

# 'Innovation and Pollution'

5<sup>th</sup> July 2017



**SIEMENS**

**THE  
Crystal**  
A Sustainable Cities Initiative  
by Siemens

**LSx**  
London Sustainability Exchange

# The aims of this seminar

- **Explore** challenges of air pollution
- **Understand** how innovative business models, ideas and technologies are helping tackle pollution
- **Develop** new ideas and solid actions to improve air quality
- **Connect** policy makers, local planners, and other community groups
- **Prepare** for a consultation response to the London Environmental Strategy and the London Plan

# Event Agenda

**Welcome by Samantha Heath, CEO of LSx**

**Quiz or survey** to assess level of innovation knowledge and use

Keynote by **Tim Ward TfL LoCity**

Keynote by **Laurie Laybourn-Langton Institute for Public Policy Research (IPPR)**

Introducing concepts: **Innovation: technology solving urban challenges by Mark Jenkinson from Siemens**

**Q&A with the Keynote speakers and Samantha Heath**

**Networking and looking at challenges** on posters around the room with questions

**Introducing solution workshops** by organisations with answers to the questions

**Feedback: Quiz or survey** to assess closing level of knowledge on innovation and how it can be applied

**Closing remarks**

## Solution workshops:

▪ **Autonomous Vehicles: Innovation in Transport**  
WSP Group

▪ **Innovation in the sharing Economy**  
DriveNow & IPPR

▪ **Innovation in last and first mile delivery**

Dearman, Parcelly & Gnewt Cargo

▪ **Innovative Technology**  
Battle McCarthy & Air Labs

▪ **Innovative Engagement**  
Tranquil City & Future City Catapult

## Challenges:

- **Mobility**
- **Unsustainable Use of Resources**
- **The First and Last Mile**
- **Pollution and Freight**
- **Apathy and Vulnerability**

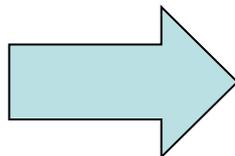
# How can innovation in cities tackle air pollution?

- While it is apparent that tackling air pollution requires a holistic response from policy makers, businesses and individuals, **increasingly there is a significant role for technology and innovation**
- **Innovative business models, technologies and ideas play an ever more important role in tackling air pollution**, in all of the following areas:
  - Monitoring, mitigation and adaptation to pollution
  - City planning
  - Movement of goods
  - Travel

# Key challenges related to air pollution and possible innovative solutions

## What are the challenges?

- Safer, healthier streets
- Unsustainable use of resources
- Pollution from freight
- Apathy and vulnerability



## Exploring innovative solutions:

- Autonomous vehicles
- Sharing economy
- Innovative freight
- Technology
- Engagement

# Tim Ward

Freight and Fleet Engagement Manager  
Transport for London

“Everything that has arrived here today – glasses on your tables, chairs that you are sitting on, IT systems – everything arrived on the back of a truck, the back of a van or possibly a boat.

That movement needs to be accommodated on London's streets, London's waterways and London's railways, and it **needs to be done in a way that is environmentally friendly and meets the Mayor's ambitious targets on air quality**”

[\(click for full presentation\)](#)



# Laurie Laybourn-Langton

Senior Research Fellow, IPPR



**“The average occupancy rates of a private car in London is 1.6 people per journey.**

Low utilisation increases the amount of land given away to vehicles, imposing a large opportunity cost for other spatial options such as cycle lanes and parks”

