Travel to work – have we forgotten the passenger?

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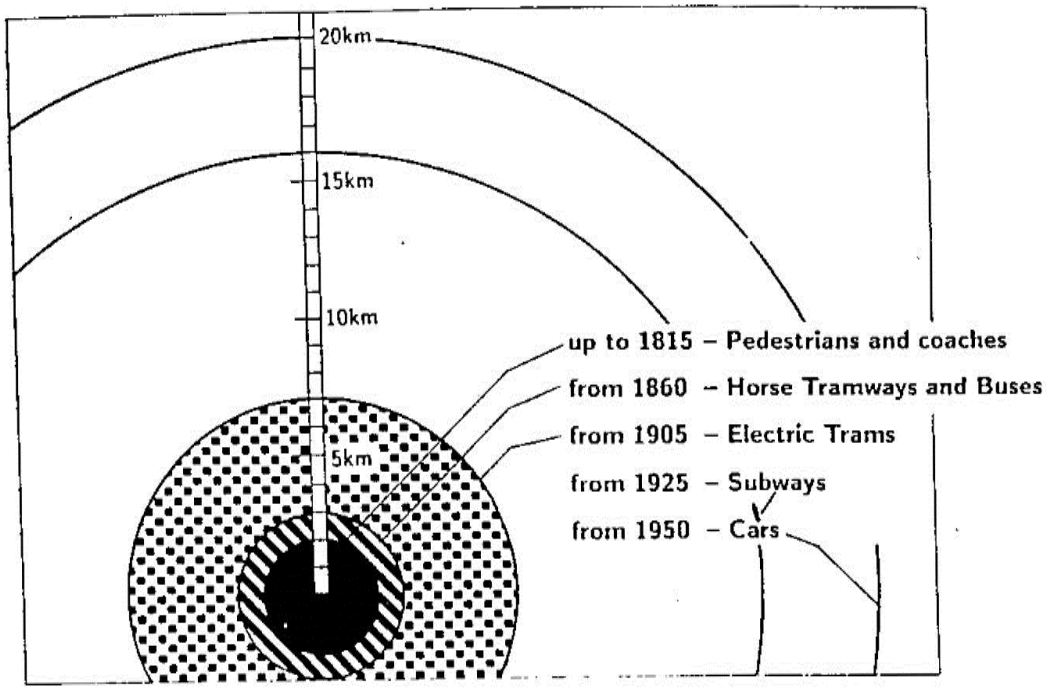
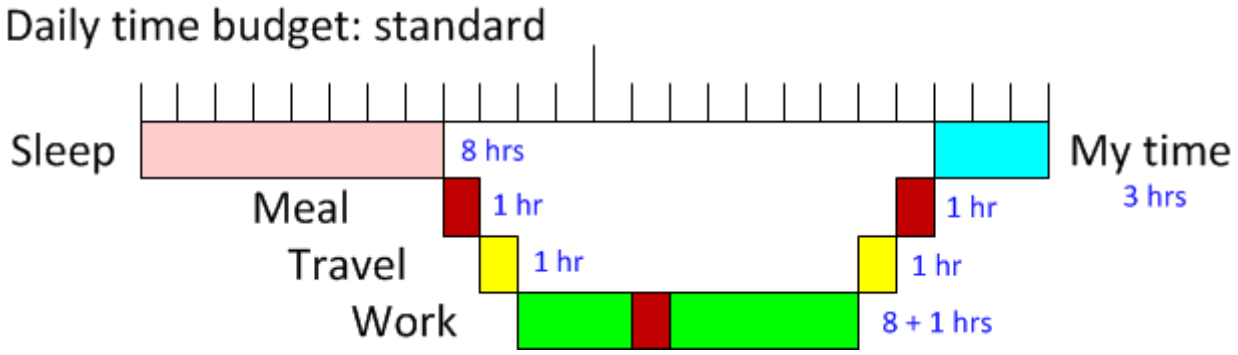
Why is travelling to work important?

- **Where we can live is constrained by it**
  - City sizes are determined by transport technology
    - Mean travel budget per day = 60 minutes (Machette (1994)).
    - The transport comes first , the city follows (Berlin, below)



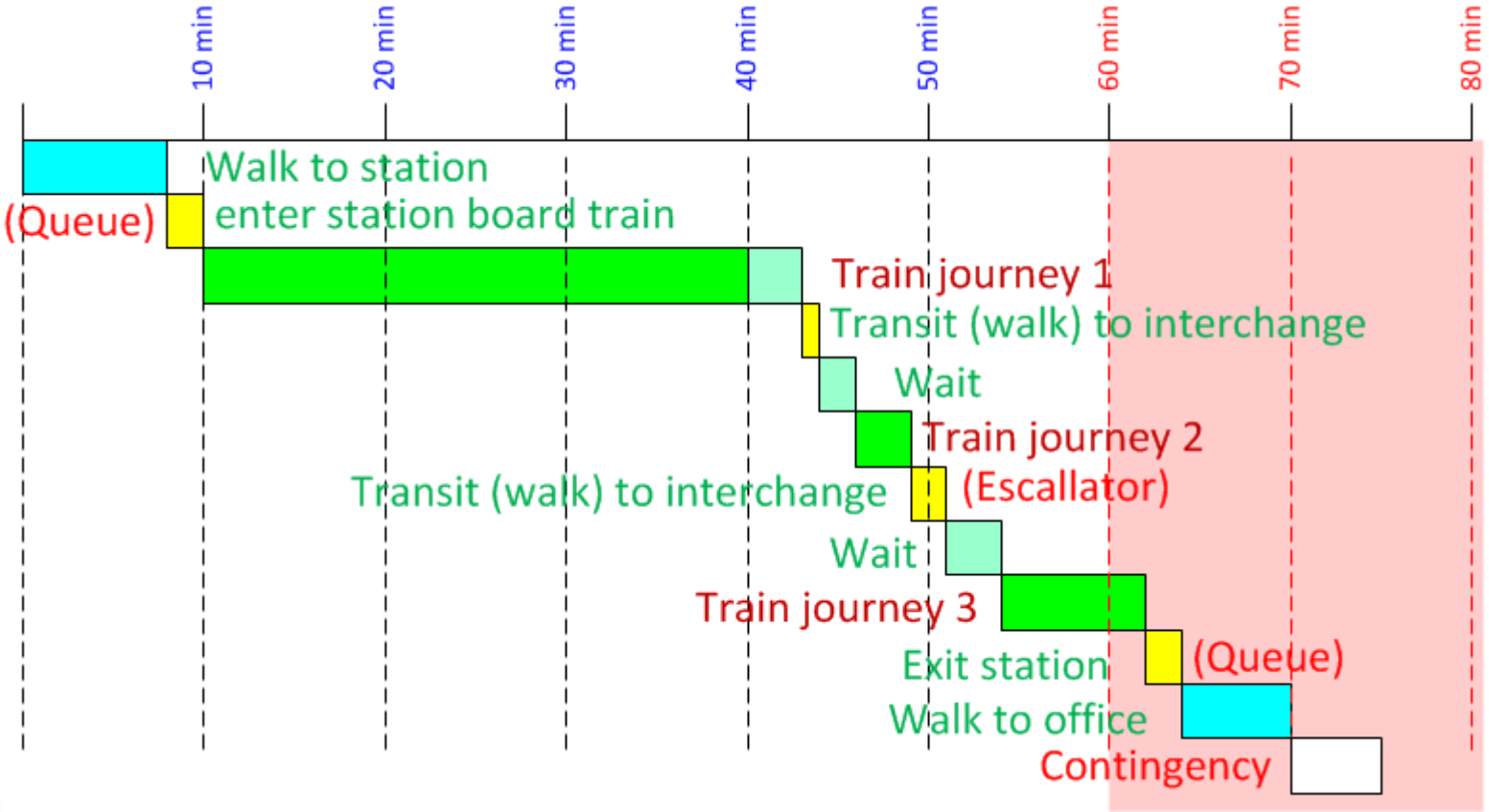
"Time spent travelling"

- **It's a big chunk out of life**
  - Australia's average commute time is 27 minutes
  - For Melbourne (2007)
    - 54% of workers spend 30 minutes or less.
    - 12% of workers spend more than 60 minutes
    - 3% of workers spend more than 90 minutes



The "Value Chain" for commuting

- Interchange design contributes
- Operational reliability contributes
- Frequency contributes



