

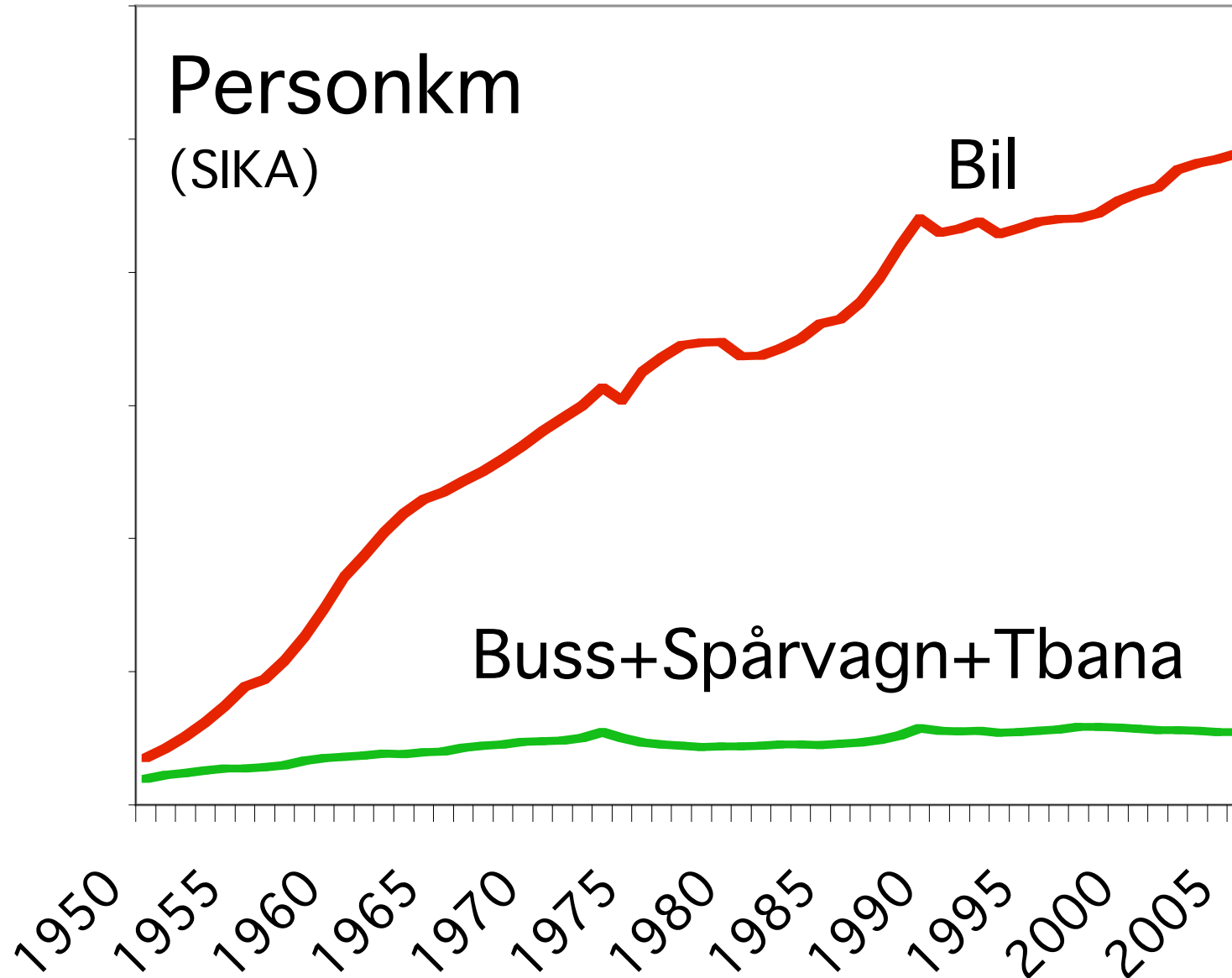
PRT for Södertälje

planning and design feasibility

LogistikCentrum
and WSP

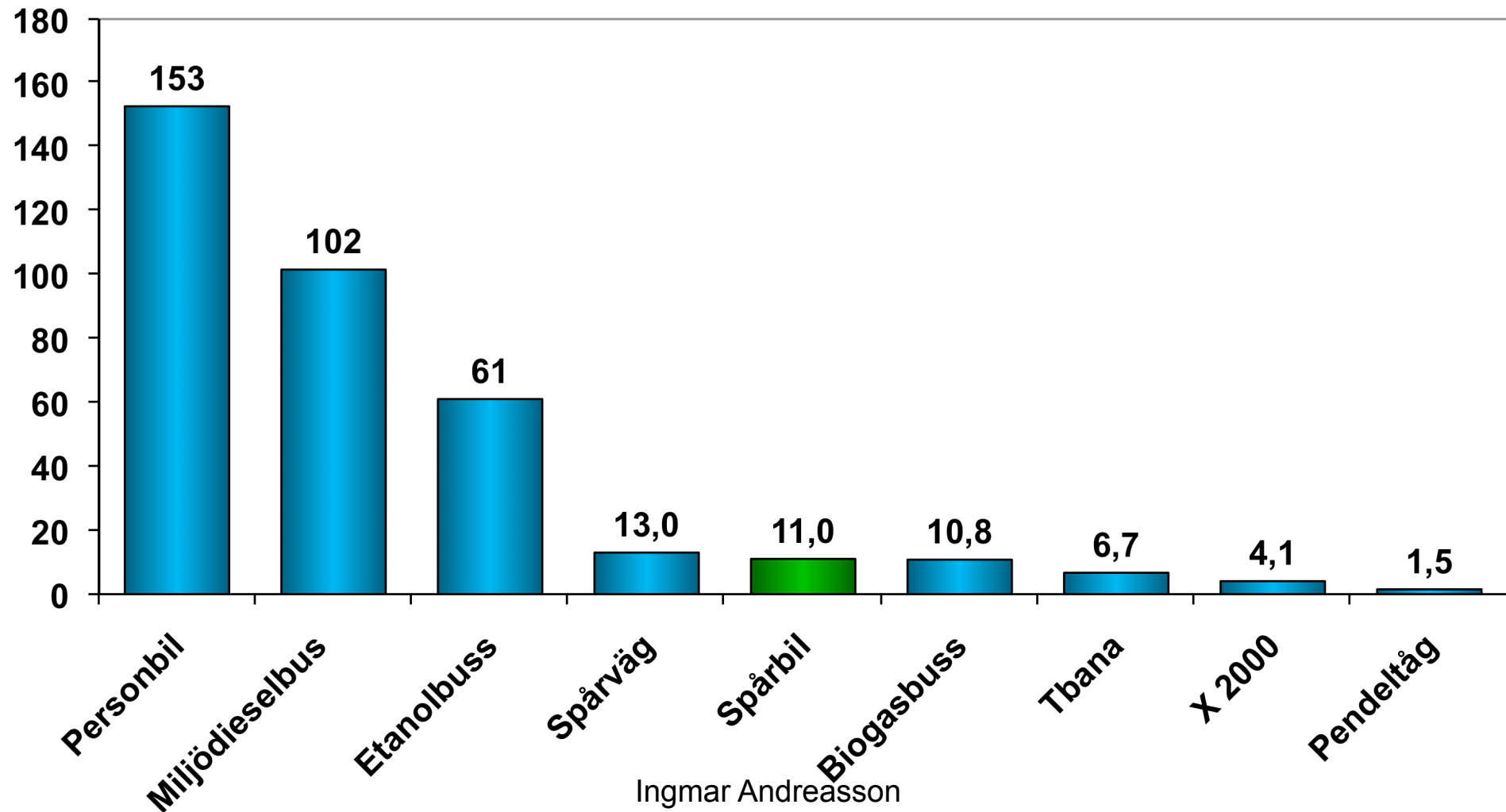
Prof. Ingmar Andreasson

Public transport is not competitive



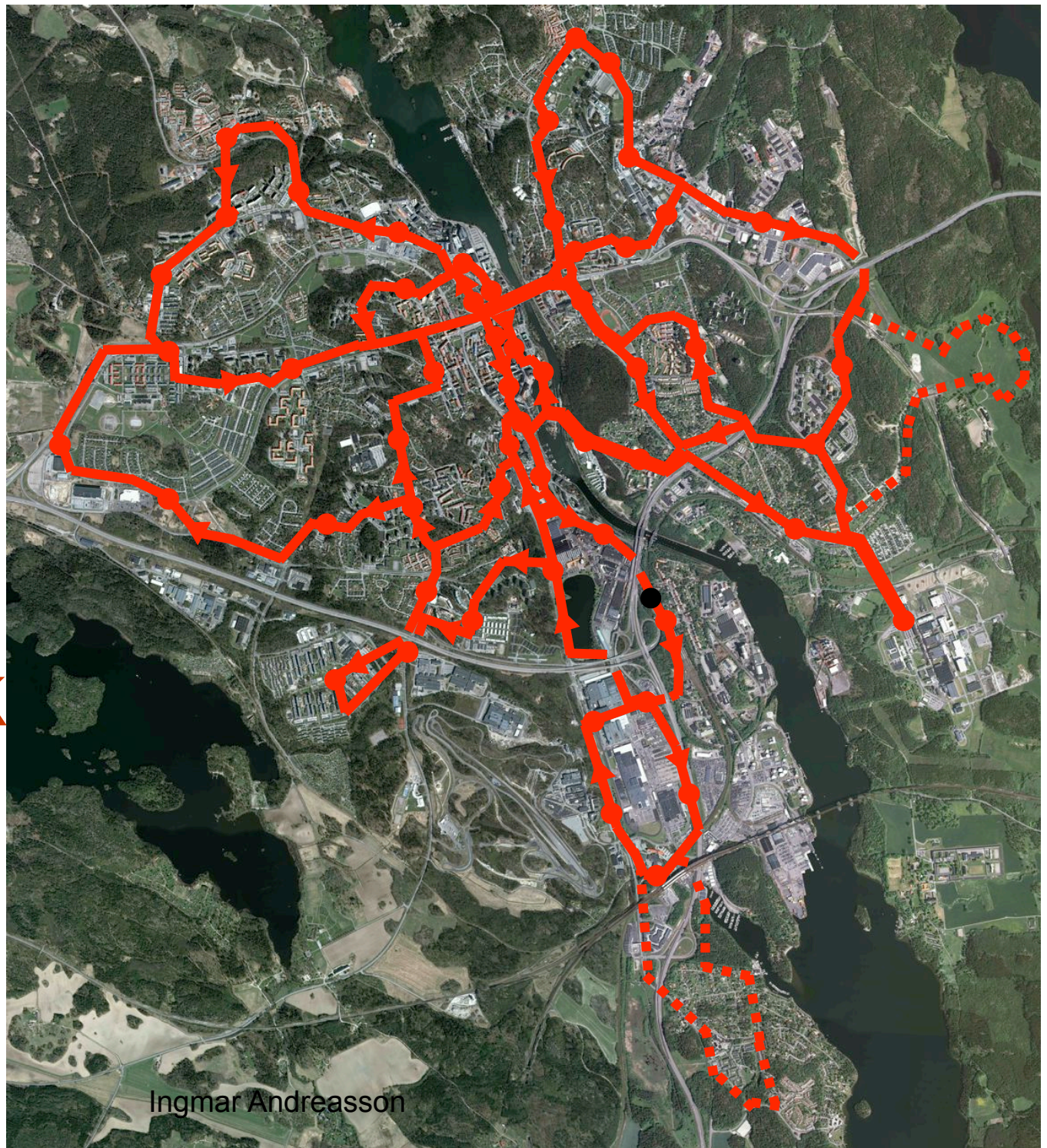
