

# THE USE OF AHP AND PROMETHEE TO EVALUATE SUSTAINABLE URBAN MOBILITY SCENARIOS BY ACTIVE STAKEHOLDER PARTICIPATION: THE CASE STUDY OF LEUVEN

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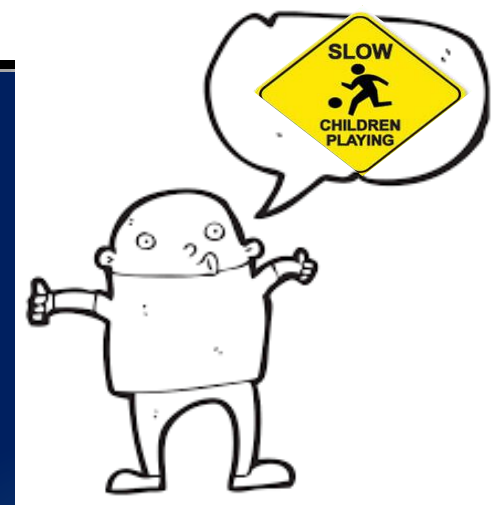
# Who is in charge of planning?



# The new “players”



# Diverse objectives of stakeholders



# NISTO project



- ▶ New integrated smart transport options
- ▶ Development of an evaluation framework and toolkit
- ▶ More information: [www.nisto-project.eu](http://www.nisto-project.eu)