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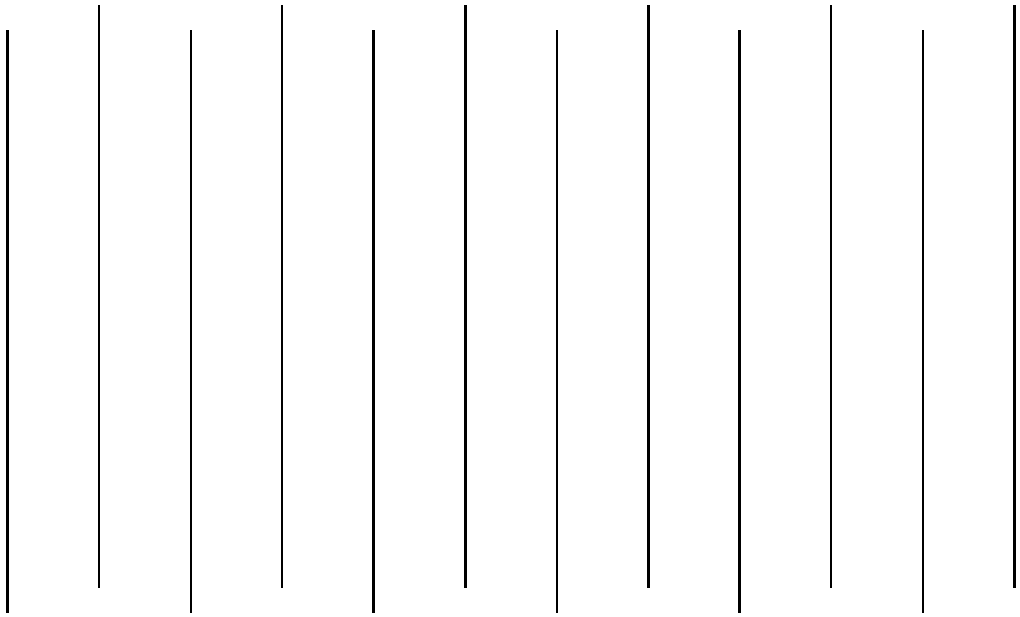
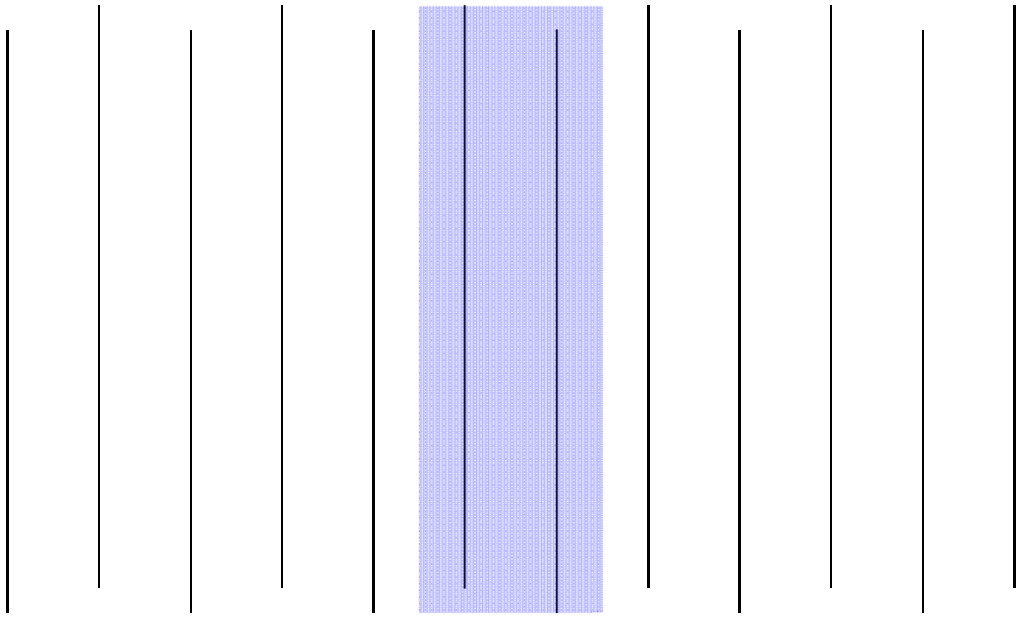
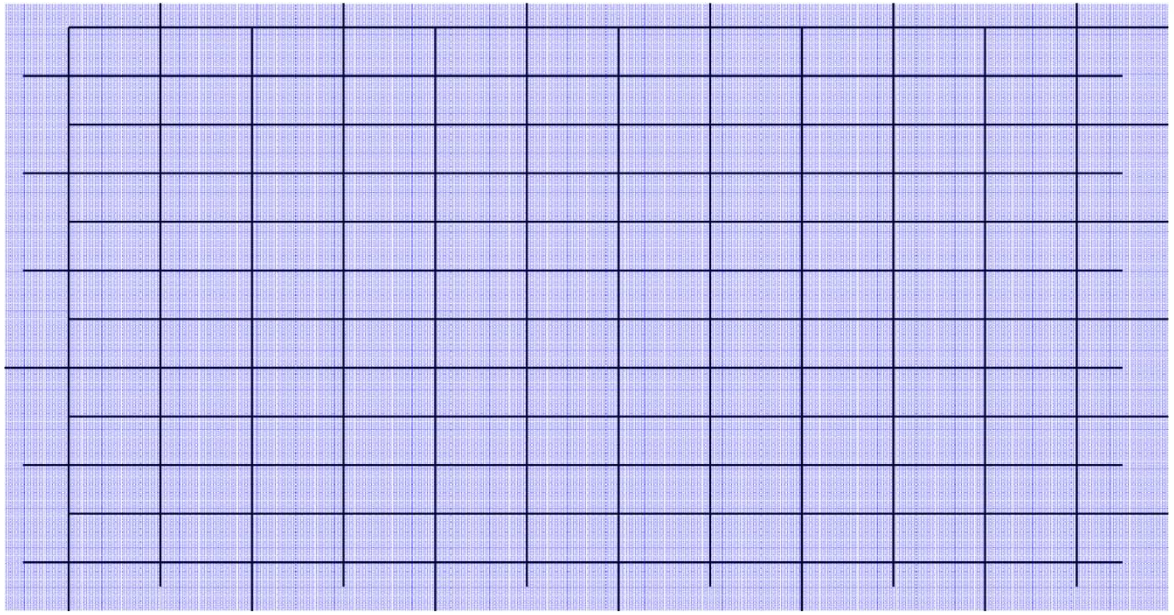
Network design 101

- Toolbox for achieving Journey time
- Solutions are not “one size fits all”
- Wait times and walk times are important
- Historically, journey time drives urban form





Non networked public transport. 10% of trips possible



Networked public transport. 100% of trips possible

Networked public transport. More walking but service frequency doubled

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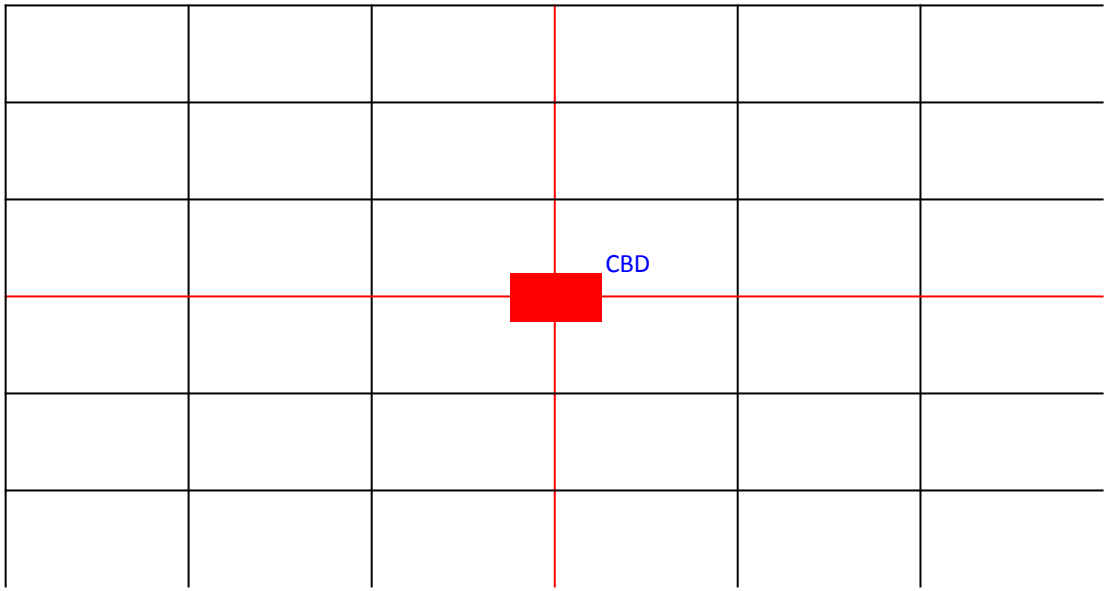
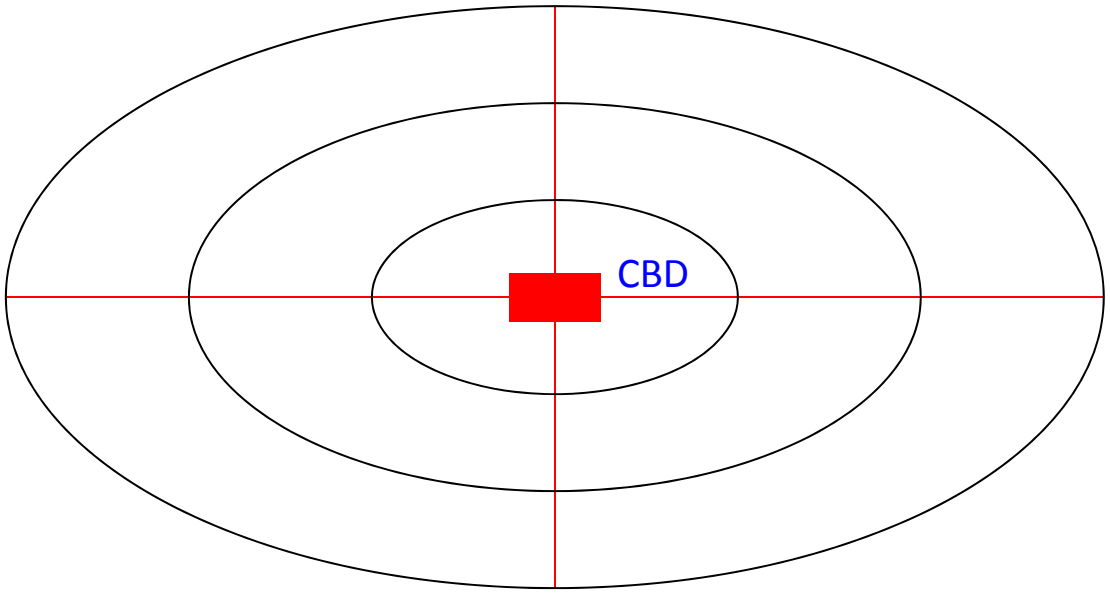
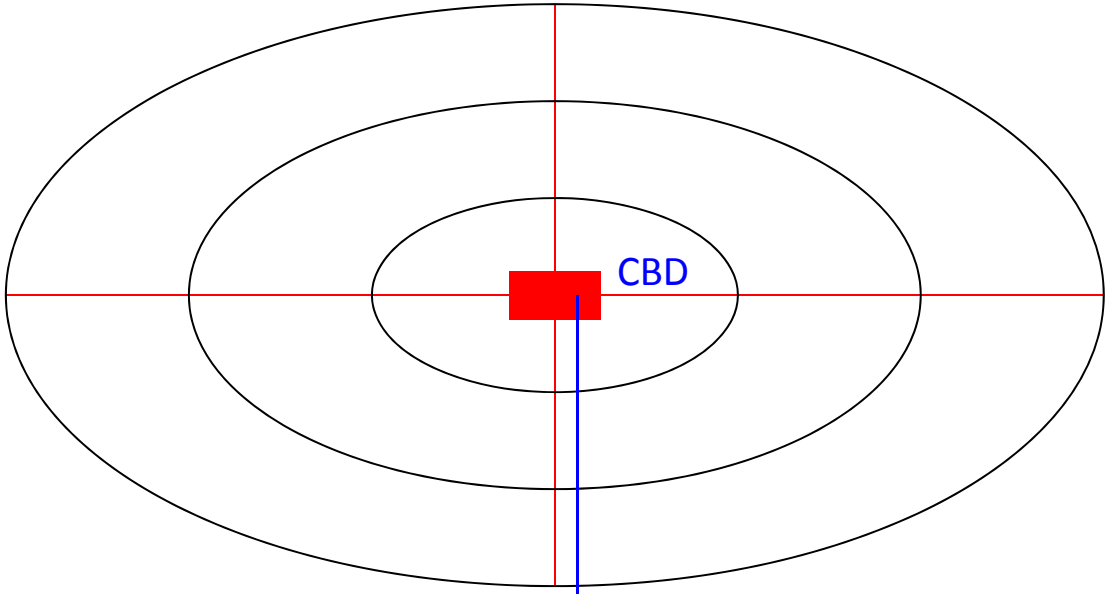