CO₂ emissions incl load factors

gram per personkm

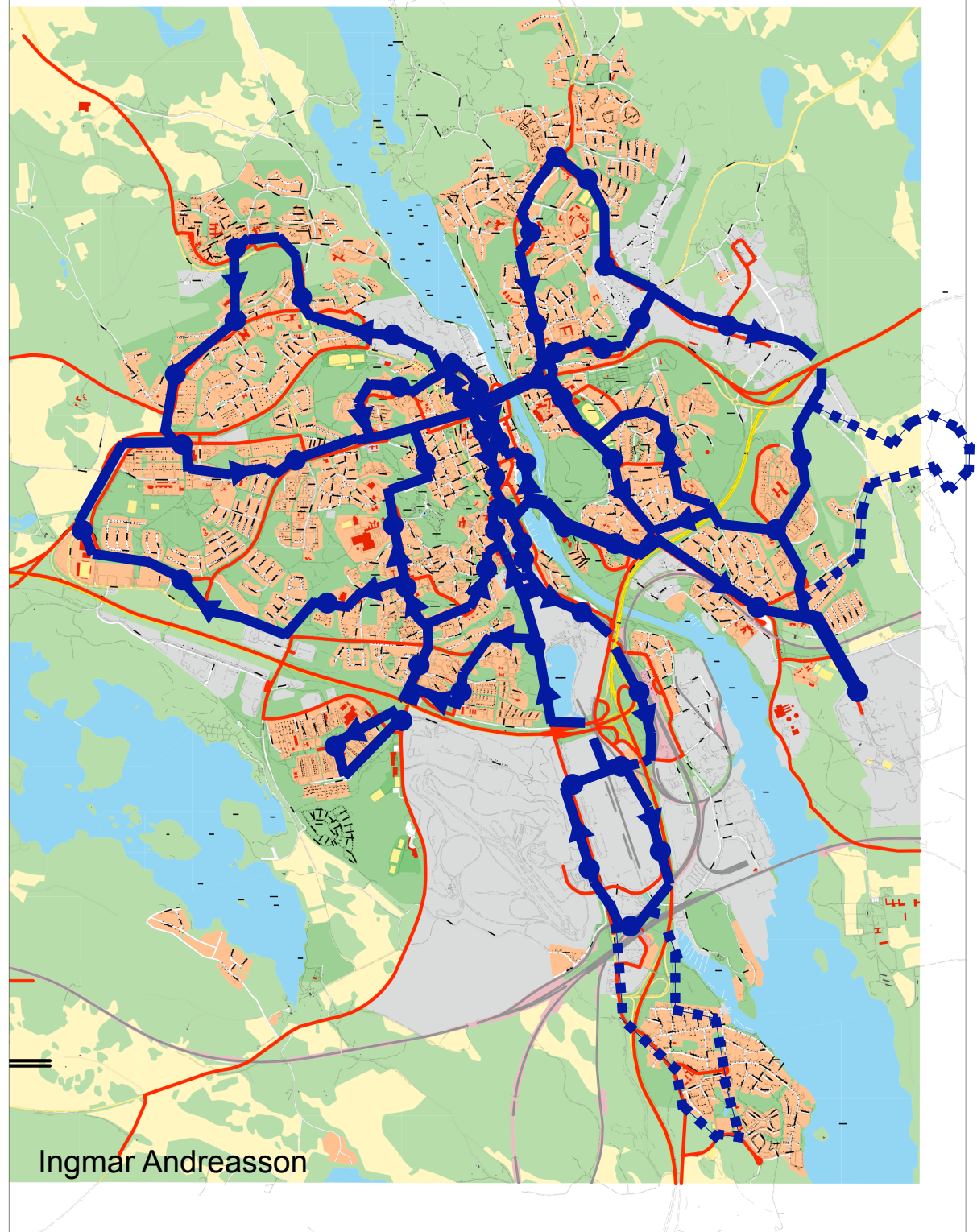


PRT
network
Södertälje
2030

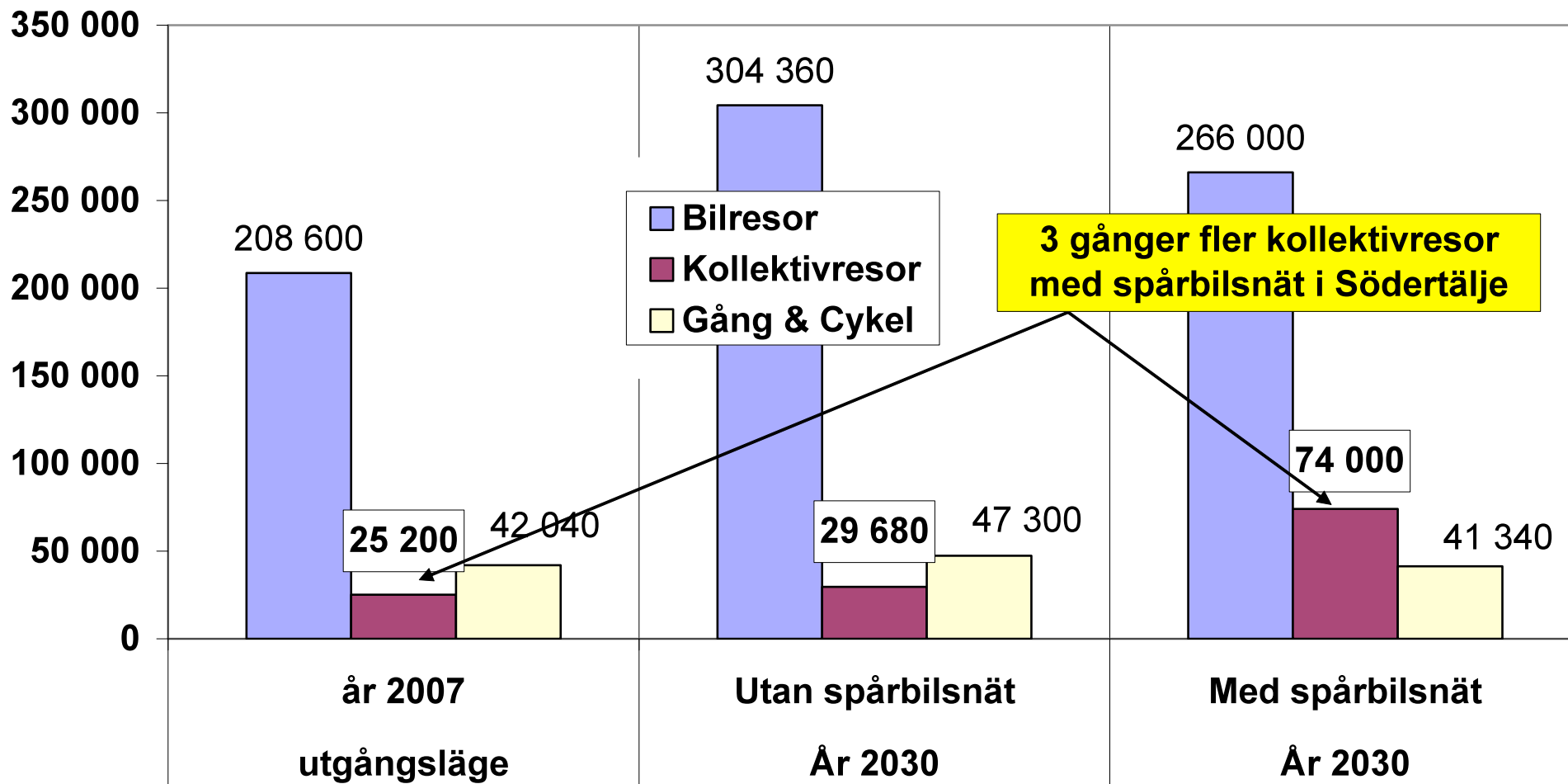
43 km track
55 stations
650 vehs



PRT
vs present
Bus routes



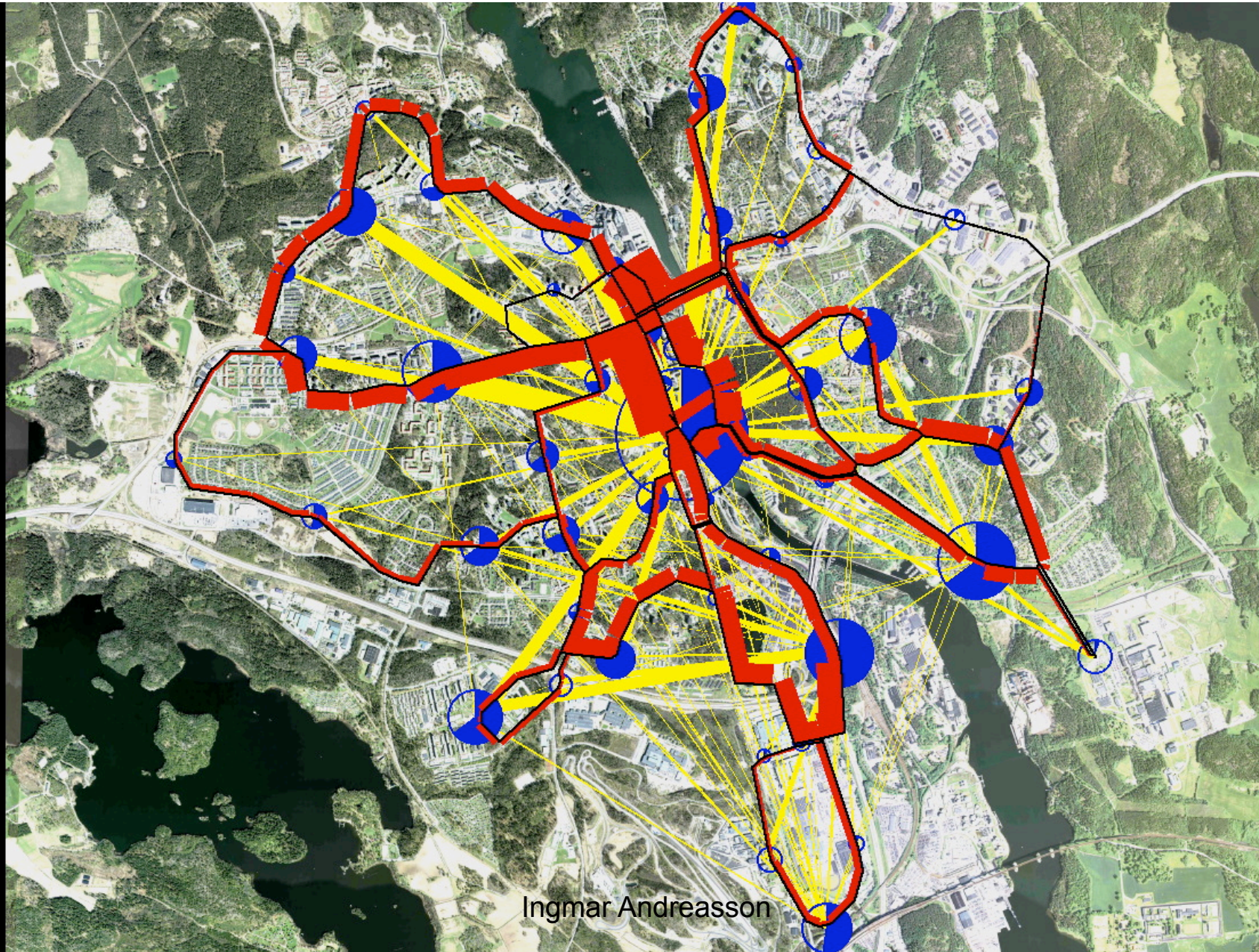
