Mobilising Mobility: Dynamic Space Management – insights from the MORE project

Peter Jones, UCL

MORE Scientific Co-ordinator

6th October 2020

MORE

Multimodal Optimisation
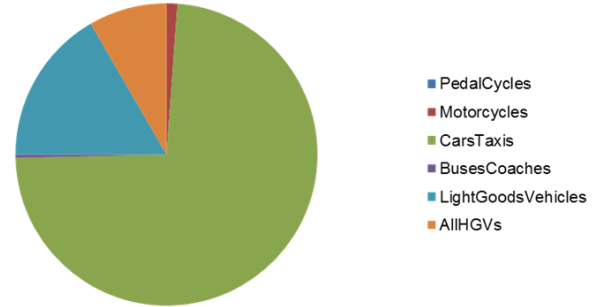of Roadspace in Europe

MORE: Multi-modal Optimisation of Road-space in Europe

- Identifies existing and future pressures on the main roads in cities that connect the 'Urban Nodes' – and their major attractors (city centre, port, etc.) - with the national/TEN-T (Trans-European Road Network)

- Develops design tools and processes that will enable these key routes to be planned, designed, managed and operated in a way that makes them responsive to future pressures, in a flexible manner:

  ➤ By exploiting possibilities for dynamic space management and operation, using various sensors

  ➤ Signing this in-vehicle and using LED road signs and markings

  ➤ Highlighting the interfaces between urban and inter-urban/national networks – where currently a mis-match of forecasts and priorities
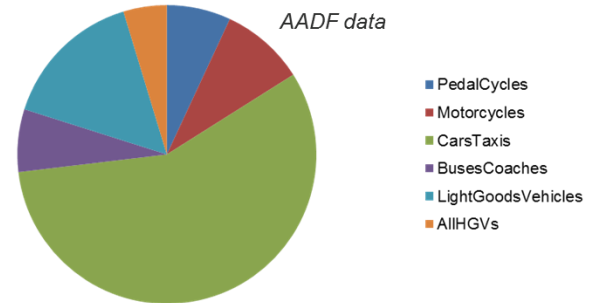
MORE
Multimodal Optimisation
of Roadspace in Europe

Participant No	Participant organisation name	Short name	Country
1 (Coordinator)	University College London	UCL	UK
2	Technische Universität Dresden	TUD	DE
3	Fondation Nationale des Science Politiques	SciencesPO	FR
4	PTV Group	PTV	DE
5	Dynniq	DYN	NL
6	VECTOS (SOUTH) LIMITED	VECTOS	UK
7	Buchanan Computing	BC	UK
8	European Integrated Projects	EIP	RO
9	Polis	POLIS	BE
10	Union Internationale des Transports Publics	UITP	BE
11	IRU Projects asbl	IRU	BE
12	International Federation of Pedestrians	IFP	CH
13	European Cyclists' Federation	ECF	BE
14	Center for Budapest Transport [City of Budapest]	BKK	HU
15	Câmara Municipal de Lisboa [City of Lisbon]	CML	PT
16	Transport for London	TfL	UK
17	Traffic Transportation Division [City of Malmo]	MALMO	SE
18	Municipiu Resedinta de Judet Constanta [Constanta municipality]	PMC	RO

Rhine-Danube	
Orient/East-Med	
Baltic-Adriatic	
Mediterranean	
Rhine-Alpine	
Scandinavian-Mediterranean	
North Sea-Mediterranean	
North Sea-Baltic	
Atlantic	