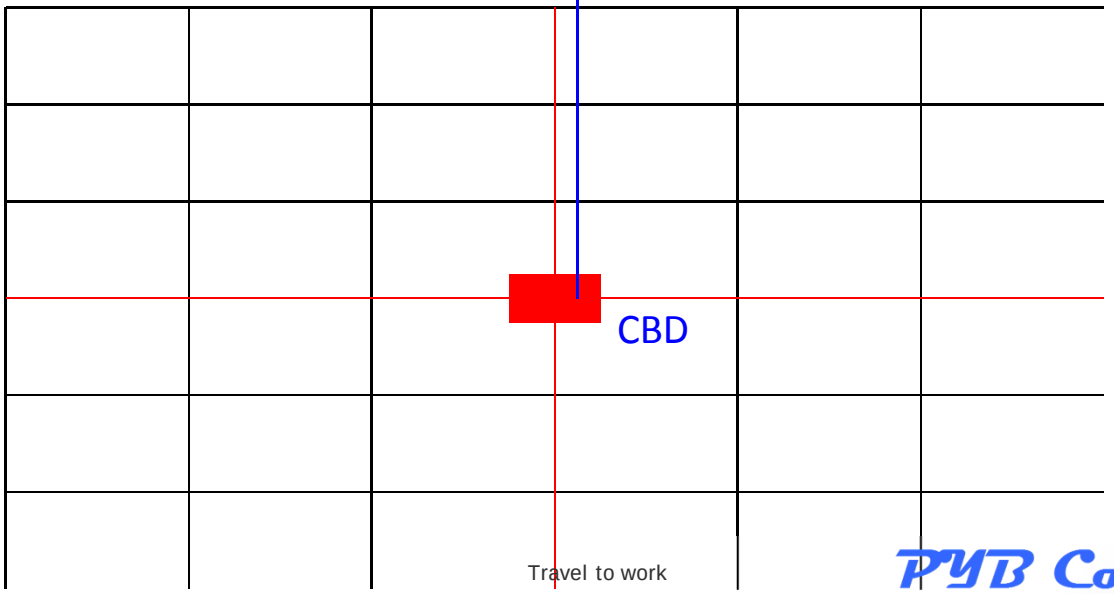
Networked public transport. CBD routes require higher capacity

