MANCHESTER METROLINK
THE STORY SO FAR

MPT
Laing O'Rourke
VolkerRail | Thales

MANCHESTER METROLINK

THE STORY SO FAR

(2008 – 2016)


St. Werburgh's Road
3021
Metrolink

CONTENTS


3036
3036

FOREWORD

Manchester Metrolink Phase 3 has been an amazing project and I am delighted to have worked with a truly world-class and dedicated team.

MPT began discussions with Transport for Great Manchester (TfGM) in 2007 and, following a period of negotiation, signed an initial contract on 16 June 2008. Since that time the project has grown considerably and became one of the largest infrastructure schemes being delivered in the UK. There is no doubt that this was a vitally important project to the North West economy and beyond.

This book celebrates our achievements on the project, looks back on the sheer scale and quality of the work undertaken over the last seven years, and looks forward to the challenges ahead of us. We remain focussed on delivering the current Second City Crossing scheme, and look forward to possible future extensions on the network. Many of our achievements are touched upon in this book, which I hope will serve as a small reminder of everyone's involvement in this landmark scheme.

We can all reflect with satisfaction on a 'job well done' and I am sure we will always feel proud when we see, read about or travel on the Manchester Metrolink in the years ahead.

My best wishes and thanks.

Bryan Diggins
MPT project director

AWARDS

British Construction Industry Awards

Major Civil Engineering Project of the Year over £50m 2015
Manchester Metrolink Airport Line

National Rail Awards (Joint TfGM/MPT)

Civil Engineering Achievements of the Year 2015
Metrolink to Manchester Airport

Chartered Institute of Highways & Transport

North West Transportation Project of the Year 2011
Major Project Award 2015

Considerate Constructors Awards

Oldham Rochdale Line	Silver Award 2012
Manchester Airport Line	Silver Award 2012
Oldham Rochdale Line	Bronze Award 2013
Manchester Airport Line	Silver Award 2013
Oldham Rochdale Line	Bronze Award 2014
Manchester Airport Line	Bronze Award 2014
Manchester Airport Line	Silver Award 2015

Light Rail Awards

Project of the Year 2011 (Joint TfGM/MPT/MRDL)
- MediaCityUK, South Manchester Line to Chorlton and the Depot

Supplier of the Year 2011

Project of the Year 2012 (Joint TfGM/MPT/MRDL)
- Oldham & Rochdale Line to Oldham Mumps

UK Project of the Year 2013 (Joint TfGM/MPT/MRDL)
- East Manchester Line / East Didsbury Line / Oldham Rochdale Line

Supplier of the Year 2013, over £10m

Project of the Year 2015, over £50m (Joint TfGM/MPT/MRDL)
- Airport Line

Project of the Year 2016, under 50m Euros (Joint TfGM/MPT/MRDL)
- Exchange Square

Significant Safety Award 2016

RoSPA (Health & Safety)

2010 Bronze Award	2011 Silver Award
2012 Gold Award	2013 Gold Award

British Precast Association

2012 Project Award

FOREWORD

I am extremely proud to be able to reflect on the truly exceptional success that we have collectively achieved whilst delivering the expansion of Manchester Metrolink over the last seven years. The number and variety of the accolades and awards that the project has received is testament to the professionalism, skill and determination we have shown throughout this staggering story so far, and will continue to do so as we fulfil our remaining commitments.

I have found reviewing this collection of photographs and narratives to be a lasting reminder of the tremendous feats of engineering achieved, and the fantastic people who have worked so well together to deliver a world-class transportation system for the people of Greater Manchester.

It has been an incredible journey.

Bryan Glass
MPT construction director

A BRIEF HISTORY OF MANCHESTER TRAMS

Manchester has a history of trams with origins early in the 19th Century. Horse-drawn omnibuses were first introduced in Manchester as early as 1824 and ran between Market Street Piccadilly and Pendleton toll gate in Salford. In the subsequent years other companies joined the rush to provide services culminating by the 1890s having 5,300 horses, pulling 515 tram cars on almost 90 miles of route. By 1896 outlying areas were served and included; Ashton-under-Lyne, Audenshaw, Droylsden, Failsworth, Gorton and Denton, Heaton Norris, Kersal, Levenshulme, Lower Broughton, Moss Side, Peel Green, Stalybridge, Stockport, Stretford, Swinton, Waterhead and Withington.

It is claimed that the peak of the system was in 1929 at 292 miles of network, 950 tramcars and 230 million passenger journeys a year.

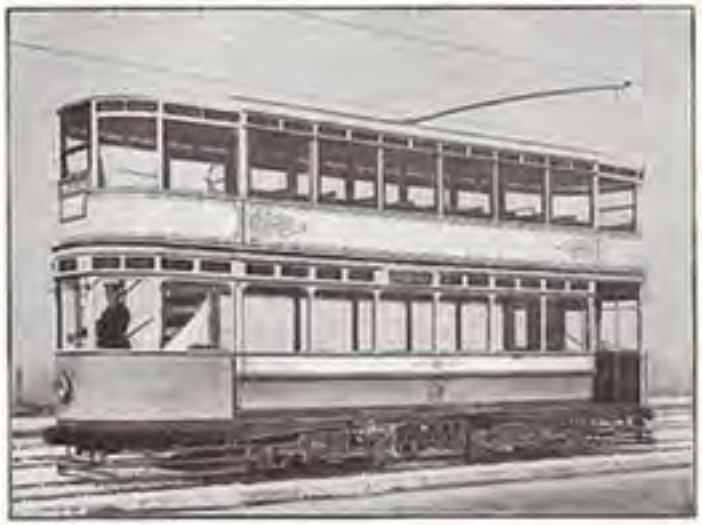
However, significant investment was required to maintain the service and the tram companies concerned were swayed by 'new technology'. By March 1938, 75 miles of single track tramway had been abandoned and 21 tram routes converted to motor or trolleybus. As the attraction of trams waned in the years preceding the war, 4,917 tons of steel were turned over to the war effort by removing abandoned tram tracks. The last of the old tram cars were stored at Hyde Road depot until 16 March 1949 when they were set ablaze in a huge bonfire, permanently signifying an end to what was once the third largest tramway system in the country.


39


TRANSPORT
41
TIME
TABLE

MANCHESTER CORPORATION TRAMWAYS.

General Offices: 55, PICCADILLY (Tel. 7800 City).



FREQUENT SERVICES TO ALL PARTS OF THE CITY AND SURROUNDING DISTRICT.

Ride in Comfort and Safety at Cheap Fares.

Special Cars supplied for Private Parties at Moderate Charges.

Through Cars from the City are run to

ALTRINCHAM	HEYWOOD	ROCHDALE
ASHTON-U-LYNE	HYDE	SALE
BURY	MIDDLETON	STOCKPORT
ECCLES	OLDHAM	SWINTON
HAZEL GROVE	PRESTWICH	WALKDEN


Piccadilly
1013
10138


15
Ecrins
1009A


Rochdale
Bury
Oldham
Salford
Manchester
Victoria
Piccadilly
Exchange Quay
Old Trafford
Stretford
Altrincham
Stockport
Metrolink Phases 1 & 2

MANCHESTER METROLINK PHASE 1 AND 2

The post-war public transport network suffered from poor north–south connections, exacerbated by the location of Manchester's main railway stations, Piccadilly and Victoria, lying on the fringe and at opposite edges of central Manchester. As part of Manchester's development plan for an integrated and efficient transport system, a light rail solution was proposed in 1982 and government approval was granted in 1988 based on a phased implementation approach.

Construction works of what became known as Metrolink Phase 1 commenced in 1990 with the network beginning to operate services between Bury and Victoria on 6 April 1992, further expanding beyond Victoria through St Peter's Square to G-Mex Metrolink station (now known as Deansgate-Castlefield) on 27 April 1992, and on to Altrincham on 15 June 1992 at a cost of £145m. Phase 1 became the country's first modern street-running tram system and began a 'new age' for tramways across the UK. Phase 1 was expected to carry up to 10 million passengers per year but this was quickly surpassed with in excess of 15 million passengers per year recorded as using the system soon after opening.

In autumn 1995, a 6.4km Metrolink line branching from Cornbrook station to Eccles, via Salford Quay to capitalise on the regenerated Quayside, was confirmed as forming Phase 2 of Metrolink. In April 1997 Altram, a consortium of the Serco Group, Ansaldo and John Laing was appointed to construct the Eccles Line. A key supply chain partner to Laing Civil Engineering was Grant Rail (now VolkerRail) who laid all the track work including significant sections of pre-coated rail. Construction work officially began on 17 July 1997.

The Eccles Line was officially opened as far as Broadway Metrolink station on 6 December 1999 by the Prime Minister, Tony Blair, who praised Metrolink as "exactly the type of scheme needed to solve the transport problems of the metropolitan areas of the country"; a service to Eccles Interchange commenced on 21 July 2000, officially declared open by Princess Anne, the Princess Royal at a ceremony on 9 January 2001.

It became evident that the Metrolink Network was becoming the catalyst for regeneration as was hoped during the planning stages, and this in turn led to more investment within the Greater Manchester area as the benefits arising from improved transport links took hold.


Metrolink future network
Rochdale
Bury
Oldham
Manchester
Salford
Ashton-under-Lyne
Altrincham
Stockport
Existing Metrolink
Metrolink extensions under construction
Metrolink extensions subject to approval & funding

MANCHESTER METROLINK PHASE 3

Greater Manchester Passenger Transport Authority developed plans for further expansion of the network during the late 1980s into the early 1990s and whilst there was an aspiration to maintain a continuous period of development, changes in government funding meant that extensions planned for the early 2000s were shelved.

Consequently, when the Transport Act 2000 required passenger transport executives to produce local transport plans, GMPTE's top public transport priority was a third phase of the Metrolink expansion, also referred to as the 'Big Bang'. Through two key stages, namely Phase 3A and Phase 3B, this would create four new lines along key transport corridors in Greater Manchester: the Oldham and Rochdale Line (routed northeast to Oldham and Rochdale), the East Manchester Line (routed east to East Manchester and Ashton-under-Lyne), the South Manchester Line (routed southeast to Chorlton-cum-Hardy and East Didsbury), and the Airport Line (routed south to Wythenshawe and Manchester Airport). Therefore, Manchester continued to lobby Parliament and as the network continued to increase levels of patronage, reduce traffic congestion on roads running parallel to its lines and further regeneration materialised, confidence grew and the foundations were laid for a Phase 3 extension of Metrolink.


Piccadilly


Rochdale
Bury
Oldham
Salford
Manchester
Ashton-under-Lyne
Altrincham
Stockport
Metrolink Future Network

2008


Metrolink future network
Rochdale
Bury
Oldham
Salford
Manchester
Ashton-under-Lyne
Altrincham
Stockport

2015

THE FORMING OF MPT

A significant factor in the success of Manchester Metrolink has been the strong relationship formed between the consortium partners.

There is a historic relationship between Laing O'Rourke and VolkerRail reaching back as far as the mid-1990s when Laing Civil Engineering chose VolkerRail as a key supply chain partner on the Midland Metro contract. This association was repeated for the Manchester Metrolink Phase 2 extension. The relationship matured further when Laing O'Rourke and VolkerRail formed a joint venture for the Dublin C1-400 contract delivery. When the opportunity arose to tender the Manchester Metrolink expansion in 2007 it was an obvious step to continue the now established relationship of the two organisations maintaining the synergy and blend of capabilities each brought to the arrangement.

The incorporation of Thales into the consortium brought technical expertise and capability within the E&M system disciplines, system engineering and assurance, dovetailing well with the capabilities of Laing O'Rourke and VolkerRail.

Statutory utility diversions

In 2008, MPT initially secured a Design, Construct and Maintain Contract (DCM) to deliver the first phase of the network expansion comprising lines to MediaCityUK, South Manchester, East Manchester and Rochdale via Oldham town centre, and a new depot facility at Trafford Bar.

Whilst delivering this initial phase, MPT worked closely with TfGM and their delivery partner WSP/PB to define a scope for future lines that fitted within the budgetary constraints, by developing engineered solutions and providing further value for money and continuous improvement. A second phase of extensions was awarded early in 2010 to extend the South Manchester Line to East Didsbury, and the East Manchester Line to Ashton together with an increase in capacity to the Trafford Depot. Further extensions were awarded later in 2010 comprising a new line to Manchester Airport and town centre routes for Rochdale and Oldham, together with further capacity enhancements at the Trafford Depot.

In 2014, after securing a European Region Development Fund (ERDF) grant, the contract for the Second City Crossing was awarded, culminating in over 60km of new tramway alignment being provided by the MPT consortium since the initial contract award in 2008.

Metrolink Now

The system is owned by TfGM and is operated and maintained under contract by Metrolink RATP Dev Ltd (MRDL). Metrolink has 92 stops along 92km of standard-gauge track making it the largest light rail system in the UK. From 2014 to 2015, 31.2 million passenger journeys were made on the system.

"FOLLOWING THE APPROVAL OF FUNDING SUPPORT, WE HAVE CONCLUDED NEGOTIATIONS FOR THE DELIVERY OF THE LONG AWAITED EXPANSION OF THE METROLINK NETWORK. THIS MILESTONE IN METROLINK HISTORY WILL SEE THE SYSTEM ALMOST TREBLE COMPARED TO TODAY'S NETWORK. WITH THE SUPPORT OF OUR DELIVERY PARTNER, PARSONS BRINCKERHOFF, AND THE EXPERIENCE OF MPT WE ARE CONFIDENT OF SUCCESSFUL DELIVERY OF THE NEW LINES."

David Leather
Chief Executive of GMPTE (TfGM)

MPT PHASE 3 SCOPE

PLANNING AND CONSENTS

Once each Transport & Works Act Order (TWAO) or Parliamentary Act was in place and planning permission granted, MPT built a strategic specialist team who were able to work collaboratively with Key Stakeholders and Statutory Authorities to ensure that all planning conditions were discharged expeditiously.

The 'Engineering Excellence' available within MPT has enabled us to advise and liaise with stakeholders with confidence, ensuring stakeholder concerns and conditions were satisfied throughout the development of construction phases. Working alongside the client, TfGM, MPT have discharged over 1,200 separate conditions.

