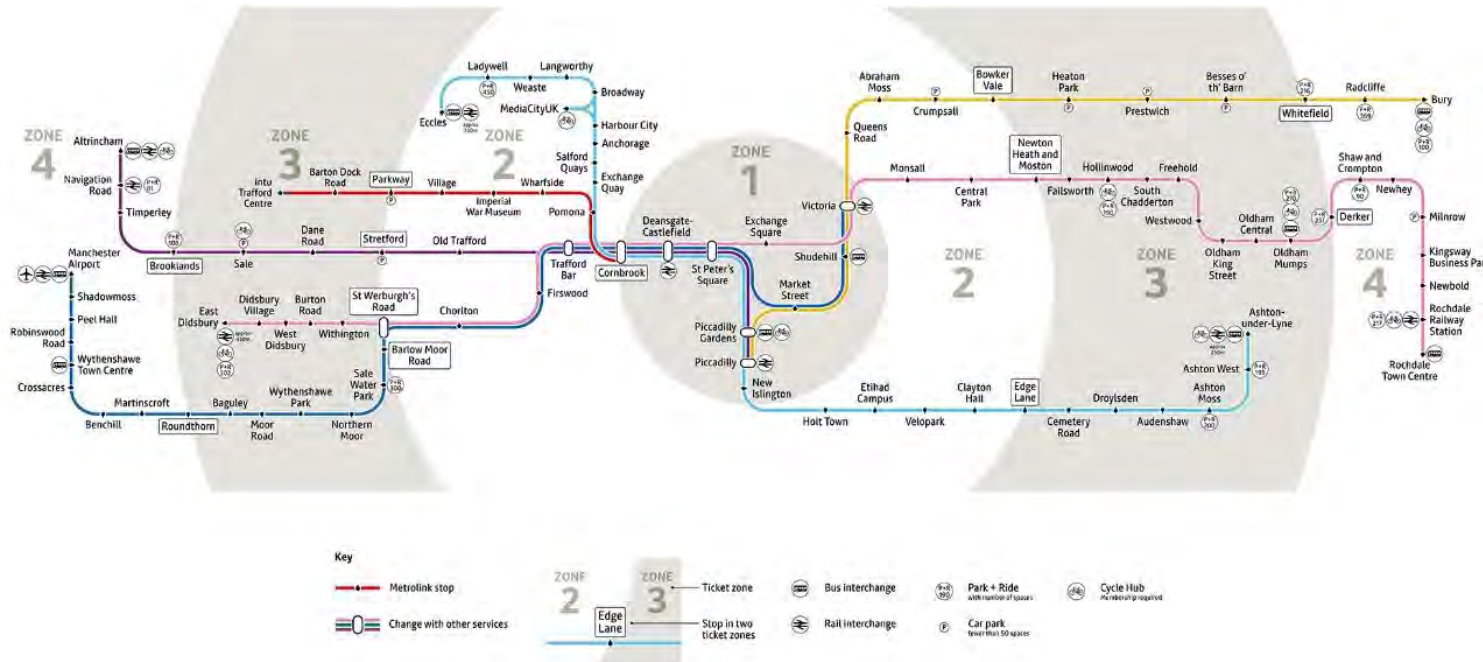




Keeping Greater Manchester Moving - Market St Curve Renewal Works

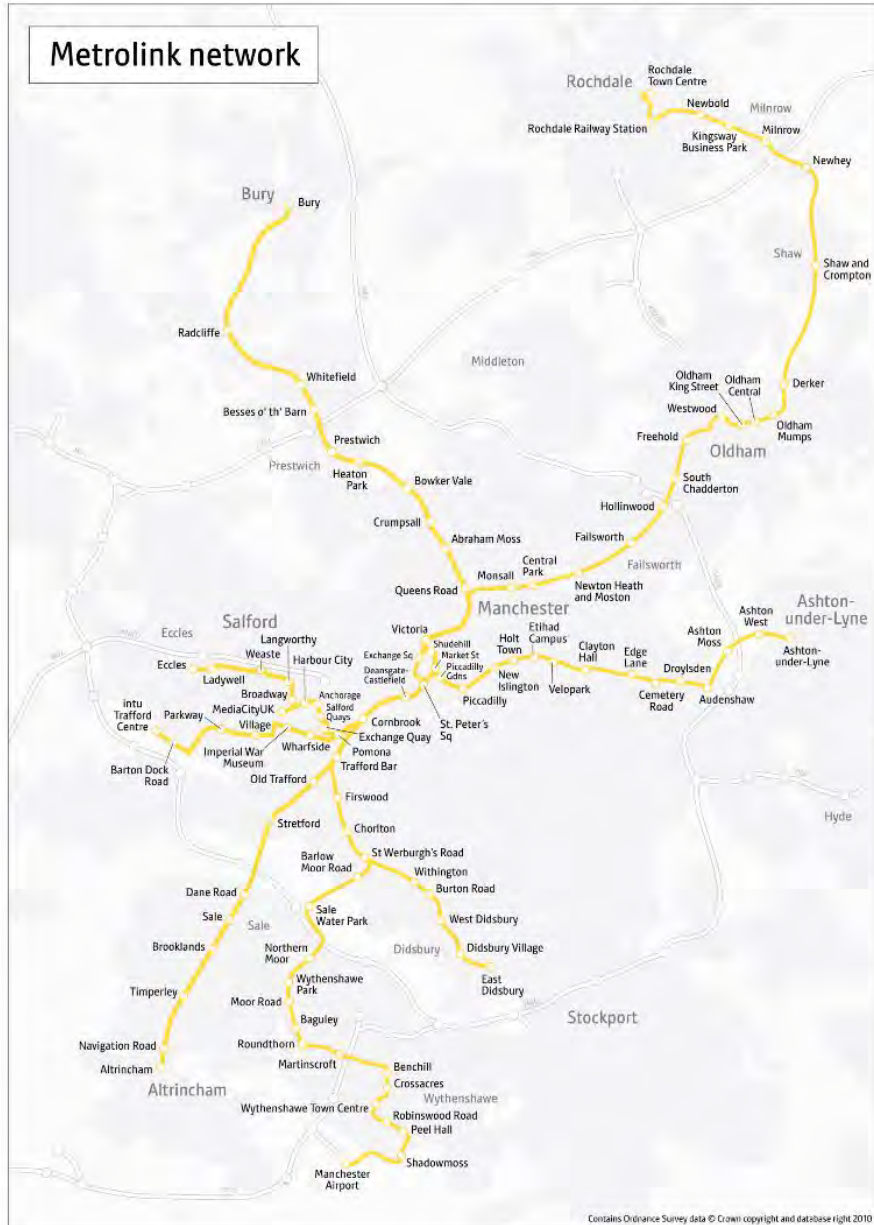
Head of Infrastructure - Jen M^cKinney
Capital Works Project Manager – Nick Coles-More

