real-time, mobile data, bluetooth, wireless



# Road: major mobility, space and capacity changes

- On-demand cheap mobility
- 30% to 100% capacity increase
- Shared and clean vehicles
- Connected vehicles
- Changed road space
- Increasing acceptance of new technology

**Moving the athletes and the “Games Family” would have been faster, cheaper and easier.**



# Rail: operational change not cost reduction dominates

- Digital control:
  - 20% to 30% service volume increase
  - Service flexibility increase: dynamic scheduling, skip-stopping...
- Customer information: pervasive, real-time and fully multi-modal
- Ticketing and pricing: integrated, phone based and demand responsive
- Changed urban, regional and national travel patterns
- Faster service recovery

**Spectator transport by rail could have been even more day specific, flexible and demand responsive**



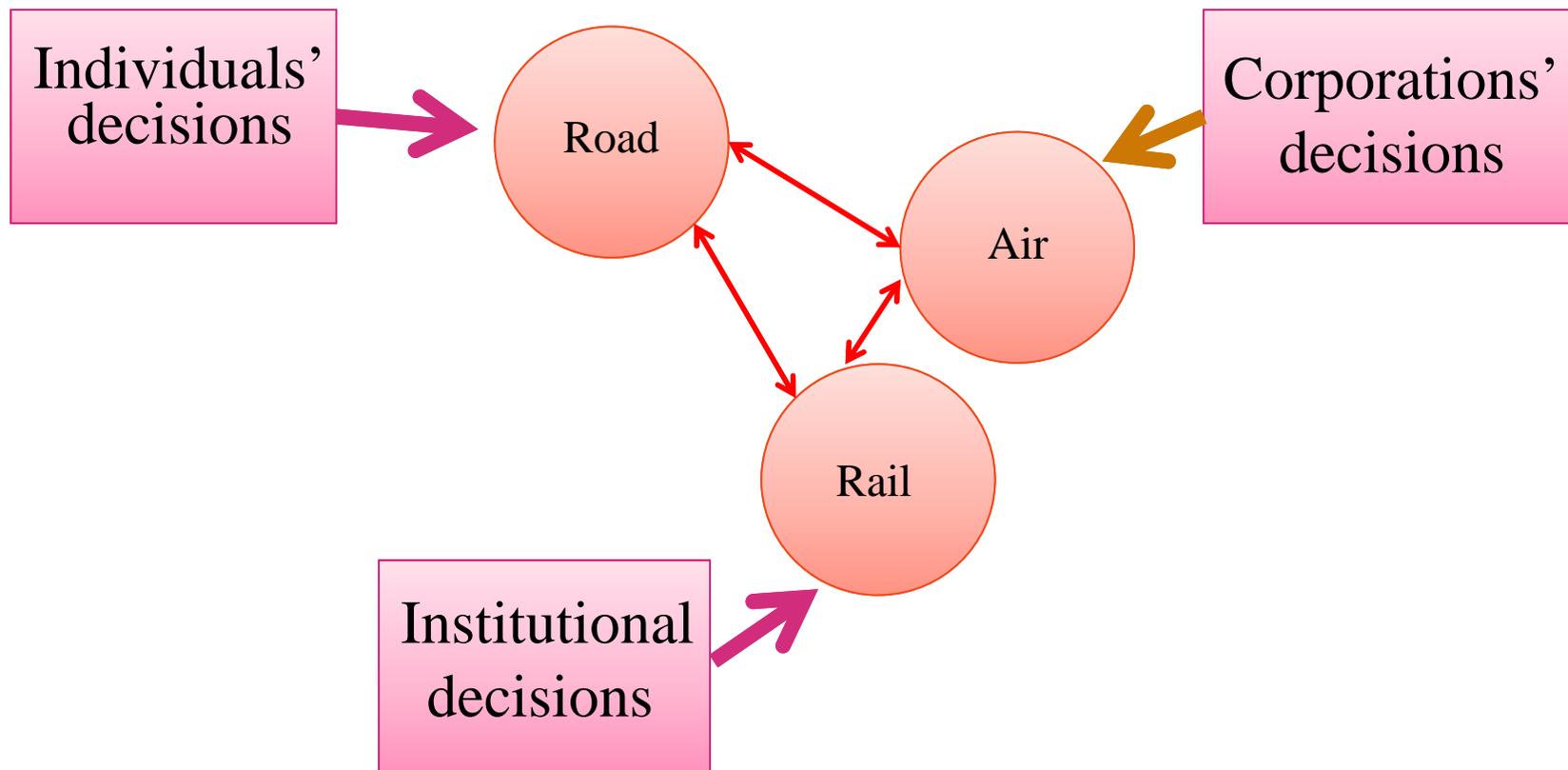
# Air: a more incremental change, but just as profound

- Aircraft: efficiency and range
- Airlines: low cost operating models
- Airports: process driven
- Airports: purpose led
- Competition, connectivity and cost
- Increasing focus on customer satisfaction, e-ticketing & smart media

