



Nottingham Phase Two Tram Extension Project

Bringing Back Trams to Bath Conference

24th November 2018

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President Light Rail Transit Association (LRTA) 2014-2017**



Nottingham & Public Transport

- Greater Nottingham population c.800k, East Midlands 2.5m. Nottingham City area 300k
- Two major bus companies – Nottingham City Transport (owned by Nottingham City Council) and Trent Barton (operates throughout the Notts-Derby-Leics area and beyond) each with c 350 buses. Also Yourbus which operates similar services to TB
- The UK market outside London is de-regulated and bus operators compete with each other and the tram. Bus journey times are uncertain although some dedicated lanes
- Electric buses were introduced although rubber tyred vehicles still pollute (The Oslo Effect) and pollution levels are too high
- Despite many efforts, modal shift from car to bus has been small (<5%)

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



Why Trams?

- Standard trams of the type used in Nottingham are normally used on transport networks where annual demand is say from 10m to 50 million pa. Above that level (eg Docklands Railway in London) – automated LRT is used (c 120m pa).
- Below that level Ultra Light Rail systems are used. At very high levels, metro systems are used
- Typical standard tram carries 200-250 people and can operate at least 8 trams per hour(1,600-2,000 pdph) but they generally average about one half peak demand for comfort and VFM.

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



Nottingham & Public Transport

- Tramline One was built ready for operation in 2004 on an existing mainline alignment to reduce costs and is a major transport corridor.
- 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)



Nottingham & Public Transport

- 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
- 20% modal switch from car to tram in the 14.5km Line One corridor with congestion held at 2004 levels. 70% switch from bus to tram in the corridor. One third reduction in journey time from Hucknall. Corridor demand 10m pa
- Bus operators competed with the tram for 6m then acted more as an integrated system (TB serves mainly radial routes. NCT serves local routes). NCT uses double-deckers and serves metro area
- 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 Contract

- 23 year PFI Design-Build-Finance-Operate-Maintain (DBFOM) Concession contract
- Approx 2/3 government funding, 1/3 Nottingham City Council
- Additional 10m annual passengers
 - 3m car journeys removed from road network
 - 18m passengers in 2018. Target 25m+
- Long term generation of up to 10,000 jobs
- Economic benefit £300m per year
- Serving 20 of the 30 largest employers in Greater Nottingham



Phase Two Contract

- Two new lines west and south west conurbation completed in August 2015 (about 8 months later than planned)
- 17.5km extension
- 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

