



Managing CONGESTION in large urban areas

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Joint OECD/ECMT Transport Research Centre, Berlin 23-24 October 2006

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Background on Working Group Project

- Working Group Composition
- Background/Meetings
- Task
- Target



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Policy-makers: Key questions about Congestion

Practical, Outcome-oriented Questions

- (Why) and when should I act?
- What should I do?
- How should I do It?

Questions often not explicitly articulated

- What is congestion? (Don't we all know?!)
- What does success look like? (Policy goals)


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What is Congestion? ... some considerations

Characterisation of Congestion:

- Congestion and *Agglomeration*
- Congestion and *Access*
- Absolute vs. *Relative* phenomenon
- Congestion vs. *Excessive* congestion

Policy Indicators:

- Not to be based on *free-flow* speeds
- Track system performance: Speed *and* reliability *
- Use to prioritise action *


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Causes of Congestion ... Key Points


Triggers and Drivers:

- Triggers: On-road, initiates congestion incidents *
- Driving forces: cause traffic growth *

Representation of Congestion on the Network:

- Speed-Flow relationship (uninterrupted facilities) *
- Junction queuing (urban street networks) *

**Variability of Demand (and supply!)
Importance of Generated/Diverted Traffic**

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Why and When Should I Act?

When Congestion is Excessive

- Cost of congestion higher than the cost of relief

What is the Cost of Congestion?:

- Relative vs. Total Costs
- Delay and Unreliability, but also...

Indirect Costs of Congestion:

- Environment
- The Urban Economy
- Safety and Health

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Congestion Management: Policy Goals

What Are We (Should We Be) Aiming for?

- Maximum throughput? -- Still widely used.
- Contribution from economics: Optimum levels

Gaps between Theory and Practice:

- User heterogeneity
- Charging for optimum levels: technology limits
- Spatial and temporal dynamics of congestion
- Different types of networks
- Maximising flows & economically optimal approaches likely to lead to different levels of traffic/congestion

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What Should I Do?

Think Before Acting: Strategic Principles

1. Manage congestion in the context of the *urban area*: integrated transport and urban planning
2. “*Lock-in*” the benefits of congestion policies
3. Deliver *reliable and predictable* travel conditions

Integrate These Principles into Congestion Management Policies

- All policies should address desired urban outcomes, manage demand & supply and take account of user expectations

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Principle #1: Align Congestion Management Policies with Land Use and Planning Processes

Land Use & Urban Form: Key Driver of Demand

- Adopt and implement sustainable land-use policies
- Integrate transport decision-making and land-use planning *
- Traffic outcomes should be compatible with citizens' wishes for, and visions of, life in the urban area


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Principle #2: “Lock-in” the Benefits of Congestion Measures

- “Traditional fixes” = More capacity (released or new),
- More capacity = More traffic (Induced traffic),
- More traffic = More congestion

Three Types of Policies Qualitatively Different re. Outcomes:

1. Access Management
2. Parking Management
3. Pricing


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Principle #2: "Locking in" the Benefits

1. Access Management

Physically Managing and Filtering Access by:

- Limiting access to, or through zones, (Rome, Vienna, Athens, etc, ...) *
- Indirectly limiting access by removing or re-allocating roadspace for traffic (Paris On-street PT) *
- Filtering access to links in the network (Ramp Metering) *


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Principle #2: "Locking in" the Benefits

2. Parking Management

Reduce Demand for Destination Traffic:

- Increase price/reduce supply of parking spaces
- Manage network to discourage through traffic
- Combination with other measures (Public Transport and access management)
- Coordination across neighbourhoods (competition)
- Revenues can be used for alternatives
- Enforcement essential


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Principle #2: “Locking in” the Benefits


3. Pricing

Long Discussed, Little Implemented. Why?:

- Acceptance (linked to use of revenues)
- Cost, itself linked to....
- Technology

However, when implemented, very effective

- London, Stockholm, Singapore, others in planning *
- Link-based initiatives (H.O.T lanes, tolls, etc...)


