

# Noise Action Planning in London

- implementing the Mayor's 'Sounder City' Strategy

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**Greater London Authority**



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## Greater London Authority (GLA)

- **GLA created in 2000** – new regional policy making body for London
  - Directly elected **Mayor**
  - Scrutinised by 25 member elected **Assembly**
  - **Transport for London** and London Development Agency – executive agencies reporting to Mayor
- Mayor's **London Ambient Noise Strategy**, published March 2004
- **First city-wide strategy in UK**, ahead of proposed National Strategy (due 2007) and **END** mapping and action planning

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## London Ambient Noise Strategy

- **Sets pace** for other UK cities
- Can **act as pilot** for National Strategy, but...
  - **Data and analysis** still being assembled on existing ambient noise in London
  - Mayor lacks **statutory powers** and **new funding** for noise reduction
  - **Years of under-investment** in roads, rail, and other infrastructure, prior to GLA.

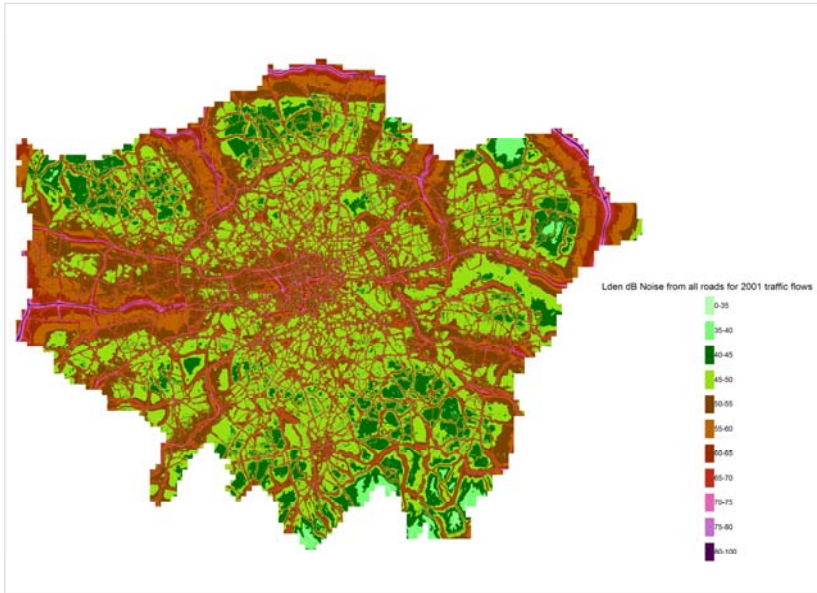
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## Noise data in London

- London's 33 Boroughs – some have commissioned **noise maps** and **surveys**
- London-wide **road traffic noise mapping** commissioned by central government, published September 2004
- **Aircraft noise contours**, but rail and industry not yet mapped to END standards
- Noise questions included in **attitude surveys** where possible
- **Measurement surveys** in outer London boroughs extended to inner boroughs by GLA & boroughs, with modelling in west London

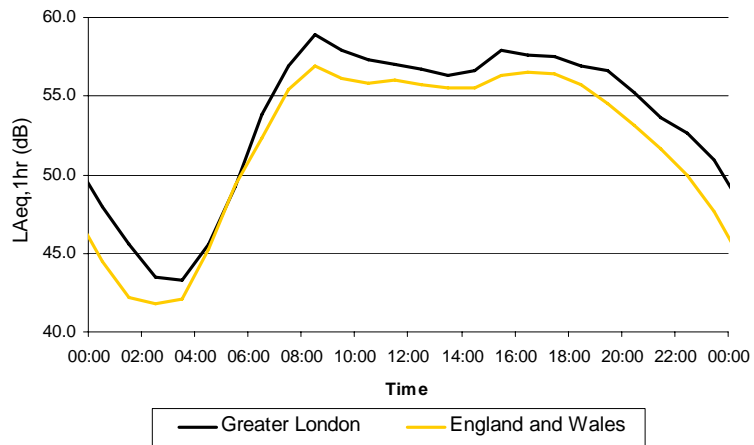
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[www.noisemapping.org](http://www.noisemapping.org)



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## Time profile of measured sound, 2000



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## London Ambient Noise Strategy

- Context of strategic **policies and proposals** for local, regional and national actors
  - guide **action planning**
  - Inform **operational management** of transport systems controlled by Mayor
  - Input to **design of buildings** and open spaces
  - influence **noise management** by key stakeholders (airports, national rail)
- Aims to persuade stakeholders to **integrate practical improvements in existing work**, pending national decisions on funding and powers.

