

Nottingham Tram Network A Success Now and into a Clean Air Future

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Public Transport in Nottingham

- Greater Nottingham population c.730k, East Midlands 2.5m. Nottingham City 330k
- Large investment in Public Transport. Total PT demand is approx. 80m pass journeys pa (up 3.3% since 2010) and second highest PT/head in the UK (150 journeys/head)
- Two major bus companies with c. 350 buses each
 - Nottingham City Transport (owned by Nottingham City Council) (49.6m pass journeys) (internal routes, double deckers)
 - Trent Barton (operates throughout the Notts-Derby-Leics area and beyond) (circa 10m pass journeys in Nottingham on radial routes)
- 3-Line 32km tram network (NET) (37 trams) with approaching 20m passengers pa. covering a 630m population area
- Cycle network, including tram corridors. Cycling up from 2.7m to 3.3m miles in 15 years

Measures to reduce pollution in Nottingham

Public Transport

- As a result of the investment in PT, Road traffic volume in the city has fallen 8% from 2000 despite the general growth in the Economy
- Introduced an Air Quality Management (AQM) Plan in 2018 with clean air zones, accepted by government – becomes the only major UK city to meet planned lower pollution targets without imposing daily entry fees for the most polluting vehicles
- £15m investment in UK's largest electric bus fleet (central areas)
- Retrofitting older buses for biogas running
- Large investment in a cycle network, with routes which use the sides of the tram corridors
- Free car parking at the ends of the tram lines and at intermediate tramstops

Further Measures to reduce pollution in Nottingham

Public Transport

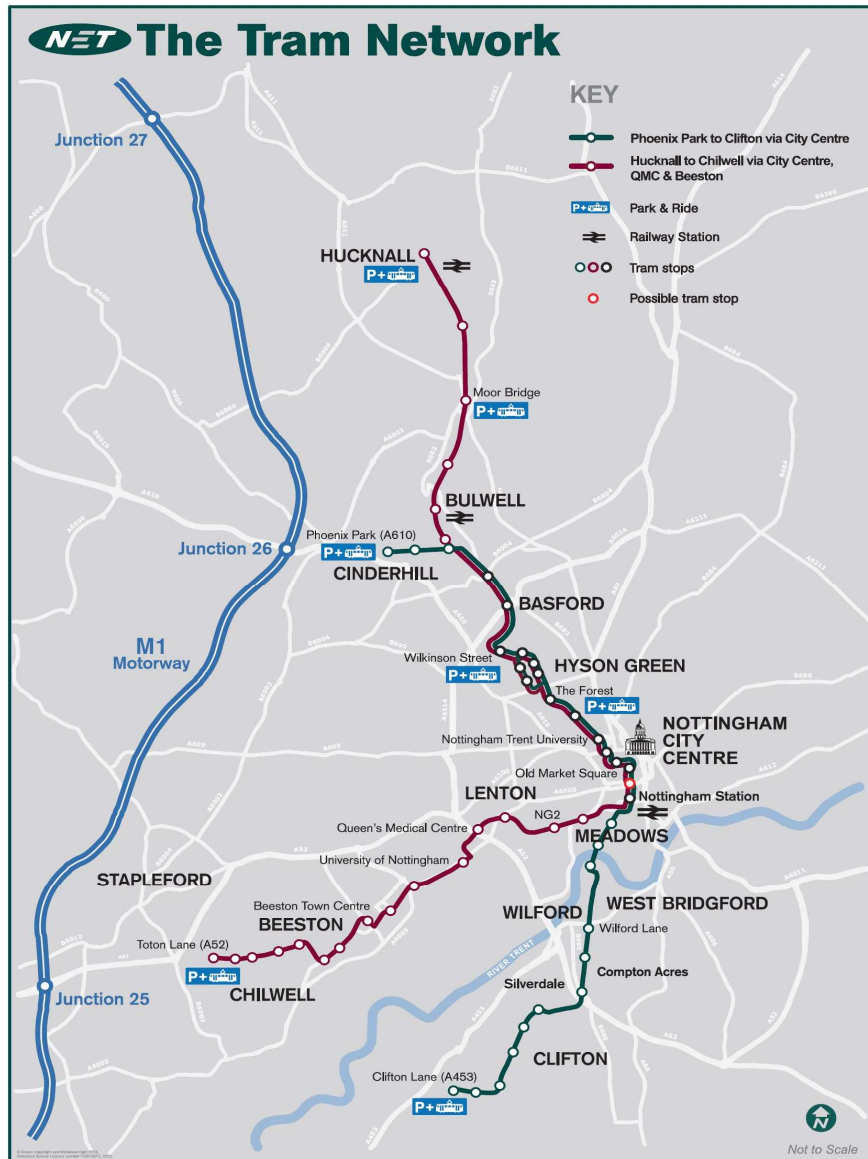
- Up to £25k grants to businesses for advice on reducing vehicle travel
- Converting 20% of the Council's vehicle fleet to ULEV by 2020 (now 28% target)
- Taxis converting to low emissions – at least Euro6 standard diesel by 2020 and ULEV* by 2025, supported by £1 from HMG for licensing discount, taxi rank charging points, home chargers
- Ability to issue idling notices, particularly outside school (car idling is a major source of pollution)

