Sustainable Urban Mobility Plans (SUMP)
Workshop – Analyse mobility situation

What is a demand analysis in the context of a SUMP ?

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Joint Assistance to Support Projects in European Regions

Content

1. Demand assessment in a SUMP
2. Basic elements of demand analysis
3. Understanding the current and future drivers of transport
4. Qualitative and quantitative understanding of mobility demand + issues
5. Conclusions

1. Demand Assessment in SUMP

Why is a complex demand assessment so important in a SUMP ?

- Demand for movement is what makes mobility !
- Need to <u>understand the current and future drivers and patterns of demand</u> for mobility
  - *and their positive and negative impacts on the city in relation to development goals….*
- Need to <u>provide for and shape demand in a sustainable and effective way</u> which supports the development goals

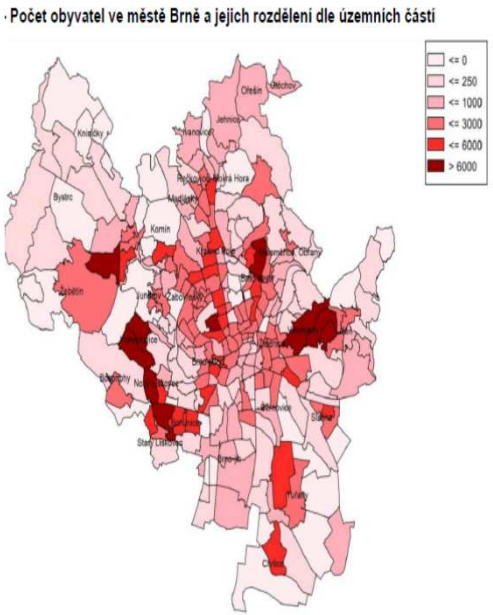
Functional / problem / potential analysis

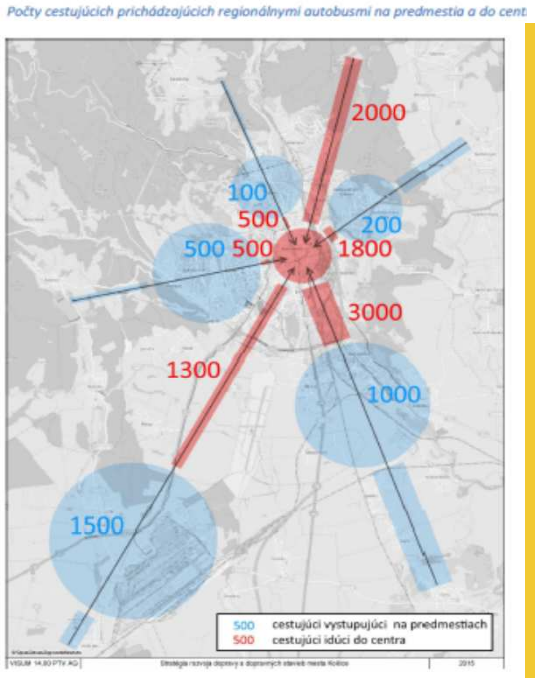
Development and appraisal of measures and scenarios

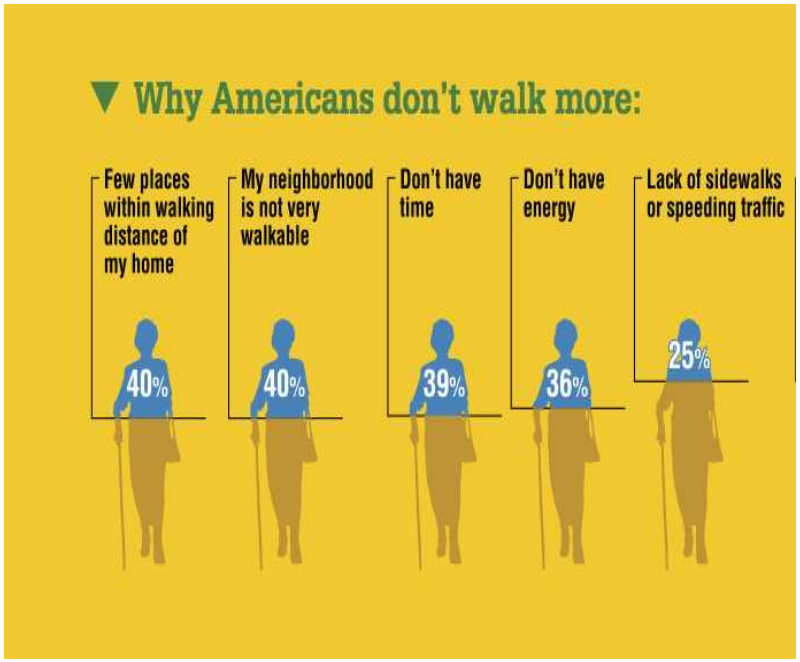
2. Basic elements of SUMP demand analysis

Key elements :

- Understanding of the current and future drivers of transport
- From the perspective of sustainable development goals together :
  - Qualitative and quantitative understanding of mobility demand issues
- Related to other layers of analysis (e.g. time/physical accessibility)







3. Current and future drivers of mobility

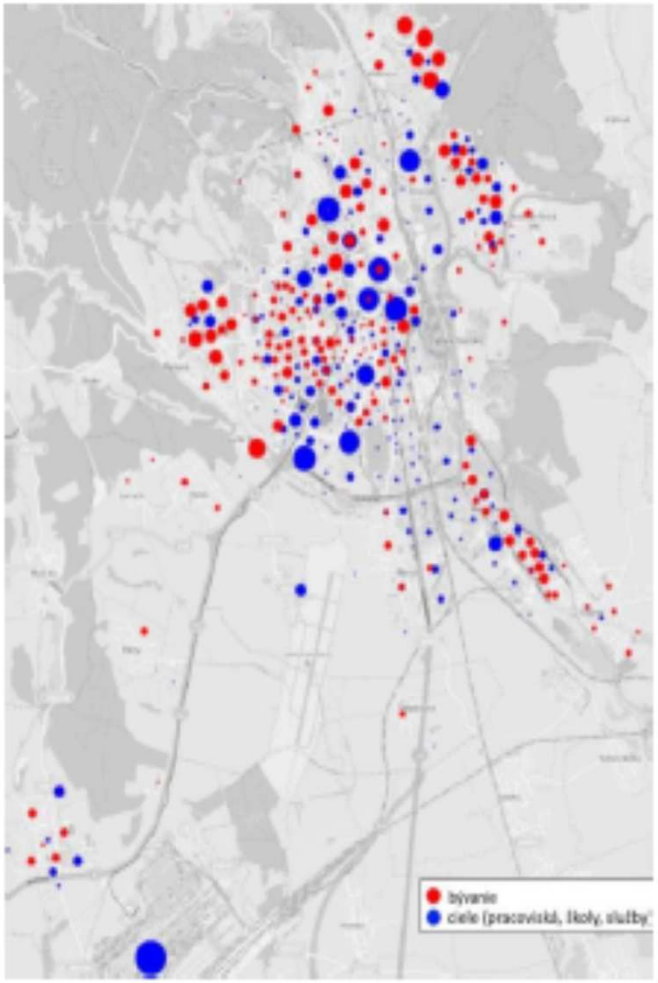
Current state + historic trends (quantify)

- Demographic basis of drivers of mobility (origins, destinations and types of traveller)
  - Homes, companies, education places, shopping, leisure, health, public offices, connection points to external networks etc.
  - Pupils, students, working, unemployed, pensioners, business/leisure visitors etc.
- Spatial mapping and tabular statistics for functional region

Future potential change expected related to

- BAU (business as usual) demographic change / economic growth expected - *can be threats*
- BAU land-use planning - *can be threats*
- Opportunities to influence land-use planning
- Likely behavior change - e.g. tele-working
- Relationship between drivers and demand

Množstvo obyvateľov a pracujúcich ľudí vrátene služieb



4. Qualitative and quantitative understanding of mobility demand + issues

Expert assessment of likely issues related to demand in context of sustainable transport goals (Initial SWOT ?)

