

A Cardiff Capital Region Metro:

Impact Study: Metro Spatial Map

October 2013



Metro Spatial Map

FINAL Report | September 2013



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Metro Spatial Map
FINAL Report



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EXECUTIVE SUMMARY

It is the view of the Metro Consortium that the production of an overall strategic regional economic plan that presents a clear vision integrating economic development, regeneration and transport is essential. In developing this plan, work was required to identify and quantify the potential wider economic benefits of a Metro via a Metro Regional Economic Impact Study. This study included the assessment of strategic development and regeneration opportunities and the role / impact of other government interventions.

To achieve key project objectives, tasks were divided between the Metro Consortia, with Capita Symonds having responsibility for delivering one of the main work streams in recommendation of metro interventions. This work task has been achieved through the identification and formation of potential interventions, their appraisal and packaging to provide recommended interventions. This sits alongside the other key tasks that Capita Symonds has undertaken in this project which included the production of a multimodal corridor study and the production of a spatial model to provide many of the data inputs which have been used in the appraisal of the Metro Interventions.

This report forms part of the Metro Regional Economic Impact Study, providing an outline of the methodology used to create a thematic model of the existing situation and compare it with a 'Do Something' scenario. This model was used to collect data on each of the Metro Interventions which was fed into their comparative assessment. This is covered in detail in the Interventions Report.

The output of the model allows an assessment of the likely changes in accessibility of strategic healthcare and tertiary education facilities; existing employment and potential development sites; and each of the Lower Super Output Areas in South East Wales, as a result of the Metro Interventions.

Appendix A contains a thematic map showing the approximate location of the proposed Metro Intervention infrastructure in relation to the existing network and each of the sites and areas assessed as part of this process.

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1. Introduction

1.1 Context

- 1.1.1 South East Wales currently faces some serious economic challenges with a wide range of economic prosperity levels existing across the region.
- 1.1.2 It has been identified by the Metro Consortium (a group of stakeholders who have come together with the common aim of promoting the Metro concept as a regional regeneration project consisting of Capita Symonds, Cardiff Business Partnership, M&G Barry Consulting, Powell Dobson Urbanists, Institute of Welsh Affairs, Jones Lang LaSalle, British Gas, Admiral, Cardiff Business School, Capita Architects, Curzon Real Estate, Paramount Office Interiors, Wardell Armstrong and J.R. Smart) that the area needs a coherent vision to 2030 that fully integrates economic development and transport. A key part to developing and delivering this vision is a Cardiff City Region Metro and more widely interventions to improve connectivity within the region.
- 1.1.3 A number of studies have been produced in recent years which have looked at the Metro concept, the most recent of these being the South East Wales Integrated Task Force Report to the Minister for Economy, Science and Transport, in March 2013. This report produced a two phase list of potential interventions, with Phase 1 representing a list of accelerated schemes identified within the National Transport Plan and Regional Transport Plan and Phase 2, a list of longer term interventions for the area.
- 1.1.4 The Metro Consortium have also recently published their report 'A Cardiff City Region Metro: transform/ regenerate / connect', which sets out a vision for a Cardiff City Region Metro focussed on economic development and regeneration within the context of a strategic plan for the region to 2030.
- 1.1.5 It is the view of the Metro Consortium that the production of an overall strategic regional economic plan that presents a clear vision integrating economic development, regeneration and transport is essential. In developing this plan, work was required to identify and quantify the potential wider economic benefits of a Metro via a Metro Regional Economic Impact Study. This study included the assessment of strategic development and regeneration opportunities and the role / impact of other government interventions.
- 1.1.6 The overall objectives of this project were:
- To provide a more comprehensive spatial and regional economic context for Metro development;
 - To inform a strategic region wide economic plan;
 - To provide guidelines / context for the regions local authorities as regards Metro development;
 - To provide input to the Wales and Borders franchise specification and Network Rail route planning;
 - To assess a range of transit modes (from cascaded EMU's through to tram-train, light rail and BRT) that could be utilised;
 - To provide details and data for further and more detailed Metro planning (network, mode, stations, engineering feasibility etc);

- To selectively assess (high level) engineering feasibility of some interventions; and
- To identify a number of quick wins for implementation at the same time as or before Valleys Line Electrification (VLE).

1.1.7 To achieve these project objectives, tasks for the project were divided between the Metro Consortia, with Capita Symonds having responsibility for delivering one of the main work streams in recommendation of metro interventions. This work task has been achieved through the identification and formation of potential interventions, their appraisal and packaging to provide recommended interventions. This sits alongside the other key tasks that Capita Symonds has undertaken in this project which included the production of a multimodal corridor study and the production of a spatial model to provide many of the data inputs which have been used in the appraisal of the Metro interventions.

1.1.8 This report feeds into the main Metro Regional Economic Impact Study and should be read alongside this study with the following constitute reports:

- Metro Modal Study, September 2013 - Capita Symonds;
- Metro Spatial Model Report, September 2013 – Capita Symonds.

1.2 Report Purpose and Structure

1.2.1 The purpose of this report is to provide a summary of the outputs of the Spatial Model and the methodology used to develop the model. The report is structured as follows:

Chapter 2 provides a detailed overview of the methodology used to develop the model including the base data used to populate the model and the do something data;

Chapter 3 describes the outputs of the model with thematic mapping and Traffic Light (Red Amber Green) assessments;

Chapter 4 provides a conclusion.