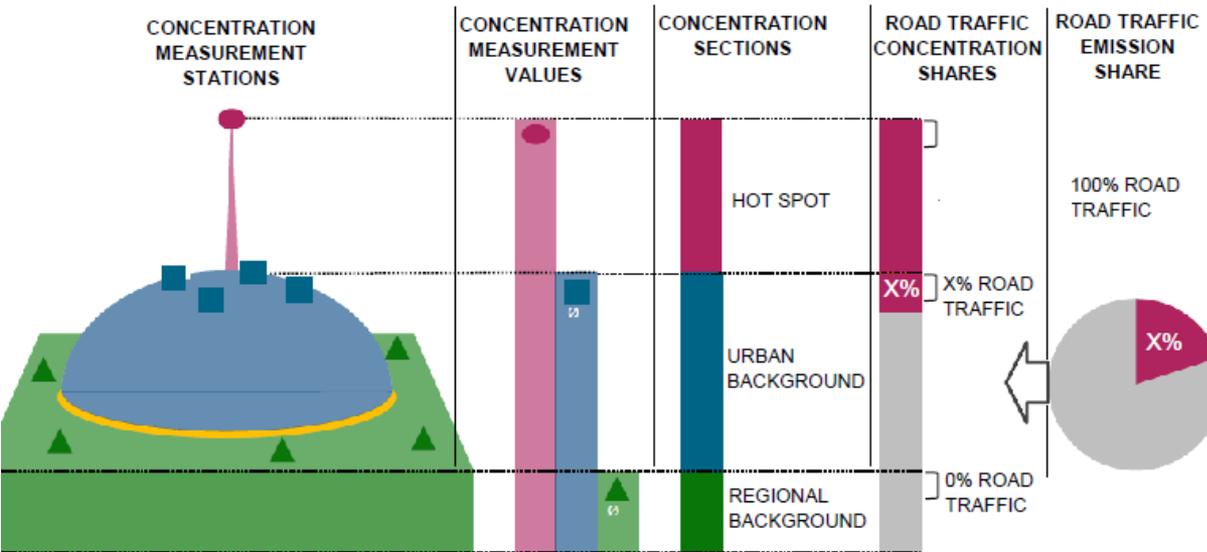
[\(click for full presentation\)](#)

- Acceptability
- Accessibility
- Security
- Power & Political Choice

# Mark Jenkinson

Urban Development: London City Director  
Siemens

## Identify and reduce traffic-related Air Pollution at Hot Spots



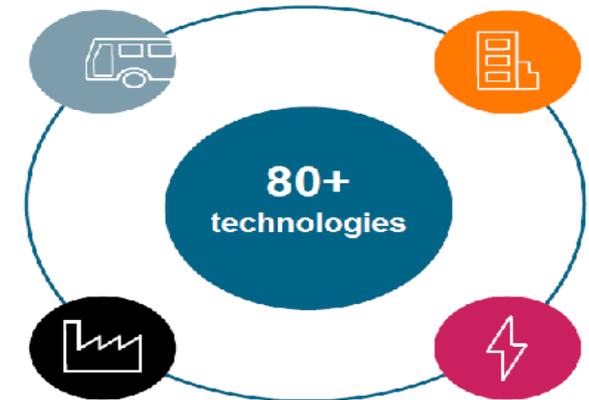
## Siemens' City Performance Tool (CyPT). Which technologies help to reduce air pollution?

### Transport

- Public transport
- Private transport
- Traffic management
- Freight

### Buildings

- Building envelope
- Building automation
- Monitoring and optimization



### Industry

- Power Industry
- Cement Industry
- Steel Industry
- + General Industries

### Energy

- Renewable generation
- Combined Heat & Power
- Grid management

## Short Term Measures

- |                       |                               |
|-----------------------|-------------------------------|
| Low Emission Zone     | Free Bike Sharing             |
| Dyn.Emission Charging | Reduce Headway of Metro/Train |
| Close Car Parks       | Reduce Industrial Production  |
| Home Office           | Car Pooling                   |

[\(click for full presentation\)](#)

# Exploring innovative solutions to the challenge of mobility: Autonomous Vehicles

## The challenge:

- **8000 hectares** of land in central London is occupied by parking spaces
- **90%** of all road accidents are due to **driver error**
- HGVs represent less than **4%** of driver miles in London but are involved with **20% of pedestrian fatalities** and **78% of cyclists fatalities**.

## Possible solution: Autonomous Vehicles

- Minimal dedicated parking would be required, as AVs can move while empty
- If usage/ownership is shared, significantly fewer total cars would be required
- AV zones therefore offer 15-20% additional developable area compared with typical central urban layout
- AV technology would be far more aware of bicycles and pedestrians.

## Main barriers:

- Attitudes: some people like the independence of owning and driving their own car
- Potential trust issues around bugs or hacking
- Establishment of a legal framework to assign responsibility in case of accidents involving driverless cars

## Next steps:

- Share information, promote pilot schemes and change attitudes
- Update infrastructure, e.g. a localised wireless network to optimally distribute “Vehicle-to-Everything” communication
- Leadership from both public and private sectors

## What we want from the London Plan:

- Legislation that permits and promotes the development of AV use and infrastructure
- Greater connectivity between existing systems and vehicles
- Incorporation of possible future AV zones in emerging development areas such as Park Royal and Old Oak Common

# Exploring solutions to unsustainable use of resources:

## Sharing Economy

### The challenge:

- London is the UK's most congested city, costing drivers in the capital more than £6 billion across the city as a whole (INRIX 2016).
- Vehicle use is highly inefficient, with vehicles parked 97% of the time (RAC Foundation, "Spaced Out", p24).
- Transportation is responsible for more than 50% of NOx emissions in London.
- Total car ownership in England is predicted to rise 25-42% between 2010 and 2040 (DfT2015).