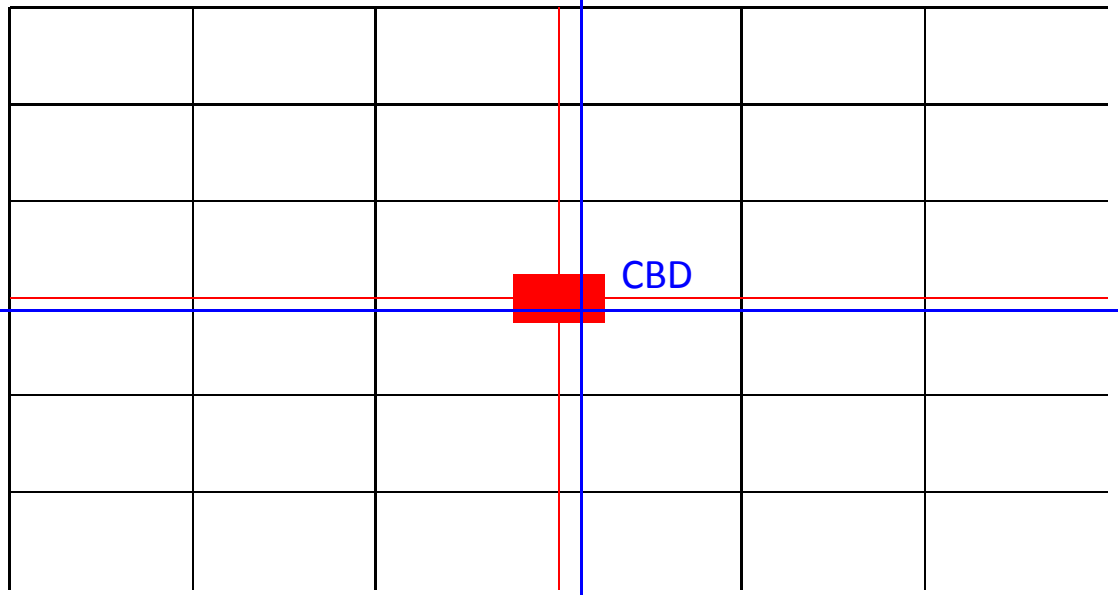


Networked public transport. Alternate form with cross-town feeders

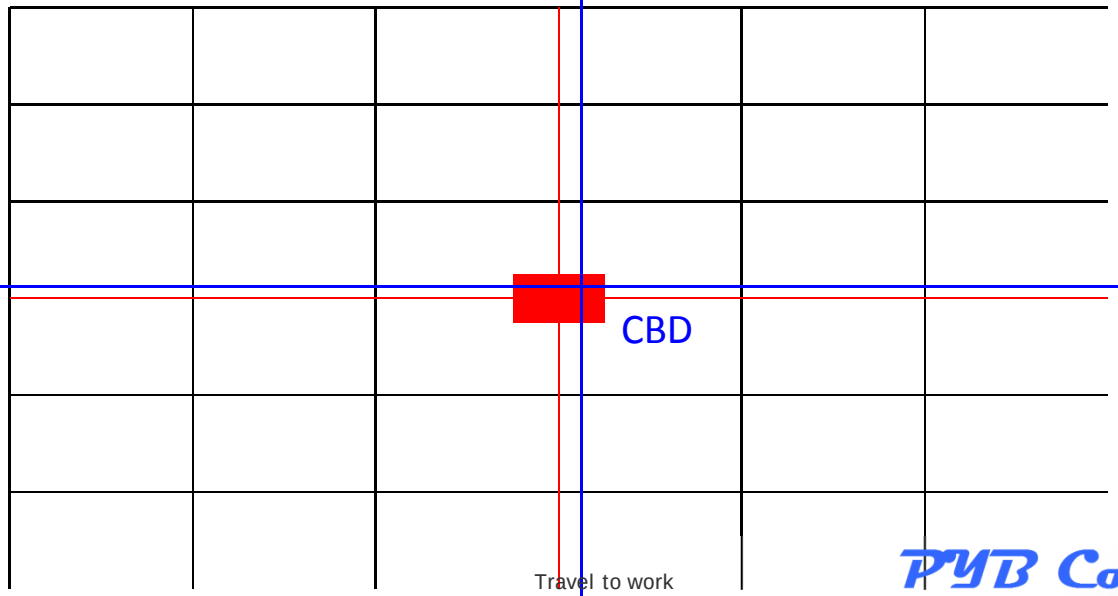


Extended public transport. A second centre can be connected by fast line

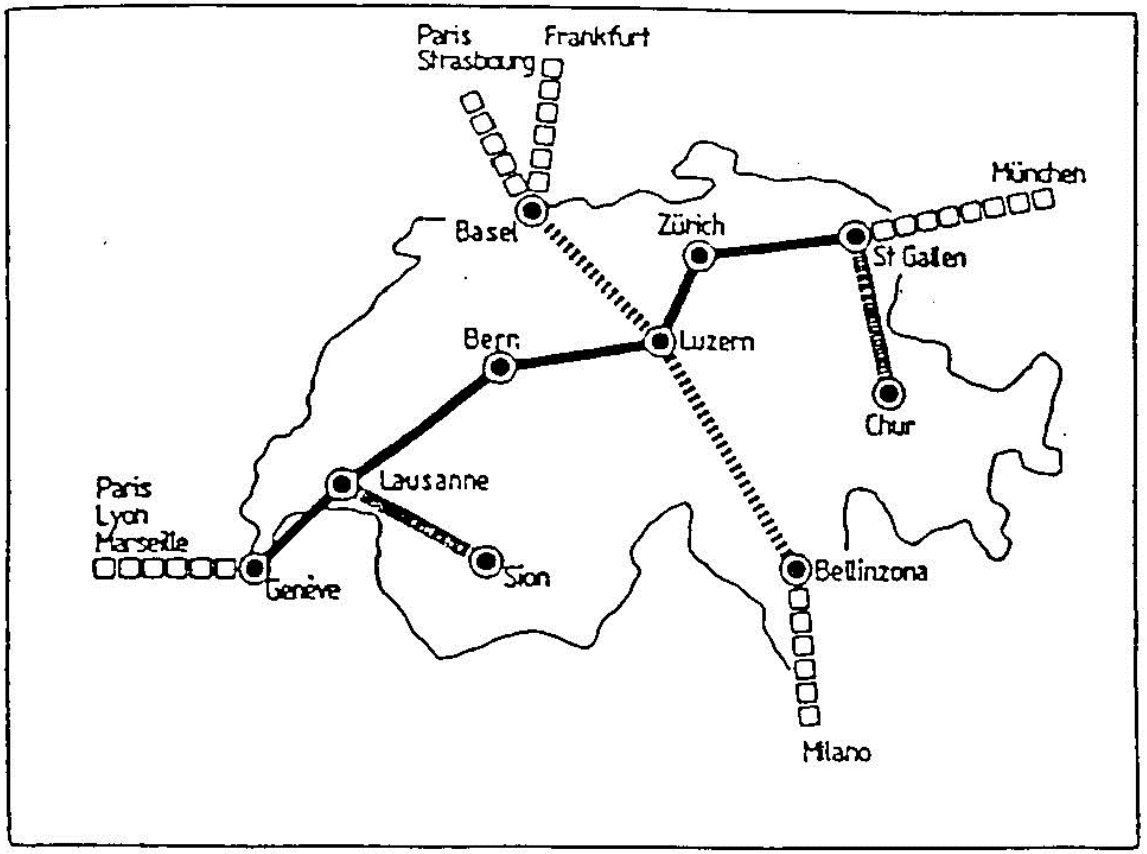




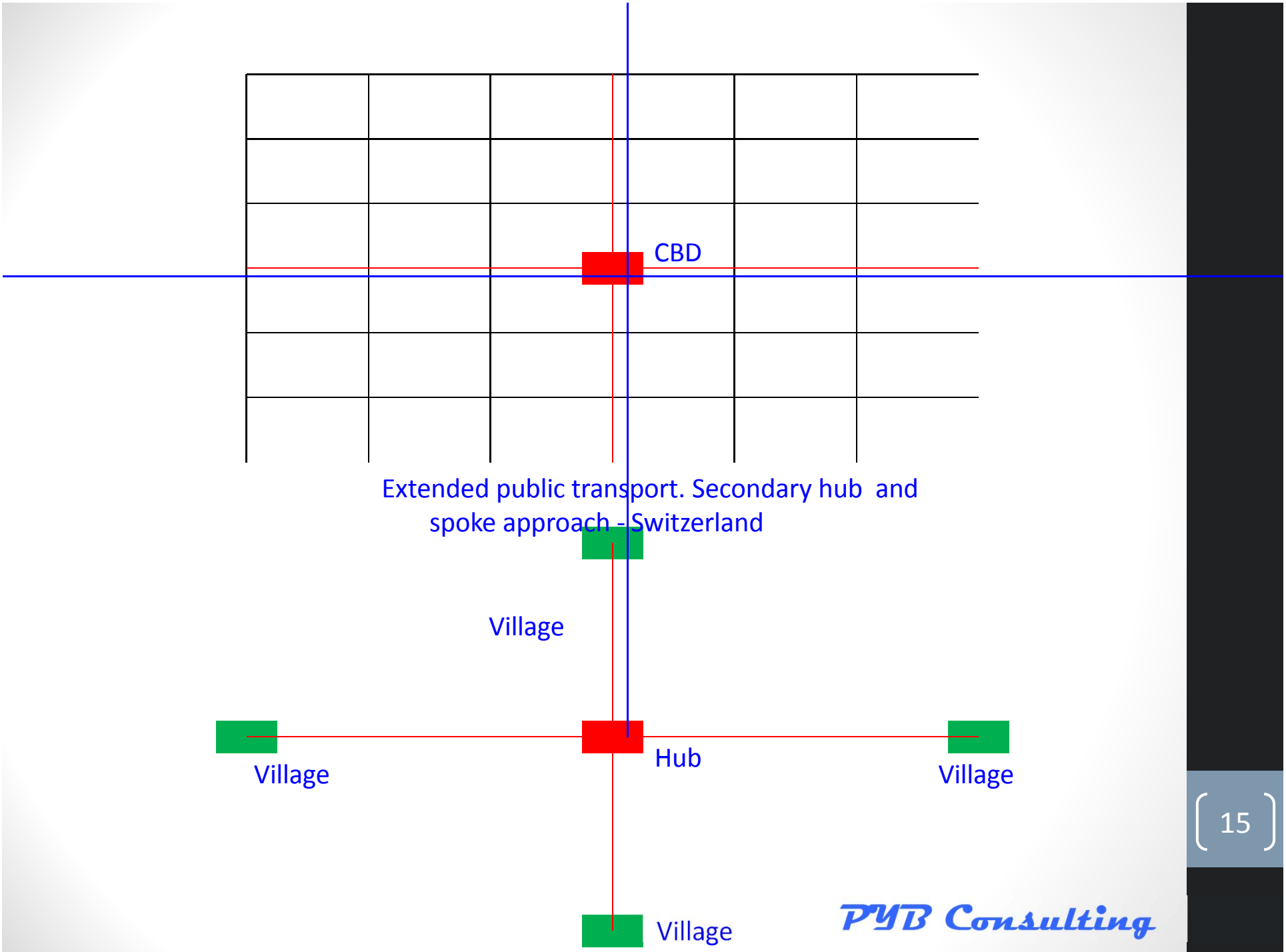
Extended public transport. Multiple centres connected by fast line network - Switzerland



Network design (Swiss intercity)



- **Swiss rail network**
  - Currently 30 minute "pulsed"
  - "Plan" to improve to 10 minute Maglev (Marchetti)