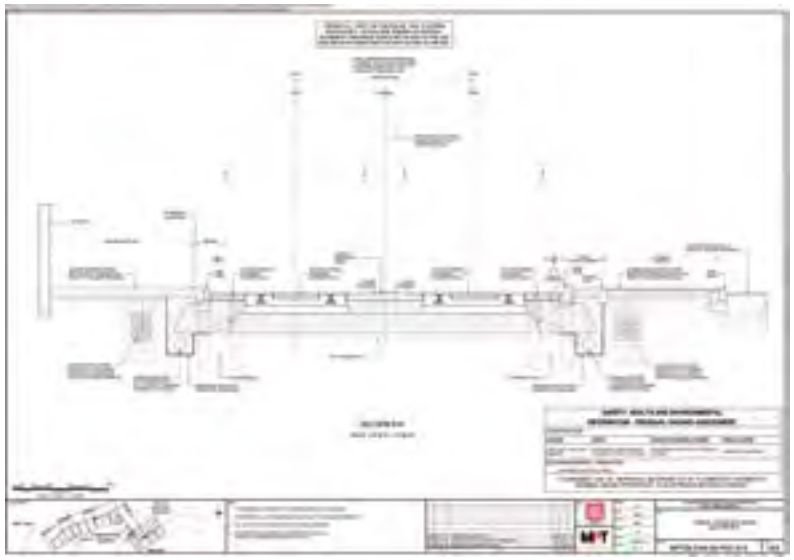
By positive collaboration with key stakeholders, including over seven local authorities, utility companies, charities, trusts, government owned companies such as Highways England, large private investment businesses and national transport operators, in conjunction with TfGM, MPT have consistently demonstrated an ability to option engineer transport schemes whilst maintaining cost certainty and value for money for the client. This has been achieved while maximising tram network capability, and subsequent revenue opportunity, whilst realising the benefits of regional regeneration and growth.

DESIGN

By careful selection and management of design partners and implementation of a rigorous design development and assurance process, MPT ensured that the design progressed from feasibility study through concept development to successful, fully integrated tram and highway schemes.

Our strong knowledge of the design process and in-house design management capability has enabled MPT to provide programme efficiencies in developing scheme designs. The design development and assurance process was driven by key, experienced individuals within MPT to ensure all key stakeholders were involved and actively engaged at each stage. Periodic reviews were kept productive, ensuring programmes were maintained and agreed deliverables achieved, whilst recording all key issues that were raised, subsequently addressing these issues either within further design development or through additional consultations. This carefully managed process has proven to allow safety concerns to be addressed and operational benefits to be realised with spatial constraints and aesthetic considerations identified efficiently and constructively.

The new public transportation system constructed across Manchester is a testament to how MPT have successfully delivered this process.



UTILITIES

Prior to the main construction phase, our team engaged with the utility stakeholders to identify advance works required to avoid delay to the construction programme.

The MPT Utilities Team coordinated the utilities diversions and monitored and managed complex programmes of work.

TfGM and MPT worked collaboratively with statutory undertakers encouraging shared use of traffic management and service trenches and ensuring that industry leading safety systems and operational best practice was implemented throughout.

Strong relationships enabled innovative solutions to be adopted which reduced the scale of utility works and minimised impact on the construction programme.

HIGHWAYS AND STRUCTURES

MPT consortium partners Laing O'Rourke brought their expert engineering and management knowledge in the delivery of complex and high profile civil engineering works to the team. This has enabled MPT to deliver the vast, multiple and varied highway, drainage and structural elements necessary to introduce an extended tram network into an urban, street environment, on a scale of this size.

Our experienced highways engineering teams have proven they can successfully phase and construct complex junction remodelling projects; working with local authorities and stakeholders to ensure a sympathetic yet efficient construction approach is undertaken. These teams have also delivered the construction of a variety of innovative track forms in both on-street and off-street environments to achieve unprecedented tolerances on quality of installation.

With the consortium embracing Laing O'Rourke's industry leading philosophies such as Design for Manufacture and Assembly (DfMA), MPT have seamlessly been able to construct major structures over and under existing major infrastructure along the scheme. Structures ranging from different types of retaining walls, to steel and concrete bridges and underpasses, have all been delivered to a rigorous programme, with minimal impact on the local environment and communities, providing surety and demonstrating competence, building further on a proven track record.

In addition MPT delivered significant urban realm improvements throughout the new tram network, bringing about mass urban regeneration extending out from the new tram corridor, improving the Metrolink experience of the general public.

RAIL

MPT utilised in house rail resource and rail plant specialists from consortium partner VolkerRail to install over 60km of new, light rail tramway across Greater Manchester. As well as installing new track laid over a variety of traditional and innovative track forms, these teams have faultlessly delivered multiple disruptive possessions across the live network to install sections of new railway connecting into existing networks, ranging from simple maintenance renewals to complex full track replacements and motorised turnouts and crossings.

A major feat was successfully achieved with the installation of a new directly fixed track form turnout into an existing tram way on top of a Victorian viaduct in the heart of Manchester City centre. This was completed within a 54 hour disruptive possession using pre-cast track slab techniques and is believed to be the first time that this has been achieved within the UK. The seven day blockade to integrate the new Oldham Town Centre's loop track into the Oldham Rochdale Line was a huge achievement, and something all involved will be justifiably proud of. Further capabilities have been demonstrated by the coordination and installation of all associated rail bonding systems, rail groove drainage system and rail to earth assurances which have been delivered seamlessly.

ELECTRIFICATION

MPT consortium partners Thales, designed, installed and commissioned new substations along each route to provide the new traction power supplies and return for each of the new lines. These substations also formed an integral part of the earthing and bonding system which was designed and installed within the scope, to the latest guidelines. Works included the construction of the substation foundation and ducting routes, installation of cabling and equipment and full testing and commissioning. Modular substation buildings were developed which could be tested and commissioned off-site allowing a simple 'plug and play' solution when installed onsite. Close and successful liaison with statutory undertakers enabled the substation to be electrified in line with the sequential opening of new tram lines.

The overhead line works were the largest ever undertaken in a UK light rail environment. The materials used to create the overhead line system for Manchester Metrolink Phase 3 included over 200km of copper wire and 2,700 poles. Working collaboratively with a specialist contractor, MPT designed, installed and commissioned each overhead line system, migrating the new overhead line equipment with the existing network at each tie-in. Various enhancements were also made to the existing network to bring it up to current regulations, standards and guidance.

TRAM SYSTEM TECHNOLOGIES

Electrical and mechanical aspects of the project are truly diverse, ranging from CCTV cameras to traction sub stations and help points to overhead lines. Equipment at the new stops, such as public address systems, passenger information displays, CCTV and help points will enhance the travel experience of the Greater Manchester public and increase operational and customer safety. A significant milestone for the project was the seamless migration of the control centre from Queens Road to the new purpose built network management centre, which was carried out over a single weekend. This was the result of excellent planning and teamwork between all parties.

MPT
Laing O'Rourke
VolkerRail | Thales

SAFETY – MISSION ZERO

Without compromise, safety is number one within the ethos of MPT. To provide consistency across the project and help promote this, Mission Zero was launched in 2013 and successfully integrated across the project such that it became embedded into many of our lives; a belief that every incident can be avoided, and that everyone should go home safely every day.

'Ask the Question' workshops focused on explaining the behavioural tendencies of individuals, helping teams to engage more with each other, whilst also promoting individuals to take responsibility for their own safety and for those around them.

The message of Mission Zero was further strengthened by the one to one process at induction which enabled the senior management team to meet individuals and reiterate MPT's safety expectations.

A Supervisors Forum programme was launched to engage and empower the workforce, with workshops on lessons learnt and collaborative working sessions held between the teams. The sessions allowed the workforce to openly discuss views and aspirations on a variety of topics.

The implementation of 'Visual Task Sheets' to improve communication onsite had a target to achieve 70% of site activities communicated visually by April 2014. MPT surpassed this expectation with some lines operating at 100% by March of that year.

Elements of the project were delivered outside the normal "9 to 5" shift pattern in order to minimise disruption to the tram service and local stakeholders. As such, a greater focus on managing shift patterns and working hours was undertaken to ensure MPT operated with negligible shift related risks.

The latest focus on health and wellbeing led to almost 100% of employees now undergoing regular health screening onsite through our wellbeing programme.

KEEPING CONNECTED

"MPTS – COMMITMENT TO DELIVER THE HIGHEST QUALITY CONSTRUCTION IN CLOSE PROXIMITY TO THE COMMUNITY IS EXEMPLARY. THIS COMPLEX AND CONSTANTLY CHANGING WORKING ENVIRONMENT DEMANDED STRONG PROJECT MANAGEMENT AND DETAILED PROGRAMMING FROM THE CONTRACTOR. THE SAFETY OF THE GENERAL PUBLIC AS WELL AS SITE OPERATIVES IS ANOTHER CORE OBJECTIVE SHARED BY MPT AND TFGM. TOGETHER WE HAVE DEVELOPED A SAFETY CULTURE ACROSS THE PROGRAMME THAT DELIVERED 19 MONTHS WITHOUT A REPORTABLE ACCIDENT."

