Trans-Pennine Tunnel Study

Stakeholder Reference Group

20th July 2016

Housekeeping

Peter Molyneux - TfN

Have we all signed in 

Fire alarms and exits 

Phones 

Toilets 

highways england

Opening Welcome

Shona Johnstone - DfT

What we'll cover today…

1. Introductions
2. Purpose of the day
3. Expectations
4. Proposed outcomes

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Transport for the North

Trans-Pennine Tunnel Study - Stakeholder Reference Group

Peter Molyneux, Strategic Road Network Director, TfN

Wednesday, 20 July 2016

One Agenda, One Economy, One North

TRANSPORT FOR THE NORTH

Transport for the North

16m PEOPLE

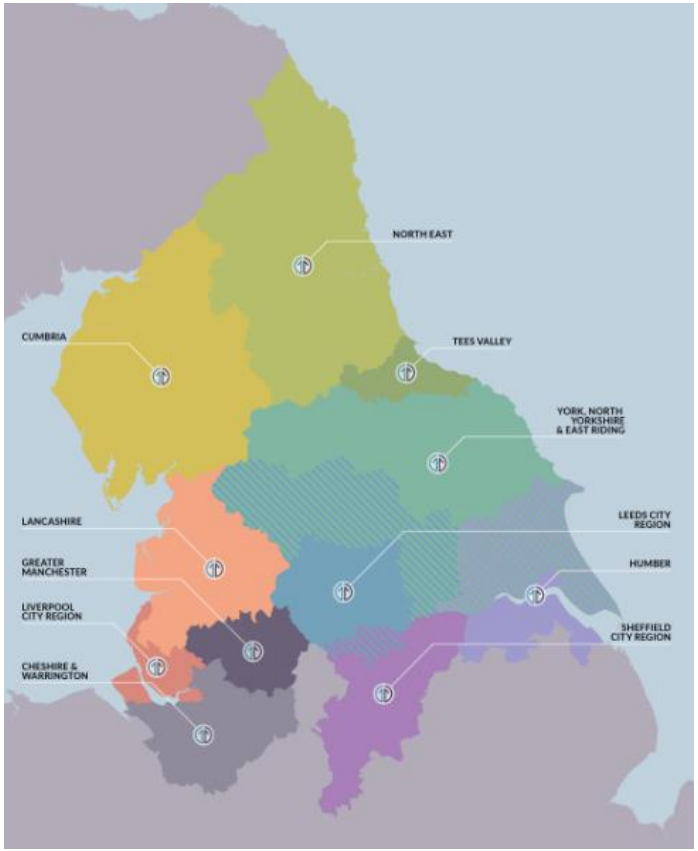
£290bn GVA TOWARDS UK ECONOMY

Size of area:
23,175 km²

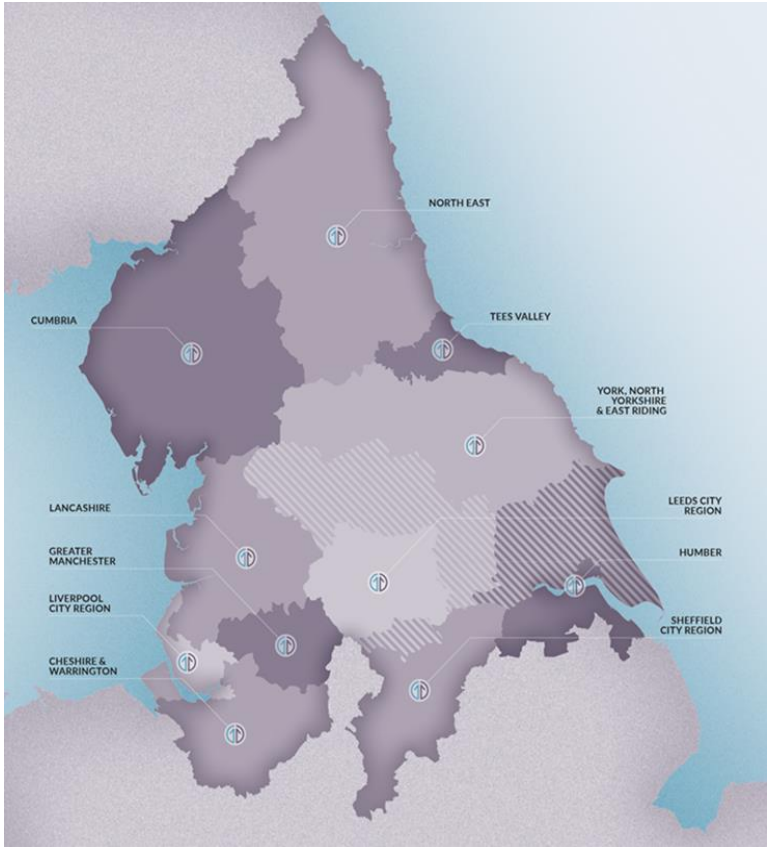
Population density:
696 people per km²

19
Transport authorities

4
Development partners



Devolution



The Cities and Local Government Devolution Act 2016 amends the Local Transport Act 2008 so that the Secretary of State for Transport can establish statutory sub-national transport bodies, provided that two conditions are met:

1. **The sub-national transport body would facilitate development and implementation of transport strategies for the area; and**
2. **Economic growth would be furthered by development and implementation of such strategies**

As a sub-national body, must produce a Transport Strategy in pursuit of these objectives.

What and whose strategy?

July 2014
One North

- Set out a strategic transport proposition for the North
- Led by Leeds, Liverpool, Manchester, Newcastle and Sheffield
- Initial response for developing a strategic transport plan to integrate HS2 with the existing transport network, as well as transforming the existing rail and road network

October 2014
Rebalancing Britain

- Sir David Higgins' recommendations to improve transport connections and reducing journey times across the North building on HS2
- Set out how the northern cities should speak as one voice through a new body, Transport for the North

March 2015
Northern Transport Strategy Report Launched

- Set out the vision for support growth across the North with the TfN partners
- Set out the plan for developing the various TfN workstreams further through the establishment of the TfN Partnership Board

November 2015
NTS Autumn Update Report

- Provided an update on the work to develop the NTS
- Set out the initial findings of the feasibility of the Northern Powerhouse Rail (NPR) network
- Set out the case for the Trans Pennine Tunnel
- Updates and plans for the other TfN programmes

March 2016
NTS Spring Update Report

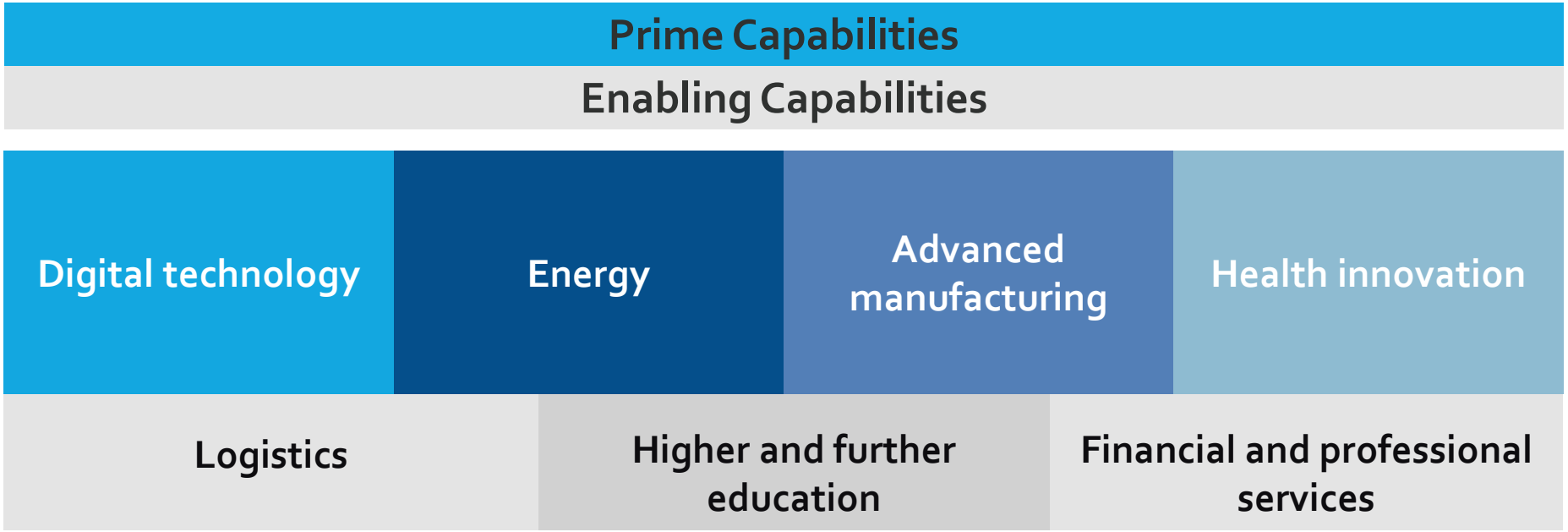
- Emerging views of options for the Northern Powerhouse Rail (NPR) network
- 2 studies were produced on improvements to the Strategic Road Network
- An implementation plan for Smart North, a new multi-modal ticketing and fares system, was outlined

