

## NTC Local Plan

Public Transport Demand Scoping  
Study  
May 2016





## Contents

1. Background	1
1.1 North Tyneside Local Plan	1
1.2 Murton Gap & Killingworth Moor Strategic Sites	1
1.3 Strategic Sites Population Forecasting	2
1.4 Sustainable Travel at the Strategic Sites	4
1.5 Purpose & Structure of the Report	4
2. Review of Existing Public Transport Provision	5
2.1 Metro Connections	5
2.2 The Metro & Murton Gap	5
2.3 The Metro & Killingworth Moor	5
2.4 Bus Accessibility	7
2.5 Bus Services & Murton Gap	7
2.6 Bus Services & Killingworth Moor	9
2.7 Diversion of Existing Bus Services	9
3. Identified Constraints of Metro Use	10
3.1 Strategic Site Permeability	10
3.2 Connection Times	10
3.3 Metro Catchment Areas	10
3.4 Metro Mode Share & Influencing Factors	11
3.5 Opportunities for Improvement / Need for Change	13
4. Proposed Public Transport Scheme for Strategic Sites	15
4.1 Proposed Scheme	15
4.2 Benefits & Impacts	16
4.3 Impact of Not Changing	17
4.4 Bus Service Improvements	17
5. Metro Feasibility: Demand Forecasting	19
5.1 Demand Forecasting Methodology	19
5.2 Metro Demand Forecasting Results	20
5.3 No Metro Demand Forecasting Results	22
5.4 Patronage Estimates for New Stations & No New Stations	22
5.5 Revenue Estimates for New Stations & No New Stations	23
5.6 Wider Benefits	23
5.7 Assumptions Matrix	24
5.8 Park & Ride Opportunities	25
5.9 Northumberland Park Case Study	26
5.10 Cost of New Metro Stations at the Strategic Sites	28
5.11 Conclusions	29
6. Bus Provision	31
6.1 Bus Route Opportunities	31
6.2 Proposed Bus Service	32
6.3 Financial Costs	33
6.4 Conclusions	33
7. Future Public Transport Developments	35
7.1 Introduction	35

7.2	Ashington, Blyth & Tyne Railway	35
7.3	Cobalt Link Metro Extension	35

## Quality Management

<b>Job No</b>	CS/085561		
<b>Project</b>	NTC Local Plan		
<b>Location</b>	North Tyneside		
<b>Title</b>	Public Transport Demand Scoping Study		
<b>Document Ref</b>	CS/085561 Reports	<b>Issue / Revision</b>	1/C
<b>File reference</b>	A:\Transport schemes\NORTH TYNESIDE PARTNERSHIP\DCLG - Murton\Report		
<b>Date</b>	May 2016		
<b>Prepared by 1</b>	Peter Granlund	Signature (for file)	
<b>Checked by</b>	Faye Styles	Signature (for file)	
<b>Authorised by</b>	Stuart Clarke	Signature (for file)	

## Revision Status / History

Rev	Date	Issue / Purpose/ Comment	Prepared	Checked	Authorised
1	04.16	Draft	PG	NB	
2	05.16	Final Draft	PG & FS	FS	SPC
3	05.16	Final	FS	MP	SPC

# 1. Background

## 1.1 North Tyneside Local Plan

North Tyneside Council (NTC) are progressing the preparation of their Local Plan for the 15 year period between 2017 and 2032. As part of this process, an Infrastructure Development Plan (IDP) is being prepared to identify the major infrastructure improvements that are necessary to accommodate the Local Plan proposals.

As part of the Local Plan, NTC has earmarked two strategic sites for residential development at Murton Gap and Killingworth Moor that equate to half of the total Local Plan housing allocation that is yet to be consented. Fully occupied, the sites will be resident to nearly 12,000 people representing 5% of the projected borough resident population by 2032.

Capita has developed a strategic SATURN model covering the entire North Tyneside Borough to test the Council's emerging Local Plan for the 15 year period. The SATURN model has been used to quantify the impacts of the preferred Local Plan options, to test the overall impact on the highway network of the proposed strategic sites at Murton Gap and Killingworth Moor, and test the proposed highway mitigation and phasing of mitigation required to deliver the two strategic sites.

## 1.2 Murton Gap & Killingworth Moor Strategic Sites

The Murton Gap site is located to the east of the A19 corridor surrounding Murton Village. The site is bounded by Shiremoor to the west, Wellfield to the north, Monkseaton to the east and New York to the south. The Metro line extends along the northern boundary of the site, with the nearest Metro stations being at Shiremoor to the west and West Monkseaton to the east. The site is allocated for housing to a capacity of 3,000 houses and the masterplan incorporates the provision of a primary school initially proposed in the south of site adjacent to New York.

The Killingworth Moor site is located to the west of the A19 corridor between Killingworth and Holystone Village. The site is bounded to the north east by the A19, Killingworth Village to the west, Palmersville to the south and Holystone Village to the south east. The Metro line extends along the southern boundary with the nearest Metro stations being Palmersville to the west and Northumberland Park to the east.

The site is allocated predominantly for housing to a capacity of 2,000 houses, with the potential for some office/business employment uses to support local job creation, to be accommodated in the south of the site. Also incorporated within the masterplan for the site is a combined primary and secondary school.

NTC's IDP includes the provision of new Metro stations at Murton Gap and Killingworth Moor to cater for new residential populations that would occupy the strategic sites. At Murton Gap, a new station is proposed to be located on the northern boundary of the site, with a new north-south highway crossing the Metro line providing a through route at the site. At Killingworth Moor, a new Metro station is proposed to be located on the southern boundary to link with an existing footpath south of the existing Metro line.

In addition to the delivery of Metro stations at the two strategic sites, the delivery of improved light rail services in North Tyneside is further enhanced by Nexus' own aspirations for the Metro system outlined in the draft 2030 Metro Strategy document and reviewed in detail in this report.

### 1.3 Strategic Sites Population Forecasting

As part of the Local Plan preparation there has been significant work undertaken on population forecasting and age profiling. Table 1 on the following page provides an outline of the population forecasts for the Murton Gap and Killingworth Moor sites.

An upper and lower estimate of each site is provided and the upper estimate is based upon an assumption that all properties are built and occupied. The rate of occupancy is broadly equivalent to the rate observed at the 2011 Census at the new homes completed over the last 15 years at Northumberland Park in North Tyneside. The lower estimate has assumed that a maximum of 3% of homes would be vacant due to sales etc. and has incorporated an average rate in decline of household size, informed by the borough wide household and population forecasts prepared by Edge Analytics for NTC.

The age profile applied to the population at Murton Gap and Killingworth Moor is based upon an average between the 2011 profile at Northumberland Park and the Borough Wide Forecast for 2032. Whilst an approximation, use of these averages enables the estimate to consider the anticipated disparity between likely occupiers of new homes and the borough wide age profile by 2032 at the two strategic sites. This is deemed the most appropriate methodology of using existing population statistics to determine the likely future population profiles for the two strategic sites.

**Table 1 Summary of Population in 2032**

	<b>All Ages</b>	<b>0 to 4</b>	<b>5 to 11</b>	<b>12 to 16</b>	<b>17 to 18</b>	<b>19 to 24</b>	<b>25 to 44</b>	<b>45 to 64</b>	<b>65 plus</b>
<b>Murton Gap (upper estimate)</b>	<b>7,064</b>	596	577	327	117	468	2,595	1,447	937
<b>Murton Gap (lower estimate)</b>	<b>6,504</b>	548	531	301	108	431	2,389	1,333	862
<b>Killingworth Moor (upper estimate)</b>	<b>4,795</b>	404	392	222	79	318	1,761	982	636
<b>Killingworth Moor (lower estimate)</b>	<b>4,386</b>	370	358	203	73	291	1,611	899	581
<b>Age profile in % on site at 2032</b>	100%	8%	8%	5%	2%	7%	37%	20%	13%
	<b>All Ages</b>	<b>0 to 4</b>	<b>5 to 11</b>	<b>12 to 16</b>	<b>17 to 18</b>	<b>19 to 24</b>	<b>25 to 44</b>	<b>45 to 64</b>	<b>65 plus</b>
<b>Borough Wide Forecast Age Profile</b>	224,124	11,501	16,545	12,012	4,761	12,937	55,499	55,127	55,742
	100%	5%	7%	5%	2%	6%	25%	25%	25%
<b>Observed Age Profile Northumberland Park 2011</b>	1764	207	158	69	21	132	859	289	29
	100%	12%	9%	4%	1%	7%	49%	16%	2%

## 1.4 Sustainable Travel at the Strategic Sites

The age profiling estimates shown in Table 1 demonstrate that a high proportion of the residents anticipated to reside at the two strategic sites will be of working age and will therefore, require appropriate and desirable public transport links that can realistically transport them to employment hubs in North Tyneside, such as the Cobalt and Quorum Business Parks, as well as other employment destinations like Newcastle city centre and Sunderland.

Therefore, one of the fundamental transport objectives of the strategic sites is to maximise travel by public transport and it was agreed early in the Local Plan process that NTC would seek to adopt the strategy of providing a high quality level of service for active travel and public transport at key strategic sites in the borough, where the opportunity to influence travel behaviour is greatest.

Capita has developed the North Tyneside Local Plan Strategic Sites Pedestrian & Cycling Study in April 2016 as part of the emerging Local Plan. This has assessed the pedestrian and cycling infrastructure in and surrounding the Murton Gap and Killingworth Moor strategic sites, and identification of key trip attractors surrounding the sites to determine infrastructure improvements required to link the sites to destinations by foot and bike.

To supplement the active transport review undertaken in the pedestrian and cycling study, this report examines existing public transport availability and accessibility at the Murton Gap and Killingworth Moor strategic sites and reviews a range of public transport options for the site. The conclusions of this study have assisted in the formulation of the trip generation for Murton Gap and Killingworth Moor used in the development of the SATURN model to test the traffic and highway impacts of the two strategic sites.

## 1.5 Purpose & Structure of the Report

This study seeks to examine the feasibility of various options for public transport provision at the two strategic sites for residential development identified as part of the emerging Local Plan. This includes the viability of proposed new Metro stations, a review of existing bus services, and appraisal of new routes to link the strategic sites with key destinations in Tyne and Wear.