Guides the analysis and questions to be asked in evidence based assessment

Quantitative analysis (current and future BAU)

- High level indicators of sustainable demand
- Variation per mode (hourly/weekly, seasonal)
- Origin-destination movements
- Trip purpose
- Traffic volumes / section of network (per mode)
- Main point bottlenecks on network, congestion
- Parking (car, bike etc.)

Qualitative analysis of mobility with users

- What supports / blocks use of certain modes and more other aspects of sustainable mobility behavior ?
- Mobility system related drivers of home/work location choices / frequency of travel.
- Etc.

Overall assessment of demand patterns and related issues

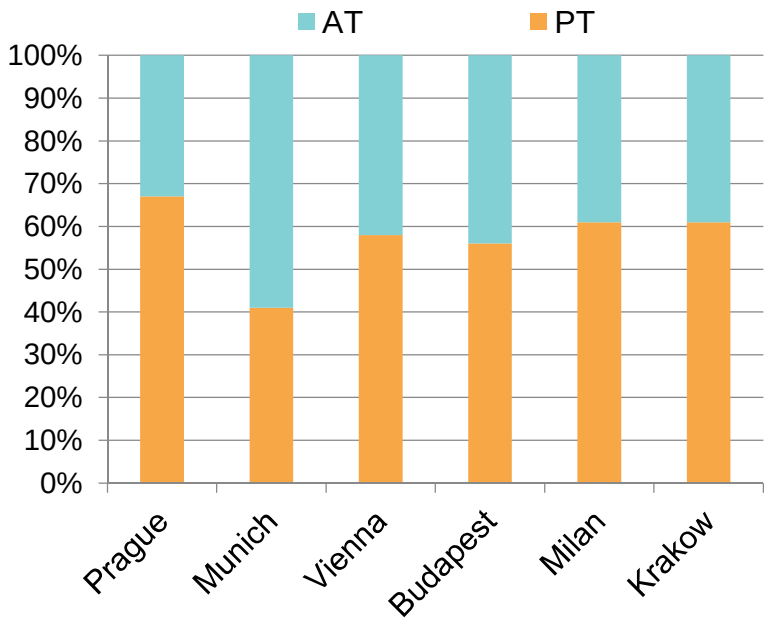
Other analysis such as emissions, noise

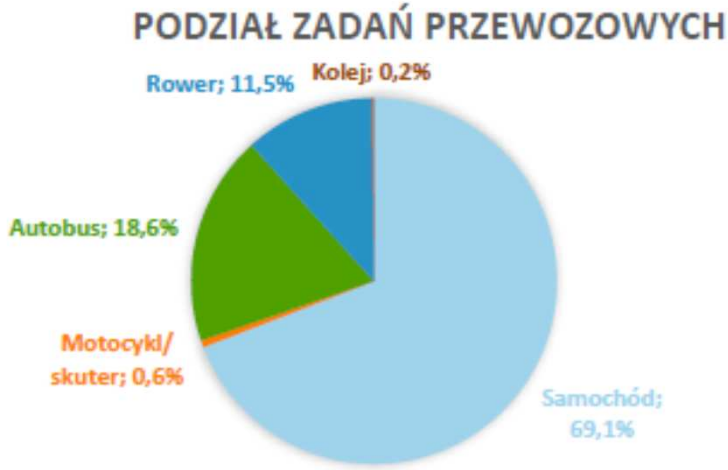
Other analysis such as travel time, stop accessibility, service quality, sensitive areas

Quantitative analysis (current + future BAU)

High level indicators of sust. demand

- Mode share
  - all relevant modes including walking, own cycling, bike sharing, electric bike/scooter, own car, motorbike, car sharing, taxi, public transport, combined modes etc.
  - No. of trips (passengers) and performance (pass. km) – give different understanding
- Average trip length (average + per mode)
- Daily number of trips per person
- Benchmark the results against indicators for similar towns in Poland and abroad ?
- Care with definitions !
- If available also historic performance
- <u>How to drill down to the underlying causes of good/poor performance, potentials for improvement ?</u>

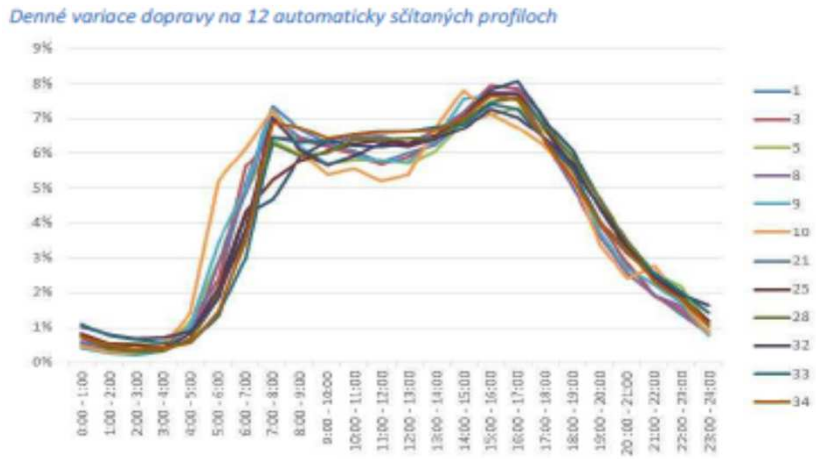


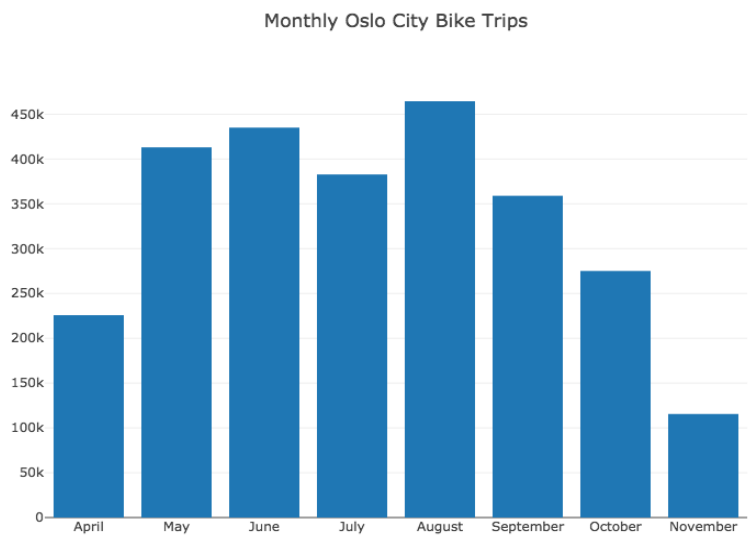


Quantitative analysis (current + future BAU)

Variations in demand

- Hourly/daily variation by mode indicates peak needs for capacity
  - morning peak can be very sharp (school + work arrival)
  - Friday afternoons might be extreme
  - input to planning for variation
- Seasonal variation can indicate
  - special needs or weakness of certain modes (e.g. cycling)
  - differing levels of „competition" between sustainable modes
  - special requirements at certain locations (e.g. trade fairs), temporary solutions required ?