* ULEV = Ultra Low Emission Vehicle (ie <75 g/km CO₂). 2030 target is electric vehicles (ie 0 g/km CO₂).

After 2030, 90% of harmful PM_{2.5} emissions will be from brakes and tyres



Tram Network & Policy Objectives



- Provide sustainable alternative to the car
- Increase public transport capacity to meet growth in the local economy
- Improve accessibility & reduce social exclusion
- Contribute to public transport integration
- Support land use & regeneration
- Extend use of environmentally friendly mode of transport

Why trams?



1 tram =



3 buses =



177 cars

Why Trams?

- Trams provide guaranteed journey times and 99% reliability
- They are environmentally friendly and do not add to road based pollution
- They are better than buses at attracting modal shift from cars (20-30% typical)
- They add to the attractiveness of cities
- They encourage inward business investment (infrastructure is permanent) and infrastructure development
- They normally operate without any operating subsidy once the infrastructure is built
- Ticket prices typically equate to bus prices and are reasonably cheap
- Can easily integrate with bus networks as an integrated whole
- Have low access and ease of access for the disabled
- Fast access and alighting (dwell time typically 20 secs) compared to buses, particularly with front door loading

Nottingham Tram Network Line One

- Tramline One was built ready for start of operation in 2004 on an existing mainline alignment to reduce costs and is a major transport corridor (c.10m demand).
- Business Case needed 75% funding from Central Government and therefore has to satisfy Treasury guidelines – a minimum 2:1 benefit to cost ratio and 25% local funding (note: the higher the local funding, the better)
- Built by the Arrow Consortium as a D-B-F-O-M scheme (Bombardier, Carillion, Transdev, NCT and debt providers)

Tram-Bus Competition on Line One

- CBI study showed that improved connectivity led to new residential development in Ashfield (around Hucknall) with new houses built at a faster rate than in Nottingham and the National Average
- Commercial bus operators continued to compete with the tram for 6 months. There was a 70% switch from bus to tram, so the bus operators reduced frequencies and then integrated with the tram line
- 20% modal switch from car to tram in the 14.5km Line One corridor with congestion held at 2004 levels. And there was a one third reduction in journey time from Hucknall
- NCC then decided to increase its tram network cross-city (no bus services cross city) and submitted a further Business Plan for two new lines costing £570m with 75% from HMG

Phase Two Tram Contract

- Additional 10m annual passengers
 - 3m car journeys removed from road network
 - Target 25m+ passenger demand
- Long term generation of up to 10,000 jobs, 2,000 new jobs created through inward investment by 2018
- Economic benefit £300m per year
- Serving 20 of the 30 largest employers in Greater Nottingham
- Accompanied by major tree planting alongside tram routes