Consideration will also be given to how public transport measures associated with the strategic sites dovetail with external and wider public transport development schemes within the region.

The report is structured into the following sections:

1. Review of Existing Public Transport Provision;
2. Identified Constraints of Metro Use;
3. Proposed Public Transport Scheme for Strategic Sites;
4. Metro Feasibility: Demand Forecasting;
5. Bus Provision; and
6. Future Public Transport Developments.



## 2. Review of Existing Public Transport Provision

### 2.1 Metro Connections

The Metro system currently runs adjacent to both strategic sites, in each instance forming part of the site boundary. The Metro line directly serves Newcastle city centre, Gateshead, South Tyneside and 17 stations within North Tyneside, with connections available to Sunderland and Newcastle Airport.

During peak periods, services operate every 12 minutes in either direction, with 15 minute headways during off-peak periods. Additional services operate between Monkseaton and Newcastle city centre during weekday morning and afternoon peak periods, increasing service frequency to approximately every 6 minutes (this is an 'average' headway – additional services are added to the timetable in a non-uniform manner resulting in service headways between 3 and 9 minutes).

### 2.2 The Metro & Murton Gap

At Murton, the Metro runs along the northern boundary of the site. The nearest adjacent Metro stations are West Monkseaton and Shiremoor. West Monkseaton station is located to the north east of the strategic site, approximately 540m walking distance along proposed site linkages and existing pedestrian routes. The journey time from West Monkseaton station to Newcastle city centre (Monument station) is 23 minutes. There is no car parking provision for Metro users at this station, and there are 13 secure cycle parking spaces provided by Nexus.

Shiremoor station is located to the north west of the site, approximately 470m walking distance from the proposed site linkages and along existing walking routes. The journey time from Shiremoor station to Newcastle city centre (Monument station) is 21 minutes. The station provides a small number of parking spaces (20) which of free for Metro users, and there are 8 secure cycle parking spaces.

### 2.3 The Metro & Killingworth Moor

The Metro line forms part of the southeast boundary of the Killingworth Moor site. The nearest adjacent Metro stations are Palmersville and Northumberland Park. Palmersville station is located to the south of the strategic site, approximately 310m walking distance along existing pedestrian routes on Great Lime Road. The journey time from Palmersville station to Newcastle city centre (Monument station) is 16 minutes. Palmersville station provides no car parking spaces, leading to the latent issue of on-street parking along Great Lime Road adjacent to the Metro station. The station provides 10 secure cycle parking spaces to support multi-modal use of the Metro from Palmersville.

Northumberland Park station is located to the west of the strategic site, approximately 1000m walking distance from the site along existing pedestrian routes. The journey time from

Northumberland Park station to Newcastle city centre (Monument station) is 19 minutes. The station benefits from a 400-space multi-storey car park, charged at one pound per day which forms part of the Metro Park & Ride scheme. 10 secure cycle parking spaces are provided at the station for those undertaking multi-modal journeys.

Multi-modal journeys are further enhanced at Northumberland Park Metro station as the station provides public transport interchange between Metro services and local bus services. A summary of connecting services that are available from Northumberland Park Metro station is shown in Table 2 below.

**Table 2 Bus Services at Northumberland Park Metro Interchange**

<b>Bus Service</b>	<b>Operator</b>	<b>Service Termini</b>	<b>Key Bus Service Stops</b>
19	Go North East	North Shields - Ashington	North Shields, Royal Quays, Tyne Tunnel Trading Estate, Silverlink, Cobalt, Cramlington, Bedlington, Ashington
53	Arriva	North Shields - Cramlington	North Shields, Shiremoor, Palmersville Metro, Killingworth, Cramlington
54	Arriva	Whitley Bay – Newcastle	North Tyneside Hospital, Shiremoor, Killingworth, Quorum, Gosforth, Newcastle city centre
59	Arriva	Whitley Bay - Backworth	North Tyneside Hospital, Murton Village, Shiremoor
359	Arriva	Marden - Backworth	North Tyneside Hospital, Murton Village, Shiremoor

With regards to access to Northumberland Park Metro station, the A19 represents a major barrier for potential users of the station from the strategic sites. Existing pedestrian and cycle access to the station from the Killingworth area is via the A19 Holystone junction, a large signalised roundabout providing interchange between the A19 motorway and local A-roads in the Holystone area. Pedestrian routes through the interchange are not direct as those on foot are required to navigate a number of crossing points to travel west-east through the interchange to access Northumberland Park station. Furthermore, the route is non-convivial and un-comfortable for pedestrians given the proximity of those on foot to high speed traffic on the A19 off slips, and on occasions, on the circulatory carriageway of the roundabout itself.

The locations of the existing Metro stations outlined above are shown in Figure 1 below.

**Figure 1 Locations of Existing Metro Stations surrounding the Strategic Sites**

## 2.4 Bus Accessibility

The Transport & Highway Supplementary Planning Document Local Development Document (LLD12) for North Tyneside stipulates that distance targets for accessibility to public transport nodes and infrastructure from a development is 400m in which routes are direct, convenient and safe. The design of the Murton Gap and Killingworth Moore strategic sites and the specific accessibility routes linking the development to the existing highway network are currently being devised through various documents being compiled to support the emerging Local Plan.

Therefore, for the purposes of reviewing the existing bus services that operate surrounding the strategic sites, bus nodes within 400m of the site boundary have been included in this study to demonstrate current bus service provision.

## 2.5 Bus Services & Murton Gap

North Tyneside has a large network of bus services run by major operators. In many areas, routes or sections of routes, duplicate those of other services and operators, resulting in a number of heavily-trafficked bus corridors. In relation to the strategic sites, one such corridor is the A191 running along the southern boundary of the Murton strategic site.

As the strategic sites are earmarked for newly developed land, there are no permeable services through either site; existing services operate around and adjacent to the sites. To the south of the Murton site, the A191 is a major bus corridor with connections to Newcastle, Whitley Bay, North Shields, Wallsend, Killingworth, Blyth, and Cramlington. The map in Figure 2 below highlights the lack of permeable routes through the strategic sites.

**Figure 2 Existing Bus Corridors around the Strategic Sites**



Areas adjacent to the Murton Gap site are served well by existing bus services operated by Arriva and Go North East, providing links to various key destinations in Newcastle, North Tyneside and south east Northumberland, including employment, commercial, retail and leisure uses. The bus services operational from bus stops located within 400m of the Murton Gap site boundary, and the key service destinations and service frequencies are shown in Table 3 below.

**Table 3 Bus Services surrounding Murton Gap Strategic Site**

Bus Service	Operator	Service Termini	Frequency (peak period)	Key Service Stops
19	Go North East	North Shields – Ashington	Every 15 minutes	Bedlington, Cramlington, Shiremoor Metro, Cobalt
53	Arriva	North Shields – Cramlington	Half hourly	Killingworth, Palmersville Metro, Shiremoor
54	Arriva	Whitley Bay – Newcastle	Half hourly	Gosforth, Quorum, Killingworth, Shiremoor, North Tyneside Hospital
59	Arriva	Whitley Bay – Backworth	Hourly	Shiremoor, Murton Village, North Tyneside Hospital
80	Go North East	North Shields – Wallsend	Half hourly	Cobalt, North Tyneside Hospital
309	Go North East	Blyth – Newcastle	Every 15 minutes	Cobalt, Whitley Bay
359	Arriva	Marden – Backworth	Hourly	Shiremoor, Murton Village, North Tyneside Hospital

## 2.6 Bus Services & Killingworth Moor

The level of service and frequency along routes adjacent to the Killingworth Moor site are relatively poor, with most services providing links to the Killingworth Centre where passengers can interchange onto direct bus services to Newcastle. The poor bus provision is reflected in the local Census journey to Work data for the new Forest Gate estate which has only a 2% modal split for bus use for commuting purposes.

The bus services operational from bus stops located within 400m of the Killingworth Moor site boundary are shown in Table 4 below.

**Table 4 Bus Services surrounding Killingworth Moor Strategic Site**

Bus Service	Operator	Service Termini	Service Frequency (peak period)	Key Service Stops
51	Arriva	Newcastle-Whitley Bay	Hourly	Shiremoor Metro
53	Arriva	Cramlington-North Shields	Half hourly	Killingworth, Palmersville Metro, Shiremoor
54	Arriva	Newcastle-Whitley Bay	Half hourly	Gosforth, Quorum, Killingworth, Shiremoor, North Tyneside Hospital
63	Stagecoach	Newcastle-Killingworth	Every 15 minutes	Quorum, Longbenton

## 2.7 Diversion of Existing Bus Services

Whilst Go North East has indicated a willingness to examine diverting existing bus services into the Murton Gap and Killingworth Moor strategic sites, further detailed discussions will be required with the operator to evaluate the operational and commercial impact of bus diversions, including the financial viability and the impacts upon existing bus users in areas that are currently served by such services.

## 3. Identified Constraints of Metro Use

### 3.1 Strategic Site Permeability

The National Planning Policy Framework encourages new developments to be supported by a wide choice of permeable sustainable transport options to reduce environmental impact and highway congestion associated with high levels of car use.

As demonstrated in Chapter 2, with the strategic sites earmarked for newly developed land, neither site has public transport provision that could be considered 'permeable' as existing bus services can only be accessed 400m outside of the site boundaries. The only exception to this is Arriva's service 59 from Whitley Bay to Backworth, which diverts from the A191 into Murton Village along routes earmarked as link roads as part of the Murton strategic site development.

### 3.2 Connection Times

In general, connection times from the two strategic sites to existing Metro stations and bus stops are disproportionately long compared to the onward journey times to likely destinations, such as Newcastle city centre, and comparable car journey times, even in congested peak periods. The following section quantifies this issue and the problem it represents.

### 3.3 Metro Catchment Areas

As already denoted in section 2.4 of this report, the design of the Murton Gap and Killingworth Moore strategic sites and the specific accessibility routes linking the development to the existing highway network are currently being devised through various documents being compiled to support the emerging Local Plan.

Therefore, for the purposes of reviewing the existing Metro services that operate surrounding the strategic sites, Metro nodes within specific distances of the site boundaries have been included in this study to demonstrate current Metro service provision. Accurate routes and accurate walking distances from within the proposed development sites cannot be ascertained at this time.