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Principle #3: Improve the Reliability and Predictability of Travel Time

Reliability and Predictability: User focus

- Identify causes of irregular delays
- “Low-hanging” fruit
- Delivers tangible benefits for (relatively) small investments
- Co-ordination and management (e.g. road works, incident response) – often outside of road management authority
- Targets


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Congestion Management Measures: Non-Road Building Measures

Four Principal Options

1. Operations and traffic management *
2. Public transport
3. Mobility management
4. Infrastructure modification *

Above Measures Free-up Existing Capacity

- Manage traffic to preserve capacity
- Consider alternative use/allocation of capacity
- Provide alternative modes

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Congestion Management Measures: Adding New Capacity

Road Construction/Expansion Often Constrained in Urban Areas – But Can be Effective

When and Where Does it make Sense?

- By-passes to remove through traffic
- Incomplete orbital networks *
- Pinch points – river crossings
- Cost benefit assessment process is key
- Again, consider options for use of new capacity

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How Should I Implement My Congestion Management Policy?

Matching the Policy Response to the Problem

- Involving key actors
- Including the public (urban areas complex with many interactions)
- Aligning incentives and powers to act with agents responsible for delivery
- Aligning scope of policy response to geographic scope of congestion (travel-to-work area)
- Funding may only be available for specific (not necessarily best-suited) responses – address this

Ex-post Assessment (Improve/build on Past)


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Parting thoughts...

- Managing congestion not a one-off policy but an urban governance process ...congestion arises on the roads but it cannot be managed solely by the authorities responsible for transport
- Free flow speeds 24/7 not a tenable goal, avoiding excessive congestion is
- Age of un-managed urban roads coming to an end
- Need to lock in the benefits of traffic management policies and infrastructure expansion
- Urban areas should be managed to provide high quality and reliable access to their inhabitants