Malmo

London

Budapest

Constanta

Lisbon
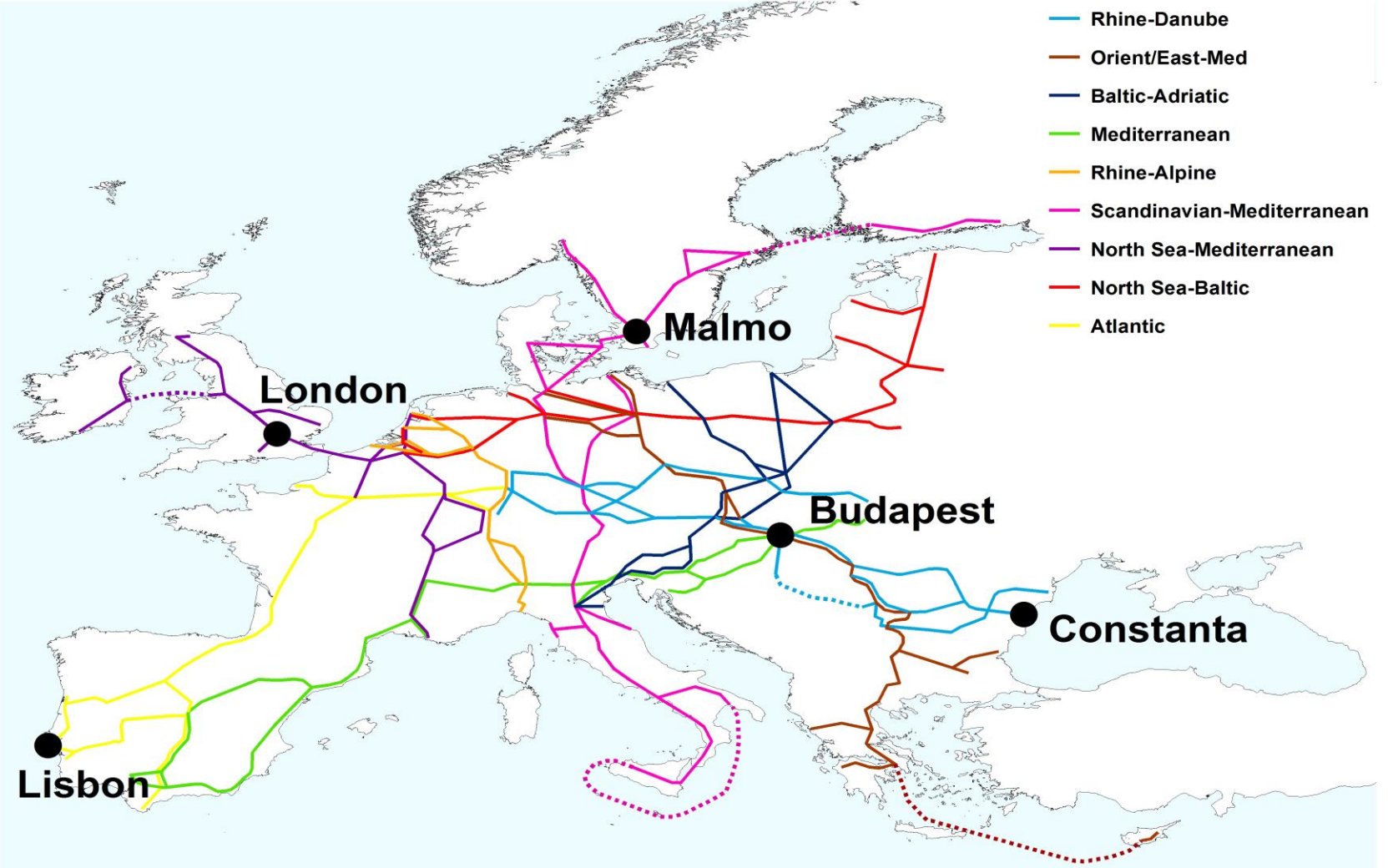
Urban Feeder Routes: Mix of 'Roads' and 'Streets'

MORE Road/Street Design Tools

Recommended Comprehensive Design Process, offering:

1. **Road Design Option Generator:** *A Web-based tool for searching for street allocation solutions, through an on-line option generation library*.