Nexus, the Tyne and Wear Passenger Transport Executive, defines a walking distance of 800m as representing the catchment area of a Metro station. This equates to an approximate walking time of 10 minutes, which is based upon an average walking speed of 5 km/h.

Table 5 below illustrates the shortest walking distances between the closest point on the strategic site boundaries to the closest existing Metro stations using both current pedestrian linkages and the linkages anticipated to be constructed as part of the strategic site developments.

**Table 5 Minimum Walking Distances from Strategic Sites to Existing Metro Stations**

Existing Metro station	Distance from Murton Gap (m)	Distance from Killingworth Moor (m)
Palmersville	-	310
Northumberland Park	-	860
Shiremoor	470	-
West Monkseaton	540	-

Analysis of the walking distances between the strategic site boundaries and existing Metro stations show that areas of the Murton Gap site are within an acceptable walking distance of the two nearest stations; Shiremoor and West Monkseaton. There are also areas within the Killingworth Moor site that are shown to be within an acceptable walking distance to Palmersville Metro station, but Northumberland Park is over an 800m walk from the strategic site.

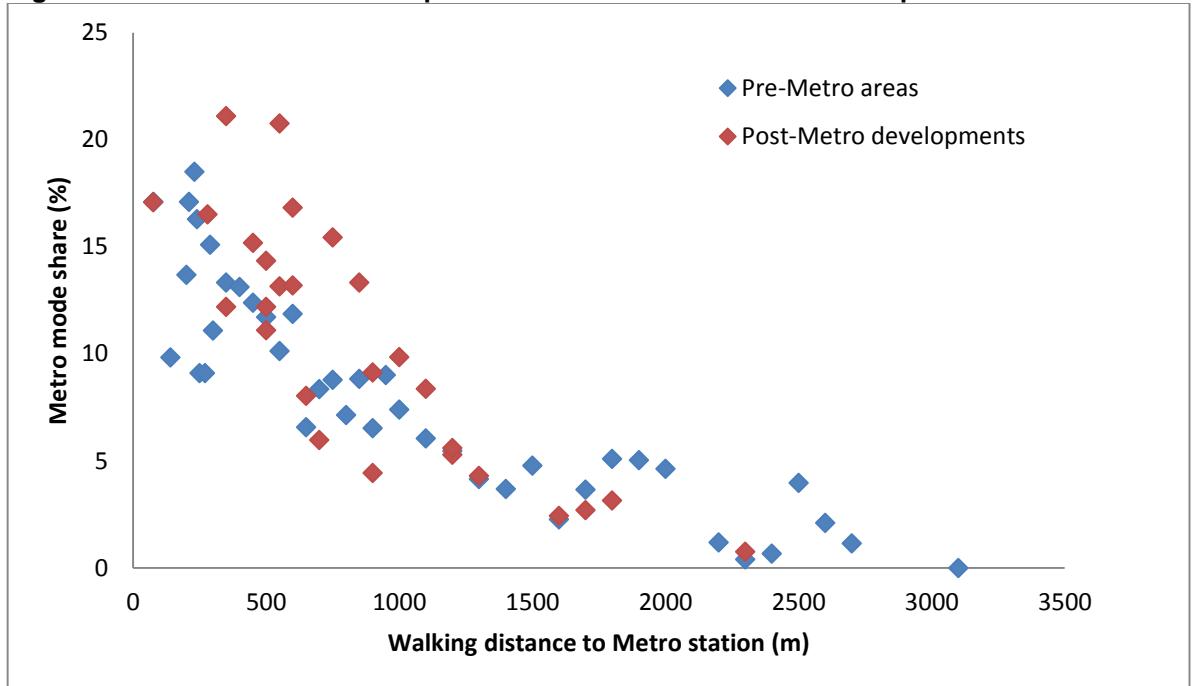
Although both of the strategic sites are shown to be located with an acceptable walking distance to at least one Metro station, these distances have been measured from the strategic site boundaries to the stations, given that the permeability of the site in terms of the exact access locations is currently being developed as part of the emerging Local Plan. When measured from the centre of the site and along the specific access links from the site (when these are identifiable), these distances will increase from those shown in Table 6 to account for the distance required to walk from the centre of the site to the site boundary.

### 3.4 Metro Mode Share & Influencing Factors

Nexus' Business Intelligence Annual Report 2009-2010 (BIAR) identifies that there is a correlation between Metro mode share and walking distances to a Metro station. Metro mode share in relation to walking distances to a station is shown in Figure 3 below.

Data in Figure 3 disaggregated into Census Output Areas (OAs) where residential housing was present before the nearest Metro station was operational and those OAs created by new post-Metro residential developments.

**Figure 3 Metro Mode Share Comparison of Pre and Post-Metro Developments**



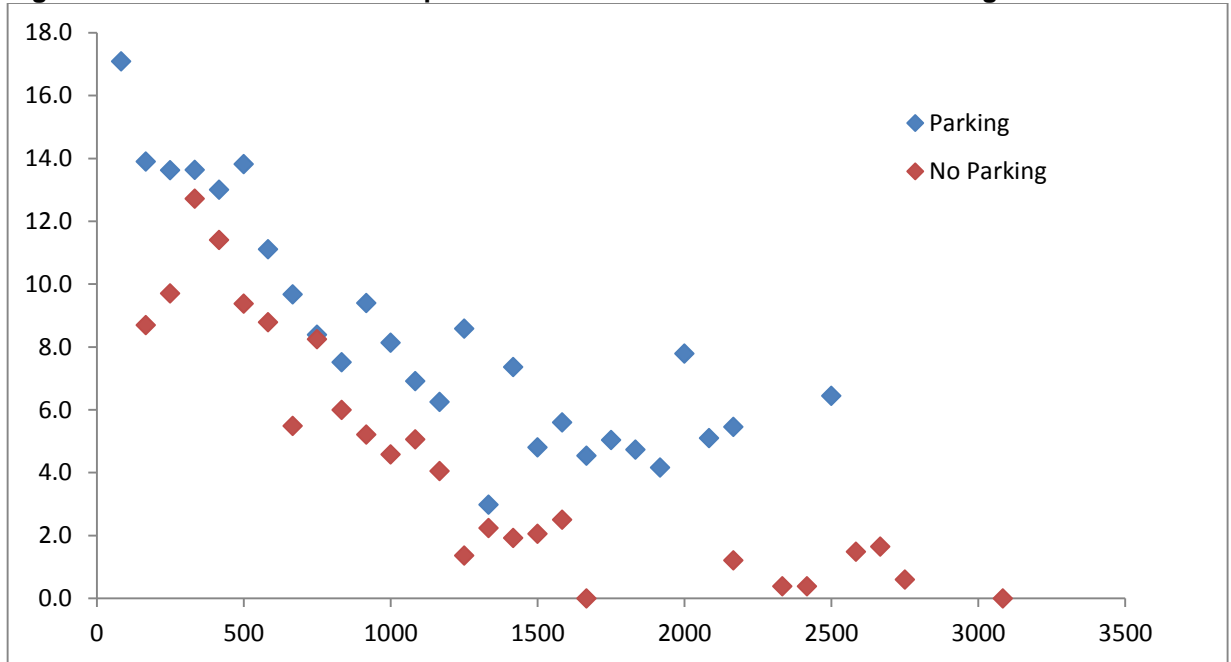
The results show that for OAs located within a 1000m walking distance to a Metro station, mode share is generally higher in post-Metro residential developments when compared with residential housing areas that were present before the Metro was operational.

Nexus' BIAR demonstrates that there is also a relationship between Metro mode share and parking spaces provided on-site at a Metro station to enable easy and efficient interchange between car and Metro. This relationship is shown in Figure 4 below, which highlights that Metro mode share is higher at those stations that provide vehicle parking than at those stations that do not.

It is important to note that the dataset used to prepare Figure 4 below is the same dataset that has been used in Figure 3 above. There are differences in the 'Metro Mode Share' upper limits shown in the two Figures; 20% (Fig. 3) and 17% (Fig. 4). A number of stations were excluded from the with-parking and without parking analysis (Fig. 4) because of ambiguity over whether they actually represented a Metro station that provides on-site car parking. For example, Benton Metro station was excluded for the analysis in Figure 4 because this station is advertised as providing on-site car parking, but in actual fact can accommodate eight parked vehicles but this does not include formal marked parking bays or spaces.



**Figure 4 Metro Mode Share Comparison of Stations With and Without Parking Provision**



### 3.5 Opportunities for Improvement / Need for Change

Development of the two strategic sites will infill two geographical and spatial gaps in the North Tyneside urban area. Currently undeveloped land, these sites have no permeable links and so bus services in the borough have routed around the areas, creating the heavily-trafficked bus corridors outlined earlier, namely the A191 corridor. Future development on the strategic sites, providing new through links, affords an opportunity to reduce bus journey times between key destinations outside the sites themselves.

Based on the analysis in section 3.3, while there is at least one Metro station within an acceptable walking distance from both of the strategic sites, these distances will increase when measured from the centre of the sites to include the walking distances along new pedestrian links built within the developments that will link up to the existing highway network at the site boundaries. Such distances can only be measured accurately on approval of the strategic site layouts.

Walking distances covering internal links within the strategic sites that will be in addition to the minimum distances from the site boundaries to the nearest Metro station as outlined in Table 5 above, indicate that the majority of houses developed at the sites would not have an existing Metro station with an acceptable walking distance.

The issue is further compounded by factors identified in Nexus' BIAR research presented in section 3.4. Potential Metro users living beyond a reasonable walking distance from the strategic sites could use Metro Park & Ride schemes as part of a multi-modal journeys at Shiremoor, and Palmersville stations. A lack of parking at these stations, however, can encourage whole-length car journeys to be made as alternatives, or result in significant pressure on the highway network

and localised congestion that can arise with heavy levels of on-street parking as demonstrated at West Monkseaton station where parking demand saturates the supply of available highway parking.

