Pedestrian priority in street design - how can it improve sustainable mobility?

Paulo Anciaes, Peter Jones – University College London
What are the effects on other street users? Who will be worse off?

What are the possible effects, on the local economy, communities, and environment? Are all those effects positive?

What are the effects on pedestrians?
Street planning and design - now

Modelling → Consultation → Decision
What this research brings new
Tool development and refinement

Trial in five cities, in busy urban streets linking to the European Transeuropean Transport Network

Feedback from street user groups:
International Federation of Pedestrians
European Cyclists Federation
International Association of Public Transport (UITP)
Option generation tools

Tool 1: Policy interventions

Tool 2: Street layout designs
A database of 210 possible interventions. Examples:

Various degrees of pedestrianization

Shared solutions

Various possible positions for walking areas

Treatments at street crossings
..and solutions targeting other modes or street functions
Tool inputs

- Street uses that should be made better off
- Street uses that should not be made worse off
- Policy objectives to meet

Tool outputs

Selected from a database of 210 interventions
### Policy Interventions tool output

#### Description page

<table>
<thead>
<tr>
<th>Walkable median strip</th>
<th>Description</th>
<th>Examples and evidence</th>
<th>Effect on road uses</th>
<th>Effect on policy objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of policy:</strong> Space allocation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Also known as (walkable) central reservation. Space in the middle of the road (between the carriageways in the two directions) that are wide enough for pedestrians to walk along them (rather than simply using them as a traffic refuge while crossing).</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Walkable medians require a suitable width along their length, including buffers to traffic, to protect pedestrians. They should also be continuous, without gaps (including those for vehicles making U-turns). They cannot be provided across road junctions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>They are usually raised from the carriageway. But they are distinct from kerbed hard shoulders or buffer zones that are not dedicated to pedestrian use.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Examples and evidence page

<table>
<thead>
<tr>
<th>Walkable median strip</th>
<th>Description</th>
<th>Examples and evidence</th>
<th>Effect on road uses</th>
<th>Effect on policy objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Examples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One of the most famous walkable median strips is Barcelona’s La Rambla, which has a wide median used by many residents and visitors to stroll. It also includes many on-street shops.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avenida da Liberdade in Lisbon is a long boulevard with a wide walkable median strip with seating areas, greenery, and public art.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some cities have a large network of walkable median strips. As an example, many of the long, wide roads in the city centre of Tirana (Albania) have a wide walkable median strips, shared with cyclists.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A walkable median has similar benefits as a wider footway, in terms of reduced walking distance, crossing risk and delay, and improved street environment, regardless of assumptions of pedestrian route choice.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See: Anciães and Jones 2016 Effectiveness of changes in street layout and design for reducing barriers to walking. Transportation Research Record 586. 39–47.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The redesign of a 4-lane road in New Jersey, adding a raised wide median, reduced pedestrian exposure risk, had a slight effect on vehicle speeds.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Policy Interventions tool output

### Effect on street uses page

<table>
<thead>
<tr>
<th>Road user</th>
<th>Road use</th>
<th>Impact</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrians</td>
<td>Walk</td>
<td>+</td>
<td>More space for walking</td>
</tr>
<tr>
<td></td>
<td>Cross the road</td>
<td>-</td>
<td>Narrower carriageway, can stop in middle of road</td>
</tr>
<tr>
<td></td>
<td>Stroll</td>
<td>+</td>
<td>More space for strolling</td>
</tr>
<tr>
<td></td>
<td>Sit (street furniture)</td>
<td>+</td>
<td>More space for seating areas</td>
</tr>
<tr>
<td>Pedestrians with restricted mobility</td>
<td>Walk</td>
<td>+</td>
<td>More space for walking</td>
</tr>
<tr>
<td></td>
<td>Cross the road</td>
<td>-</td>
<td>Narrower carriageway, can stop in middle of road</td>
</tr>
<tr>
<td>Cyclists</td>
<td>Move</td>
<td>-</td>
<td>+ Narrower carriageway</td>
</tr>
<tr>
<td></td>
<td>Park</td>
<td>-</td>
<td>May need to accommodate cycle parking</td>
</tr>
</tbody>
</table>