2. **Road Design Stakeholder Engagement Tool:** *Web-based tool to assist with stakeholder engagement, both collectively during design workshops and by providing a portal for individuals to comment on design options, building on Buchanan Computing's TraffWeb product*

3. **Road Design Dynamic Simulator:** *A simulation tool to assess how all road-based activities perform under particular design options, building on PTV's existing VISSIM software*

4. **Road Design Appraisal Tool***: A web-based tool to assist with the appraisal of design options, using the outputs from the VISSIM simulations.*

The challenge - 1

- Demands on busier urban streets are increasing & changing:
  - ➢ The emergence of new modal options (e.g. e-scooters)
  - ➢ Growing mobility-related sectors (e.g. home deliveries)
  - ➢ A greater interest in pace-related activities
  - ➢ Population densification

- Future streets must accommodate emerging/disruptive technologies:
  - ➢ Electrification of the vehicle fleet
  - ➢ Autonomous vehicles: road, rail water, air
  - ➢ Advances in traffic control systems
  - ➢ Advances in kerbside management
  - ➢ Implications of employing new types of sensors
  - ➢ Self-healing roads
  - ➢ Trenchless technologies and underground logistics

MORE
Multimodal Optimisation
of Roadspace in Europe

The challenge - 2

- Looking at street space allocation holistically, from building to building – not by each use separately – as a comprehensive eco-system:
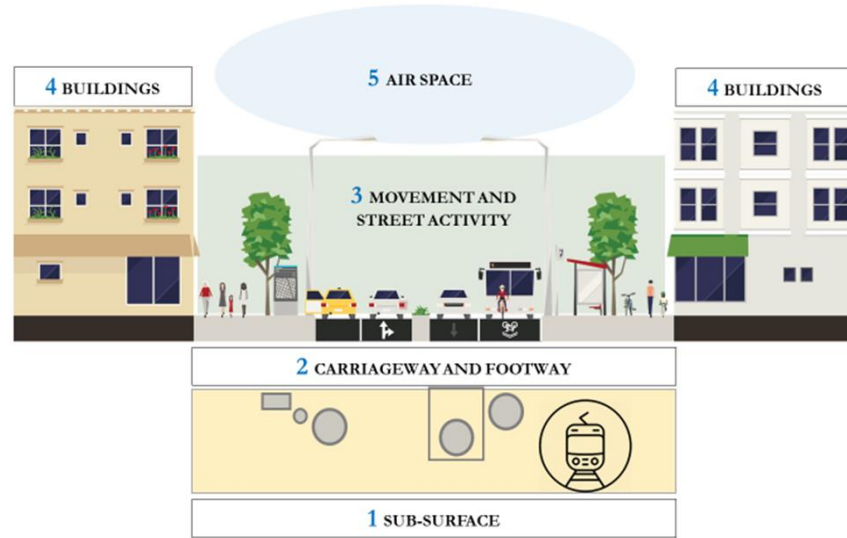
- Being sufficiently imaginative in considering options for the allocation of urban street space.....

MORE
Multimodal Optimisation
of Roadspace in Europe

Possible road designs

Scroll to see more road designs

Option Number	Pavement	Carriageway	Median	Carriageway	Pavement	Capacity (people/hour)
1						42,000
2						80,000
3						99,000
4						99,000
5						61,000
6						61,000
7						61,000
8						101,000
9						87,000
10						78,000
11						59,000