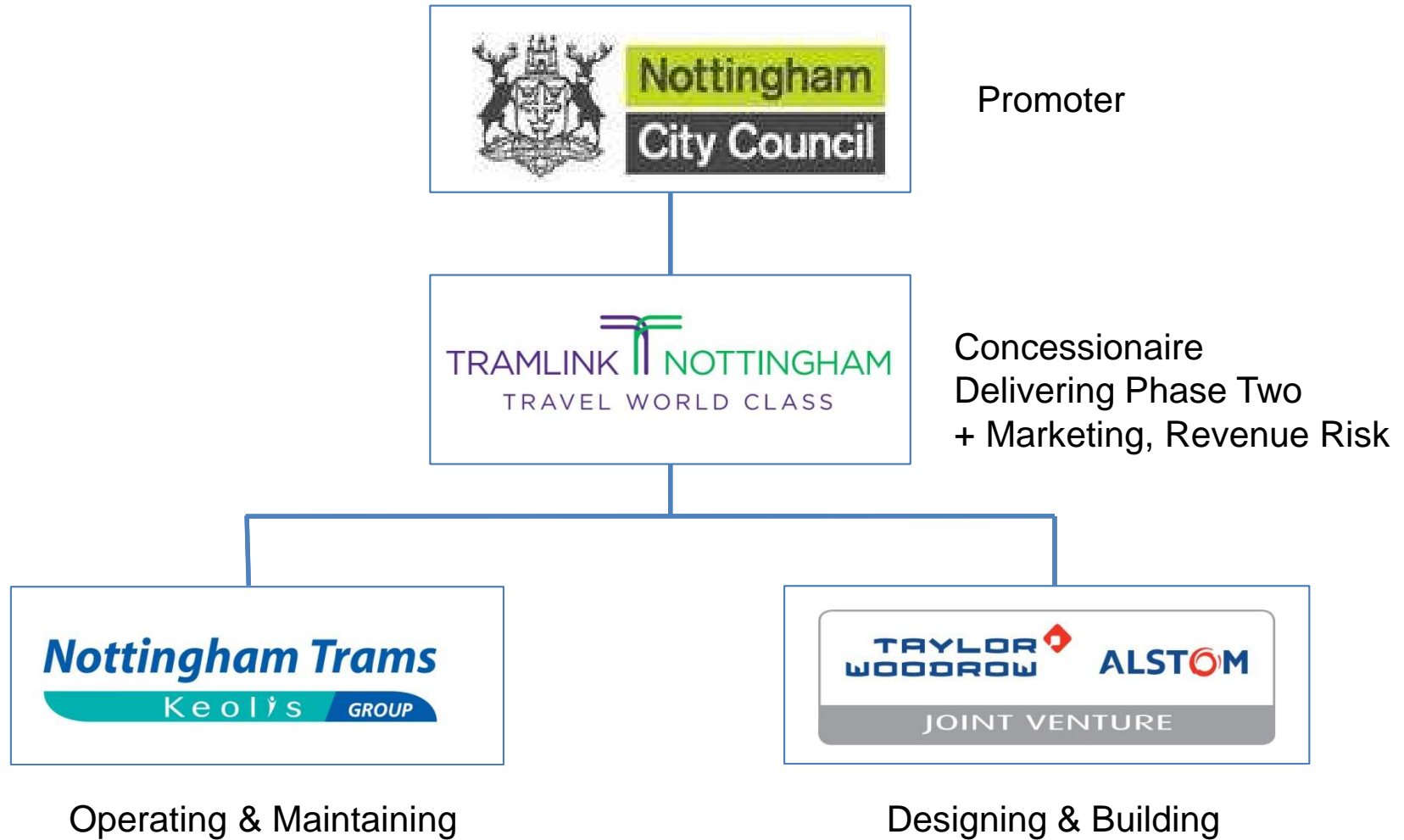
Phase Two Contract

- Two new lines west and south west conurbation completed in August 2015 (about 8 months later than planned)
- Built through as a 23 year Design-Build-Finance-Operate-Maintain (DBFOM) Concession contract
- 17.5km extensions
- 22 new Alstom Citadis trams (37 total fleet including 15 Bombardier)
- 2,400 additional Park & Ride sites (5,400 in total)
- Expanded Depot
- 8 trams an hour service across the network
- Converted to Off-tram Ticketing and use of SMART Cards