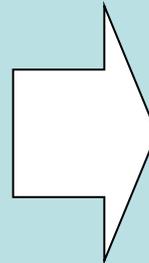


### Possible solution: car sharing

- Reduces car ownership and usage: every car club car on the road leads to the sale or disposal of 10.5 private cars (Carplus Survey 2016/17)
- Reduces congestion and space allocated for car parking
- Saves transport costs
- Improves air quality
- Increases efficiency (2.4 occupants per car as opposed to current 1.6 – Carplus Survey 2016/17)
- Triggers behavioural change towards public and active transport

### Car clubs – main barriers:

- Lack of customer awareness
- Customer options are limited because of how hard it is for car clubs to get permits from boroughs - expansion requires separate negotiations of permits with each borough
- Different political interests between Mayor and boroughs
- Cultural barrier- some people are not keen on sharing



### Next steps:

- Raise awareness – change behaviour
- Visible infrastructure
- Visible and extensive car club operational map
- Coordination between different boroughs across London to create interconnected operational areas
- Association with other car clubs to reach more people

### TfL and GLA to work with boroughs to incentivise car clubs by:

- Providing preferential parking for car club vehicles in each area
- Establishing preferential congestion charge rates for car club cars, or being consistent and also charging taxis, private hire etc.

- Promoting an integrated, pan-London network of car club collaboration
- Advocating for interchangeability between car clubs, and integration with public and active transport and payment systems

# Exploring innovative solutions to pollution from freight: First and Last Mile Delivery

## The challenge:

- E-commerce is growing in the UK.
- More and more vans are used to deliver parcels.
- Over 110 million of deliveries are failed on the first attempt – this creates the need for redelivery which adds to poor air quality.

## Innovative solutions:

- **Dearman** technology harnesses the power of liquid nitrogen to deliver zero-emission cold and power for delivery vehicles.
- **Parcelly** offers a fully mobile based click & collect solution to solve the problem of failed home deliveries and to convert any local business and selected private individuals into a parcel collection.
- **Gnewt Cargo** is the last mile city logistics operation that uses a 100% electric commercial vehicle fleet delivering on behalf of parcel carriers and retailers.
- **Tyler Construction Plant** created mobile lightning towers for construction sites which is powered by the energy produced by fuel cells

## The barriers:

- Costs
- Time – customers want their parcels on a specific day/time
- People lack awareness
- Problems with postcodes that are not unique
- Contradictive government policies: promotion of new '0 emission technologies' and subsidies for Red Diesel
- Lack of coherent provider of electric car charging points and regulations

## Next Steps:

- Raise awareness – change behaviour
- Create a ring of consolidation centres on the outskirts of the city with logistic centres and local collection points throughout London
- Stop subsidies for Red Diesel
- Subscription free electric car charging points or coherent charging points provider
- Improve navigation technology

## What we want:

- Collaboration reaching demand side (retailers and consumers)
- A ring of consolidation centres on the outskirts of the city with logistics centres throughout London
- Carrier delivery charge to fund infrastructure across capital

# Exploring innovative solutions: Technology

## The challenge:

- Political talk on reducing pollution is often on a large-scale, requiring huge infrastructure and policy change. However, the technology for short-term ways to clean up air pollution immediately does exist.
- Technology can sometimes be exclusive – it needs to be more inclusive and passive, and not depend upon people taking action themselves.

## Innovative solutions:

- **Airlabs** have created technology which can clean **all** pollutants out of the air, but above all NO<sub>2</sub> and PM. They create bubbles of clean air, e.g. in cars or sheltered locations, using air flow. Their bus shelter is a bench that cleans the air around it.
- **Battle McCarthy's** approach to engineering and infrastructure design fully incorporates greenery into the planning and design process. They can create carbon sinks and clean air spaces through designs and buildings.
- **Plume Labs** have created a personal air pollution monitor which not only allows you to track the pollution you are exposed to on a daily basis but also feeds the data back into a central system to create a larger picture of the air pollution in cities.