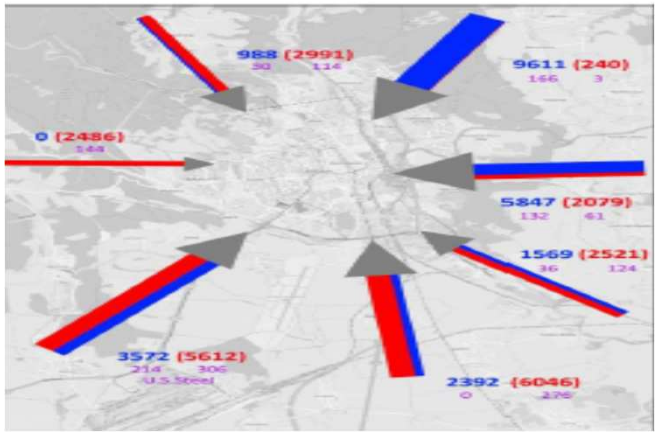




Quantitative analysis (current + future BAU)

Origin-destination movements

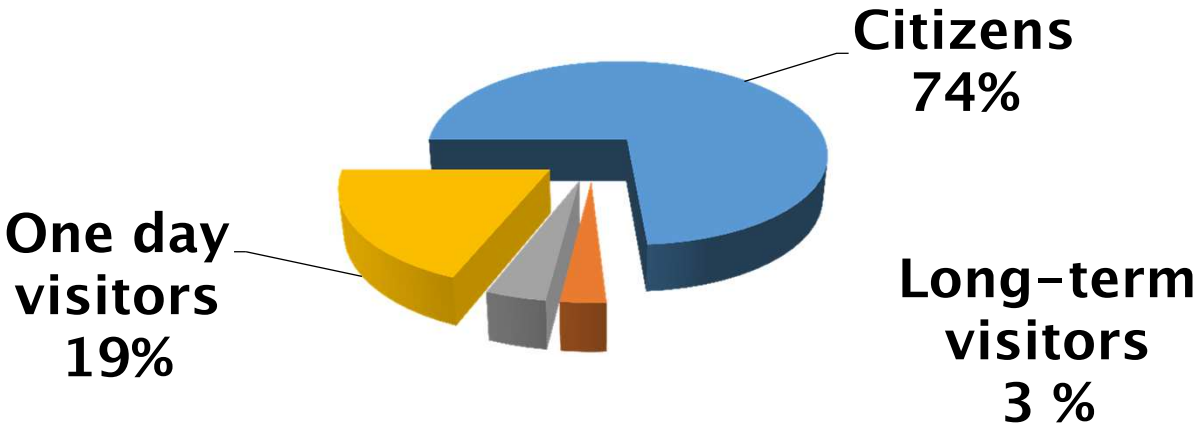
- <u>Basic patterns and functionality</u>
  - Main relations between spatial zones (per mode)
  - Transit, external, internal
  - Radial, tangential, transversal and polycentric…
  - Passenger and freight
  - Spatial maps and more detailed tables
- <u>O-D information is used to</u>
  - Understand directional sources of mobility needs/problems
  - Understand key mode-shift potentials
  - Help propose effective mobility solutions including backbone of public transport, transit relief, pedestrian routes….



Quantitative analysis (current + future BAU)

Trip purpose

- Basic motivations/person types for travel
  - Work, school, shopping, recreation, external visitors / residents etc.
  - In what proportions and when during the day, in what directions etc.
- Information is used to
  - Understand underlying causes of mobility issues
  - Understand key mode-shift potentials
  - Help propose effective mobility measures – e.g. work and school travel plans, tourist friendly information

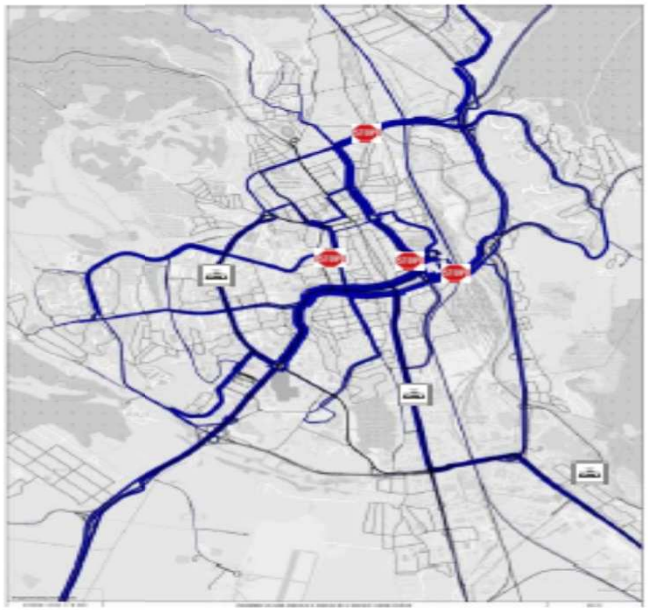


Quantitative analysis (current + future BAU)

Traffic volumes / section of network

- <u>Basic line and junction utilisation</u>
  - Indicates main flows and important junctions/points/areas per mode
  - Can picture full flows or types of flows (e.g. transit)
  - Map and tabular presentation