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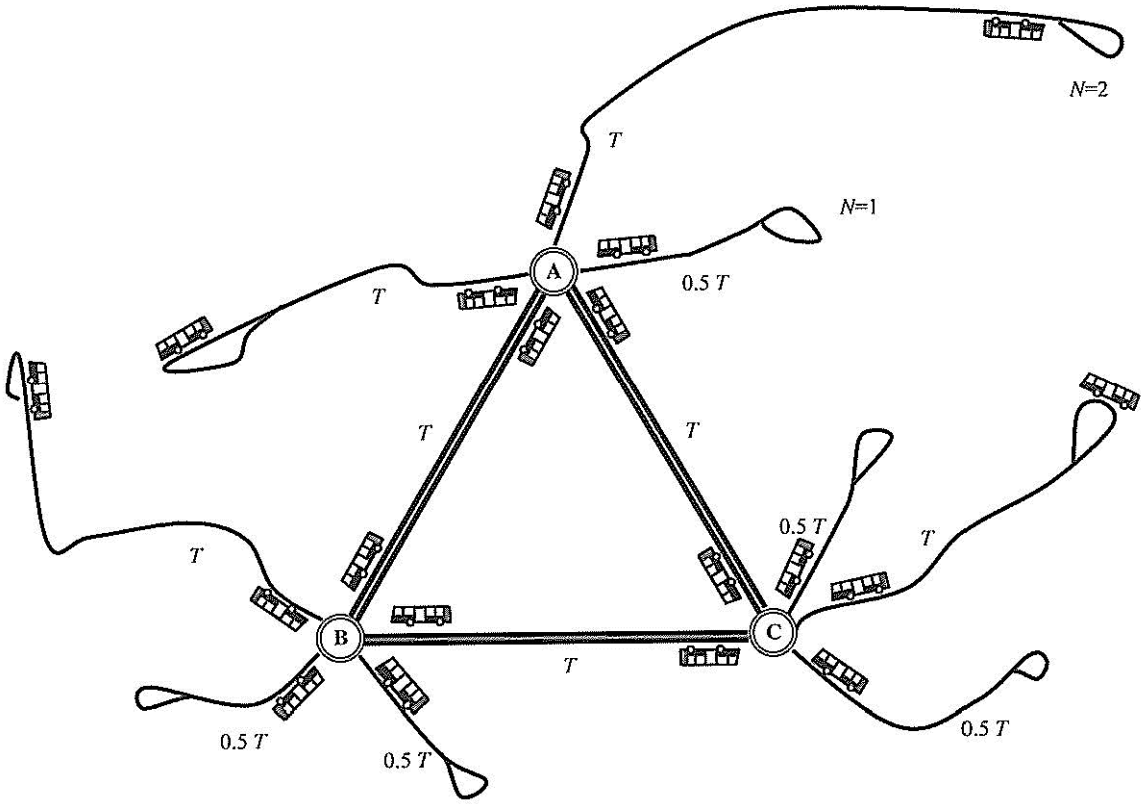
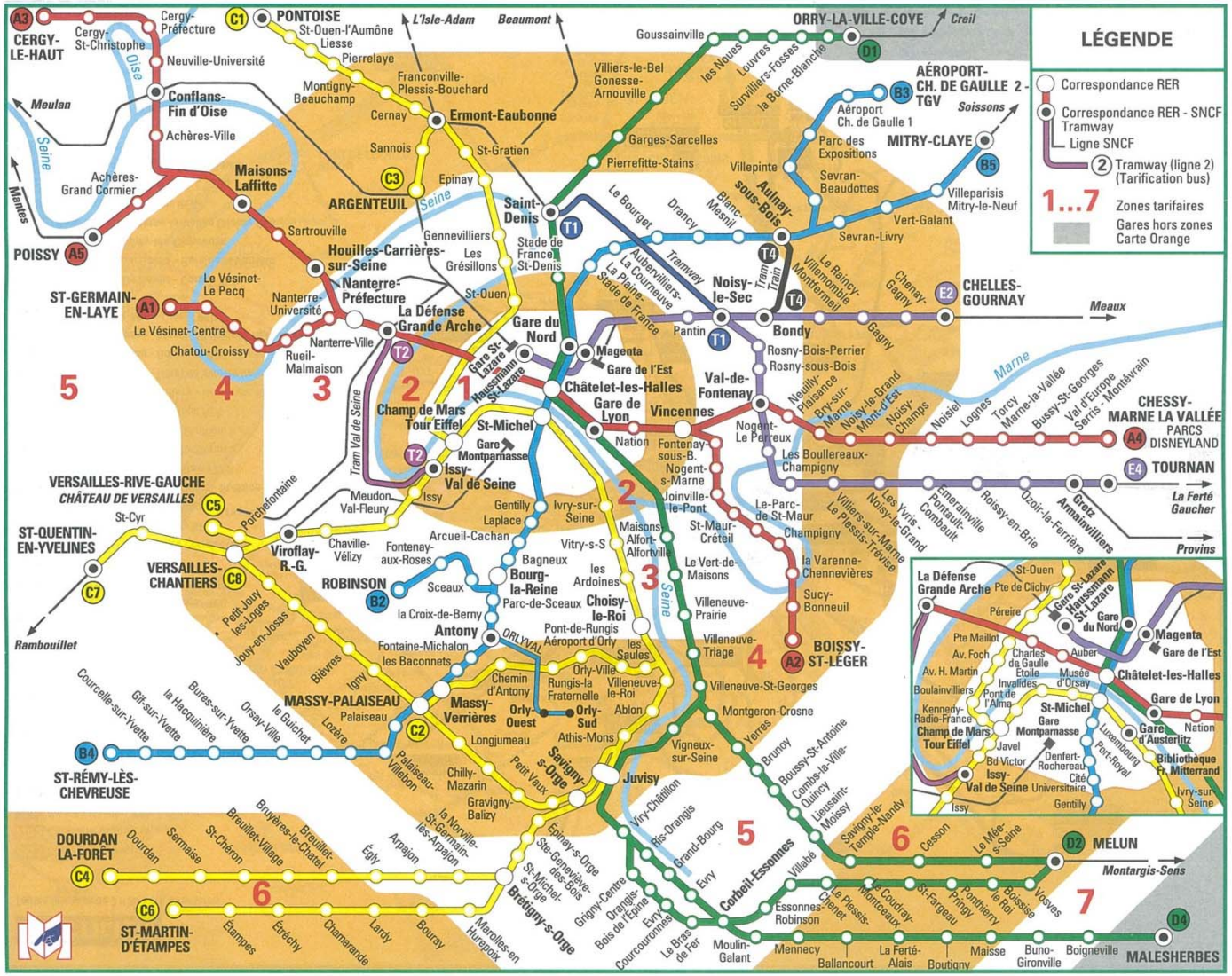
Network design (Swiss hub and spoke)

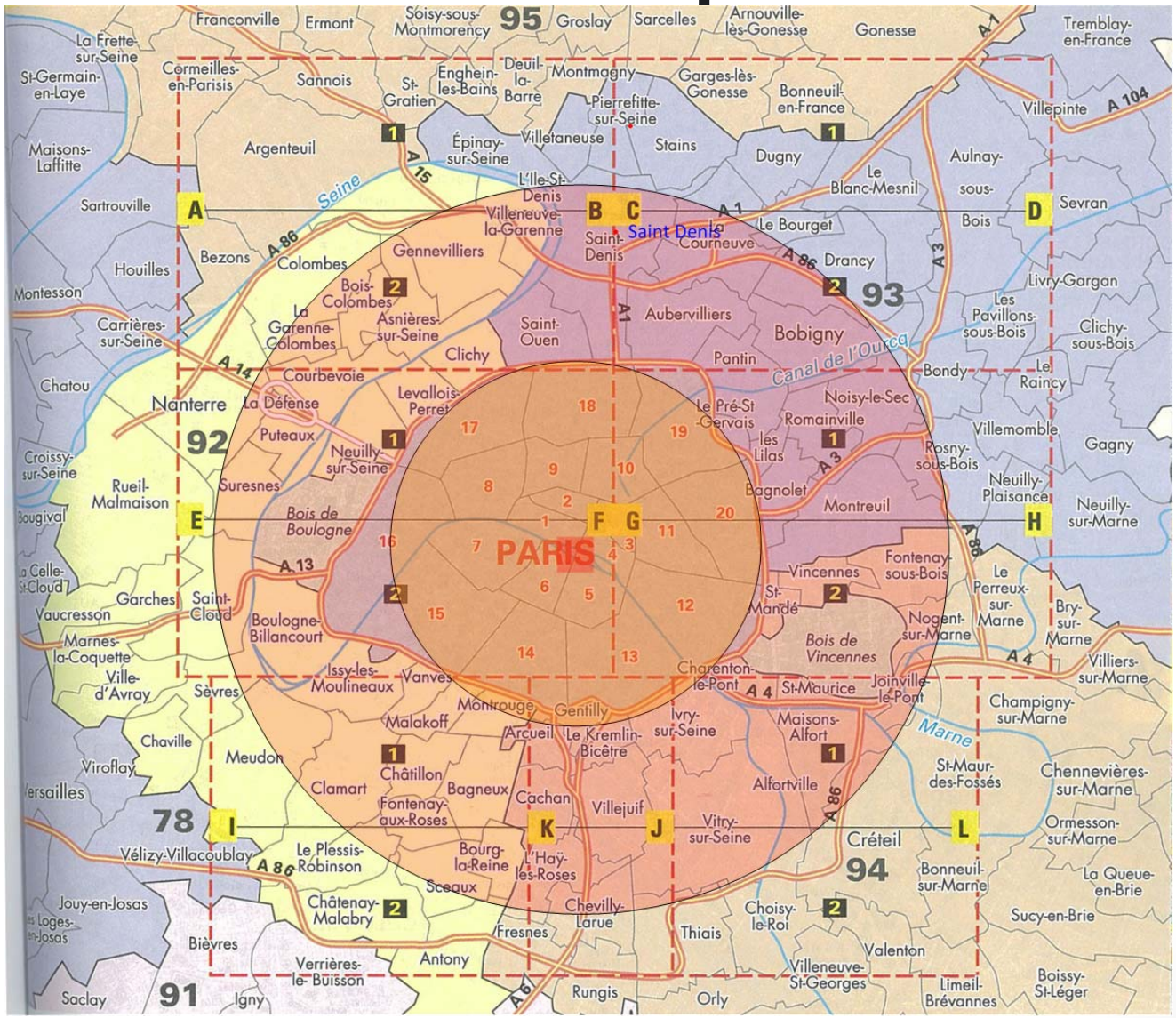


Paris Metro – 2 networks (RAPT)

