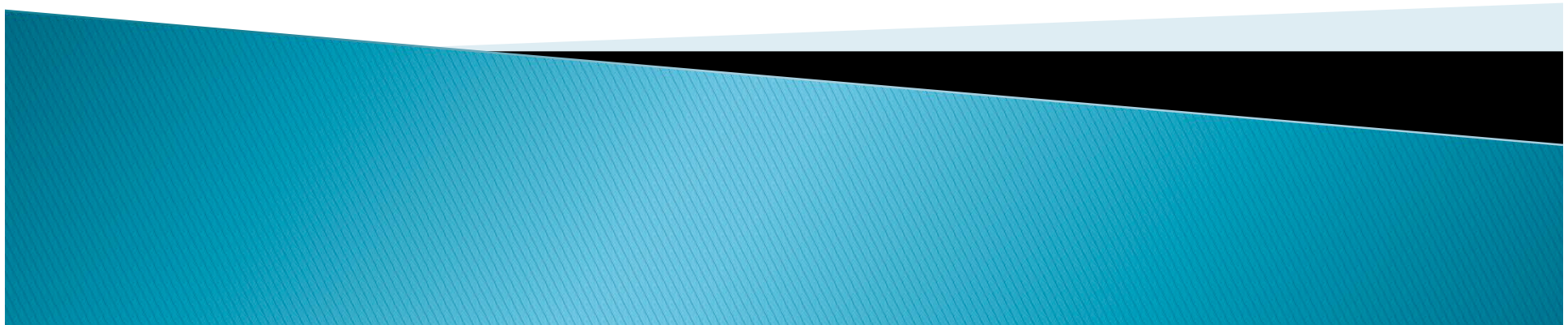




ANNUAL CONFERENCE

June 2013

WORKSHOP 1 Manchester Metrolink



Manchester Metrolink



Stuart Kay – AECOM
Lance Fogg – Arena Associates

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Manchester Metrolink

Workshop Structure

- ▶ Introduction
- ▶ Setting the Scene
- ▶ Metrolink 2013
- ▶ Workshop
- ▶ Feedback/Discussion



Introductions

- ▶ Us
- ▶ You
- ▶ Metrolink



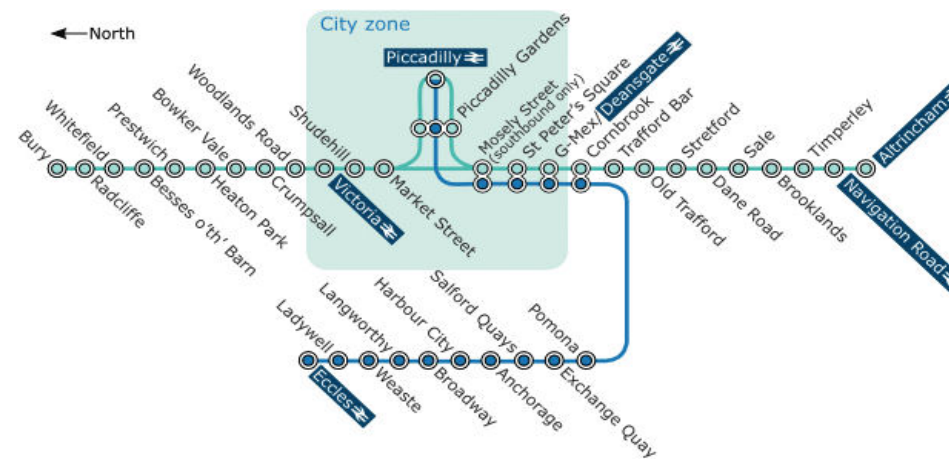
...just to set the scene...

- ▶ Manchester Metrolink was Britain's first second-generation street-running tramway
- ▶ Originally intended to link Victoria and Piccadilly railway stations – to provide "an integrated and efficient system of public transport" (GM Structure Plan)
- ▶ First leg to Bury included in Phase 1 – used former East Lancashire Railway connecting with Victoria station
- ▶ Runs off 750v DC powered via overhead line