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## London Ambient Noise Strategy

- Many **key actors lack experience** in noise control
- Some are sceptical of its value and practicality

Key early tasks - '**consciousness raising**' and **building capacity** (design and management)

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## Implementing action

- **Mayor's Strategy** – actions include implementation framework, annual progress reports, toolkits, demonstration projects
- **Transport for London (TfL)** - Traffic Noise Action Programme on TfL Road Network, bus and rail noise management
- **London Boroughs** – several preparing own noise action plans, some using Borough Spending Plan funding from TfL
- **Town planning** – Boroughs, with major applications referred to Mayor

## Proposed London Noise Action Partnership

- **Forum of**
  - GLA
  - London Boroughs
  - Association of London Government
  - Government Office for London...
- **Remit**
  - share and develop good practice across London – e.g. 'London Noise Control Standards'
  - help develop pilot projects – secure funding and evaluate.

## Transposing END

- **Launch** of London Noise Action Partnership delayed pending allocation of **noise action planning duties** under END
- **Government** proposes to commission both **maps and action plans** nationally, with limited exceptions (e.g. airports)
- **Mayor** proposes that in London, Boroughs should have duty to prepare '**Stage 2**' **action plans**, which have to be in conformity with London-wide strategy.

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## Building support

- **Pan-London research** to fill gaps - can be more cost-effective than Boroughs acting individually
- **London Noise Survey**, e.g. noise measurements in inner London
- **Equalities Analysis** of London Road Traffic Noise Map
- **Toolkit for Action Planning**, including unit costs
- **Noise Barrier Review** + seeking photovoltaics
- **Sound-conscious urban design...**

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## Sound-conscious urban design

- urban designers should use sound positively and consider acoustics at project design stage
- illustrates innovative and visually attractive projects, to demonstrate potential



**Cartier Foundation for Contemporary Art**


**Acoustic Feature**

- Building integrated screening more sophisticated than basic acoustic glazing.
- Sound scattering by trees.

The Cartier Foundation is a mixed-use development that includes 3700m of office space, 1400m of public exhibition space, storage facilities and car parking for 120 vehicles. Planning constraints at this location included conservation orders on 37 mature trees.

The design solution is a freestanding façade at the site boundary incorporating the existing trees within the main building. The façade permits views through the building from Boulevard Raspail ending the boundaries between street, nature and building.

The additional façade and the distance from the road created by the set back protect the building and the gallery spaces from the noise pollution of the busy Boulevard Raspail.