## The barriers

- Public awareness, or lack thereof, is one of the main things inhibiting greater uptake – e.g. people don't tend to know that the place you have the greatest exposure to air pollution is inside a vehicle.
- While there is traction in the media about air pollution and greater knowledge, this does not translate to behaviour change automatically.

## Next steps:

- We need a real across-the-board consensus on using the technology.
- More awareness is needed to understand the levels of pollution we are exposed to: can this be driven by further data? For example, a five-day pollution forecast with the weather/pollen forecast on the news.

## What we want:

- More visible pilots to demonstrate new technology in schools
- Technology needs to be integrated in all new GLA, TfL and boroughs projects
- "LEAP" to invest in technologies

# Exploring innovative solutions: Engagement

- **Air pollution needs to be made visible so that people appreciate the dangers and risks of continued inaction.**  
Pollution is invisible. We need to make it visible through monitors, displays, narratives, media, and education to engage people
- **The messages that are used to unite people need to engage and empower them, not scare them into inaction** as has happened so many times before.
- **Behavioural change is necessary** otherwise new technologies alone won't have enough of an impact, and these changes need to be bottom up, not top down.
- **Action should be about preventing emissions, not just avoiding** high levels that are already happening.  
E.g., in Paris: pre-emptive notifications for pollution events, such as alternate days that cars with certain number plates can drive in the city.
- There still isn't enough awareness of air quality issues INSIDE cars and buildings.

- NHS needs to do more engagement work with issue to prevent health problems (e.g., GPs talking to asthma patients about risks of air pollution and ways to reduce exposure/contributions).
- Pollution levels should also be presented as common information next to outside temperature/weather, time and date so people are always aware and reacting to it becomes natural process like preparing for rain.
- London Plan needs to take air quality in to account when addressing the issue of retrofitting homes/buildings.
- Stop building roads/parking spaces around the city.
- Cycling campaigns against congestion: consultations and feedbacks need to be heard and taken into account (e.g., cycling path schemes)
- In schools, to make pollution more visible, show filter materials in air ventilation systems to demonstrate physical effects

- Joined up public awareness across all boroughs
- Network of citizens
- NHS to visibly promote awareness, e.g. at doctors' surgeries
- An effective segmented social marketing

# Workshops consolidation: What do we need?

## **Perception change :**

- Raise awareness about the air quality issue and about things people can do to address it
- Raise awareness about new technologies and alternative fuels, giving people a choice and a chance to change their behaviour

## **Visible infrastructure:**

- A ring of consolidation centres on the outskirts of the city with logistic centres and local collection points throughout London
- Coherent provider of electric car charging points and regulations
- Alternative fuelling options

## **Support for highly localised solutions:**

- May require a new tax
- Collaboration is the key

“We will never get adoption if we go down this road of complication”

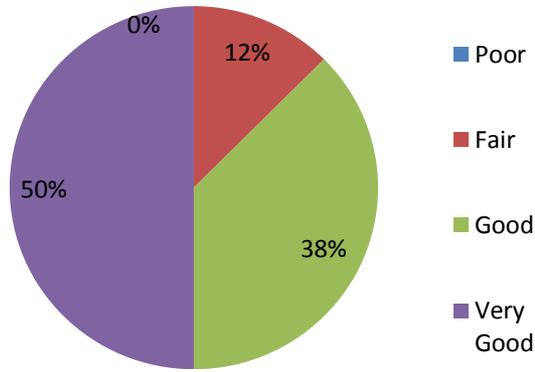
- workshop delegate

# What does the Mayor need to do?

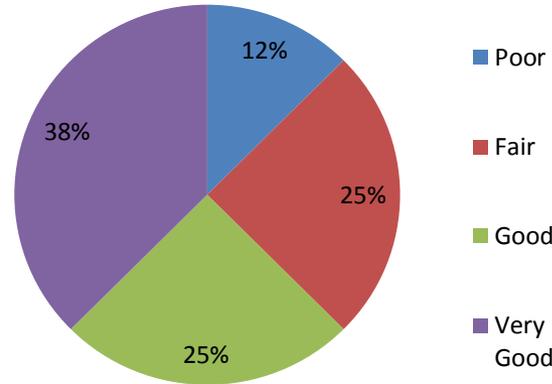
- Push for a co-ordinated vision between GLA, TfL and Boroughs to promote joined-up awareness of car clubs in all areas and citizen networks
- Support the provision of preferential car parking for car share clubs
- Provide car share parking spaces in each neighbourhood
- Put in place a preferential congestion charge rate for car club cars
- Enact legislation that permits and promotes the development of AV use and infrastructure
- Facilitate greater connectivity between existing systems and vehicles
- Encourage the incorporation of possible future AV zones in emerging development areas such as Park Royal and Old Oak Common
- Foster collaboration between suppliers reaching demand side (retailers and consumers)
- Support the creation of consolidation centres on the outskirts of the city with logistics centres throughout London
- Establish a carrier delivery charge to fund infrastructure across the capital
- Enhance public understanding of new technology through visible pilot schemes in schools
- Integrate air pollution technology into all new GLA, TfL and borough projects
- Champion greater investment by LEAP in relevant technologies
- Require that some NHS facilities such as doctors' surgeries feature clearly visible material that raises awareness of key air pollution issues