## 4. Proposed Public Transport Scheme for Strategic Sites

### 4.1 Proposed Scheme

The proposed scheme to address the issues and constraints outlined in Chapter 3 involves the following:

- Provision of a new Metro station between Shiremoor and West Monkseaton stations to serve the Murton strategic site;
- Provision of a new Metro station between Palmersville and Northumberland Park stations to serve the Killingworth Moor strategic site;
- Car parking facilities to be provided at both new stations to provide Park & Ride opportunities and facilities and to minimise on-street highway parking at the stations;
- Secure cycle parking and storage at both stations to provide opportunities for sustainable multi-modal trips by cycling and Metro, utilising proposed new cycle paths on the strategic sites; and
- Real-time passenger information, CCTV and Help Point.

Nexus' research highlights the importance of the timing for delivering new Metro stations on the network. The earlier the provision of a new station is made the larger the mode shift toward this mode. It is easier to convert/persuade users to utilise the Metro if it is there prior to them relocating to the new housing area. The later the Metro is provided the more established existing residents will be in terms of their travel choices/mode.

The practicality of when to deliver a new metro station at Murton and Killingworth is linked to the proposed/anticipated phasing of the strategic sites. As identified in the previous chapter there are existing Metro stations adjacent the strategic sites that would part serve the site. If initial phases were within reasonable distance of these existing stations (Palmersville, Northumberland Park, Shiremoor, West Monkseaton) then need for the new station could be deferred. In conjunction with this would be the prerequisite for sufficient internal site infrastructure to provide access to the proposed new stations. At Murton this would be linked to the delivery of the main link road, whereas at Killingworth the delivery of the new station is linked to the delivery of development phases beyond reasonable walking distance of existing stations

An important factor concerning the delivery and integration of new Metro stations at the two strategic sites is station accessibility. The North Tyneside Local Plan Strategic Sites Pedestrian & Cycling Study (April 2016) outlines that safe and direct pedestrian and cycle links will be provided to the new Metro stations from within the development sites themselves and linking to external pedestrian and cycle infrastructure on the existing highway network. To supplement the direct linkages, secure cycle parking and ramp accesses to platforms for disabled users will be provided. Direct and convenient links to the new Metro stations will help to reduce walking and cycling distances and encourage use of the Metro at the two strategic sites.

West Monkseaton and Palmersville Metro stations do not provide any on-site parking provision, which according to Nexus's research has been shown to inhibit the use of the Metro, as shown in Figure 3 in Chapter 3.

Contradicting this however, is the significant on-street parking that is evident surrounding West Monkseaton station on Earsdon Road for example, which suggests that the Metro mode share from this station has not been influenced by a lack of on-site station car parking. The highway network along Earsdon Road adjacent to West Monkseaton station has been under pressure from on-street parking associated with daily Metro use which has resulted in grass verges being destroyed, footways being obstructed by vehicles, and localised congestion due to reduced traffic speeds because of reduced road space.

These impacts have resulted in NTC recently introducing formalised parking bays adjacent to the station to cater for parking demand. This is already at saturation daily and therefore, parking demand at this station if it was to increase, would overtake the supply of available parking and lead to further highway pressures. This station demonstrates the negative impact of highway parking at Metro stations where parking spaces with the curtilage of the station site is not provided.

The creation of new Metro stations at the two strategic sites should incorporate on-site car parking provision to not hinder Metro use, as per Nexus' BIAR research, as well as preventing adverse impacts to the operation of the highway network associated with high volumes of highway parking as demonstrated at West Monkseaton station.

## 4.2 Benefits & Impacts

The proposed public transport scheme will improve accessibility from the Murton Gap and Killingworth Moor strategic sites to Metro and bus services. It will improve linkages between the strategic sites and key employment areas in Tyne and Wear, reducing journey times and encouraging sustainable travel to and from the sites. This contributes to improved access to a range of employment, education and leisure facilities. Installation of car parks will provide interchange for multi-modal and linked trips for those living outside acceptable walking distance of the Metro stations, as well as reduce on-street parking pressures.

For example, the Murton Gap Metro station, located close to the A192, will be attractive to south-east Northumberland residents commuting to places of work in Newcastle city centre and North Tyneside. Killingworth Moor will attract commuters from east Killingworth.

In addition to the two strategic sites, there are planning permissions granted for a further 1040 residential properties in the vicinity of Palmersville and Northumberland Park Metro stations, at Shiremoor West (590 homes) across the A19 from Killingworth Moor and Scaffold Hill (450 homes) south east of Holystone.

Demand at existing surrounding stations will be reduced as current Metro passengers transfer to new stations that will be geographically closer to their place of residence. Demand abstraction from existing stations that is likely to transfer to the new stations is summarised in Table 6 below.

**Table 6 Metro Station Demand Abstraction**

<b>New Metro Station</b>	<b>Station Demand Abstracted From</b>	<b>Areas of Abstraction</b>
Murton	West Monkseaton	South Wellfield, Earsdon

Killingworth Moor	Palmersville	Killingworth Village, east Killingworth, Benton Square Industrial Estate, Scaffold Hill (future development)
-------------------	--------------	--

### 4.3 Impact of Not Changing

Assuming full occupation of each of the two strategic sites, there will be 4,510 working age residents living at Murton Gap and 3,062 at Killingworth Moor. Without new or revised public transport provision, large numbers of car trips will be generated and the local highway network will be adversely affected by increased congestion, queuing, and journey time delays.

The local highway network is already heavily congested around both sites at peak travel times. The proximity of Cobalt Business Park to the south west of the Murton Gap site attracts and produces large amounts of peak period traffic along the A191 corridor to the south of the Murton site. The Killingworth site is located adjacent to Great Lime Road and Killingworth Way, both of which experience commuting related congestion during peak travel periods, including high volumes of traffic destined for Quorum Business Park.

Without provision of new Metro stations, residents of the strategic sites are likely to use cars for the whole of the commuting journeys, or at the very least to access existing stations along congested highway links. Use of existing Metro stations will require lengthy walks or involve Park & Ride using car parking spaces where provided, and will generate on-street parking on the highway network at stations where no parking is provided.

Access to existing Metro stations is also via congested highway links, for example, Northumberland Park Metro station is accessible via the congested A191 corridor, and additional traffic travelling to the stations would contribute to significant amounts of additional traffic congestion on highway links. The need to inhibit potential car trips at source becomes apparent and strengthens the case for on-site Metro provision at the two strategic sites.

### 4.4 Bus Service Improvements

The proposed new Metro stations for the two strategic sites will provide public transport links to key employment, commercial, retail and leisure areas in North Tyneside and further afield. However, origin-destination projections for the two strategic sites show a number of areas attracting significant journey to work trips, areas that are not currently served by a Metro station within a reasonable walking distance (25 minutes).

Table 7 below shows the number of residents of each strategic site projected to make daily Journey to Work trips to the Cobalt Business Park/Silverlink employment area. This has been derived from population estimates for the strategic sites and 2011 Census data for the Northumberland Park area, which offers the most appropriate representation of where strategic site residents are likely to work, and therefore, make commuting trips to. LSOAs 11D, 15A and 15D geographically represent the Cobalt Business Park and Silverlink employment corridor stretching from West Allotment to the A1058 Coast Road.

**Table 7 Journey to Work Trips from the Murton Gap & Killingworth Moor Strategic Sites**

NT LSOA	Murton Gap Trips	Killingworth Moor Trips
11D	104	70
15A	186	126
15D	101	68
Total	391	264

Table 7 shows that on a typical weekday it is estimated that 391 and 264 commuting trips will be made by residents from the Murton Gap and Killingworth Moor strategic sites respectively, to the Cobalt Business Park/Silverlink employment corridor.

A second area attracting Journey to Work trips is the western half of Killingworth (8B, 8C and 8D), incorporating the Killingworth Centre, Camperdown, and the industrial areas along the B1505 Station Road. Walking access to these areas from the nearest Metro stations at Four Lane Ends and Benton is between 40 and 55 minutes.

Without a new bus service to link these attractor LSOAs that are not served by the Metro system, the envisaged impact is that these short trips will be undertaken by car. Whilst the Metro system serves some major employment areas well, the Quorum and Cobalt Business Parks are more reliant upon access by road and access by public bus services. Provision of new bus services should consider inclusion of these two large business parks as well as the Murton Gap and Killingworth Moor strategic sites. Delivering public transport provision at the strategic sites provides additional opportunities to re-route existing bus services to improve access to fundamental employment and job creation areas in North Tyneside.

## 5. Metro Feasibility: Demand Forecasting

### 5.1 Demand Forecasting Methodology

For the purpose of demand forecasting, each strategic site has been subdivided into geographical areas, approximate in size to Lower Super Output Areas (LSOAs). Murton is represented as 'North Tyneside 31' with seven subdivisions (A-G) and Killingworth Moor as 'North Tyneside 32' with five subdivisions (A-E). These subdivisions represent areas approximately equal in size to LSOAs.

The population of each LSOA has been estimated by applying an average of persons per household figure (2.5ppp) to the proposed housing allocation in each area to determine average number of people. A multiplier was applied to the total number of people in each LSOA, based on Office of National Statistics projections for working age populations. This gives an overall estimate as to the working age population in each LSOA by which to estimate the number of daily journey to work trips made.

The same methodology has been used as that in the Metro Demand Study; a direct demand, elasticity-based model. This model employs observed (historical) relationships between demand and explanatory variables from historic data on the existing Metro network, combined with additional evidence as required from comparable UK networks to estimate future-year demand. This model assumes that the demand for the Metro between two locations is a function of a range of variables relating to that trip, and these variables include fares, in-vehicle time, connection times, service frequency, and the relative attractiveness of competing modes of transport such as equivalent car journey times and parking costs.

Initially, a journey time matrix was developed for journeys between each 2011 Census LSOAs in North Tyneside, including those LSOAs in the wider Tyne and Wear area that could be considered to be within a reasonable walking distance of a Metro station, and therefore, within the catchment area of the Metro system.

Each LSOA represents a zone in the demand matrix, with the population-weighted centroid representing the centre of each zone. The component parts of each LSOA-LSOA journey, listed in full in Table 8 below, were calculated for both Metro and car journeys.