**Location**  
Paris

**Year Completed**  
1994

**Client**  
Foundation Cartier

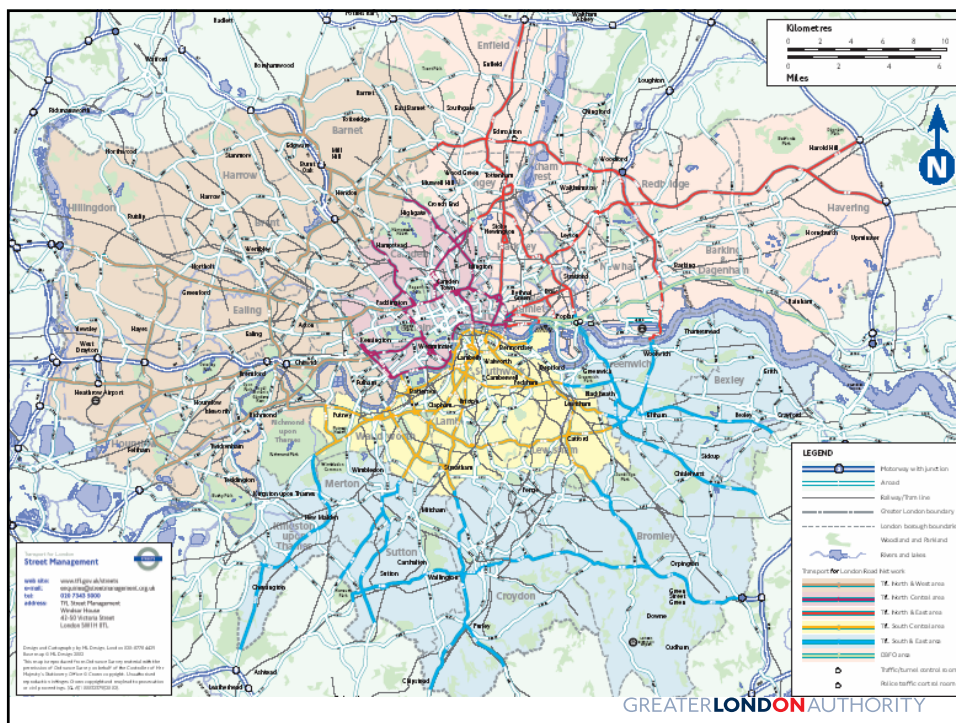
**Architect / Designer**  
Jean Nouvel, Emmanuel Caltani & Associates  
[www.pcmrouve.fr](http://www.pcmrouve.fr)

## Transport for London, TfL

- TfL responsible for **major roads**, most **buses**, **underground rail** and **trams/light rail**
  - Mayor appoints TfL **Board** and sets **budget**
  - TfL is **executive agency** responsible for action, but many competing priorities
- TfL roads, **5% by length (580 km)**, but carry **25% of traffic**
- **Borough roads 12000 km**, including **1200 km of 'principle roads'** – many not much quieter
- Some Motorways, run by Highways Agency for Government.

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## Some TfL noise actions

- Noise maps being analysed to draw up **Traffic Noise Action Programme**
- TfL **noise monitoring** network
- Lower noise **road surfaces**
- Low speed acceleration **bus** noise test, driver training programme
- Night noise - **heavy vehicles**, routeing and deliveries
- Design of **public spaces**

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## Traffic Noise Action Programme

- **Optimise** choice of lower noise **road surfaces**, monitored trials...
- Identify opportunities for **noise barriers**, including innovative designs, with **photovoltaics**...
- **Integrate noise management** more proactively in all operations, e.g. signals, queue relocation...
- 'What if' **network scenarios**...
- Identify '**Noise Reduction Projects**' – combined measures, -5 dB(A), seek new funding...

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## Performance indicators for a growing city?

- Incentivise transport operators to minimise '**noise generation per unit of transport supply**' (e.g. normalise for route-km, passenger-km)
- Periodically check **population exposure profiles (END)** to take account of change outside transport operator control

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## Key issues for action-research 1

- **New road surfaces** – low speed, frequently dug up, bus and tram lanes...
- **Barriers** - conflicting needs: access, anti-graffiti, transparency, sound absorption, photovoltaic, green...appearance?
- **Quieter vehicles and tyres** – low speed test, in-service test (e.g. brake squeal and hiss, body noise), reversing trend to wider tyres, hybrid-electrics, sound quality / risk of greater tonality...?

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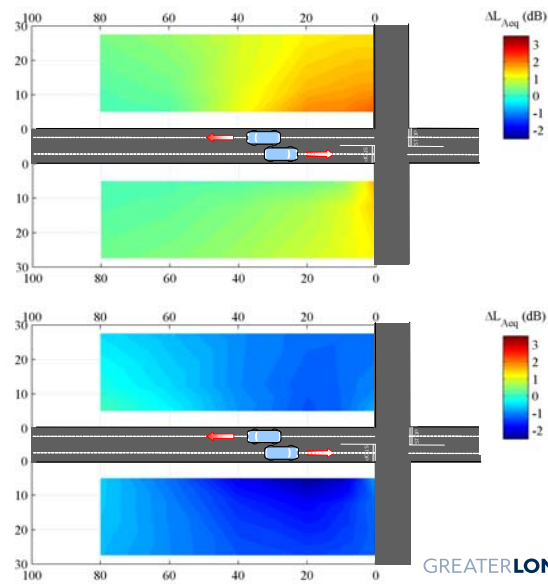
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## Key issues for action-research 2

- **Smarter traffic calming** – demand-responsive ‘road humps’, ‘drive-style’ campaigns, intelligent speed adaptation (limiters)...?
- **‘Streets for People’** – design for ‘talkscape’ and ‘eventscape’ - role of absorptive materials in canyons and squares; active water; old and new soundmarks, innovative paving...?

