



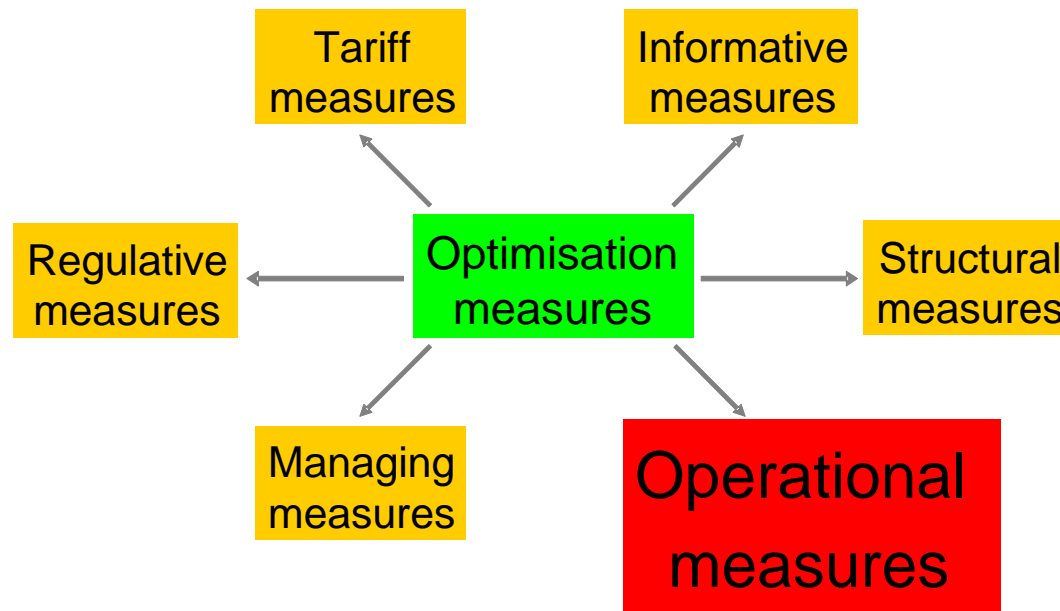
# Operational Management

John P. Boender

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# Optimisation measures



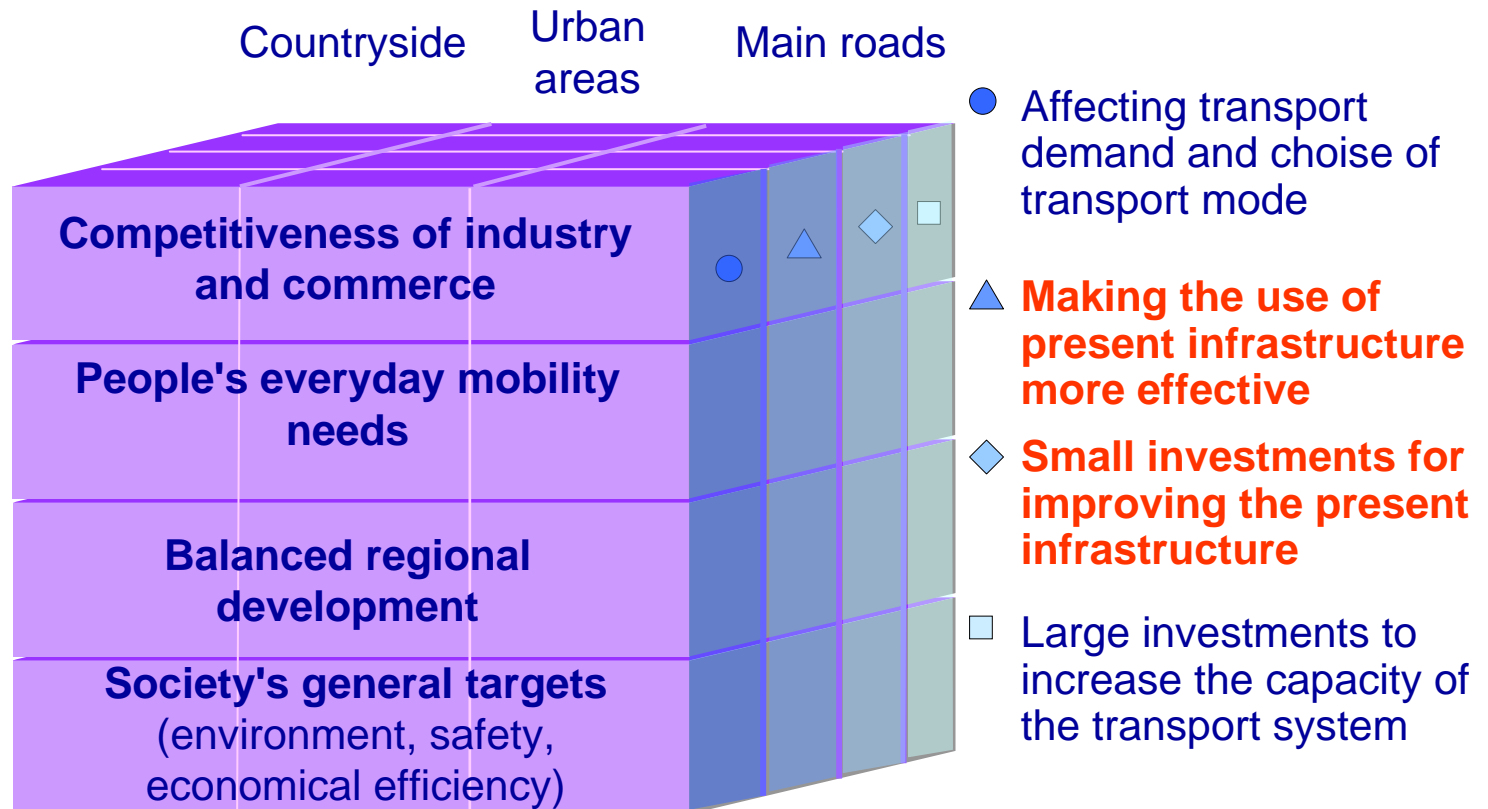


# Operational Management in relation to "the Cube"

**Using the infrastructure as efficient as possible**

# Operational Management in relation to "the Cube"

Using the infrastructure as efficient as possible



## Case studies (1)

- Automated variable mandatory speed limits,
- Use of buslane on heavily congested motorways,
- ITS Strategy for Operational Management,
- Peak-, plus- and buffer lanes,
- Large scale Road Maintenance on Motorways,
- Upgrading and improving a highway,
- New variable toll lanes within reconstructed highway,
- Variable pricing introduced at existing toll stations,
- Provision of bus lane on congested access route

## Case studies (2)

- Traffic management system,
- Managing traffic across a motorway and the connecting main roads,
- Warning system for detecting overweight vehicles,
- Using safe U-Turns as indirect left turn in highways
- Toll variation schemes
- Speed Control
- Incident Management
- Road network robustness model

# Contributions

David Wright	United Kingdom
Jean-Michel Gambard	France
Mahmoud Saffarzadeh	Iran