Färdmedelsfördelning i utgångsläget, resp. år 2030 utan och med spårbilsnät hela tätorten



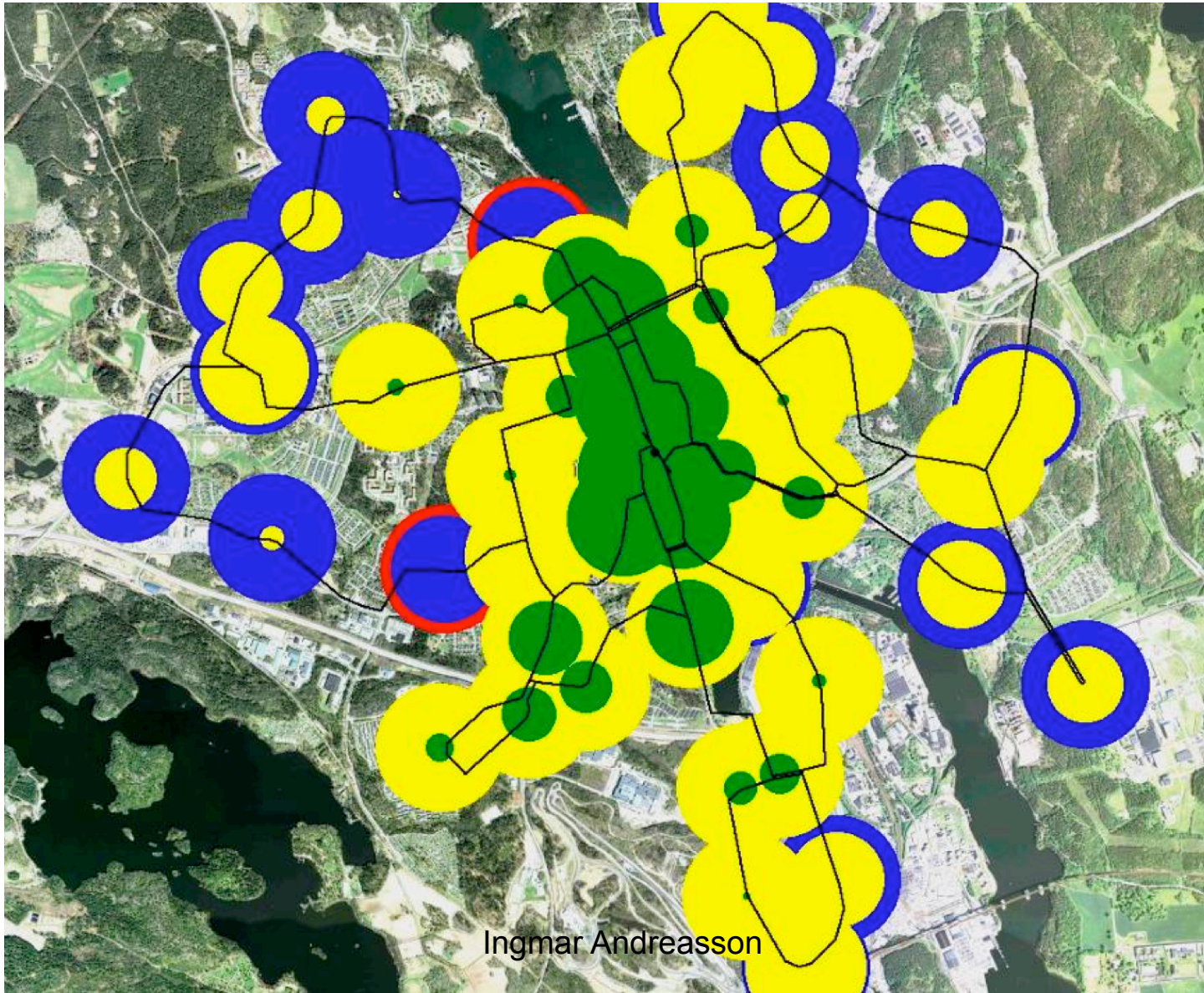
PRT vs Bus

- Reduced waiting 7,5 -> 1 min
- Half ride-time (40 km/h)
- 2.5 x more passengers
- Cost 35-50 % of county average per trip