(Source: The Indypendent)
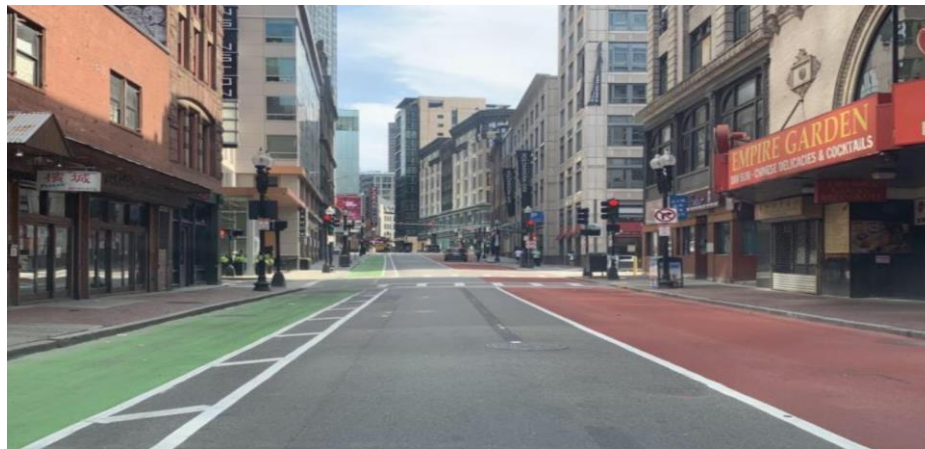
(Source: BTD)

(Source: City of Lisbon)

(Source: Twitter)

Dynamic space allocation – the solution?

- On busy urban streets user needs are many, varied and complex – changing from hour-to-hour and day-to-day

- The scope for adapting street space use and capacity is limited, is often binary (e.g. bus lane or parking/loading bays) and can only be changed infrequently (e.g. every X years)

- Dynamic space allocation would much better match supply and demand, on an hour-by-hour basis

- But, there are many factors to take into account......

MORE
Multimodal Optimisation
of Roadspace in Europe

Martin Chan, 2019

Street Loading Supply at Acton

Kerb space (m) vs Time
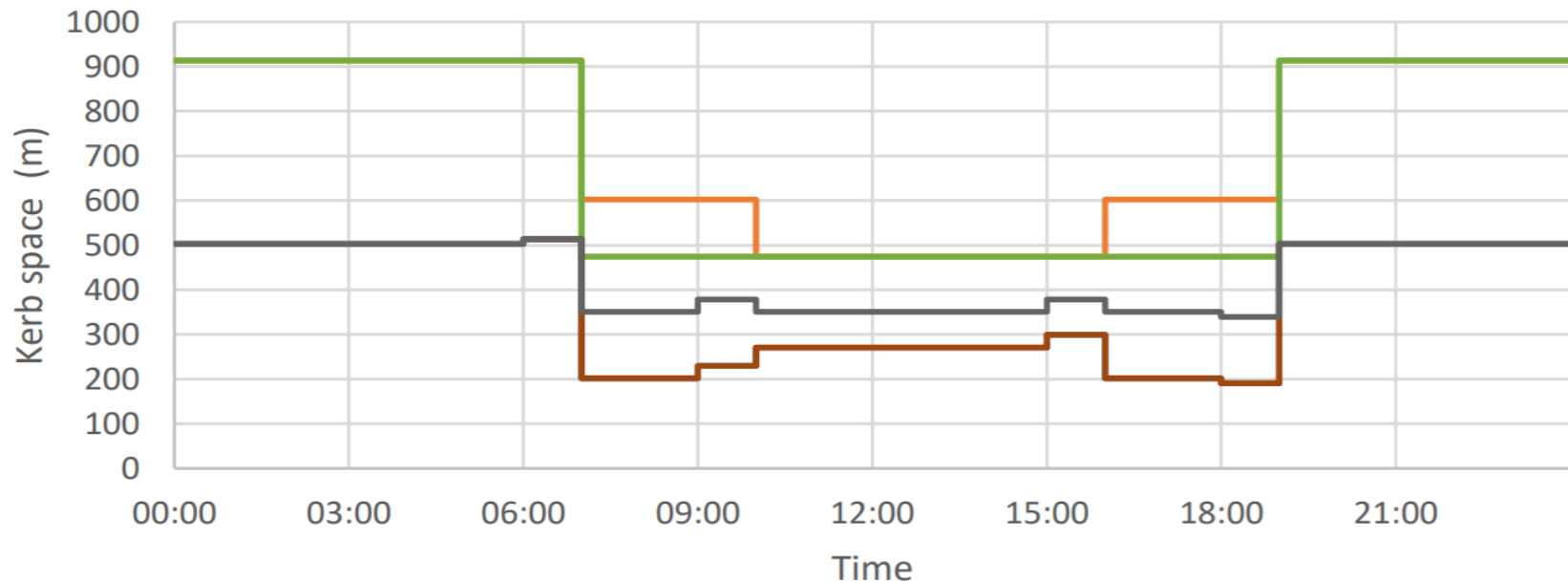
Legend:
- Sunday Loading (Total)
- Saturday Loading (Total)
- Weekday Loading (Total)
- Sunday Loading (Dedicated)
- Saturday Loading (Dedicated)
- weekday Loading (Dedicated)