Jean-Claude Terrien / Philippe Barrette	Quebec, Canada
Norman Johnston	United Kingdom
Ysela Llort / Gary Sokolow	USA
Lindy Molenkamp	The Netherlands
Jesus Rubio	Spain
Layos Kisgyorgy	Hungary
Guy Boyadjian	France
John Boender	The Netherlands

# Automatic variable speed limits



M25, United Kingdom



# Bus lane on motorway

M4, United Kingdom



# Peak-, Plus- and Bufferlanes in The Netherlands



Outside  
peak hours



During  
peak hours

# Upgrading and Improving Highway 117, Quebec - Canada



# Bus lane on congested access route



Madrid, Spain

# Variable pricing project



Lee County, Florida, USA

# Most significant results

- Developed mature networks: reducing congestion



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- Less mature networks: improving safety and pavement durability



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- Less mature networks: improving safety and pavement durability
- Dedicated lanes for buses increase demand for public transport





# Most significant results

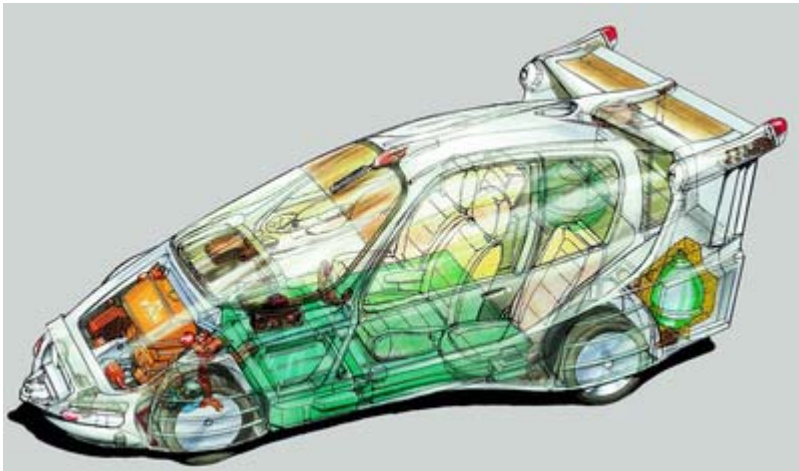
- Developed mature networks: reducing congestion
- Less mature networks: improving safety and pavement durability
- Dedicated lanes for buses increase demand for public transport
- Controlling vehicle speed: capacity and safety improvements