2017
STB Transport Strategy and Investment Plan

- Acts as a commissioning framework for TfN's activity
- Sets out the quantum's of growth and transport demand
- Builds on the evidence developed under the remit of the NTS and beyond
- Is developed in the context of the Transport Strategy owned by the STB
- Focused on the operating space agreed through the constitution

Northern Powerhouse Independent Economic Review

- First ever **pan-Northern economic review**

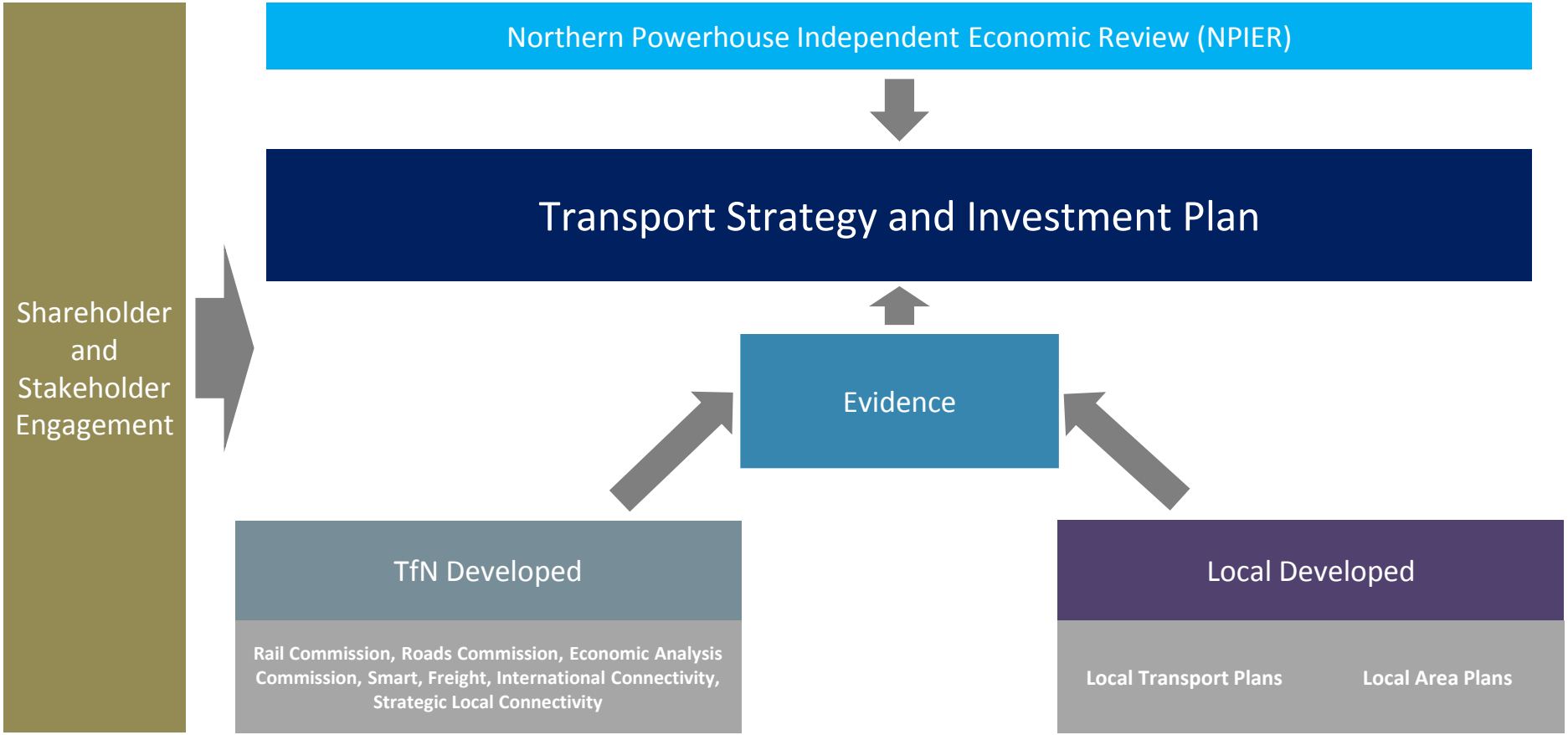


Strategy Development Principles

The Transport Strategy must:

- Set out a long-term strategy with a clear prioritised and sequenced delivery programme
- Present a strong case for transformational investment
- Support transport investments in pursuit of economic outcomes
- Be holistically developed to draw together complex modal and economic priorities
- Be a public facing, publicly supported document
- Have an agile strategic approach in its development
- Be a living document

Holistic Strategy Fit



Integrated Strategic Road Report

- A long-term, multi-year investment plan covering:
  - 3 TfN/DfT strategic studies;
  - Associated wider transport connectivity assessment;
  - Evidence from the TfN programmes on Freight, Strategic Local Connectivity and International Connectivity
  - An analysis of strategic connectivity gaps and additional evidence, including integration with rail and other modes

- Includes approach identifying priorities to inform the RIS2 process, as well as long term investment
- Strategic Road Network in the North and strategic cross boundary routes
- Identification of core conditional outputs to support Northern Powerhouse economic growth aspirations
- Potential for smarter management of data on the transport network, communicating real time travel information to drivers / passengers
- Consideration in the long term of factors such as autonomous vehicles

Overview of Timetable

July 2016	Summer 2016	Autumn 2016	Spring 2017
Scoping workshop, engagement with DfT & Highways England. Commission consultancy support	Engagement with CA's , LEP's & Highway Authorities. Evidence gathering, gap analysis & strategic policy development	First draft of Strategy –setting out objectives, gap analysis. conditional outputs & benefits	Finalised draft of strategy including high level recommendations to feed into RIS2 and for subsequent implementation programmes

RIS2 evidence gathering May – Jul '16

RIS2 evidence analysis Aug-Sept '16

Development of RIS2 Route Strategy documents Oct '16 – Feb '17

SRN Initial Report Nov '17

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Northern Strategic Studies: Update

Shona Johnstone: Strategic Studies Programme Lead
Nafis Kibriya: Policy Advisor, Strategic Studies

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RIS2 – Planning for the future

- The next road investment strategy – RIS2 – will cover the second Road Period, starting April 2020.
- Between now and 2020 we will be developing RIS2, covering everything from vision to performance measures to investment.
- This will rely on a major phase of research, involving people inside and outside of government.
- In the spring, we published our ‘Planning Ahead’ document, detailing how we will craft RIS2.

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The process for developing RIS2

There are three major stages in the journey to craft RIS2 and get to the beginning of the second Roads Period:

- Research
- Decision
- Mobilisation

In the Research phase, we will gather evidence on the strategic road network's performance and the potential options to address the problems identified.