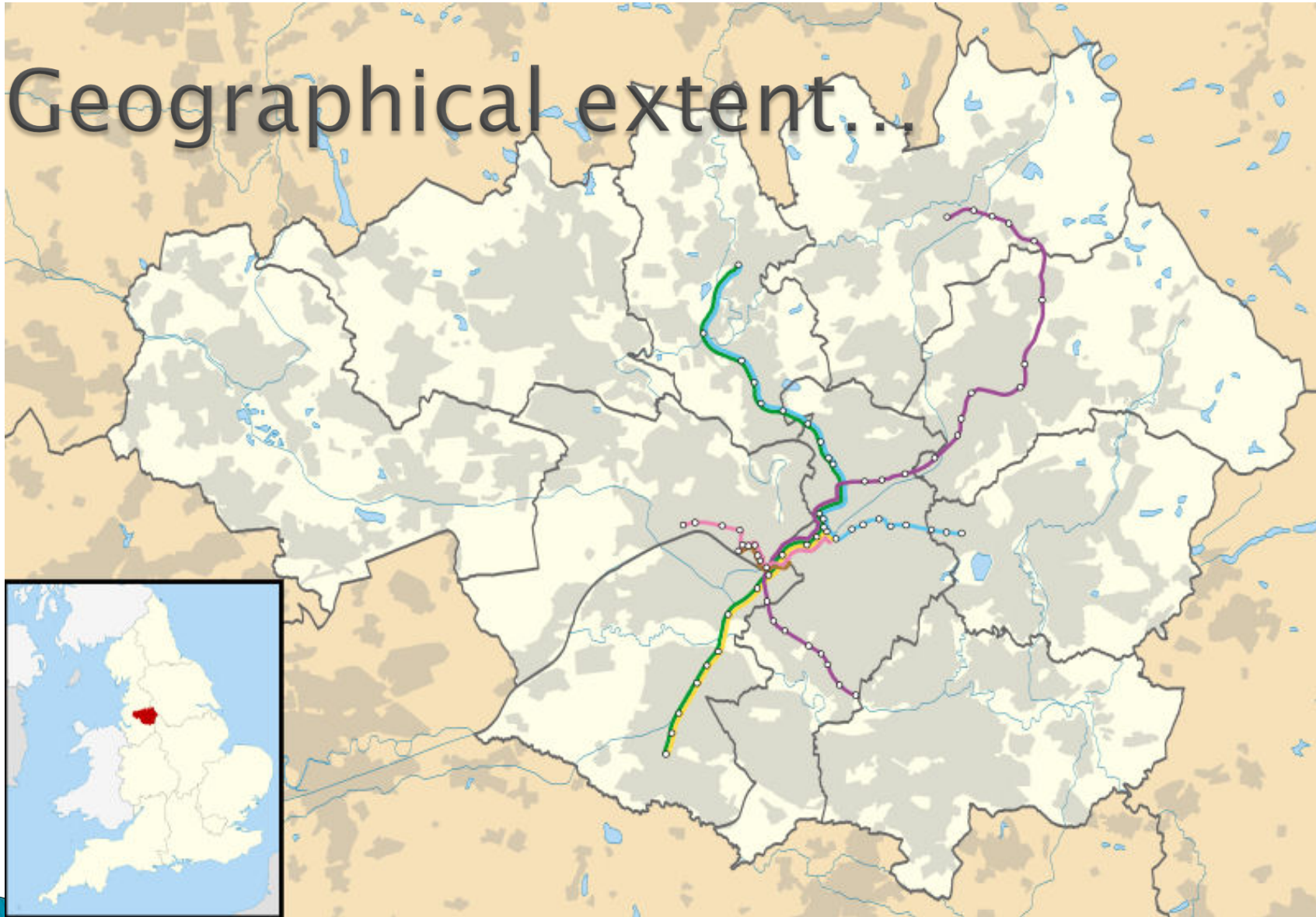


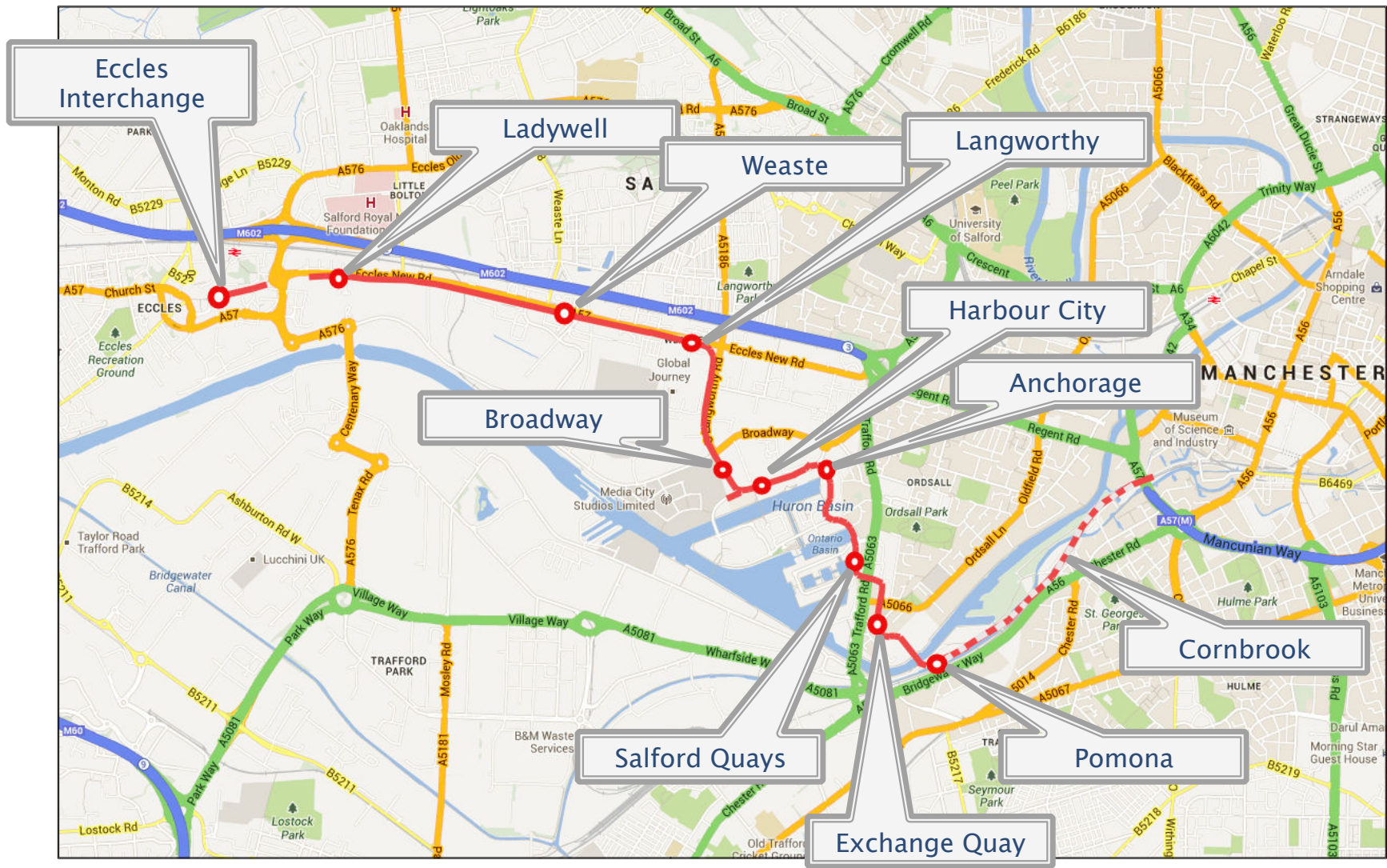
Further history.....

- ▶ Phase 1 extended to G-Mex and on to Altrincham in June 1992
- ▶ Originally estimated to carry 10 million passengers/year
- ▶ Salford Quays development resulted in Phase 2 to Eccles via the Quays - branching off Altrincham line at Cornbrook, opened in 2000
- ▶ 14.2 million carried in 2000; 21.8 million in 2011



Geographical extent...





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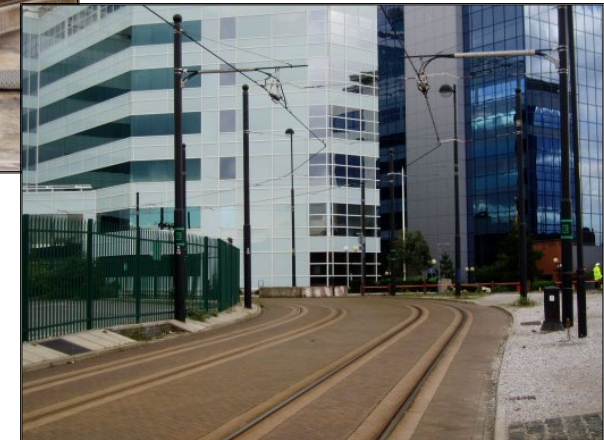
...some views along the route.....