## Most significant results

- Developed mature networks: reducing congestion
- Less mature networks: improving safety and pavement durability
- Dedicated lanes for buses increase demand for public transport
- Controlling vehicle speed: capacity and safety improvements
- Toll variation: influence demand significantly

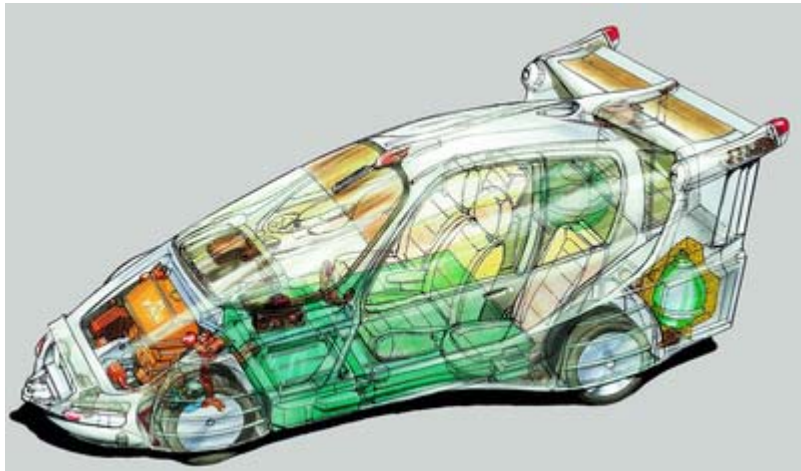
# Trends and predictions

- Increasing control, discipline, rationing of the available road-space and pricing



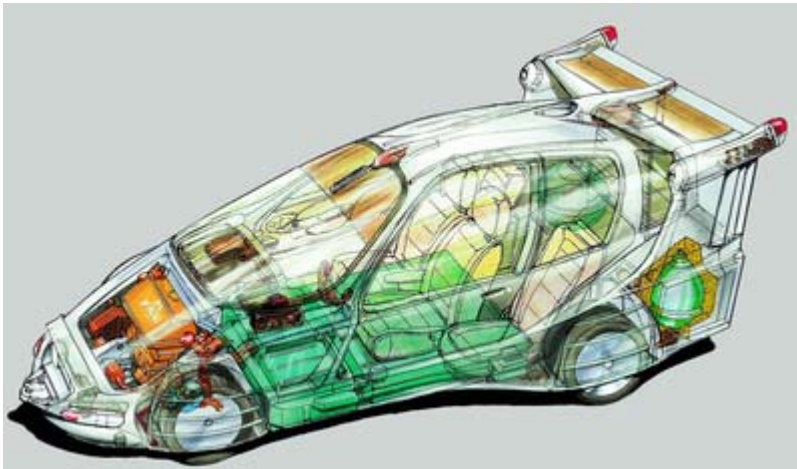
# Trends and predictions

- Increasing control, discipline, rationing of the available road-space and pricing
- Means of control into the vehicle



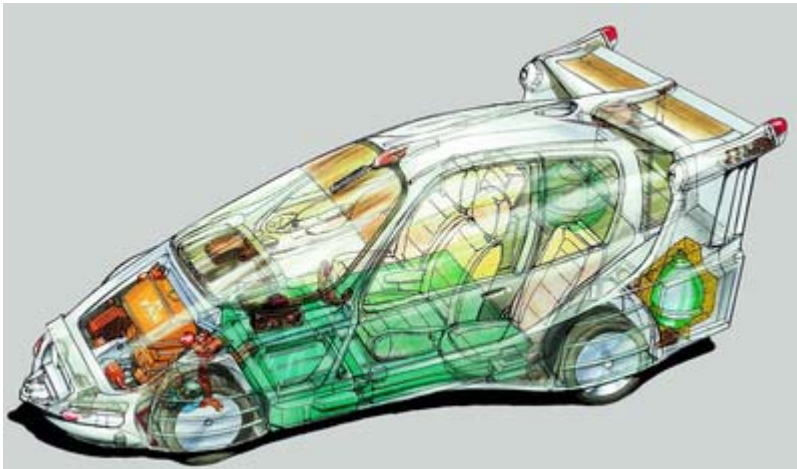
# Trends and predictions

- Increasing control, discipline, rationing of the available road-space and pricing
- Means of control into the vehicle
- Facilitate road-side to vehicle communications



# Trends and predictions

- Increasing control, discipline, rationing of the available road-space and pricing
- Means of control into the vehicle
- Facilitate road-side to vehicle communications
- Manage increasing loss of freedom to the road user





# Access Management

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# Access Management

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# Some of the Members and Contributors