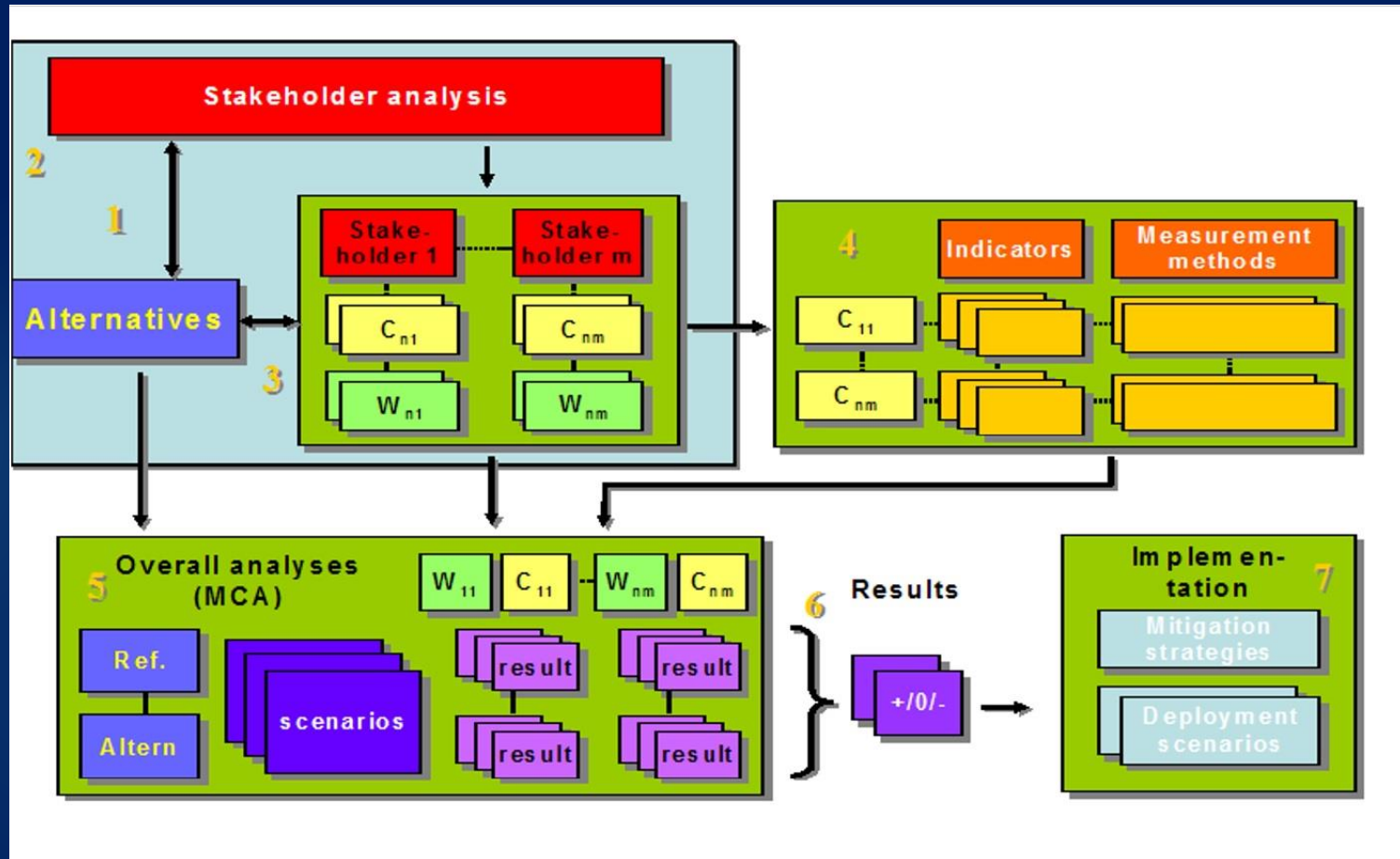


# Research questions



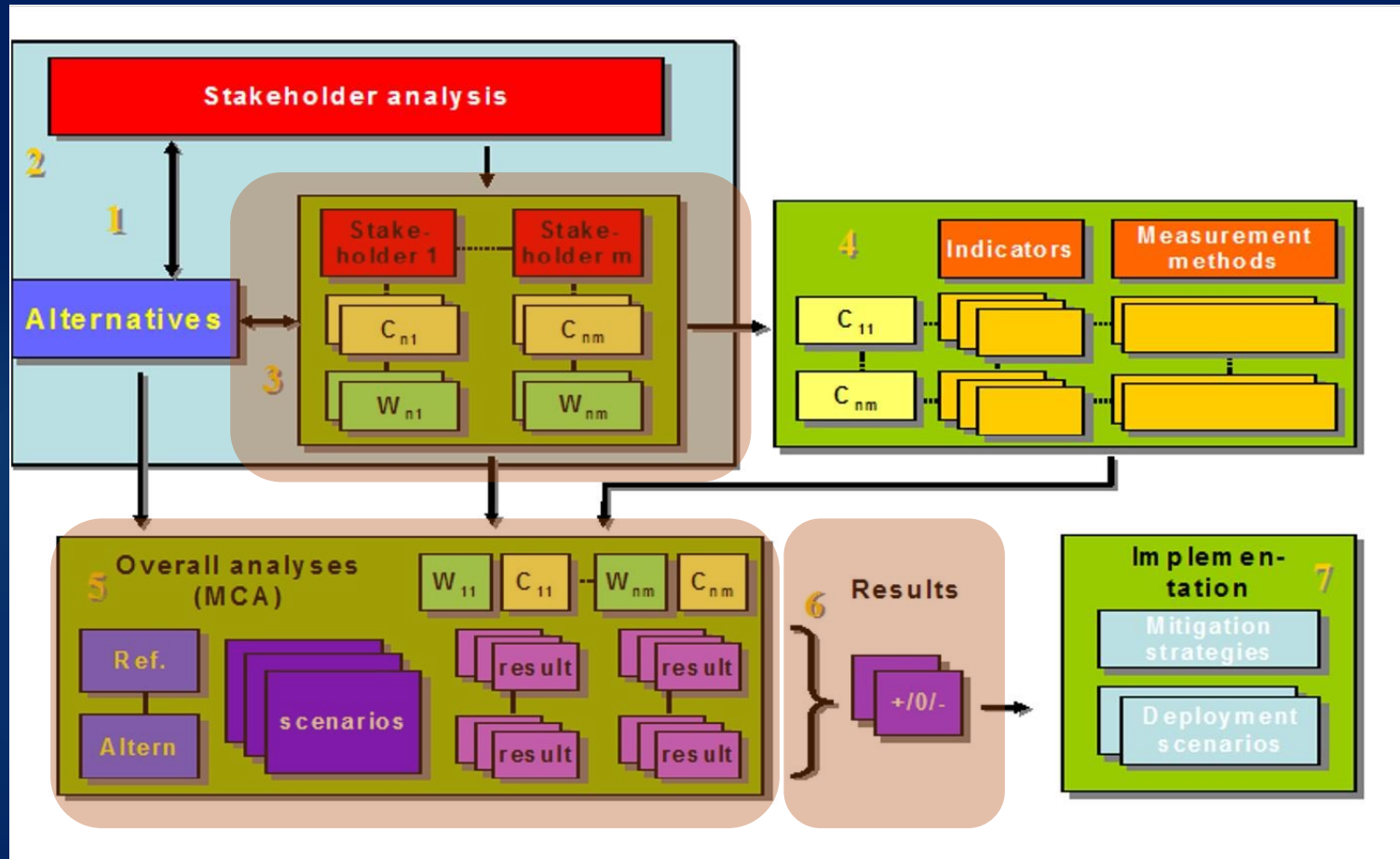
- ▶ Is the multi-actor multi-criteria analysis (MAMCA) a suitable tool for decision making for sustainable urban mobility?
- ▶ How can electronic GDSS make MAMCA more resource efficient while involving a high number of stakeholders?