David Bray
Programme director TfGM

KEY FACTS

OVER

8

YEARS IN
THE MAKING

61km

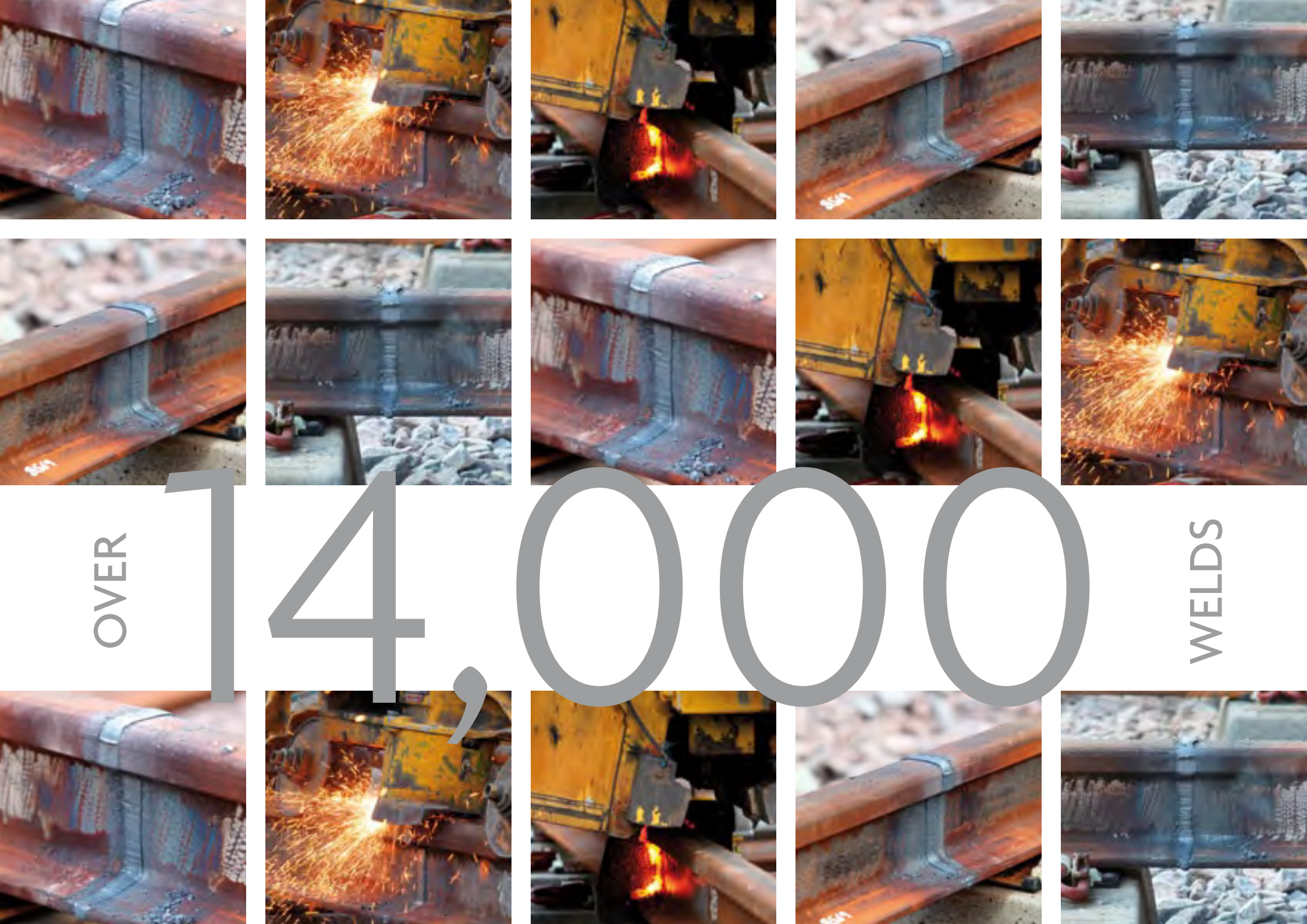
NEW TRACK LAID

57

NEW TRAM

STOPS


OVER
164,500
CUBIC METRES
CONCRETE LAID



OVER 14,000 WELDS

MAJOR

BRIDGE INSTALLATION ACROSS THE NETWORK

OVER 2,800 OVERHEAD

LINE POLES INSTALLED


MORE THAN 2,300 PEOPLE
INVOLVED THROUGHOUT THE PROJECT

OVER 14.5 MILLION MAN HOURS COMPLETED


OVER
2 MILLION
MAN HOURS COMPLETED
WITHOUT A REPORTABLE INCIDENT

INTERFACED WITH

7 LOCAL PLANNING AUTHORITIES

CREATING

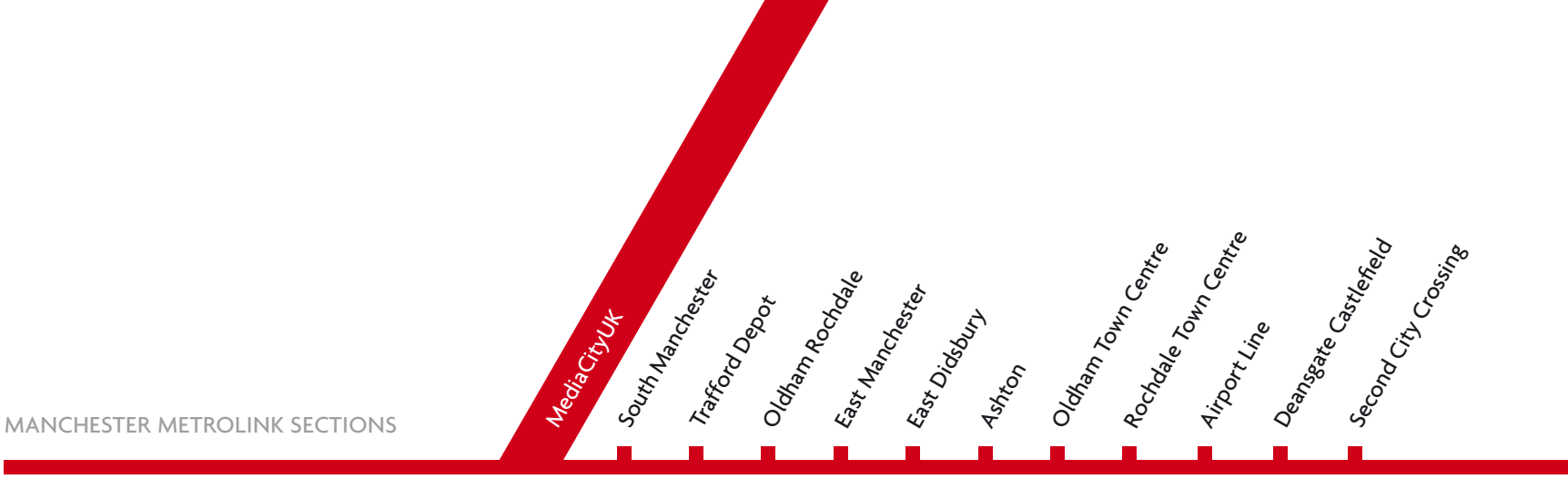
1,400 STATUTORY APPROVALS

"OUR CONSIDERABLE RAIL EXPERTISE AND THE APPLICATION OF INNOVATIVE CONSTRUCTION TECHNIQUES SUCH AS OUR AWARD-WINNING MODULAR TRAM STOPS, ARE HELPING US PROVIDE MASSIVE TRANSPORT INFRASTRUCTURE IMPROVEMENTS TO THIS GREAT CITY."

Bryan Diggins
MPT Project Director

SECTION BREAK DOWN


Piccadilly 2 min
Piccadilly 20 min
ensure you have a valid ticket bef
15:20:53
Piccadilly
3074B



MediaCityUK

This scheme was a 0.4km spur off the existing Phase 2 Eccles line at Harbour City, to form a new stop within MediaCityUK. Construction commenced in March 2009 and was completed in April 2010, with the line opening to passengers in September 2010.

Interface with MediaCityUK complex

With the MPT construction being implemented simultaneously with the MediaCityUK development works there was specific restrictions on site access and additional constraints within the construction programme. The integration of the urban realm into the main MediaCityUK design was also complex, where high quality granite paving and bespoke architectural shelters were required for the stop area, all of which were influenced by MediaCityUK's high profile planning requirements.

Tie-in to the existing Metrolink service

To tie the spur into the existing Metrolink system MPT constructed two turnouts off the existing Eccles line. This enabled the development of the single line section and formed the delta, providing inter-connectivity. After a short length of single track the MediaCityUK spur then turned back into twin track with a turn-back facility constructed within the platform area. As the section was short the overhead line had to be installed after the completion of all the track works, and tied into the existing overhead line equipment system.

Testing and commissioning

As the construction phase came to an end the testing and commissioning commenced. With the MediaCityUK line being the first of the Phase 3 sections to undertake final tram testing and commissioning, the lessons learnt between the various teams would prove invaluable on subsequent Metrolink projects.


MPT
MPT

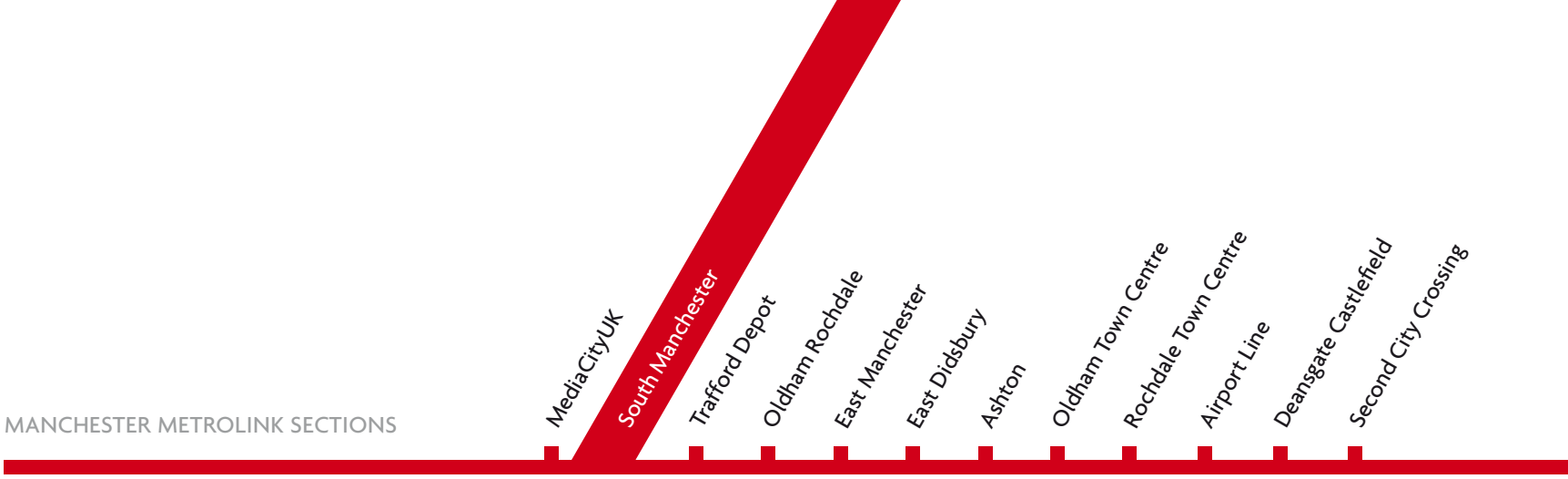

MPT


MediaCityU


MediaCityUK
Piccadilly
3063


The Studios
MediaCityUK


ct Metrolink customer services or
11:41:04
Victoria
3023



SOUTH MANCHESTER LINE

With a connection into the existing Metrolink system at Trafford Bar the majority of the new 3km route was created through the conversion of a disused rail line. The route included the construction of three new stops and one substation. Construction commenced in April 2009 and the line to St Werburgh's Road was handed over in March 2011.

Limited access to site

Most of the route was along an old rail cutting and as such there were limited access points. For the majority of the scheme, access from the new depot was the only feasible access point and so innovative methods of working were devised to ensure the construction programme was not adversely affected. This included phased working between excavation works and the permanent way construction, along with the development of an innovative concrete ducting bank arrangement; which sat above ground eliminating the need to excavate at the toe of the embankments and widening the effective cutting. The deep cutting also posed a major challenge for the drainage provision where accumulated water needed to be managed throughout the construction. The drainage design was also made sympathetic to the single access point in its alignment by minimising excavations within the central part of the corridor.

Protecting the environment

Having been disused for approximately 30 years, the rail cutting had become an established wildlife habitat and required a strategic environmental approach. The approach detailed the careful clearing of site vegetation, protecting and monitoring of badgers; prior to and during construction, construction of alternative off-site environmental habitats; in association with local schools, replacement fox dens, installation of new bat boxes and tree replacement along the route.

Innovative modular stop construction

The South Manchester Line was the first to utilise innovative DfMA approach for the tram platforms. Modular concrete units formed part of the main platform design and were subsequently detailed and manufactured off-site at Laing O'Rourke's state of the art manufacturing facility, Explore Industrial Park. The units were delivered to site and assembled into position reducing typical onsite construction associated risks, providing consistent quality and additional surety to the construction programme by minimising the risk associated with typical in-situ construction.

Testing and commissioning

With the construction phase approaching completion the testing and commissioning phase began. This included a series of newly devised and structured countdown meetings held jointly between MPT, TfGM and MRDL. This resulted in a successful collaborative effort, covering every aspect of preparing to open the new line and resulting in the successful grand opening in July 2011.

BEFORE

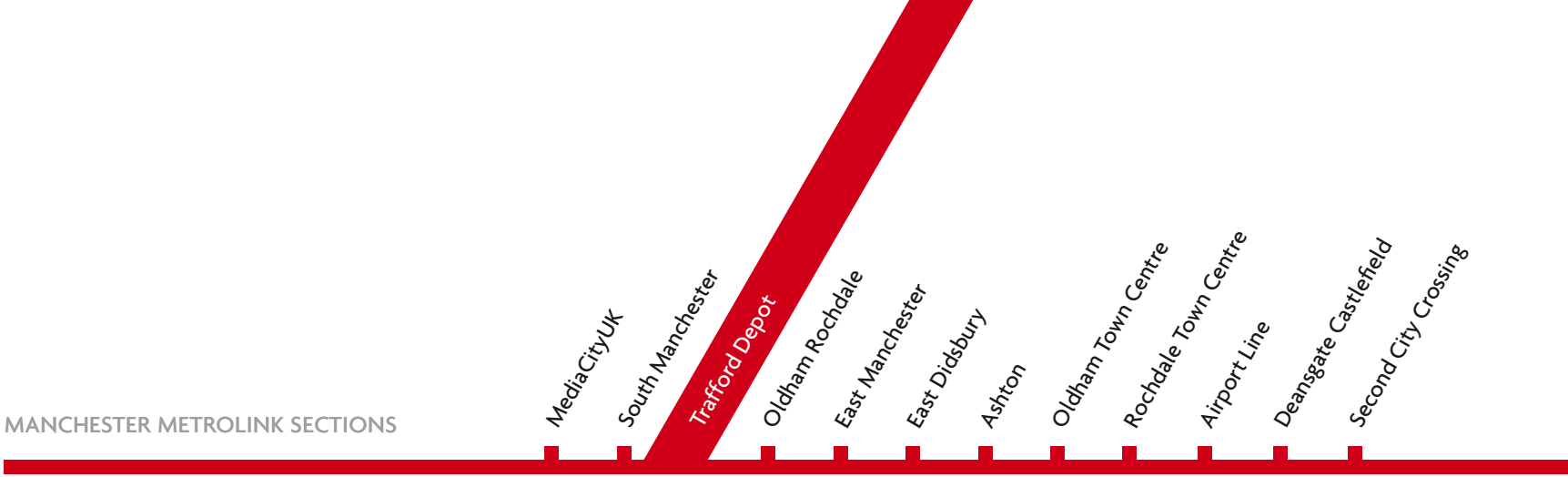
AFTER

BEFORE

AFTER


St Werburgh's Road
St Werburgh's Road 8 min
act Metrolink customer services o
11:14:18
St. Werburgh's Road
3014
3014A


Street



TRAFFORD DEPOT

At the same time as the construction of the South Manchester Line the construction of Trafford Depot was ongoing. The depot is situated west of the South Manchester Line and south of the Altrincham Line, between Trafford Bar stop and Old Trafford stop.

During the completion of Phase 3 the new M5000 tram fleet was introduced, with the older T68 trams phased out by 2014. The new 120 number M5000 trams are predominantly stabled and maintained at the new state of the art depot facility. The depot was constructed on a former industrial site and includes a stabling area, a new maintenance building, tram wash and sand plant, and over 6km of ballasted track.

Remediation of the industrial site

Following the demolition of the original buildings and extensive ground investigation, the former industrial site was remediated. MPT implemented a sustainable remediation strategy with over 95% of the material diverted from landfill. The majority of the materials were utilised within the foundation layers of the main depot structure.

Managing change

With the successful securing of funding for the Manchester Metrolink Phase 3B programme the depot needed to be further extended to accommodate the additional M5000 fleet and increased maintenance requirements. This was a huge challenge for the MPT team who, in addition to completing, testing and commissioning the Phase 3A works, successfully extended the depot building and stabling areas in line with the original programme, in readiness for the completion of the Phase 3B works.

DEPOT MIGRATION

(QUEENS ROAD TO TRAFFORD DEPOT)

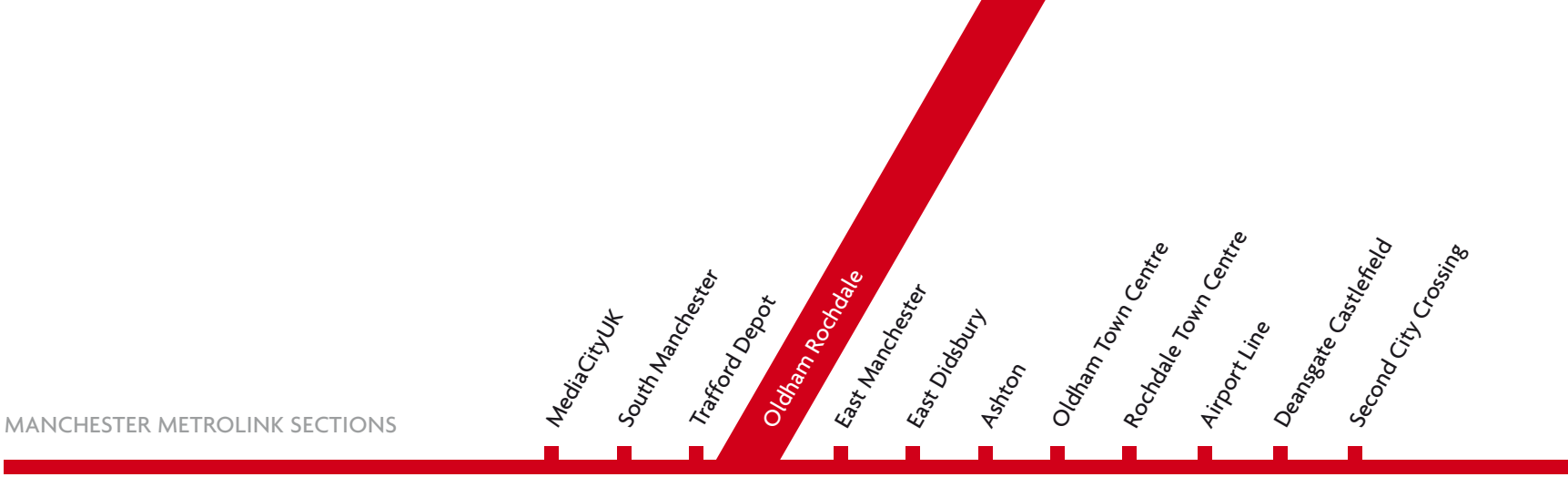
Following the successful completion and handover of Trafford Depot, MPT's electrical and mechanical team installed, tested and commissioned TfGM's new Network Management Centre (NMC). This allowed the migration of the Tram Management System (TMS) and monitoring, controlling and communication systems from the existing, live NMC at Queens Road Depot. The operational transfer was a great success, with no disruption to the control room staff or to the operation and management of the network.