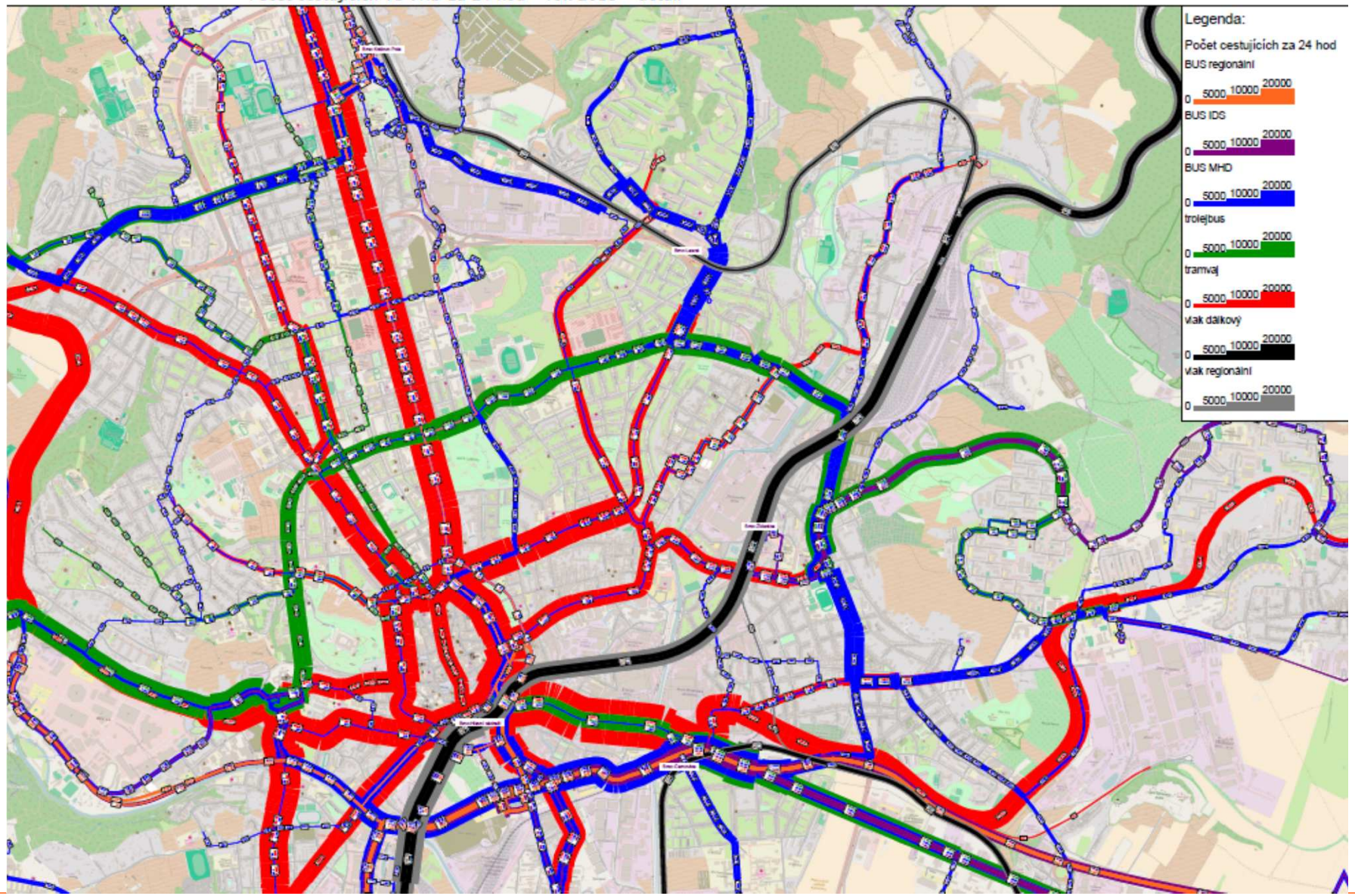
- <u>Section/junction volume info. used to spatially</u>
  - Assess negative impacts of mobility
  - Indicate main potentials for mode shift
  - Assess bottlenecks/capacity issues
  - Plan service levels



Quantitative analysis (current + future BAU)

Traffic volumes - PT

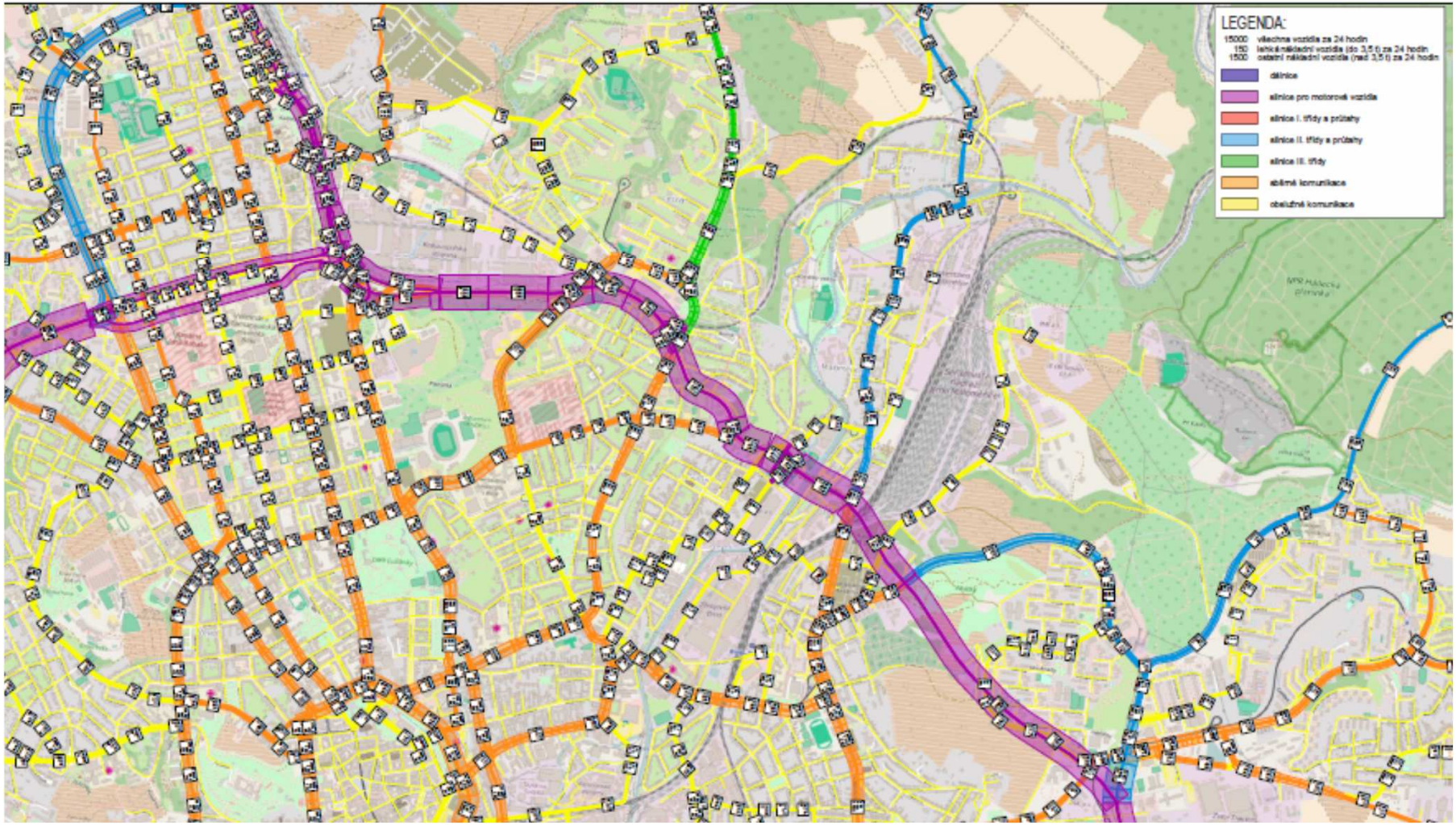
Počet cestujících ve VHD za 24 hod – rok 2015 – detail



Quantitative analysis (current + future BAU)