# Methodology: multi-actor multi-criteria analysis



(Macharis et al., 2004)

# Methodology: Computer support for MAMCA



(Macharis et al., 2004)



# Methodology: AHP and PROMETHEE



# Methodology: AHP and PROMETHEE

## Weight elicitation – AHP

- ▶ Easy to use
- ▶ It can decompose a complex problem into its constituents
- ▶ Widely used for weight elicitation

## Evaluation - PROMETHEE

- ▶ Avoids trade-offs between scores
- ▶ Simplifies the evaluation procedure

# Case study: MAMCA GDSS workshop

- ▶ Leuven, 30<sup>th</sup> January 2014
- ▶ 40 participants
- ▶ 7 stakeholder groups
- ▶ 14 subgroups
- ▶ Software: D-Sight Web

# Problem



# Alternatives

Business as usual



Car-free city centre



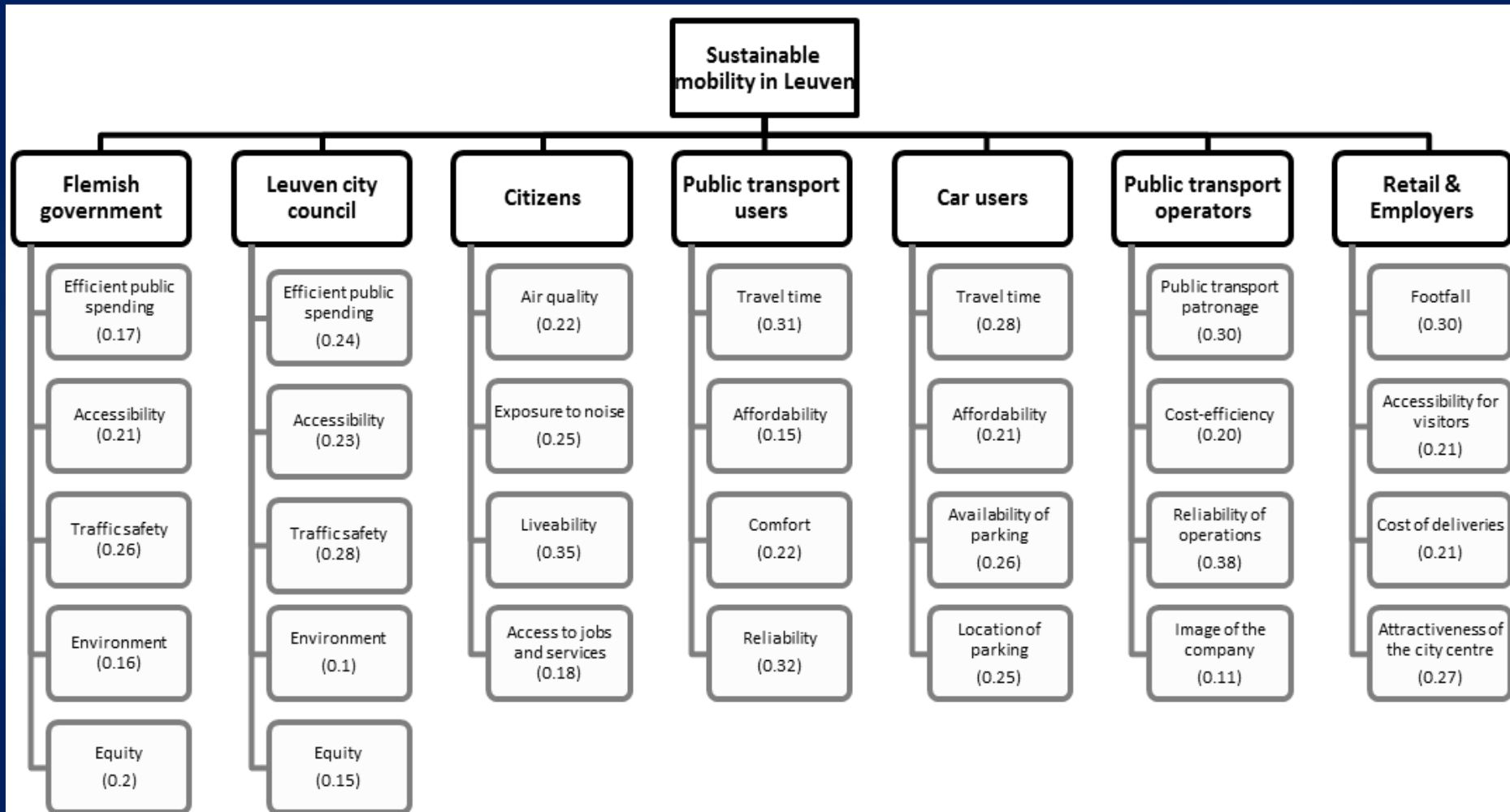
Park and Walk



Smart road user charging



# Stakeholder criteria and weights



# Weight elicitation: AHP

**Weights Elicitation** ✕

**Step 1 / 1: Root Category**

Travel time	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Travel cost
Travel time	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Availability of parking in the city centre
Travel time	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Location of parkings
Travel cost	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Availability of parking in the city centre

Next

Source: D-Sight Web

# Evaluation of alternatives: PROMETHEE

**D-SIGHT.WEB**

1. Alternatives 2. Criteria 3. Users 4. Weights 5. Parameters 6. Evaluations 7. Analysis 8. Report

## Evaluate Alternatives 0

	Imago van het bedrijf	OV cliënteel	Kostenefficiëntie	Betrouwbaarheid van dienstverlening
Slimme kilometerheffing	Positief ▼	Erg posit ▼	Neutraal ▼	Positief ▼
Park & Ride	Positief ▼	Positief ▼	Negatief ▼	Positief ▼
Verkeersvrije binnenstad	Negatief ▼	Negatief ▼	Neutraal ▼	Negatief ▼
Business as usual	Negatief ▼	Negatief ▼	Negatief ▼	Negatief ▼ Erg negatief Negatief Neutraal Positief Erg positief