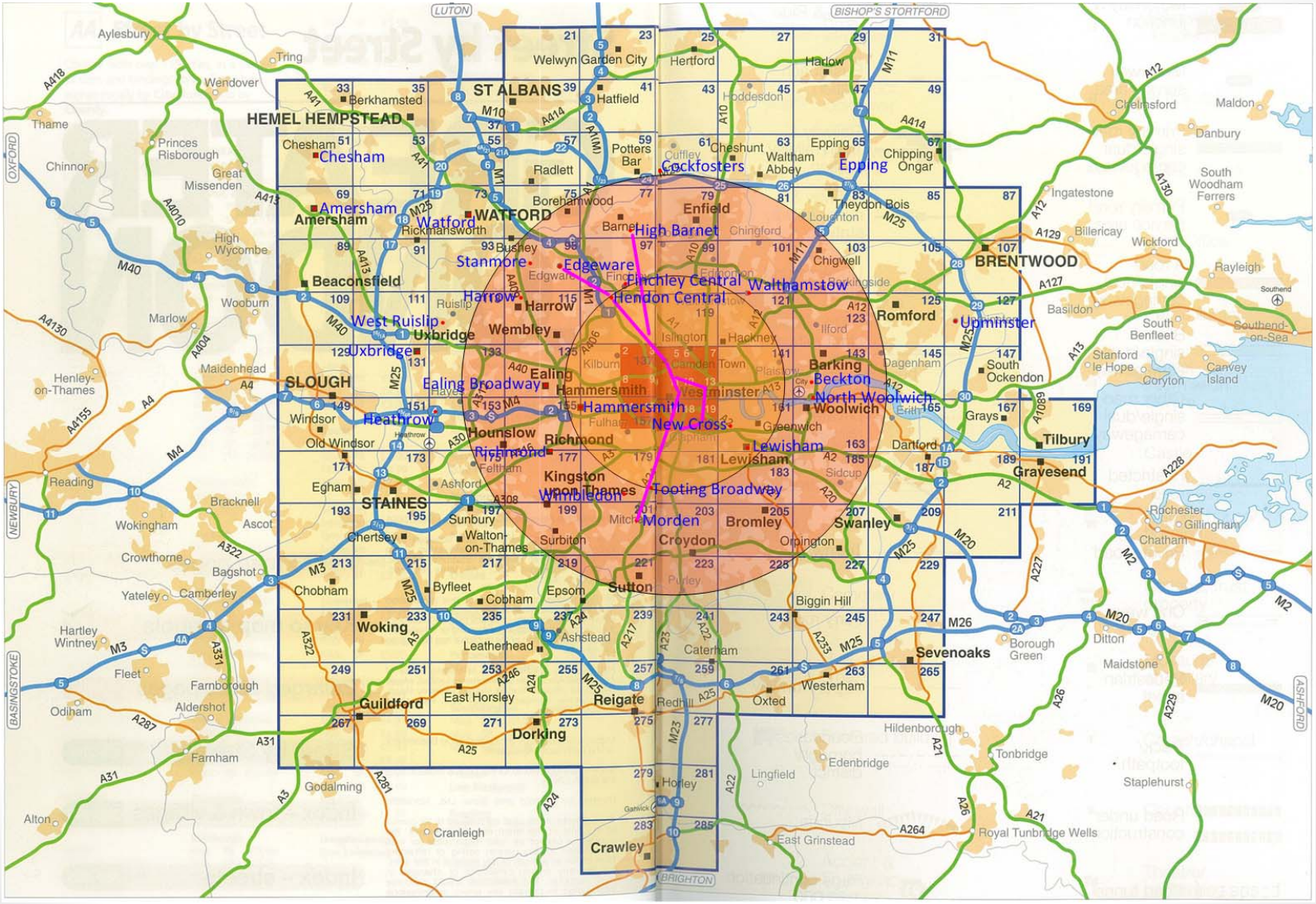
Paris Metro – 2 networks (RER)