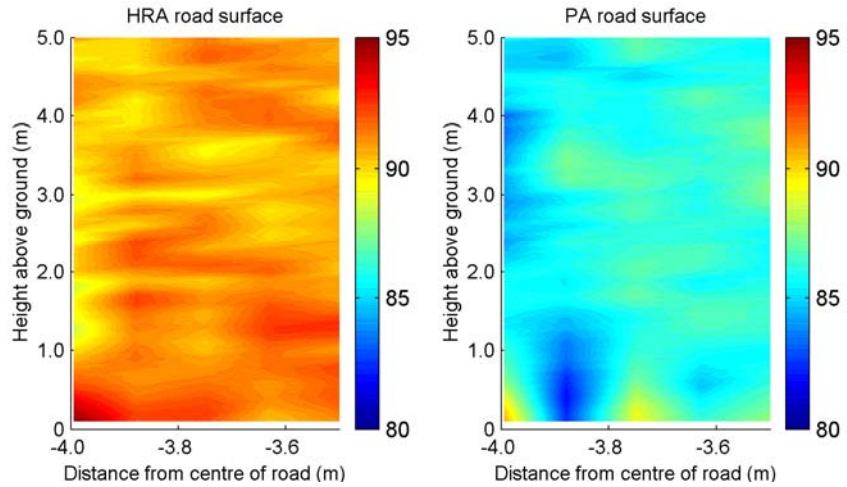
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## Reducing acceleration and deceleration +/- 2 m/s/s to 1 m/s/s (50 kph approach speed) TRL



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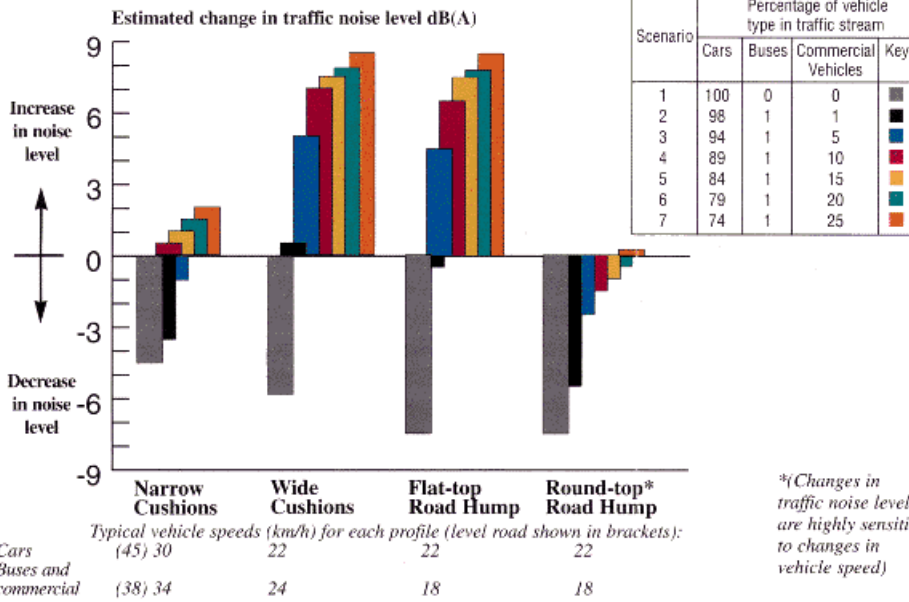
## Effect of porous asphalt in street canyons, A-weighted SPLs near building façades, TRL



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## Effects of four traffic calming measures, TRL

**Figure 1: Estimated change in traffic noise level after installing different types of speed control measures for a range of traffic scenarios**




## TfL and Borough Spending Plans

- **Boroughs bid to TfL** for funds for transport projects, including environmental
- GLA Noise Team advises on **criteria and assessment**
- Severe **competition for funds**
- **Pilot projects and local action planning** - building skills and confidence...

