

TfL – Managing Adaptation to Climate Change

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Transport for London

River services

Walking

- 5.7m walk trips per day

London Buses

- More than 8,000 services operated to 270 stations
- More than 5m journeys per day
- 2.2bn passenger journeys per year

London Underground

- 3m trips per day
- 1bn passengers last year

Traffic management services operated to 170 signal boxes of major roads (including bridges and tunnels)

- 6,000 traffic signals

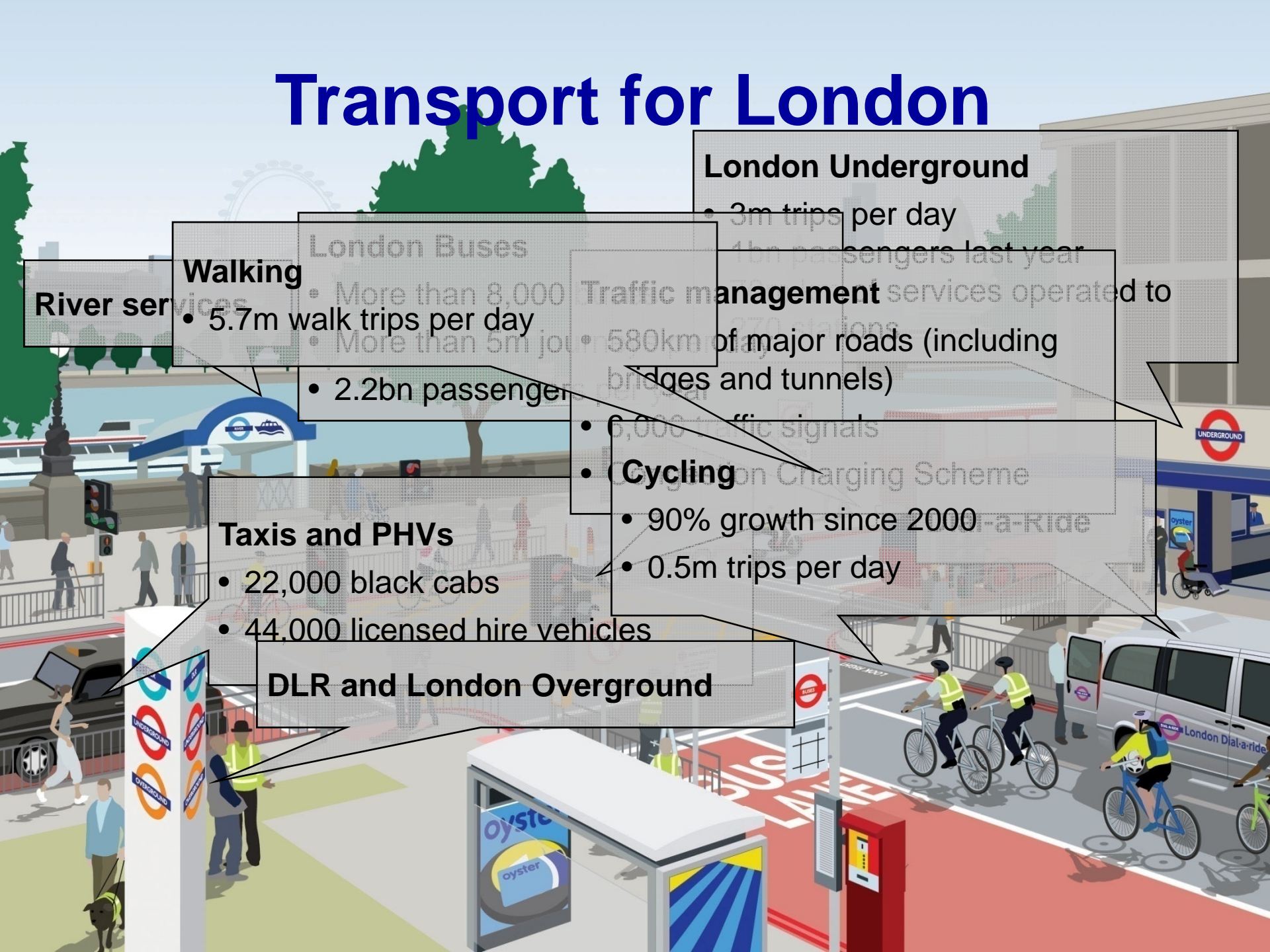
Cycling

- 90% growth since 2000
- 0.5m trips per day

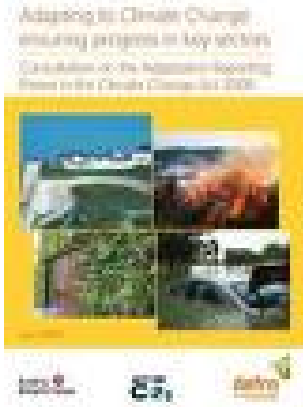
Taxis and PHVs

- 22,000 black cabs
- 44,000 licensed hire vehicles

DLR and London Overground



Adapting to Climate Change - Legal and Strategy Drivers



- Government Reporting Power
 - requires public bodies (including the GLA) to carry out risk assessments into the impacts of climate change and to publish these and plans to deal with the impacts
 - TfL reporting as part of GLA, due 31 December 2010



- Mayor's Climate Change Adaptation Strategy
- *The United Kingdom Climate Projections have helped to give us information on which to make our risk assessments and plans*

TfL's Analysis of the UK Climate Projections 09 show that there is likely to be:

- Warmer wetter winters, rainfall becomes more seasonal
- Hotter drier summers
 - European temperatures seen in Summer 2003 could become normal by the 2040s and be relatively low in comparison by the 2060s.
 - Increased number of summer deaths during heatwaves (ref 2003)