Kerbside Activity on Friday (Acton)
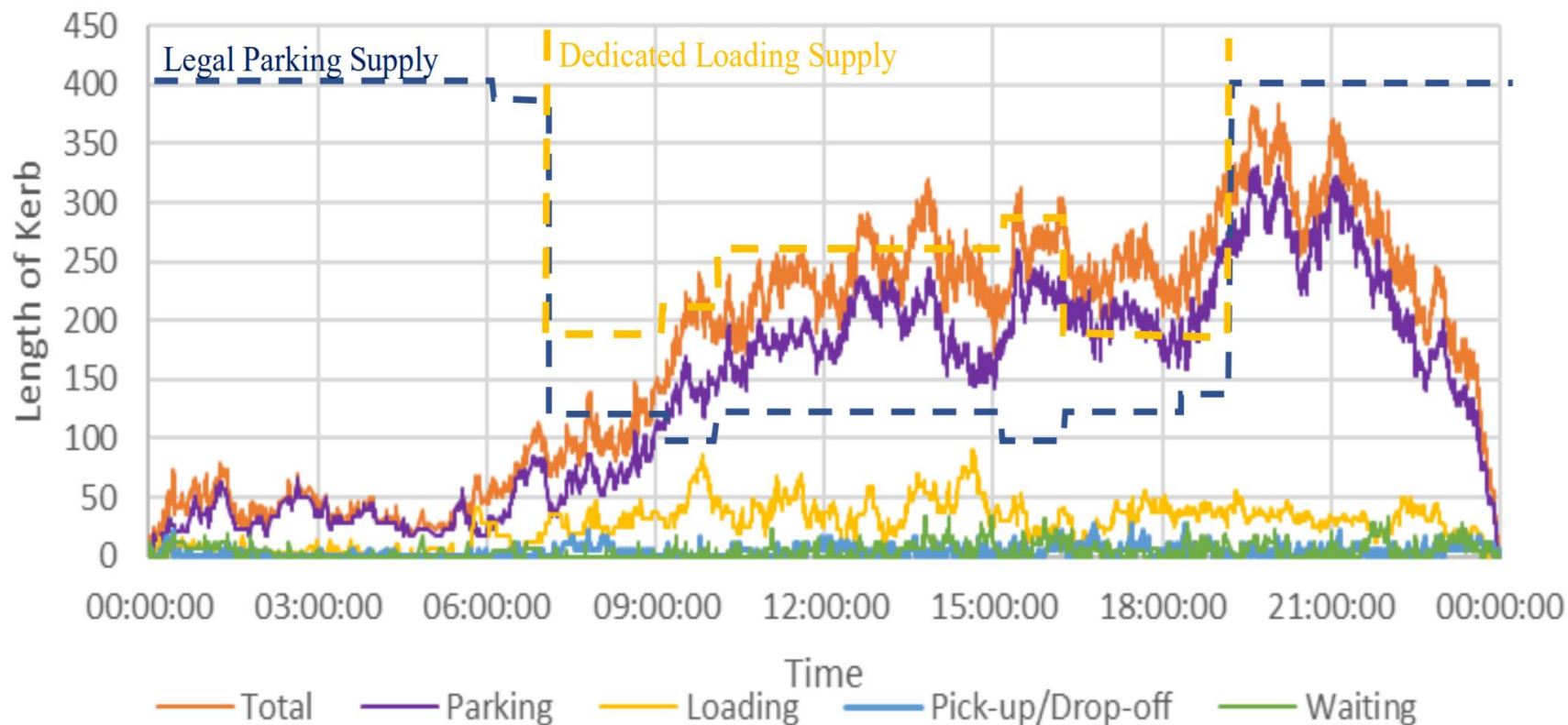
How dynamic could we go?