# Content

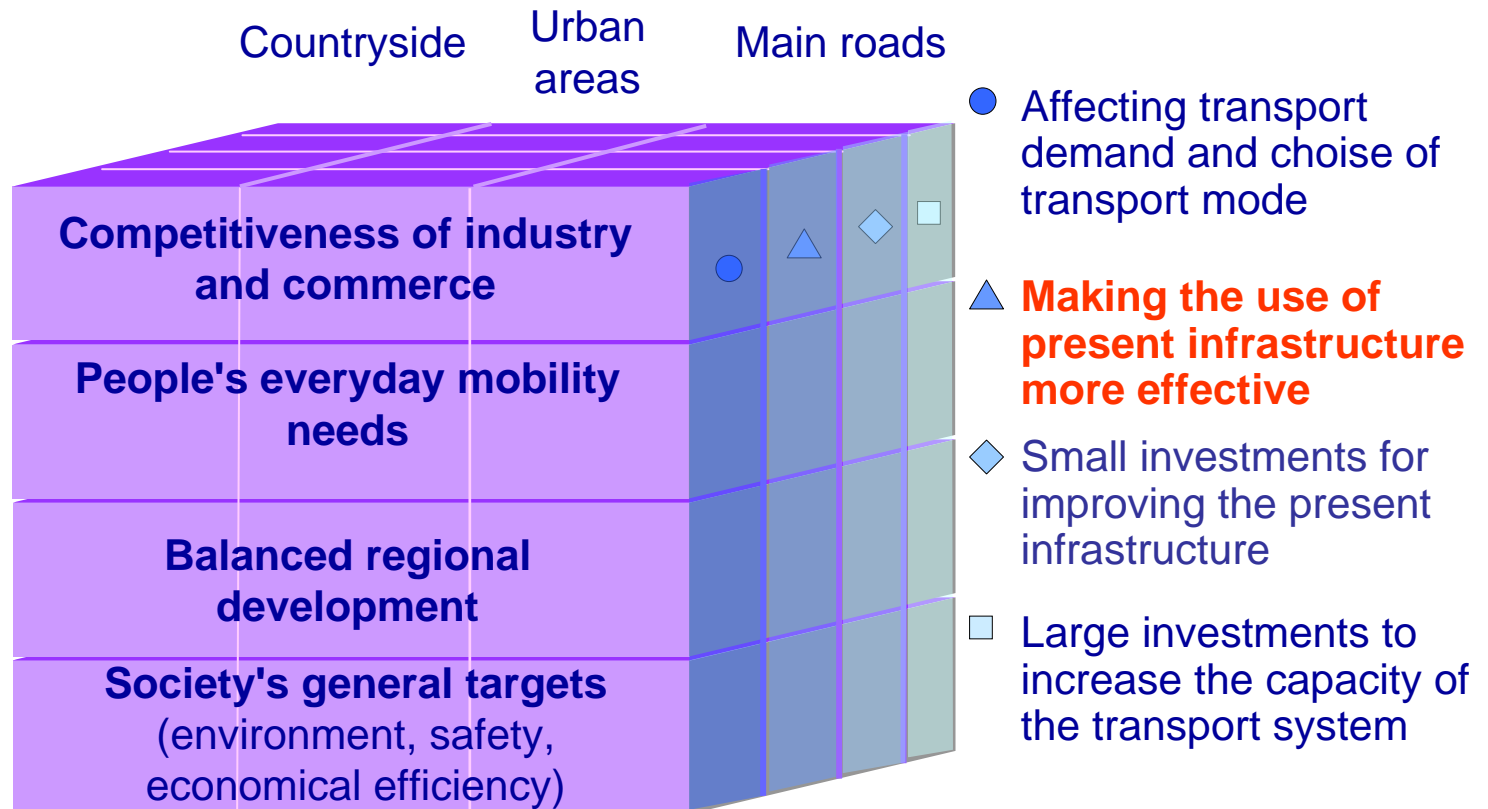
- What is Access Management
- What are the benefits
- Access Management techniques
- Case studies
- Trends and predictions