Demand 2030 Orig/Dest Travel flow

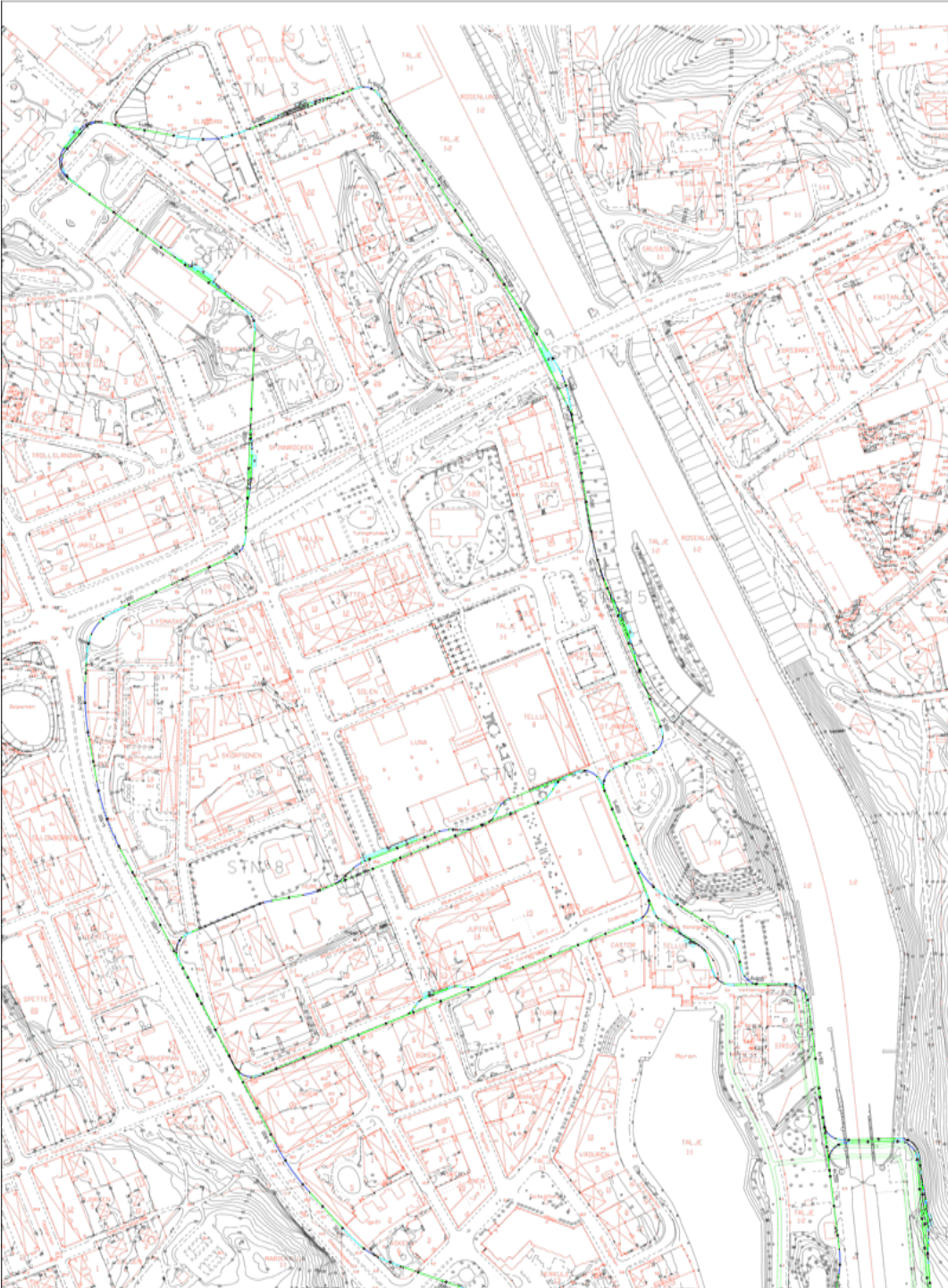


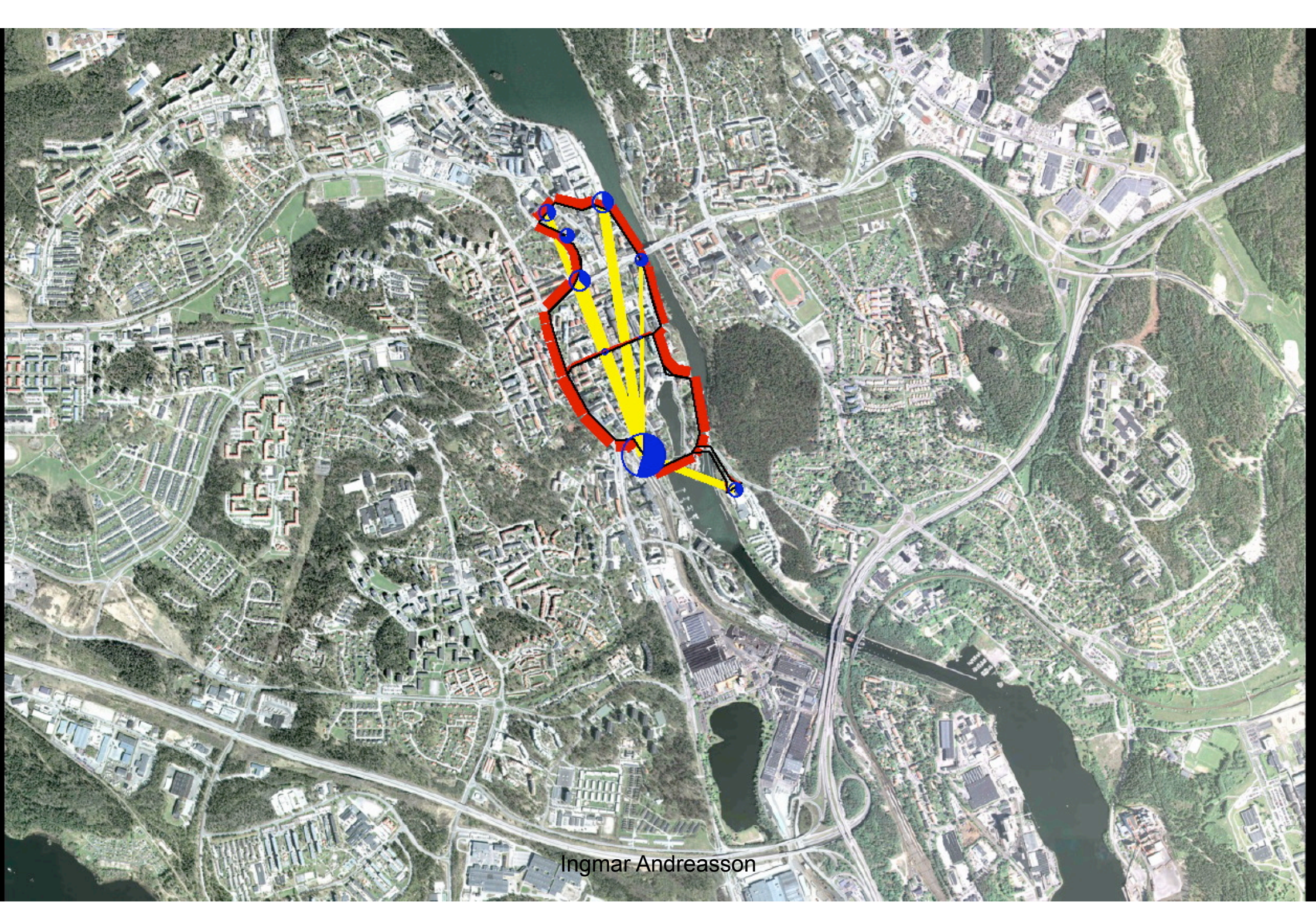
Accessibility 5-10-15 mins



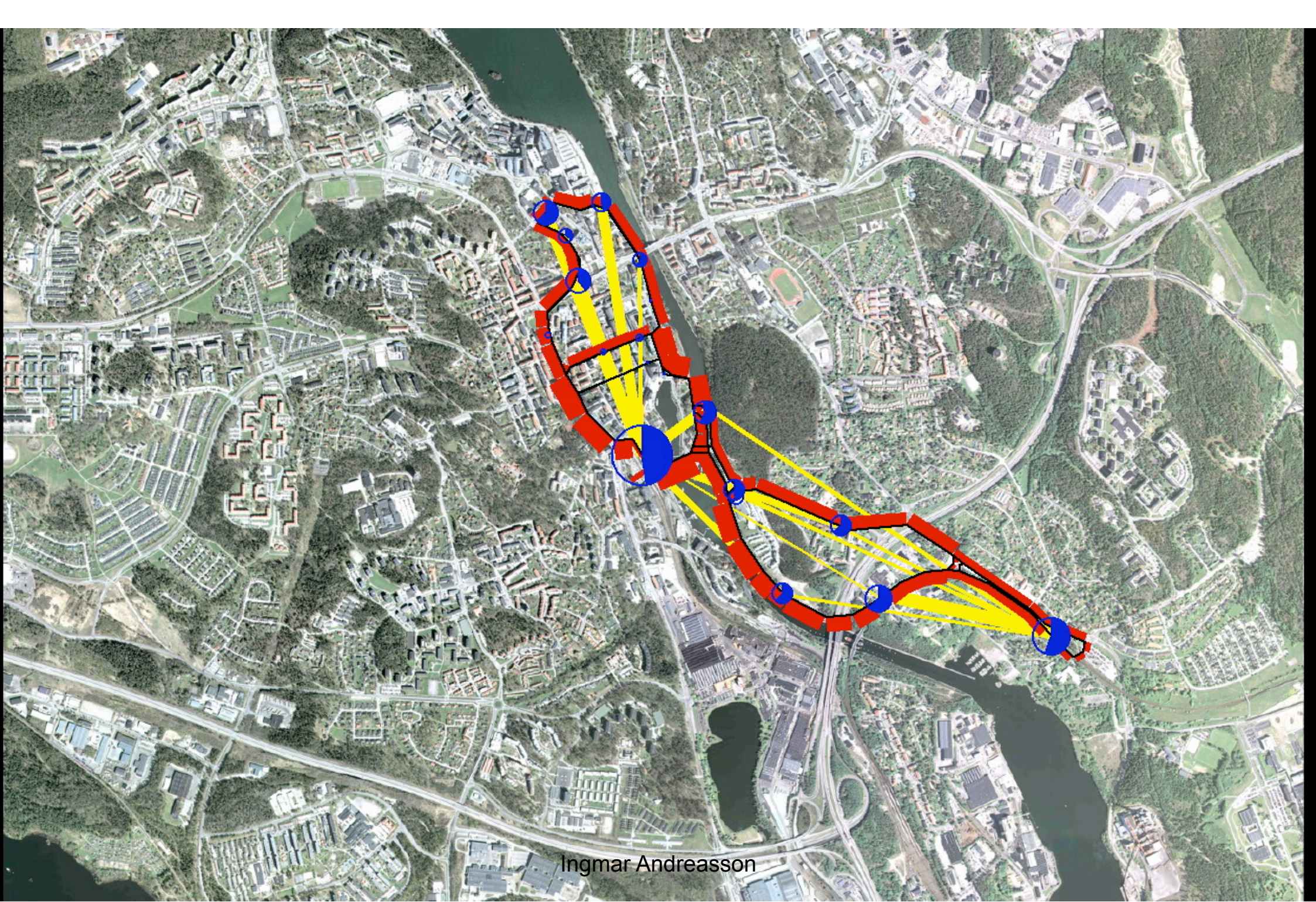
Design feasibility, initial phases

- Östertälje – Centrum – Astra
- Transfer with commuter train
- Integration in cityscape and buildings