### Effect on objectives page

<table>
<thead>
<tr>
<th>Objective</th>
<th>Impact</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement</td>
<td>Increase number of trips</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Reduce travel time</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Increase travel time reliability</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Reduce congestion</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Improve trip quality</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Achieve a more sustainable modal split</td>
<td>+</td>
</tr>
<tr>
<td>Place</td>
<td>Facilitate place activities (e.g. people sitting)</td>
<td>+</td>
</tr>
</tbody>
</table>
# Policy Interventions tool: Behind the scenes

## 210 interventions

<table>
<thead>
<tr>
<th>ID</th>
<th>W01</th>
<th>W02</th>
<th>W03</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pedestrianisation</td>
<td>Part-time pedestrianisation</td>
<td>Walkways</td>
</tr>
<tr>
<td></td>
<td>Space allocation</td>
<td>Time reallocation</td>
<td>Space allocation</td>
</tr>
<tr>
<td></td>
<td>Street open to all modes</td>
<td>Road always open to all modes</td>
<td>No walkways. All pedestrian links along road</td>
</tr>
<tr>
<td>description1</td>
<td>Street for the exclusive use of pedestrians. It usually has level surfaces, seating, on-street commercial areas (e.g., kiosks, outdoor cafes, stands), street furniture (e.g., information boards, bins), public art, greenery, and good-quality lighting. Streets for the exclusive use of pedestrians at certain hours of the day or days of the week. At other times, the street is open to motorised traffic, including private cars. However, car parking may be banned. Space for walking separated from the road, elevated or underground, or across buildings are also known as skywalks. Some sections of walkways or escalators. Many at-level an</td>
<td></td>
<td></td>
</tr>
<tr>
<td>description2</td>
<td>Pedestrianised areas are common in city centres and high-density in shopping streets, the pedestrianised times may be mornings and afternoons, when shops are open. In leisure areas, pedestrianisation is also used at night. In larger cities, pedestrianisation is linked to public transport.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Likely effect on all street uses (and reason)

- **Emergency move**: Can use road but usually many pedestrians
  - **emergency_move_why**: Gain of carriageway space by releasing footway space

- **Service stop**: Can use road but usually many pedestrians
  - **service_stop_why**: Gain of carriageway space by releasing footway space

- **Trips**: More public transport and walking trips to city centres
  - **trips_why**: Discourages some people from walking

- **Time**: Delays to car, taxis, and freight vehicle travel times
  - **time_why**: No integration with other transport

### Likely effect on all objectives (and reason)

- **Climate why**: Less emissions, more space for green areas
  - **climate_why_why**: More and faster traffic, less green

- **Energy**: Less use of motorised modes
  - **energy_why**: Less walking, more scope for motorised travel times

- **Regional**: Less emissions
  - **regional_why**: Less walking, more scope for motorised travel times

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**Notes**

- **Evidence3**
  - European Commission 2004 Reclaiming city streets for people - Chaos or quality of life?

- **Image ref**

- **Peds walk why**
  - More space to walk
  - More space to walk at the restricted times

- **Peds cross why**
  - +

---

**References**

- Yiu 2011 The impact of a pedestrianisation scheme on retail rent: evidence3ref
<table>
<thead>
<tr>
<th>Should be better off</th>
<th>Should not be worse off</th>
<th>Objectives</th>
<th>Generated options</th>
</tr>
</thead>
<tbody>
<tr>
<td>walk; cross the street</td>
<td>walk (pedestrians with restricted mobility); stop (service vehicles)</td>
<td>improve traffic safety</td>
<td>greenways; de-clutter footway; footway extensions; inclusive design; cycle street (shared with car); cycle parking/hire on side street; narrow the street carriageway; reduce number of traffic lanes; decrease width of traffic lanes; high-occupancy vehicle lanes; area-wide traffic restriction; vehicle-based restrictions; license plate number traffic restrictions; dynamic traffic restriction; road pricing; cordon and area-wide charges; dynamic pricing; high-occupancy toll lanes; reduce speed limit; low speed zones; corner extensions of footway; park &amp; ride; kiss &amp; ride; parking/loading space on side streets; consolidated freight distribution; part-time parking/loading space</td>
</tr>
<tr>
<td>stroll; sit (outdoor café); cross the street (pedestrians with restricted mobility)</td>
<td>cross the street; sit (street furniture)</td>
<td>facilitate place activities; promote local economy; promote social interaction</td>
<td>pedestrianisation; part-time pedestrianisation; de-clutter footway; greenways; add/improve street lights; footway extensions; narrow the street carriageway; reduce number of traffic lanes; decrease width of traffic lanes; point closures/traffic cells; area-wide traffic restriction; regular road closure; vehicle-based restrictions; road pricing; cordon and area-wide charges; high-occupancy toll lanes; kiss &amp; ride; parking/loading space on side streets; enforcement of parking/loading regulations; part-time parking/loading space; consolidated freight distribution; add/improve courtyards, squares, plazas</td>
</tr>
<tr>
<td>walk; cross the street; sit (street furniture)</td>
<td>reduce community severance; increase personal security; promote social inclusion</td>
<td>part-time pedestrianisation; add/improve street lights; de-clutter footway; narrow the street carriageway; reduce number of traffic lanes; decrease width of traffic lanes; point closure/traffic cells; regular road closure</td>
<td></td>
</tr>
</tbody>
</table>
Option generation tools