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The five aims to the government RIS vision

Economy including
- Building the Northern Powerhouse
- Help business to get goods to market

Integration including
- Links with other modes
- Links with local road network

Safety including
- Road standards
- Operation of the network

Network capability including
- Keep the main arteries flowing
- Linking the country together
- Tackling pinch points

Environment including
- Cycle-proofing the network
- Tackling noise and air quality
- Managing impacts on nature

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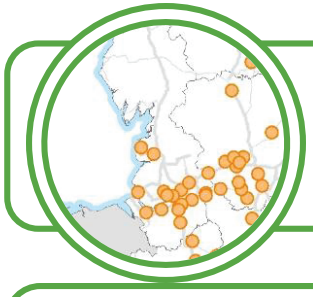
RIS2 Investment Plan



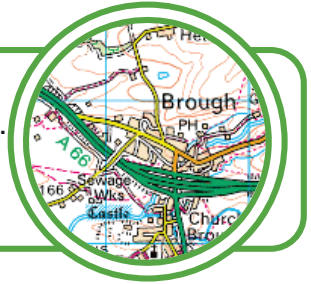
RIS1 Schemes

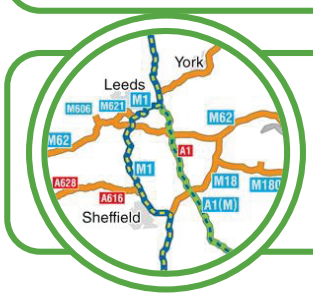
Projects started in RIS1 will need to be completed. Schemes identified for development for RIS2 will also be brought forward so they can start work soon after 2020.

Strategic Studies

Six studies looking in detail at large scale and transformational projects.

- Northern Trans-Pennine Route
- Manchester NW Quadrant
- Trans-Pennine Tunnel
- A1 East of England
- Oxford to Cambridge Expressway
- M25 SW Quadrant





Route Strategies

An audit of pressures, needs and opportunities across the whole of the network, identifying the places where action is most urgently needed. HE has launched the process and is seeking evidence online currently.

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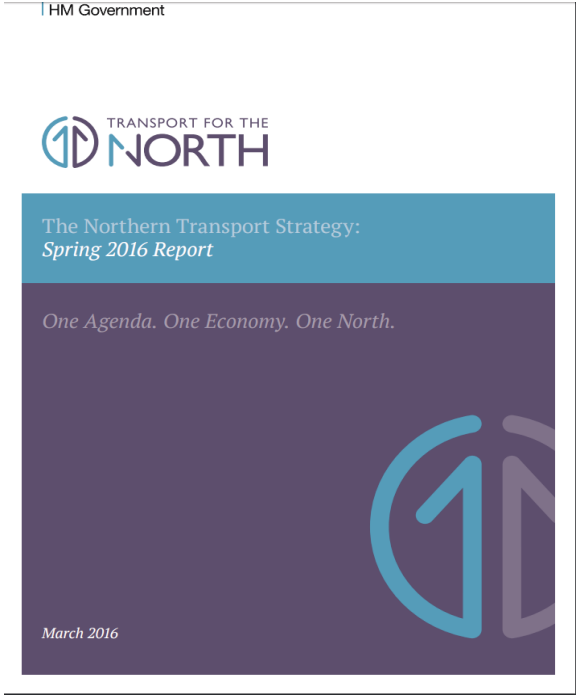
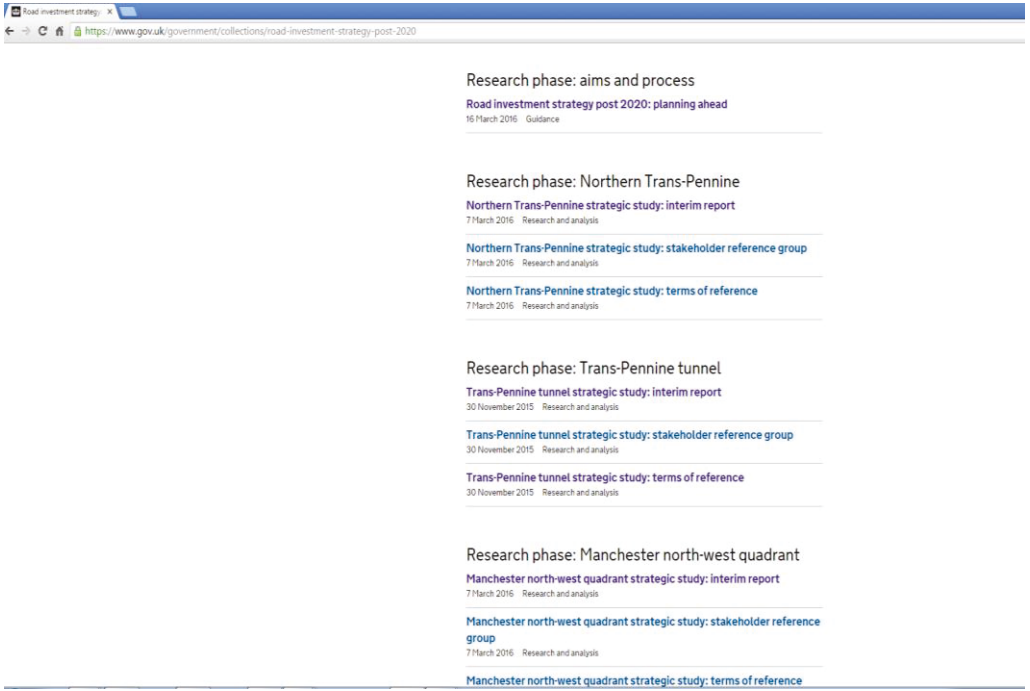
Current Progress





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M60 North West Quadrant Initial Report

Published in March

The Strategic Road Network within the study area performs multiple functions, providing international, national, regional and local connectivity.

The network can suffer from severe congestion and there are also significant environmental considerations – particularly air quality and noise.

If the economic aspirations of the Northern Powerhouse are to be achieved a number of radical transport interventions will be required, particularly on the Strategic Road Network.

Heavy rail does not cover orbital routes and experiences over-crowding
Lack of Park & Ride facilities at stations

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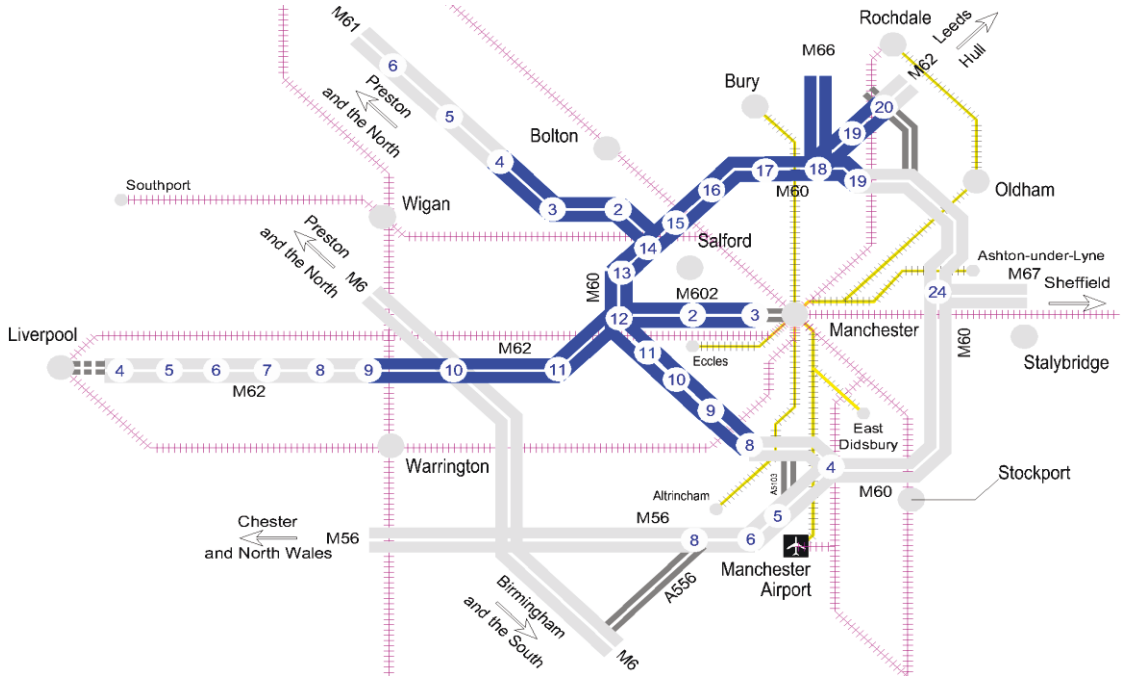
M60 Study Area