Overview



- Metrolink Background
- Covid-19 Measures
- Market Street Curve Rail Condition
- The Challenge – Renew or Shut 1CC!
- Operational Readiness
- Customer Comms
- Key Stakeholders
- Market Street Curve Renewal Work
- Programme Delays – Extreme Weather Alert
- Lessons Learned for the next Renewals

Manchester Metrolink Background



- Metrolink is the UK's largest tram network:
 - Running to a total of 101.5km
 - 8 lines
 - 99 stops
 - 120 trams (plus 27 due 2020)
 - 2 depots – Old Trafford and Queens Road
 - 7 (of 10) Greater Manchester Boroughs
- Keolis Amey Metrolink (KAM) commenced in July 2017 as Operator and Maintainer of Metrolink – 7+3years
- Manchester Metrolink owned by Transport for Greater Manchester (TfGM)
- TfGM are responsible for Renewals, Enhancements & Extensions

Keolis Amey Operator Maintainer



- Keolis Amey Joint Venture (KAM)
 - Keolis international passenger transport business
 - Amey leading supplier of consulting and infrastructure support services
- Keolis Amey are involved in 3 JV's:
 - Manchester Metrolink
 - London Docklands Light Railway
 - Wales and Borders

Trafford Park Line Launch – 22nd March 2020

- The new Trafford Park Metrolink line opened to the public to provide vital service to key workers in the area, seven months ahead of schedule.
- The new line added a further 5.5km of track and six additional stops constructed by MPT (Laing O'Rourke, VolkerRail and Thales).
- The delivery of the new line supports Greater Manchester's progress towards a London-style transport system. Launched in June 2019, 'Our Network' is a ten-year plan to create an integrated, modern and accessible public network – of which further Metrolink extensions and the introduction of tram-train are focal points.

