

# A Cardiff Capital Region Metro:

## Impact Study - Executive Summary

October 2013



## A Cardiff Capital Region Metro: Foreword

Wales is changing; we are at last showing the confidence to embrace the biggest opportunities. Three years ago no-one really expected the valley lines to be electrified, let alone contemplation of a Metro in South East Wales. This is now a real prospect and I was delighted that the Minister for Economy, Science and Transport, Edwina Hart, asked me to lead this Metro study to help frame the development of what will be the most important project in Wales for a generation.

In taking on this work I was committed, as were my colleagues, to include informed consideration of the economic development and regeneration opportunities that could be aligned and integrated into Metro. This is the embodiment of the '*transform | regenerate | connect*' strapline The Metro Consortium presented earlier this year.

Our aim was to develop a strategic regional plan for Metro that can inform and direct the more detailed work that is ultimately required. In doing so, we have drawn upon much of the work recently completed by other bodies. However, we also saw the need to look at the big picture and for the first time begin to present a coherent regional plan that much more effectively integrates the development of the regions public transport network with economic development and regeneration.

Working with colleagues at Capita Symonds, Jones Lang LaSalle, Powell Dobson Urbanists and Steer Davies Gleave and drawing on the work of Welsh Government, South East Wales Transport Alliance (SEWTA), Arriva Trains Wales (ATW) and Network Rail, we have prepared a vision for Metro and some of its wider economic and regeneration benefits.

This is not a locally focussed or detailed plan, rather it is a broad regional analysis that sets out the priorities for investment; it can also be used to stimulate further strategic discussion, as more data and the influence of a dynamic market dictate.

The production of this report provided an opportunity to observe the progress that can be made with a small focussed team that embodies a range of expertise and experience from the property, regeneration and transport sectors. Together with Welsh Government and the rail industry we have all been ready to apply our experience and expertise pragmatically to make progress. I'd like to thank all my colleagues for their effort, energy and imagination.

There are also some hard realities to address in progressing with the Metro. The capital costs demand that we augment traditional sources with a range of more imaginative funding mechanisms. Perhaps more challenging will be the development of a system that can minimise operating costs and on-going subsidies. A closer and cooperative relationship between operators, industry and Government will be needed to address this challenge. In doing so we also need to take a long term view, recognising that early capital investment may be required to secure long term cost reductions in operations; this assessment must also factor in the longer term and wider economic benefits that can accrue from investment in transport. We must also be prepared to consider new ways of delivering transport services.

We are now at a key decision point; having developed a regional vision for Metro, we now need to undertake the more detailed work that is required to fully appraise all the priority Metro projects identified. This work will explore engineering feasibility, transport modelling, business case development, financing, rolling stock, station design, operating costs, place making, planning, land assembly, branding, engagement etc. Work will also need to be accelerated on issues of integration; especially as regards multi-modal services, ticketing and customer information. Whilst these were not within the scope of this study, addressing current integration challenges are fundamental to the long term success of the Metro.

This project is also pivotal to the emerging City Region as it provides, perhaps more than any another initiative, the physical embodiment of the concept. The team that prepared this report all recognise the need to create a more economically effective and cohesive region. I hope this work can help move that debate toward a pragmatic conclusion.

On a related subject, readers of the document will notice a range of different names being used to describe the Metro: The Metro, The Cardiff City Region Metro, The Capital Region Metro, The South Wales Metro, The Cardiff Capital Region Metro, The Valleys Metro, etc. It matters less what we call it – it matters that we do it.

The development of the Metro concept has drawn on the effort and input from those directly involved in the preparation of this report and the group assembled to guide and challenge the work of the team, as well as those from national and local government, the rail industry and the wider business and academic community, who have provided input and/or support over the last two years.

Whilst they won't all agree on all aspects presented, I would like to thank them; they include: Alan Davies, Jon Fox, David McCallum, Steph Malson, Michelle North, Alison Walker, Carolyn Dyer, Antony Hyde, Colin Wood, Richard McCarthy, James Brown, Liam Hopkins, Martin Sullivan, Chris Sutton, Patricia Freeth, Chris Whitehouse, Simon Ellis, Chris Busch, Jim Steer, Jeff Collins, Tim James, Mark Langman, Ian Bullock, Mike Bagshaw, Claire Falkiner, Janice Morphet, Stuart Cole, Chris Gibb, Brian Morgan, Calvin Jones, Francesca Sartorio, Kevin Morgan, IOD, CBI, South Wales Chambers, Cardiff Business Partnership, Roy Thomas, David Stevens, Graham Morgan, Sian Callaghan, Lynda Campbell, Nick Griffith, Nigel Roberts, Elizabeth Haywood, Institute of Welsh Affairs, Stuart Watkins, Roddy Beynon, Stephen Bussell, Dan Saville, Andrew Davies, Jon Duddridge, Roger Tanner, Alex Smart, David Llewellyn, Victoria Winkler, David Eggleton, Robert Chapman, David Swallow, John Osmond, Mark Youngman, Ian Courtney, Martin Buckle, Geraint Talfan Davies, Lee Waters, Henk Broekma, Robert John, Terry Morgan, Jonathan Adams and many more. I apologise for those I have omitted.

I believe this report clearly signposts the way forward for Cardiff and South East Wales, we just need the confidence and ambition to make Metro a reality.

**Mark Dafydd Barry**

September 2013

# Executive Summary

## What Metro Can Deliver For South East Wales

The Metro provides an opportunity to improve the economy of the Cardiff Capital Region. By delivering a once-in-a-generation project to create a more dynamic, connected and liveable region we can improve our GVA/Capita which currently stands at 80% of the UK average. However, this can only be realised if we are unconstrained in our ambition...

### Building the City Region: transform | regenerate | connect

Half the population of Wales, 1.49M people, live within 20 miles of the centre of Cardiff. In order to secure the benefits of this critical mass, South East Wales needs to operate as a cohesive city region. This is especially relevant given that, globally, cities are increasingly becoming the dominant engines of both economic activity and societal change.

The Metro provides an opportunity to physically embody the developing city region concept and deliver economic benefits across all south east Wales<sup>1</sup>:

- City regions can deliver three main economic benefits: larger and more efficient labour markets; larger potential for goods and services; and a greater exchange of knowledge.
- A connected city region makes it possible for different parts of the region to specialise in a particular offering; whether housing, manufacturing, bioscience, business services or leisure facilities and in doing so attract labour from across the region.
- For example, by maximising the pool of available skilled labour across the region, Cardiff will be able deliver projects and inward investment that the rest of the region cannot. Cardiff can look to be economic driver of the region with enhanced Metro connectivity helping to spread prosperity across the region.
- Metro will allow for opportunities to be maximised for investment and economic growth in our more disadvantaged communities through greater connectivity to Cardiff's prime markets for labour, outsourcing of services from the centre to the sub-region and the increased attractiveness of regional living and commuting.

### Metro can help deliver long term economic benefits:

Delivering the Cardiff Capital Region Metro by 2030 will:

- Support the creation of **7,000 jobs**.
- Over 30 years contribute an additional **£4Bn** to the regional economy.
- Deliver a one-off construction impact from Metro and contingent developments of **£4Bn**.

This will be achieved as a result of:

- Increasing the catchment of the regional transport network by **420,000 or 60%**.
- Reducing average door to door journey times across the region.
- Better connecting people to major employment and development locations.

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## Metro can help create a liveable City Region

Not only is it important for the City Region to operate based upon its scale, it also needs to operate based upon its *quality*. There are hundreds of other cities than are far larger than the Welsh Capital City Region so it is therefore essential that the *quality of life* is what makes the Capital City Region special. The Metro is a unique opportunity to create a city which has a high quality of life, often referred to (indeed measured globally) as *liveability*.