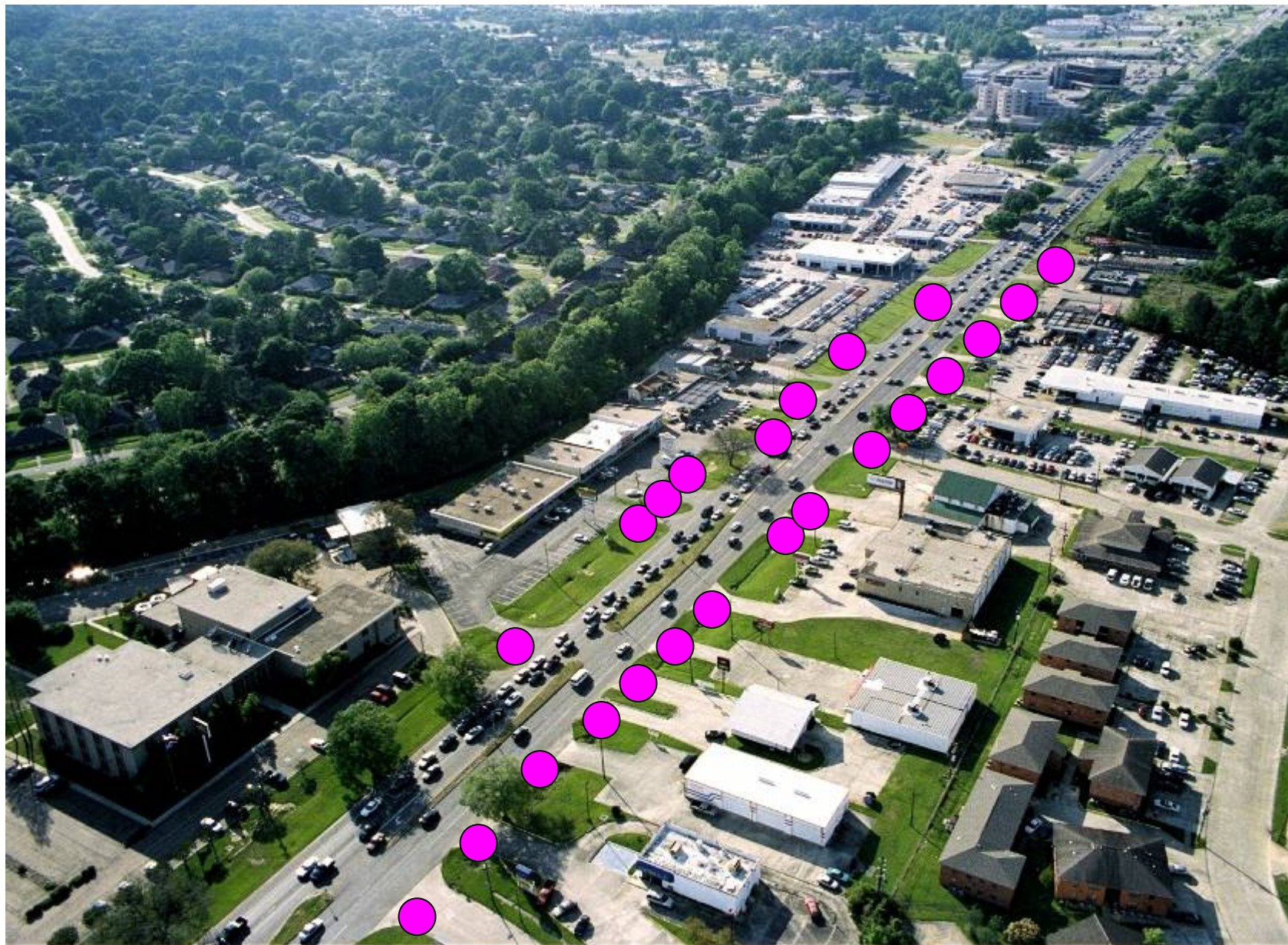


# What is Access Management?

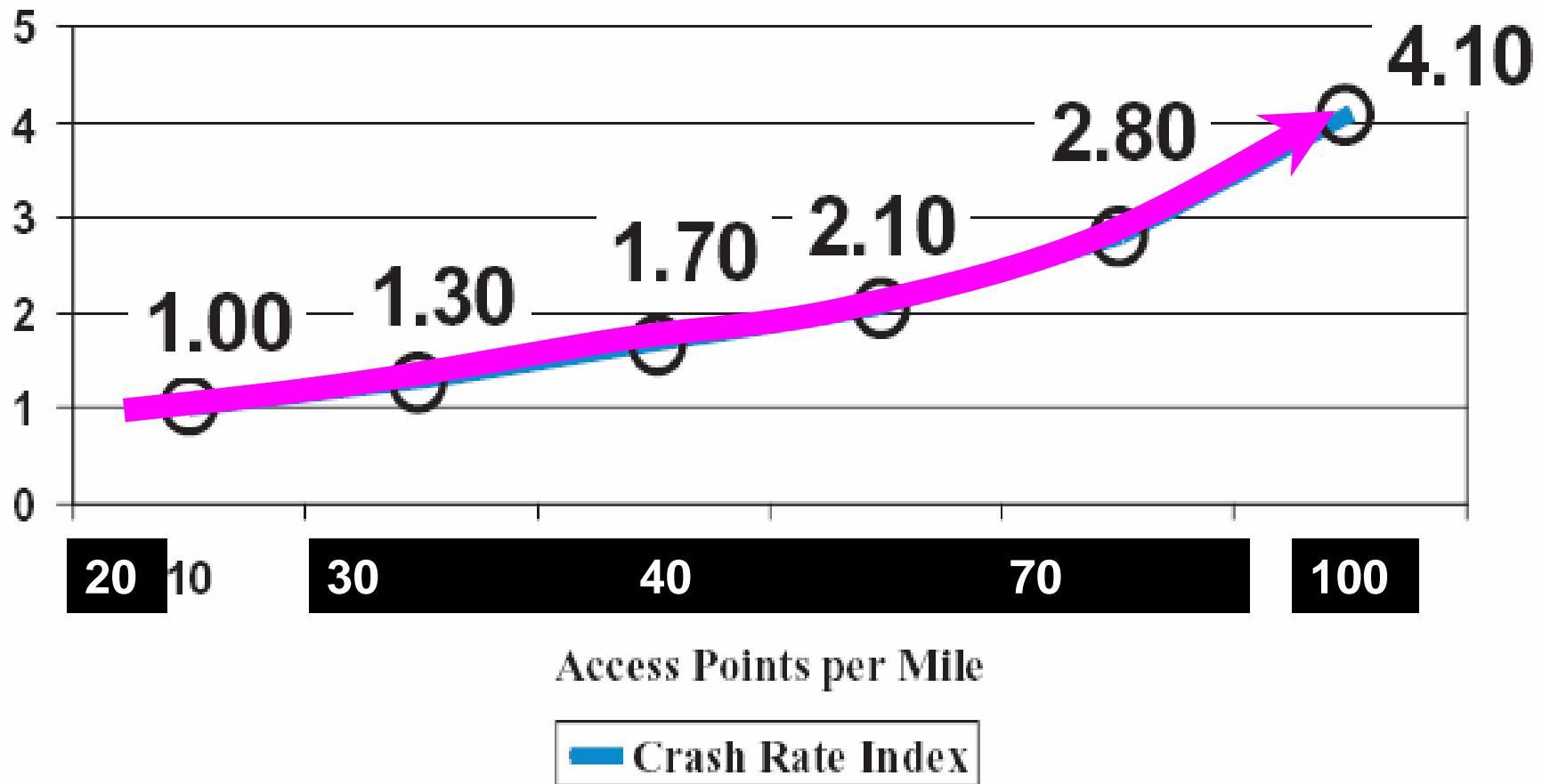
Access management is the systematic control of the location, spacing, design, and operations of driveways, median openings, interchanges, and street connections to a roadway