# Response to the event

88% of delegates agreed that their level of new learning was either good or very good:



63% felt they had an increased understanding of sustainability issues after the event:



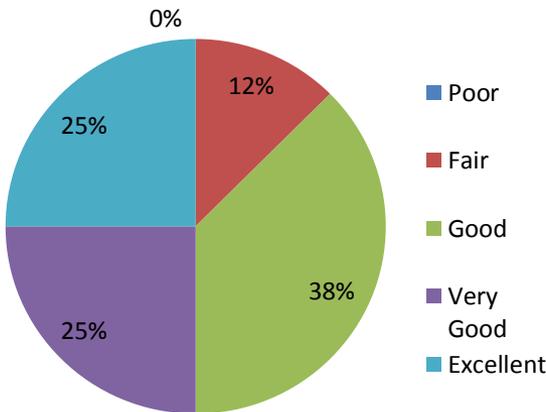
What was most helpful/ useful and why?

“The input from the group about the challenges, and also the need for community engagement.”

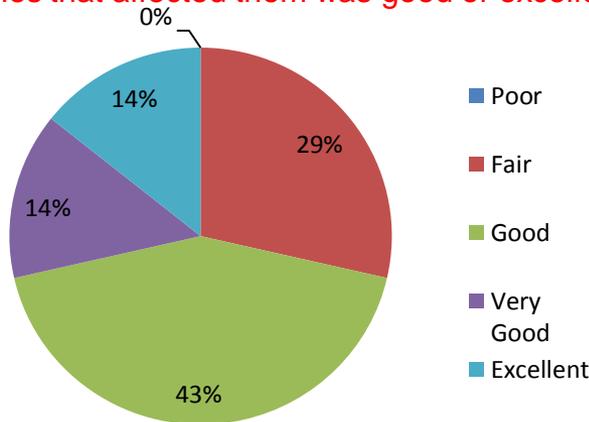
“The encouraging speakers, the use of the ‘storyboard’ and facilitation.”

“There were great speakers and a great presentation.”

88% of delegates agreed that this was a good opportunity to meet new people:



71% thought that the opportunity to understand policies that affected them was good or excellent:



# Thank you to our attendees

## Representatives from organisations including:

Lifeworld	Natural Resources Institute, University of Greenwich	Airlabs
Tilbury Riverside Project	Women of Wandsworth aka WoW Mums	Mace
Taylor Construction Plant Ltd	Transport Studies Unit, Oxford University	TCP Ltd
Tenants' groups	Cycling Embassy of Great Britain	WSP
Southwark Cyclists	Just Space/Hayes Community Forum	Bywaters
Sustainable Hackney	Clapham Transport Users Group	GEOmii
Create Consulting	Wandsworth Environment Forum	Lee Forum
Westway Trust	London Metropolitan University	EcoMuslim
Newable Ltd.	BuggyAir & LowCarbonChilterns	Clean Air Merton
Cross River Partnership	Environment Agency	GLA
Bloomsbury Air	Survivors Together	Bywaters
Greener Jobs Alliance	Urban Generation	SWIG
The Brixton Society	London Assembly	Eco-Shul
Project Centre	The Cross River Partnership	London Play
Meristem Design Ltd	Project Earth Rock	Living Streets
British Heart Foundation	Amec Foster Wheeler	WSP
Biopure Air Ltd	Transition Town Tooting	Dearman
Bloomberg Philanthropies	London Borough of Sutton	Selby trust
Sow, Grow and Reap	Westminster City Council	AECOM
UK Health Forum	Wiles Greenworld	Tranquil City
		LB Hounslow