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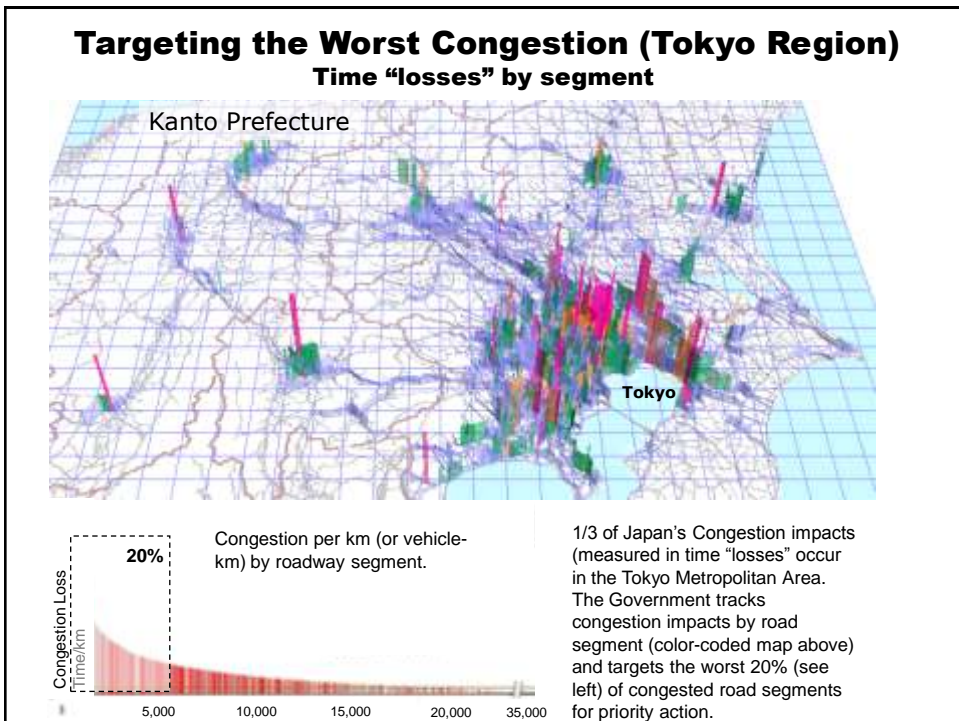
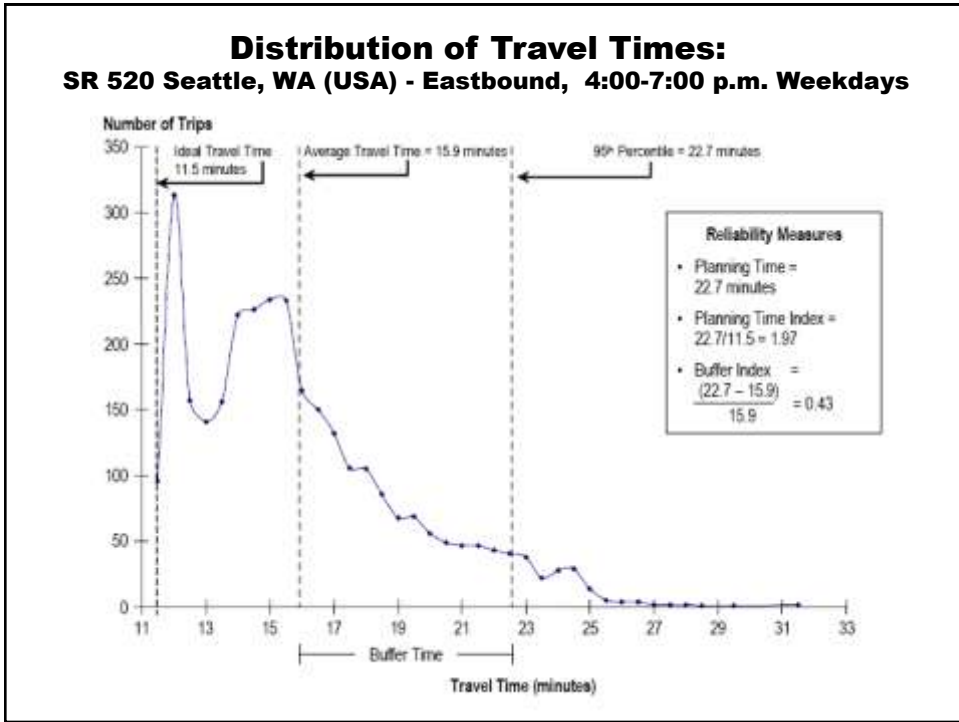
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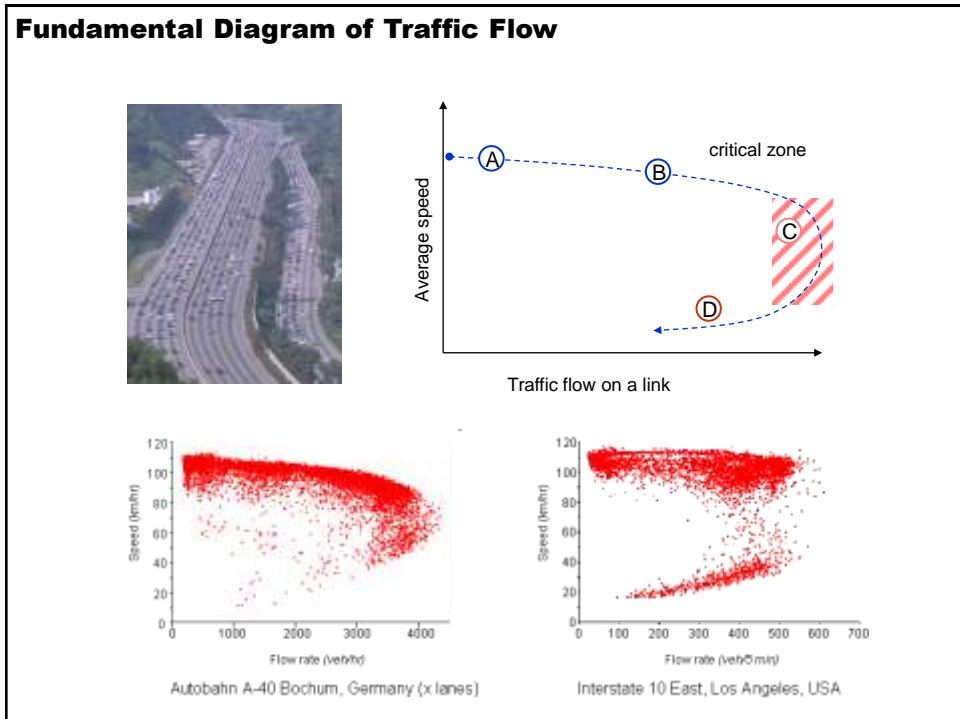
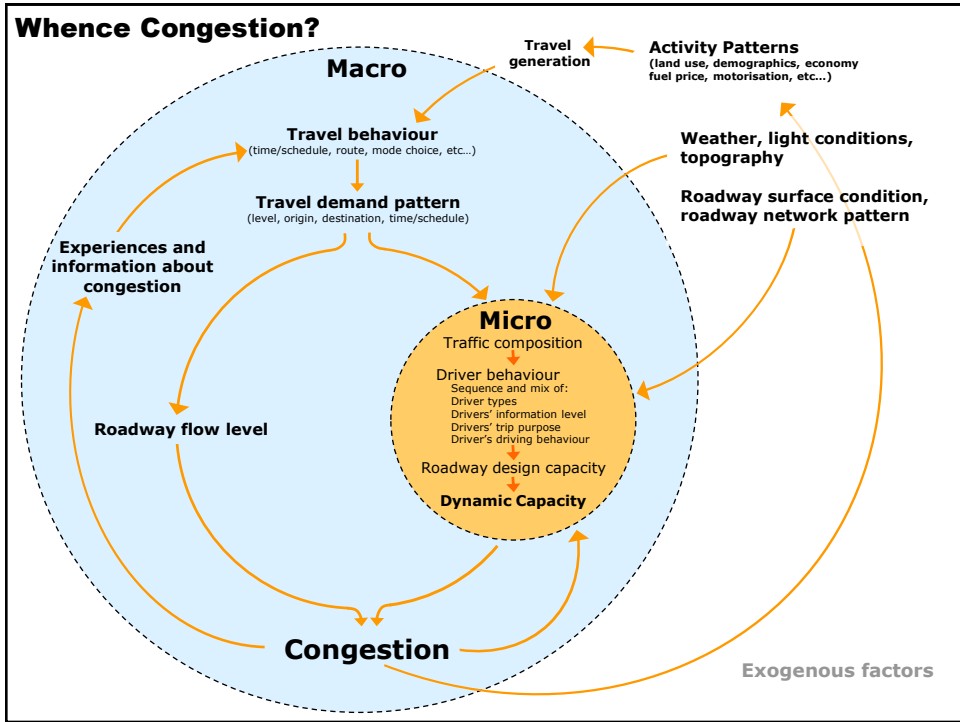
Questions?