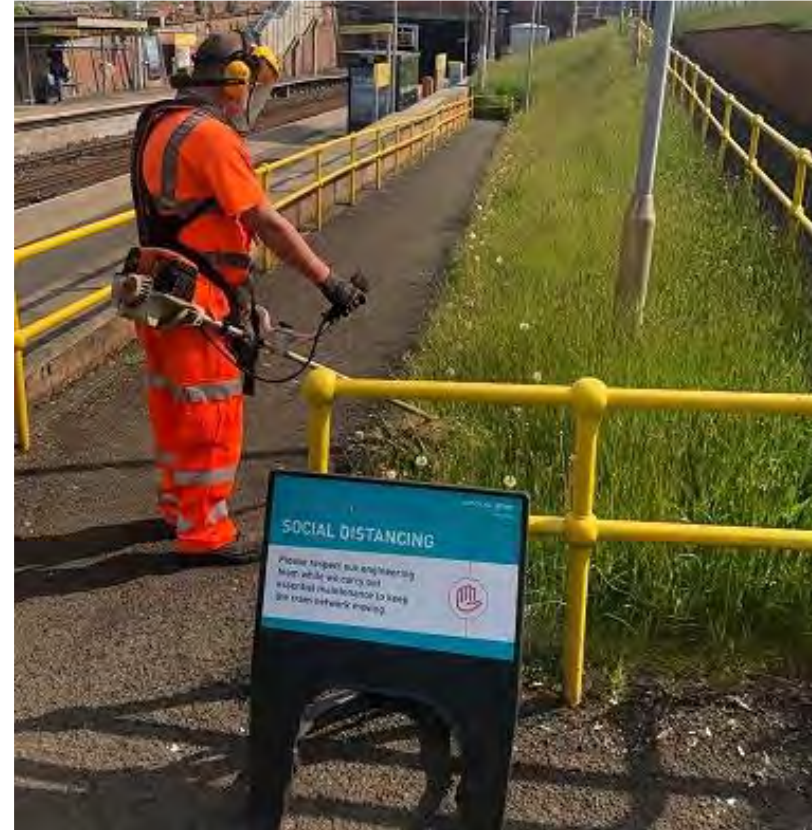


Covid-19 Measures

KEOLIS amey
Metrolink

SOCIAL DISTANCING

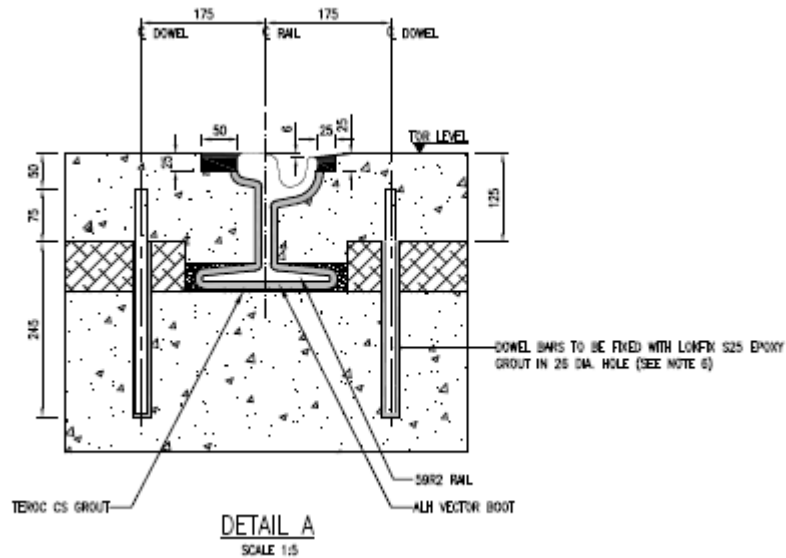
Please respect our engineering team while we carry out essential maintenance to keep the tram network moving.



Security resources
to support
essential
maintenance in
Street running
areas

- Special coronavirus related safety signage has been created to keep colleagues safe.
- The messaging reminds members of the public to respect our colleagues and observe social distancing measures when they see essential maintenance work taking place to keep the tram network moving.

Market Street Curve Rail Condition



Temporary Approved Non-Compliance (TANC):

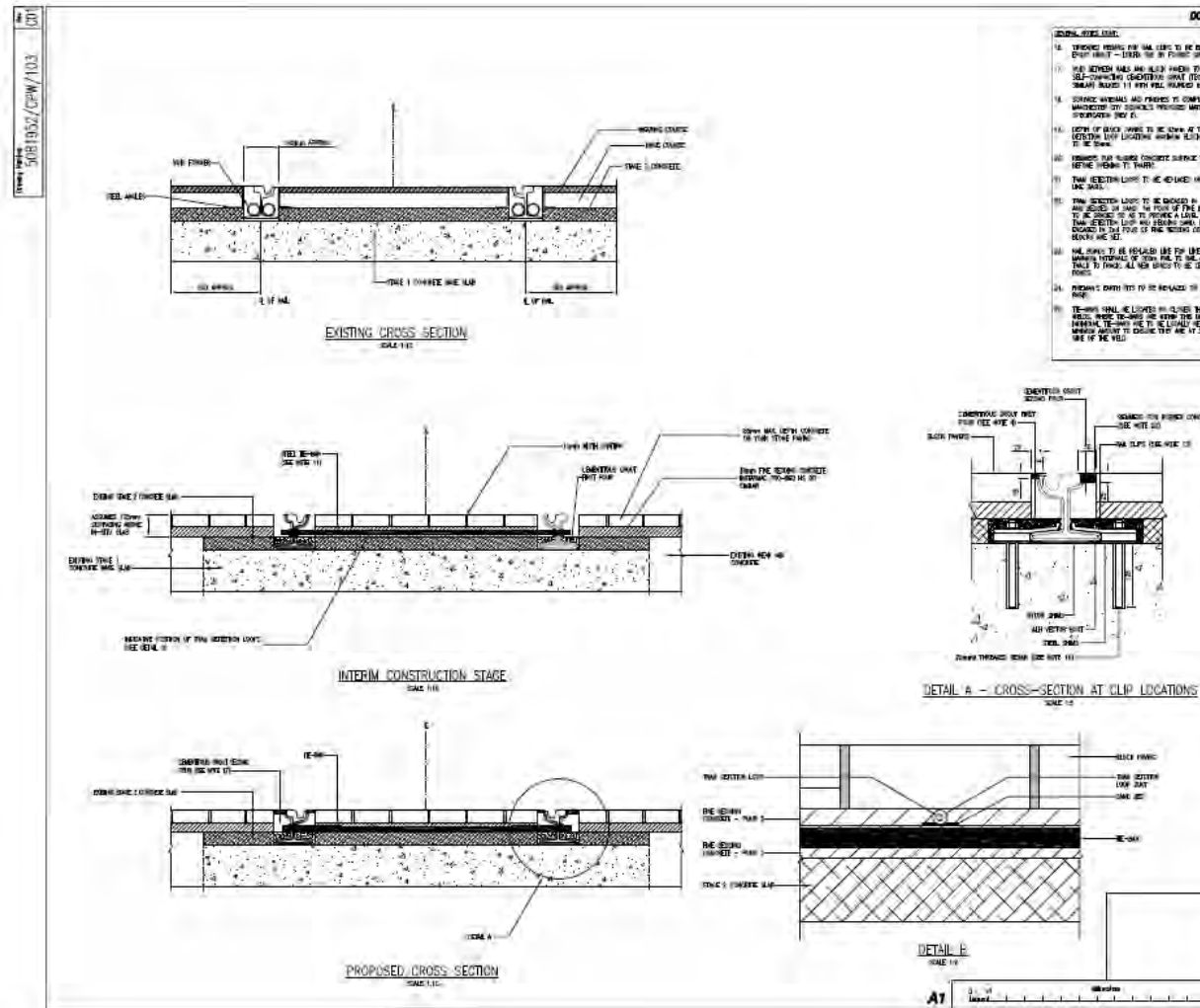
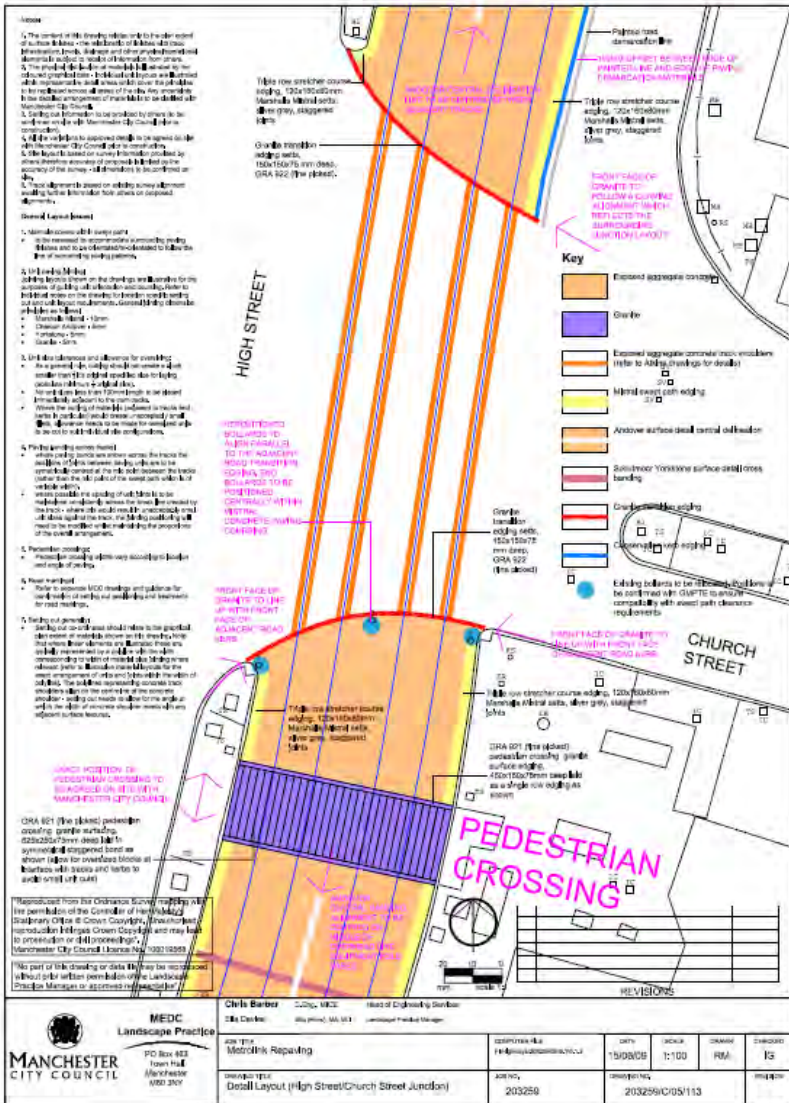
- TSR of 5 MPH in place
- Dye Penetrant Testing every two weeks until the curve is renewed
- Results from the Dye Penetrant Testing to inform when the line is closed and any cracked keep is removed
- Wear measurements recorded every two weeks
- Visual inspection daily