# Access Management in relation to "the Cube"





# More Access Points = More Crashes



# Pedestrian Safety: Center Lane



# Benefits of Access Management

- Road safety
- Economy

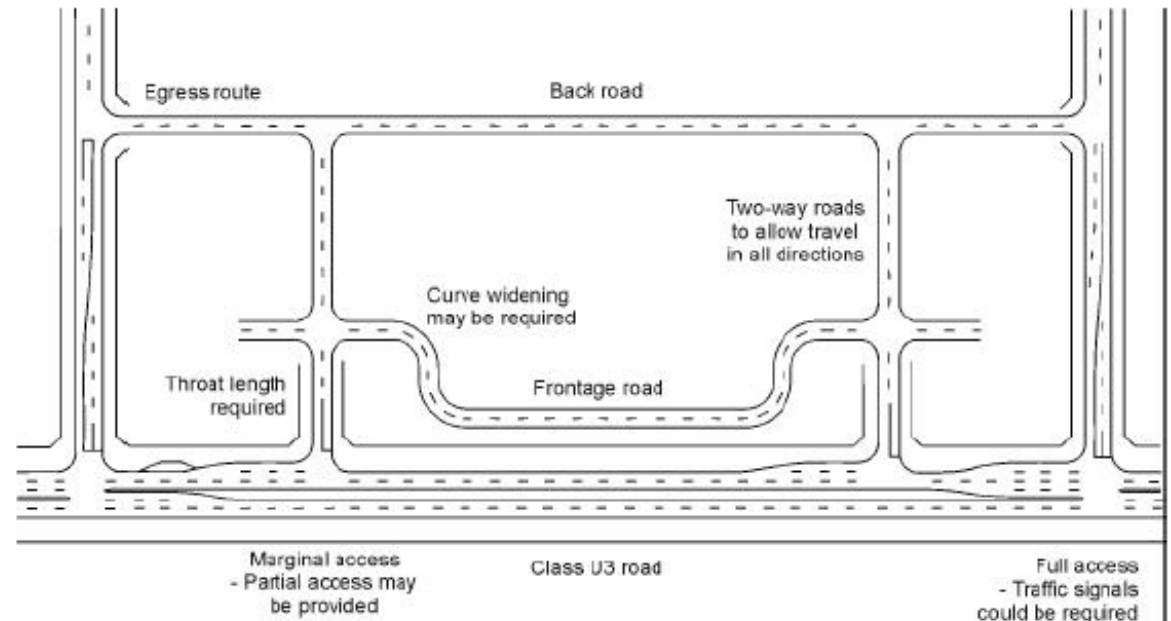


Figure 5.5 Frontage road on a Class U3 road

National Guidelines for Road Access Management in South Africa



# Access Management Techniques



restrictive medians

# Access Management Techniques

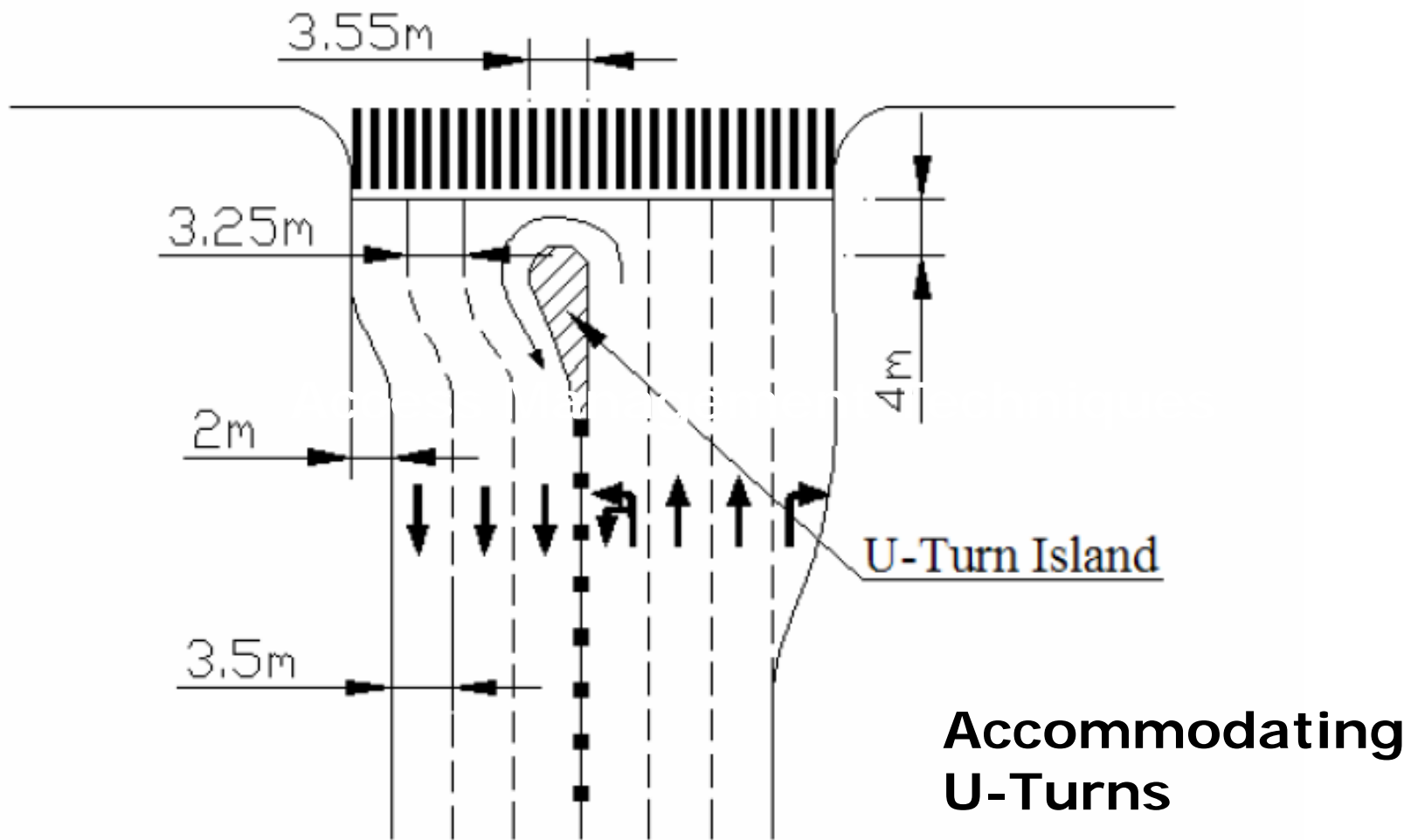


Figure 5. U-turn Island at Approach of Signalized Intersection

# Access Management Techniques

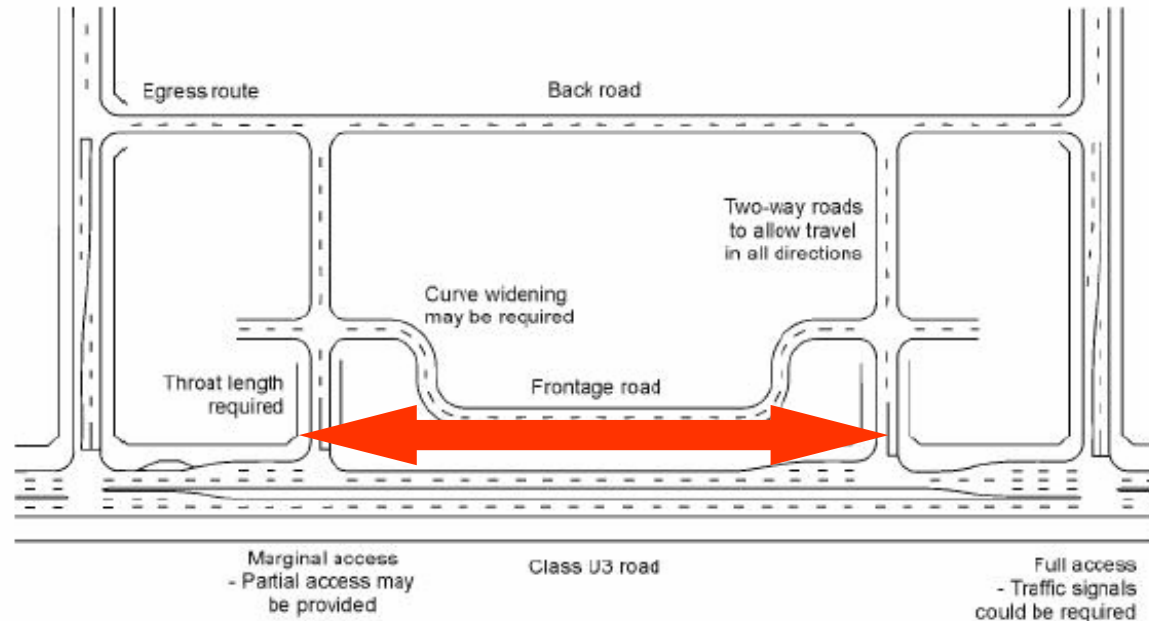


Figure 5.5 Frontage road on a Class U3 road

National Guidelines for Road Access Management in South Africa

## Connection spacing

# Case studies

- India