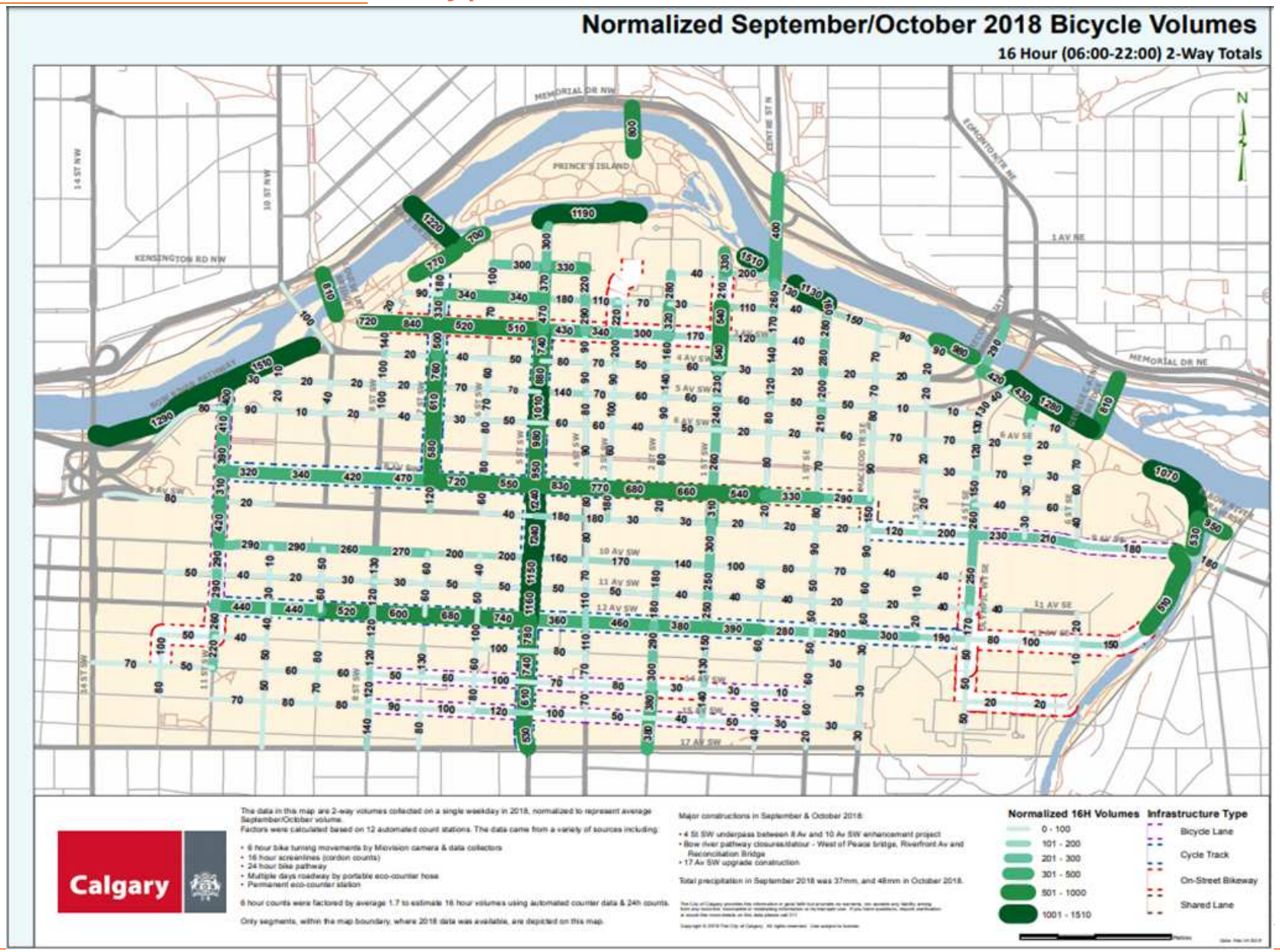
Traffic volumes - car

Počet vozidel IAD za 24 hod – rok 2050 – varianta bez projektu – detail



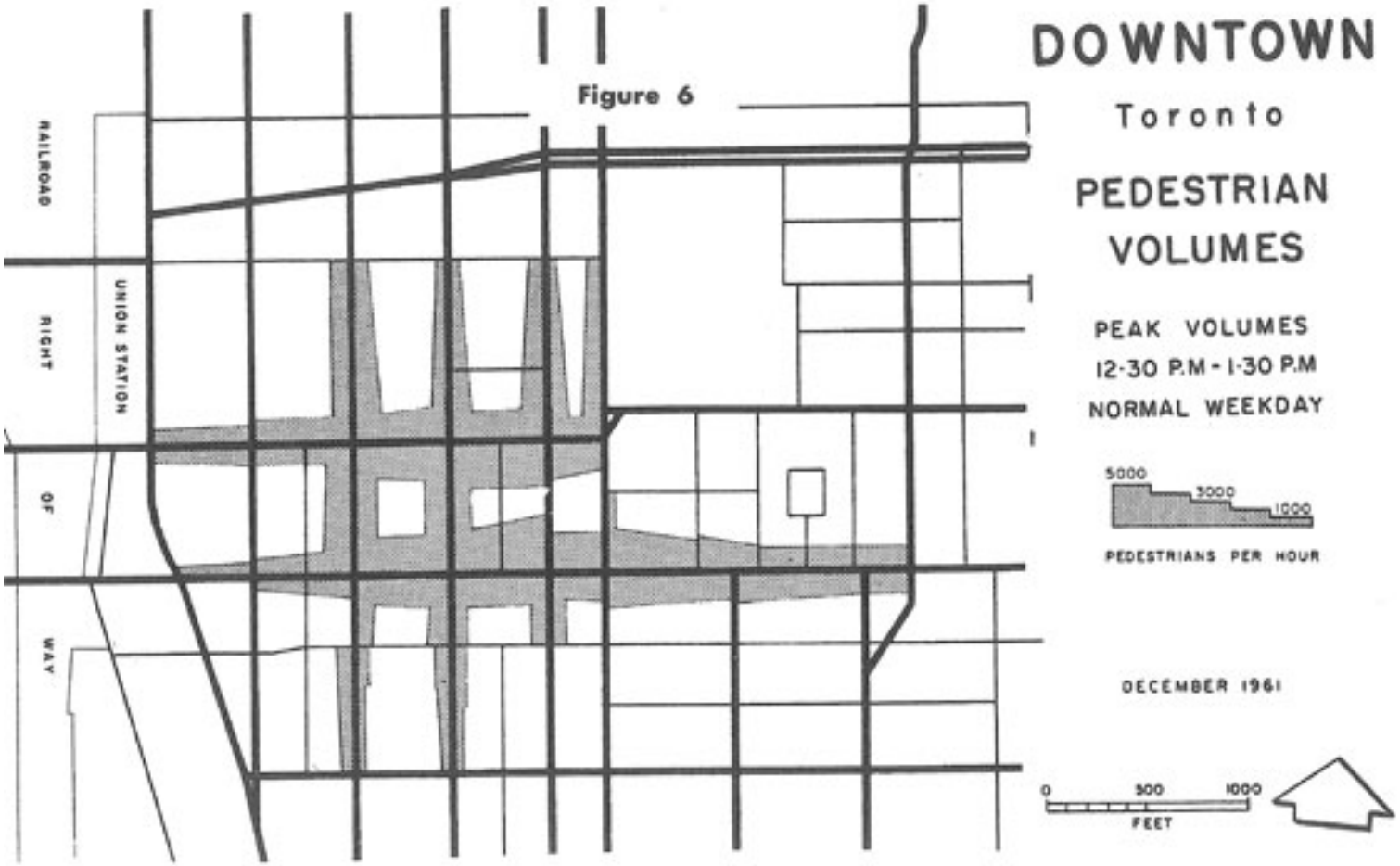
Quantitative analysis (current + future BAU)