Cornbrook Interchange



Pomona



Exchange Quay

...and further along....



near Harbour City



Langworthy



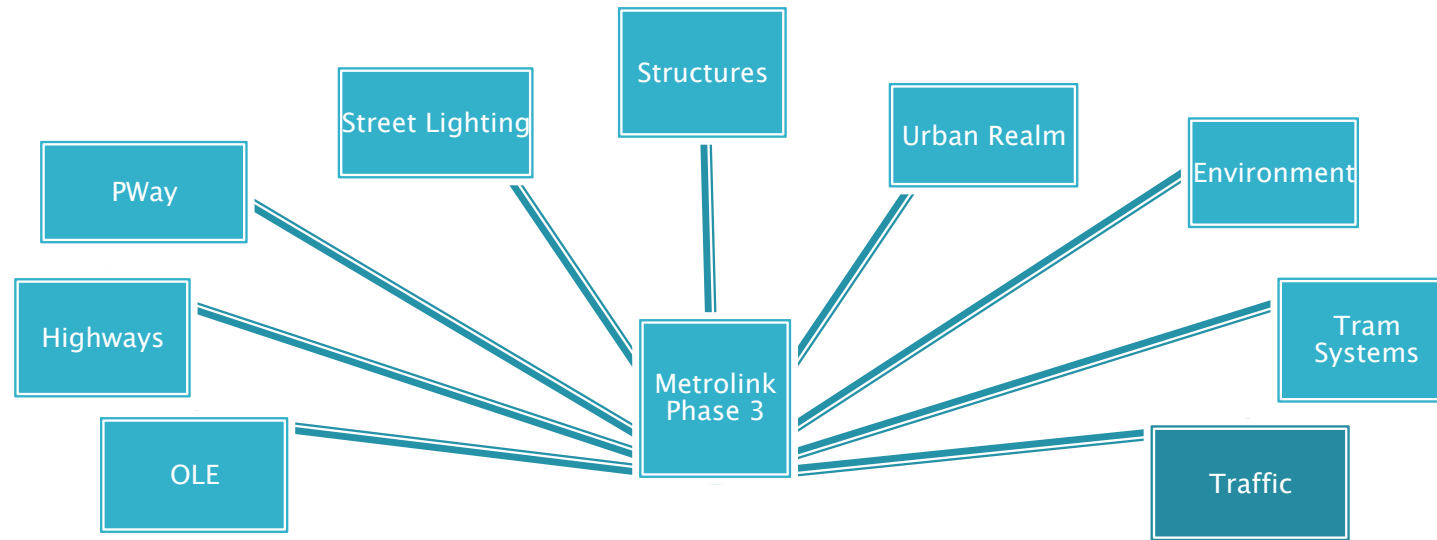
Ladywell tunnel

Metrolink 2013



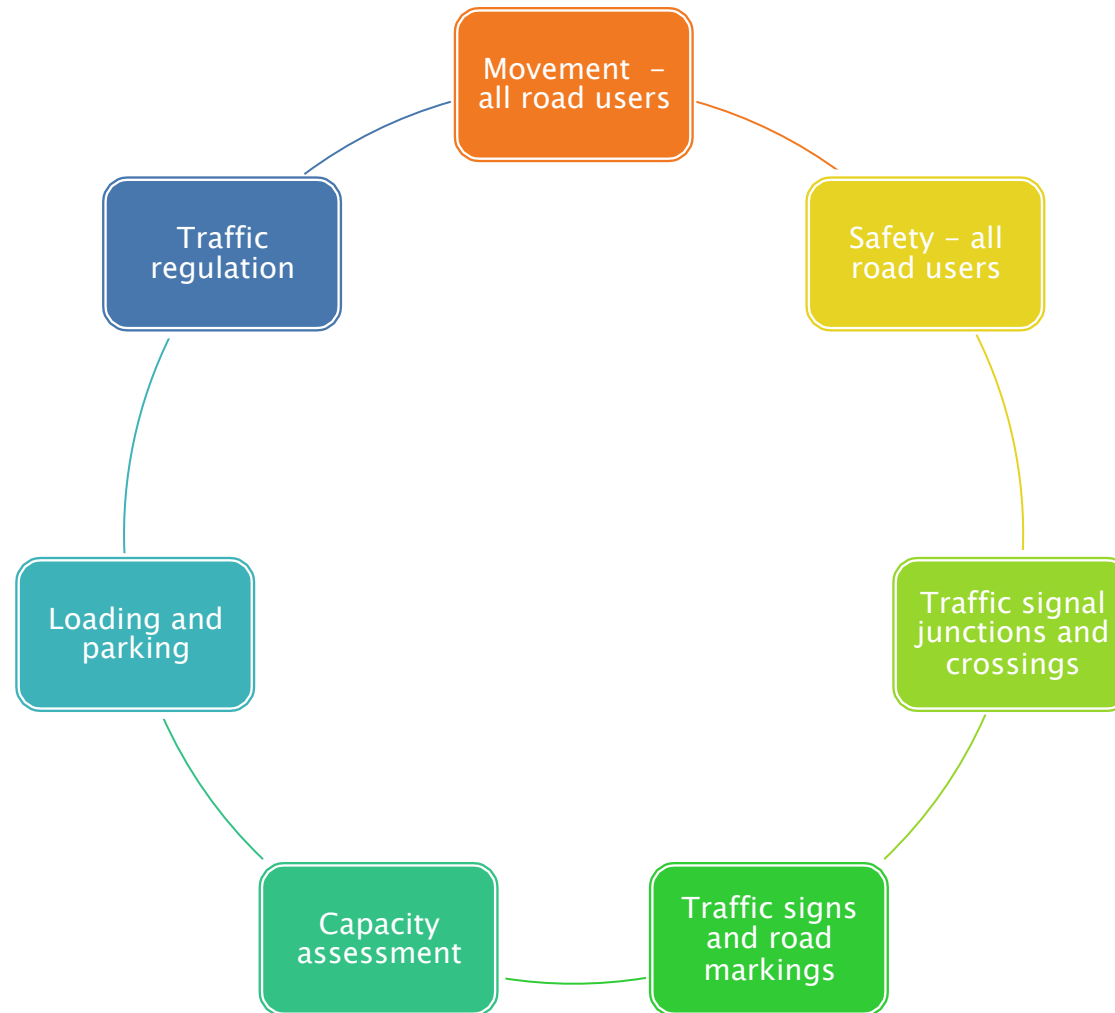
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Metrolink Phase 3 Engineering Design Disciplines