**Table 8 Journey Time Matrix Components**

Journey time matrix components	
Metro	Car
Walking time to station (access)	In-vehicle driving time
Walking time from station (egress)	Fuel cost
At-station wait time	Non-fuel cost
Interchange time between Metro services	Parking cost (where applicable)
Station-to-station fare	Toll cost (where applicable)

Components for each journey were translated into generalised cost (GC) using WebTAG parameters for price-based components where necessary (WebTAG values used are detailed below), and total GC for each LSOA-LSOA journey were derived. The difference in GC between a Metro and equivalent car journey was then calculated.

Three existing North Tyneside LSOAs have been subject to demand abstraction of Metro trips with the provision of the proposed new stations at the two strategic sites. Demand from LSOAs 7A and 7B, representing the areas encompassing South Wellfield and Earsdon, will transfer from West Monkseaton station to the proposed Murton Gap station.

Similarly, demand from LSOA 18D which covers Holystone, will transfer from Palmersville station to the proposed Killingworth Moor station. Future demand for Metro services from Scaffold Hill, a major housing development of 450 homes with planning approval for development south of Holystone, has been included in the demand forecast for the proposed Killingworth Moor station.

In relation to the Metro demand forecasting exercise, it is envisaged that the new Metro stations would be operational at the strategic sites in 2018, prior to the housing to deliver post-Metro developments following the analysis discussed in Chapter 3.

## 5.2 Metro Demand Forecasting Results

Table 9 on the following page illustrates the outcomes of the demand forecasting exercise. The table shows the annual commuting trips that would utilise the proposed new Metro stations at the two strategic sites up to the year 2032.

The graph in Figure 5 that follows Table 9 summarises the predicted annual Journey to Work boarding projections at Murton Gap and Killingworth Moor stations in comparison to the most recent new stations opened on the Metro system which are Simonside and Northumberland Park. The projections demonstrate that the proposed Metro stations for the two strategic sites can achieve annual Journey to Work patronage figures comparable to Northumberland Park station.

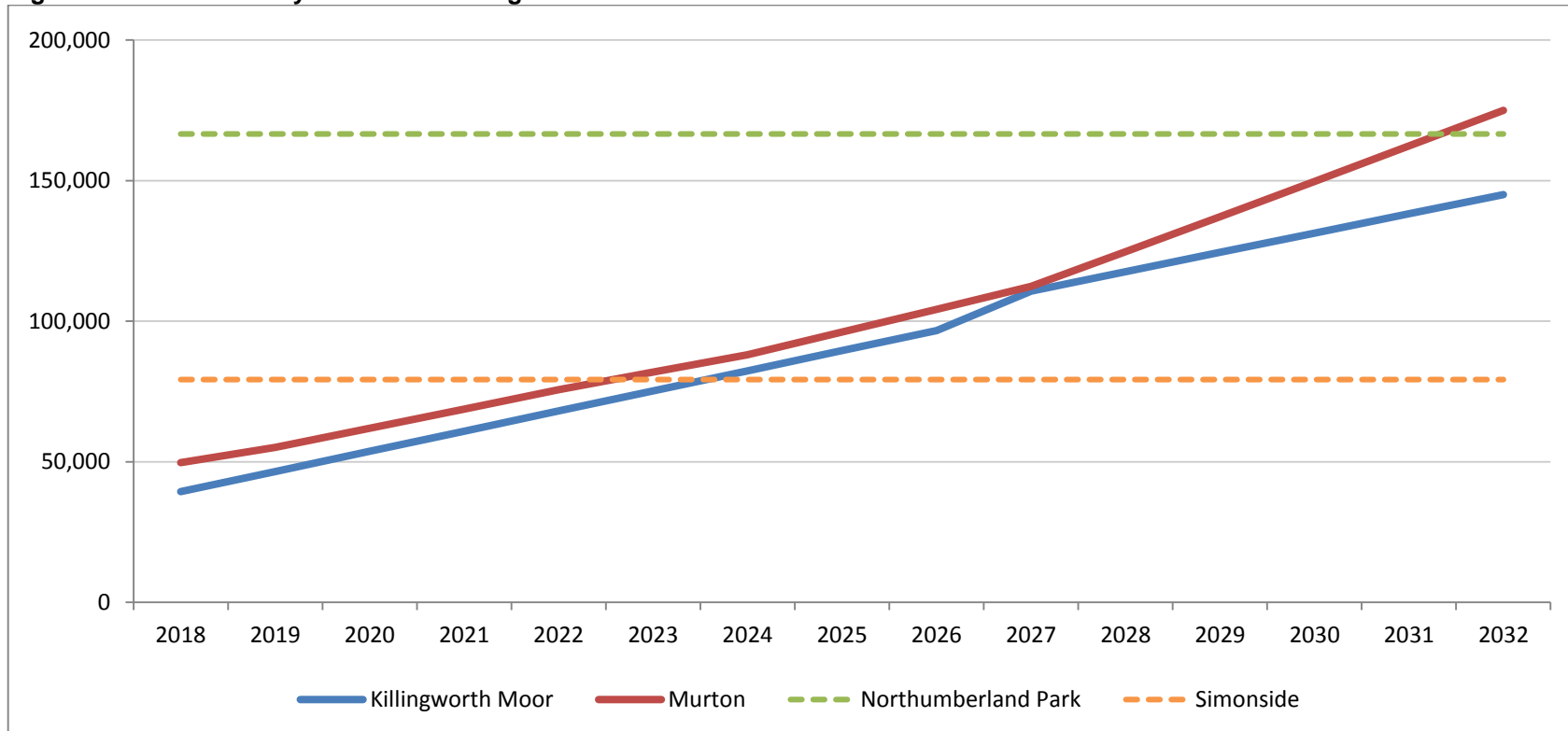
On completion of the strategic sites in 2032, the Murton Gap station has been estimated to achieve annual Journey to Work boardings of over 175,000, with 145,072 boardings at the Killingworth Moor station. This compares favourably with Northumberland Park station, which has 166,642 annual commuting boardings.



**Table 9 Metro Demand Forecasting for Murton Gap & Killingworth Moor Metro Stations**

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Killingworth Moor	39,349	46,536	53,717	60,894	68,065	75,214	82,363	89,504	96,636	110,711	117,604	124,487	131,359	138,221	145,072
Murton	49,650	55,081	61,901	68,753	75,657	81,842	88,066	96,125	104,232	112,389	124,760	137,208	149,736	162,343	175,031

**Figure 5 Annual Journey to Work Boardings**



### 5.3 No Metro Demand Forecasting Results

No provision of new Metro stations at the two strategic sites would result in all those residents aspiring to use the Metro as a means of travel, using existing stations; Shiremoor and West Monkseaton for Murton Gap residents and Northumberland Park and Palmersville for Killingworth Moor residents.

To forecast the number of new Metro journeys from the strategic sites at full development in 2032, the Metro station catchment functions derived from Nexus have been applied to the projected populations at each site. The centroids of each site’s LSOA has been used, with the walking distance to the nearest existing Metro station derived. Possible walking routes include both existing paths and future links proposed as part of the development of the strategic sites.

Results of demand forecasting for use of existing Metro stations, indicate that 294 daily trips would be created from the Murton Gap site and 574 would be created from the Killingworth Moor site. The forecast number of Journey to Work boardings from existing stations by residents of the strategic sites is shown in Table 10 below.

**Table 10 Daily journey to work trips from existing stations with no new Metro stations**

Existing Metro Station	Strategic Site	Daily Journey to Work Boardings
Shiremoor	Murton Gap	157
West Monkseaton		137
Northumberland Park	Killingworth Moor	235
Palmersville		339

### 5.4 Patronage Estimates for New Stations & No New Stations

Analysis of journey purposes by Nexus indicates that Journey to Work trips account for 47% of all Metro trips. Applying this to the demand forecasting results presented in sections 5.2 and 5.3, the total annual Metro trips generated by the strategic sites in 2032, including a breakdown of which stations would cater for these trips, are summarised in Tables 11 and 12 below.

**Table 11 Murton Metro Patronage Estimates for 2032**

Station	Annual patronage (2032)		
	With New Stations	With no New Stations	Patronage Change with New Stations
Murton	371,065	n/a	+371,065
Shiremoor	42,285	166,420	-124,435
West Monkseaton	27,193	145,220	-118,027
<b>TOTAL</b>	<b>440,543</b>	<b>311,640</b>	<b>+128,903</b>

**Table 12 Killingworth Moor Metro Patronage Estimates for 2032**

Station	Annual patronage (2032)		
	With New Stations	With no New Stations	Patronage Change with New Stations
Killingworth Moor	307,552	n/a	+307,552
Northumberland Park	0	249,100	-249,100
Palmersville	323,333	359,340	-36,007
<b>TOTAL</b>	<b>630,885</b>	<b>608,440</b>	<b>+22,445</b>

The tables above shows that with no new stations, 311,640 new Metro trips would be generated by full development of Murton Gap strategic site, with 359,340 generated by Killingworth Moor. New patronage would be distributed relatively equally between the two sets of existing stations that would serve each site.

The provision of new Metro stations would create an additional 151,348 new Metro trips annually. Murton Gap would abstract most demand from Shiremoor and West Monkseaton. The new Metro station at Killingworth Moor would abstract all demand for Northumberland Park station, while a substantial number of users would continue to use Palmersville station.

## 5.5 Revenue Estimates for New Stations & No New Stations

Using the estimated Metro patronage figures discussed in section 5.4 above, and applying an average Metro ticket fare of £1.65, which has been derived using an average of all fares and weighted by sales of each ticket type, an estimated annual revenue from new Metro patronage can be calculated to provide a monetary context to the estimated patronage figures.

It is estimated that an increased annual revenue from new patronage of £249,724 at full strategic site development in 2032 would be generated. Table 13 below summaries the increase in revenue arising from new Metro patronage and total estimated revenue with new stations.

**Table 13 Revenue Forecasts for Metro Stations**

	With New Stations	With no New Stations	Revenue Change with New Stations
Total Revenue	£1,767,856	£1,518,132	£249,724

## 5.6 Wider Benefits

The provision of new Metro stations at the two strategic sites will encourage modal shift from car to Metro, subsequently reducing the number of vehicle journeys by road as well as providing greater opportunity for walking and cycling trips to connect to stations. This will have quantifiable benefits in terms of carbon reduction and health benefits associated with increases in active travel in the borough. This would be determined as part of a full scheme business case in conjunction with detailed analysis of highway network decongestion as a result of increased Metro patronage.