Traffic volumes on different types of bike lane



Quantitative analysis (current + future BAU)

Traffic Volumes - walking



Quantitative analysis (current + future BAU)

Bottlenecks on network, congestion

- Requires multi-modal assessment of
  - Traffic volumes information (peak time)
  - Transport capacity (junction/lane capacity, PT vehicle capacity/timetable)
  - Travel times and reliability of travel time useful
- Used for
  - Identification of priority lines, points and areas which need (sustainable) capacity relief
  - Assessment of congestion impacts on environment
  - Input to sustainable solutions of problems (supply provision / demand management)

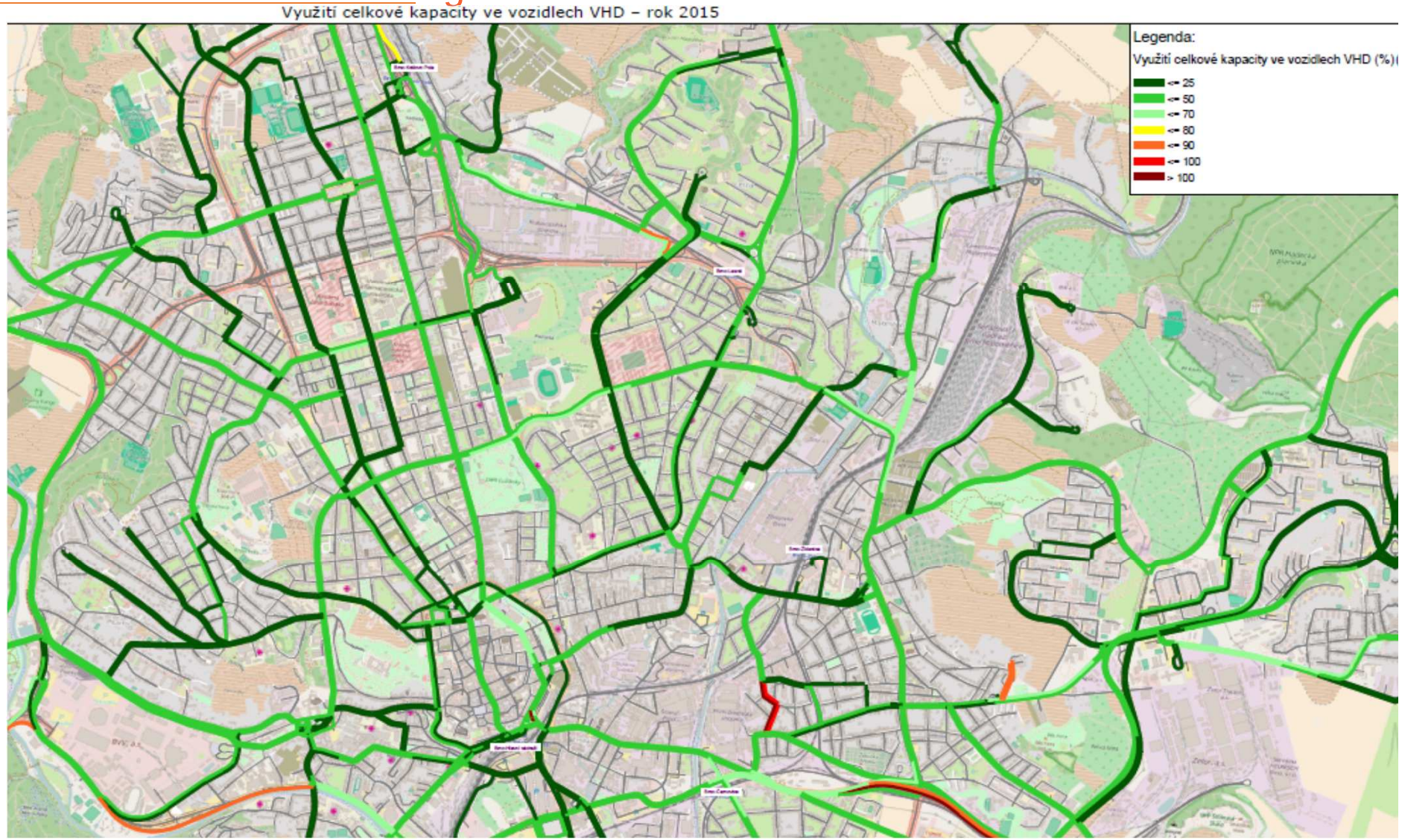
Quantitative analysis (current + future BAU)

Bottlenecks – Overcrowded PT lines, car congestion

Linka	Nejzatíženější úsek	Cestující/ 24 hod	Cestující/ šp. hod	Počet spojů/ šp. hod	Cestující/ 1 spoj	Kapacita 1 spoje	Využití kapacity
TRAMVAJE							
1	Hrnčířská - Pionýrská	45 180	3 041	16	190	180	106%
2	Celní - Hluboká	25 260	1 700	12	142	180	79%
3	Tábor - Rybkova	17 200	1 158	9	129	180	71%
4	Körnerova - Malinovského nám.	12 270	826	12	69	135	51%
4	Proškovo nám. - Maloměřický most	6 010	404	6	67	135	50%
5	Dětská nem. - Nám. 28. října	21 030	1 415	14	101	135	75%
5A	Poliklinika Lesná - Lesná, nádraží	3 730	251	7	36	135	27%
5B	Hel. Malířové - Lesná, nádraží	9 660	650	7	93	135	69%
6	Nem. U sv. Anny - Šilingrovo nám.	17 740	1 194	15	80	170	47%

Quantitative analysis (current + future BAU)