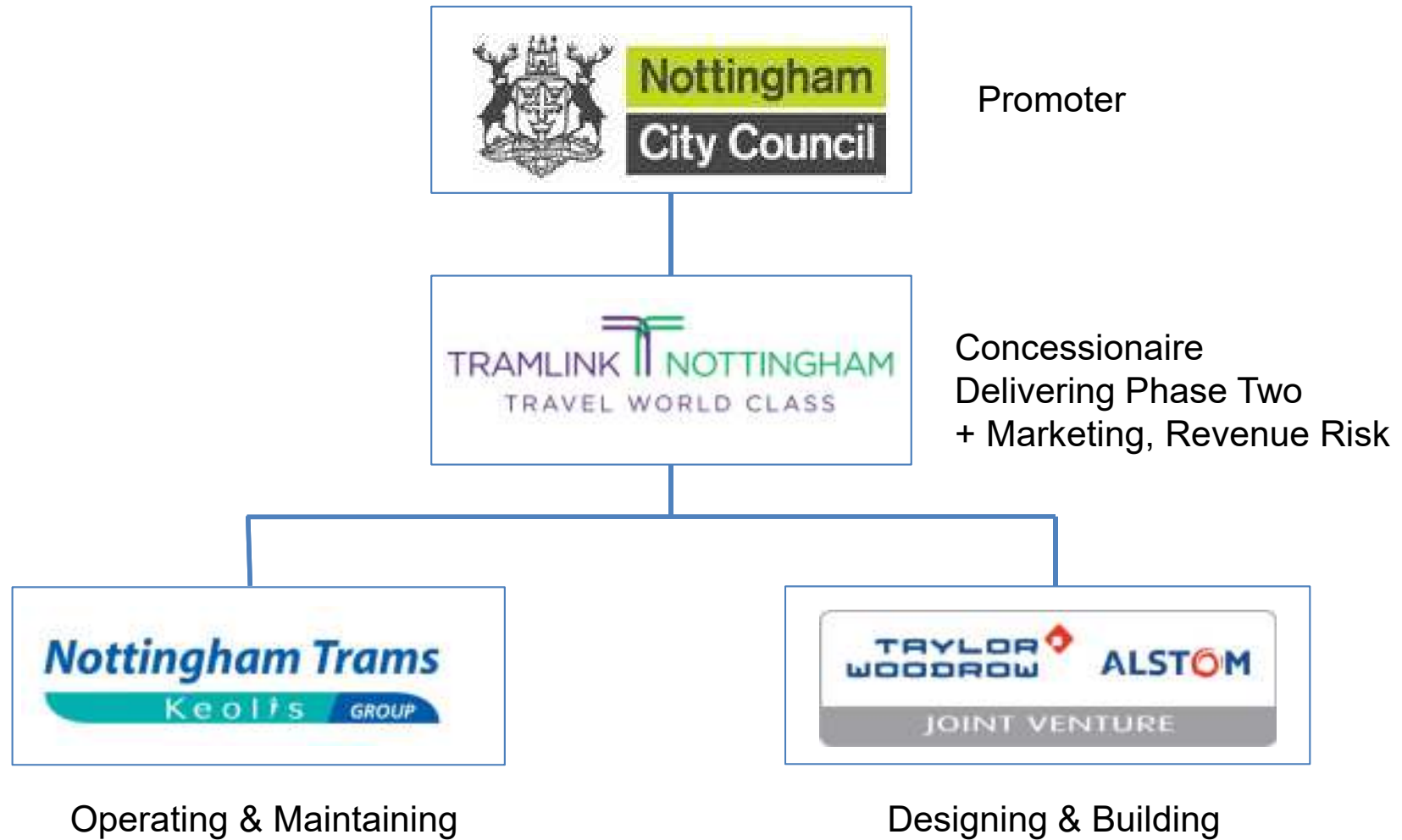
- Overall cost £570m
- Construction cost two new lines £435m budget (actual c.£500m) of which trams were £50m, utilities diversions £35m, project preparation costs/PFI costs £50m. Civils circa £235m M&E circa £200m
- Cost per km (17.5km) £32.6 million (construction cost alone £24.8m incl UD)
(French 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) – Bircham Dyson Bell client lawyers
- Local Government funding through Workplace Parking Levy raise about £14m pa and can/will increase – so providing extra Local Govt funds for other transport projects (cf population of Nottingham city c. 300,000)