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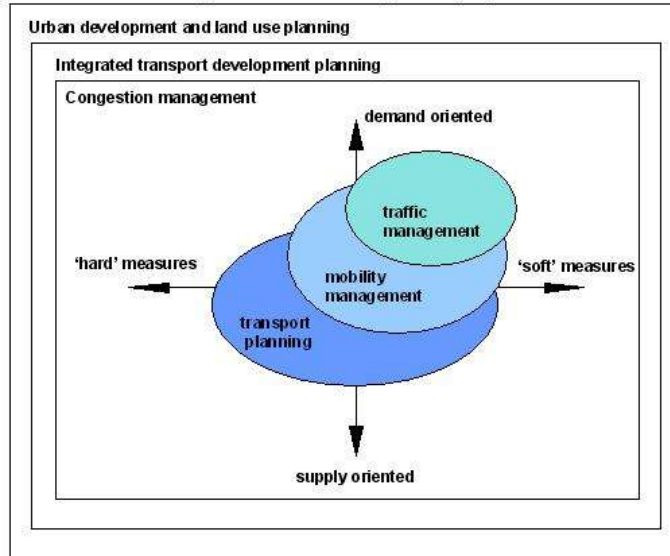


Urban Networks: Intersection Clearing Times

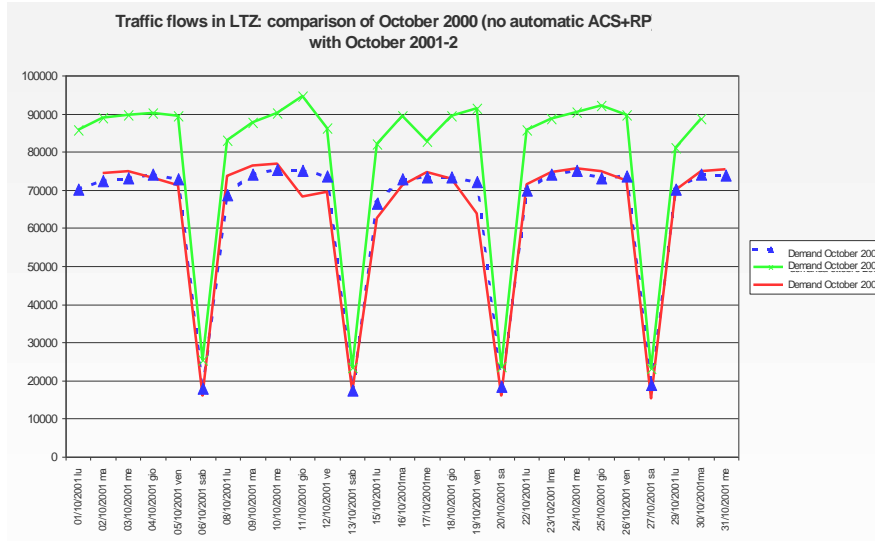


Integrated Framework for Congestion Mitigation Measures (Germany)