 - Exacerbated by Urban Heat Island effect
- Summer 2050's (high emissions)
 - +3°C
 - -30-40% rainfall
- Winter 2050's (high emissions)
 - +1.5 -2 3°C
 - + 25-30% rainfall
- More frequent extreme weather events
- Rising sea levels - increased risk of river flooding
- Increase in PM10 concentrations in hotter weather



How is London vulnerable to climate change?

- *Vulnerability is... 'the degree to which a system is susceptible to and unable to cope with adverse effects of climate change'*
- Flooding
- Water Resources
- Overheating
- Air Quality
- Subsidence and heave
- Wind Storms
- Global climate events



Examples of recent weather impacts

- Summer 2003 heatwave
- July 2007 rainfall
- February, December 2009 and January 2010 snow



Identifying Climate Change Risks to TfL Assets and Services

- Risk Identification Workshops Approach

- Current assets

- Tracks
- Drainage
- Bridges
- Embankments
- Signals
- Stations
- Green estate
- Surfaces – platforms, footways, pavements
- Transport interchanges



- Planned build eg Crossrail, stations bridges

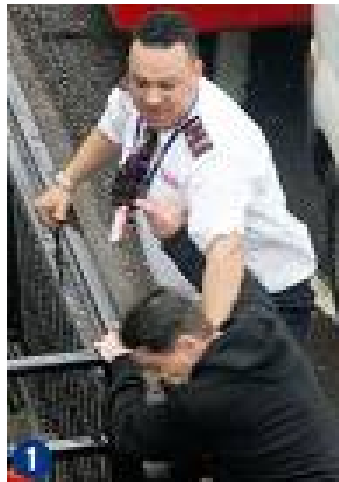
- Service issues eg speed restrictions, frequency

- Communication and managing expectations



People, not just assets/infrastructure

- Importance of communication, with customers, partners, businesses
- Employees' and contractors' skills, health and safety and quality of work
 - Currently no legal upper temperature limit for workers
- Services, timetables, frequency, emergency planning
- Customer comfort and information (eg snow alerts, Stay Cool LU campaign)