- Feasibility and cost estimates

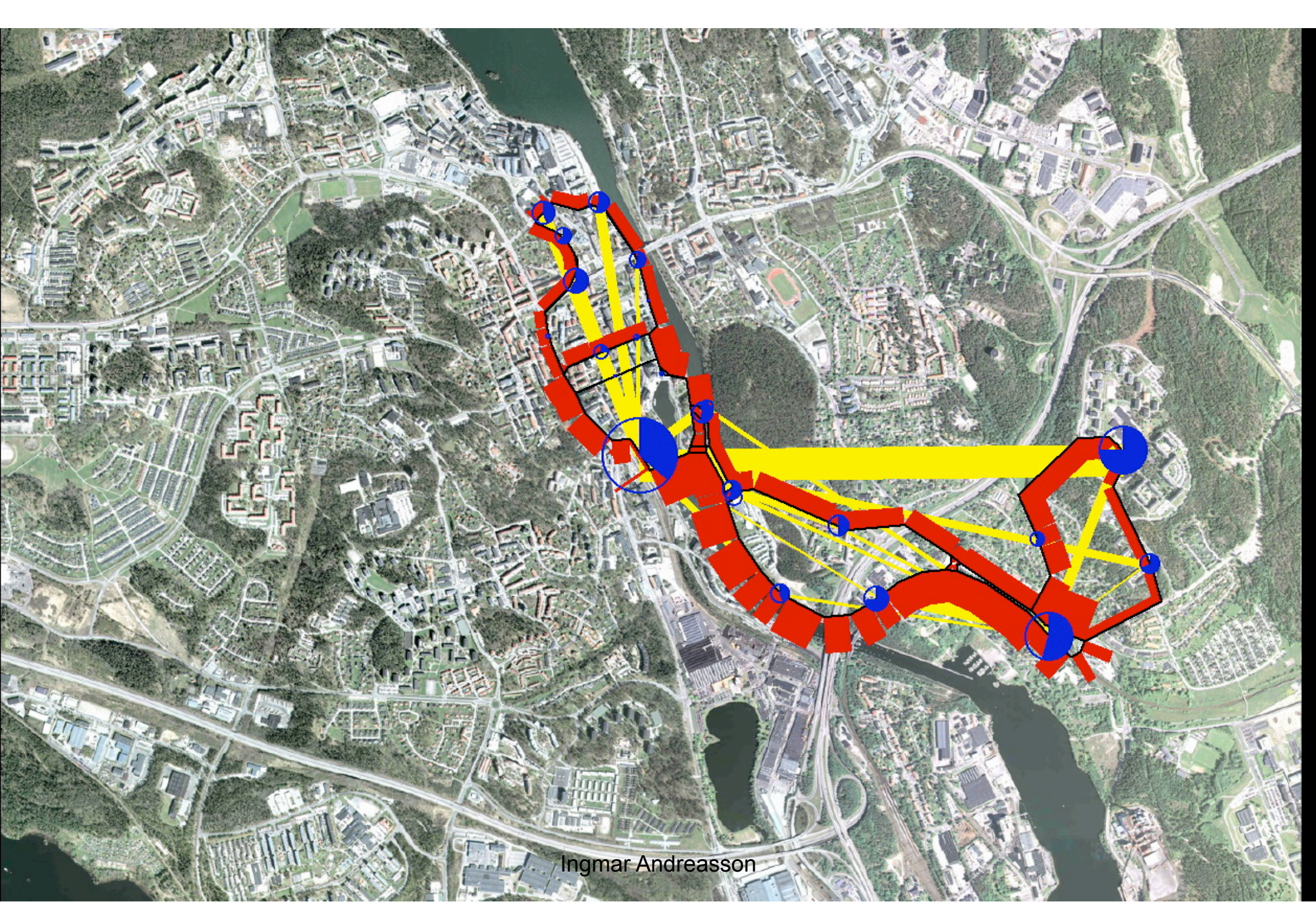




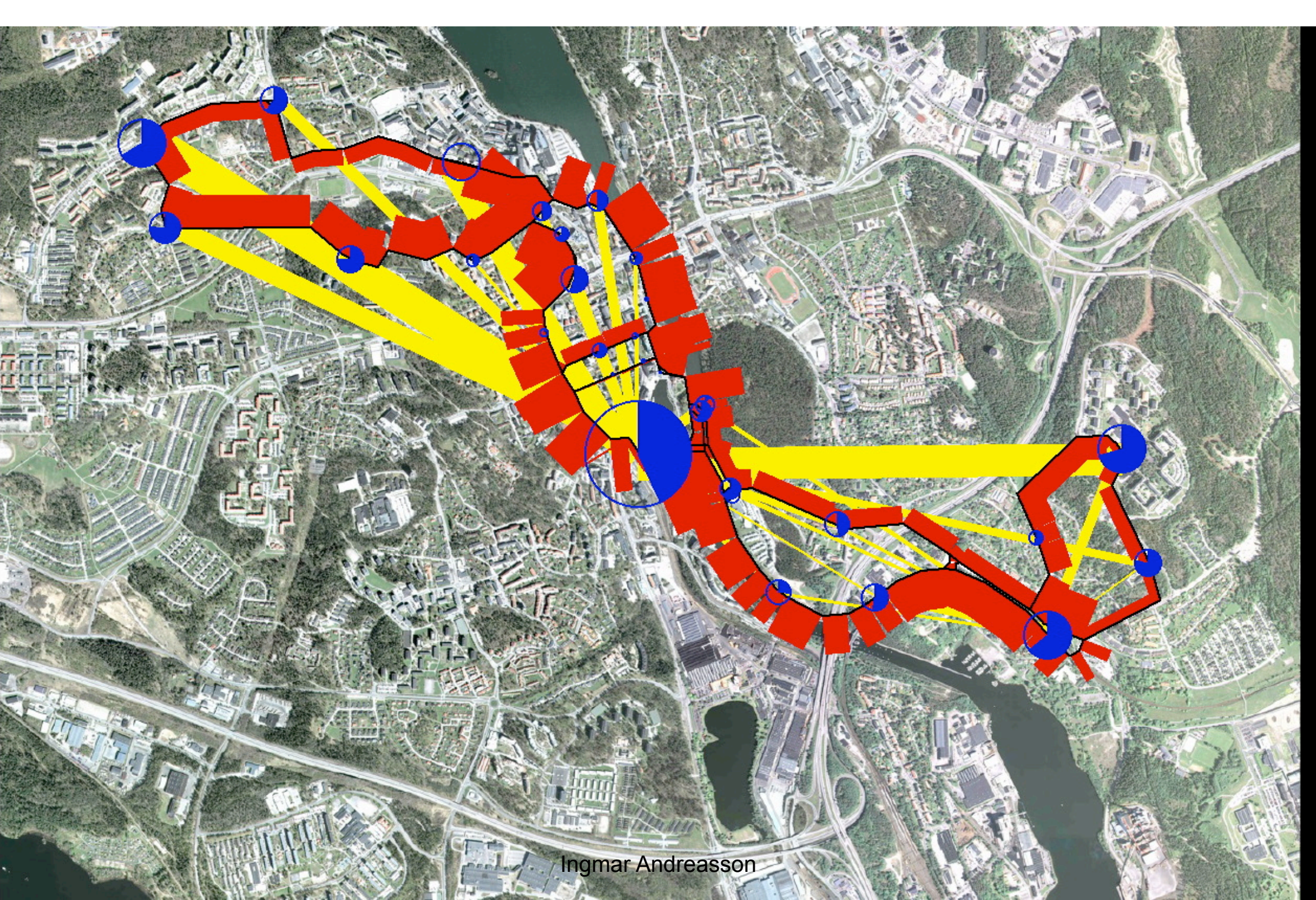
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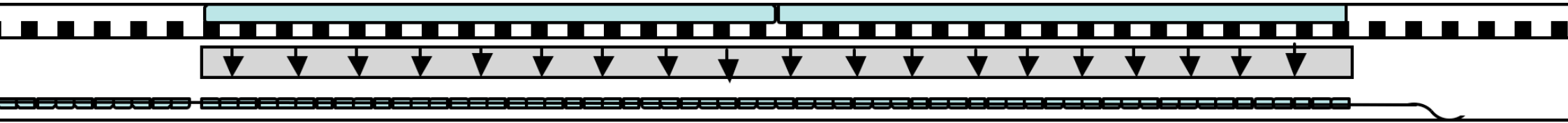
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Transfer from train