## Metro Network

“The Metro is a turn up and go integrated transport network that will connect over 70% of the population of the Cardiff City Region, developed in a way that enables and/or enhances developments at strategic sites, maximises economic benefits & facilitates regeneration”

The transport component of this Metro vision will be delivered incrementally to 2030 by:

- Enhancing infrastructure to support higher frequencies and more stations on the existing rail network.
- Adding new routes & stations to serve the most disconnected and densely populated communities, and to better connect the region’s strategic development sites.
- Improving integration of rail and bus services.

The potential Metro network is illustrated in Figure 1.

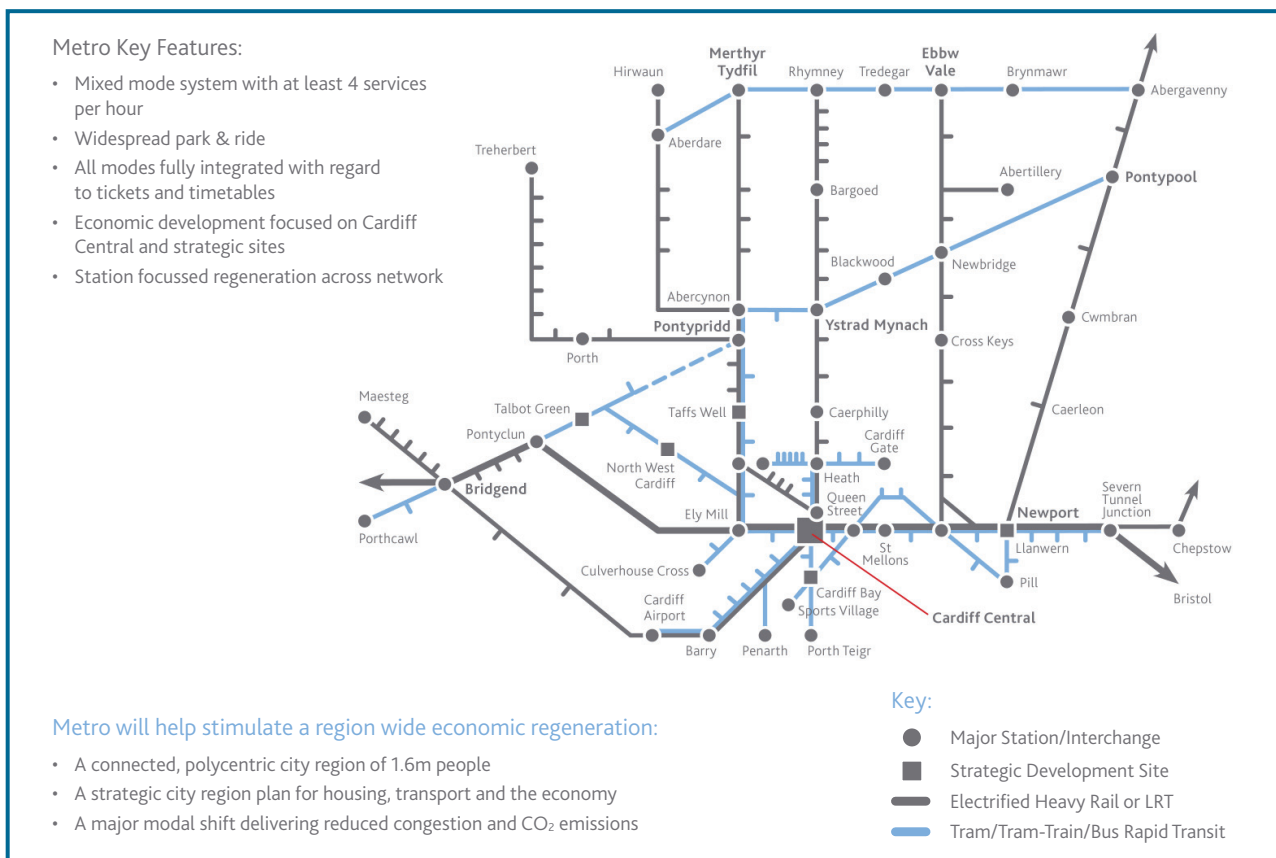


Figure 1: Illustration of overall Metro network

## Wider benefits of the Metro include: transform |

- **Enable and/or enhance economic development** - at strategic sites across the region which, by 2030, could add £270M per year to the regional economy and support the creation of 7,000 jobs. For example:
  - Sites contingent upon transport investment - This includes new residential and mixed use development in the NW of Cardiff and into RCT (Figure 9), Cardiff Bay and major development opportunities along the M4 corridor.
  - Sites where improved transport can enhance economic output - these will include Central Cardiff Enterprise Zone, Cardiff Bay, St Athan-Cardiff Airport and Ebbw Vale Enterprise Zones and town centres such as Newport, Pontypridd and Talbot Green.

A 10% contribution from Metro to the ability of the Central Cardiff EZ to support employment by increasing its Travel to Work Area (TTWA) would add £30M annually to the regional economy. Cardiff Bay could benefit proportionately more because of the significant improved connectivity to the wider region; a 20% contribution delivering another £30M pa to the regional economy.

These benefits alone, when considered over an assessment period of 30 years would likely be circa £4B on the conservative assumption that no benefit will accrue during the first 15 years of construction.

- **Construction Multiplier** - implementation of the Metro itself and some of the contingent developments, would result in one off impacts. The construction of a £2Bn Metro would generate an impact of £3.5B and the construction of 5,000 houses in NW Cardiff, £0.9B.
- **Encourages Metro Planning Policy** - influence local authorities and developers so that, in future, major developments are aligned to the Metro network.

## regenerate |

- **Station Focussed Development and Regeneration** - across the region Metro can help facilitate and/or enable regeneration at key stations on the network that themselves can become sub regional transport hubs (Caerphilly, Ystrad Mynach, Bridgend).
- **Community Regeneration** - Metro will give many communities, especially in the valleys, a new lease of life with stronger commuter settlements able to support a wider range of secondary services.
- **Environmental and Sustainability Benefits** - through modal shift and reduced car journeys, road congestion and CO<sub>2</sub> emissions; by 2030 the Metro could support over 80,000 daily passengers vs 40,000 today, contributing to greater use of public transport.

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### connect |

- **Direct Economic Impact** - a by providing easier access to employment across the region.

The Metro will increase by 60% the number of people who can easily access the regional public transport network; this will benefit both commuters by increasing their employment choices and employers by increasing their catchment area, reducing churn in recruitment and improving staff retention.

An average reduction of 5mins in generalised journey times for 100,000 commuters into Cardiff and Newport could be worth £30Mpa.

- **Agglomerative Economic Impact** - Making it easier for people across the region to interact and access more places of work will increase the net effective density of the city region and deliver circa 20% in additional benefits on top of the direct transport benefits.
- **Address the Region's Existing Transport Problems** - including congestion at key points on the road network (M4 J32-34, Newport & the A470 into Cardiff) and minimise the need for further congestion measures; avoiding costs of potentially hundreds of millions to 2030.
- **Support Population Growth** - to provide capacity to accommodate continued population growth in the region which will reach 1.6M by 2030 vs 1.49M today and especially a further 80,000 people in Cardiff by 2030.

Delivering these benefits, aligned with complementary economic development interventions, will enhance the image of Cardiff and the wider city region to the rest of the world. This will help attract, retain and nurture high value jobs and companies to improve both Cardiff and the wider region's GVA/Capita Vs the UK. In short, the Metro can help shake off the legacy of a century of industrial decline and create a cohesive city region that can compete effectively on the international stage.