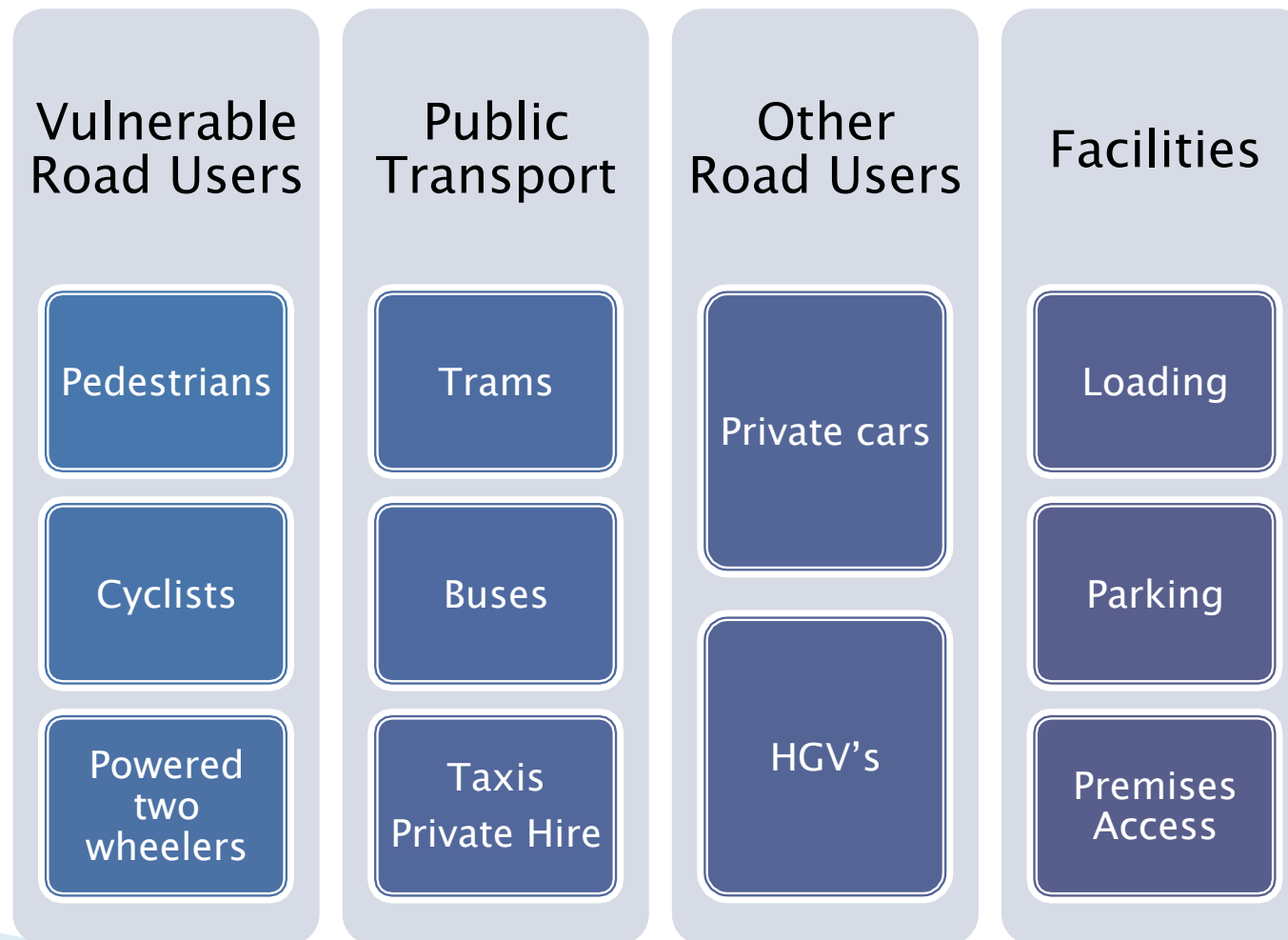


Complex Multi-Disciplinary Design Process

Traffic Design Scope



Traffic Design – Road Users & Facilities

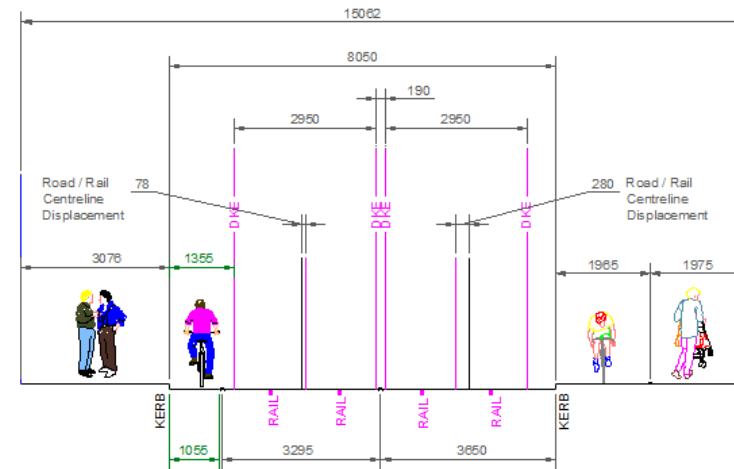
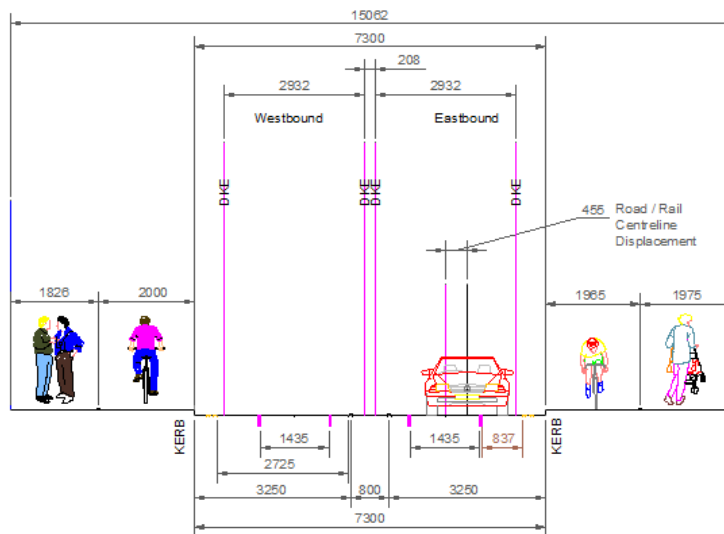