Not in Service
3044
Not in Service
3046


Not in Service
3046


MediaCityUK
3045


East Didsbury
via Oldham
3054A



OLDHAM AND ROCHDALE

The Oldham and Rochdale Line forms part of the Manchester Metrolink Phase 3A project, running between the Irk Valley junction at Smedley viaduct, Rochdale railway station. The Oldham and Rochdale Line is primarily constructed on an existing heavy rail alignment, transferred from Network Rail ownership to TfGM in October 2009 and was constructed in three stages. The full Phase 3A section achieved substantial completion in April 2011, although tram service was not implemented until June 2012.

The three sections comprised of 15 new stops, 10 new substations, refurbishment of existing structures and approximately 23km of ballasted track, spanning over three district councils. However, before any track was laid MPT faced a huge logistical challenge to remove large sections of disused railway. Over 20km of rail were removed and thousands of tonnes of ballast cleaned ready for re-use.

Network Rail interface

At Thorpes Bridge the tram line crosses the Manchester to Normanton heavy rail line via an advanced works structure and connects with the previously Network Rail Oldham loop line. Between Thorpes Bridge and Mill Lane the tram system operates as single line, to enable the existing heavy rail service to the Household Waste Recycling Centre to be retained. Metrolink continues to operate as double track to Newbold stop, where it turns to single line running across and adjacent to the Leeds to Manchester railway line; before reverting back to double track at Rochdale Railway Station. MPT successfully interfaced with Network Rail enabling the construction of the scheme alongside existing heavy rail operations and allowed integration of the Metrolink light rail network into the same corridor.

"THIS IS THE BIGGEST INFRASTRUCTURE PROJECT EVER UNDERTAKEN HERE, AND WE BELIEVE IT WILL ACT AS A CATALYST TO CREATE NEW JOBS AND OPPORTUNITIES."

Jim McMahon, Oldham Council leader

STRUCTURES

RESTORATION OF EXISTING STRUCTURES

One of the most significant challenges along the route was the restoration of over 100 Victorian bridges, tunnels and retaining structures. These structures required extensive refurbishment, including completely replacing a number of bridge decks, improvement in structural integrity and extensive refurbishment of brick, stone and metalwork.

ROCHDALE EAST VIADUCT

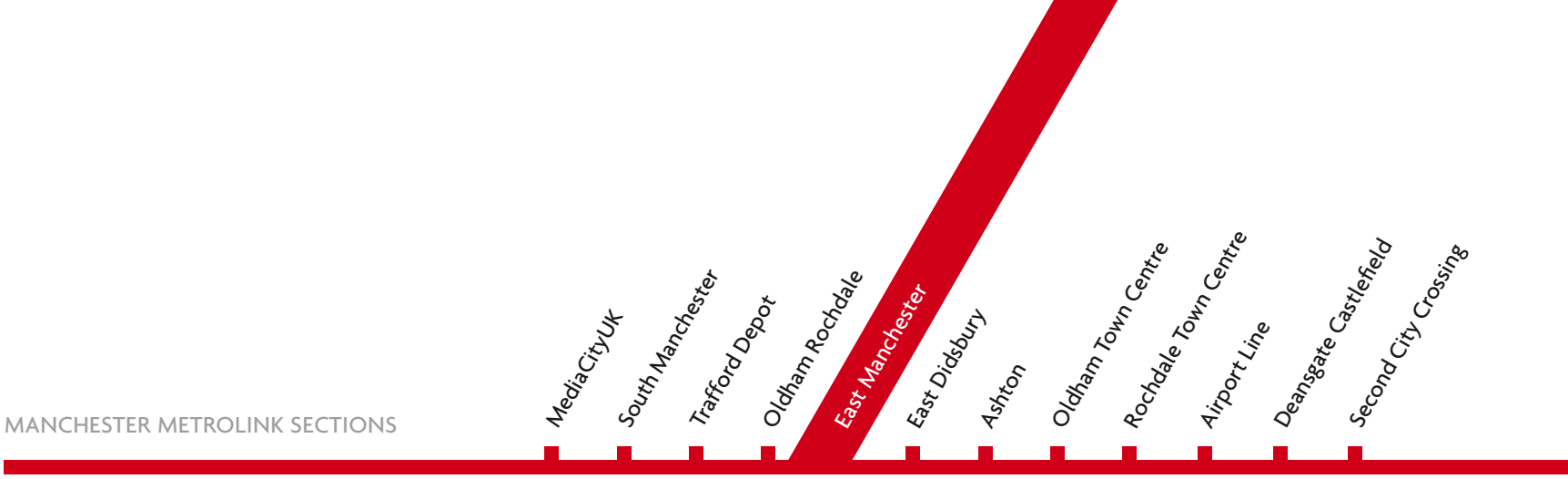
Although the majority of this line is the conversion of the previous heavy rail track there are two exceptions. The first is where the tram line temporarily crossed an extensively remodelled and improved junction at Oldham Mumps, until the introduction of the Oldham Town Centre scheme. The second is at the Rochdale end of the line where the new Rochdale East viaduct takes the tram over Network Rail's Calder Valley route, leading to a short section of street running track up to the new stop outside Rochdale Railway Station.

Various constraints led to an oblique crossing at an angle of 70 degrees meaning delivery of this complex structure had to be planned in fine detail in order to achieve challenging possession timescales and minimise disruption to local properties. Working closely with Network Rail, a bespoke design with a weathered steel finish was developed for ease of maintenance and to blend in with the surroundings. The structure was successfully placed during a 99 hour possession over a Christmas period.

"THE ARRIVAL OF THE METROLINK AT ROCHDALE RAILWAY STATION MARKS A SIGNIFICANT POINT IN THE DEVELOPMENT OF THIS EXCITING PROJECT. THE LAUNCH OF SERVICES FROM ROCHDALE RAILWAY STATION WILL BENEFIT RESIDENTS AND BUSINESSES IN THE AREA AND PRESENTS A MAJOR BOOST TO THE LOCAL ECONOMY."

Councillor Colin Lambert
Leader of Rochdale Borough Council


SERVED



EAST MANCHESTER

The 6.3km East Manchester Line to Droylsden runs from the existing Metrolink stop at Manchester Piccadilly, through the key regeneration areas of Ancoats, New Islington and Beswick; within the heart of East Manchester. The line runs under Great Ancoats Street, through Holt Town towards Etihad Campus (Manchester City football stadium) and the Velodrome cycling centre. From here, between Clayton and Droylsden the line runs for approximately 3km on-street along the busy Ashton New Road and Manchester Road prior; to terminating in Droylsden town centre. Construction commenced in March 2009 and opened for passenger service, up to Droylsden on 11 February 2013.

Statutory utility diversions

Prior to the commencement of the construction works MPT had to manage the diversion of over £25m of utility assets, predominantly within the 3km street running corridor. The management of these diversions prompted the development of a collaborative team known as the Joint Utilities working Group (JUG).

This included representatives from all the statutory utility companies, Manchester and Tameside highway authorities, MPT and TfGM, and is now the standard approach for addressing utility diversions on all other lines.

Great Ancoats Street underpass

Within the early phases of the project, Great Ancoats Street underpass structure was constructed under the Manchester inner ring road. In order to complete the structure, substantial archaeological works were undertaken and approximately several million pounds of utilities diverted. The underpass was constructed using the top down method, whilst maintaining highway flows at all times on what is one of Manchester's busiest strategic routes. The chosen solution provided the optimum balance between tram alignment, service diversions and impact on traffic, with its successful completion heralded by Manchester City Council as a "major feet of civil engineering".

STREET RUNNING TRAMS

The 3km of street running tracks were constructed through heavily populated residential areas along a key arterial commuter route, including through the main suburban town centre of Droylsden. This phase featured significant utility diversions, extensive highway and urban realm improvements, innovative construction methods, and sensitively planned sequences and sections to minimise disruption to commuters.

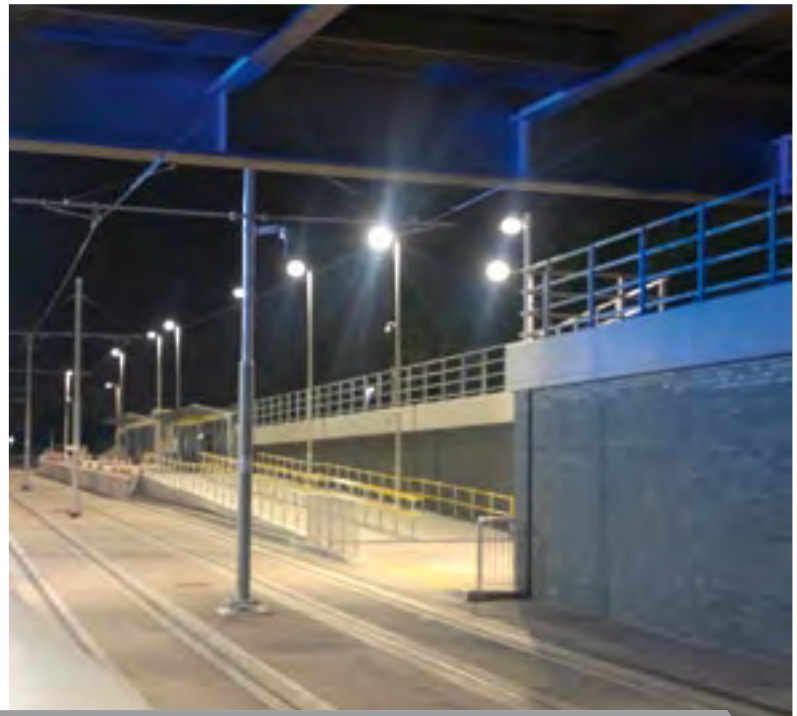
The East Manchester section was the first of the Phase 3A sections to install the overhead line equipment within the street running environment. The extensive sections of embedded track form led to the innovative use of slip forming the track complete with rails, and is understood to be the first time this has been achieved in the UK. This, along with the testing and commissioning of the new line required close liaison with the highways authorities of Manchester and Tameside as well as Greater Manchester Police and the urban traffic control teams.


Not In Service
3005A
T110 HPT


AINSCOUGH

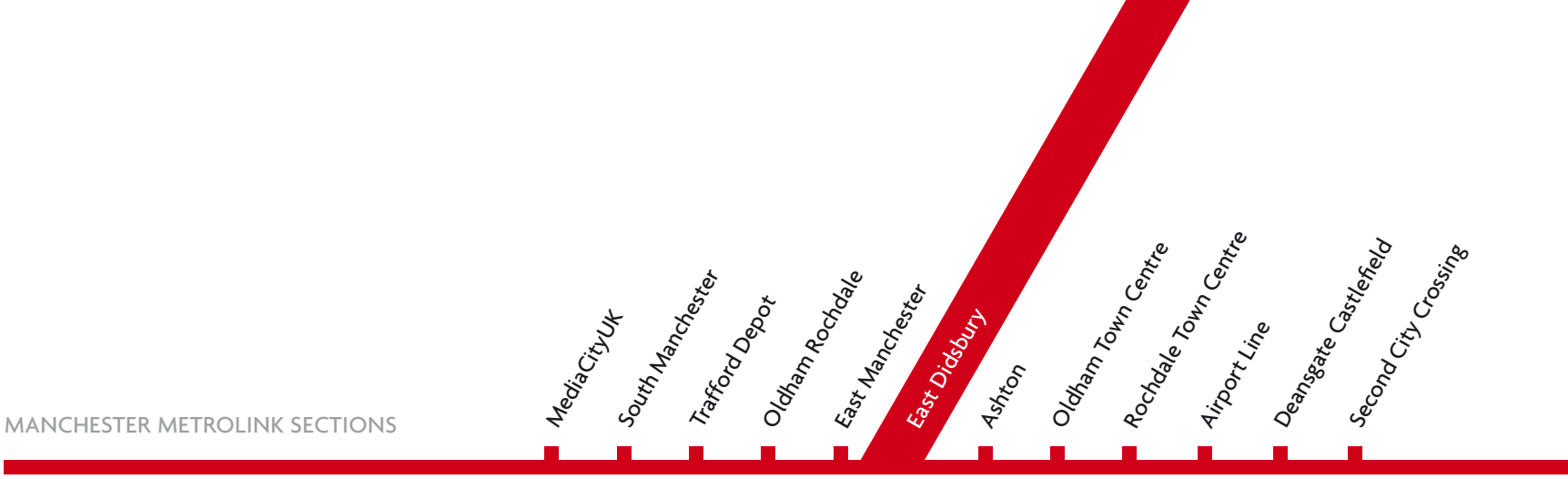
"I'VE BEEN EAGERLY AWAITING THE LAUNCH OF SERVICES TO DROYLSDEN SINCE FUNDING WAS CONFIRMED IN 2008. A GREAT DEAL OF HARD WORK HAS GONE INTO THIS NEW LINE, A GREAT DEAL OF CHALLENGES OVERCOME, AND WE ARE NOW ON THE CUSP OF REALISING THE BENEFITS OF ALL THAT EFFORT."

Councillor Andrew Fender
Chair of the Transport for Greater Manchester Committee



ETIHAD CAMPUS STOP

A landmark stop was constructed behind the Etihad Campus which included crowd control facilities, a 'living' earth retaining wall, lift, curved concrete concourse stair approach and fabric canopy structure. This required close liaison with Manchester City FC and the local planning authority during the regeneration of the former industrial site.