Corss-platform transfer

- Fill platform with PRTs

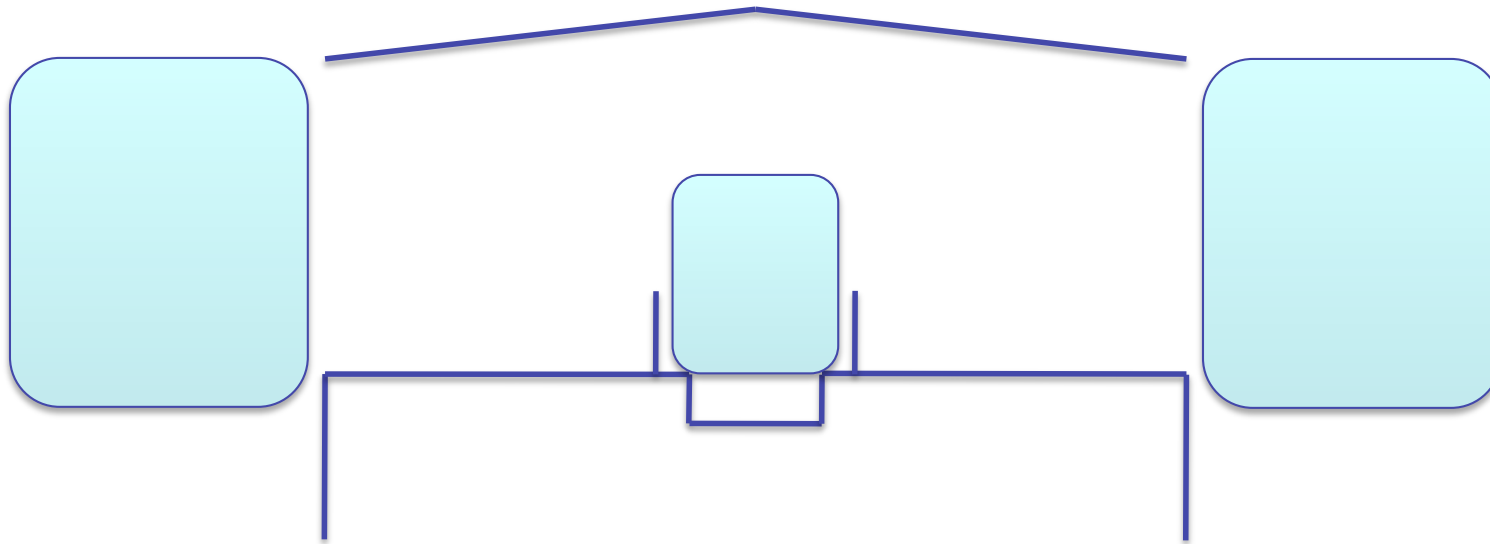


- Length of train = 64 PRT
- Up to $64 \times 5 = 320$ passengers
- 3 mins to depart (3 sec headway)

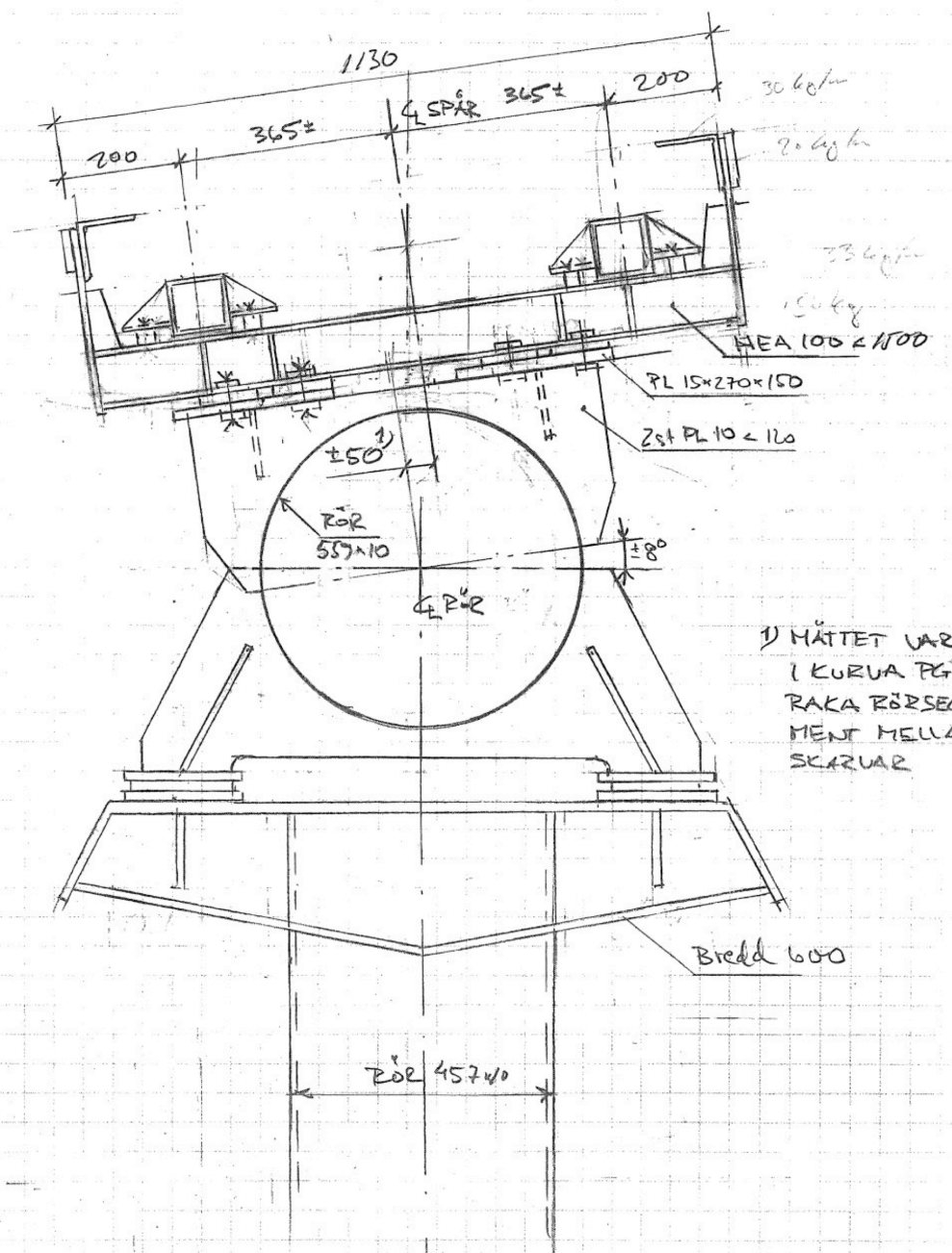
Train station operation

- Predict demand for each train arrival
- Sign destinations based on statistics
- No ticketing
- Advance another platoon if needed
- Distribute and return for next train

Platform station



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1) MÄTTET VAR
 I KURVA PG,
 RAKA RÖRSEG
 MENT MELLA
 SKARVAR

Guideway

- 56 cm tube
- 46 cm posts
- 24-26 m span
- 80-100 m welded
- One post may be removed