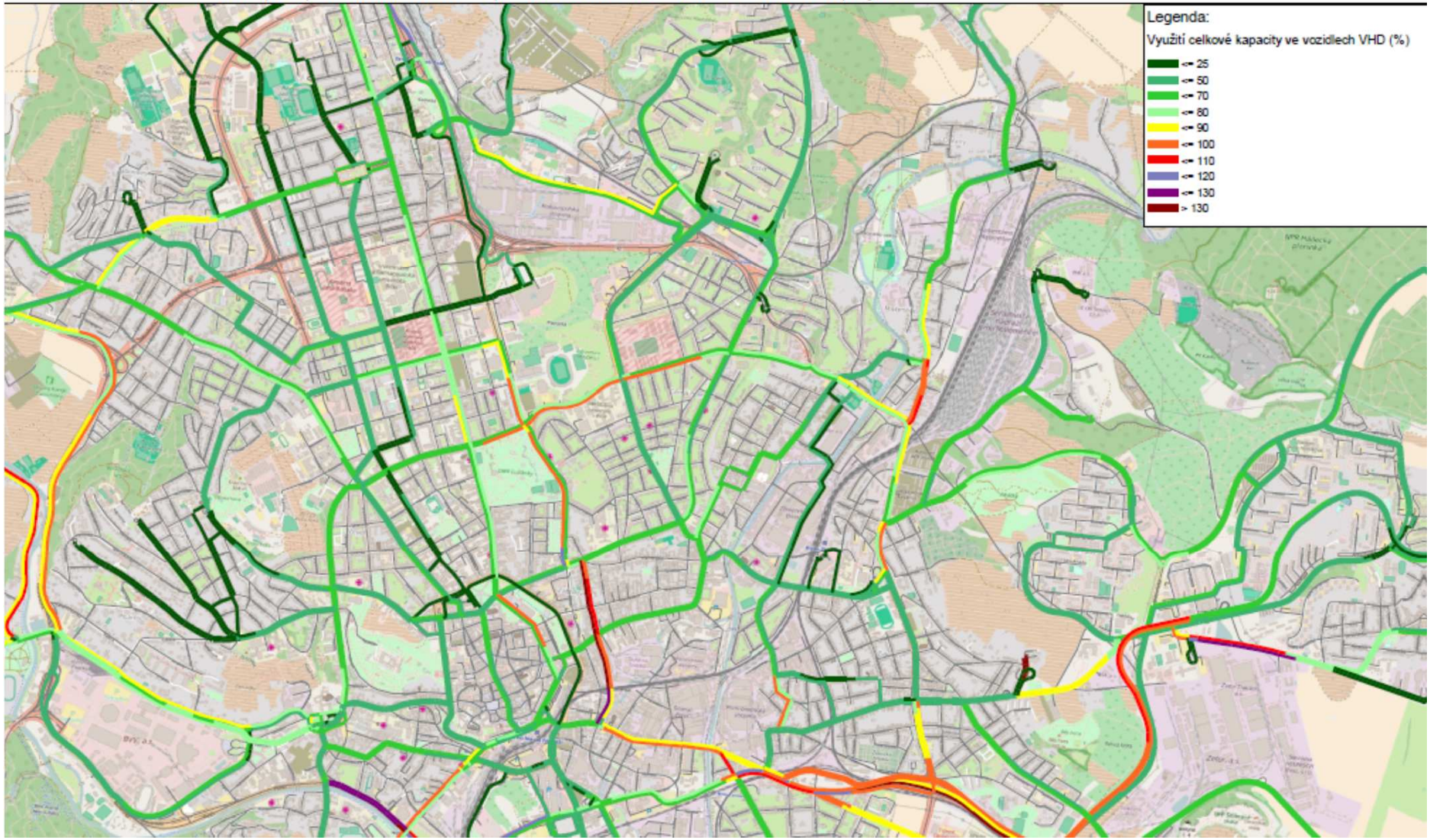
Bottlenecks – PT crowding now



Quantitative analysis (current + future BAU)

Bottlenecks – PT crowding future if we do nothing

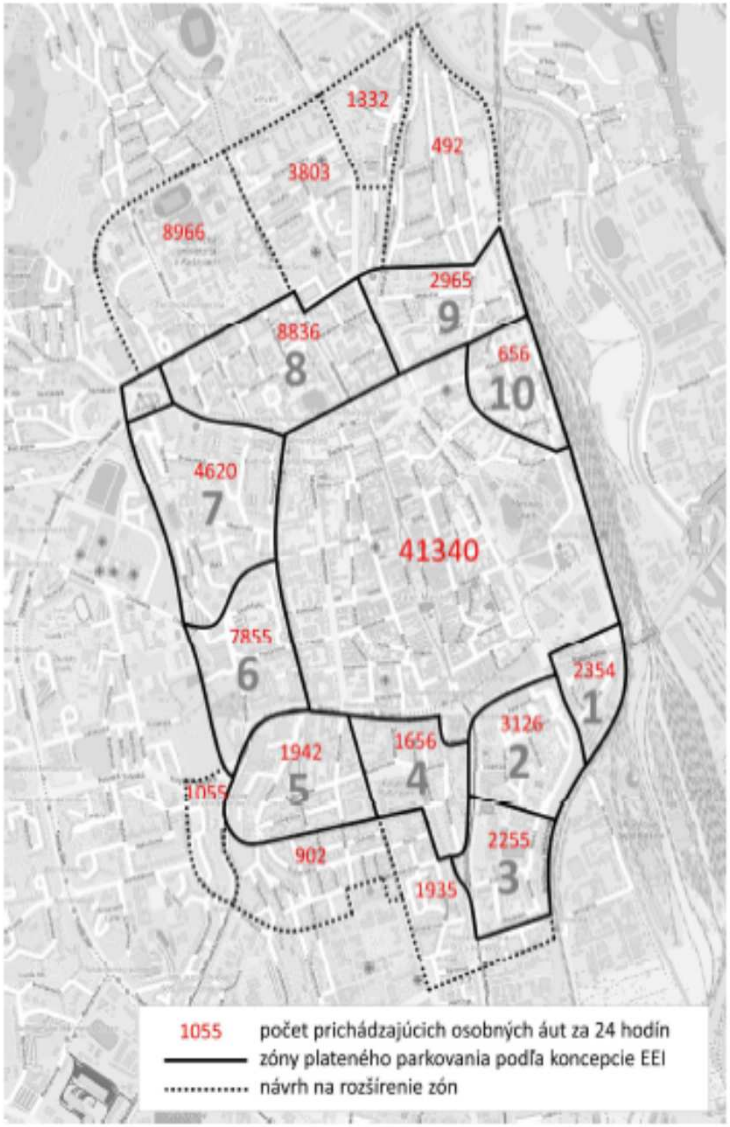
Využití celkové kapacity ve vozidlech VHD – špičková hodina – rok 2050 – varianta bez projektu



Quantitative analysis (current + future BAU)

Parking (car, bike etc.)