- Advanced junction traffic signal controls can adjust capacity in real time, second-by-second, but this does not affect the road layout

- This concept can't be directly translated to links, where we are regulating who can do what and where:
  - ➤ Switching a traffic lane into bus lane
  - ➤ Replacing kerbside parking with loading, as demand increases

- This raises fundamental questions:
  - ➤ How often could allocations be changed, without causing confusion and resentment?
  - ➤ How to deal with transitions, from one state to another?
  - ➤ How to 'signal' changes to street users?

MORE
Multimodal Optimisation
of Roadspace in Europe

What are we doing in MORE??

- Developing protocols for the use of street space:
  - ➤ Deciding how to determine who gets priority and when?
  - ➤ Designating parts of the street for particular user types (e.g. e-scooters)
  - ➤ Planning for autonomous road vehicles and footway drones – what should be the rules of the road and the footway (e.g. ISO TR4448)?
- Practical implementation issues:
  - ➤ Consistency vs spontaneity: developing alternative 'plans' rather than fully dynamic solutions
  - ➤ Ability for LED road signs and road markings to convey information to all road users
  - ➤ Dealing safely with transitions

MO R E
Multimodal Optimisation
of Roadspace in Europe

Dynamic signing – Clearview Intelligence
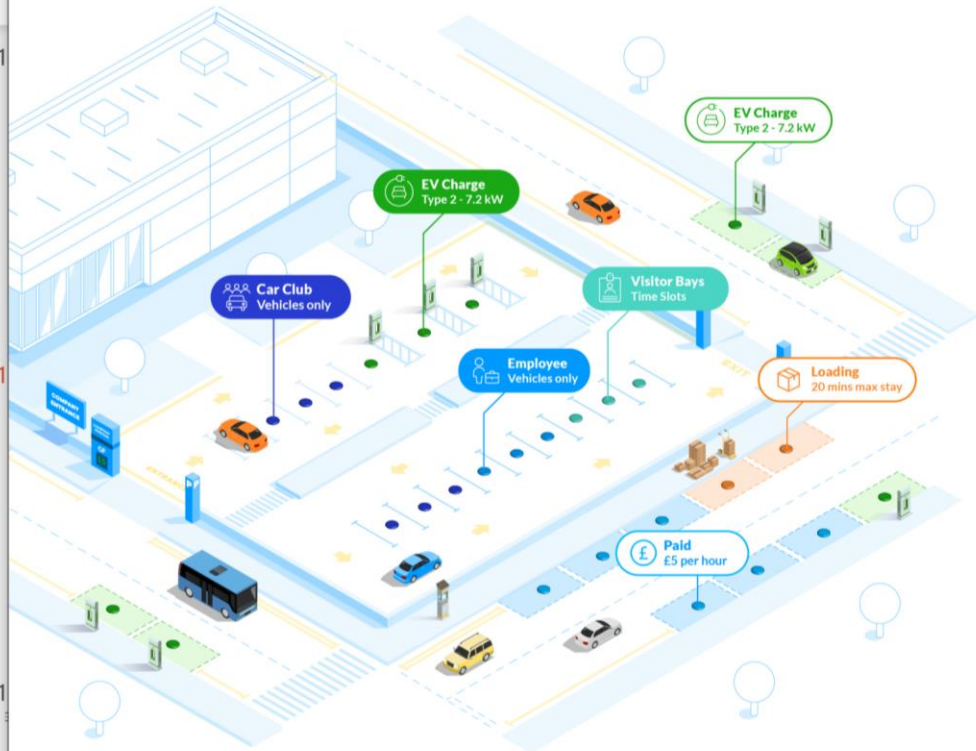
kerb™

We want to better manage the kerb space, using our Intelligent Kerbside Management solution, 'Kerb' to create a positive impact on the environment, reducing congestion and improving air quality.