Market Street Curve CC69 to CC81 measurements.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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Reduced traffic pattern due to Covid 19 Government restrictions on travel and the TSR of 5 MPH imposed through curve has reduced the wear through the curve apart from discrete locations which can be seen on the spread sheet. Service to ramp up from 20 min to 12 mins from 26 May 20. TANC process conditions to remain in force. Service change to 10 mins from 22 June 20. TANC process conditions revised 17 June 20 and issued for action 18 June 20.



The Challenge – Renew or Shut 1CC!

[illegible]

Operational Readiness

Operational Readiness Plan
Market Street Curve and
Hagside Demolition Works



Saturday 8th to
Sunday 16th August
2020

- Amended tram service pattern
- Bus replacement service
- Customer Service Reps deployment plan
- Crowd control arrangements
- Vulnerable and disabled passenger arrangements



Customer Comms

August 2020 – Planned engineering works



Saturday 8 to Sunday 16 August Market Street and Shudehill closure

Lines affected: Airport – Victoria and Bury – Piccadilly

Due to planned engineering works no services will operate via Market Street or Shudehill during this time.

Bury services will operate to Victoria only.

Airport to Victoria services will operate via Exchange Square.

During this time customers are advised to change services at St Peter's Square or follow the walking routes provided.

Sat 15 and Sun 16 August Bury to Whitefield closure

Line affected: Bury – Piccadilly

Due to works taking place between Radcliffe and Bury there will be no services operating between Bury and Whitefield.

Bury services will operate Whitefield to Victoria.

A bus replacement service will operate between Bury and Whitefield on both days.

Due to other works taking place in the city centre (see above) passengers wishing to travel towards Piccadilly are advised to change at St Peter's Square.

Alternatively, alight at Victoria and follow the walking routes provided.

Sat 22 and Sun 23 August Bury line closure

Line affected: Bury – Piccadilly

Planned engineering works will be taking place on the Bury Line.

No tram service will operate between Bury and Piccadilly.

A bus replacement service will operate between Bury and Piccadilly calling at every stop on both days.