## Metro Study Approach

The Metro vision presented in this report and illustrated below, has been developed by:

- Identifying the most densely populated communities over 800m and over 1.2Km away from a rail station (*Section 5*).
- Appraising strategic development opportunities across the region (*Section 4*).
- Assessing the regions existing transport problems (*Section 3*).
- Reviewing strategic policy objectives and initiatives, for example the role of Cardiff Airport in the regional economy (*Section 10*).

The baseline used for the connectivity assessment is the rail network that will be in place as a result of Valley Line Electrification (VLE) and the Cardiff Area Signalling and Renewal Project (CASR). To ensure rapid progress and facilitate completion of this report, the assessment methodology adopted relied on the qualitative experience and expertise of the team, as well the quantitative analysis undertaken.

The largest, most densely populated and disconnected communities are in suburban Cardiff and Newport, parts of Torfaen, Caerphilly, Blaenau Gwent and Lower Rhondda Cynon Taf (RCT) (Figure 2).



Figure 2: Metro most densely populated and disconnected places



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Sian Callaghan, Director of Regional Corporate Affairs, Centrica

“ As a major employer in Cardiff, Centrica staff travel from all over the region to our office adjacent to Cardiff Central Station. Good public transport for our people is vital to our business, and to our future development. Better connecting people to places of work is vital, not just for companies like us, but for the economic well-being of the wider region. However, the current transport infrastructure is in need of major enhancement as it presents challenges for those travelling to work.

Our staff tell us every day of challenges they face travelling, not only from the Heads of the Valleys to Cardiff but also from places within Cardiff like St Mellons. So, using the decision to electrify the valley lines as a foundation, we are most supportive of plans for a Rapid Transit network in Cardiff as part of a Metro for the wider Cardiff City Region. ”

The most commercially viable and strategic development sites are along the M4 corridor and include the Central Cardiff Enterprise Zone(6), Cardiff Bay(7), North West Cardiff (9), Talbot Green/Llantrisant(16), Newport City Centre (12) and Taffs Well/Treforest (17). *Figure 3*

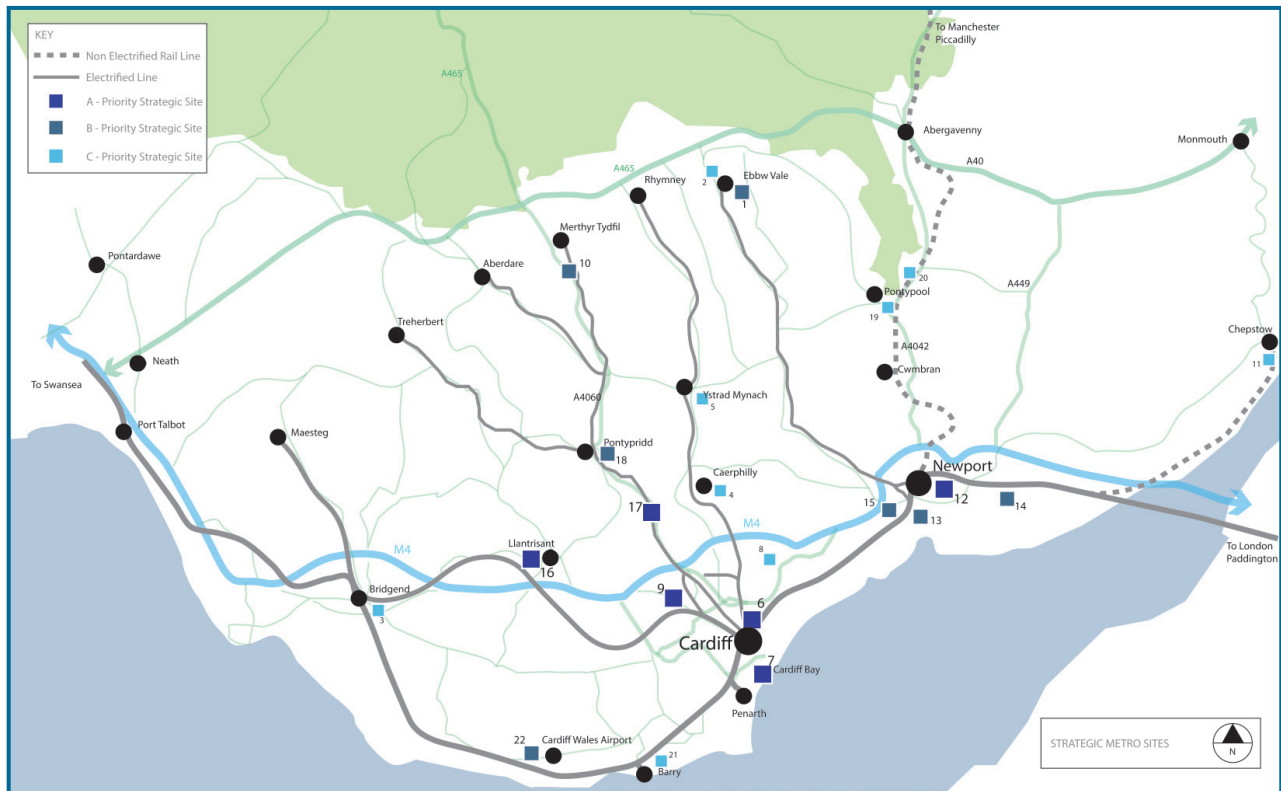


Figure 3: Metro strategic sites

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Figure 4: Metro existing trunk road/motorway congestion

The primary points of road congestion in the region are on the M4 around Newport, the M4 to the NW of Cardiff between J32 and J34, the A470 approaching Cardiff and urban congestion within Cardiff itself. *Figure 4*

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## Metro Priorities

This process has identified the strategic priorities for Metro, as illustrated in Figure 5, as:

- **Priority enhancement of the Existing Network** - new stations, higher frequency services, P&R and station/interchange enhancements. Early scope defined within quick wins. Will include infrastructure enhancements to enable higher frequencies and new stations (1).
- **Ebbw Vale Town to Newport** - enhancements to deliver at least 2 trains per hour (tph) and a service to Newport (2).
- **Cardiff North West Corridor** - new routes and stations to facilitate the medium term expansion of Cardiff, from Cardiff Bay to RCT via Creigiau and a link to Taffs Well to support redevelopment and help alleviate congestion on the A470. Explore early conversion of the City and Coryton lines to Tram-train operation as part of first phase linking to Cardiff Bay (3).
- **M4 Corridor** - new routes and stations to provide a commuter network for East Cardiff and Newport by introducing rail/tram-train services on the electrified relief lines between Cardiff and Severn Tunnel Junction (STJ) and the use of Bus Rapid Transit (BRT) (4).
- **Cardiff Airport** – new/upgraded station able to support local and interregional service (9).
- **Mid Valley Corridor** - BRT between Pontypridd and Pontypool/Cwmbran (8).



Figure 5: Metro Priorities

### Cardiff Business Partnership

“ High quality and dependable connectivity between major employers and their workforce is one of the defining characteristics of successful city regions. To that end, the vision for the Metro, which the Cardiff Business Partnership helped shape, must be a fundamental component of Welsh Government Economic Policy well into the 2020s. ”

Delivering the Metro not only makes it easier for someone in Pontypridd, Blackwood, St Mellons, Caerleon, Ely or Roath to access work in Cardiff city centre, but also work in Newport, Talbot Green, Cardiff Bay, Pontypridd and Taffs Well.