Key Design Constraints

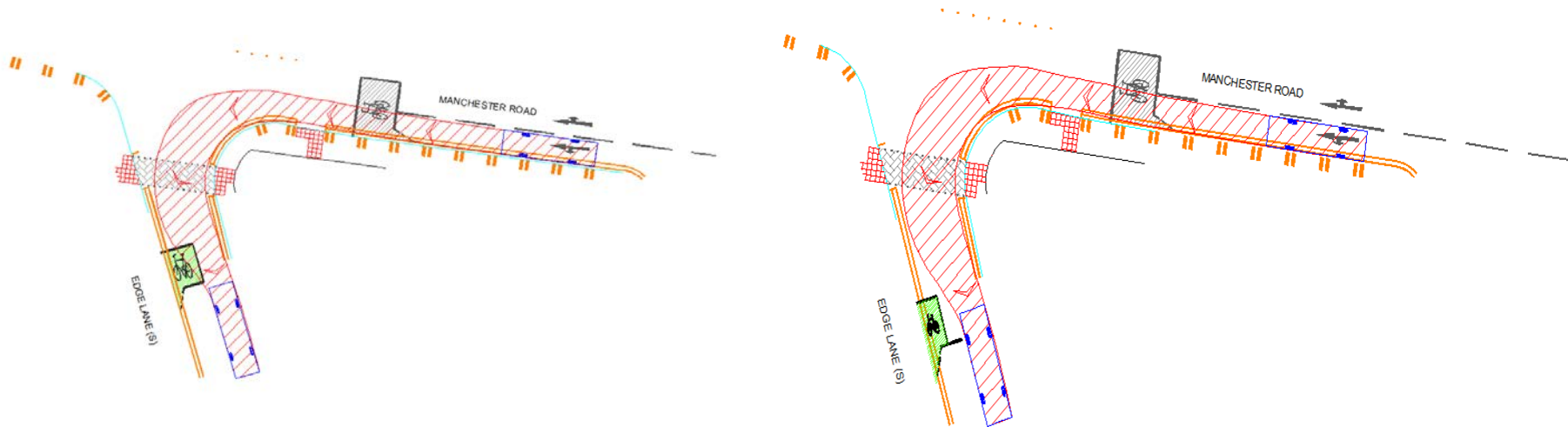
Street running tram design is complex and constrained by many factors including:

1. Land availability
2. Rail design
3. Highway design
4. Safety and Risk
5. Constructability and Maintainability

Constraints : Land availability Impacts on cross-section design

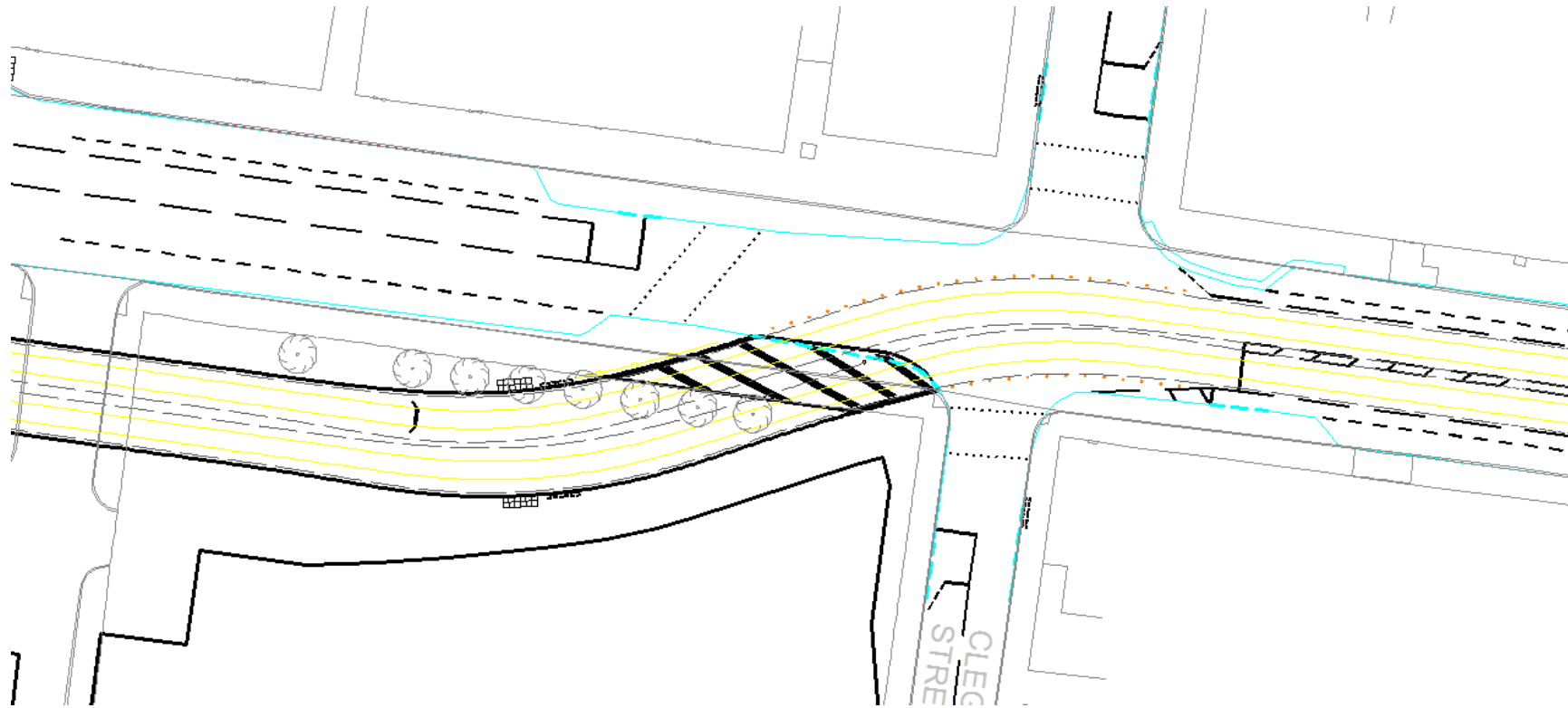


Constraints : Land availability Impacts on geometric design

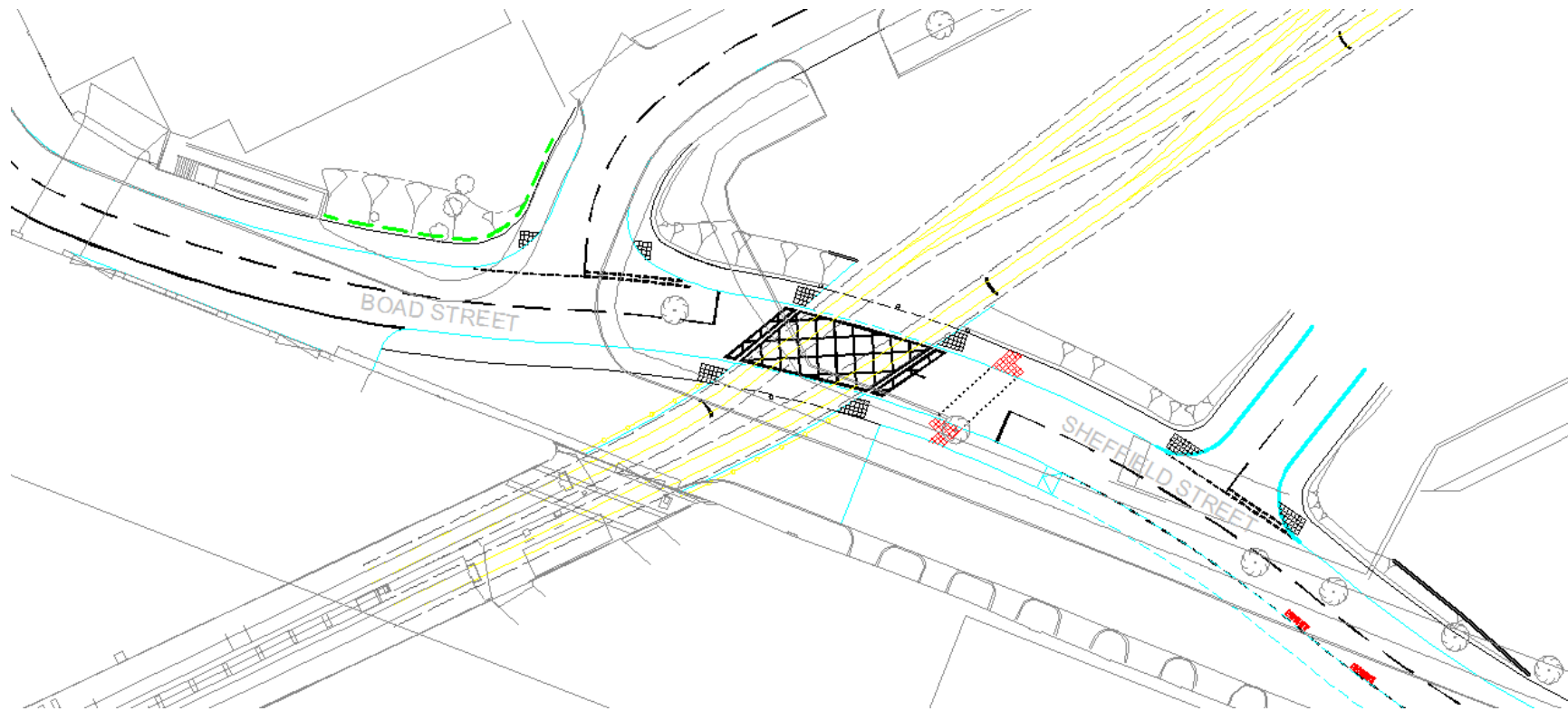


Constraints : Rail Design

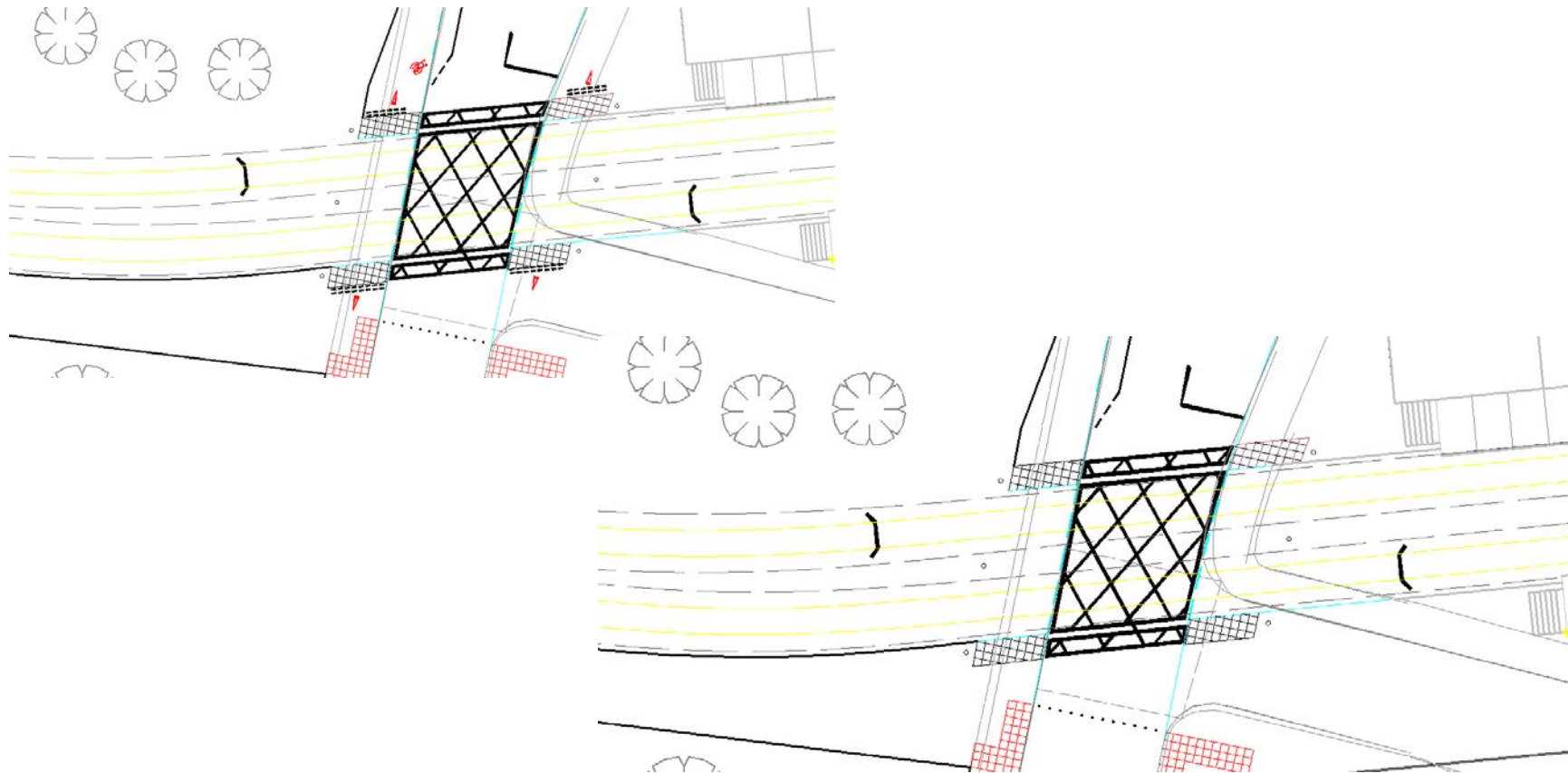
Impacts on geometric design



Constraints : Highway Design Impacts on geometric design

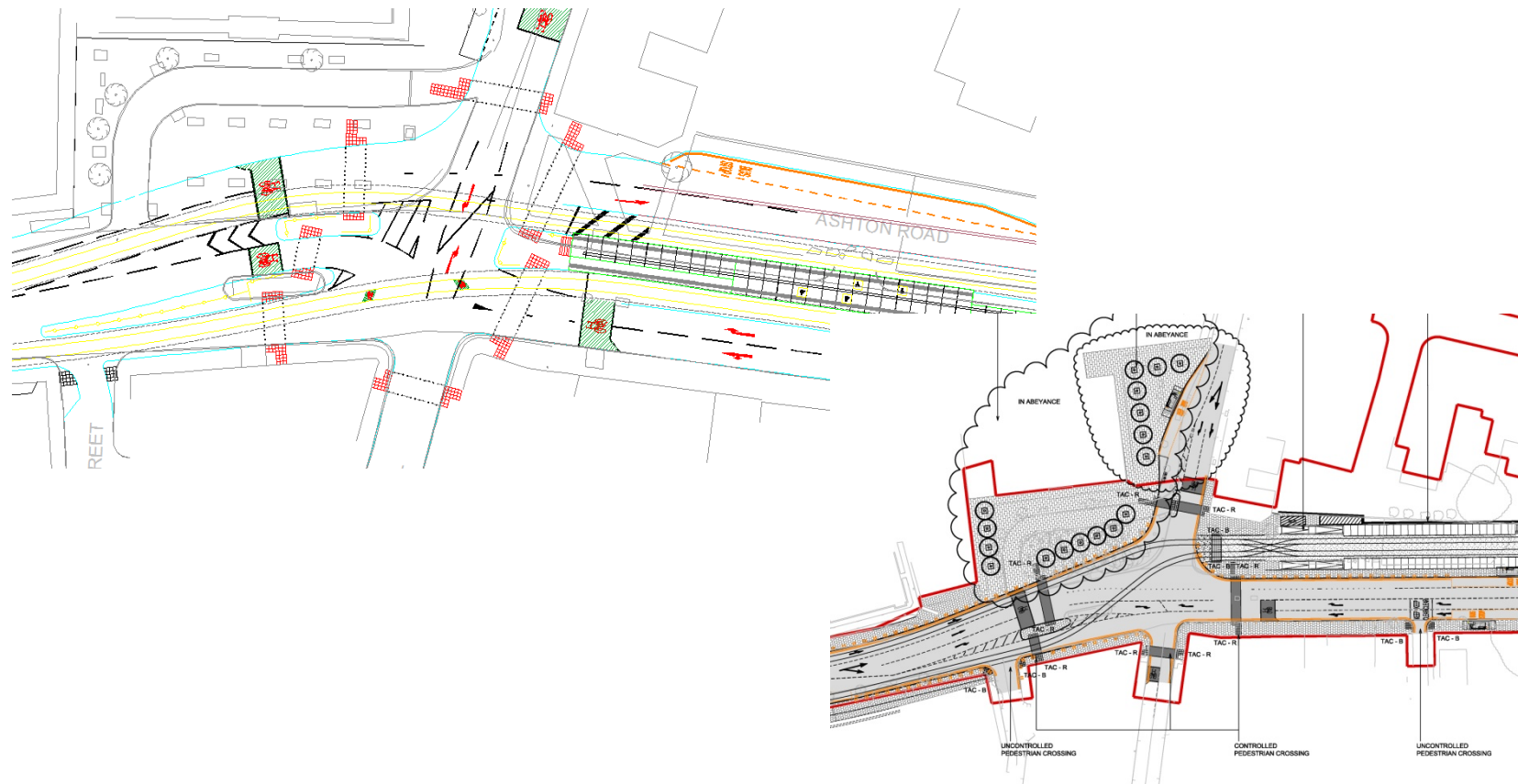


Constraints : Safety & Risk Impacts on all areas of the design process



Constraints : Constructability and Maintainability