Tool 1: Policy interventions

Tool 2: Street designs
All possible combinations of design elements (which can assume different sizes)

<table>
<thead>
<tr>
<th>Walking</th>
<th>Place activities</th>
<th>Green area</th>
<th>General purpose</th>
<th>Bus lane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrow</td>
<td>Narrow</td>
<td>1 lane</td>
<td>1 lane</td>
<td>1 lane</td>
</tr>
<tr>
<td>Medium</td>
<td>Wide</td>
<td>2 lanes</td>
<td>6m</td>
<td></td>
</tr>
<tr>
<td>Wide</td>
<td>2m</td>
<td>3m</td>
<td>6m</td>
<td>3m</td>
</tr>
</tbody>
</table>

- Elements assigned to alternative positions on footways, carriageways, and median strip
- Unfeasible combinations removed, buffers between elements (e.g. cycle lanes and parking spaces) added
Tool inputs

- Current space allocation
- Level of priority to each design element in the redesigned street

Tool outputs

![Possible Road Designs Diagram](image-url)
Example of application in one of the cities

<table>
<thead>
<tr>
<th>Should have at least the same space but more, if possible</th>
<th>Should have some space (but not more than now)</th>
<th>Number of options generated</th>
<th>Capacity range (per 75m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space for walking; space for place activities; green area; space for parking/loading</td>
<td>Lanes for general traffic; space for cycling</td>
<td>30</td>
<td>155-225 people 65-80 people 0-11 vehicles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>70</td>
<td>175-255 people 65-80 people 0 vehicles</td>
</tr>
<tr>
<td>Space for place activities; green area; space for cycling; space for parking/loading</td>
<td>Space for walking; lanes for general traffic</td>
<td>80</td>
<td>125-195 people 65-80 people 0-5 vehicles</td>
</tr>
</tbody>
</table>
Option appraisal tool
### Performance indicators

#### Link (by travel mode):
- Volume
- Speed or travel time
- Delays
- Reliability
- Trip quality

#### Place (vehicle or people-based activities, by type of activity)
- Number
- Duration
- Quality

#### Wider objectives:
- Property prices
- Visits or expenditure in local businesses
- Traffic safety
- Health (physical activity)
- Personal security
- Air pollution

### And also:

### Road design

<table>
<thead>
<tr>
<th>Option name (short)</th>
<th>Option 0 (Do nothing)</th>
<th>Options for space reallocation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6 traffic lanes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Option 1</td>
</tr>
<tr>
<td>Implementation cost (1000€)</td>
<td>135.7</td>
<td>90.5</td>
</tr>
<tr>
<td>Maintenance cost per year (1000€)</td>
<td>24.4</td>
<td>16.3</td>
</tr>
<tr>
<td>Allocated road width (metres)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General motorised traffic</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>Bus-only lane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cycle-only lane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus+cycle lane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus+taxi lane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pavement (walk)</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>Pavement (sit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pavement (place activities)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parking</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Loading/servicing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green areas</td>
<td></td>
<td>1.8</td>
</tr>
<tr>
<td>Total road width (metres)</td>
<td>32.5</td>
<td>32.5</td>
</tr>
</tbody>
</table>