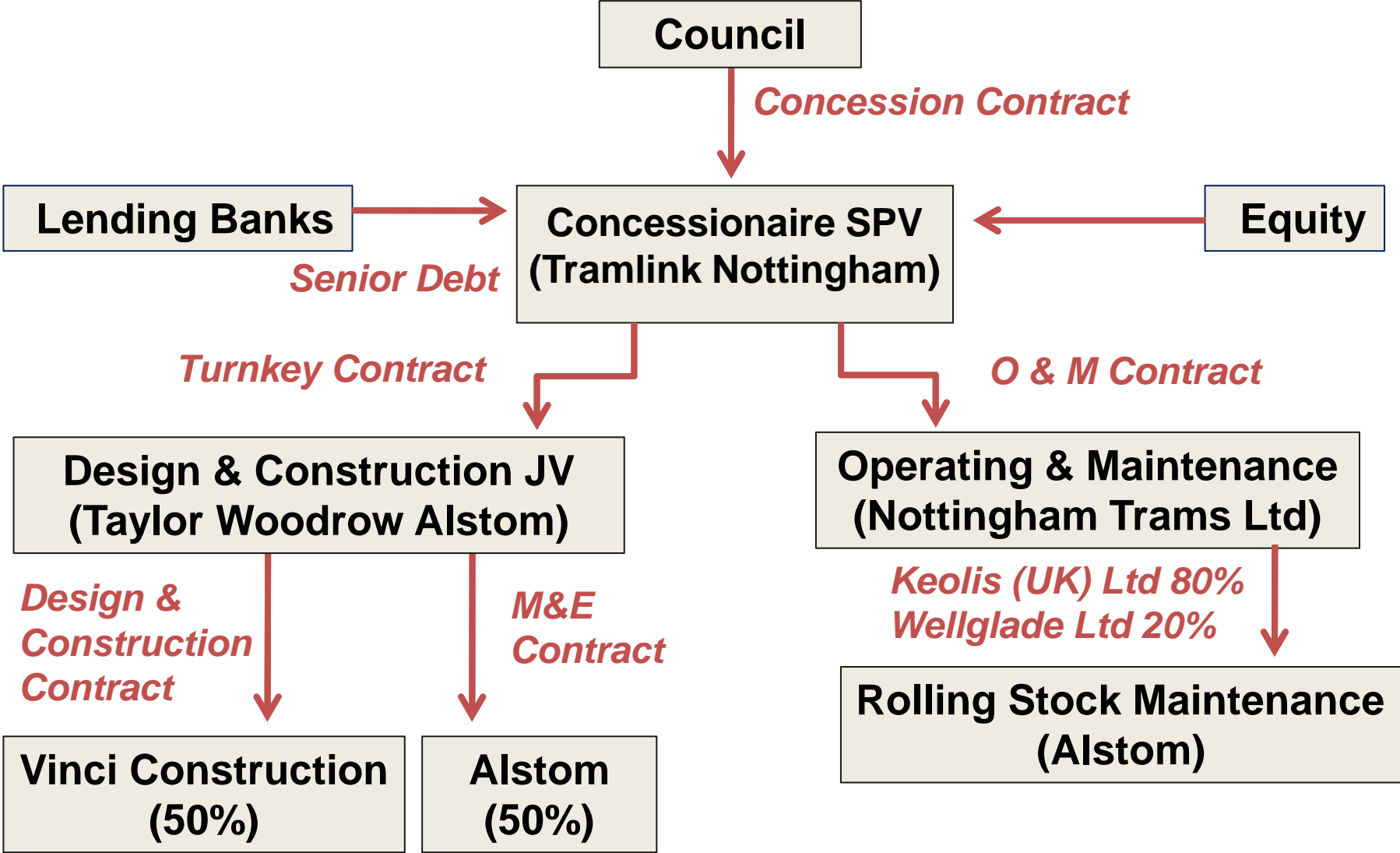
Phase Two Costs

- Overall cost £570m (approx. 2/3 Government and 1/3 Local Authority)
- Cost per km (17.5km) £32.6 million (construction cost alone £24.8m incl UD)
(French construction costs circa €30m/km, rubber-tyred versions less 30%)
- O&M maintenance costs plus operator surplus covered by ticket revenues
- Whenever Government funding is required, need a Transport and Works Act Order (TWAO)
- Local Government funding through Workplace Parking Levy:
 - tax (£379/space last year) on employers with 11 or more parking spaces
 - raises about £9m pa for the city and costs <5% to run
 - used towards LA tram local contribution, station upgrade and new electric buses
 - introduced in 2012, raised £25.3m in first three years and £61m to 2019
 - levied on 25,000 spaces (42% of total spaces)
 - 33% reduction in carbon emissions & modal shift to PT use (now 40% journeys)
 - 100% collection rate
 - 100% discounts for disabled badge holders, NHS premises & emergency services

Contract Structure



Contract structure



OPERATOR RECRUITED MORE PEOPLE and switched to OFF-Tram ticketing

An expanded service – an expanding team

- Operator created around 130 new jobs