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Packaging

- Long list of options grouped into themes, which were assessed and then combined into four packages
- Three Highway led packages developed with multi modal elements
- One public transport only package developed

Northern Corridor Package	Orbital Corridor Package	In-Corridor Enhancements Package	Public Transport Max Package

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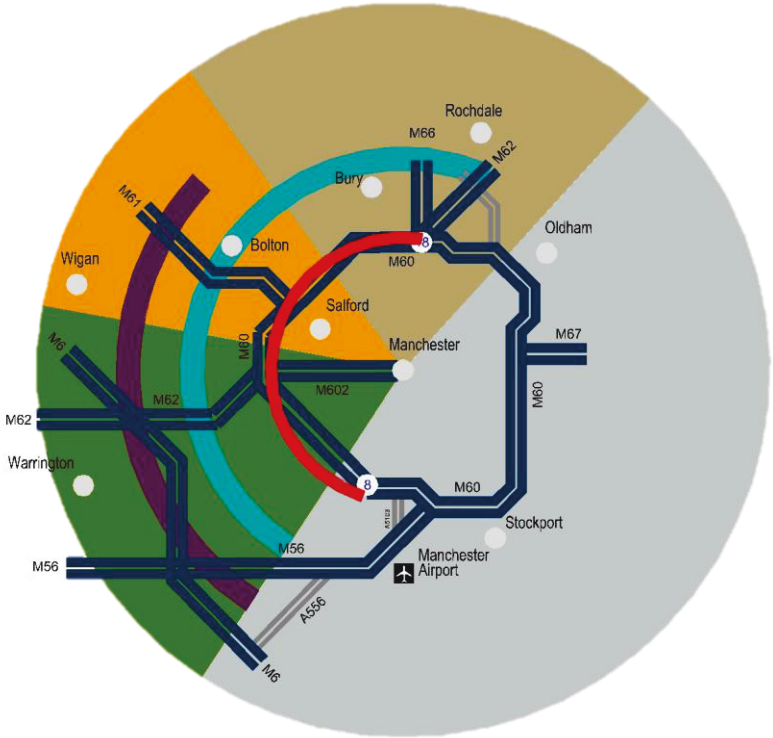
Highway Options



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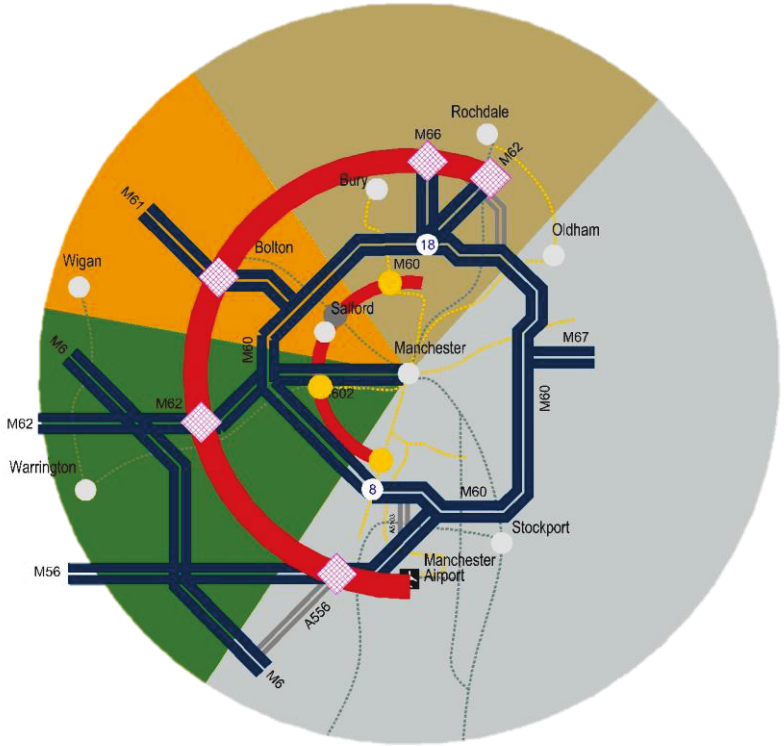
Public Transport Options



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Northern Trans-Pennine Initial Report

Published in March

The A66 is a key strategic link, particularly for freight. Its importance will only increase with the economic growth of the Northern Powerhouse agenda, and other strategic road link improvements.

The A69 performs a key function in integrating communities along the route into the wider North East/North West economy.

Inconsistency in route standards along both routes will constrain future economic development

Intervention will have a positive impact on travel reliability, network resilience, future national and regional connectivity, economic growth and the economic vitality of local communities

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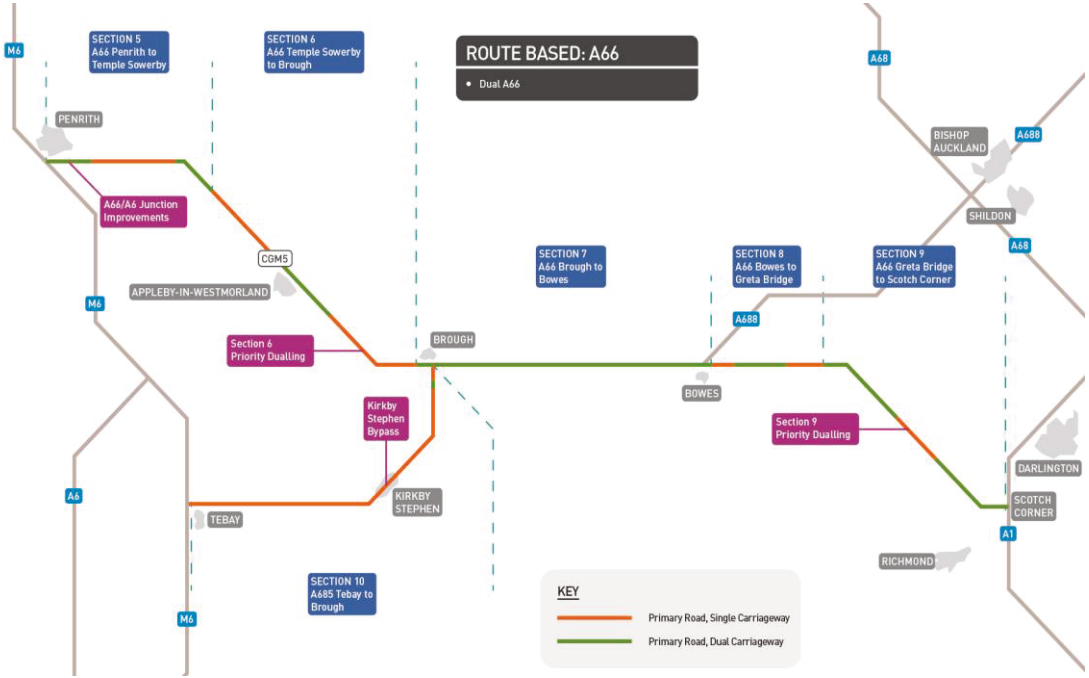
A66 – Study Area