Economic benefits can also be secured by businesses locating or expanding at the strategic sites as their potential catchment population is increased significantly. Additional services to Ebbw Vale and Merthyr can help make these locations more accessible and attractive to employers as well reducing average journey times for commuters to Cardiff and Newport.

In particular, Newport can benefit from increased connectivity to help address its current poor rail access. Metro will deliver new stations on the east and west of the city and at Caerleon (Figure 6) and potentially a link to Pill and Mon Bank using tram-train technology to help underpin regeneration in that part of the city.

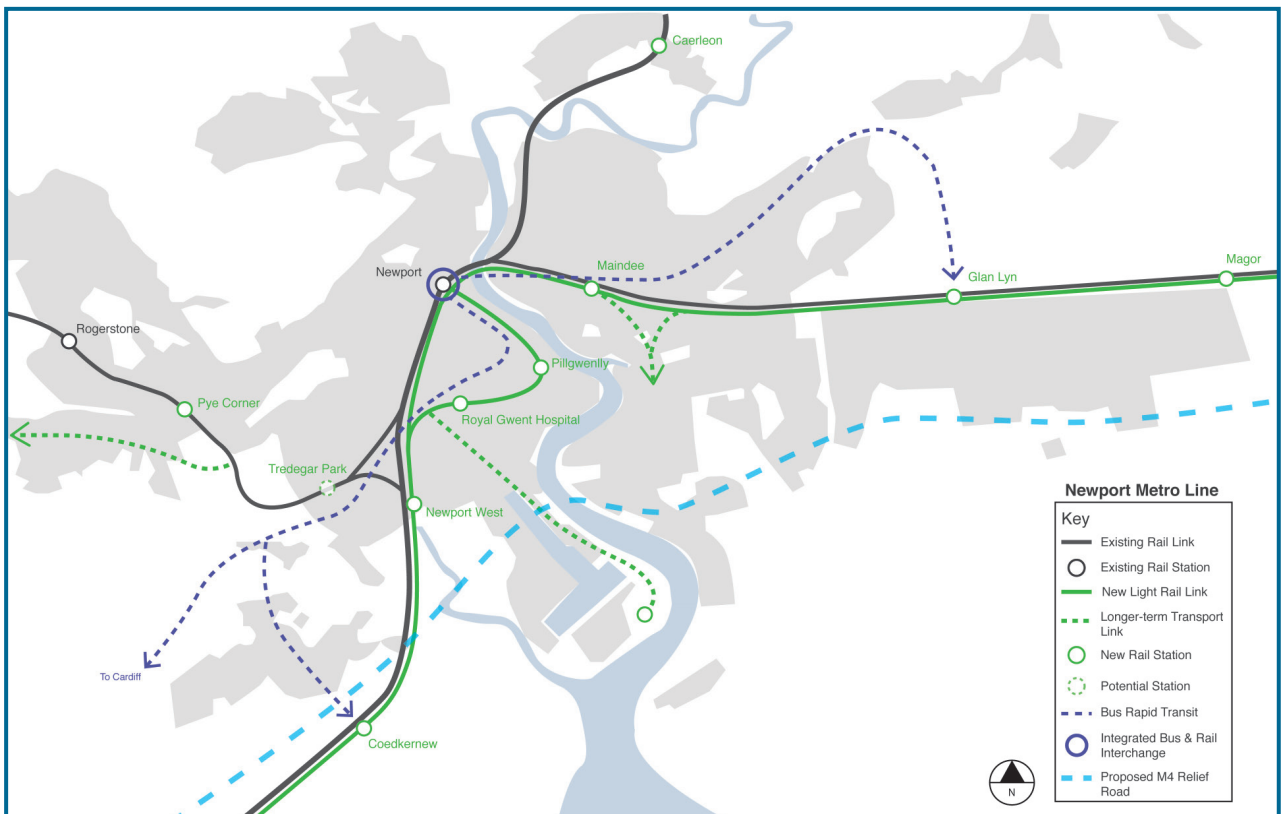


Figure 6: Newport enhanced Metro connectivity

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These are described in more detail in Section 6. Several other strategic interventions have been identified including: Cross Valley BRT from Aberdare to Abergavenny, Rapid Transit (RT) in Cardiff and Newport, enhancement and electrification of the Newport Abergavenny line. These are explored more fully in the main body of the report. A range of wider regeneration benefits of the Metro are also explored in Section 8.

Emma Watkins, Director, CBI Wales

“ *Improving the quality and reliability of infrastructure can be a catalyst for the economic development and regeneration of South Wales. This year’s CBI/KPMG Infrastructure Survey once again has shown how much emphasis businesses put on the standard of infrastructure when making investment decisions.*

*High quality infrastructure is a critical component in economic development and will also be the decisive factor in attracting private investment into an area. In terms of the provision of employment property, developers recognise that businesses, and the people that work in them, increasingly require commercial property that is well connected and will not take the risk of backing schemes without strong transport links.* ”



## Quick Wins

To make rapid progress, a number of early Metro projects have also been identified (Figure 7) that can be delivered incrementally from now until the completion of VLE in 2020.



Figure 7: Metro Quick Wins

These are:

- Within the scope of the current proposed programme to 2015:
  - Enhancements under the National Stations Improvement Programme (NSIP) - at Bargoed, Merthyr Tydfil, Porth, Rhymney, Treherbert, Treforest Industrial Estate and Ystrad Mynach.
  - Enhancements - to the Ebbw Vale line to enable new stations at Ebbw Vale Town & Pye Corner, an additional hourly service from Ebbw Vale Town to Newport and a passing loop on the Maesteg line to allow 2tph.
- From within Metro Interventions (1), Enhancement to Core VLE network
  - New stations on the existing network - at Roath Park/Wedal Rd, Crwys Rd, Gabalfa, Maindy, Ely Mill/ Victoria Park, St Mellons, Llanwern and Cardiff Airport (May require infrastructure enhancements to deliver some of these, eg capacity/signalling).
  - Park and Ride (P&R) - at Bargoed, Treforest, Pontypool & New Inn, Pencoed, Chepstow, Taffs Well, Porth, Pyle, Llanbradach, Severn Tunnel Junction, Pontyclun, Pentrebach and Abergavenny.

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- Bus/rail integration improvements - at Barry Docks, Cardiff Central, Merthyr, Porth, Pontypridd, Newport, Bridgend, Pontyclun, Abercynon, Pengam, Pontypool, Taffs Well, Chepstow and Abergavenny.
- Cross Valley BRT - from Pontypridd to Pontypool. The potential to include this service within the scope of the next “rail/Metro” franchise from 2018 should be explored.
- Tram-train pilot (as first phase of NW Corridor project) - between Cardiff Bay & City Centre with the conversion and extension of the current Queen St - Bay rail link. A new spur to Central station, new stations at Herbert St and South Loudon Square (Figure 8 ) and penetration further into Cardiff bay to Wales Millennium Centre (WMC) are recommended; this pilot should also include consideration of the early conversion of City and/or Coryton lines to ‘tram-train’ operation.



Figure 8: Illustration of potential tram-train station at South Loudon Square on Bute Street

Robert Lloyd Griffiths, Director, IOD Wales

“ To fully exploit the potential of the Metro, it is essential that strategic land use planning and economic development across the region are incorporated into plans for its development and delivery. ”

## North West Corridor: Priority Metro Project for Economic Development

Of all the Metro interventions proposed, the project to connect Cardiff Bay via the City Centre to NW Cardiff and Llantrisant/Talbot Green has been identified, by the assessment process adopted in this study (described earlier), as the highest priority.