EAST DIDSBURY

The East Didsbury Line is a 4.4km extension to the South Manchester Line made up of five stops; Withington, Burton Road, West Didsbury, Didsbury Village and East Didsbury. Work first began on the extension from St Werburgh's Road in Chorlton to East Didsbury in summer 2010 with the line opening three months ahead of schedule, on the 23 May 2013.

The light rail tram extension has been built along a disused heavy railway line which was closed down. Before construction could commence drainage work was required to pump out accumulated water along the line, stabilisation work was also undertaken along the embankment and significant earth retention measures were put in place.

Protecting the environment

The area was extremely overgrown with a well established wildlife population. Before works began detailed ecological surveys were carried out to identify the presence of any protected species and mitigation and habitat replacement measures were implemented as part of the scheme. This included the provision of two ponds, a bog pool, four artificial badger setts, two owl boxes and a planting scheme, at two local allotment sites. Extensive tree replacement work was also undertaken along the route with some 17,000 trees being planted.

Trans Pennine Trail

MPT temporarily diverted part of the Trans Pennine Trail, which ran along the old railway line between Didsbury village and the line terminus at East Didsbury. Improvements to a 2.2km long section of the Trans Pennine Trail route was provided alongside the new Metrolink line, and was completely resurfaced and made fully accessible for wheelchairs and families with buggies and pushchairs.

"HAVING A WELL-CONNECTED CITY WHERE PEOPLE CAN EASILY ACCESS EMPLOYMENT, SOCIAL AND LEISURE OPPORTUNITIES IS ABSOLUTELY FUNDAMENTAL TO MANCHESTER'S FUTURE SUCCESS. THIS NEW LINE IS ANOTHER IMPORTANT STEP TOWARDS DELIVERING THAT VISION."

Councillor Nigel Murphy
Executive Member for Environment for Manchester City Council

BURTON ROAD STOP

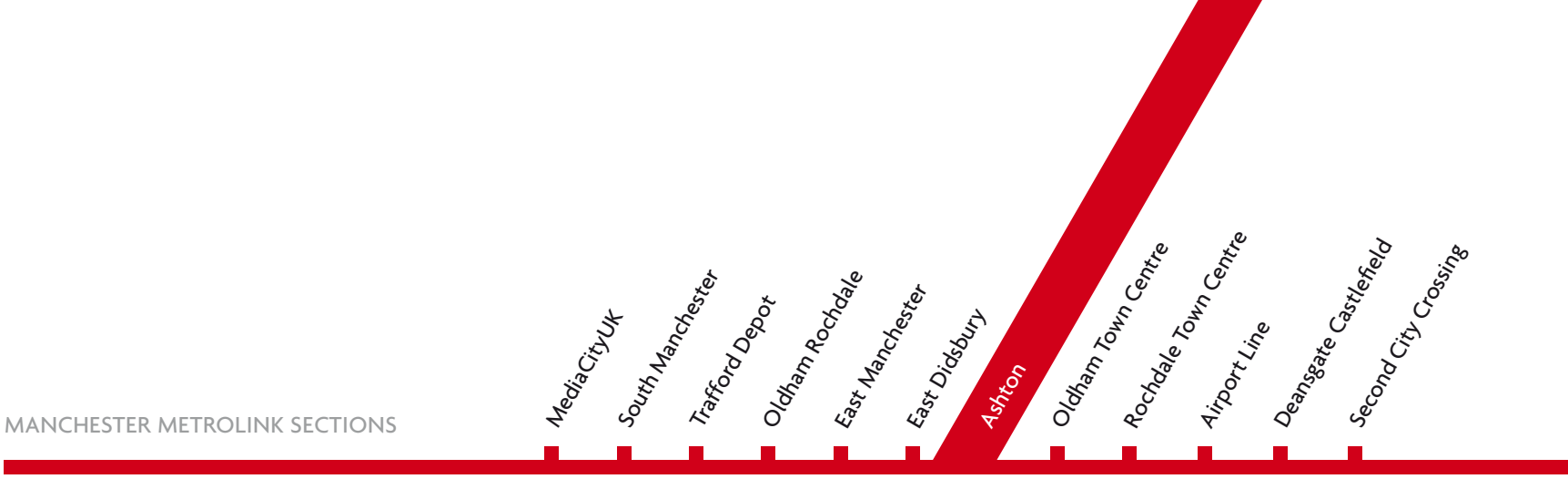
One signification construction challenge for this line was the introduction of the pedestrian access ramp at the Burton Road stop. Due to the height difference between the adjacent highway and the platform the ramp needed to achieve a gradient that was suitable for wheelchair and mobility impaired users. Combined with spatial constraints, the ramp infrastructure had to be installed in close proximity to residential properties that abutted the corridor. Considerable care was taken when carrying out the works including exploration trial holes to determine property foundation depths and subsequent careful vibration monitoring at each property.

BEFORE

AFTER


MPT
ENVIRONMENTALLY SENSITIVE AREA
RESTRICTED WORKING
NO ACCESS
NO EXCAVATIONS


Eccles
3085A



ASHTON

The Ashton Line is a 4.4km extension to the East Manchester Line picking up from Droylsden and running to Ashton-under-Lyne adding a further four new stops and two additional substations. The section between Droylsden and Audenshaw comprises a 0.8km extension of the embedded 'street-running' track where the trams share the highway with the traffic. At Audenshaw the tram corridor leaves the highway where it follows either alongside or within the central reserve of Lord Sheldon Way, over the M60 motorway and subsequently terminating in Ashton Town Centre. The final stop on the line also forms an interchange with Ashton bus station and is in close proximity to Ashton rail station.

Construction commenced in February 2011, overlapping with the adjoining East Manchester section which opened to passenger service in October 2013.

Street running trams

The street running tracks were constructed through heavily populated residential areas along the busy arterial commuter route from Droylsden to Audenshaw.

This section featured significant utility diversions, extensive highway and urban realm improvements, use of innovative construction to minimise disruption and detailed phased construction sequences to keep traffic moving throughout.

During the construction of the street running sections extensive deep excavations were required to remove peat formations, that were encountered under the existing carriageway. This section also incorporated a novel street running arrangement which became known as the 'flush reserved tram lane'. This operates as a dedicated tram lane, in the middle of the carriageway, for inbound trams to benefit from a reserved lane providing traffic free passage along the busy corridor.

Park and ride

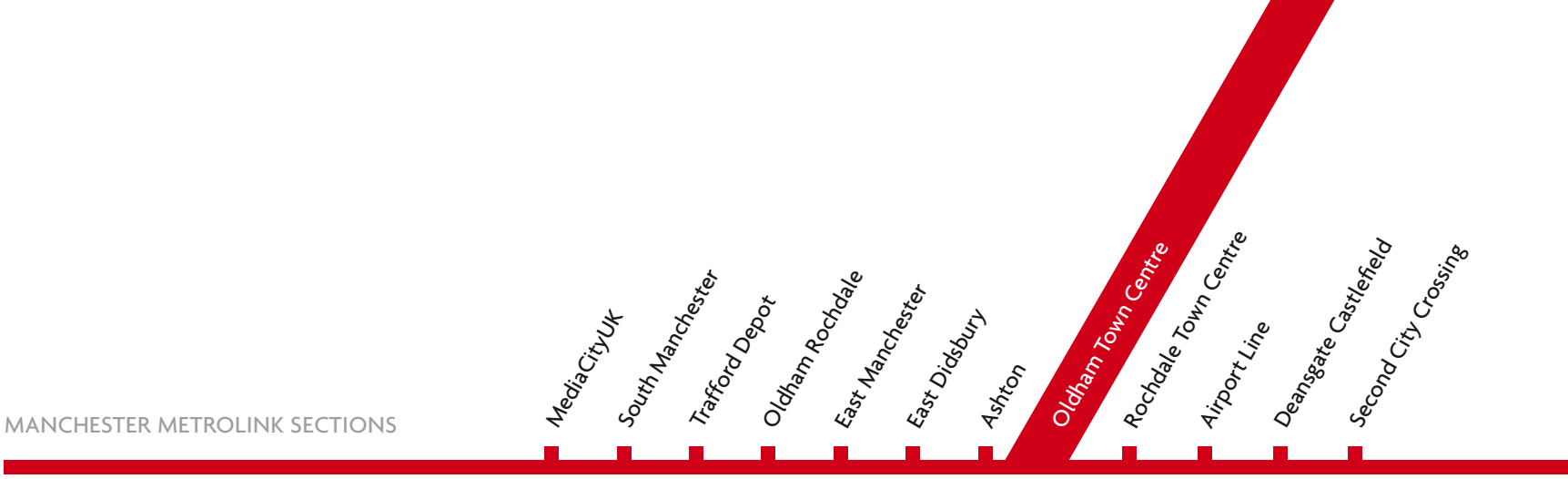
A new park and ride facility was built along this route consisting of a dedicated 200 space facility at Ashton Moss stop.

ALTERNATIVE TRACKFORM


3079

"THESE ARE EXCITING TIMES FOR OUR BOROUGH WITH THE METROLINK LINE TO ASHTON PROVIDING ANOTHER PIECE IN THE PUBLIC TRANSPORT JIGSAW FOR TAMESIDE. WE HAVE ALREADY SEEN THE POSITIVE IMPACT THE TRAM SERVICE TO DROYLSDEN HAS HAD ON THAT TOWN, AND THIS WILL BE EQUALLY POSITIVE FOR ASHTON."

Councillor Peter Robinson
Tameside Council's Executive Member for Transport and Land Use



OLDHAM TOWN CENTRE

The Oldham Town Centre project comprised of 2.4km of new tramway infrastructure constructed right through the centre of Oldham and now forms part of the main route of the Oldham and Rochdale line. The advanced works started in 2010 and required major infrastructure changes local to Oldham Mumps station with the removal of the Mumps Viaduct, as part of the OTC works, eventually replacing this with an at-grade roundabout / tram crossing in 2012. The route takes a loop via Oldham town centre and incorporates a substantial element of street running track, where the tram shares the highway with the traffic through the town centre.

The main construction work commenced in February 2011 following an extensive statutory utility diversions programme that had to be completed within this urban environment to pave the way for the new tramway to be built. The works including mechanical and electrical installations and associated testing and commissioning were completed within the following 2 ½ year period. The line successfully opened to passenger service on 27 January 2014 following a period of driver training and the critical connection works to tie the new Oldham town centre tramway into the Oldham and Rochdale line, several months earlier than stakeholders' expectations.

Co-op funeral parlour

Within the route of the proposed alignment there was an existing Co-op funeral parlour. To overcome this MPT constructed a new funeral parlour in a nearby location allowing the business to move to the new facility and further enabled MPT to demolish the vacated building. The new tramway alignment into Oldham town centre could then be constructed. The new building, very different from anything else constructed on the Metrolink scheme so far, was successfully completed and handed over to Co-op/TfGM achieving practical completion on 13 June 2012, allowing the construction of the main tram scheme to progress on programme.


3004

OLDHAM MUMPS

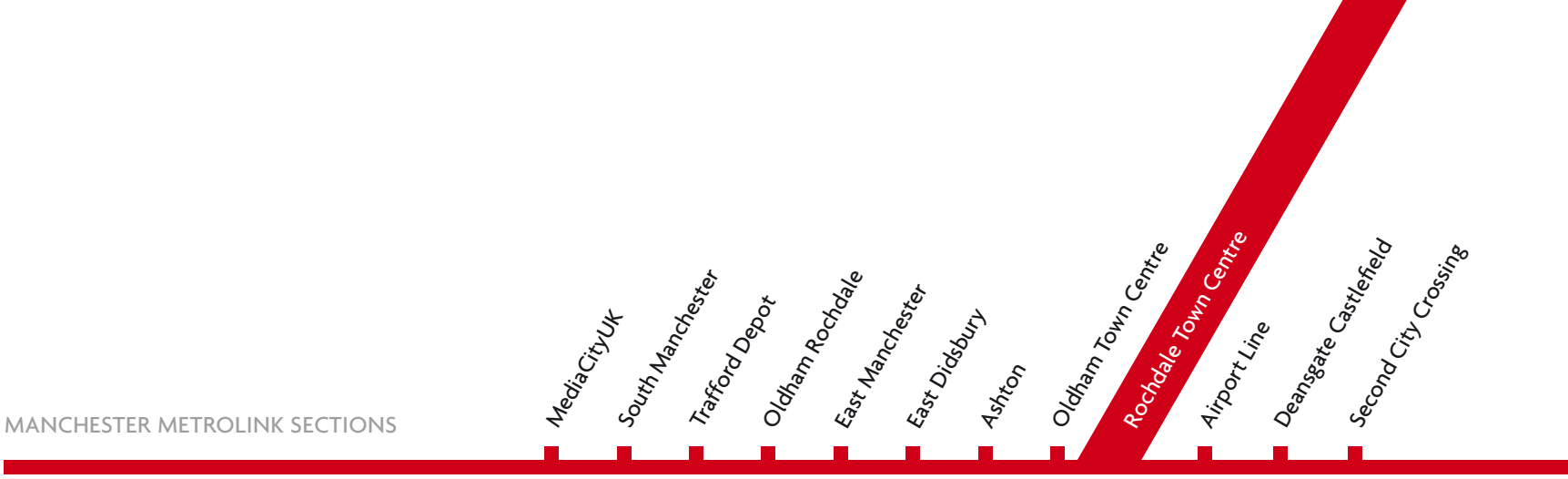
When funding was approved for the Oldham town centre section, MPT worked with TfGM and Oldham Council to derive the most effective way to deliver Metrolink through the Oldham area; whilst also achieving long-term benefits in town centre regeneration and highway improvements. This led to a dramatic scheme which has genuinely transformed the Oldham Mumps area. An old stone viaduct was demolished opening up the entire area. A roundabout was removed and replaced with a much more effective signalised junction with substantially increased traffic flow capacity catering for current and future traffic volumes. This also included a new link road into Oldham town centre to facilitate the delivery of the final Metrolink alignment and to provide access to the new park & ride.