- Former conductors redeployed and new drivers were trained
- Initially created new category of Ambassador to ease transition plus Customer Service and Revenue Protection Officers (RPO)
- Over 75% from local area



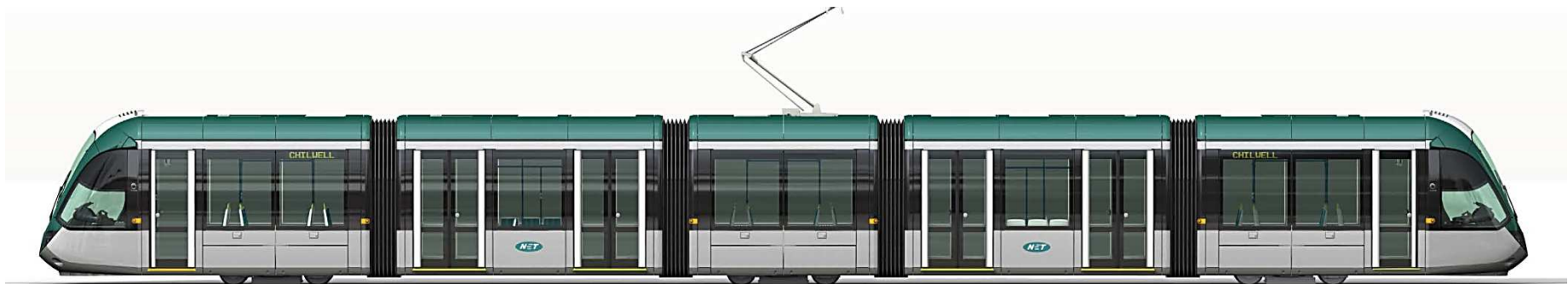
Local Sustainability Commitments included

- 1,140 TWA workforce
 - 70% from East Midlands
- 3 Sector Based Work Academies
 - working with the Employer Hub, New College Nottingham and Stephenson College
 - 61 attended academies
 - 75 vacancies filled via the Hub
- 10 apprentices, 43 trainees on NVQs
- £125m orders with 200+ suppliers placed in East Midlands of which £64m in Nottingham



NEW ALSTOM CITADIS TRAMS

- 22 new Alstom trams + 15 existing Bombardier Trams
- Capacity 203 people, 70kph max. speed, 32.70m long, 58 seats
- 1,524 Citadis trams in operation worldwide
- All tested prior to going into service
- Phased introduction onto Line One



OFF TRAM TICKETING

Principal changes

- Ticket machines and validators.
- Cash & card payments
- Smart cards (Trent Barton Mango & network wide Robin Hood city cards).
- On-line sales best value ticketing;
 - Short hop fares.
 - Dynamic capping.
- NET Travel Centre.
- Buy Before You Board.