This one scheme will impact five strategic development sites, enhance regional connectivity and enable the sustainable expansion of Cardiff (Figure 9). Whilst costing an estimated £400M, the economic impact from the strategic sites benefitting from the project could, by 2030 be circa £100M per annum and 3,000 jobs and a construction impact of circa £1.6Bn (from both Metro £700M and associated housing £900M). This project will:

- Utilise tram-train technology (subject to further investigation) on a 20km route from Cardiff bay to Pontyclun via Creigiau/J33. Spur to serve Beddau and/or Llantwit Fardre.
- Enhance and/or enable developments at Waterhall, J33, Creigiau, Talbot Green/Llantrisant as well as further sites not yet subject to formal plans.
- Encourage denser residential development focussed around stations on the route, in particular Talbot Green/Llantrisant in RCT; this could also support higher value land use.
- The route to Taffs Well will be explored as part of a comprehensive Masterplan from Coryton J32 to Treforest that should explore land use (and potential for more and higher density mixed use development), major P&R and new/relocated stations.
- Include a major P&R at J33 on the M4 and an expanded P&R at Taffs Well on the A470 both of which can provide a source of revenue for new tram-train services. By enabling mode shift the P&R can also help ease congestion on the A470, the M4 and in Cardiff.
- Improve access to a number of existing communities in the west of Cardiff by providing more than 4tph to the City Centre, Bay and RCT.
- Option to segregate and by pass Cardiff West rail junction (fly-over or on street), this will help relieve congestion at the core of the rail network.
- Provide a Metro station to the new development at Ely Mill and Victoria Park.
- Provide opportunities for integration with local bus services at a number of locations.
- Provide a major interchange at Pontyclun to give commuters from RCT the option of accessing employment opportunities to the west at Bridgend and Swansea and vice versa.
- It will also make it easier to access the Central Cardiff EZ and increase its TTWA and therefore its ability to secure high quality tenants looking to attract well qualified employees from access the region.
- The link to Cardiff Bay also addresses the issue of connectivity between the city centre and the bay – this can form an early phase of the project (see Quick Wins) - help support further development in and around Cardiff Bay. This should subject to early investigation and aligned with work planned on Valley Lines electrification.
- Can be linked to the proposal to operate new services on the relief to Newport and STJ.



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## South Wales Chambers

“ Business opinion solicited by South Wales Chamber of Commerce has consistently indicated a creative solution to providing for the transportation needs of South East Wales is critical to on-going economic development. A fully integrated metro system offering local station connectivity would not only provide an easy solution for employees to efficiently access their place of work but equally be a key part of Inward Investment strategy.”

“Many businesses with International links have applauded the quality and skill within the Welsh work force and if this can be complemented by making it really attractive to draw the skills of a constantly changing modern business to an environment yielding the very best in work/life balance it can certainly place Wales in a visibly attractive competitive position. Getting government support for this strategically important infrastructure investment alongside electrification/HS3 has to be a common determination for all involved in the private sector in Wales.”

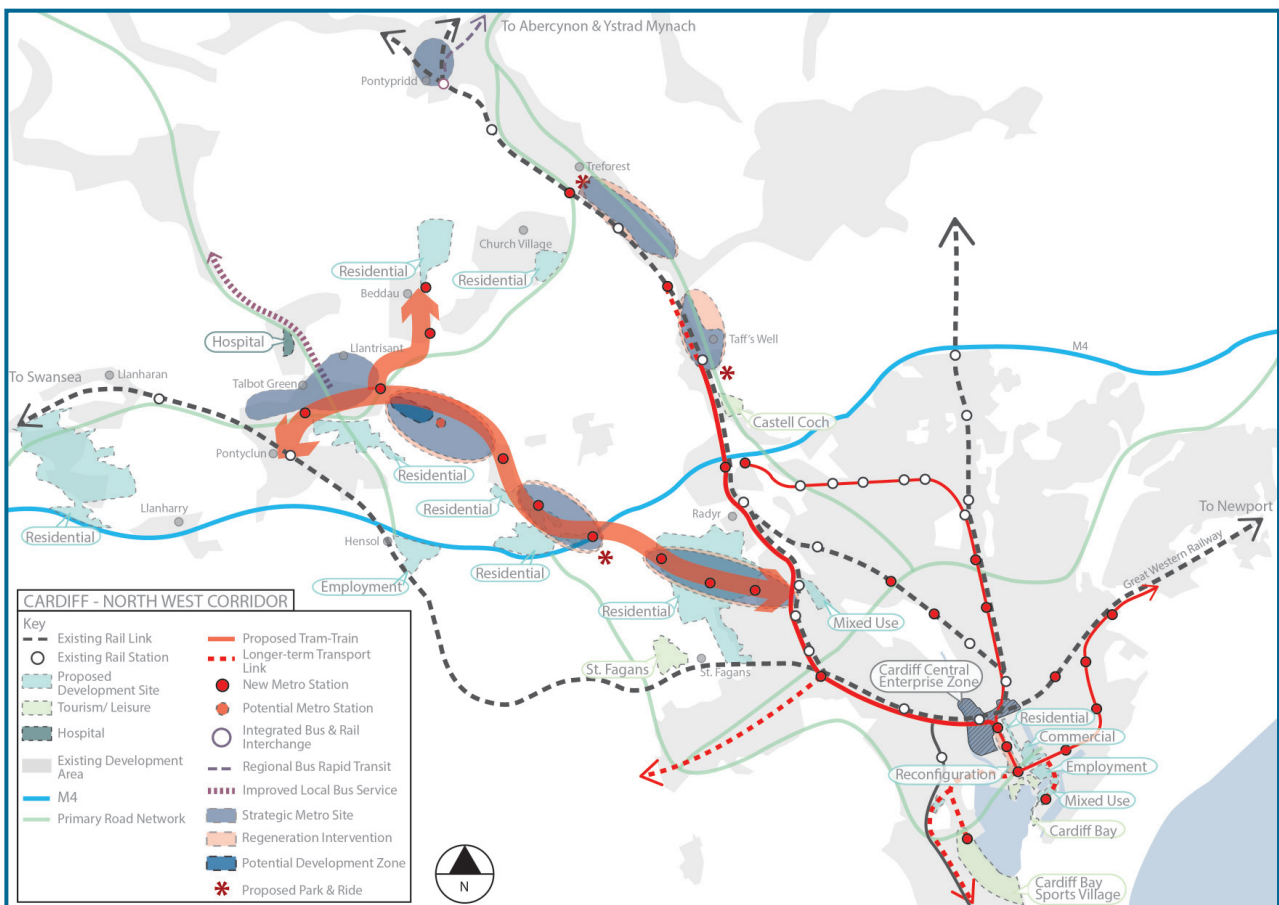


Figure 9: Spatial illustration of NW Corridor Intervention

## Economic opportunities at key regional centres

The Metro will provide an opportunity to enhance the economic potential of the primary centres across the region. For example:

### Cardiff

Commensurate with its growing size and potential, Cardiff contains one of the UK's leading research universities and member of the Russell Group, Cardiff University. For example, the Neuroscience and Mental Health Research Institute<sup>2</sup> ranks alongside Cambridge as one of world's leading academic centres in this field of study. There have also been initiatives and some early success, in exploiting this intellectual base in terms of commercialisation with a number of biotech companies established based in part on Intellectual Property from the University. Recently, Welsh Government initiatives in the Life Science sector have also had an impact with the New Welsh Life Science Fund investing in leading companies in this fields adding to a growing list of Life Science and Healthcare companies in the region.