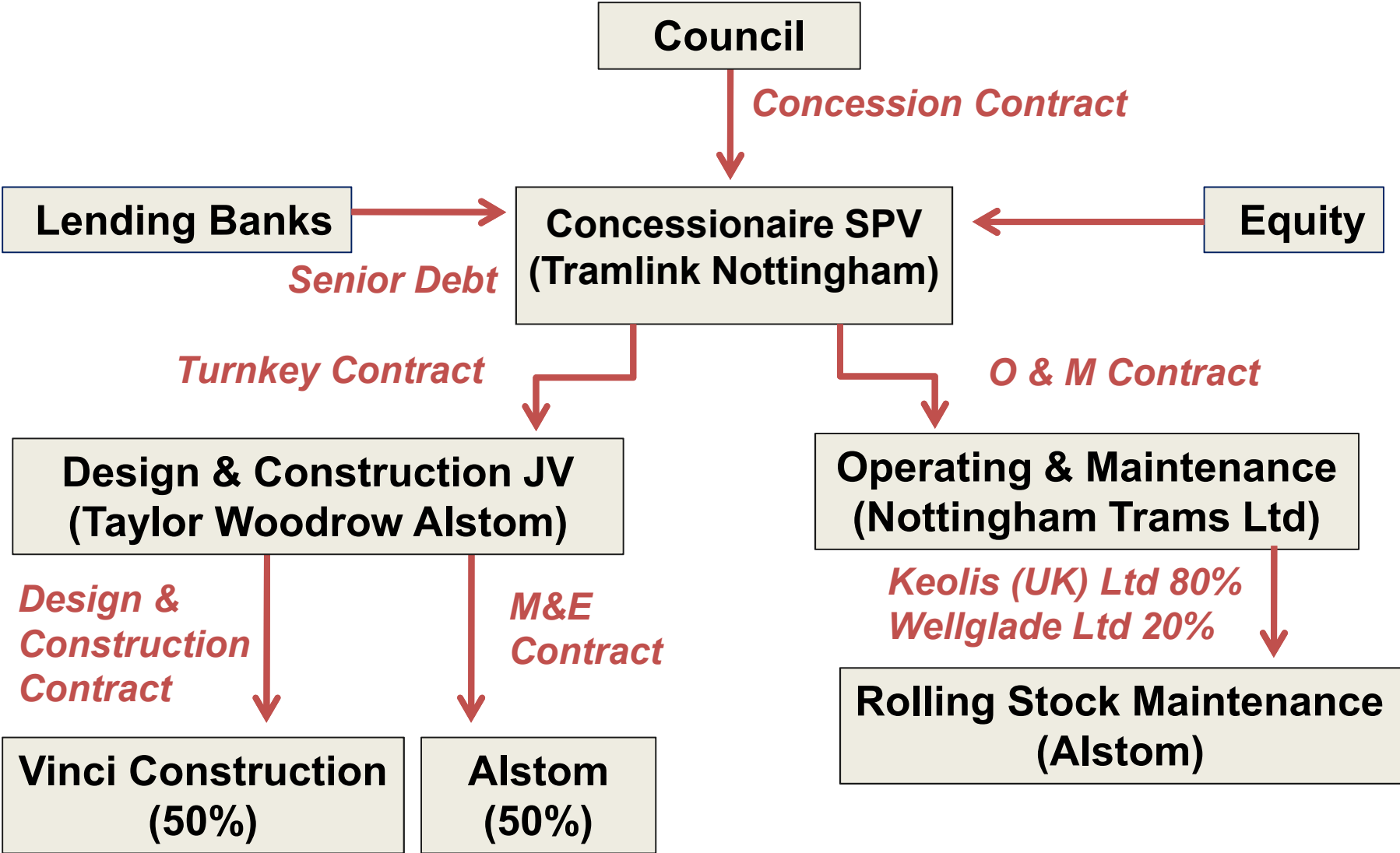
Tram system financing

- The Workplace Parking Levy is very similar to the tax on business car parking (>10 spaces) used in France (Versement transport). It is seen as a tax on business but despite warnings, no business relocated from Nottingham and indeed many new ones invested
- Manchester used the concept of borrowing against future rates payable by new investing businesses (“Earn-Out”)
- LAs may now be able to borrow for capital investment (PWLB cheapest loans)
- Occasionally developer contributions are available (but small)
- Transforming Cities Fund (£240bn extra to £1.7bn Fund)
- Private investors if they can get a return on their money (the higher the risk, the greater the return required)
- Crowdfunding for smaller projects