Please check before you travel.
To plan your journey visit tfgm.com

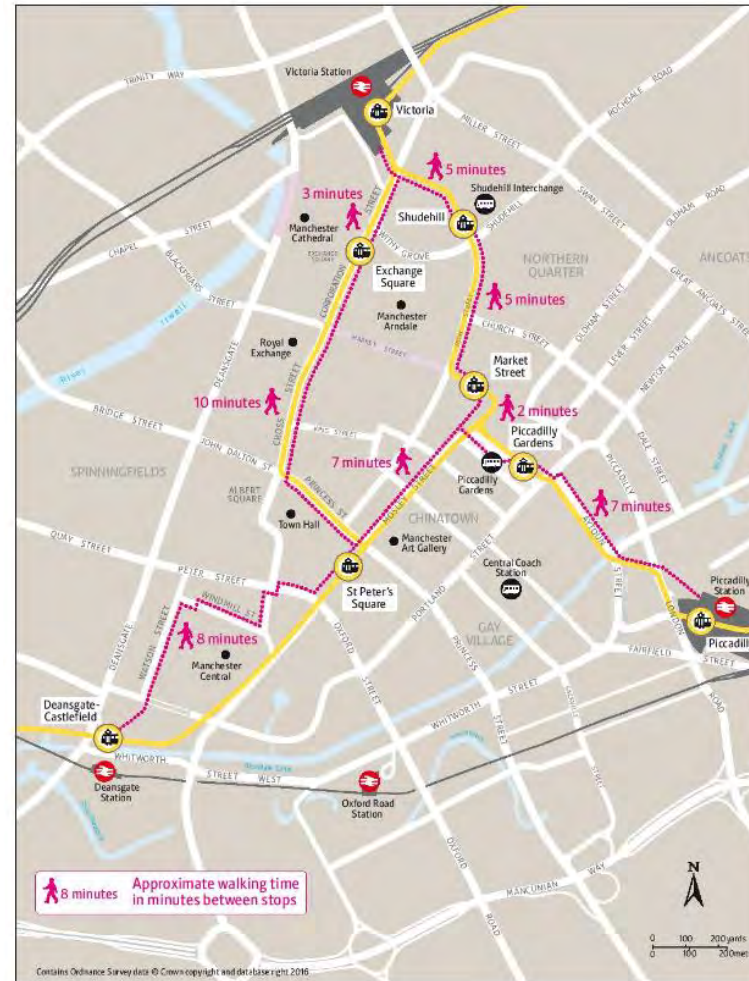
For detailed service information please download the Metrolink app, available on Apple and Android

tfgm.com

@McMetrolink

0161 205 2000

or use the Help Point on this platform



THIS SIDE FOR:
• Debenhams
• William Hill
• Saints & Sinners
• Johnsons Cleaners
• Cafe Metro
• Bet Fred



THIS SIDE FOR:
All other shops and walking routes

Follow the signs for the Metrolink stop in PICCADILLY GARDENS



PICCADILLY GARDENS METROLINK STOP



VICTORIA STATION METROLINK STOP

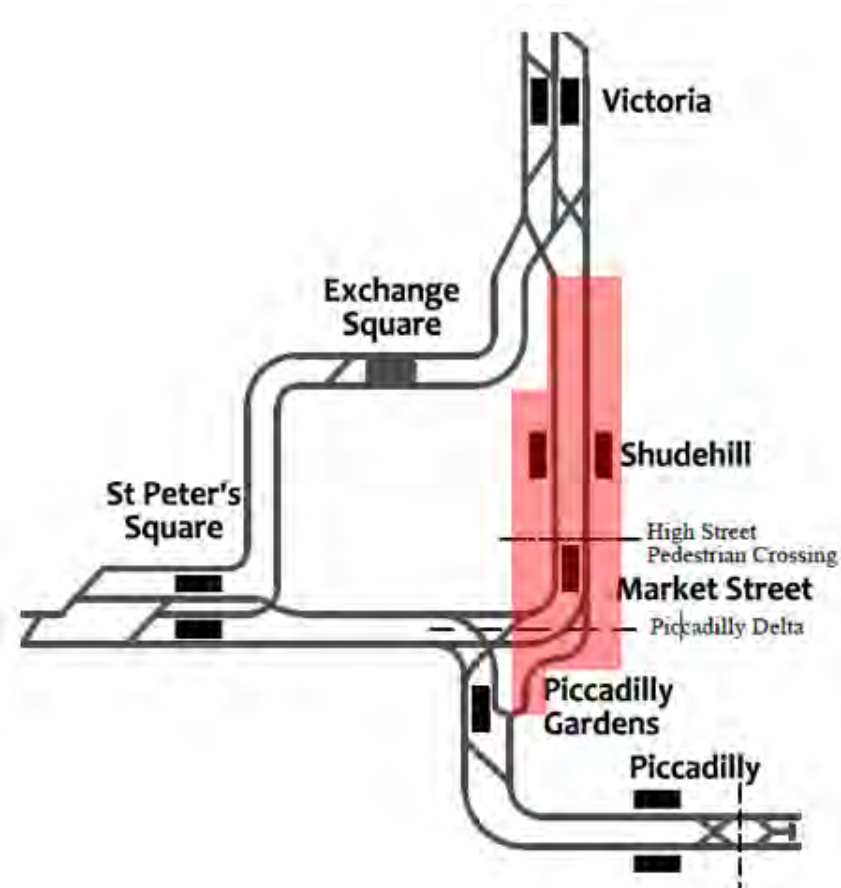


Key Stakeholders

- Key businesses and priority stakeholders were engaged with in advance and during the works, including:
 - The Mayor, MPs and ward councillors
 - 22 surrounding businesses including Debenhams
 - City Council and the Chamber of Commerce
 - Passengers were informed via on-stop assets (such as posters and PA announcements), website updates, updates to Metrolink / get me there database, across social media, partner channels and through proactive engagement with media.
- Letters were sent out to 1072 local properties with contact details and information.