Providing new Metro stations at the strategic sites would link in with the proposed cycling and walking improvements being developed as part of the strategic sites, which are discussed in

greater detail in the pedestrian and cycle study prepared by Capita for the emerging Local Plan. The internal links and routes that will be developed through the strategic sites will provide direct, convenient and safe links from dwellings to the on-site Metro stations. These links will enable sustainable interchange with the stations, allowing residents and users of the strategic sites to make linked trips entirely by sustainable modes. Secure cycle parking facilities will be provided at the Metro stations to encourage the use of bicycles to travel to and from Metro stations.

## 5.7 Assumptions Matrix

In determining generalised costs for Metro and car journeys, a number of assumptions have been made where actual values were not available for each element. For example, when determining car parking charges it has been assumed that for journey to work trips, a car user must pay any hourly rate for the duration of a typical working day i.e. 8 hours.

Table 14 below summaries all of the assumptions made in determining generalised costs of journeys including, where applicable, references to external values used.

**Table 14 Assumptions Made in Journey Time Matrix Development**

Element	Methodology	Data source(s), where applicable	Assumption(s), where applicable
Metro fare	Average station-to-station fare based on Metro fare zones and weighted by quantity of ticket types sold (based on Nexus Ticket proposals for 2016-17, submitted to NECA).	Nexus submission 'Revision to the Metro and Ferry Fares 2016' to NECA Transport North East (Tyne and Wear) Sub-Committee, 24 November 2015, Appendices B & C.	Average fare between station pairs is average of all available ticket types, weighted by number of tickets sold of that type.
Metro in-vehicle time	Station-to-station journey times based on Nexus/Metro timetables.	Metro timetables on Nexus website.	All Metro users travel on shortest route between station pairs.
Metro access/ egress	Shortest walking route derived from Google Maps journey planner, from LSOA population-weighted centroid to Metro station.		All Metro users will use geographically closest station and access station along shortest route. Average walking speed 5kmh (WebTAG Unit 5.1/DMRB 11.8.3)
Metro wait	Headway between services, divided by two.		Maximum wait time for service is half headway between services. No operational delays.
Metro interchange	Number of interchanges required between two stations.		Transfer time between services uniform across entire network. All Metro users travel on shortest route between station pairs.
Car parking charges	Parking charges in each LSOA derived (multi-storey and on-street) from 'Parkopedia' website, full day rate calculated.		Whole working day parking duration.
Car tolls	Tyne Tunnel usage fee of £1.60 applied to all car journeys where fastest route is through tunnel.		

Value of Time (VoT)	All monetary figures translated into Value of Time in minutes, based on WebTAG values/parameters for 'Car Driver'.	All monetary values associated with trips translated into values of time based on WebTAG parameters.	All car trips are single occupancy.
Value of Time (VoT)	'PSV Passenger' values used for Metro journeys.	All monetary values associated with trips translated into values of time based on WebTAG parameters.	
Metro in-vehicle time			Increases in journey times to/from new stations offset by new Metro fleet.

## 5.8 Park & Ride Opportunities

The draft 2030 Metro Strategy document recognises that attracting car users to the Metro for all or some of their journeys will be a component of increased future demand. One way of achieving this will be by the targeted expansion of Park & Ride sites in North Tyneside where demand exists or is likely to do so in the future.

Park and Ride facilities at strategic locations will have an important part to play in widening the reach of Metro across the region in this manner. Any new network extension proposals will also seek to incorporate Park & Ride sites at the planning stage to fulfil a similar role.

Both of the strategic sites provide a strong opportunity to include Park & Ride provision as the strategic link roads central to both sites will by definition serve users beyond the sites themselves. At Murton Gap this would provide an opportunity to reach residents within south east Northumberland (Seaton Delaval, Holywell, and Blyth). Many of these residents enter North Tyneside via the A192 at Earsdon close to where the proposed link road would connect and cross the Metro line within the Murton Gap site.

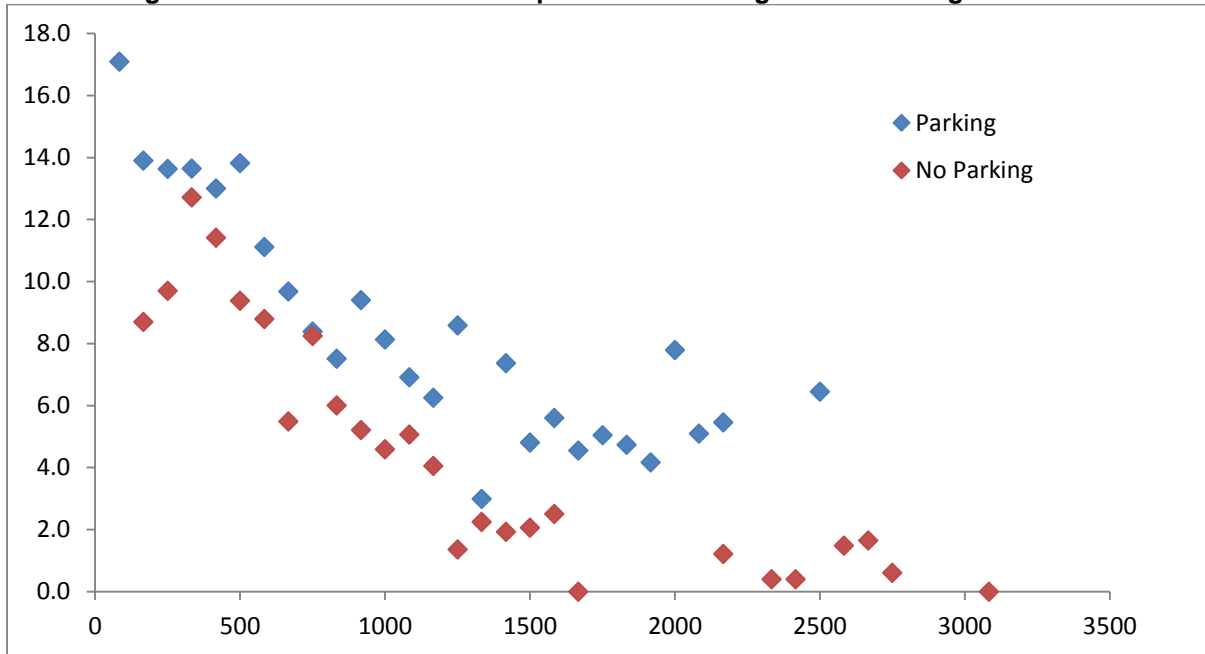
The Park & Ride opportunities at Killingworth Moor site would serve a more local catchment. There is a latent demand for this provision as parking on Great Lime Road around the Palmersville station is becoming an increasing problem due to a lack of appropriate parking provision. Parking on the highway network demonstrates the opportunity for formalising a Park & Ride scheme at this location.

The provision of parking facilities at Metro stations is shown to increase mode share by Metro from all LSOAs using that station. Analysis shows that a parking facility increases Metro mode share within reasonable distance of the station by up to 5%. The relatively short distances between Metro stations, typically 1-2km, limits the potential to determine whether geographical catchment areas of stations are affected by parking facilities; at more than reasonable distance, it is difficult to differentiate from the catchment areas of adjacent stations.

Sensitivity testing has been undertaken to determine the effect on mode share if the proposed Metro stations at the two strategic sites incorporate dedicated parking versus a scenario in which no such parking facilities are provided. Figure 6 below shows mode share by Metro for stations with and without parking provisions. Stations used that have parking facilities include

Northumberland Park, Cullercoats, Monkseaton, and Whitley Bay, and the stations used that do not have parking facilities include Palmersville and Howdon.

**Figure 6 Metro Mode Share Comparison of Parking & Non-Parking Stations**



The scale of the Park & Ride facilities that could be created at the strategic sites will require additional demand forecasting to be undertaken and will be included as part of the outline business case preparation.

### 5.9 Northumberland Park Case Study

Northumberland Park Metro station and interchange provides an excellent proxy by which to project/estimate future Metro demand for the Murton Gap and Killingworth Moor strategic sites. The Northumberland Park area was a strategic site in NTC’s previous UDP that will represent approximately 1,500 new homes when it is completed. To date circa 1,200 homes have been built and 1,800 people lived in this area in 2011 during the Census data collection period. This represents a good sample size from which to estimate likely modal split, trip distribution, and household composition from.

Table 15 below summarises the modal split of Northumberland Park taken from 2011 Census Journey to Work data. The table shows that a significant proportion of trips are made by Metro with 17% the average for the area.

**Table 15 Northumberland Park Modal Split, 2011 Census Journey to Work**

Mode	%
Car	62%
Passenger	6%
Train	2%
Metro	17%
Bus	5%
Cycle	2%
Walk	7%

When the Metro modal split is broken down into greater detail at Output Area level, the relationship between distance from the station and propensity to travel by Metro becomes apparent. This is shown in Table 16 below.

**Table 16 Northumberland Park OA Level Modal Split, 2011 Census**

2011 Output Area	Metro %	Distance from Metro (m)
E00166131	24%	200
E00166127	20%	100
E00166128	18%	250
E00166162	17%	300
E00166130	16%	350
E00043507	10%	625
E00166166	8%	550

The data in Table 16 shows proportions as high as 24% of commuters using the Metro when they resided within 200m of a Metro station, distances for which were measured from OA centroid to Northumberland Park Metro Station. For reference areas within North Tyneside without a Metro station within reasonable walking distance (2km) achieve a Metro modal split of around 2% which normally forms part of a multi-modal linked trip.

Table 17 below summarises the Metro patronage data for journeys from Northumberland Park station to areas in the north east, with 58% travelling to stations within Newcastle City and 33% of journeys retained within North Tyneside. It should be noted that Northumberland Park has Park & Ride facilities which will distort the trip distribution slightly, although this is likely to represent a small proportion of total trips from the station.

**Table 17 Northumberland Park Metro Trip Destinations by North East Borough**

Borough	%
North Tyneside	33.0%
Newcastle	57.9%
South Tyneside	1.8%
Sunderland	1.0%
Gateshead	6.3%

Table 18 below summarises those trips travelling from Northumberland Park Metro station to stations associated with major employment areas.