Plans and measures of higher levels and from neighbouring regions or cities



Rome: Impacts of Automatic Access Control



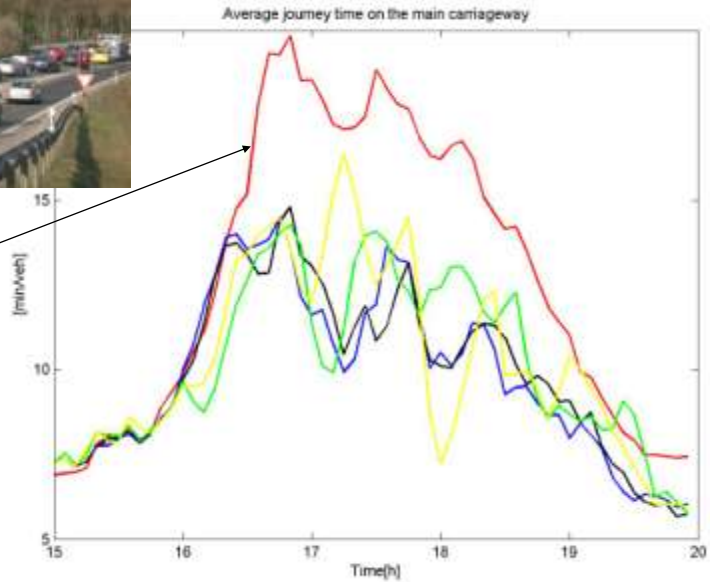
Re-allocation of Roadspace: Paris Southern Orbital Tramway



Ramp-metering (Munich): Motorway Travel Times Metering vs. different metering strategies