### Pedestrian crossing facilities (number)

<table>
<thead>
<tr>
<th></th>
<th>Option 0 (Do nothing)</th>
<th>Options for space reallocation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Option 1</td>
</tr>
<tr>
<td>Signalised crossings</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2-stage signalised crossings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Footbridge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underpass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zebra</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pedestrian refuge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of crossing facilities</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
## Cost-benefit analysis: further inputs (monetary unit values)

**Data source**

Institution

(if in official guidance)

Original research

Country

Year

Unit

Original value

Value in 2018 €

Unit value

<table>
<thead>
<tr>
<th>Data source</th>
<th>Institution</th>
<th>Original research</th>
<th>Country</th>
<th>Year</th>
<th>Unit</th>
<th>Original value</th>
<th>Value in 2018 €</th>
<th>Unit value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Link function

**Value of travel time**

- **Private car driver**
  - WebTAG
  - UK Department for Transport
  - ITS Leeds
  - England
  - 2013
  - Value of 1h working time
  - £17.69
  - €19.81

- **Private car passenger**
  - WebTAG
  - UK Department for Transport
  - ITS Leeds
  - England
  - 2013
  - Value of 1h working time
  - £17.69
  - €19.81

- **Taxi driver**
  - WebTAG
  - UK Department for Transport
  - ITS Leeds
  - England
  - 2013
  - Value of 1h working time
  - £12.96
  - €14.52

- **Taxi passenger**
  - WebTAG
  - UK Department for Transport
  - ITS Leeds
  - England
  - 2013
  - Value of 1h working time
  - £17.69
  - €19.81

- **Motorcyclist**
  - WebTAG
  - UK Department for Transport
  - ITS Leeds
  - England
  - 2013
  - Value of 1h working time
  - £17.69
  - €19.81

- **Light-goods vehicle**
  - WebTAG
  - UK Department for Transport
  - ITS Leeds
  - England
  - 2013
  - Value of 1h working time
  - £12.18
  - €13.64

- **Heavy-goods vehicle**
  - WebTAG
  - UK Department for Transport
  - ITS Leeds
  - England
  - 2013
  - Value of 1h working time
  - £14.35
  - €16.07

- **Cyclists**
  - WebTAG
  - UK Department for Transport
  - ITS Leeds
  - England
  - 2013
  - Value of 1h working time
  - £17.69
  - €19.81

- **Pedestrians**
  - WebTAG
  - UK Department for Transport
  - ITS Leeds
  - England
  - 2013
  - Value of 1h working time
  - £10.02
  - €11.22

### Congestion/overcrowding multiplier of travel time

- **Motorised modes**
  - Swedish guidance
  - Swedish Road Administration
  - Börjesson & Eliasson
  - Sweden
  - 2011
  - Multiplier of travel time savings
  - 1.5

- **Bus**
  - Swedish guidance
  - Swedish Road Administration
  - Börjesson & Eliasson
  - Sweden
  - 2011
  - Multiplier of travel time savings
  - 1.5

- **Cyclists**
  - WebTAG
  - UK Department for Transport
  - Heuman
  - England
  - 2005
  - Value of pedestrian crowding per km
  - £0.02
  - €0.02

### Value of road design

- **Segregated bus lane**
  - WebTAG
  - UK Department for Transport
  - Hopkinson and Wardman
  - England
  - 1996
  - Value per minute travel time
  - £7.03
  - €7.87

- **Segregated cycle lane**
  - WebTAG
  - UK Department for Transport
  - Hopkinson and Wardman
  - England
  - 1996
  - Value per minute travel time
  - £7.03
  - €7.87

- **Non-segregated cycle lane**
  - WebTAG
  - UK Department for Transport
  - Hopkinson and Wardman
  - England
  - 1996
  - Value per minute travel time
  - £7.03
  - €7.87

- **Wide cycle lane**
  - WebTAG
  - UK Department for Transport
  - Hopkinson and Wardman
  - England
  - 1996
  - Value per minute travel time
  - £7.03
  - €7.87

- **Shared lane bus-cyclists**
  - WebTAG
  - UK Department for Transport
  - Hopkinson and Wardman
  - England
  - 1996
  - Value per minute travel time
  - £7.03
  - €7.87

### Place function

- **Value of parking time (cars)**
  - WebTAG
  - UK Department for Transport
  - Hopkinson and Wardman
  - England
  - 1996
  - Value of parking facilities per minute
  - £0.98
  - €1.10

- **Value of parking time (bicycles)**
  - WebTAG
  - UK Department for Transport
  - Hopkinson and Wardman
  - England
  - 1996
  - Value of parking facilities per minute
  - £0.98
  - €1.10

- **Value of loading time**
  - WebTAG
  - UK Department for Transport
  - Hopkinson and Wardman
  - England
  - 1996
  - Value of parking facilities per minute
  - £0.98
  - €1.10

(...)