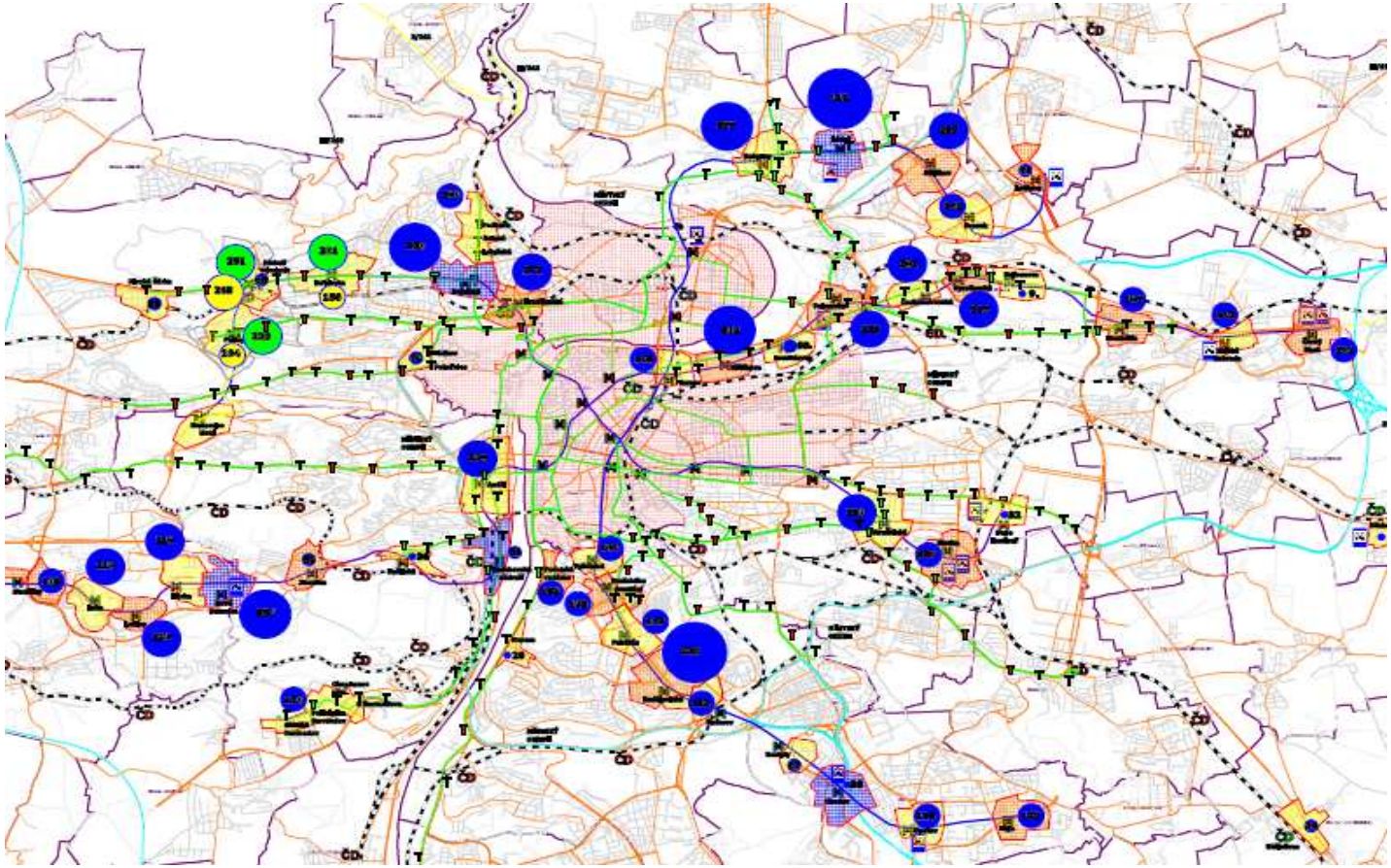
- Background
  - Parking is a major driver and inhibitor of mobility demand
  - Car parking takes up a huge amount of urban space
- Key aspects of parking analysis
  - Numbers of spaces (public and private) and urban space taken by parking
  - Occupation and turnover of parking spaces per hour and day per city area
- Used as basis for
  - Identifying parking related causes of mobility problems
  - Proposal of car parking schemes to free space and reduce car trip demand
  - Improving bike parking



Quantitative analysis (current + future BAU)

Unregulated Parking

In Prague between 2011 and 2016, a survey of unregulated non-residential parking was made, hinting at the need for 8000-12,000 regulated parking spaces in the public road network including P+R



Qualitative analysis of mobility with users

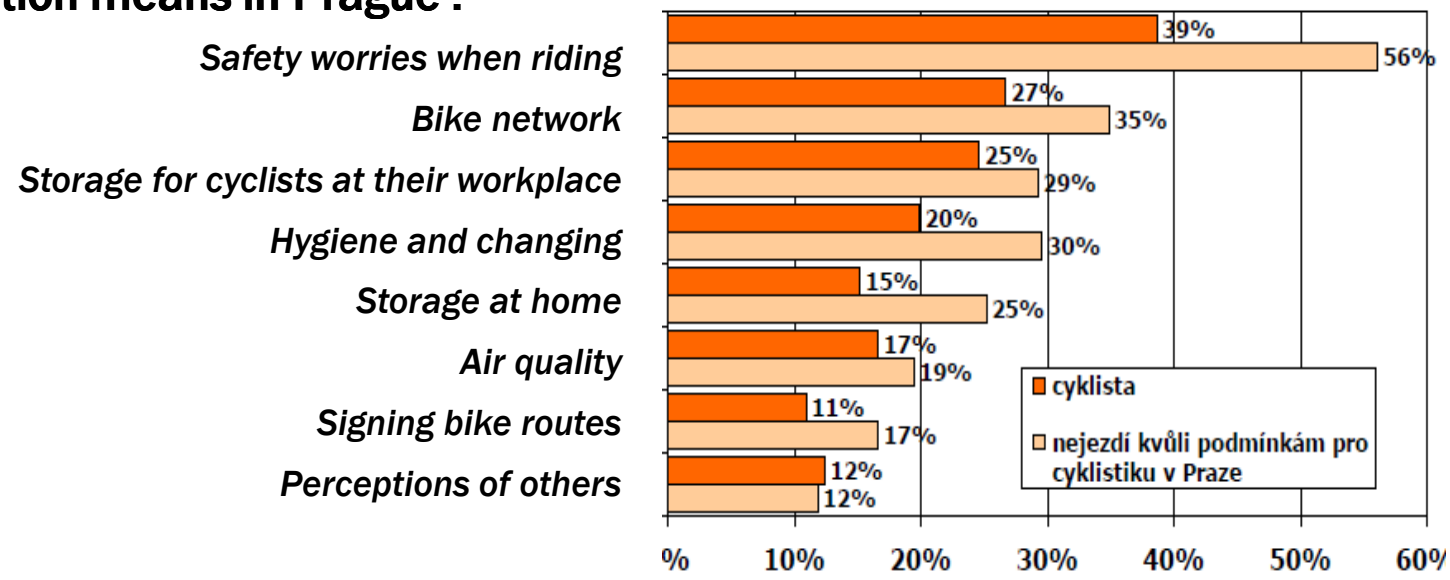
Enablers/Barriers to more sustainable transport behavior ?

- Key aspects
  - Many qualitative factors important for use of car, public transport, biking and walking
  - Not just mode choice, could also be related to trip length
  - Not just a question of cost and travel time as you find in models
  - General and specific issues, closed (and open) questions

- Used as basis for
  - Getting to the causes of behaviour !!
  - Understanding qualitative barriers to and enablers of sustainable behaviour
  - Proposing and prioritising effective sets of measures to improve sustainable behaviour

Qualitative analysis of mobility with users

Why people do not use their bicycles (more) as a transportation means in Prague :



5. Conclusions

Expert assessment of likely issues related to demand in context of sustainable transport goals (Initial SWOT ?)

Guides the analysis and questions to be asked in evidence based assessment

Quantitative analysis (current and future BAU)

- Understand starting points, strengths, weaknesses and future potentials/threats for sustainable transport
- Mode-share, trip length, key directions of transport, motivations for transport, problematic points, areas and corridors
- Start high level and drill-down to the details
- Hard numbers through rigorous data collection and thorough analysis - not debatable

Qualitative analysis of mobility with users

- Barriers and enablers to sustainable behaviour
- Better understand the key problems and their causes
- Better understand what sort solutions might be effective

Overall assessment of demand patterns and related issues

Other analysis such as emissions, noise

Other analysis such as travel time, stop accessibility, service quality, sensitive areas

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