MAKING THINGS FAIRER

Penalty Fares

- Main customer complaint was that the fare dodgers didn't pay, so we changed that
- Nottingham Express Transit System Order 2009.
- Byelaws Revised
- £50 Penalty – 22 days to pay
- Robust Appeals Process
- Independent Appeals Panel
- Fare evasion dropped from 7% to 2-3%

WE'RE MAKING THINGS FAIRER

NET

Within the next few weeks we're introducing a few changes in the way we check your tickets.

Feedback shows that a real concern for a lot of customers has been the small minority of people who try to avoid paying their fare. So we're doing something about it... we're putting in place new procedures to ensure people travelling on our network all have valid tickets.

It is your responsibility to ensure you have a valid ticket or travel pass and that you keep it and have it ready to show our staff on request when you are on a tram or at a tramstop when leaving a tram. We'll be checking tickets either during your journey or at the tram stop and you may be asked to show your ticket even after you've just got off of a tram.

Customers who can't produce a ticket will be asked to purchase one - even after their journey has ended. NET staff also have the right to request the name and address of anyone travelling without a valid ticket. People who are found to be repeatedly travelling without paying their fare can be prosecuted and fined up to £1000 under current byelaws.

The procedures are being introduced following a change in our byelaws and conditions of carriage which came into effect at the end of last month. If you'd like to read the small print, please visit: www.thetram.net/terms-and-conditions

For the vast majority of our customers, these changes won't have any real impact except that you might be asked to show your ticket more frequently. For people who try to dodge paying their fares however, life will become much more difficult!

See over for our ticket options or if you have any specific questions then please visit the 'contact us' section of our website at: www.thetram.net

PLEASE REMEMBER:
GET A VALID TICKET AND KEEP IT WITH YOU!

SAFETY & SECURITY

- New Control Room – 24 hours
- CCTV on tram and at stops
- Specific Driver Training
- Dedicated Help Points
- New park and ride, system-wide security system



Phase Two Construction

- Involved ground preparation work followed by construction above ground
- 80 km utilities diverted (cost c. £40m)
- Physical connection to Line One at main station
- Construction completed by late summer 2014, then Testing & Commissioning
- Opened mid August 2015



Major Bridge Structures

- A52 bridge positioned overnight watched by 400+ in Sept 13
 -(next day was Nottingham half marathon)



- QMC viaduct



Major Bridge Structures completed

- Wilford Bridge widening and strengthened
- Lenton Lane bridge positioned overnight over the main railway line



Track Laying

- Alstom Appitrack machine for slab track with grooved rails on street
- First use in the UK
- Achieved 220m in one day on 3rd July 2013