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## Some TfL noise actions

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- GUTE project - London one of 10 cities testing hydrogen fuel cell buses – extended by a year
  - Not yet optimised for noise - purpose-designed fuel cell buses should be quieter
  - Invitation to tender for 10-12 new HFC buses
  - Testing 6 hybrid diesel-electric buses
  - Quieter signals and alarms

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## Some TfL rail noise actions

- **Underground** – groundborne noise from underground (CONVURT), rail grinding and lubrication, renewals
- **Docklands Light Railway** – point monitoring and maintenance, barriers

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## Small incremental noise reductions should not be undervalued

- danger if focus only on **one-off improvements** which are easily perceptible or significantly change the 5 dB contour maps

Noise management will often mean **revisiting the network periodically**, to get incremental improvements of 1 or 2 dB which will **accumulate**

- contrary to ‘minimum perceptible change’ criteria usually applied to assessment of individual traffic schemes

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## Action planning challenges 1

- 'Creeping ambient' – incremental growth, plus more cooling plant with climate change...?
- 'Compact city' – higher densities can mean less car use and more sustainability in medium term, but potentially some local noise increases in short term...?
- Difficult **local choices** - e.g. noise increases for some, but reduction for the many....
- Potential for **action plans** to trigger action, when **project in isolation** would not...?

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## Action planning challenges 2

- How far should housing rely on sound insulation, with **special ventilation** - and, with climate change, **cooling**....?
- END emphasis on external noise levels – self-protecting, single or reduced aspect, with **openable windows on quiet façades** and **access to quiet outdoor areas** – hard to achieve with intense development pressures....?

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## Future approaches – quiet areas

- National survey in 2001 suggested outer London noisier than UK average not because noisiest areas had higher levels, but because there were fewer quiet (residential) areas
- Recent London Noise Survey work in inner areas supports this
- Thus need to consider **relative quiet**, not just absolute quiet...

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## Future approaches – sound quality

- Need to consider **positive sounds**, e.g. running water, and
- distinctive **local soundscape character**



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## Future approaches – people

- Trafalgar Square improved by partial **pedestrianisation** – ‘can now hear the fountains from in front of the National Gallery’
- aim is to improve **100 public spaces** across the city
- **Noise from people** could become more noticeable as traffic noise is reduced, and with growth of **late night economy...**

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## Future approaches - soundscapes

Positive acoustic design of spaces:

- ‘**Soundscape**’ should be given same importance as townscape or landscape
- Some sounds can be a **positive element** in city identity, e.g. fountains can mask unwanted noise
- Understanding **context and values**
- **Public participation, auralisation....**

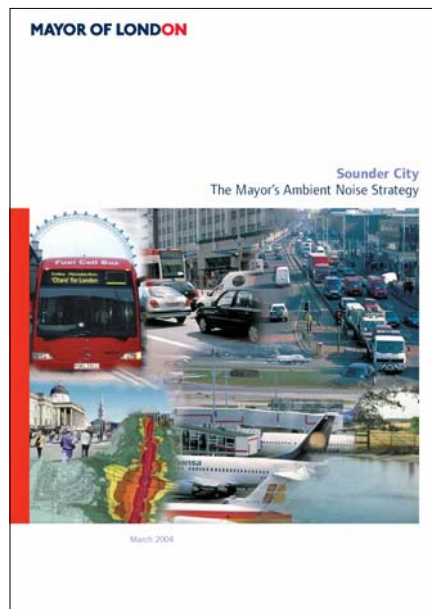
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## Future approaches – soundscape design

Removing sound energy is a big task – can we do more to change the **characteristics of unwanted sounds** to make the city sound better?

- **Fuel cell-hybrids** and **tyre-road** design...
- Alarms and other **informational sound**...
- Mobile communications and entertainment, ageing population, and **new forms of hearing mediation**...?
- **Soundscape design** needs new modelling techniques and more research

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<http://www.london.gov.uk/mayor/strategies/noise/ambient-noise-strategy-all.pdf>

[www.london.gov.uk](http://www.london.gov.uk)

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