Impacts on all areas of the design process



Design Constraints – In Summary...

- Constraints placed on design impact significantly on it.
- Constraints are the ‘challenges’ that are placed on designers of all disciplines
- Constraints are the source of one of the most commonly coined phrases in a design office:

“Quart in a pint pot”

Workshop

- ▶ Oldham Town Centre
- ▶ Werneth to King Street along Union Street
- ▶ 3 stops – Westwood, Olham King Street and Oldham Central

Workshop

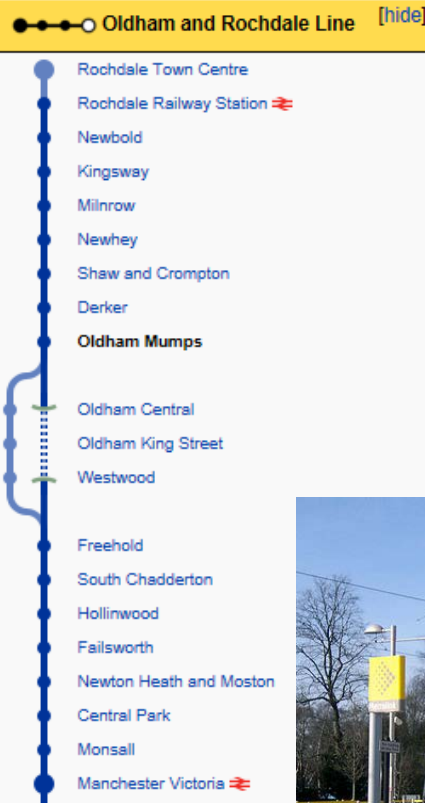
- ▶ Information provided:
- ▶ Traffic Signs
- ▶ Road Markings
- ▶ Traffic Signals
- ▶ Much more available.....