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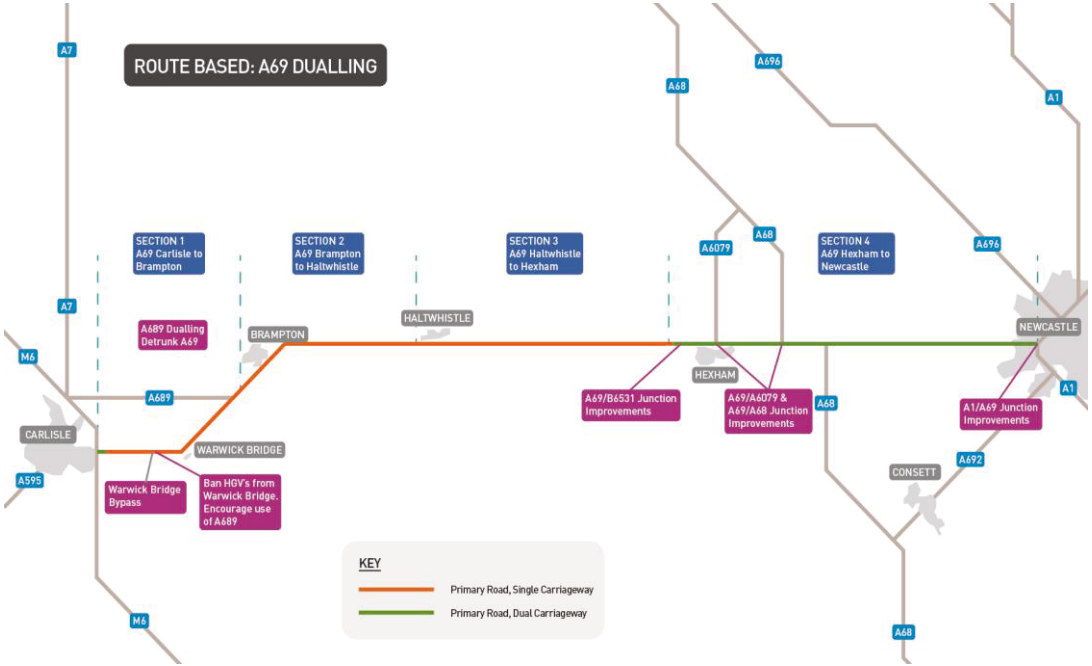
A69 – Study Area



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Initial Appraisal Results

- A69 dualling generates the largest journey time savings but will also be the most expensive option (32m length of single)
- Completion of A66 dualling will generate around half the journey time savings of the A69 dualling but will be less costly (15m length of single in total)
- Dualling of A66 section 6 (Temple Sowerby to Brough) would generate a high proportion of A66 dualling journey time savings – due to current speed limits; topography
- A685 by-pass of Kirkby Stephen would generate low journey time savings – due to low traffic volumes; single carriageway

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Next Steps – Northern Strategic Studies

- Publication of updated interim report
- Shortlisting of options to develop strategic outline business case
- Final Reports for all three studies in autumn 2016
- Budget 2016 committed funding through the Transport Development Fund for:

> developing the future transformation of east-west road connections, including a new Trans-Pennine tunnel under the Peak District between Sheffield and Manchester, as well as options to enhance the A66, A69 and the north-west quadrant of the M60. The government will allocate £75 million, including to **develop a business case for these schemes by the end of the year**

- No impact on timeline for current studies
- But: will accelerate the development of any solutions arising from the recommendations

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Freight and Logistics Study

- The Northern Freight and Logistics study, carried out by Mott Macdonald and MDS Transmodal, has been completed. Main recommendations of the report are:
  - The development of 50 hectares of rail and/or water connected Multimodal Distribution Parks per year, located at the edge of urban centres
  - Rail network upgrades to allow 20% longer trains to operate on a six day week basis
  - The promotion of short sea shipping, particularly for unitised freight, to bring freight directly to Northern Ports, facilitated through the provision of Liquid Natural Gas bunkering
  - Complementary land-side access improvements to ports to reduce local road congestion, most importantly along the route of the M62/M60 north of Manchester and into Hull and Liverpool
- A report will be published on the TfN website shortly

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Freight and Logistics Study - next steps

- TfN will be commissioning a number of studies at LEP level to take the outputs of the TfN Freight and Logistics Study and refine them to scheme level on both the road and rail network. The outputs from these studies will:
  - Inform the development of the TfN Road and Rail Strategies, which will themselves inform Transport for the North's input into the development of future Control Periods and Roads Investment Strategies
  - Develop a framework for the continuation of public sector regional stakeholder engagement prioritising infrastructure investment with a view to getting ahead of freight sector demand growth
  - Create a freight-centric blueprint of the North, building upon the initiative gained from the Private Sector Working Group

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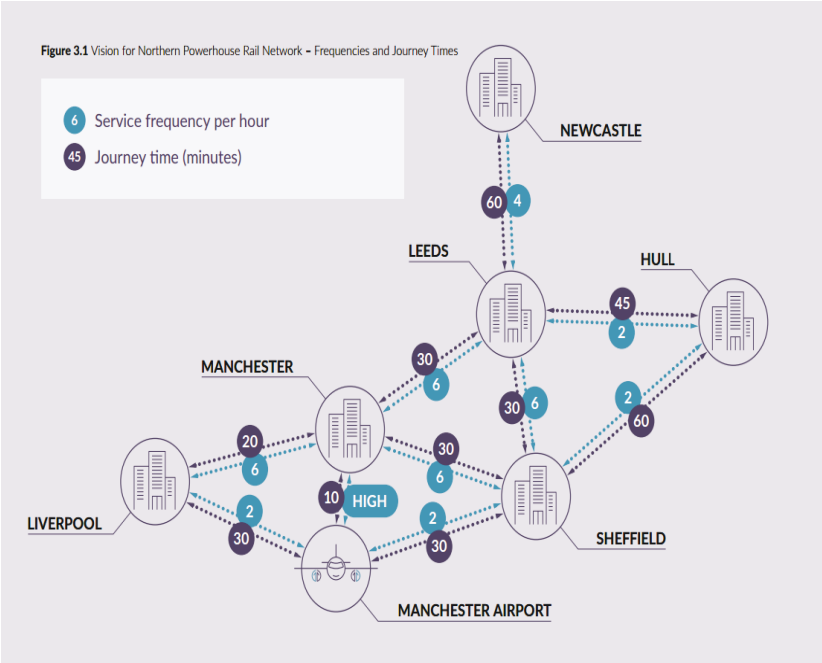
Northern Powerhouse Rail

- The Northern Powerhouse Rail (NPR) programme is developing options for a network of transformed rail services across the North to support economic growth
- The March 2015 Northern Transport Strategy set out aspirational journey times, service frequencies and capacity for a network connecting Liverpool, Manchester, Manchester Airport, Leeds, Sheffield, Newcastle, and Hull
- This built on the previous Chancellor's original 'HS3' concept for a fast new railway linking Manchester and Leeds
- Last update to the Trans-Pennine Tunnel - Stakeholder Reference Group was 4th February 2016



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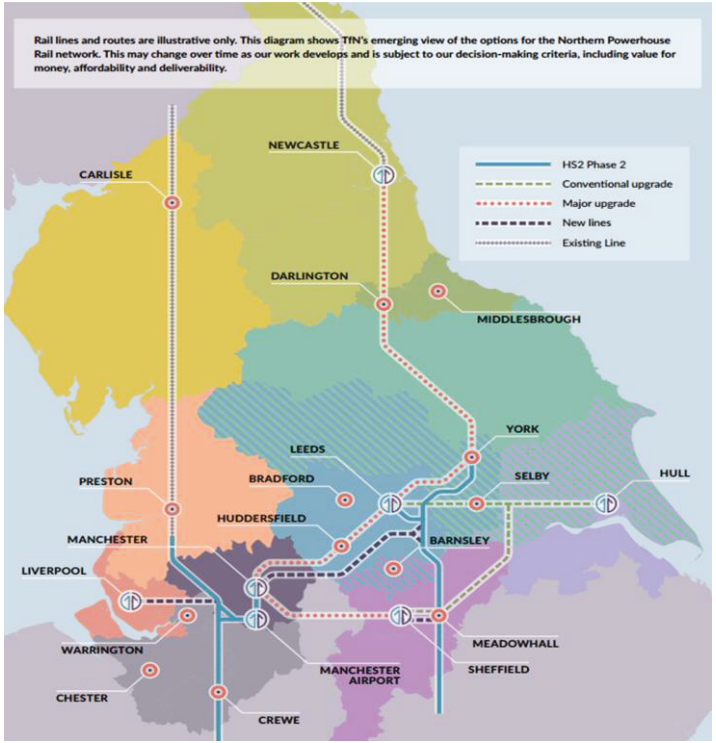
2016 Spring Report