**Table 18 Northumberland Park Metro Trip Destinations by Major Employment Area**

Employment Area	%
Newcastle City	41.2%
Quorum & DWP	11.8%
Regent Centre / Gosforth	6.7%

The evidence from the Northumberland Park Metro station case study suggests that a Metro station provides the potential for transferring vehicle trips from the local highway network that are destined for Newcastle city centre. As this is likely to represent around 31% of all commuting trips from the Murton Gap and Killingworth Moor strategic sites, this generates a significant opportunity to instil sustainable travel as a primary mode choice from the strategic sites. Furthermore, this would help reduce the burden upon the local highway network in relation to traffic congestion and journey time delay on radial routes into Newcastle city centre.

## 5.10 Cost of New Metro Stations at the Strategic Sites

Nexus is unable provide specific cost estimates for new Metro stations as construction costs are heavily dependent on design specifications including geographical location, ground conditions, land ownership status, and level of facilities provided.

The two most recent station openings on the Metro network were Simonside (2008) and Northumberland Park (2010), and the construction costs of the most recent stations provide a realistic estimate of potential costs of providing new Metro stations at the strategic sites. Construction costs for Simonside station, a ‘basic’ and standard design, was £3m, and costs for Northumberland Park station were in the region of £5.75m, which included the cost of constructing the vehicle bridge over the railway line and the 400-space multi-storey car park.

Using this information, it can be surmised that the cost of providing a station at the Murton Gap and Killingworth Moor sites is likely to be in the region of £3m to £5m each (subject to inflation), dependent upon the level of construction that would be associated with providing on-site car parking (size and design of a car park) and road access infrastructure that maybe required to site the station on the strategic sites.



Operating costs for a Metro station are also dependent on the station specification, associated build etc., however, operating costs for a Metro station of standard or basic design and size is estimated at £50,000 per annum. This would amount to £100,000 operating costs for new stations at Murton Gap and Killingworth Moor.

The revenue estimates shown in Table 13 in section 5.5 suggest that the annual revenue change with new stations would be £249,724. This revenue would offset the £100,000 annual operating costs for the two stations.

## 5.11 Conclusions

The Metro feasibility demand forecasting exercise has demonstrated that there is anticipated to be significant demand for Metro use by future residents of the Murton Gap and Killingworth Moor strategic sites. On full occupation of the two strategic sites, annual Journey to Work boardings for new Metro stations developed at the sites indicate are predicted to be comparable to the boardings experienced at Northumberland Park Metro station currently, a comparable station demonstrating demand for Metro services at the strategic sites.

Without the provision of new Metro stations, significant additional Metro trips will be created and distributed across the existing stations located closest to the strategic sites. It has been estimated that the Murton Gap site would generate 294 daily trips to Shiremoor and West Monkseaton stations and Killingworth Moor would generate 574 daily trips to Palmersville and Northumberland Park stations.

These are significant daily volumes of trips that are destined for a public transport node from the two strategic sites during an average commuting period to work. If the majority of these trips are undertaken by car, the sites will generate a combined 868 daily trips between the sites and existing Metro stations. This would further exacerbate the heavily congested highway links, in particular the A191 corridor and the B1505 Great Lime Road.

It is estimated that with the provision of Metro stations at the two strategic sites, these forecasted 868 trips would be made from the on-site Metro stations, access to which would be provided via dedicated direct and convenient pedestrian and cycle linkages. The provision of Park & Ride facilities at the new Metro stations would also enable people to drive to the stations and enable people living outside of the sites to travel to the new stations. Provision of parking facilities encourages multi-modal trips, reduces full-journey car trips, and limits the extent to which on-street highway parking occurs, which causes localised congestion and obstructions to other road users.

The conclusions of this Metro demand forecasting exercise have assisted in the formulation of the vehicular trip generation for Murton Gap and Killingworth Moor, used to develop the SATURN model to test the traffic and highway impacts of the two sites. The trip generation has been calculated with the inclusion of Metro stations being provided at the two sites, and hence, providing lower vehicular trip rates to account for notable Metro patronage.

Without the inclusion of Metro stations at the two sites, the vehicular trip rates for the two sites will be higher than those forecast, and the traffic impact on the local highway network which suffers from peak period congestion along key routes and at important junctions daily, will be exacerbated by the delivery of the strategic sites.

The costs associated with the construction of new Metro stations at the two strategic sites has been estimated to be in the region of between £3m and £5m for each station. Operating costs are estimated at £50k per annum for each station (£100k in total per annum), with anticipated annual revenue to reach approximately £249,724.

It is important to note that Nexus is currently developing a new assessment criteria for the delivery of new Metro stations. Once this is adopted, the proposed Metro stations for Murton Gap and Killingworth Moor strategic sites will need to be re-assessed against this criteria.

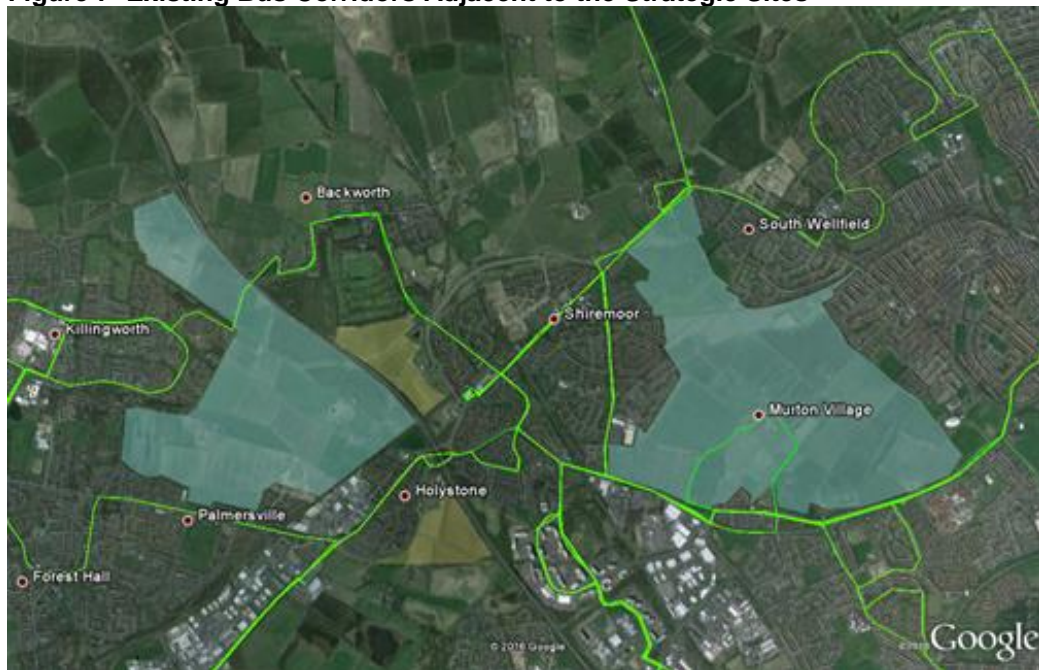
## 6. Bus Provision

### 6.1 Bus Route Opportunities

The location of the Murton Gap and Killingworth Moor strategic sites are such that they are both just beyond reasonable walking distance (2km) of the Quorum and Cobalt Business Parks respectively. Killingworth Moor is situated halfway between the two large employment attractors and therefore, provides great opportunity to convert short car journeys to the two employment sites to sustainable journeys.

Discussions with landowners have already progressed and the importance of a permeable route, which is currently lacking at both strategic sites, as shown in Figure 7 below, has been appreciated and accepted as a design consideration. The proposed highway network at each strategic site has elements of bus priority and central link roads that will allow direct services to key employment areas whilst keeping journey times/dead mileage to a minimum.

**Figure 7 Existing Bus Corridors Adjacent to the Strategic Sites**

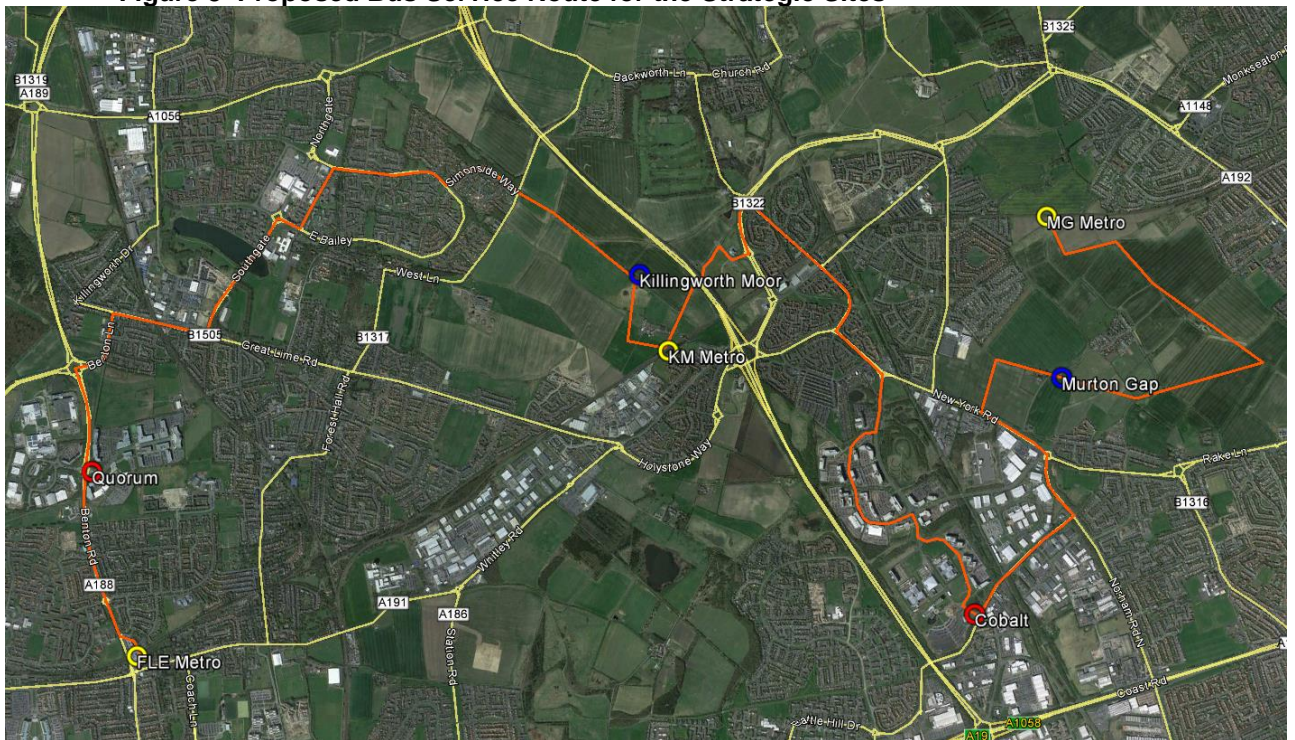


The Killingworth Moor site in particular could provide bus services the opportunity to route directly between the Killingworth Centre and Cobalt Business Park, avoiding local congestion on the A191 whilst still serving the majority of the proposed residential development.