**Games-time air travel and its management easier**



The big challenge for Tokyo 2020 and for future cities will be achieving coherence between these interlinked and fast changing road, rail and air modes



# These changes provide a wide range of opportunities for Tokyo to use for the 2020 Games and beyond

- Autonomous and green vehicles: e.g. in village transport shuttles
- Transport Co-ordination Centre: version 2.0
- Real time crowd monitoring, prediction and management
- Spectator accommodation e.g. Airbnb V2.0, underwritten
- Vehicle fleet management systems e.g. Uber/Lyft V2.0
- Travel Demand Management: V2.0, targeting, push, viral



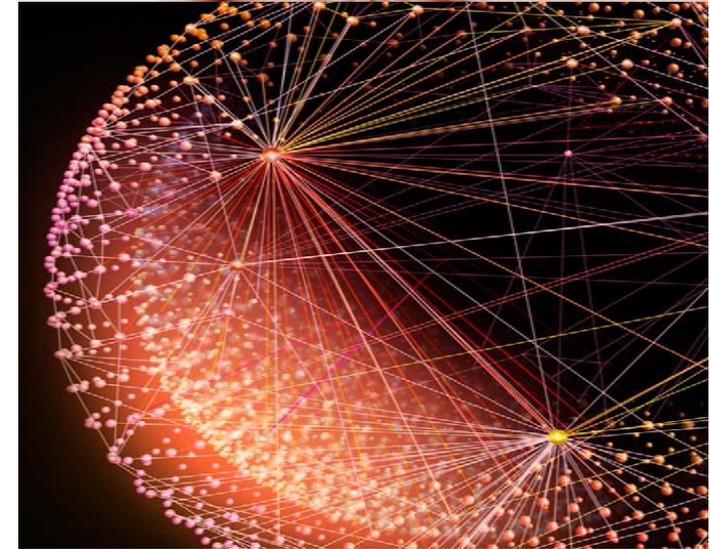
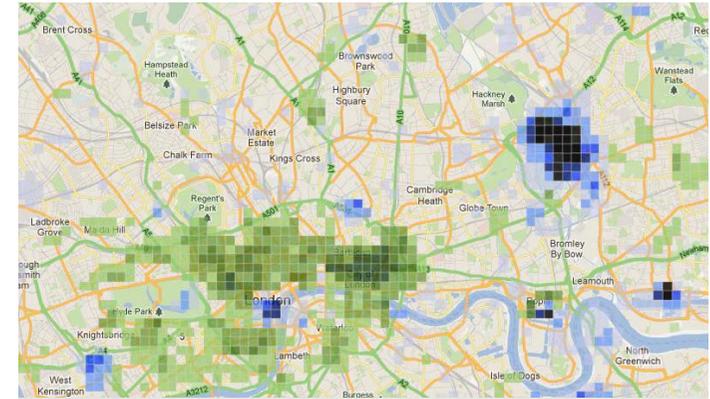
# Smart Transport – Recent London Examples

- Mobile Technology
- Open data and GPS integration e.g. bus location, cycle availability
- Isochrone modelling and distribution of public transport
- One Transport – Internet of things



# Mobile Phone Data

- Not widely available for 2012 Games but used for Live Sites, City Ops & Legacy events (New Years Eve)
- Rapid evolution since:
  - Highways England creating 5 sub regional UK models using mobile phone data
  - Transport for London in-vehicle Bluetooth for ONE model
  - TfLs Project EDMOND – mobile phone data for London & the SE
  - Fusion with other big data sets (Oyster, WiFi) to create multi modal platform
  - Opportunities for ‘real time’



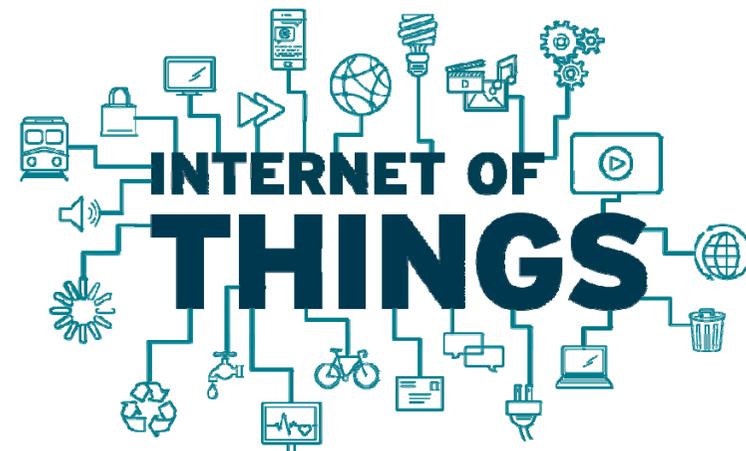
# Advancing Technologies

- Mobile phone data
- iBeacon/Bluetooth/RFID technologies
  - send transport updates, queue information and wayfinding etc.
  - collected for real-time tracking people movements
  - Increasing accuracy of technology
- Payment Methods including Near Field Communications, Smart Phones and Wearable technology
- Tickets for transport, venue access and events through phone apps and wearable technology