The city also boasts a FTSE100 company from the financial service sector, which the Welsh Government has targeted for support by creating The Central Cardiff Enterprise Zone. The ambition is to provide 90,000M<sup>2</sup> of high quality office space adjacent to Cardiff Central. By 2020, with GWML electrification, Western Access to Heathrow<sup>3</sup> and Crossrail the Cardiff EZ will be only two hours from Canary Wharf and one hour 45mins from both Paddington and Heathrow.

The creative and media industries are also well represented in Cardiff with the BBC recently establishing a major production facility in Cardiff Bay. These developments all demonstrate the potential of the city, and the region, to support and grow the high value jobs the region needs.

### Newport

As the third largest city in Wales, Newport is the economic hub and driver for a sub-region of over 400,000 which also includes Torfaen, Blaenau Gwent, Monmouthshire and part of Caerphilly. Newport's hinterland and especially Blaenau Gwent, suffer from economic inactivity rates of 30%, amongst the highest in the UK. However, Newport itself has demonstrated an ability to attract and nurture successful export generating technology, manufacturing and financial service organisations. More recently the University of South Wales established a campus in the city centre. If Newport's connectivity to its hinterland, especially by rail, is improved it will help deliver economic and social benefits enabling Newport to play a full role in the regeneration of the wider city region by connecting people more effectively with places of work, learning, healthcare and leisure.

### Pontypridd

Pontypridd is located in a pivotal position in the region acting as the natural focus for both the Taff and Rhondda Valleys. Current rail network connectivity will be improved even further with Valley Lines Electrification. Metro will deliver more north-south services and cross valley BRT that will enhance this connectivity. The challenge is to exploit this improvement to better connect Pontypridd to both its local hinterland and to Cardiff to enable more development in and around the centre of Pontypridd and on the A470 south towards Cardiff.

<sup>2</sup> [www.cardiff.ac.uk/research/neuroscience](http://www.cardiff.ac.uk/research/neuroscience)

<sup>3</sup> <http://thamesvalleyberkshire.co.uk/wrath/>

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### Cardiff Airport

There is much evidence that demonstrates a link between the economic performance of a region and its level of international connectivity<sup>4</sup>. Whilst better access to Heathrow and its extensive range of long haul flights is essential to the economy of South East Wales, so is the need to provide access to international markets from Cardiff Airport. Such connectivity will support the case for inward investment to the region. Whilst Cardiff airport has a limited natural catchment area, it can be extended with the appropriate investment in transport infrastructure. This may help the airport secure untapped demand for services to destinations in the Middle East, some European cities and locations in the US & Canada (predominantly served via Heathrow and Bristol).

### Elsewhere in the region

Across the region other key centres can play a more prominent role in the regional economy (Bridgend, Caerphilly, Ystrad Mynach, Merthyr, and Ebbw Vale). The Welsh Government's Enterprise Zone policy can also help focus both public and private sector investment at key locations. The Metro, by better connecting these places, can be a key component of economic growth across the entire Cardiff City Region.

### Wider Regeneration Opportunities

Metro can help enhance the impact of regeneration initiatives to help address long standing problems faced by many communities across the region – not least poor connectivity. It can also allow us to intervene in a way that enables the region to compete properly in a new context that is now dominated by mega-cities and globalization.

The Metro has the potential to transform the communities, settlements and economies of the Capital City Region by:

- Enabling the region to compete nationally, continentally and internationally for investment.
- Removing barriers to employment.
- Transforming perceptions that have previously inhibited development viability.
- Responding to changes in business practice that require greater flexibility, collaboration and innovation.
- Supporting the vitality and diversification of land uses in traditional town centres.
- Reinforcing regional character, culture and identity through sensitive design.
- Supporting tourism by celebrating regional distinctiveness and connecting regional visitor destinations.
- Encouraging healthier lifestyles by integrating active travel into the transport network especially as regards station design to encourage safe pedestrian and cycle access.
- Considering Metro stations as important civic buildings that are key parts of the town centre environment.
- Stimulating the development of new places to live and work that are designed in development patterns that promote the use of public transport.
- Making a significant contribution to national carbon reduction targets.

Regeneration opportunities covered in more detail in Sections 9 and 8 and comprehensively in sub report, 'Regeneration and The Metro'.

Malcolm Wilson, Deputy Chief Executive & Commercial Director, RCT Homes

“ RCT Homes is committed to much more than simply managing housing and collecting rent. We promote community involvement and support economic regeneration and development of the communities that we serve. Within this role, we support our tenants and encourage them into employment. Poor connectivity and the cost of travel is a major barrier to employment for many of our tenants. The proposed Metro has the potential to transform many of the neighbourhoods that we manage by connecting them to employment opportunities throughout the region by a sustainable and efficient transport system. We endorse the concept of the Metro along with any initiative that will improve the delivery of sustainable employment in the valleys and look forward to optimising the new opportunities it can create for our tenants. ”

## Modal Study

The Metro aims to provide the region with a high quality, high capacity, ‘turn up and go’ transport network. The main operational implications of this are:

- Increased rolling stock requirement due to higher frequencies and new services.
- A requirement for new types of rolling stock optimised around urban mass transit high frequency/ frequent stopping characteristics in the form of BRT, Tram Train and LRT.

This study identified the principal corridors in the region which form the strategic network, and assessed the most appropriate mode to perform the strategic public transport function at a regional scale. This is as distinct from the denser network of local bus services and with which the Metro network will need to interface.

Two future network scenarios have been developed; Scenario 1 is largely based on the ‘status quo’ with majority of services remaining integrated with the heavy rail network with the development of a number of ‘tram-train’ services and limited separation on routes into Cardiff and along the South Wales main line relief lines to Newport.

Scenario 2, considers the merits and potential benefits of separation of elements of the Valleys rail network from other areas of the rail network. This could enable the introduction and use of different classes of rolling stock on the segregated elements; these could include lighter trains and tram-train solutions. Scenario 2 could be a development of Scenario 1.

There are also a number of network wide issues and implications resulting from the introduction of new modes to existing bus and heavy rail routes. These need to be addressed and include:

- For the existing network - determine the degree of separation that is possible and could be introduced and the benefits that could be obtained. Benefits could include not only those relating to operation and maintenance of the network but also those associated with the procurement, operation and maintenance of rolling-stock. For new networks, the question of appropriate governance, ownership, operation and maintenance would also need to be considered.
- Rolling stock requirements and fit with existing Valley Lines Electrification and planned Diesel Multiple Unit (DMU) Fleet replacement timescales. In particular, the opportunity to replace proposed cascaded stock with new tram – train and light rail transit over its remaining lifespan and whether tram train could replace some heavy rail stock at commencement of electric services.

# EXECUTIVE SUMMARY

More detailed future passenger demand modelling and capacity calculations are required to ensure future network proposals fit with demand levels. This will assist in determining fleet requirements to meet peak demand over the next 20-40 years. There are also detailed technical considerations associated with each corridor which need to be explored. These will need to be considered together with the preparation of business cases to confirm a final decision on the preferred mode by corridor.

More details presented later in this report and comprehensively in subordinate report, "Metro Modal Study".