Paris Metro – Size of footprint

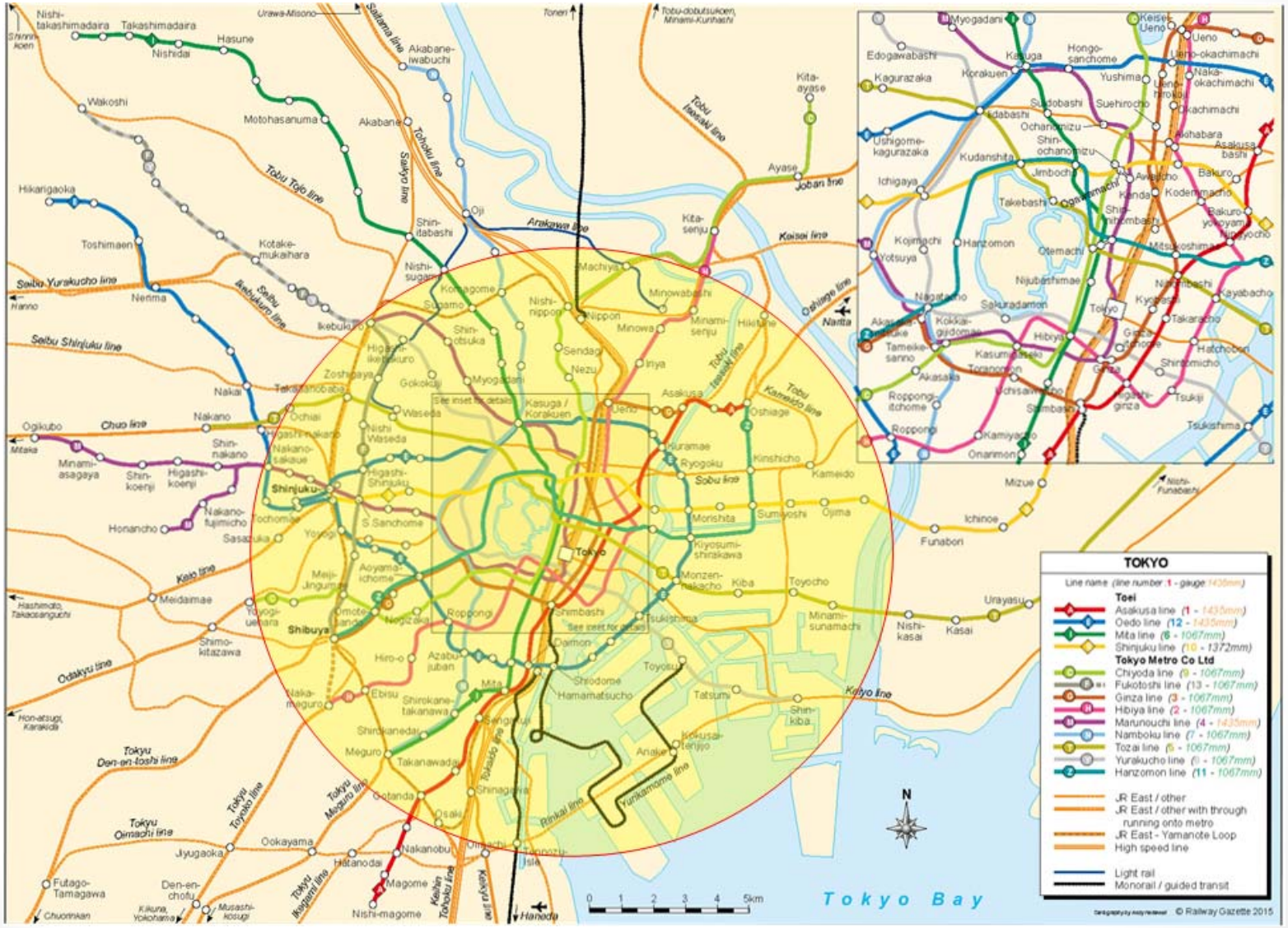


London Tube – Size of footprint

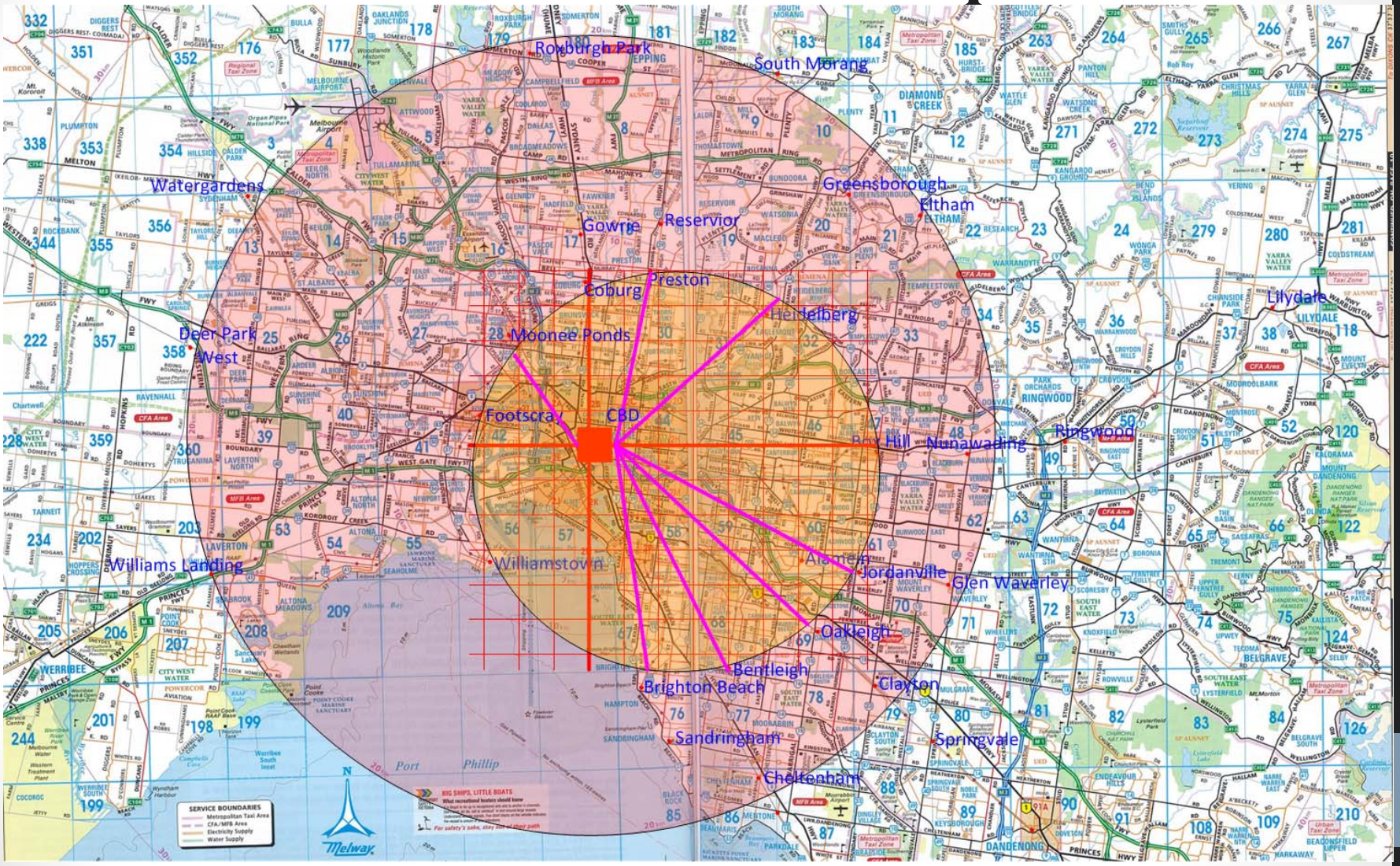


London Tube – Size of footprint

Tokyo JRE & Metro – Size of footprint



Melbourne metro – Size of footprint

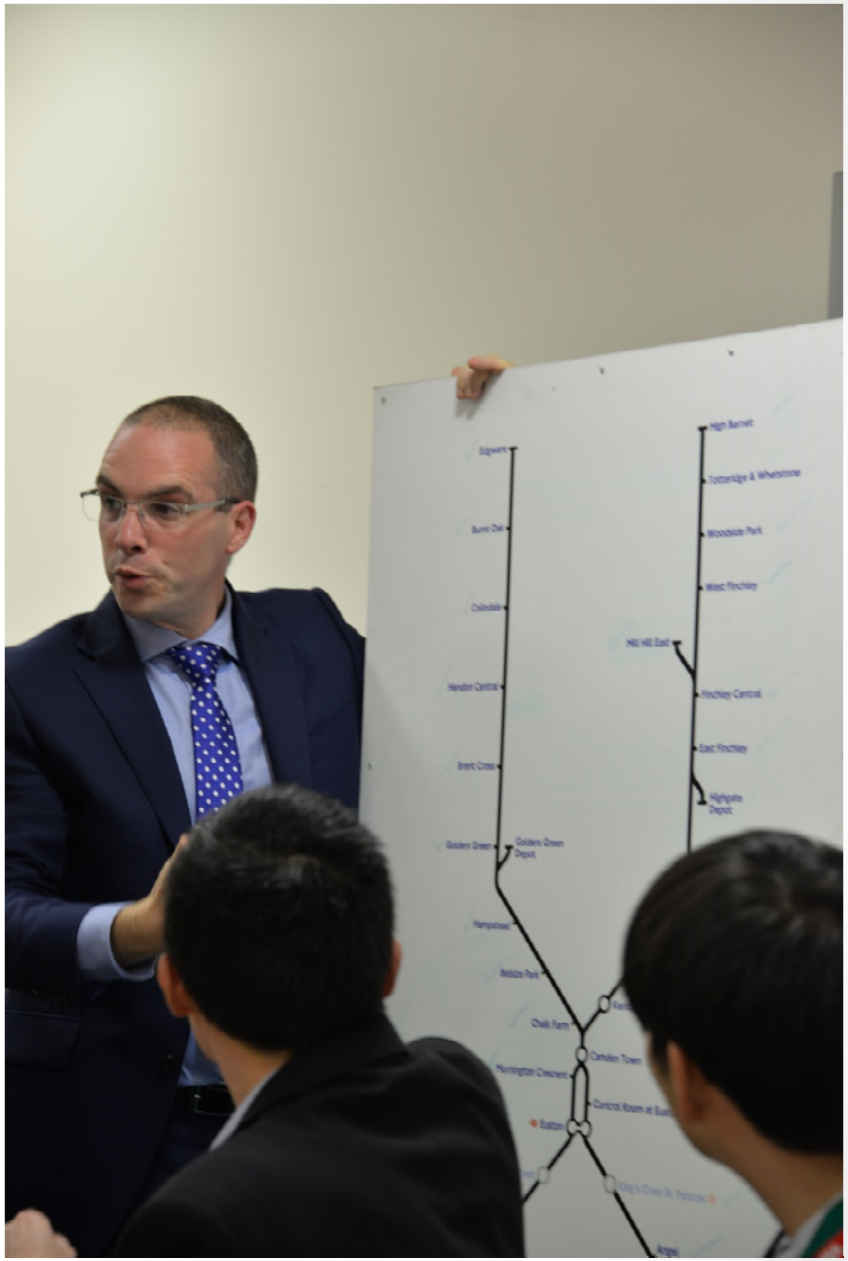


Melbourne transport distribution

- **Inner circle centred around Punt Rd**
- **Distribution by mode (2014):**
  - Trams = 200M passengers per year (mostly inner area – "stagnating")
  - Trains = 230M passengers per year (spread)
  - Bus = 100M passengers per year (spread)
- **Inner area is a "destination" for travelling to work**
  - CBD is best served area
  - 30% "CBD" workers have offices South of river (1996 data)
  - St Kilda Rd travel is not "counter peak"
- **Opportunities to improve inner network**
  - St Kilda Rd Metro
  - Punt Rd Metro (existing North South spine for cars)
  - "Last mile" projects
- **"20 km" Network boundaries**
  - Williams Landing, Deer Park West, Roxburgh Park
  - South Morang, Eltham
  - Nunawading, Glen Waverley, Clayton (Springvale?), Cheltenham

Group running?

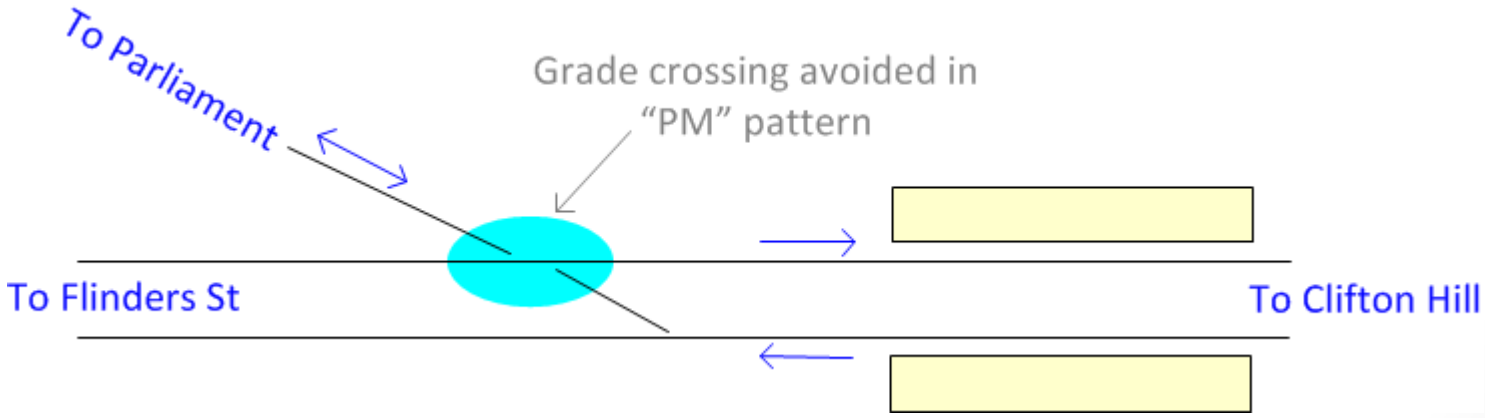
- **London Northern line**
  - Busiest transport corridor in London
  - Two corridors combine and cross each other twice (points are well used)
  - Interchange capacity at interchange stations insufficient to support “group running”
  - One size does not fit all



Travel to work

Grade separated junctions 1

- **Clifton Hill loop junction at Jolimont**
  - "AM" pattern had lower reliable capacity than "PM" pattern
    - 15 trains per hour with flat cross (AM)
    - 20 trains per hour with no crossing (PM)
  - Capacity improvement of 5 trains per hour by running PM pattern all day.
  - The same benefit can be achieved by grade separating any busy junction.
  - Remember Franklin St and Burnley



Grade separated junctions 2

- **Grade separation and design for interchange**
  - Grade separation at junction avoids capacity penalty
  - Interchange between local and fast train is on a single platform.
  - Minimises exposure to constrained infrastructure for transfer between platforms.
  - Bring together platform faces to maximise interchange potential on a single platform