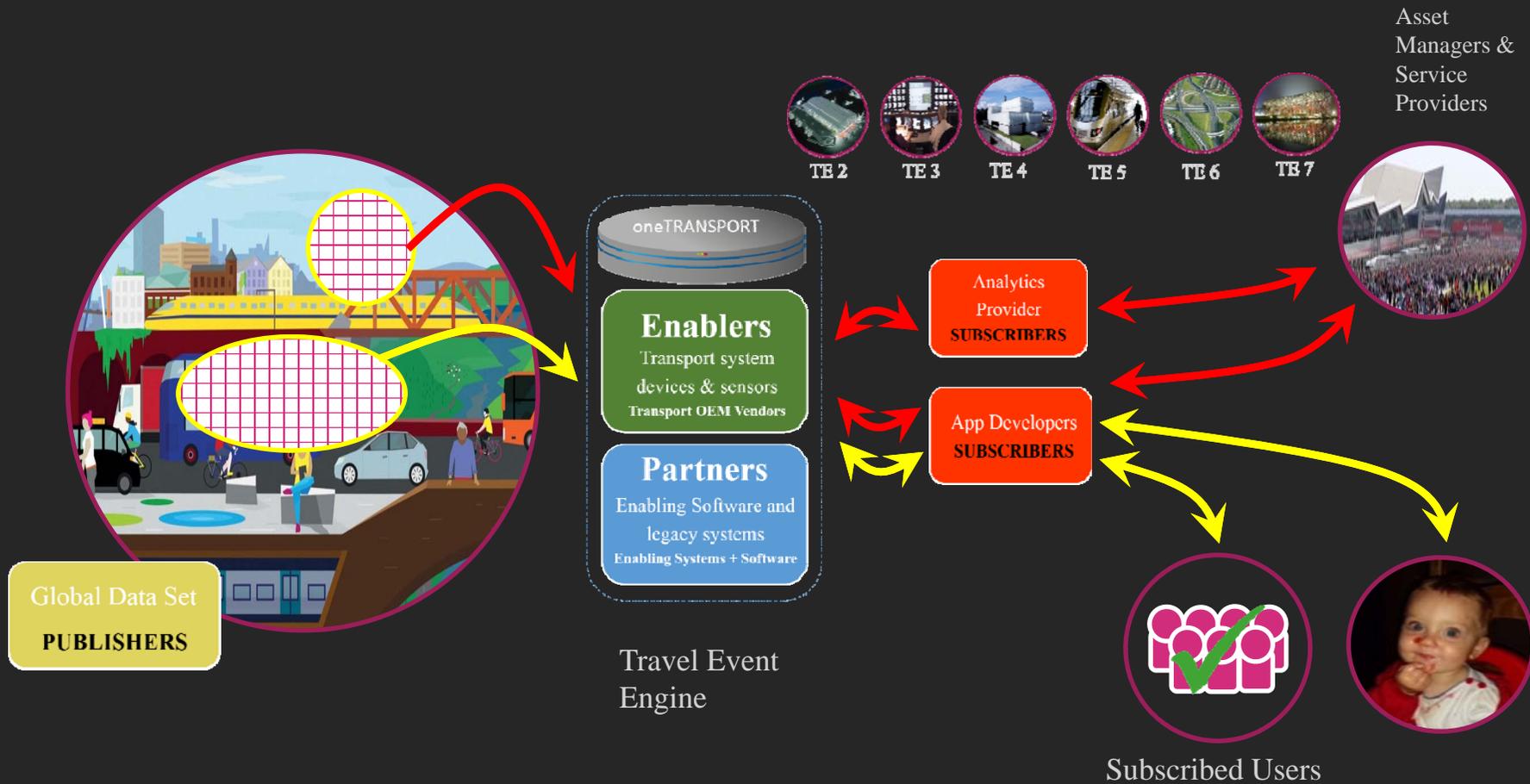
# OneTRANSPORT

- Brings together ‘locked’ proprietary data assets and IoT sensors in one location
- Envisaged as the ‘transport’ component that provides improved mobility within the ‘smart cities’ agenda
- Based upon internationally standardised technology fully compatible with ‘smart city’ solutions of the future
- Smart Parking - Car parking and bicycle space sensors to give live reading of capacity and provide usage data over time



# One Transport

## Establishing an open market place to develop services



# Conclusions

- The London 2012 Games stretched London and the nation's transport systems: a good test bed for the future
- Transport for 2012 was a success: The 2012 “ingredients” and “total transport” planning worked
- The coming road, rail and air transport discontinuities resonate well with the lessons from 2012
- Technologies can offer increased resilience
- This gives confidence that the transport challenges of mega-cities can be met, and at the same time...
- These changes provide significant opportunities for Tokyo 2020 to grasp and take forward as legacies.