Central Park opened for Driver training Dec 2011



After three months in operation, Metrolink services to Oldham were hailed a "huge success" by TfGM, with 250,000 passengers on the line between June and September

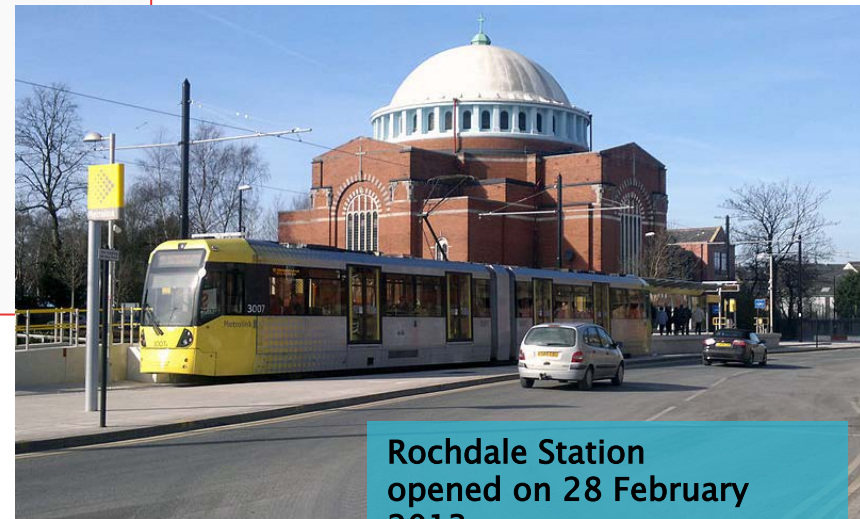
Oldham Mumps opened on 13 June 2012



Shaw and Crompton opened on 16 December 2012



Rochdale Station opened on 28 February 2013



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Feedback / Discussion



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Stage 3 RSA, July 2000

- ▶ First audit of Metrolink with street-running trams
- ▶ Audit team consisting of representatives from PBKD, Design and Risk Assessment, GM Police TM and Metrolink and Salford CC
- ▶ A full day's visit followed by night time visit



Issues arising.....

❖ Prevention of Entry to Tram Only Sections



Salford Quays – then

...and now

Risks –

- Little deterrent value of single bollard,
- Non-reflective bollards
- Little or no surface difference between tram track surround and highway

Recommendations –

- Additional signing,
- Retro-reflective bollards
- Unfriendly surfacing between tram and motor traffic



Issues arising.....

❖ Use of road junctions by trams



Sth Langworthy / Broadway
– then

Recommendations –

- Secondary road markings
- Additional / correct signing
- Warning signs

...and now

Risks –

- Road markings becoming obscured by stationary trams
- Incorrect signing
- Motor traffic vying with trams for position in approach lanes



Issues arising.....

❖ Yellow box junction markings



Eccles New Road, Weaste tramstop
– then

...and now

Recommendations –

- Redesign junction layout
- Deployment of road studs to emphasise road markings for traffic
- Use of deterrent paving

Risks –

- Edge markings could encourage motorists along incorrect line
- Excessive distances between stop line and junction
- Motor traffic has to judge turning trams



Issues arising.....

❖ Pedestrian safety



Eccles New Road, Langworthy tramstop – then

...and now

Recommendations –

- Guardrail
- Controlled crossings linked to adjacent signals
- Warning signs

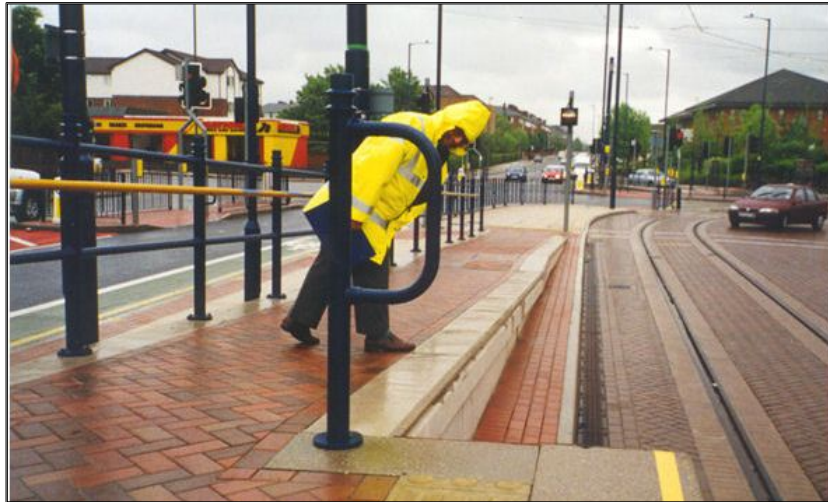
Risks –

- Pedestrians crossing unaware of trams
- Pedestrians crossing after alighting from trams in vicinity of tramstops



Issues arising.....

❖ Pedestrian safety



Eccles New Road, Langworthy tramstop – then

Recommendations –

- Pedestrian rail on ramps
- DDA compliant textured paving
- DDA compliant grades on ramps
- Adequate footpaths to platforms

...and now

Risks –

- Pedestrians falling off platforms and ramps
- Disabled pedestrians having difficulty accessing tramstops



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Issues arising.....

❖ Conflicts at junction exits



Eccles New Road / Stott Lane– then

...and now

Recommendations –

- maximise merging lengths
- nothing else specific!!

Risks –

- Traffic merging against trams – unexpected high performance
- Length of tram (double unit, 30m)



THANK YOU FOR YOUR PARTICIPATION

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Lance Fogg – Arena Associates

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