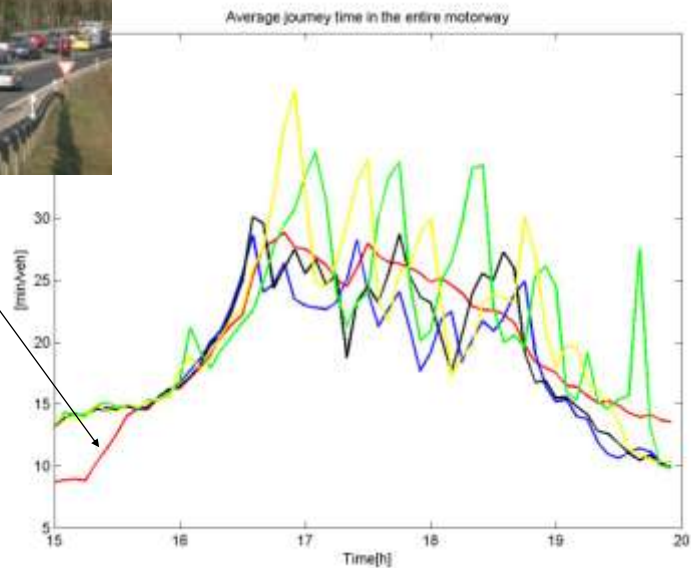
No metering



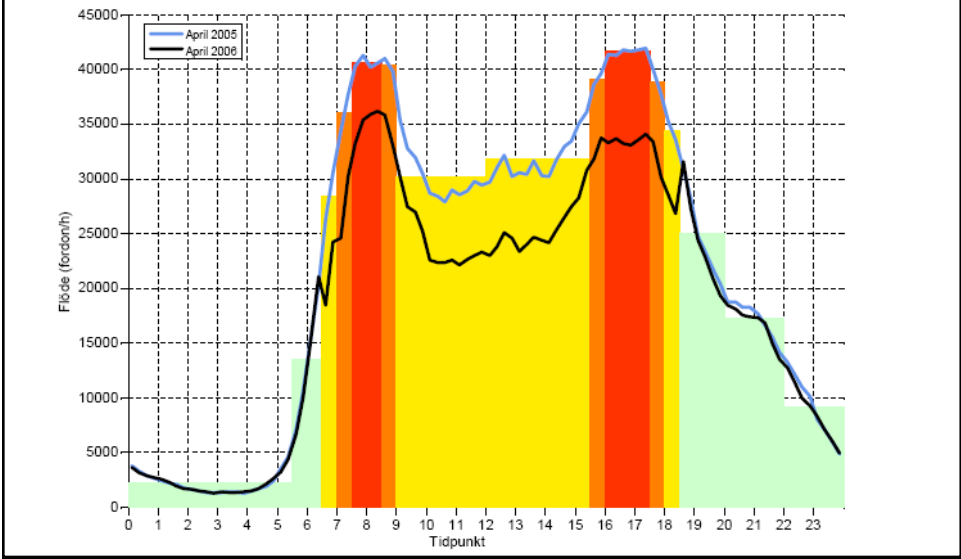
Ramp-metering (Munich): Motorway+Ramp Wait Travel Times Metering vs. different metering strategies



No metering

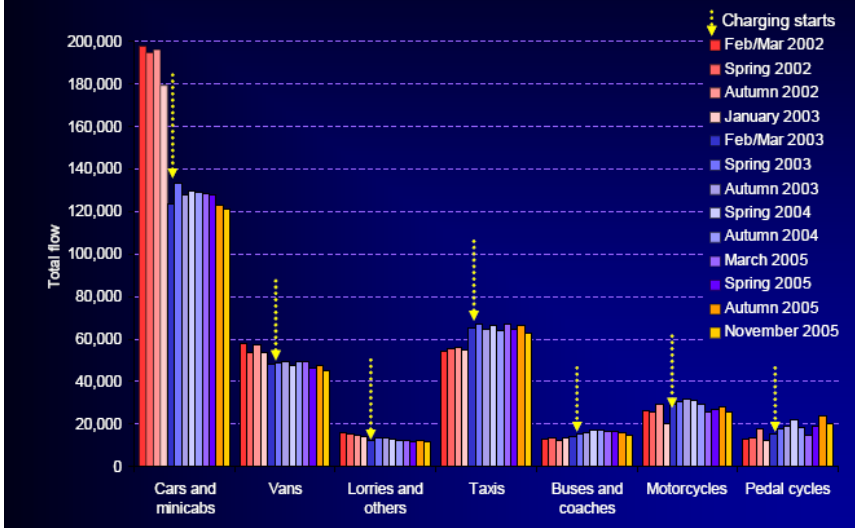


Cordon Charging: Stockholm (-22% During Peaks)



Cordon Charging: London (-20-30%)

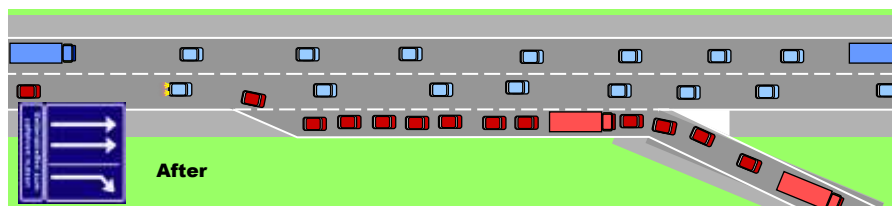
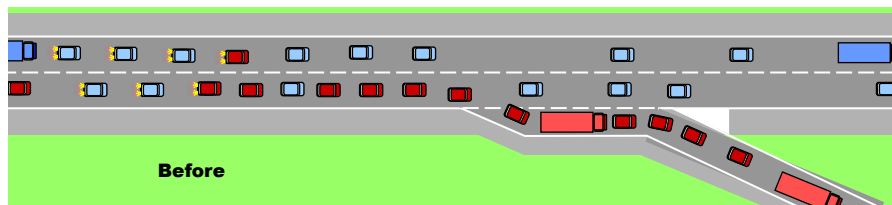
Total traffic entering the charging zone During charging hours



Paris Region Traffic Management Centre (SISER)



On-ramp/Off-ramp Lengthening: Stauventil (Germany)



■ Exiting vehicles

Incomplete Orbital Road Network (Tokyo)