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Garvaregatan

Garvaregatan



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Transition curves

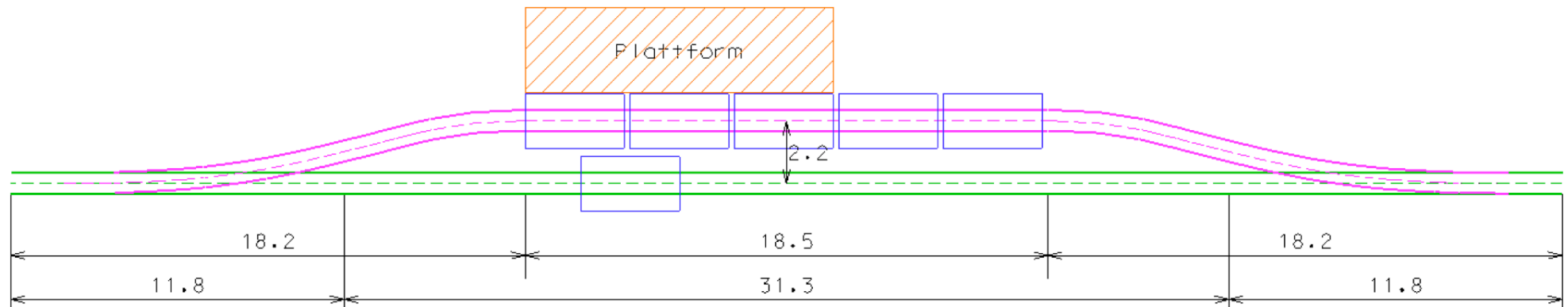
- Rail design tables for constant speed
- Shorten switch to corner or stopping
- Brake into curve
- Acceleration $<.25$ g and jerk $<.25$ g/s
- Length- and sideways

Station for 12.5 m/s

- Curve radius min 62 m at 12.5 m/s
- (Transition curve 17 m)
- Clear from main track after 31 m
- Stopping distance 37 m
- 2-berth station $68+20+68 = 156$ m

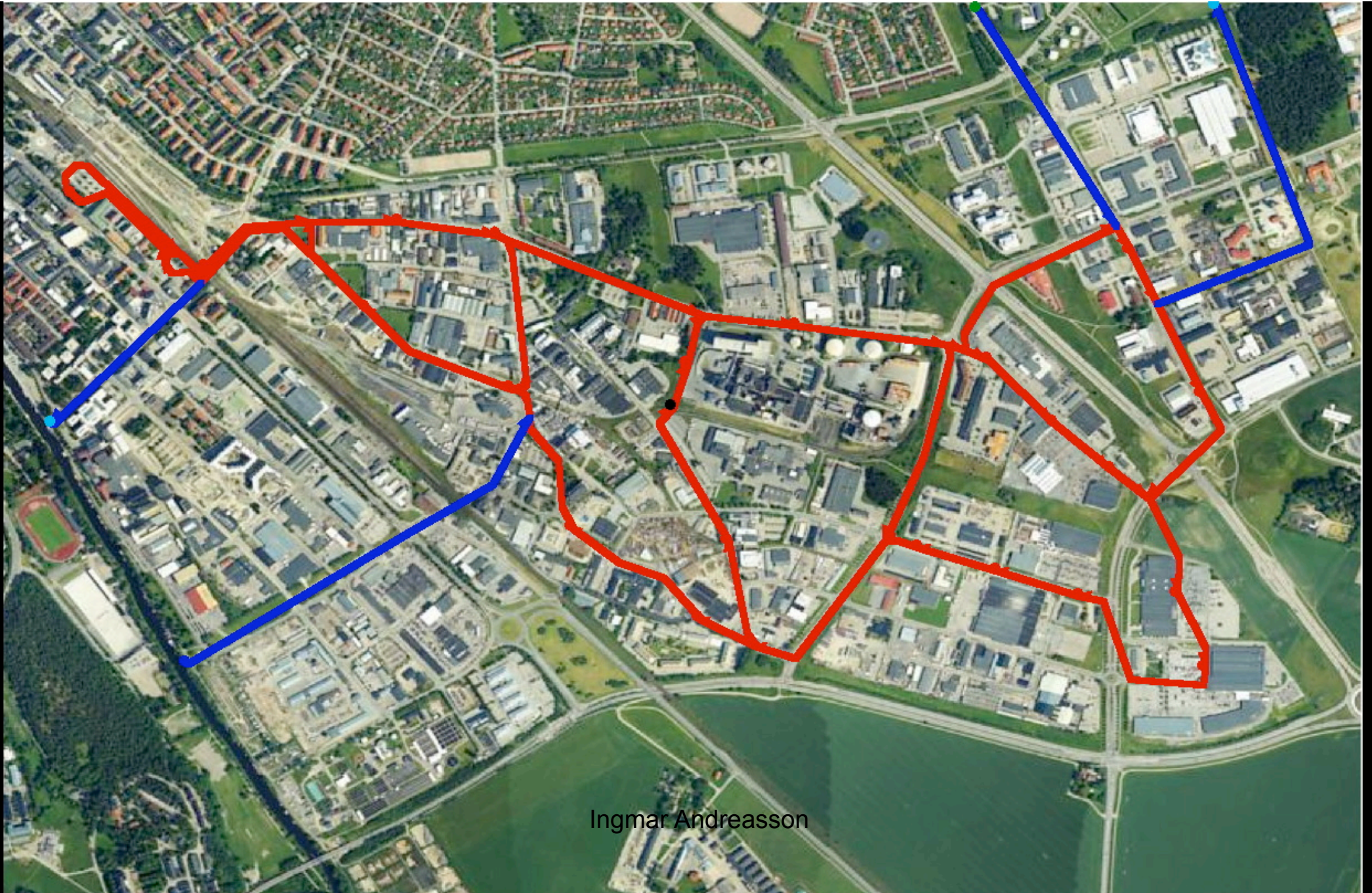
Not acceptable!