OTC BLOCKADE

As the Oldham Town Centre section was a new alignment to the recently commissioned Oldham Rochdale Line, it had to be connected into the existing infrastructure with minimal disruption to the Metrolink network. Therefore the Oldham Rochdale Line infrastructure was reconfigured at both Mumps and Werneth during an intensive seven day blockade in January 2014. This included partial decommissioning of the Oldham Rochdale Line with subsequent reconfiguration and full testing and commissioning of the new track alignment, overhead line cabling and various communications equipment, enabling trams to travel through Oldham town centre on the 27 January 2014.


Tram on Test
1030


3071
Metrolink
3071
3070

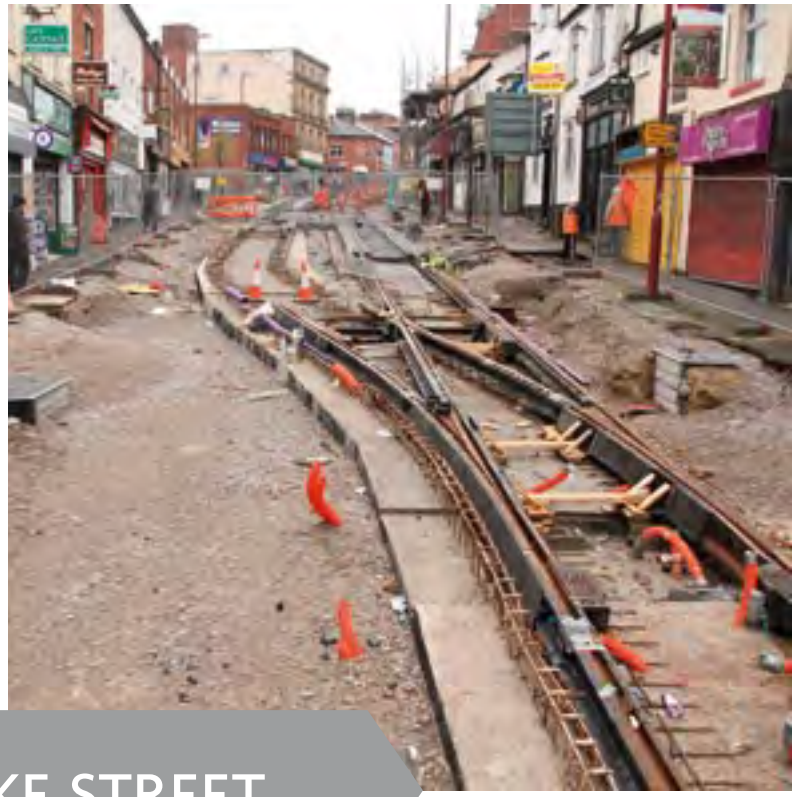


ROCHDALE TOWN CENTRE

The Rochdale Town Centre section is a 0.9km extension to the Oldham Rochdale Line from the Phase 3A terminus at Rochdale railway station right into the town centre of Rochdale. The route is solely a street running track with extensive statutory utility diversions which started in late 2010 enabling construction activities to commence in earnest, early 2012. This was followed by an 18 month period of tram-way construction, including all mechanical and electrical installations, with the line opening for passengers in March 2014.

Rochdale Town Centre stop

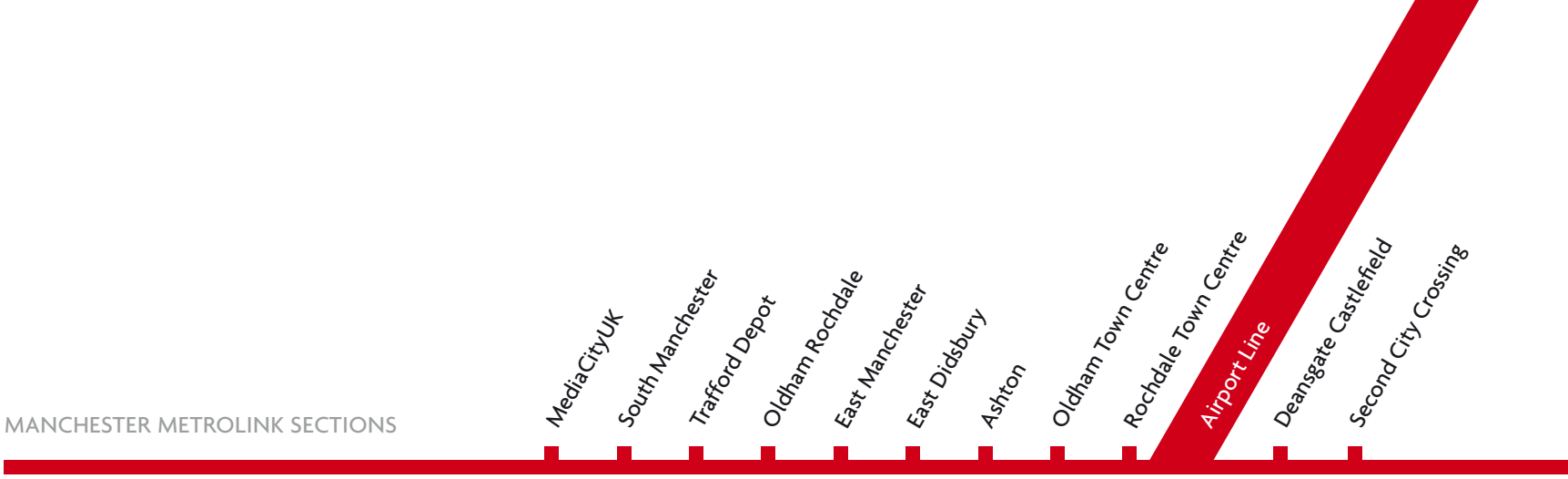
The terminus stop in Rochdale town centre was constructed on top the River Roch bridge, one of the widest span bridges in the world, previously formed by the joining of seven separate bridges and refurbished. Prior to the construction of the Metrolink stop the MPT team had to first remove the existing surface and carefully expose the structural bridge deck before installing a waterproof membrane and then constructing the platform.



DRAKE STREET

Whilst Drake Street was closed to vehicular traffic, fundamental to this scheme was phasing the construction in order to maintain pedestrian access to the multiple businesses and traders which operate there. This was successfully achieved by MPT who by working in conjunction with the TfGM stakeholder team, was able to keep businesses and traders advised on all future developments and provide regular updates on project progress.


WI
08
963



AIRPORT LINE

The Airport Line extends for a total distance of 14.5km from the Phase 3A St Werburgh's Road stop, through Chorlton-cum-Hardy, Sale Moor, Northern Moor, Baguley and Wythenshawe, terminating at Manchester Airport. The route has a total of 15 stops.

The route is a combination of integrated and segregated on-street tramway sharing a highway corridor. A new viaduct carries the new tram route over the River Mersey, to Sale Water Park stop where a park and ride facility has been constructed. A section of ballasted track then takes the route alongside the M60 where a new, 52m clear span concrete and steel structure was constructed over the M60. The route travels south through to Wythenshawe Park and Baguley where a further structure was constructed over a Network Rail line before heading over a new M56 bridge structure and towards Wythenshawe town centre stop and future transport interchange, before terminating at Manchester Airport.

Baguley rail bridge

A grade separated structure crossing the new Metrolink over the Network Rail Glazebrook and Godley line was constructed alongside the existing Southmoor Road Bridge.

Hilton hotel retaining wall

A 115m long retaining wall built alongside the hotel was constructed to retain the car park from the reduced level tram way, consisting of contiguous bored piles with concrete capping beam.

"IT'S GREAT TO SEE WORK PROGRESSING SO WELL ON THE AIRPORT LINE. THE MERSEY VALLEY VIADUCT IS A MAJOR PIECE OF INFRASTRUCTURE ON THE ROUTE."

Councillor Andrew Fender
Chair of the Transport for Greater Manchester Committee


Sale Water Park

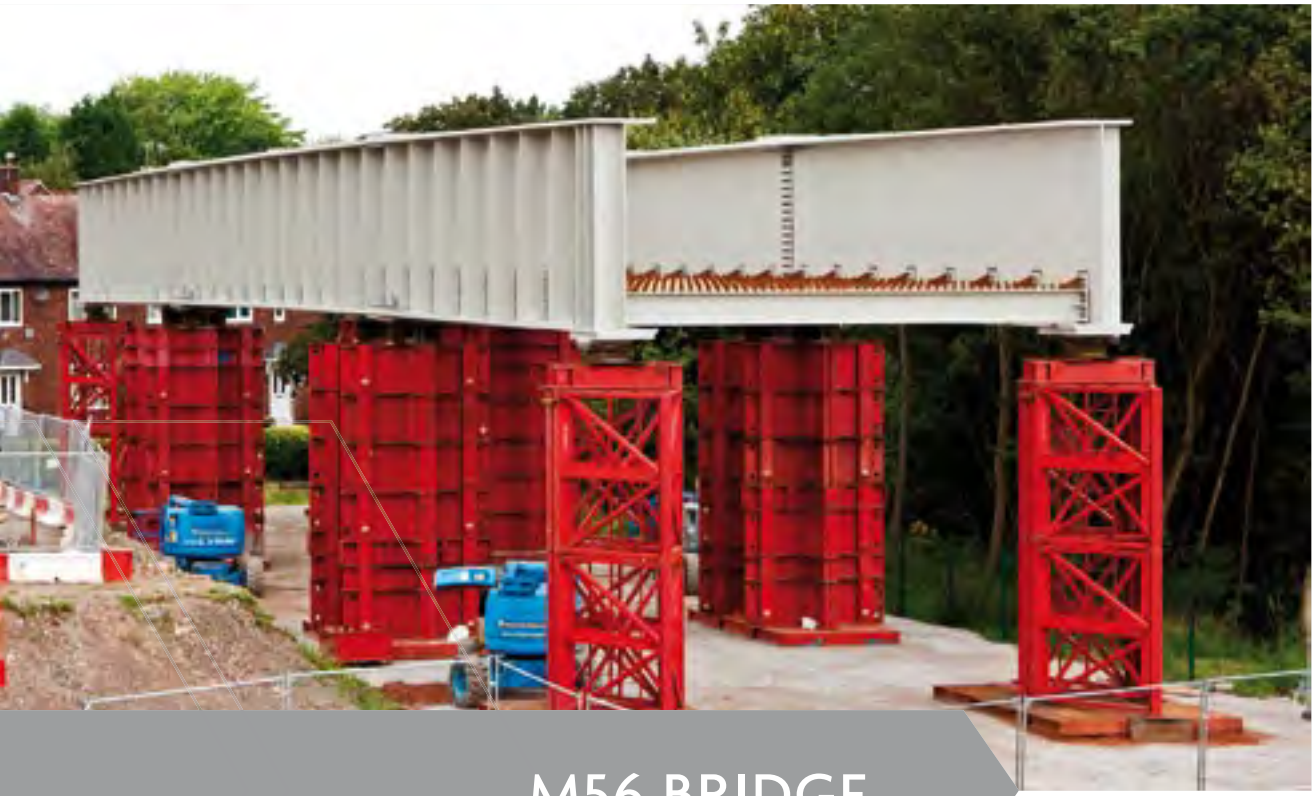
MERSEY VALLEY

This new structure is an eleven span concrete pier and composite deck viaduct constructed to take the new tram route over the River Mersey and its associated flood plain, from Barlow Moor Road stop to Sale Water Park; crossing the River Mersey. The southern approach consisted of a reinforced concrete 'U'-trough and 'L'-shaped retaining structure. The structure was a mix of in-situ concrete and pre-cast concrete to make best use of the benefits associated with off-site manufacture and minimise the construction duration onsite.

M60 BRIDGE

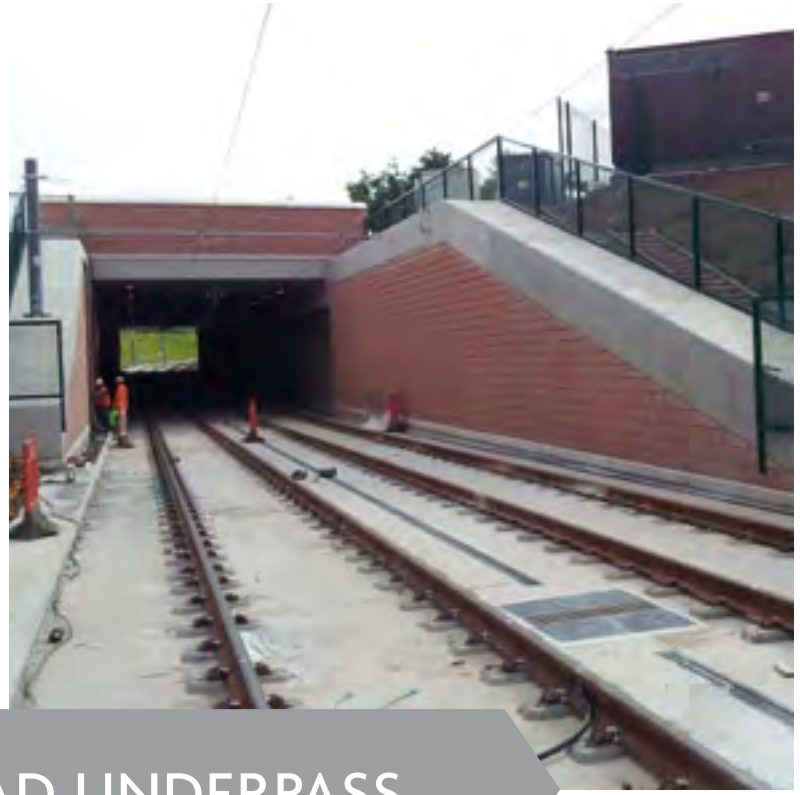
The structure comprises of skewed, single span bridge with longitudinal steel outer girders, transverse girders and a composite reinforced concrete deck. The substructure comprises of a full height reinforced concrete abutments with inspection galleries, founded on 60cm diameter CFA piles reducing the long term settlement of the structure. The main bridge superstructure was constructed alongside the M60 motorway at an elevated level and was installed using specialist transport equipment during a highway possession.


Select
ALE
Select
CAT
M316D



M56 BRIDGE

This square, single span bridge structure passes over the M56 motorway approximately 30m south of the existing Hollyhedge Road bridge. With main steel girders and cross members supporting a composite reinforced concrete deck, the bridge superstructure is supported on in-situ reinforced concrete cantilevered abutments on spread type foundations. The approaches are formed by reinforced concrete 'U'-trough retaining structures.