**OR choose a unit from the dropdown menu and insert a new unit value**

**Congestion/overcrowding multiplier of travel time**

**Value of road design**

**Place function**

**Choose built-in unit value, from previous studies**

**OR specify new unit value**

**see details of those studies**
## Synthesis of Cost-Benefit Analysis

<table>
<thead>
<tr>
<th>Option</th>
<th>Net benefit (over 5 years)</th>
<th>Benefit-cost ratio</th>
<th>Acceptable violations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 0</td>
<td>€ 0</td>
<td>0.0</td>
<td>No</td>
</tr>
<tr>
<td>Option 1</td>
<td>-€ 3,409,872</td>
<td>0.3</td>
<td>No</td>
</tr>
<tr>
<td>Option 2</td>
<td>-€ 3,911,205</td>
<td>0.2</td>
<td>Yes</td>
</tr>
<tr>
<td>Option 3</td>
<td>-€ 5,673,467</td>
<td>0.2</td>
<td>No</td>
</tr>
<tr>
<td>Option 4</td>
<td>€ 941,195</td>
<td>1.1</td>
<td>Yes</td>
</tr>
<tr>
<td>Option 5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Detailed Cost-Benefit Analysis

#### Performance indicator

<table>
<thead>
<tr>
<th>Performance indicator</th>
<th>Unit</th>
<th>Now (do nothing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation cost</td>
<td>1 €</td>
<td>€ 0.0</td>
</tr>
<tr>
<td>Maintenance cost</td>
<td>1 €</td>
<td>€ 0.0</td>
</tr>
</tbody>
</table>

#### Link function

<table>
<thead>
<tr>
<th>Private cars</th>
<th>Space per vehicle (m²/vehicles/day)</th>
<th>0.08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel time</td>
<td>Travel time (minutes)</td>
<td>0.2</td>
</tr>
<tr>
<td>Delays</td>
<td>Average delay (minutes/km)</td>
<td>0.6</td>
</tr>
<tr>
<td>Reliability</td>
<td>% of satisfied users</td>
<td>0.14</td>
</tr>
<tr>
<td>Trip quality</td>
<td></td>
<td>0.6</td>
</tr>
</tbody>
</table>

#### Taxis

<table>
<thead>
<tr>
<th>Level of service</th>
<th>Space per vehicle (m²/vehicles/day)</th>
<th>0.08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel time</td>
<td>Travel time (minutes)</td>
<td>0.03</td>
</tr>
<tr>
<td>Delays</td>
<td>Average delay (minutes/km)</td>
<td>0.4</td>
</tr>
<tr>
<td>Reliability</td>
<td>% of satisfied users</td>
<td>0.4</td>
</tr>
</tbody>
</table>

### Monetised changes

<table>
<thead>
<tr>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
<th>Option 4</th>
<th>Option 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Widen pavements</td>
<td>Add green median</td>
<td>Add cycle lane</td>
<td>Radical change</td>
<td></td>
</tr>
<tr>
<td>-€ 135,700</td>
<td>-€ 90,500</td>
<td>-€ 81,300</td>
<td>-€ 375,400</td>
<td></td>
</tr>
<tr>
<td>-€ 122,130</td>
<td>-€ 81,450</td>
<td>-€ 73,170</td>
<td>-€ 337,860</td>
<td></td>
</tr>
</tbody>
</table>

(...)

## Cost-benefit analysis: outputs
Feedback welcome!

Option generation tools:  https://more.traffwebdev.uk

Option appraisal tool:  Request from p.anciaes@ucl.ac.uk

Project website:  https://www.roadspace.eu
(from 2022, will also include tools)