- The TfN 2016 Spring Report presented an update on NPR development to date
- Emerging findings demonstrate that achieving the rail vision could require a network including new railway lines, major upgrades to existing lines and major work at stations.
- Work is also examining potential synergies with the HS2 network, to integrate NPR services between Liverpool - Manchester and Sheffield – Leeds
- The map shows TfN's emerging view of the options that could meet, or move towards meeting the aspiration, of which we are currently working up in further detail



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Next Steps - NPR

- NPR is several months behind the Trans-Pennine Tunnel Study workstream
- Outline feasibility work on all corridor and stations options will be completed by Autumn 2016 – providing a view of the physical work required, alongside analysis of the indicative costs and benefits
- In Autumn 2016 a prioritisation process will be conducted to identify the best performing options, which will then be developed in greater detail
- Planning and development work needs to take into account the National Infrastructure Commission recommendations

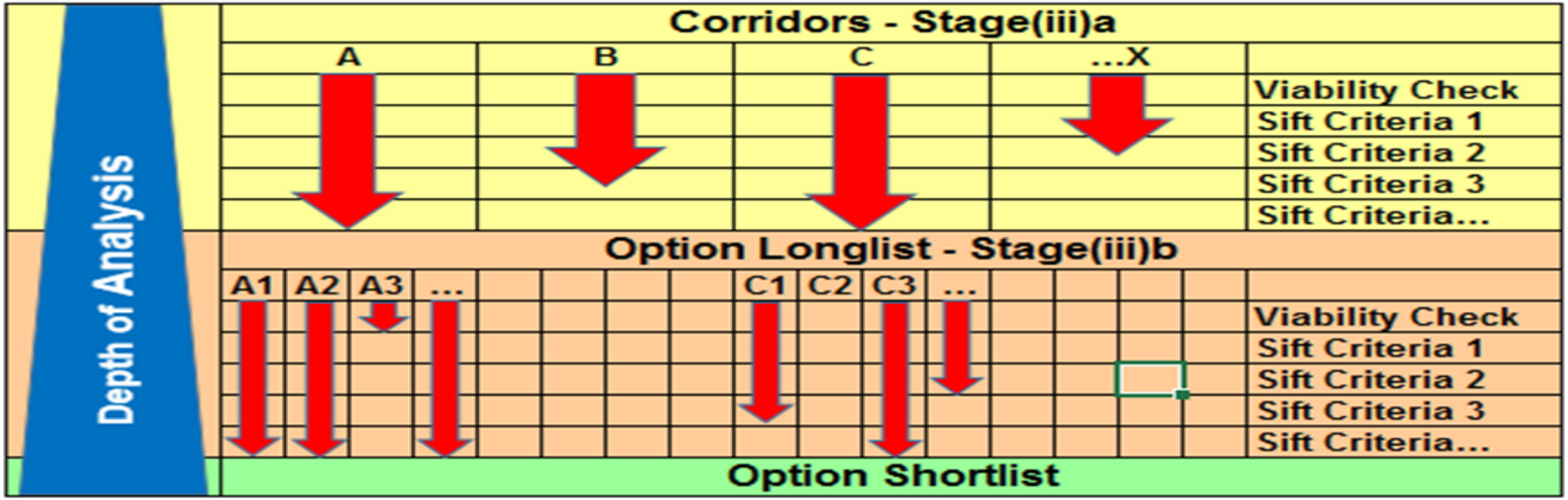
- Throughout the continued development, NPR will continue to integrate with the other NTS workstreams, maximising the potential to accommodate ambitious freight growth, serving other significant economic centres and retaining the opportunity to connect the NPR network into local markets
- Post identifying the prioritised options, we expect intensified joint working with the Highways Workstream, as options are developed in greater detail
- Wider partner and stakeholder engagement

Update on study progress
Darren Oldham

Re-cap of the previous SRG and outcomes

(Corridor assessment)

Corridor assessment methodology



Viability assumptions

1. Fits with project scope – i.e. strategic link connecting Manchester and Sheffield under the Pennines
2. Is largely within study area boundary
3. Does not involve construction of surface route within the National Park and its wider setting

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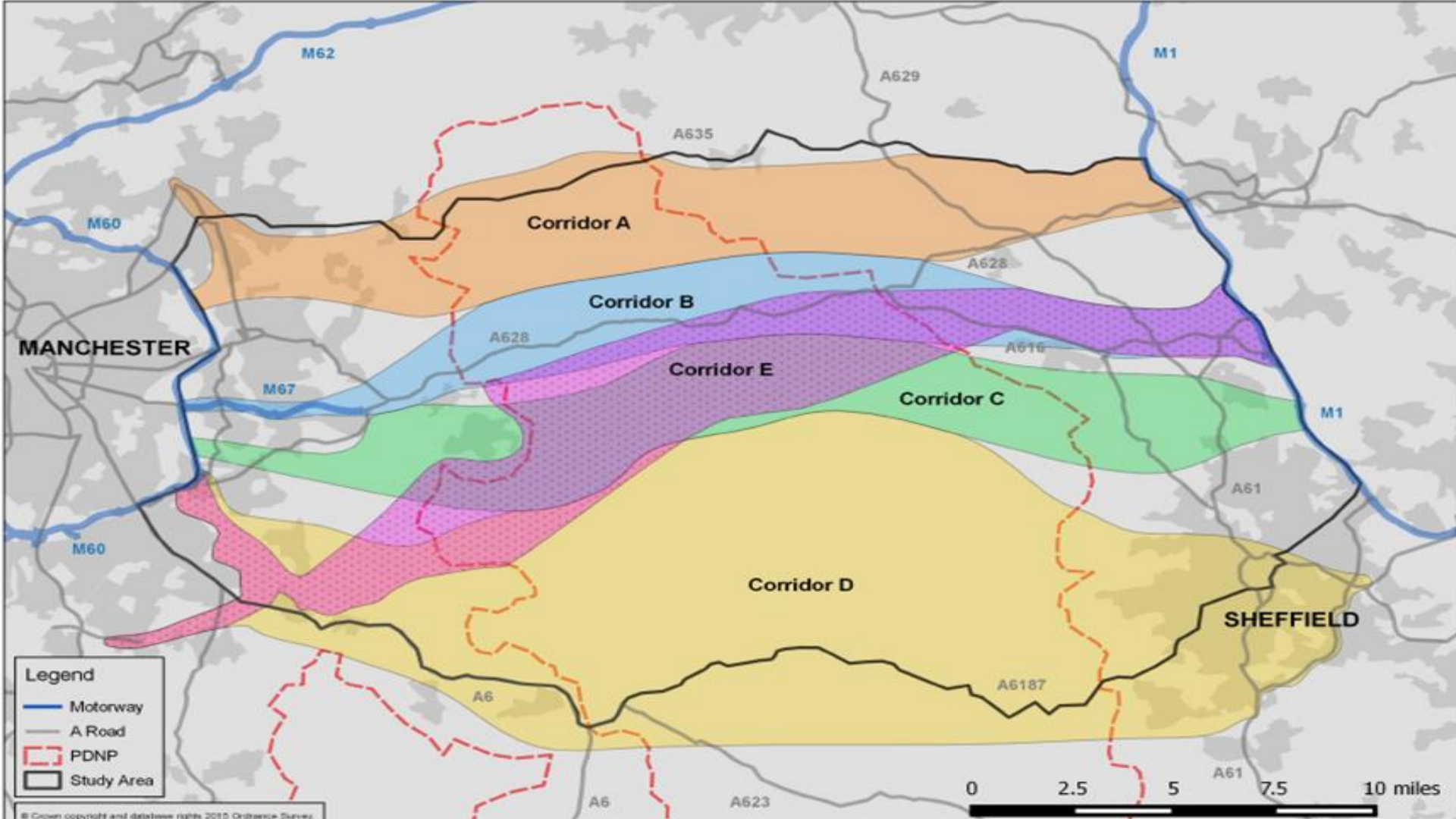