RINGWAY ROAD UNDERPASS

On the approach to Manchester Airport a 1km long dual carriageway was constructed and the new tram alignment passed under this through a contiguous concrete piled underpass. The main reinforced concrete bridge deck under the carriageway was constructed integral to the contiguously piled retaining walls, with the wall also extending to form the approaches where the piles were finished with a concrete capping beam. A 30m long reinforced concrete surface water attenuation tank constructed beneath the tracks, to the west side of the underpass, was designed to also act as a prop to the concrete wall piles.

MANCHESTER AIRPORT 4TH PLATFORM

As part of Network Rail's Northern Hub improvement programme, MPT were approached to deliver the 4th platform at Manchester Airport train station, with works to be incorporated into the Manchester Metrolink Airport Line project. In order to accommodate the construction of the new 4th Platform, MPT were required to demolish an existing span of Outwood Lane bridge, excavate out the existing abutment and, using a 750 tonne crane, lift in 28 new precast beams each weighing 35 tonnes.

Working in close proximity to live road and rail infrastructure and the UK's third largest airport created a number of challenges. Manchester Airport station receives almost 10,000 passengers a day, and approximately six times that number pass through the airport itself. Throughout the possession public access had to be maintained at both the station and the airport, to minimise disruption. This resulted in the original 37 day program being condensed to 16 days. Works commenced Saturday 15 March. MPT successfully delivered the works 10 hours early, allowing roads to re-open to traffic ahead of schedule on Sunday 30 March 2014.


UCH

"SEEING OUR TRAMS REACH MANCHESTER AIRPORT MORE THAN A YEAR AHEAD OF SCHEDULE IS A TRULY AMAZING ACHIEVEMENT – AND A GAME-CHANGER FOR THE COMMUNITIES SET TO BENEFIT FROM ITS 15 NEW STOPS AND FREQUENT, FULLY ACCESSIBLE SERVICES."

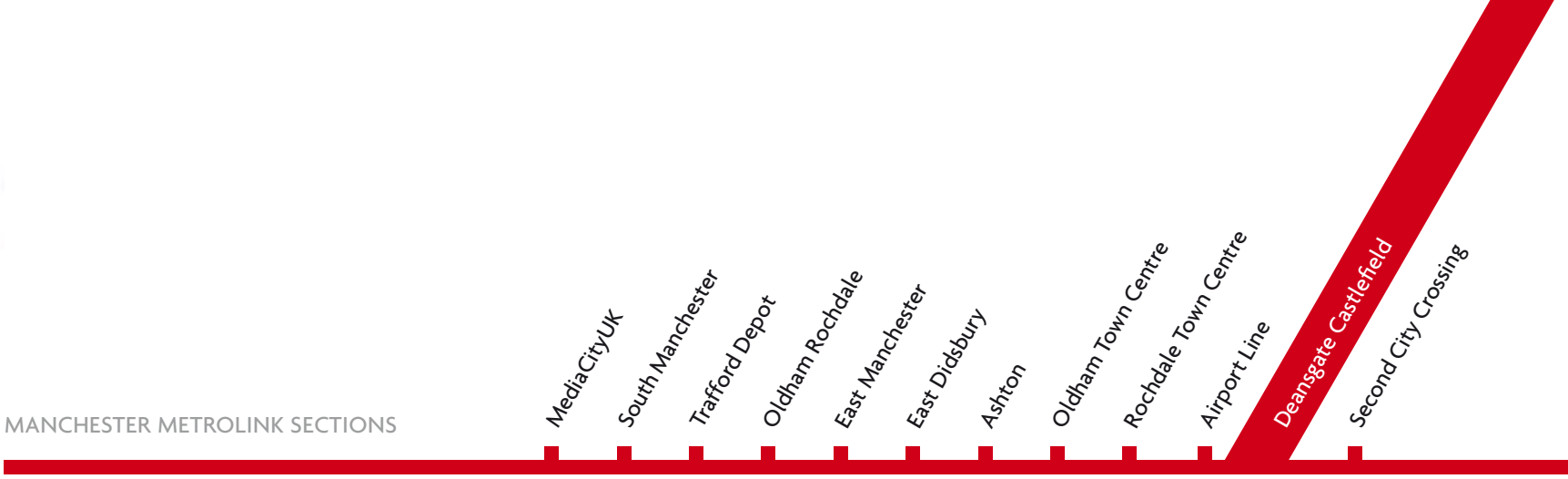
Councillor Andrew Fender
Chair of the Transport for Greater Manchester Committee


Manchester Airport
3071
Metrolink
3071A


DEANSGATE LOCKS

European Union
European Regional Development Fund

MANCHESTER METROLINK SECTIONS



DEANSGATE CASTLEFIELD

Deansgate Castlefield tram stop was an existing Metrolink tram stop originally opened in April 1992 under the Metrolink Phase 1 works and is situated on a Victorian brick viaduct to the south western edge of Manchester city centre, within the area known as Castlefield. The scheme at Deansgate Castlefield was to create a green urban oasis within the city centre with TfGM employing Ian Simpson Architects to help create the visualisation. MPT worked closely with the client and architect to replicate those visualisations through sympathetic design and a great attention to detail. The intent was also achieved by the production of multiple innovative new features such as 'sedum track', an illuminated balustrade, CorTen steel clad buildings, a planted 'living wall' and platforms laid in slate stone.

Improved public access routes to the tram stop were achieved by the design and construction of a new glazed through lift and stair access, a new stair bridge spanning over the Rochdale canal and the refurbishment of an existing link bridge to the Deansgate heavy rail station. All of these extended the Metrolink identity into the surrounding public areas, advertising the presence of the reformed Metrolink stop.

Increased flexibility to the operational network was gained by the creation of a 'loop track' and bi-directional track with additional platform. This facilitates multiple tram movements within the stop, aiding the public flow in and out of the city centre.

Further construction difficulties were overcome with regards to the stop location situated over Deansgate Locks consisting of tenanted arches of bars and restaurants, with only a single vehicular access to the high level. Adjacent to this is the Rochdale Canal and a mix of residential and commercial use high rise buildings, including the Hilton hotel, part of the 47-story residential Beetham Tower.

Delivered in under 2 years, successfully completing 16 disruptive possessions of the tram network and by careful management of shift working, MPT were able to maintain full operational use of the tram stop throughout to deliver a practical and unique green space legacy that thousands of people will enjoy each and every day.

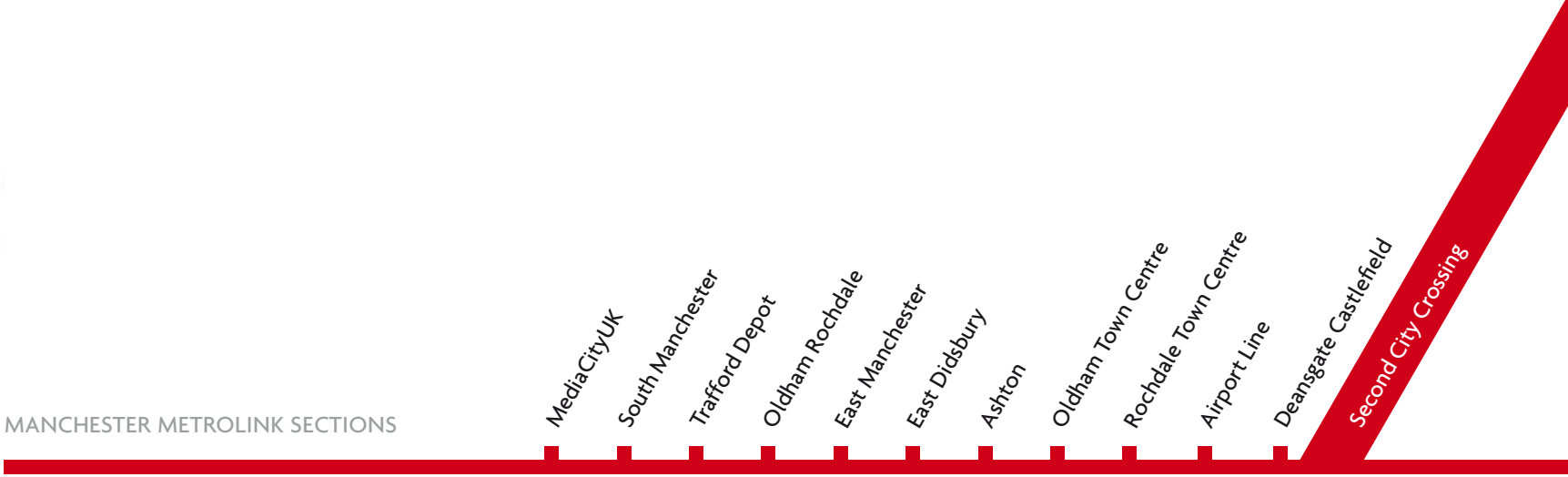
"THE NEW STOP IS LOOKING REALLY IMPRESSIVE AND IT'S CLEAR JUST WHAT A GREAT NEW FACILITY PASSENGERS WILL ENJOY WHEN THE TRANSFORMATION IS COMPLETED. THIS IS A FAST EXPANDING AREA OF THE CITY AND METROLINK WILL BE READY TO CATER FOR THE EXTRA DEMAND WE WILL NO DOUBT SEE FOR TRAVEL AT THIS STOP."

Councillor Andrew Fender
Chair of the Transport for Greater Manchester Committee

"SEEING THE TRAMS RUNNING INTO THE NEW LANDMARK STOP AT EXCHANGE SQUARE IN THE HEART OF THE CITY'S RETAIL DISTRICT, IS A MAGNIFICENT SIGHT. THE STRIKING ARCHITECTURE AND SURFACE FINISHES ENHANCE THE URBAN REALM WHILST PROVIDING A KEY TRANSPORTATION LINK FOR THE PEOPLE OF GREATER MANCHESTER."

Jim Goldsby
MPT project leader

European Union
European Regional Development Fund



SECOND CITY CROSSING – THE STORY CONTINUES...

To provide essential network flexibility and additional capacity, TfGM awarded MPT the design and construction of a second tram route through the busy streets of Manchester city centre. The Second City Crossing project sits within the heart of Manchester's retail and commercial districts to provide an additional link between the existing St Peter's Square tram stop and the recently upgraded Victoria tram stop, connecting to heavy rail lines. St Peter's Square tram stop will be extensively remodelled to accommodate the new route and complement Manchester city councils existing flagship redevelopment of the square. On Cross Street the exhumation of over 250 bodies from a burial site dating back to the early eighteen hundreds had to be sensitively managed during the early stages of the scheme.

Exchange Square

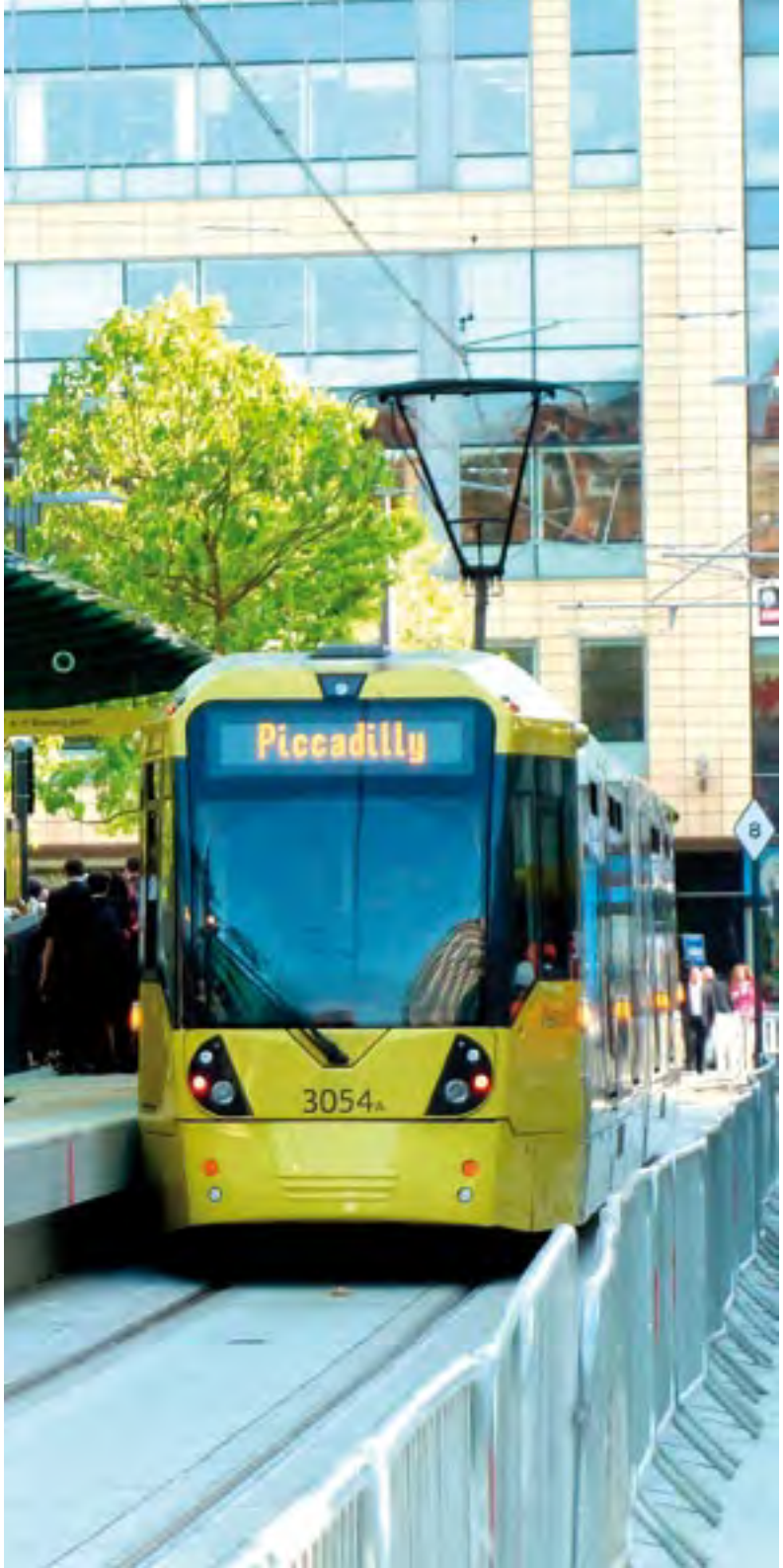
Section 1 of the new city crossing was successfully opened for passenger service on 6 December 2015 as an interim, phased opening of the full Second City Crossing scheme. The new section of tram way runs through to a newly constructed Exchange Square stop and facilitates tram movements on the Oldham and Rochdale line right into the heart of the city.