Contract Structure



Contract structure



Concession Agreement

Highlights

- Shareholders invested £95m equity & raised £323m senior debt from 5 banks (EIB, CA, BBVA, BTMU & RBS) to fund the construction & capital investment, of which £100m repaid at end of construction
shareholders: Equity Providers: Meridiam (30%), OFI Infravia (20%),
Industrial Investors: Vinci/Wellglade/Keolis/Alstom (12.5% each)
- Tramlink receives monthly income from a) fare revenues and b) unitary charge payments. T/o last year c.£60m
- Tramlink pays its two main sub-contractors:
 - Nottingham Trams Ltd a fee against achieving KPIs (22.5 year contract)
 - Taylor Woodrow Alstom JV (D&C for Lines 2/3) against milestones (circa 3 year contract)

OPERATOR RECRUITED MORE PEOPLE

An expanded service – an expanding team

- Operator created around 130 new jobs
- Former conductors redeployed and new drivers were trained
- 108 new entrants; 98 via Employer Hub; 5 apprentices initially, then + 2 per year
- New categories of Ambassador, Customer Service and Revenue Protection Officers (RPO)
- Over 75% from local area



Local Sustainability

- 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



ENHANCED LINE ONE SERVICES

The move to eight plus eight

- Major uplift in service frequency to 8 trams per hour per direction at peak times
- Introduced on Line One as well as Phase Two lines. Network operated as a mixed fleet
- Responding to customer demand
- New marketing opportunity



OFF TRAM TICKETING

Principal changes

- Ticket machines and validators.
- Cash & card payments. Ticket Revenues to March 2018 were £19.1m Pass Journeys 17.8m Average £1.07/journey (av ticket price c.£1.5)
- 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
- Fare evasion dropped from 7% to 2-3%
- Nottingham Express Transit System Order 2009.
- Byelaws Revised
- £50 Penalty – 22 days to pay
- Robust Appeals Process
- Independent Appeals Panel