Smaller station

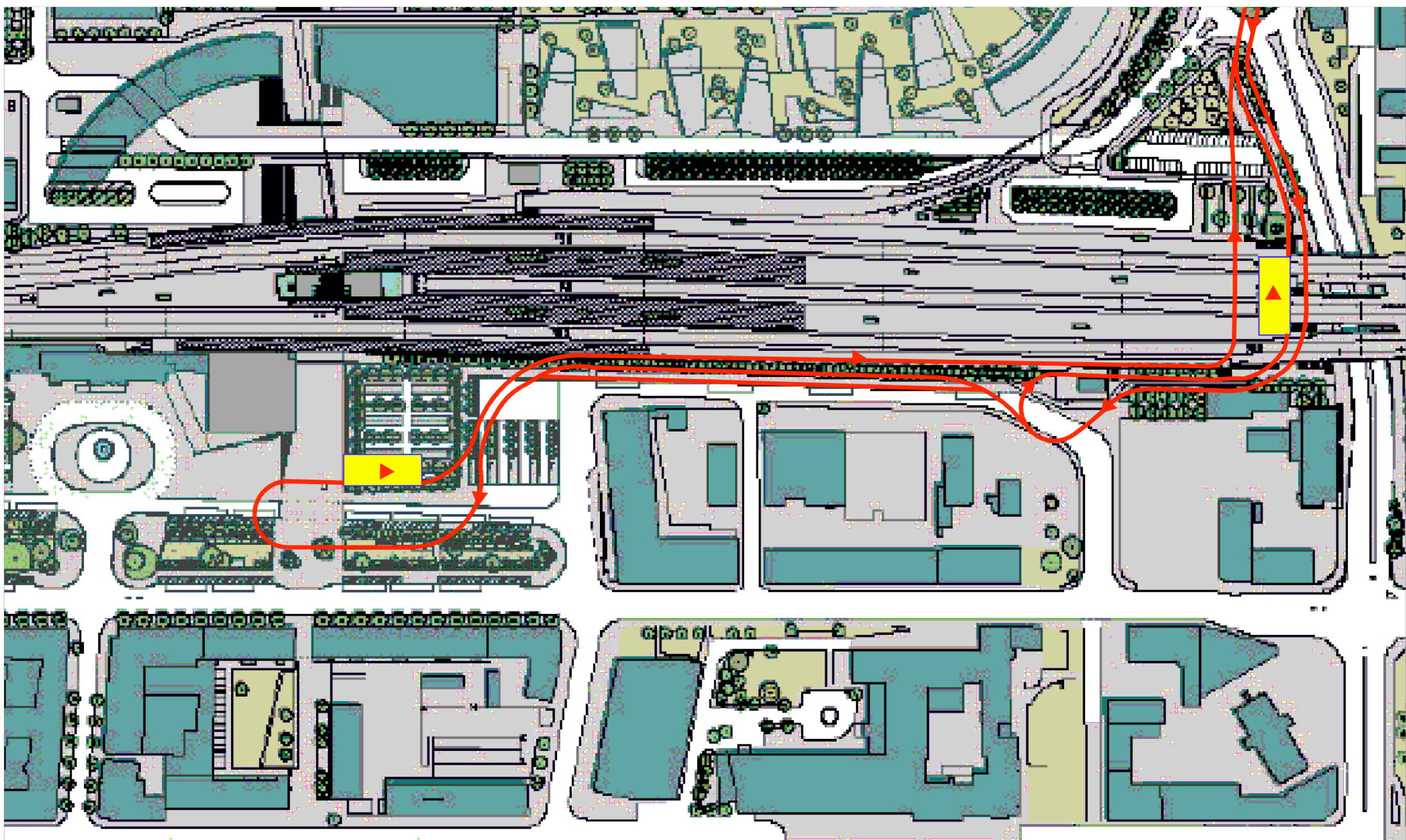


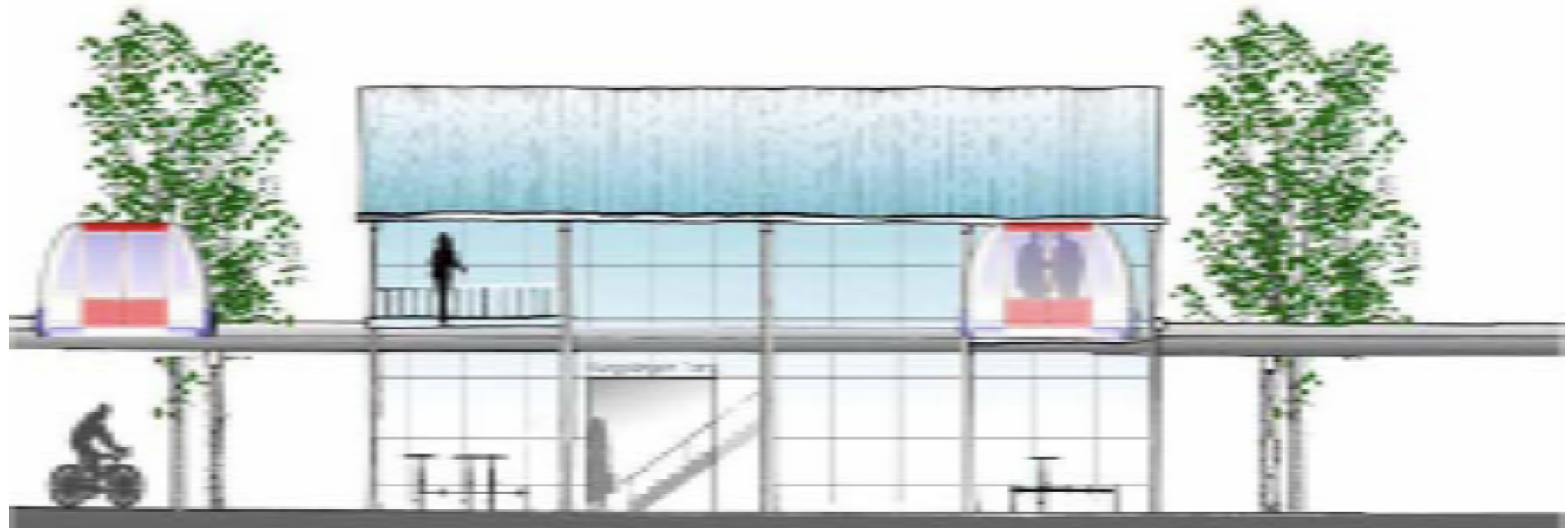
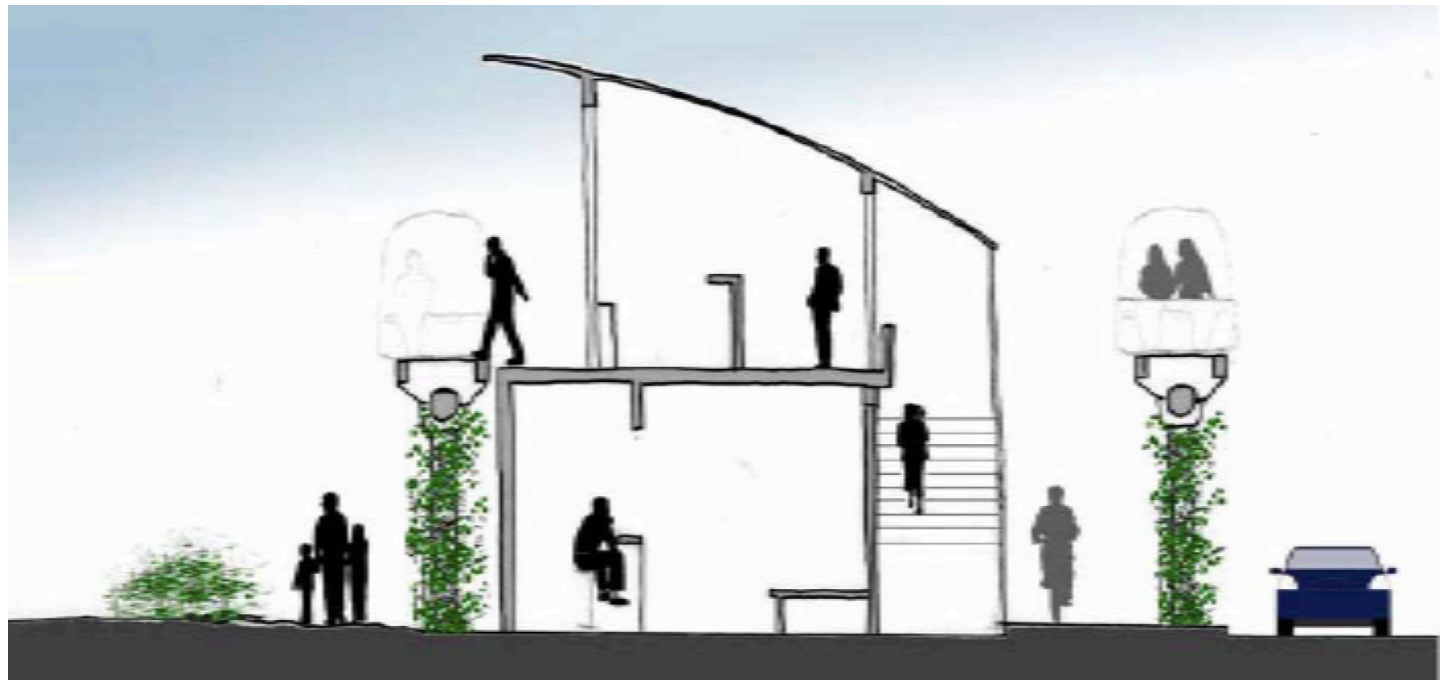
- Local speed limit 12.5 → 10 m/s
 - Shorter stopping and headway slack
 - Use slack to slow before entering
- ⇒ 31 m between switches, 55 m in all

Uppsala



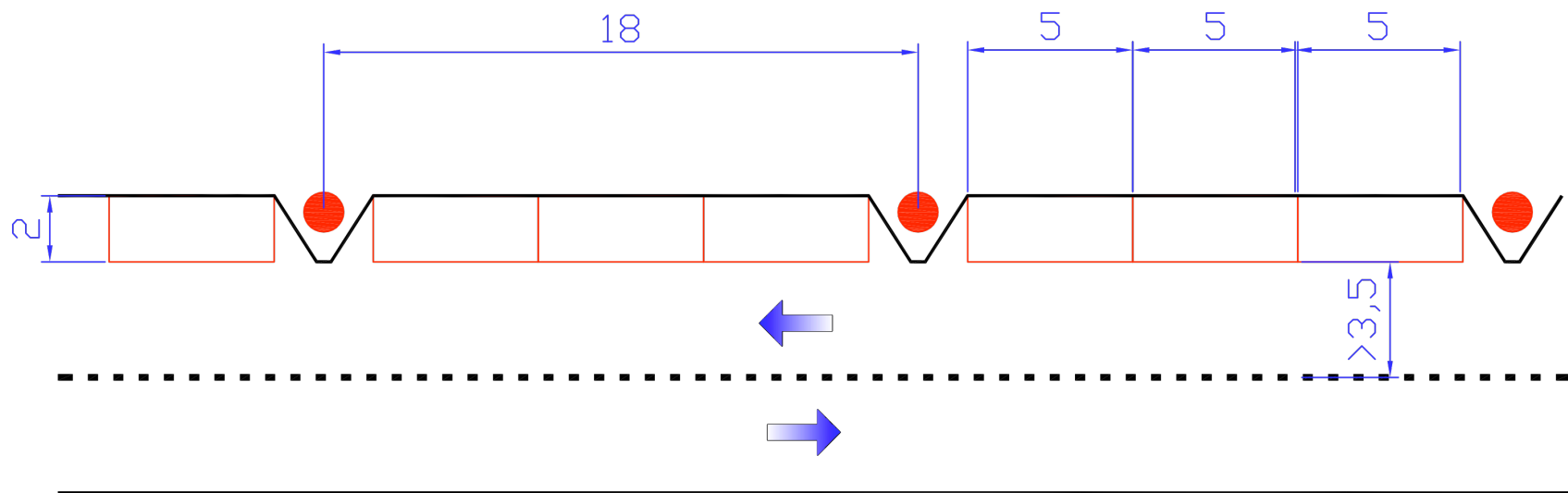
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Supports in parking lane

Pelare c/c 18 m, med plats för 3 kantstens p-platser emellan



Financing

- Development fees
- EU or National funding 30-40 % ?
- Supplier consortium financing
- Build-Operate-Transfer
- Authority keeps fares (same as transit)
- Fixed annual fee for capital and operation

BOT advantages

- Less risk for buyer
- No investment – easier decision
- LCC-efficient designs
- Competence for operation
- Annual cost easy to compare w alternative