Stakeholder views – SRG 9th Dec

- Tested viability assumptions (suggested tweaks rather than wholesale changes)
- Identified 5th corridor (Corridor E)
- Identified some advantages specific to corridors in the north:
  - follows current route
  - better geology and environment
  - benefits to north Manchester (regeneration)
  - shorter tunnel lengths
- Identified some advantages specific to corridors in the south:
  - less severe weather
  - bring more traffic away from M62
  - improve links to Manchester Airport
- Identified need to position road and rail together, where possible
- Keen to see investment in public transport e.g. P&R
- See reduction in traffic through PDNP as a benefit

Stakeholder views – SRG 4th Feb

- Range of views on corridor assessment results. Majority see the logic in Corridors D and E not being progressed, some wanted them to stay in, others want more detail before deciding
- Concerns over number, location and size of ventilation shafts
- Concerns over removing excavated material (support route options which would minimise disruption)
- Concerns over broad range of environmental issues in corridor D. Including option for viaduct (surface route)
- Benefits of using existing infrastructure (e.g. M67) – impact on community, severance, acceptability
- Corridor/route (western end) concerns over capacity of M60, particularly SE quadrant)
- Corridor/route (eastern end) works better north of Sheffield
- Identified range of local issues which could impact on route options

EAST results summary

Case	Indicator	EAST Score				
		A	B	C	D	E
Strategic	Scale	5	5	5	4	4
	Fit with wider transport and government objectives	4	4	4	4	4
	Fit with other objectives	4	4	4	4	4
	Key uncertainties	Timescales of other studies. Construction in PDNP. Mining constraints. SRN capacity. Ventilation.				
	Consensus over outcomes	2	2	2	2	2
Economic	Economic growth	G	G	G	G	G
	Carbon emissions	A	A	A	A	A
	Socio-distributional impacts	A/G	A/G	A/G	A/G	A/G
	Air Quality	R	R	R	R	R
	Noise	R/A	R	R/A	R	R
	Biodiversity	G	G	AG	R/A	G
	Heritage/Townscape	A/G	A/G	A	R/A	A
	Landscape	A	A/G	A	R/A	A
	Wellbeing	A/G	A/G	A/G	A/G	A/G
	Expected VfM	Not able to assess at the corridor level.				
Financial	Capital cost (£m)	£1000m+	£1000m+	£1000m+	£1000m+	£1000m+
	Revenue cost (£m)	Don't know	Don't know	Don't know	Don't know	Don't know
	Overall cost risk	1	1	1	1	1
Management	Implementation timetable	10+ years	10+ years	10+ years	10+ years	10+ years
	Public acceptability	3	4	3	2	3
	Practical feasibility	3	4	3	2	2
	Quality of supporting evidence	3	3	3	3	3
	Key risks	Funding availability. Level of public support. Level of stakeholder support. Scheme cost estimates. Adverse environmental impacts. Obtaining statutory powers. Impact of future technological advances. Existing network capacity.				
Commercial	Where is funding coming from?	Funding uncertain. Specific procurement route unknown. Tolling to be considered in Stage (iii)b.				

Relief to existing Trans-Pennine routes

Route	Relief to Existing Trans-Pennine Route AAWT* 2015 by Corridor				
	A	B	C	D	E
M62	9,500 (10%)	10,000 (10%)	10,000 (10%)	10,000 (10%)	9,500 (10%)
A628	13,600 (90%)	15,000 (95%)	13,600 (90%)	13,300 (85%)	13,300 (85%)
A57	2,000 (45%)	2,100 (45%)	2,000 (45%)	2,100 (45%)	2,000 (45%)
A635	2,300 (90%)	700 (25%)	400 (15%)	300 (15%)	300 (15%)

Journey time savings by origin/destination

Origin/ Destination	Vehicle hours saved by corridor				
	A	B	C	D	E
Manchester – Sheffield	500	450	500	850	300
Manchester – South Yorkshire	1,000	950	1,000	600	900
Sheffield – Greater Manchester	750	800	950	1,500	600
Greater Manchester – S Yorkshire	2,250	2,200	2,100	1,250	2,000
Greater Manchester – W Yorkshire	950	100	100	-	50
Greater Manchester – Nottinghamshire	800	1,150	900	850	750
Greater Manchester – Derbyshire	500	550	550	850	450
Greater Manchester – The South	650	700	750	700	650
South Yorkshire – Cheshire, Shropshire, Staffordshire	550	650	650	650	700
Total (key O&D)	**7,950**	**7,550**	**7,500**	**7,250**	**6,400**
Other sectors	3,550	3,950	3,500	3,750	3,100
Absolute total	**11,500**	**11,500**	**11,000**	**11,000**	**9,500**

Comparison of corridors for quantified economic benefits

Corridor ranking and relativities for GVA benefits

	Corridor				
Regions	**A**	**B**	**C**	**D**	**E**
GVA benefit relative to Corridor D	0.93	0.96	0.99	1	0.82

Change in connectivity by area in 2037 after investment

	Corridor				
Regions	**A**	**B**	**C**	**D**	**E**
Greater Manchester	1.73%	1.77%	1.83%	1.60%	1.77%
South Yorkshire	2.80%	2.84%	2.93%	3.12%	2.84%
Merseyside	0.95%	0.93%	0.96%	1.36%	1.16%
Great Britain	0.22%	0.24%	0.25%	0.24%	0.24%

Potential tunnel lengths

Corridor	Tunnel Length (miles)		Strategic Link Length (miles)	
	Min	Max	Min	Max
Northern (A)	11	16	23	31
A628 / A616 (B)	10	13	28	29
Central (C)	13	20	24	30
Southern (D)	14	19	23	36
Overlapping (E)	15	17	32	34

Summary of corridor assessment

- **Scale of Impact** – Broadly similar, some corridors fare less well against study objectives (D & E)
- **Economic** – Corridors could broadly offer a similar level of impact with one corridor faring less well (E)
- **Environment** – Corridors could broadly have a similar level of impact with one corridor facing more challenges in terms of local environment outside of the national park (D)
- **Journey time saving** – Corridors could broadly offer a similar level of time saving, with one corridor fairing less well (E)
- **Public acceptability** – some corridors make use of existing infrastructure, limit impact on national park, and are closer to potential rail alignments (to remove excavated material) (B + A & C)
- **Practical feasibility** – Longer tunnels lengths present more challenges; embedded carbon, capital and maintenance costs, more excavated material, more ventilation shafts (C, D & E)
- **Viability assumptions** – some corridors challenge agreed assumptions (D)

Summary of corridor assessment

- EAST analysis concludes that corridors A, B and C score better in terms of meeting the objectives of the study

  - Corridor D fails the viability test that the route "does not involve construction of a surface route within the PDNP and its wider setting".
  - Corridor D has additional environmental challenges, for example heritage features, ecological designations and noise issues that would make delivery more difficult.
  - Corridor E is estimated to deliver materially less economic benefits and less additional output to the UK than the other corridors.
  - Time saving within Corridor E would be lower than for the other corridors.
  - Corridors D and E could have longer tunnel lengths than Corridors B and A, and offer no discernible benefits in terms of connectivity, wider journey times, and economics.
  - A longer tunnel will cost substantially more, and be proportionately less likely to provide a business case for investment. Also (more embedded carbon, greater maintenance costs per annum, more excavated material to dispose of and more ventilation shafts to be constructed within the PDNP.