Existing TfL Activities

- Review of risk assessments
- Flood Risk Assessments, asset management plans
- TfL road network - drainage hotspots work
- LU groundwater management
- Bus specification
- Crossrail detailed design
- LU's Tunnel Cooling programme
- Resilience, Business Continuity, Emergency Planning, Risk Assessments and management
- With GLA:
 - Drain London
 - Environment Agency Thames Estuary 2100



Lessons Learned from Managing Snow Events

- January 2010 - longest spell of freezing conditions for 30 years.
- London largely continued business as usual
 - Lessons learned from the snow in February 2009.
- **Partnership working and multi-agency cooperation**
 - London boroughs - cold weather plans.
 - Key routes for buses indentified.
 - Gritted bus garage access.
 - Priority plans.
 - All night trains running.
- **Clear communication strategy**
 - multi-agency meetings
 - clear and consistent messages.



Adaptation Report – Early Highlights

- Review of all risk assessments – reviewing mitigated risks
- Review of priorities and processes

1 Heat – key signal, power, communications assets

2 Snow and Ice – slips/trips for staff and customers

3 Snow - Depot operations

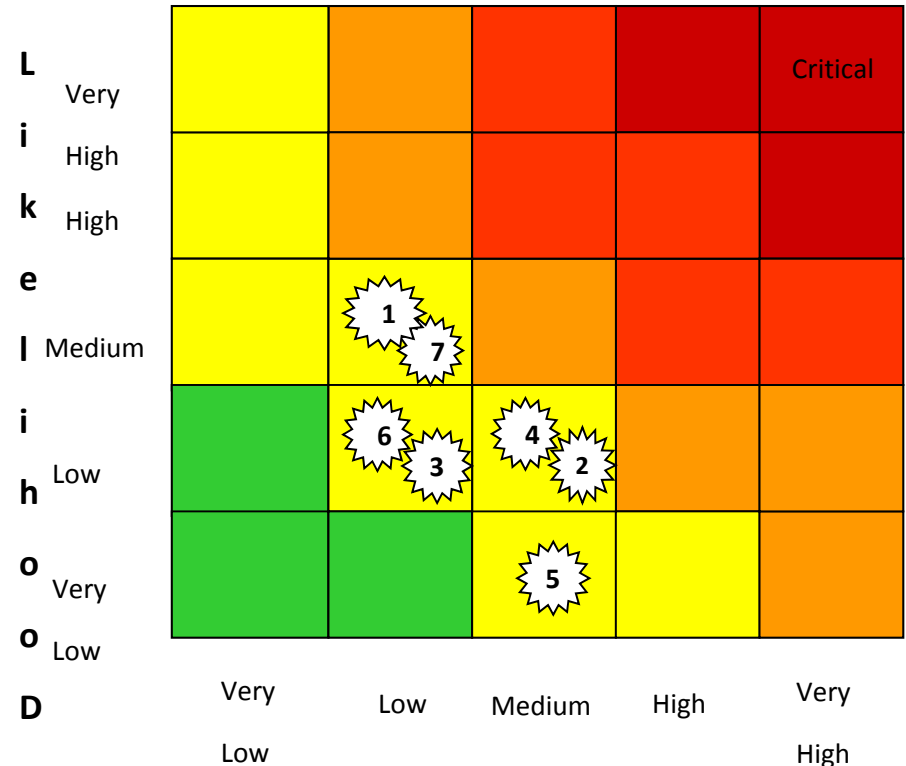
4 Snow – Track and street clearances

5 Wind – Damage to overhead lines

6 Flooding – Depots and Tracks

7 Rain – Track drainage

London Rail Weather-Related Risks



London Underground Next Steps

- **Increased level of understanding of the interdependencies**
 - Develop protocol of communication
- **Asset & Business planning**
 - Feedback loop within asset/business plans to trigger work once climate threshold reached.
- **Funding impact on long term ability to manage impacts of climate change**
 - Agree how we measure for the impact of climate change on LU