Market St Curve Renewal Works

Inbound curve rails from approx. Bridgewater PI Market Street replaced to midway down Market Street Platform to renew life expired rail, removal and reinstatement of pedestrian blockwork over 53m immediately outside Debenhams, Manchester City Centre.



Worksite Setup – Site Perimeter, Signage & Security



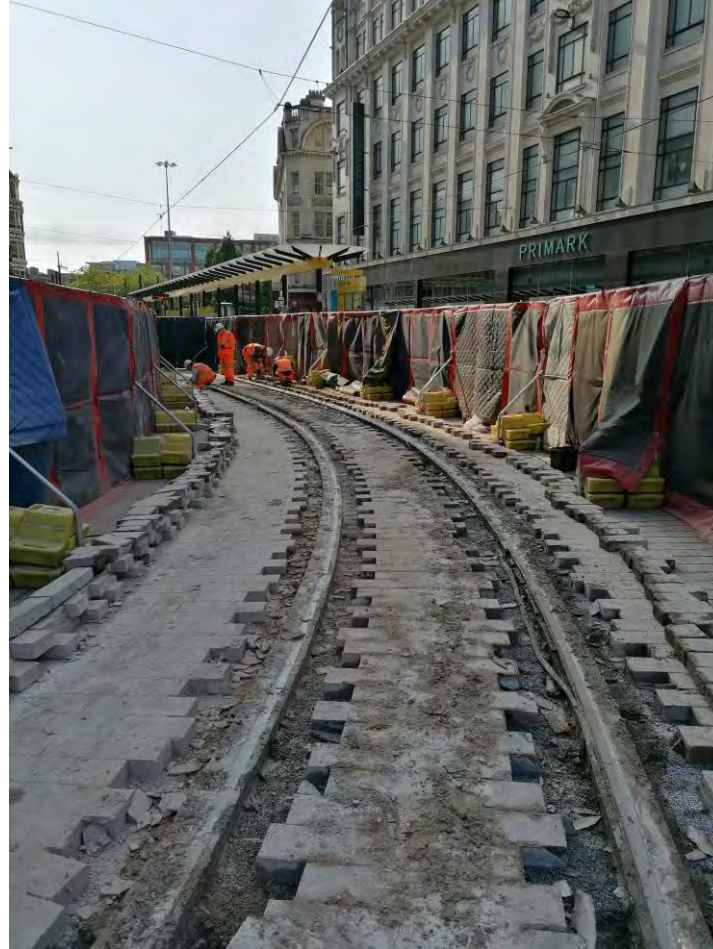
- Delivery and installation of Heras fencing for site perimeter
- Wayfinding signage for customers
- Delivery and set up of welfare facilities
- Travel Safe Offices deployed over night managed instances of anti-social behaviour from the public

Worksite Setup – Acoustic Barriers & Noise Monitoring



- Delivery and installation of acoustic barriers
- Commencement of noise monitoring
- Stakeholder management with adjacent business owners to ensure concerns are addressed

Block Paving Removal

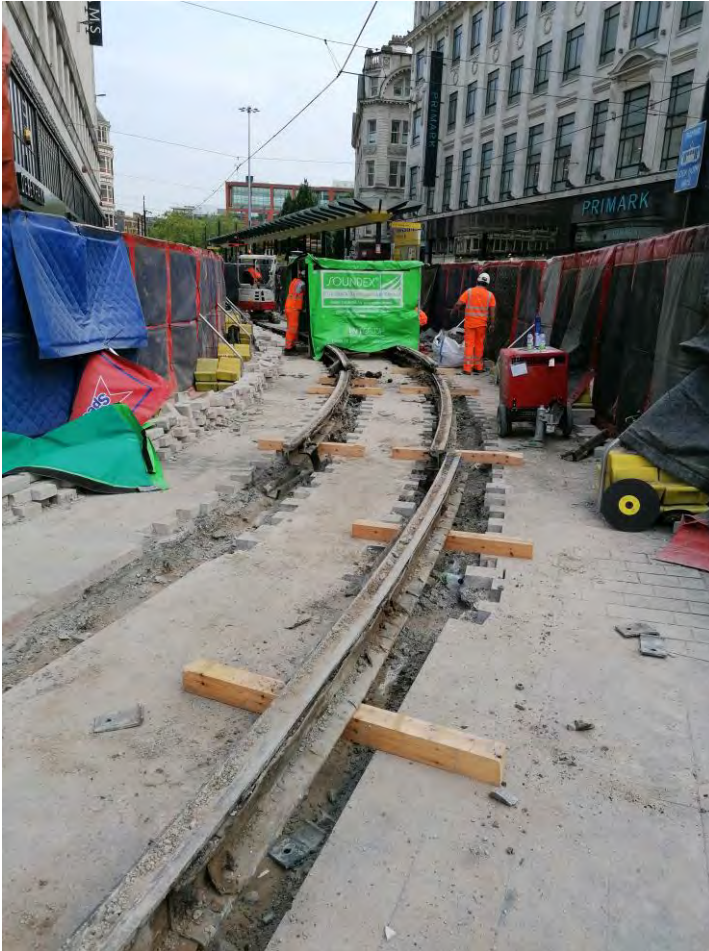


Block Paving Removal cont.