## 6.2 Proposed Bus Service

The proposed bus service route denoted in Figure 8 below incorporates links to existing Interchange facilities as well as the proposed Metro Stations on the two strategic sites. The route would provide direct access from each strategic site to the Quorum and Cobalt Business Parks by sustainable transport. The proposed bus service route timetable is summarised in Table 19 below.

**Figure 8 Proposed Bus Service Route for the Strategic Sites**



**Table 19 Proposed Timetable for Bus Service for the Strategic Sites**

Location	Journey Time from Previous Stop	Total Journey Time (minutes)
Four Lane Ends Interchange	-	-
Quorum Business Park	7	7
Killingworth Centre	5	12
Killingworth Moor Site	3	15
Killingworth Moor Metro	3	18
Northumberland Park Interchange	3	21
Cobalt Business Park (North)	6	27
Murton Gap Site	4	31
Murton Gap Metro	5	36

The proposed bus route enables residents of the Killingworth Moor site to have direct access into Quorum and Cobalt Business Parks within 8 and 12 minutes respectively. Residents of the

Murton Gap site would have travel times of 24 and 4 minutes to Quorum and Cobalt Business Parks respectively.

Public transport access to Cobalt could be enhanced further through designation of a bus only route along the disused waggon-ways track to the southeast of Backworth Lane, linking to Quicksilver Way in the northern section of Cobalt Business Park. Design and delivery of this would however, be dependent upon securing funding through a successful major scheme business case.

### 6.3 Financial Costs

The proposed new bus service would have an indicative initial operational cost of £400k per annum while providing a service every 15 minutes. There is a fleet requirement of 5 vehicles (plus any contingency the operator deems necessary), with the operational costs reducing as the service became financially viable.

The length of time financial support would be required for is dependent on when the service begins operation; serving the two strategic sites during initial construction phases will reduce patronage potential for a period of time and require a longer initial funding term. Further work will be necessary to map variations to the route that would be necessary prior to highway infrastructure being delivered, including bus only routes on the A19 underpass.

Further discussions with the operator after the agreed route is determined will provide accurate operating costs and the term at which funding would be required for. Until then, speculative operational costs can only be determined at this stage.

### 6.4 Conclusions

It is recommended that the provision of a new bus service is delivered in conjunction with new Metro stations at the two strategic sites to maximise the extents of sustainable site accessibility to major employment destinations in North Tyneside and further afield.

The provision of new bus links need to serve key destinations that are not already served by the Metro system, notably the employment growth areas at Cobalt Business Park / Silverlink corridor and Quorum Business Park. The bus service proposed to serve the strategic sites would provide enhanced sustainable links between the sites and the employment areas, while improving public transport links from other areas, notably Killingworth, which is not currently served by the Metro system and there are no proposals to change this.

The proposed bus service will also enable sustainable transport interchange at the two strategic sites also without being dependent upon the delivery of other future public transport schemes. For example, without the Cobalt Metro link, routes from the coast or further inland could be made by Metro to the Murton Gap site and then by bus to the Cobalt Business Park. Providing the proposed bus route and Metro stations will provide public transport coverage in Murton and Killingworth that currently is fairly poor.

The envisaged costs associated with the proposed new bus service linking the strategic sites with key employment sites in North Tyneside would have an initial operational cost of £400k per

annum, providing a service frequency of 15 minutes. Discussions with the operator after the agreed route is determined will provide accurate operating costs and the term at which funding would be required for. Until then, speculative operational costs can only be determined at this stage.

Further detailed analysis would have to be undertaken on the agreed route of the bus service for the strategic sites to assess the impact of the proposed highway network changes on existing bus routes and the highway network. For example, a substantial examination of demand for non-car lanes and highway capacity impacts if lanes were given over to buses would need to be undertaken, as well as the exploration of the potential scope for on-road bus priority measures in addition to the off-road sections discussed above.

## 7. Future Public Transport Developments

### 7.1 Introduction

There are several proposals for alterations to the local/regional public transport network that would impact upon the Murton and Killingworth Moor strategic sites. These include new Metro lines and the re-opening of an existing heavy rail route to Northumberland. Each is discussed in detail below.

### 7.2 Ashington, Blyth & Tyne Railway

The re-opening of the Ashington Blyth and Tyne Railway would see the re-introduction of passenger services on the fully operational and maintained freight line between Newcastle and Ashington, with intermediate stations at Northumberland Park (Metro connection), Seghill, Seaton Delaval, Newsham, Bebside, and Bedlington.

Initial feasibility work has been undertaken which demonstrates that the line condition is adequate and that subject to a business case demonstrating the line's cost benefit viability, the line will re-open. Northumberland County Council (NCC) have included proposals for the re-opening of the line within their Core Strategy Infrastructure Development Plan, and have begun a GRIP-2 Feasibility Study into the scheme.

NTC have engaged with NCC regarding the possibility of the Northumberland Park station providing a Metro connection to the Ashington, Blyth and Tyne Line. This proposal is in the very early discussion stages and is being led by NCC and Nexus, in which no definitive decision has been made in relation to this yet. Discussions regarding opportunities to dovetail the new Metro stations at the strategic sites with the reopening of the Ashington Line have also been had and more detailed discussions will be undertaken as both potential schemes undergo further assessment.

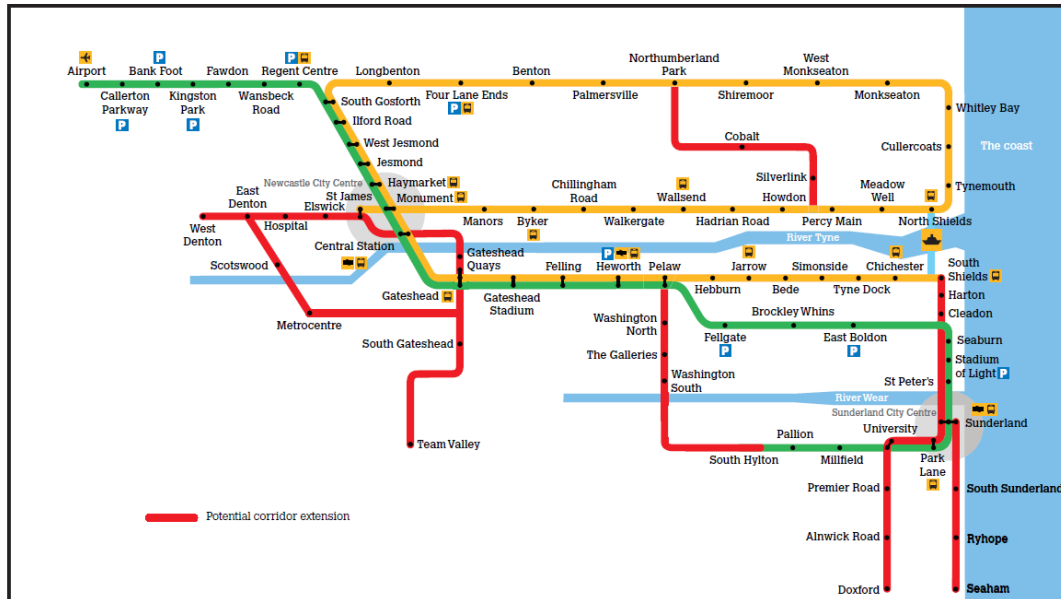
### 7.3 Cobalt Link Metro Extension

Nexus has highlighted within the draft 2030 Metro Strategy document that a possible route through Cobalt Business Park may become a viable extension to the existing network. While the 2030 Metro Strategy remains a draft document, discussions with Nexus have indicated a continued aspiration to deliver the Cobalt extension.

The route would connect both arms of the North Tyneside Metro loop running from Howdon/Percy Main to Northumberland Park and serving the Tyne Tunnel Trading Estate, Silverlink and Cobalt Business Park destinations on route. The route would link this corridor of employment, retail, and leisure uses to Metro destinations across Tyne and Wear through the operation of an 'inner circle' service linking the Wallsend, Cobalt and Benton areas in either direction.

An indicative route map incorporating Nexus' aspirations for a Metro station at Cobalt Business Park from the Metro Strategy document is shown in Figure 9 below.

**Figure 9 Potential Metro Extension Link through Cobalt Business Park**



The Cobalt Metro extension line would significantly help reduce the congestion on the local highway network around the business park and provide a sustainable alternative mode choice for the 20,000 staff anticipated to be employed at the park following full occupation. Of the 20,000 staff, approximately 51% are expected to be residents of North Tyneside which equates to a significant number of short car journeys that could be removed from the highway network if a Metro station was constructed.

The Cobalt Metro link would provide an excellent alternative for prospective residents of the Murton Gap and Killingworth Moor strategic sites as the proximity of the Northumberland Park Metro is somewhat of a deterrent currently. The difference between car journey times from the two strategic sites to Cobalt/Silverlink and Metro journey times to Cobalt with the inclusion of the Cobalt Metro line extension would be negligible, and furthermore, would reduce the adverse impacts of parking shortfall on the Cobalt Business Park.



**Capita Property and Infrastructure Ltd**

North Tyneside Council  
The Quadrant  
The Silverlink North  
Cobalt Business Park  
North Tyneside NE27 0BY