The new Exchange Square platform builds upon the successful off-site manufacturing system developed by MPT and was substantially pre-clad off-site with a mix of black and white granite paving. The platform also holds a series of four bespoke shelters to provide its own distinct statement, whilst managing to retain the Metrolink identity.

Sitting directly on the doorstep of the Manchester Arndale shopping centre within Manchester's main shopping precinct, this new addition to the Metrolink network met TfGM's aspiration to be open just in time for Christmas. With works starting in late 2014 this section of track has been constructed, tested and commissioned within 14 months and is a testament to how mature and accomplished the MPT and TfGM team have become.

SECOND CITY CROSSING


ROADCRAFT


Piccadilly
3054


MPT

MAINTENANCE CONTRACT

MPT as part of the DCM contract with TfGM, are delivering infrastructure maintenance services across Phase 3 of the Manchester Metrolink. Key deliverables include the provision of a 24/7 service centre that handles around 500 reactive and planned maintenance tasks per period. Services are delivered by a dedicated round the clock team of technicians, across approximately 60km and 60 stops. Maintaining assets that include: all stop passenger information equipment, overhead lines, track, fibre and copper cables, traction power substations and structures. The maintenance contract commenced in 2010 and runs through until 2017 initially for the MediaCityUK section but then progressively extending as sections have achieved Infrastructure Maintenance Services Commencement Certificate (IMSCC) and moved into maintenance.

The MPT maintenance key objectives are to provide overall management of the assets in accordance with the contract and associated documents to achieve the annual maintenance and service plan deliverables on a year on year basis. This has been made successful by establishing a positive and constructive working relationship with the Metrolink Operation Control Centre, TfGM and all suppliers and sub contractors. The maintenance team has consistently demonstrated to TfGM and MRDL their ongoing capability and competence to successfully deliver the overall maintenance service, contributing significantly to the overall running of an efficient Metrolink system and a positive passenger experience. This in return delivers best performance of assets and the best return on client investment.


MPT


Safety Award
Metropolitan
Council
THALES


MPI
Laing O'Rourke
VolkerRail

SUPPLY CHAIN

Without the support of a dedicated, knowledgeable and expert supply chain it would have been impossible to successfully deliver Phase 3 of the Manchester Metrolink. Mutual relationships with suppliers have allowed traditional supply agreements to be challenged, with many of the new innovations being a result of meaningful collaborations with the supply chain. To this end, MPT chose to positively recognise at least some of the contributions made through a Suppliers Award scheme.

Annual Suppliers Award dinners have been held regularly, ensuring that time is taken to sit back, reflect and reward some of the exceptional support that has been offered by our partners both as organisations and individuals.

INNOVATIONS

Throughout the project MPT have demonstrated a culture of innovation by encouraging, embracing and supporting ideas from across the team. It is essential that any business demonstrates continual learning and an ability to streamline processes and procedures throughout its' life. MPT have been able to demonstrate this through the life cycle of the project and an exemplar continuous delivery track record. This then provided the confidence on which additional funding was secured.

MPT are proud of the innovative solutions developed over a wide range of disciplines and from all parts of the team. From advancing our BIM capabilities to integration of the latest software into our everyday working lives, building unique and collaborative relationships with stakeholders, challenging traditional construction methods and further investing in, and working with suppliers to adapt, develop and modify products, from small tools and equipment to permanent works.

M56 and M60 bridges

A key factor in the success of the major tram bridges over the M56 and M60 motorways was the assembly of the main bridge span structures in advance onsite, adjacent to the abutments, before being eased into position in a precise and controlled operation. The operation briefly involved the closure of the motorway, the removal of the verge and central refuge, the transportation of the structure and supports from its assembled location across the motorway and into the correct alignment, the accurate placing of the bridge span structure and fixing into position, the reinstatement of the central refuge and verge prior to the reopening of the motorway. This innovative approach enabled each bridge to be installed during a thirty hour closure of the associated highway, with both bridge installations being installed ahead of schedule and roads opened eight hours early.

PRE-CAST MANUFACTURING

One of the major challenges posed by this project was to see how tram stops could be built more safely, economically and to an award-winning standard. The answer? Build the platform in a factory. MPT has used Laing O'Rourke's unique off-site manufacturing capability to construct modular concrete units, which were then brought to site and assembled to form the tram stop platforms. In total there were over 2,900 pre-cast units required to deliver the 57 new tram stops to date. So successful was this approach that it achieved the 2012 Project Award from the British Precast Association.

The use of digital engineering to design these structural segments in a virtual world enabled significant savings and efficiencies to be achieved on the project. It also allowed operational performance to be predicted with greater certainty, and by using the latest prototyping techniques, allowed multifaceted models to be created with integrated data about each element's design, construction and performance once installed onsite. Off site manufacturing also supports greater production efficiency, promotes safety by utilising a controlled environment and enables consistently higher quality components to be constructed. For many of

the tram stops, complete lift assemblies, steps, access ramps and retaining walls also realised benefits from being manufactured off-site.

At Deansgate Castlefield a heavy architectural influence led to the platform being paved in a natural slate stone sourced from various quarries within the Lake District. This, as well as the need to install the new platform right alongside a live operational tram line, led to the development of a 'flat packed' pre-cast, pre-clad solution. Substantial sections of the platform arrived onsite already clad with the natural stone. This was made possible by an innovative bonding system developed in conjunction with our suppliers (Explore), to facilitate the differential expansion between the concrete and natural slate materials.

SEDUM ‘GREEN TRACK’

Architectural and local authority aspirations to create a green urban oasis in the city centre led to innovative thinking on the new Deansgate Castlefield tram stop remodelling project. Through several iterations, product trials and joint party reviews a standard, Network Rail approved Polysafe rail crossing product was developed to hold trays of Sedum shrubs.

“Sedum is a large genus of flowering plants in the family Crassulaceae. Up to 600 species of leaf succulents can be found throughout the Northern Hemisphere, varying from annual and creeping herbs to shrubs. The plants have water-storing leaves. The flowers usually have five petals, seldom four or six.”

The Polysafe panels were developed to be post fitted into an existing rail line and yet facilitate typical track maintenance such as rail clip inspection and replacement. Whilst the sedum itself requires minimal maintenance, it encourages nature into the space and helps to manage rainfall as part of a Sustainable Drainage System (SuDS). Such was the success of the final appearance the public regularly comment on how wonderful the tram stop looks.

PPE – THEN & NOW

MPT recognise that it is vital to look after and continuously invest in our people. Not only does the latest PPE offer much greater protection when out onsite carrying out duties, it also sends a clear, professional and consistent message about our business and the industry within which we work, to those looking in. Our people have recognised these benefits and genuinely feel proud to be part of a unified team.

DISABILITY DESIGN REFERENCE GROUP

The MPT project team, together with Transport for Greater Manchester, has worked closely with the Greater Manchester Disability Design Reference Group (DDRG), established by TfGM, to ensure that the designs for the new trams stops not only met the relevant standards of access for potential users with impaired mobility, but through early involvement in the planning and design stages, ensured that the new stops provided a genuinely welcoming environment for anyone with disabilities.

The work was not just confined to accessing the trams at the stops. The DDRG also gave practical advice on a host of accessibility issues from the design and layout of the stops and car parks to the seating arrangements on the new trams. Test visits while the new lines were in shadow running operation were undertaken to ensure that no details had been overlooked and that the newly extended network would offer a better journey for disabled travellers from day one. The success of this approach by TfGM and MPT working together with the DDRG has been widely applauded, led to several awards, and is now recognised as a model of best practice by the Equality and Human Rights Commission.

‘FLAT PACK’ STOP EQUIPMENT ROOM AND OTHER INNOVATIONS

An immediately successful innovation was the precast ‘flat pack’ Stop Equipment Room (SER) buildings which has been utilised extensively across the new Metrolink network. The system is able to be transported and unloaded efficiently using current transport frames which provide safe access to the integrated lifting points. The concrete wall units are connected together with a simple bracket system fitted into pre-set fixing channels, eliminating onsite drilling, and requiring minimal temporary propping to stabilise the walls during erection. The innovative building can be assembled in a few hours and minimise onsite construction considerably, whilst offering a consistently high level of quality.

Further innovations

Significant lengths of the new tram way were situated in an on-street environment. Typical ballasted track here was not desirable and the inherent costs associated with embedded track led to the development of an alternative ‘embedded sleeper’ track form. The track system is based upon a simple reinforced concrete ‘stage 1’ foundation slab, and utilises twin block sleepers to level the rail off the ‘stage 1’ using integrated screw jacks, in order to cast a ‘stage 2’ concrete around the sleepers.

WORLD ENVIRONMENT DAY

To coincide with World Environment Day, VolkerRail alongside Laing O'Rourke and partners working on the MPT Manchester Metrolink project teamed up with local landscapers, Ground Control and Wythenshawe Community Housing Group to help create a 'sweet' legacy in the local community.

Twenty-five fruit trees have been donated and planted in the gardens of community groups within the area, including the offices of Wythenshawe Community Housing Group, The Young People's Support Foundation, Macmillan Cancer Research's volunteer centre at Wythenshawe hospital, The Dandelion Community – a gardening group ran at a local church and The Crossacres Cultivators - a gardening group at a local Age Concern community centre for over 60s.

ENVIRONMENT

Over the course of the scheme many environmental initiatives were introduced. These included recycling large volumes and whole areas of materials; tree replacement schemes; encouraging local wildlife and wildlife education; habitat replacement schemes; monitoring and reducing carbon outputs; careful management of sensitive areas and operations; and strategic management of noise and vibration throughout construction.

An allotment challenge was engaged across the entire scheme in 2013 with the various project teams competing against each other to cultivate the best produce. With a multitude of innovative plots being constructed, judges from the local communities around Manchester were impressed with all the sites and the engagement from the site teams.


ENVIRONMENT
ENVIRONMENTALLY
SENSITIVE AREA
No Access
Do not move fence
MT


COSHH
Waste
Only

"MPT HAVE BEEN ABSOLUTELY FANTASTIC. IT HAS BEEN A PLEASURE TO WORK WITH SUCH A PROFESSIONAL GROUP OF PEOPLE AND THE COMMUNITY GROUPS HAVE BEEN BLOWN AWAY BY THE KINDNESS AND GENEROSITY."

Jacqueline Naraynsingh
Real Food programme manager for Wythenshawe Community Housing Group

COMMUNITY MATTERS

Throughout the course of construction MPT have committed to engage in local community projects within the Greater Manchester area through which the new tram alignment passes. A significant number of people have volunteered time to help build school and local community gardens, enhance children's playgrounds and mentor local students. Many teams have also contributed to improving the local environment through a number of initiatives such as planting fruit trees, improving the quality of landscaping to community areas and creating wildlife habitats along the routes.

Recognition of the short term impact that construction has on the local community has led to the MPT teams raising internal awareness of often simple but effective measures that mitigate such impact, looking for new and innovative solutions along the way. External awareness of the dangers of construction sites, and in particular the risks associated with operational tramways, has also been spread through schools and local communities by the dedicated people working on the projects.

By effective communication the project teams have been able to consistently develop a good rapport with local residents and businesses which is shown by our excellent quarterly scores on the Considerate Constructors Scheme, with their mascot Ivor Goodsite making a guest appearance on some of our sites.

St Edmund's wildlife garden

Pupils at St Edmund's Primary School in Monsall are still enjoying their new wildlife garden which was built by MPT in 2010.

The wildlife garden, which was designed by the children themselves (with a little help from the MPT consortium), was built with hedgehog house, rabbit hutch, logs for mini-beasts, an amphibian bog and raised flower beds. MPT contacted St Edmunds to suggest the donation of materials and time to construct the new wildlife garden at the school.

ST EDMUND'S WILDLIFE GARDEN

"THE GARDEN GIVES THE CHILDREN AN AREA TO RELAX AS WELL AS A GREAT OPPORTUNITY TO LEARN MORE ABOUT WILDLIFE."

Mrs Beteny
St Edmund's Primary School Teacher

SCHOOLS


GO TEAM
MACMILLAN


MPT


221
219
220
218
222

FUND RAISING

Both local and national charities have benefitted from the dedication and commitment of our people who have undertaken sponsored or fund raising events. Each year our teams have been sponsored to run the Manchester 10k, a run along the new tram route from Rochdale to the Airport with press-ups at every stop along the route, and a climb of the 3 Peaks of Britain to name but a few. Raffles have been drawn regularly to support some of the smaller charities, and a secret Santa was organised in 2012 and 2013 for the Children's ward at Wythenshawe Hospital with Christmas gifts handed out to over a hundred children. More recently food and clothing collections have been generously gathered and donated to help those closer to the project within the city centre, along with a sponsored dragon boat race where the finish line was warmly welcomed.

Through these activities and our corporate events such as the MPT golf day and the Annual May Ball, the Metrolink Team can be very proud to have raised over £75,000 for charity.

OUR PEOPLE

A huge thank you goes out to the thousands of people who have dedicated their time to deliver what is truly a world class transport and regeneration scheme. Amazing individual achievements have seen careers blossom and the way that every single person has worked collaboratively towards achieving the same vision has been inspirational. Without this level of commitment, challenging undertakings like the Metrolink would not be possible, especially when you account for the sheer magnitude of what has been achieved. This runs from the workforce managing the front lines, right through to the councillors and directors who have helped to make this happen.

Fantastic individuals.

Great teams.


MPT
Volker Rail
THALES


Next: MediaCityUK


MPT


Tram to: Bury via Victoria


Trafford Plaza


MPT


DAYTONA

MANY THANKS


MPT
Laing O'Rourke
VolkerRail IThales


VolkerRail


LAING O'ROURKE


THALES

MPT
Laing O'Rourke
VolkerRail | Thales

LAING O'ROURKE

VolkerRail

THALES