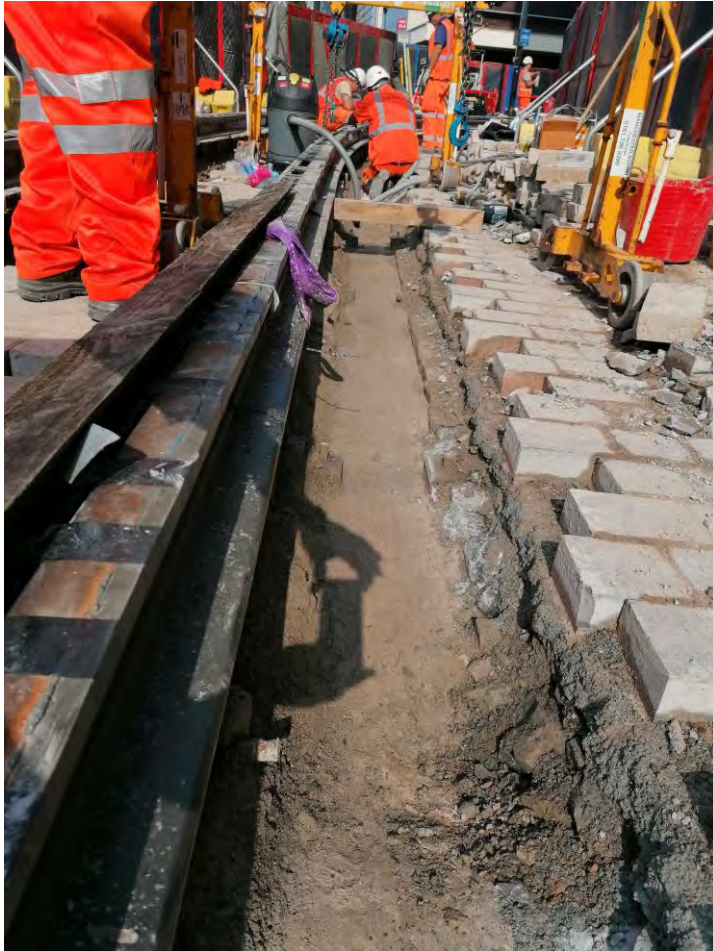
- Exposure of clips for rail removal
- Removal of grout around clips was slower than anticipated
- Concrete encountered through pedestrian crossing was unexpected and slowed down break out

Rail Removal



- Rail removal
- Breakout of grout from trough
- Establish weld pits
- Acoustic shroud over concrete breakout reduced noise impact of works

Rail Installation



- Breakout of grout from trough
- Cleaning of Trough
- Remove blocks at tie bar locations
- Install and Low & High Leg Rail
- Line and Level low and high leg rail

Tie bars and Stray Current Testing



- Re-Cleaning of Trough
- Tie in welds
- Tie bars installed
- Stray current testing

Rail Installation cont.



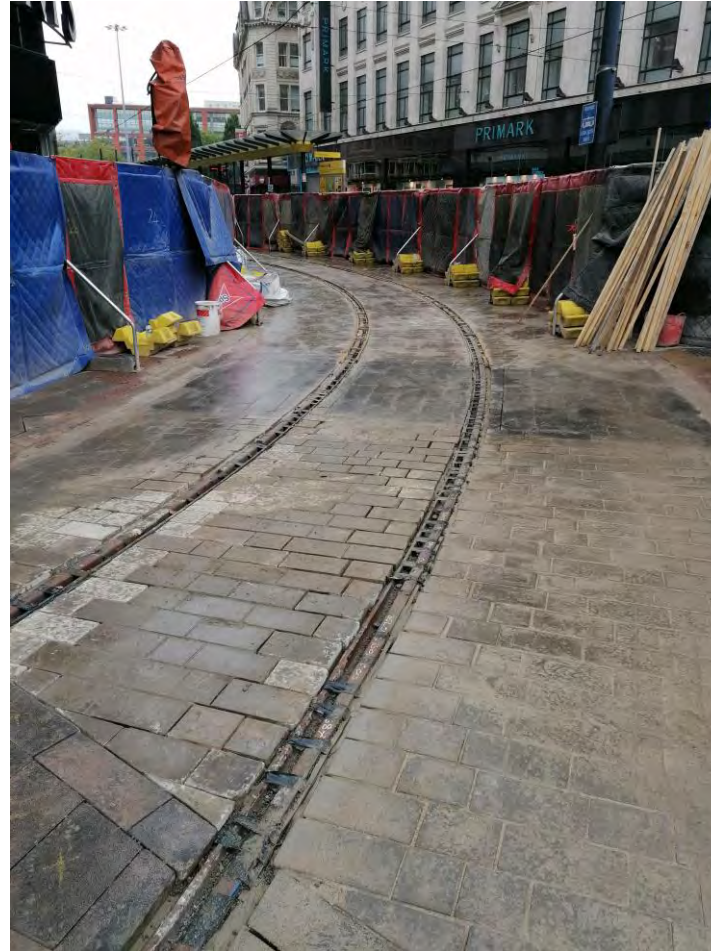
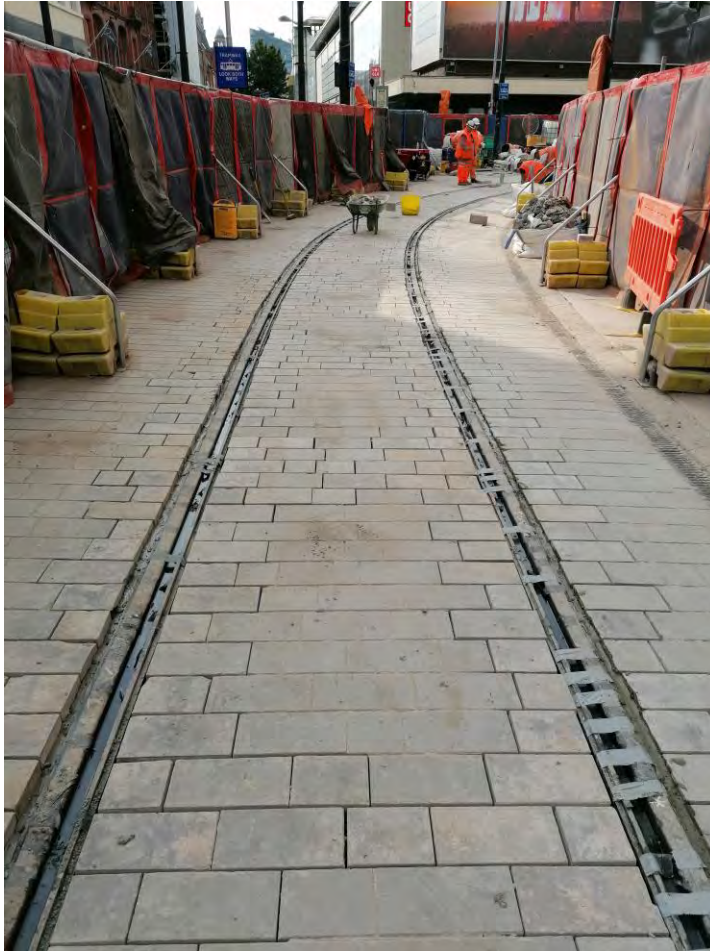
- Finalisation of tie bar install, painting and taping
- Removal of redundant materials and plant from site
- Vector boot rectification
- Line and level low and high leg rail
- Grout pour