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driving forward

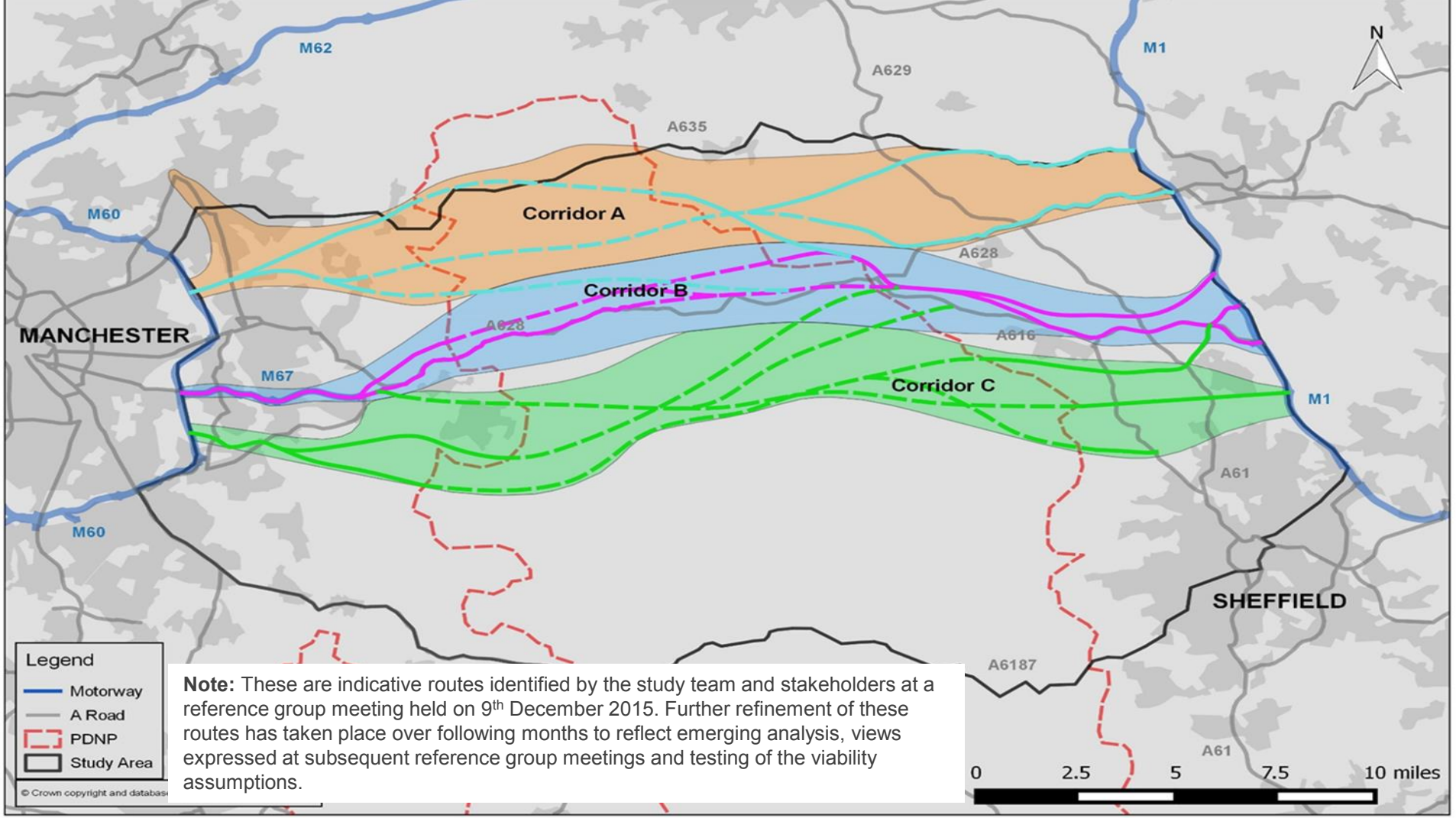
Update on study progress
Darren Oldham

Route option assessment

Option assessment

- Identify and assess individual options within Corridors A, B and C
- Option Assessment Framework (OAF)
  - Outlined in Transport Appraisal process TAG unit
  - Consistent with business case principles (best practice five case model)
  - Adds depth of analysis and provides increased level of assurance
  - Seven point scoring scale

Large Beneficial	LB
Moderate Beneficial	MB
Slight Beneficial	SB
Neutral	N
Slight Adverse	SA
Moderate Adverse	MA
Large Adverse	LA



Note: These are indicative routes identified by the study team and stakeholders at a reference group meeting held on 9th December 2015. Further refinement of these routes has taken place over following months to reflect emerging analysis, views expressed at subsequent reference group meetings and testing of the viability assumptions.

Route option summary – Strategic Case

Emerging analysis

- Regional policy alignment – link anticipated to improve the capacity, connectivity, resilience, reliability, quality and safety of the network
- Regional policy alignment – supports national and regional economic activity, facilitating growth, joining up communities and creating jobs
- Local policy alignment – supports a number of the objectives within local transport plans and strategies of Greater Manchester, Sheffield City Region and Derbyshire
- Fit with Scheme objectives – all routes align strongly with scheme objectives some differentiation

Route option summary – VfM (economy)

Emerging analysis

- Business users – corridor level assessment demonstrated that there was no substantive difference between corridors A, B and C
- Regeneration – all routes provide good links to known regeneration areas. With some differentiation for some of the routes
- Wider impacts – no differentiation between options. All options offer good time savings

Route option summary – VfM (environmental)

Emerging analysis

- Within the PDNP – some environment indicators show some positive impacts (air quality, noise, water)
- Outside the PDNP – some routes have more impacts than others
- Overall impacts could be mitigated at future stages

Route option summary – VfM (impact on society)

Emerging analysis

- Collison and casualties – switch in traffic will lead to reduction in collisions on existing routes
- Collision and casualties – design of any new link would be to the latest standards. Differentiation based on number of junctions anticipated
- Severance – some route option relieve existing severance
- For collisions and casualties, and severance, there are marginal differences between routes

Route option summary – VfM (public accounts, distributional impacts, BCR) and Financial case

Emerging analysis

- High level estimate of the anticipated Present Value Costs (PVCs) has been developed based on the application of unit rates for various tunnel and surface link components
- These cost estimates have been converted into ratios, relative to the lowest cost route option
- Majority of these assessment areas will be looked at in the final stage of the study including production of high level cost estimates

Route option summary - Delivery & Commercial case

Emerging analysis

- Likely delivery agents – anticipated to be a high level of interest in all options
- Likely delivery agents – all deliverable but different levels of complexity which are being assessed, including:
    - Quantity of excavated material
    - Nearest rail access from the tunnel, for removal of excavated material
    - Number of ventilation shafts
    - Number of interchanges
    - Number of structures
    - Proportion of tunnel section within a coal mining affected area
- Stakeholder acceptability – substantial amount of engagement taken place. Too early to have a clear picture of the overall level of support or challenge
- Public acceptability – Assessed against positive (connectivity, resilience reliability) and negative (construction in PDNP, surface construction, tunnel length) factors

Next steps

Darren Oldham – Study Consultant

Broad Tasks
An assessment of the impacts, benefits and costs, considering its strategic and economic case together and whether these impacts are truly additional
An assessment of the impacts and benefits on the M62 motorway and other existing trans-Pennine routes
Consideration of the impact on local and regional labour markets, wages, employment levels, and skills
Consideration of the impact on current and future land use
Consideration of the consequences of the scheme in terms of increased investment in the region
Consideration of the potential opportunities and synergies for creating a new railway alignment between Manchester and Sheffield
Calculation of the estimated cost of each option and the approximate time for its delivery
Identifying the risks and opportunities associated with each option
Final report **SOBC**

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Next steps – Stakeholder Engagement

Shona Johnstone – DfT

- Follow up meetings for those unable to attend today
- Following publication of Updated Interim Report, we'll organise meetings
- Possibly additional SRG covering all northern strategic studies, format yet to be determined
- Final meeting with all stakeholders planned for autumn

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