Find out more ❯

MORE
Multimodal Optimisation
of Roadspace in Europe
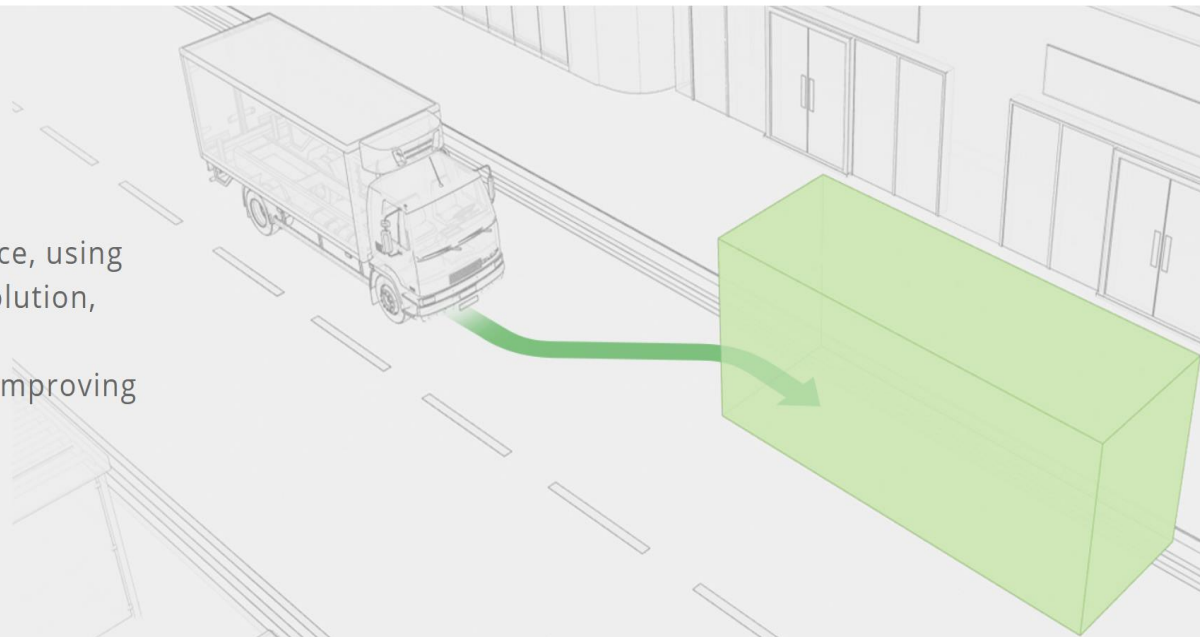
LED signing – enabler, but with tricky issues

- Allowing for different uses of the same physical space (e.g. kerbside) at undefined times of day – not pre-specified. In some extreme cases, part of a footway might become part of the carriageway at certain times.

- Ensuring that the electronic signs and road markings are correctly operating and are fully visible at all times.

- Determining how to record the traffic regulations in operation at any particular point in time, in a way that is reliable and enforceable.

- Determining how to handle transition periods, from one set of regulations to another; (e.g. for parking switchover period would be set at the maximum allowed parking duration; but for the sudden introduction of a bus lane might find a driver in the 'wrong' lane for a short period of time.

MORE
Multimodal Optimisation
of Roadspace in Europe

Thank you –

https://www.roadspace.eu

peter.jones@ucl.ac.uk

MORE
Multimodal Optimisation
of Roadspace in Europe