Reinstatement



- Grouter walking route to be improved to reduce trip hazards
- Laying of drop sheets to protect surface at grout station

Reinstatement cont.



- Delap photos used to assist with reinstatement of pedestrian crossing block paving arrangement
- Laying of blockwork and base prep/laying
- 2nd stage Grout Pour
- Exposed aggregate similar finish to existing surface

Extreme Weather Impact



KEOLIS amey Metrolink
Extreme Weather Action Team (EWAT)
Extreme Weather Alert
Risk to Network Operations
MINOR
Date
Thursday 13th until Monday 17th August 2020
Type of Weather Forecast
THUNDERSTORM
Severity of Forecast
Severe Thunderstorms & Hot Weather

Forecast (from Meteogroup)				
THU 13/08		25° / 16°	Beautiful with some sun	25% →
FRI 14/08		23° / 15°	A couple of thunderstorms	62% →
SAT 15/08		21° / 16°	Some sun with a thunderstorm	55% →
SUN 16/08		21° / 15°	A couple of thunderstorms	62% →
MON 17/08		21° / 14°	A couple of thunderstorms	61% →
Commentary				
Short term forecast				
Very warm and humid this afternoon with spells of hazy sunshine. However, a few scattered thunderstorms are likely to break out at times, especially through this afternoon. This evening, any thunderstorms will gradually fade. Overnight, it will then be largely dry with some clear spells, although it will become mostly cloudy through the early hours. A muggy night. Tomorrow will be largely dry but there will be a good deal of cloud. A few sunny spells may develop at times, especially in the afternoon. Cooler with a moderate north-easterly breeze.				
2 to 5 day forecast				
Friday is expected to be mostly cloudy with spells of showery rain at times, which could be thundery. Cooler than in recent days but still rather muggy. For Saturday, it then looks to be largely dry with a few sunny spells but there will be a good deal of cloud. Sunday looks to be mostly cloudy with the chance of a few showers moving in at times.				
KAM Response				
- Proactive check of Agility to assess any asset risks - Manchester Urban Cleaners to be placed on Standby - Adapted Run Out Sheet offering less double services, but in order to protect frequency of services throughout EWAT Period - Bottled Water to be distributed to Driver and CSR Rest Facilities - Drivers to have whiteboards updated to remain vigilant for OHLE Sagging and Track Buckling - Heat Patrols to take place throughout affected days (May result in Emergency Speed Restrictions being placed) - Usual Emergency Speed restrictions to be placed between Weaste and Eccles (15mph) and Martinscroft (15mph) due to OHLE Risk.				

ALH Installation



Site Demobilisation



Lessons Learned

Lessons learned for the next City Centre renewals:

- Concrete breakout challenges
- As built quality
- Handling of rail within tight confines
- Damage to infrastructure which could be reused
- Minor damage to vector boot during install requiring re-work
- Weld failure rate
- Failed weld led to re-drilling requirements
- Adverse weather
- Complex surface finish - Manchester City Council conservation area



Remote Condition Monitoring – Improving Predictions



- Mounted onto tram bogie
- Measures track geometry and rail profile/wear
- Utilises lasers to measure rail profile
- Unattended operation
- Visualisation software
- Video image capture of rail head
- Identifies exceedances

Thank you