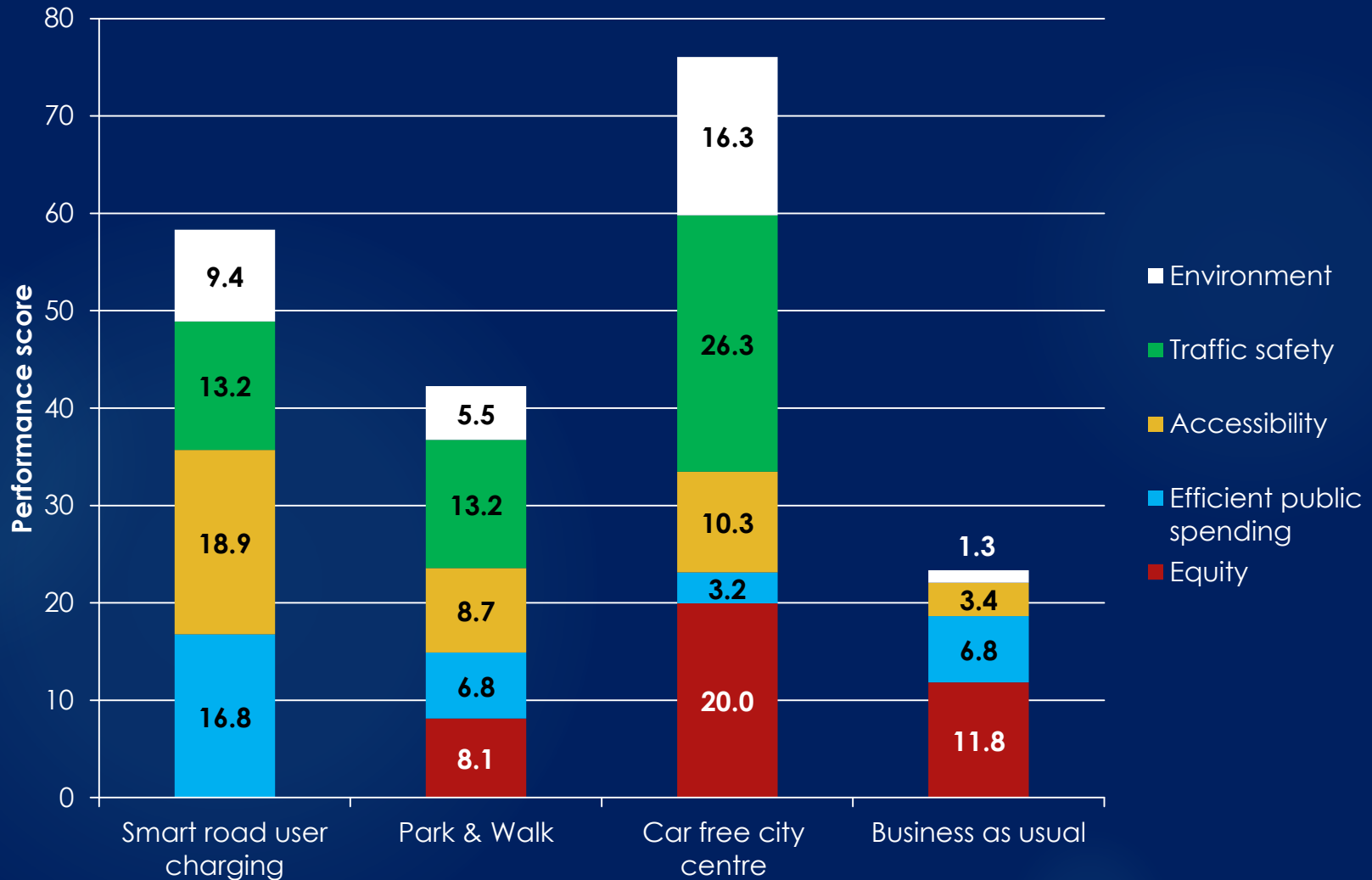
Save Import from Excel Show related help



# Results: multi-actor view



# Results: Criteria contribution (Flemish government)



(Source: adapted from D-Sight Web)

# Conclusions 1

- ▶ MAMCA provides a **structured way** to appraise the preferences of stakeholders for urban mobility
- ▶ The interactive evaluation with the combination of AHP and PROMETHEE was **well received** by the participants
- ▶ The combination of a workshop setting and the online software can help to improve **understanding** and **conflict resolution**
- ▶ The EGDSS assisted MAMCA is more **resource efficient**

# Conclusions 2

- ▶ The real-time analysis of **multiple decision trees** requires computer support
- ▶ The **software** was **not ideally suited** for the MAMCA workshop (only single value trees are supported)
- ▶ **Further research**: software based on the specific requirements of MAMCA

# Thank you for your attention!

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