*EMU – Electric Multiple Unit. Standard 'heavy rail' Electric Commuter Trains in widespread use across the UK and likely to be rolled out on some/all of the valley lines network following electrification by 2020.*



*Tram-train : A hybrid train used in parts of Europe, able to run on normal electrified rail lines and also in 'tram' mode on street enabling lower cost extension of rail services. Could work well in Cardiff to link City and Coryton lines to Cardiff Bay and beyond, as well as potential extension to the North West of Cardiff and RCT. The best known example is Karlsruhe in Germany. Currently being trialled in Sheffield.*



*LRT – Light Rail Transit. Lighter Electric Trains better suited to operating high frequency services with close stop spacings than EMUs. The best example in the UK is perhaps the Newcastle Metro. Could be considered on the core Valley lines network instead of EMUs.*



*BRT – Bus Rapid Transit. Range of technologies involving full or partial segregation of high quality bus network away from other road users. Operation and performance more akin to light rail/tram rather local bus service with fewer stops/shorter journey times. In the UK The Cambridge guided bus way is perhaps the best example.*

## Estimated Costs, Development and Delivery

The Metro has a potential total cost of £2Bn and can be delivered incrementally in the period to 2030. The projects identified below can benefit the entire region and mark the beginning of a period of long term sustainable economic growth across the region. The estimated capital costs to implement the primary Metro components are as follows:

METRO COMPONENT	EST. CAPEX £M	NOTE
<b>Valley Lines and South Wales Main Line Electrification Cardiff Area Signalling and Renewals</b>		Already committed
<b>Current programme proposals</b>		Includes NSIP/DDA station enhancements and extension to Ebbw Vale Town with 2tph; allocation for further Metro development.
1. Enhancements to core network	£470M	Quick win components to be priority for early development but remainder phased to 2030.
2. Ebbw Vale Newport Corridor	£30M	Priority for early development (some work in current programme above).
3. North West Cardiff Corridor	£390M	Priority for early development and to be complete by 2022.
4. M4/Relief Lines Corridor	£250M	Priority for early development and to be complete by 2025.
5. Other Rapid Transit in Cardiff	£450M	Majority to be delivered later in the programme post 2025.
6. Rapid Transit to/in Newport	£70M	Medium term to 2025.
7. Newport - Abergavenny Corridor	£70M	Likely to be 2025-2030.
8. Regional BRT	£70M	Prioritise Pontypool - Pontypridd BRT.
9. Cardiff Airport	£60M	Priority for early development.
10. Nelson Newport Corridor	£110M	Long Term 2035-2030.
<b>Total for all new Metro schemes</b>	<b>£1,970M</b>	

*Note: These costs have not been based on a detailed engineering assessment but on desk research and use of previous studies and reports. The margin of error in some cases is likely to be significant. Further and more detailed analysis and assessment will be required as the schemes are developed further.*

# EXECUTIVE SUMMARY

Within the above programme are a number of 'quick wins' that can be developed and delivered by 2020. Subject to the results of more detailed engineering assessment, these will cost of the order of £350M. Similarly, estimates for the priority projects (which include the quick wins) to 2025 suggest a total cost £1.3Bn.

In addition to the capital costs estimated above, further work will be required to explore costs for:

- Additional rolling stock.
- Station Design and Placemaking.
- On-going operating costs and potential subsidies; this will require more detail modelling of service patterns, mode options, etc on a route by route basis.
- Systems and wider integration measures (ticketing, services and customer information).
- Longer term operating and administration costs to support potential dedicated Metro development/delivery team/function.

An illustrative programme for delivery has been set out which will enable the benefits to be delivered incrementally from 2015 to 2030 as illustrated *Figure 10*.

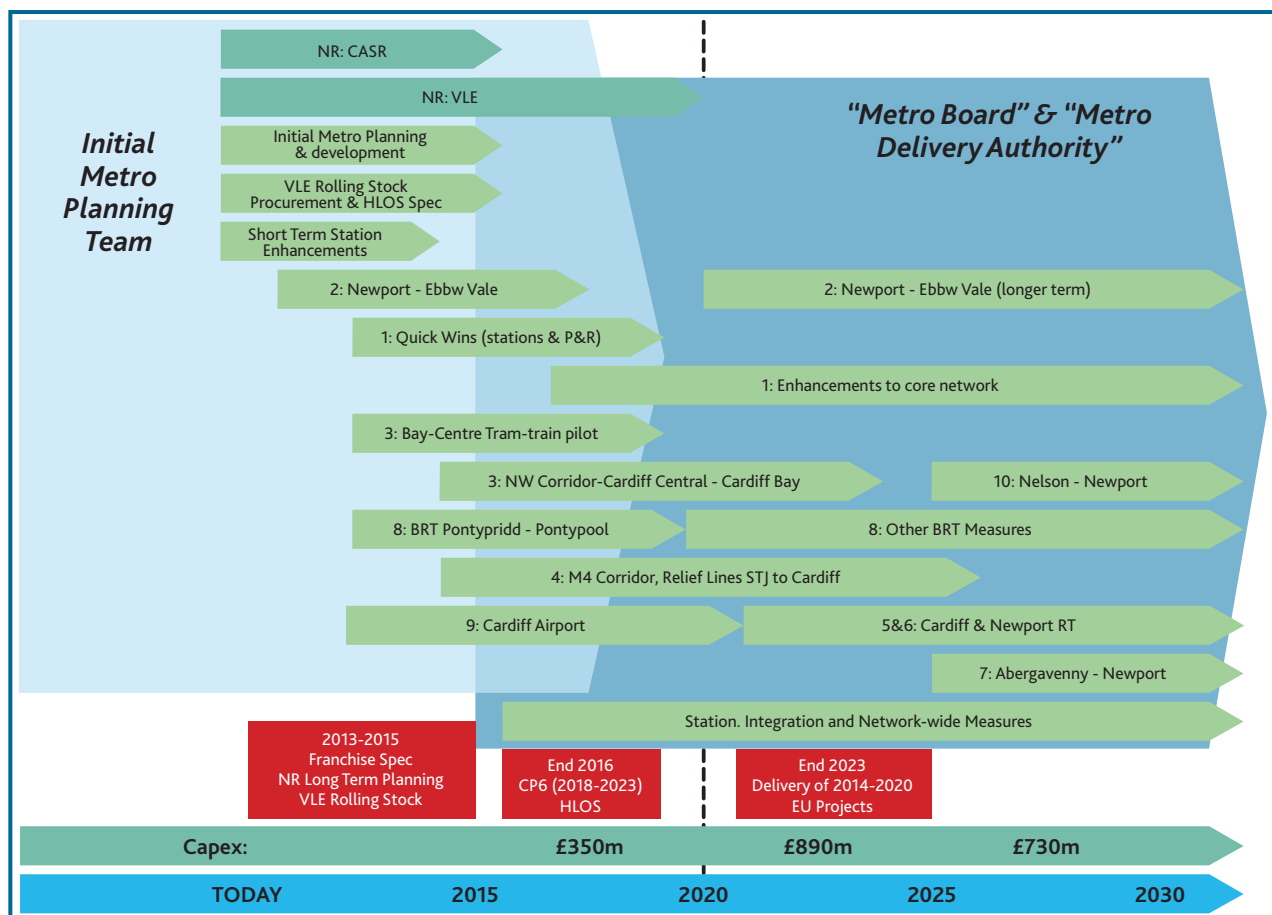


Figure 10: Illustrative Metro Implementation Plan to 2030

## Metro Funding Sources

The investigation of funding undertaken and a review of the work completed as part of earlier studies, clearly presents the need for a range of funding mechanisms to be developed and applied to the Metro.

This will include consideration of: direct Government capital, borrowing, developer contributions, the rail industry's High Level Output Specification (HLOS) funding, borrowing vs Network Rail's Regulated Asset Base (RAB), opportunities provided by the next Wales and Borders franchise, EU Cohesion funding, local authority contributions, BIDs, the use of business rates and possible Tax Increment Financing (TiF), the use of other financial instruments supported with ring fenced revenue (eg car park charges) and fare box revenue.