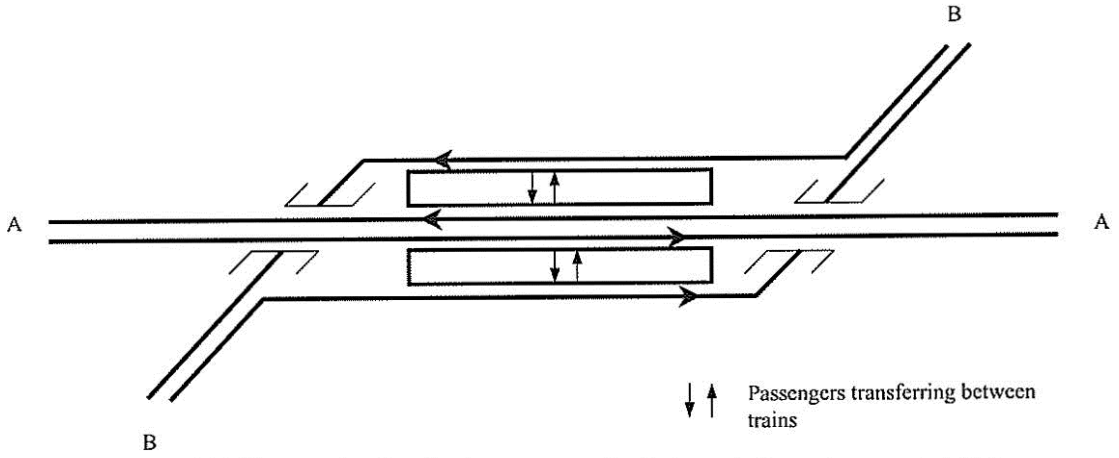


Figure 4.16 Metro station for simultaneous transfers between trains on two weaving lines.

Points used for facilitate interchange

- **Tokyo**
  - Home of “group running”
  - Junction points mediate between multiple lines in single direction
  - Opposing direction crosses grade separated

Grade separated junctions 3

- **Hong Kong**
  - Two interchange patterns accommodated using two stations
  - Turn back method at terminal avoids junction penalty on turn back

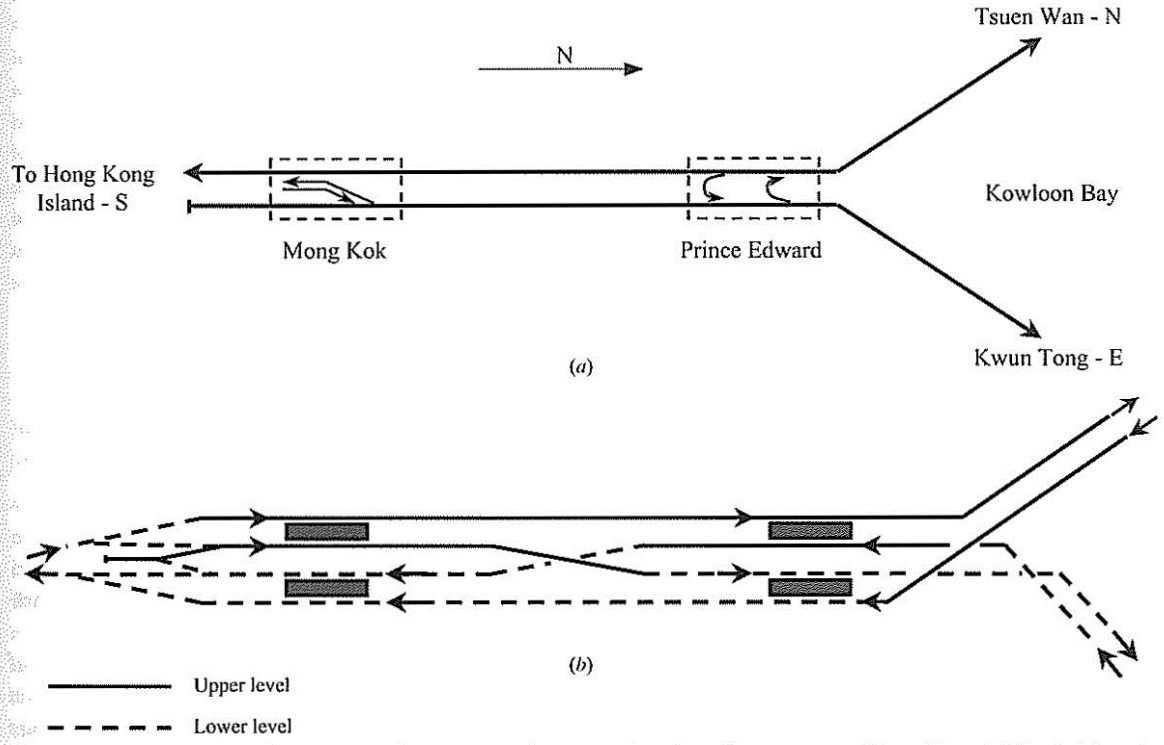
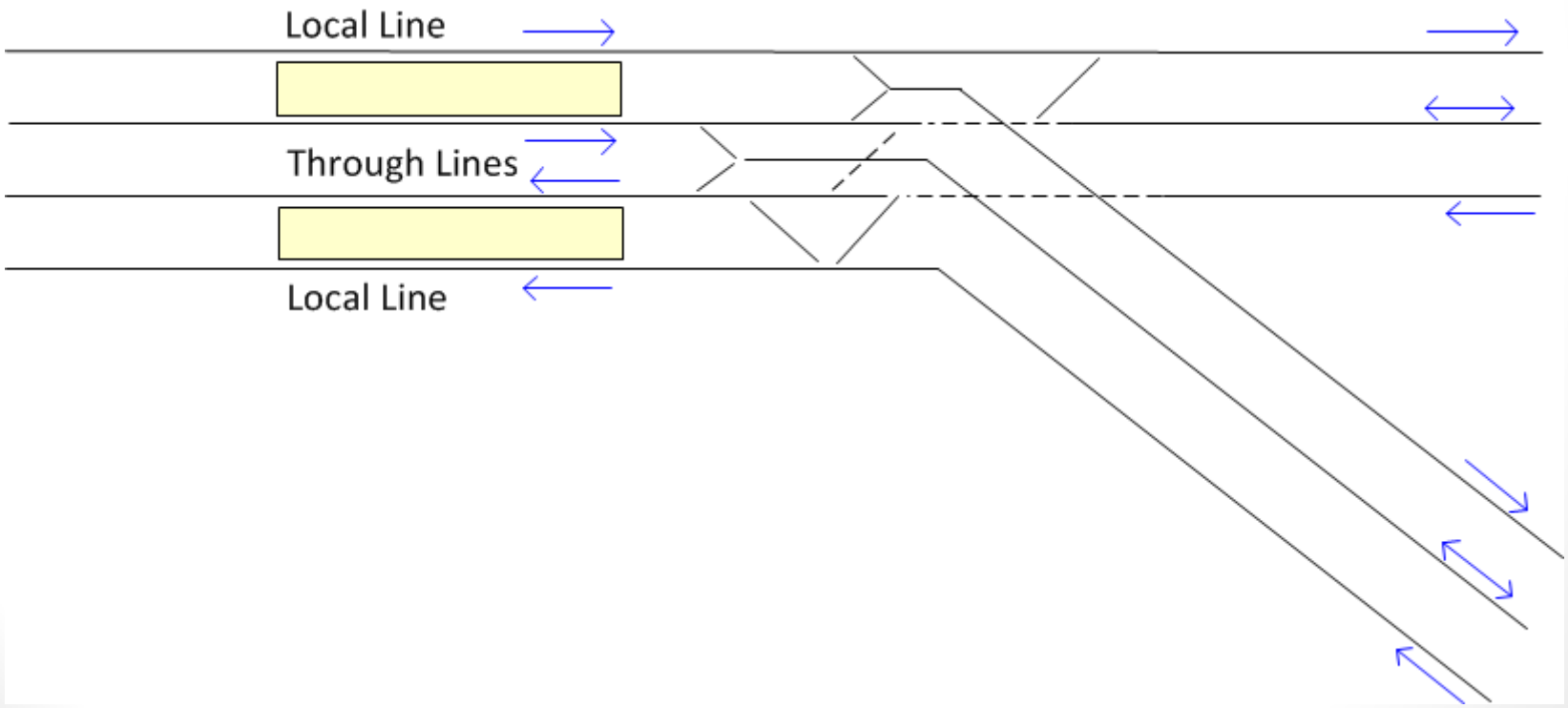


Figure 4.17 Two-station Y junction with across-platform transfers for all movements (Hong Kong MTR—left-hand driving): (a) distribution of transfers; (b) layout of tracks and platforms.

Grade separated junctions 4

- **Melbourne (indicative Glen Waverley line third track)**
  - Grade separated junction with triple track each way
  - Interchange between express and local on single platform



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Conclusion

- **Analyse and manage all components of 60 minute travel budget**
  - "Metro" style network to 10 – 20 km from centre
    - Consider passenger time between home and station
  - Express "suburban" style beyond 20km
  - Inter-urban style between identifiable centres
- **Grade separate busy junctions**
- **Design for interchange**
  - Use single platform interchange as preference
  - Design for all passenger flows
- **Growth follows network capability, rarely the other way around**