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



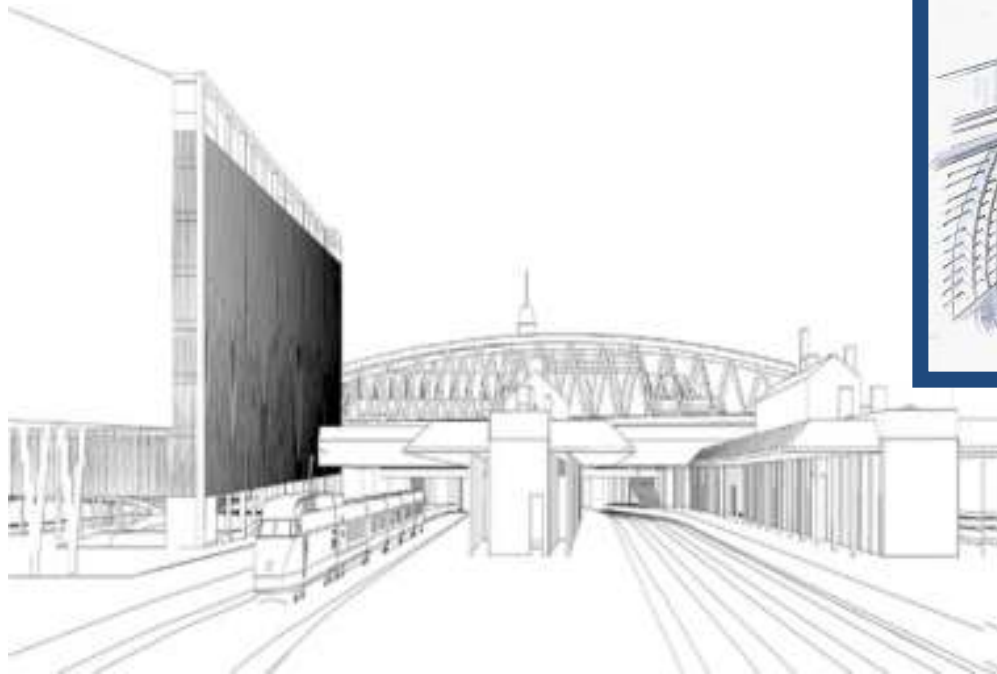
Chilwell Road in Beeston

- Large number of unknown utilities caused delays and traffic congestion



Nottingham Station Viaduct

Karlsruhe Friendship Bridge



Queen's Medical Centre



Beeston Town Centre



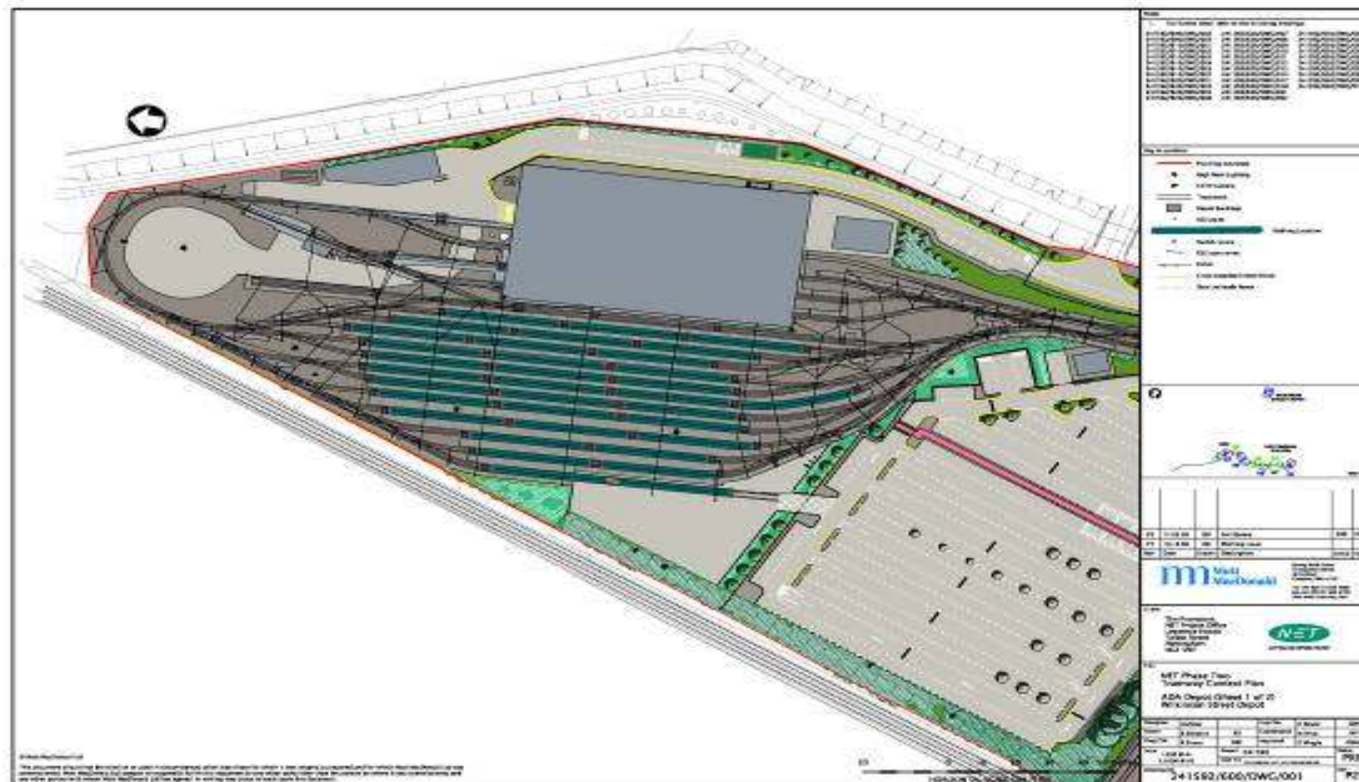
Wilford Toll Bridge



Clifton Town Centre



Depot Extension





NET Phase Two Project

Thank you