In particular EU Cohesion funding for a programme that satisfies European Urban Mobility<sup>5</sup> policy objectives can provide a major component of the total funding package.

Special purpose vehicles could also be established to coordinate, focus and execute the provision of funds. These could be to raise or borrow money, as a vehicle to exploit assets that will secure value uplift as a result of the Metro, or as a Public Private Partnership (PPP) arrangement to develop, implement and operate the Metro.

There is a possibility that some of the components will need an operational subsidy, on an on-going basis. However the timing and quanta of any revenue support can only be determined after more detailed modelling of demand and passenger flows for each identified Metro intervention.

Each of the Metro components will also have a different funding profile. The next stage of work on transport modelling/ appraisal and business case development will also explore fully the appropriate funding profile (Capex and Opex) of each Metro scheme.

Some of the funding considerations are explored in more detail in subordinate report, "Metro Funding and Financing Independent Advice"

5 [http://ec.europa.eu/transport/themes/urban/urban\\_mobility/index\\_en.htm](http://ec.europa.eu/transport/themes/urban/urban_mobility/index_en.htm)



## EXECUTIVE SUMMARY

### Governance Principles

Whilst conceptual and detailed design can continue under the auspices of a dedicated Welsh Government team in the short term, the development and implementation of a comprehensive Metro programme over 15+ years will require a different approach. The 'city region' nature of the Metro and the potential for some form of local government re-organisation in the coming years will have an influence how this is addressed. Given that that process has some time to run, with a number of potential outcomes, it is timely to set out below the key governance principles that should be considered for the Metro project.

- **Develop and Agree a Clear Vision for Metro**

To realise the Metro project there must, from the outset, be an agreed vision and goal allied to an appropriate governance structure which spans the 3 key and inter-related areas of: Design, Development and Delivery to ensure appropriate coordination from start to finish.

- **Separate Strategic and Operational Responsibilities**

It is considered essential to have both a strategic leadership group the 'Metro Board' and an operational delivery group the 'Metro Delivery Authority'. This is an approach that allows a clear separation of roles and responsibilities, with a delivery team left to focus entirely on the implementation of the agreed project across size, scope, timescale and cost.

- **Establish a Metro Planning Team**

To move the debate forward and start to crystallise the vision, scope, timescale, budget and governance arrangements a small focused planning team should be created to initiate an outline plan over the next 1-2 years. This team would initially support the minister in defining the Metro in more detail and then become an integral part of the formal Metro Board structure.

### Support from the Business Community

Over the last few years, the development of the Metro concept has secured widespread political support. Perhaps more importantly, support has also come from leading employers like Centrica and Admiral as well as the region's leading business groups including The Cardiff Business Partnership, CBI Wales, IOD Wales and The South Wales Chambers.

Their support is most welcome and has been an essential foundation for the successful development of the Metro concept to date. It is important therefore, to nurture and maintain the input and support of the wider business community in the on-going development of the Metro.

## Recommendations

1. Establish a dedicated team and supporting resources to further develop each of the priority interventions:
  - a. Formal planning stage will be undertaken, including the development and publication of an associated Strategic Environmental Appraisal.
  - b. Detailed engineering feasibility, transport modelling/options appraisal and business case development.
  - c. Exploration of passenger demand, operating costs, revenues and potential on-going subsidy implication.
  - d. Early assessment to determine scope for segregating some of the network.
  - e. Funding strategy for each phase (bringing in expertise to the team as required).
  - f. Operating model for each phase.
  - g. Detailed location focussed regeneration plans.
  - h. Land use/transport masterplan development and regeneration frameworks for key sites (in partnership with local authorities where applicable), including
    - Treforest/Taffs Well,
    - Creigiau/Talbot Green/Llantrisant,
    - Cardiff EZ to Cardiff Bay
    - Newport Pill/Mon bank.
2. Develop regional multi modal demand and accessibility model to support Metro development and appraisal.
3. Progress with planned short term measures and hand over to 'Delivery team'.
4. Fully explore quick wins and develop implementation plan; in doing so work with relevant local authorities and developers.
5. In developing Metro, priority to be given to increased connectivity (including more stations on existing network), higher frequencies and modal integration over absolute point to point journey times. The former will help reduce generalised journey times across the region. With faster rolling stock, accommodating new stations on existing network has the potential to increase revenues without adding to operating costs.
6. Position Metro as a national project and prioritise it for EU and Wales Infrastructure Fund investment.
7. Align Metro implementation and development opportunities with M4 Relief Road design.
8. Work with industry partners to continue to reduce industry costs, and specifically the high level of subsidy per passenger mile; recognising that a review of fares policy maybe needed; consideration of the opex impact will be a factor in detailed appraisal of Metro projects.
9. Plan more formal consultation process for Metro proposals.

## EXECUTIVE SUMMARY

10. Prepare formal Metro input to Wales and borders (or other relevant) franchise specification, the High Level Output Specification (HLOS) for CP6 and CP7 and Network Rail's long term planning.
11. Within the constraints of the VLE Rolling Stock procurement programme timetable and in light of this Metro study and mode review, explore:
  - a. If any proposal can be realistically included in current procurement timetable; especially for the 'Scenario 2' with widespread use of Light Rail and/or Tram-train on core valley network.
  - b. If the implementation risk is too great, for valley lines electrification adopt EMUs (new and/or cascaded) on flexible terms to allow phased implementation of more appropriate LRT/tram-train vehicle on primary valley line corridors in the 2020s.
  - c. As a minimum explore potential to operate tram-train on the Bay, City and Coryton lines as part of the Bay-Centre pilot before extending to the Cardiff NW Corridor priority project.
  - d. Ensure that procurement choices and operational model provides maximum flexibility for Metro to introduce stations and services on the existing network.
12. Progress with work to develop and deliver an integrated multi modal and single ticket network.
13. In the context of taking forward the preferred solutions in the region and any future transport interventions, determine the most appropriate arrangements for developing and implementing policies for integrated and efficient transport facilities in the SE Wales region.
14. In the medium term, establish a new organisation to fully develop, deliver and ensure effective operation of the Metro and ensure these are aligned with the emerging consensus on city regions and the potential for new PTA/PTE arrangements in south east Wales.
15. Work to ensure Metro priorities set out in this report are integrated into policies across other government departments and local authorities.
16. Develop a set of guidelines, which should be applied to the development of a brief for a new Metro intervention to ensure that the wider benefits are captured. This will include guidance on design, permeability, scoping development potential, evaluating viability of mixed use developments etc.
17. Identify (with support of stakeholders) a pilot project which brings together:
  - a. Transport planning and engineering;
  - b. Placemaking;
  - c. Active travel and health;
  - d. Housing development;
  - e. Employment development;
  - f. Skills; and
  - g. Tourism.

This pilot project could take place in conjunction with one of the quick win Metro interventions

18. Specifically, ensure Metro design principles are incorporated into the development of new stations at Ebbw Vale town and enhancement as part of the NSIP.
19. Determine potential development sites that would benefit from some form of supplementary planning guidance that would help deliver Metro compliant developments.
20. Undertake further research to identify private and not for profit sector partners that could provide expertise and investment for Metro-led regeneration projects. These might include, Developers, Registered Social Landlords and certain commercial operators.
21. Work with CREW, Welsh Government and the Welsh Local Government Association (and other relevant stakeholders) to develop mechanisms which could work alongside future Metro delivery organisations to ensure regional coordination of Metro-led regeneration to avoid duplication.



Study led by Mark Barry of M&G Barry Consulting and included Capita, Powell Dobson Urbanists, Jones Lang LaSalle and Steer Davies Gleave



**CAPITA**  **steer davis gleave**

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