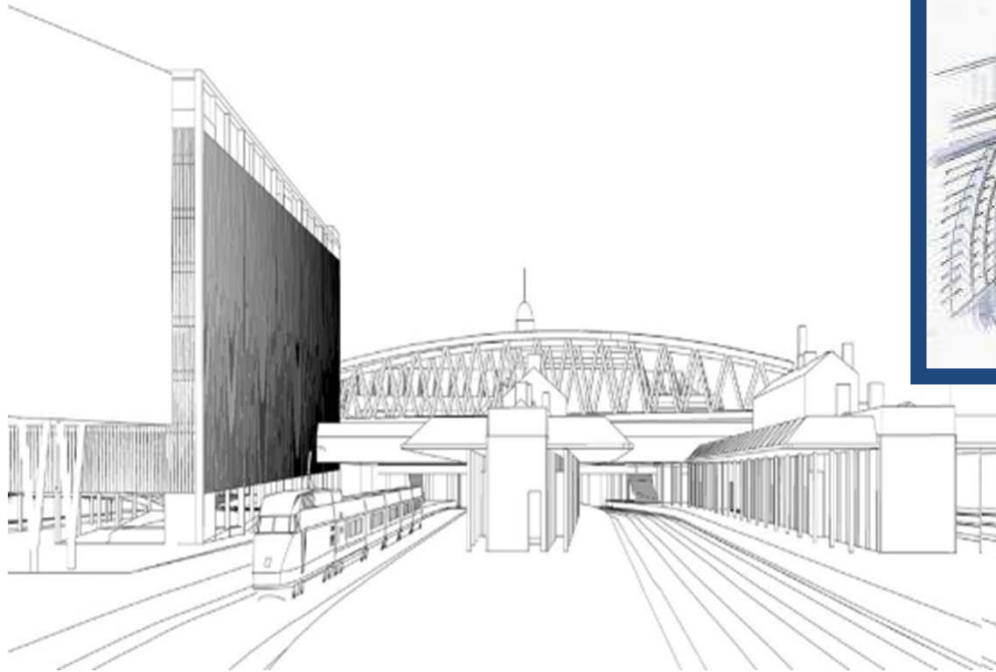


Chilwell Road in Beeston

- Large number of unknown utilities caused delays and traffic congestion



Nottingham Station Viaduct



Queen's Medical Centre



Beeston Town Centre



Wilford Toll Bridge



Clifton Town Centre



Air Quality and Pollution

- After major UK cities failed to reduce pollution levels below targets and after a Supreme Court ruling in 2015 that LAs must reduce levels of NO₂ (regarded as the most dangerous), the Government published air quality targets and 36 of the largest most polluted cities were ordered to design action plans to meet legal limits.
- **EU legal limit for Nitrogen Dioxide is 40 micrograms (µg) per cubic metre annual average (<200 no more than 18 times per year). Nottingham achieved 34 (GOOD) in 2018 and has been consistently below 40, after 41 in 2012. NO₂ is regarded most dangerous pollutant**
- According to Public Health England, air pollution contributes to 36,000 premature deaths per year in the UK and 5.5% of all deaths in Nottinghamshire (410) and 5.9% (127) in Nottingham city
- The Air Quality Index is a average of key pollutants (Ozone, Nitrogen Dioxide, Sulphur Dioxide, PM_{2.5} Particles & PM₁₀ Particles). Nottingham had **36 AQI (GOOD) on 19/2/20**.


Air Quality and Pollution

- Transport is one of the largest contributors to pollution – especially road transport
- Microplastics cause digestive problems and penetrate deep into lungs, affect aquatic organisms, are carriers for other poisonous pollutants, harmful to plants, animals and humans
- Pollution from tyres and brakes will account for 10% of national emissions of PM2.5 by 2030 according to DEFRA (Oslo effect)
- 68,000 tonnes of microplastics (ie <5 mm in length) from tyre abrasion are generated each year (with 7-9k tonnes entering waterways)
- In 2018, research in Germany found microplastics from tyres and brakes made up 89% of particles taken from air above motorways (TIP (USA) research suggested 50% comes from road surface abrasion and 50% from brakes/types)

Air Quality and Pollution

- Institute of Motoring Research (IMR) concludes that tyre emissions are 1,000 worse than exhausts of modern Euro6 diesel engines.
- In 2012, DEFRA concluded 18% of PM2.5 emissions came from vehicle exhausts and 11% from tyres and brakes
- Cars emit 200 milligrams of tyre pollutants per km based on 1.5kg of mass lost per tyre per 30,000 miles (ie 22 x higher than the permitted current exhaust gas emissions 4.5 mg/km)
- The heavier the vehicle, the higher the tyre wear.
- **This pollution effect from road vehicle tyres & brakes, including buses, is one reason why rail based light rail/tram networks are chosen for cities.** There is some brake disc pollution which is much reduced by regenerative braking, but brake dust and rail wear is much lower than with road pollution

Further Plans in Nottingham to become a Carbon Neutral City by 2028 (zero emissions)

- Ambition to achieve 22 years before HMG's 2050 target
 - 27,000 Council homes to be installed with net zero carbon cladding and roof top solar panels
 - Already powers 5,000 homes and >100 businesses through energy created from its own waste
 - 300 new electric charging points
 - Nottingham City Council has cut its own emissions by 40% over the last decade & installed 4,000 solar panels across its own buildings
 - Robin Hood Energy (owned by NCC) supplies 130,000 customers with renewable power
 - Refurbishment of 20,000 properties, planting of 50,000 trees, increased pedestrianisation
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Thank you