# India

## NATIONAL HIGHWAYS DEVELOPMENT PROJECT

Status as on April 30, 2005



The Golden Quadrangle

# Non Standard Vehicles



## Non Standard Vehicles



Animal transport or truck?

# Case studies

- India
- Iran





# Road Access Management in Iran



# Case studies

- India
- Iran
- South Africa



# Informal Trading Area



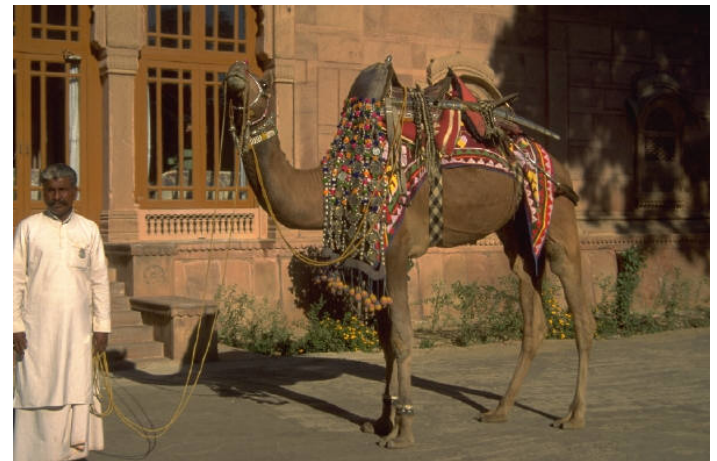


# Trends and predictions

- **Social equity**

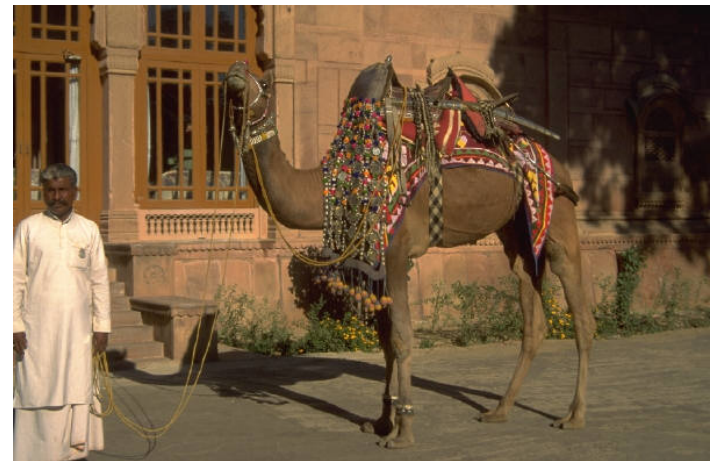
# Trends and predictions

- **Social equity**
- **Pedestrian Bicycle and Animal traffic**



# Trends and predictions

- **Social equity**
- **Pedestrian Bicycle and Animal traffic**
- **Remote Areas**



# Trends and predictions

- **Social equity**
- **Pedestrian Bicycle and Animal traffic**
- **Remote Areas**
- **Supply of Professionals**