2. Methodology

2.1 Development of the Base Model

- 2.1.1 The Metro Spatial base model was based on an ordnance survey background which was overlaid with the Lower Super Output Area boundaries (LSOAs) and their corresponding population centre points, using GIS software (MapInfo).
- 2.1.2 Layers containing the existing rail network in South East Wales were manually plotted using the OS background as a guide.
- 2.1.3 A list of major existing employment sites (including retail, commercial and industrial) and proposed development sites (including retail, commercial, industrial, enterprise zones and residential), identified in the local authorities UDP/LDPs, provided by JLL, were also manually plotted using a series of polygons.
- 2.1.4 Locations for strategic healthcare (hospitals and other major facilities) and higher education (universities and tertiary education colleges) facilities were identified and located using a single reference point. Pedestrian access to these facilities is often from many entrances and it should be noted that their accessibility from a station should be examined more thoroughly as an agreed scheme is developed.
- 2.1.5 A list of LSOAs with a high level of deprivation (ie lowest 10%) were identified using the Welsh Index of Multiple Deprivation (WIMD).

2.2 Analysis using the Base Model

- 2.2.1 The model was used to undertake a series of traffic light RAG analysis on each of the data sets available to assess their accessibility to the existing rail network. The following criterion, which reflects the known relationship between rail station demand and decay over distances, was applied to each site based on its proximity to an existing station in a direct line.

G	< 800m from an existing train station
A	Between 800m and 1.2km from an existing train station
R	>1.2km from an existing train station

- 2.2.2 It should be noted that this approach does not take into consideration actual pedestrian routes. Analysis of recent survey data shows that the actual distance walked compared with a direct line can be assumed to be 1.3 times the distance.
- 2.2.3 Strategic healthcare and education sites were located using a single point and the result was simply recorded as 'Green' if that point fell within an 800m radius of an existing station.
- 2.2.4 For the employment and development sites a manual approach was adopted. A site was recorded as 'Green' if either a relative significant area of the site or, for larger sites, a substantial area which could be regarded as an entrance point of the site fell within the 800m radius.
- 2.2.5 The LSOA's, which for South Wales contain approximately 1578 households each, were recorded as 'Green' if their population centre point fell within the 800m radius. This was also used for the WIMD areas which are based on the LSOA boundaries.

- 2.2.6 It should be noted that the accessibility analysis for both pre- and post-Metro Interventions ignores local bus services and hence accessibility changes are only in respect of the rail and other strategic transport proposals.
- 2.2.7 The model produced does not provide demand forecasts. However, the population data produced by the model could, if required at a later date, be input into demand forecasts for new stations using a trip rate model.
- 2.2.8 Thematic maps showing the RAG analysis of the LSOA's, LSOA WIMD's and the densely populated LSOA's were produced to feed into the gap analysis.

2.3 Gap Analysis

2.3.1 The thematic maps and the RAG lists of strategic healthcare and tertiary education sites were used to identify population areas and key facilities which are poorly connected.

2.3.2 Areas with high population densities which are currently poorly served by the rail network include:

- Llantrisant/Beddau/Church Village;
- Potypool/Abersychan/Blaenavon and parts of Cwmbran;
- Porthcawl;
- East of Caerphilly;
- East and Western suburbs of Cardiff;
- Newport suburbs & Caerleon;
- Mid Valley area Blackwood/Nelson; and
- Abertillery.

2.3.3 Just over 75% of the strategic healthcare facilities are located within 1.2km of an existing or committed railway station. Strategic healthcare facilities which are currently poorly served by the rail network include:

- Maindiff Court Hospital;
- St Cadoc's Hospital;
- Royal Glamorgan Hospital;
- University Hospital;
- Prince Charles Hospital;
- Tredegar General Hospital;
- Nevill Hall;
- Llanfrechfa Grange; and
- Barry Hospital.

2.3.4 Half of the 24 tertiary education facility sites in Sewta are located within 800m of an existing or committed railway station. The Bridgend and Pencoed campuses of Bridgend College Site are within 1.2km of an existing railway station. Tertiary education facilities which are currently poorly served by the rail network include:

- Bridgend College – Queens Road Campus;
- Cardiff & Vale College - Barry College;
- Cardiff & Vale College – Coleg Glan Hafren, Trowbridge Campus;
- Cardiff University – Heath Campus;

- Coleg Gwent – City of Newport Campus;
- Coleg Gwent – Pontypool Campus;
- Coleg Gwent – Usk Campus;
- University of South Wales – Caerleon Campus;
- Coleg Margannwg – Aberdare Campus;
- Coleg Margannwg – Nantgarw Campus;
- UWIC – Llandaff Campus; and
- UWIC – Cyncoed Campus.

2.3.5 A list of Metro Interventions was subsequently identified to target these gaps. These are discussed in detail in the Metro Interventions Report.

2.4 'Do Something' Model Development

2.4.1 The Metro interventions were plotted onto the base model in the following layers to create a 'Post Metro' model:

- New Stations;
- New Rail and associated Stations;
- Interchange Improvements;
- New Park & Rides;
- Increased Frequency schemes;
- New Services on Existing Lines; and
- Strategic Bus/BRT Routes.

2.4.2 Again, the model was used to undertake a series of traffic light RAG analysis on each of the data sets available to assess their accessibility to the improved network following the proposed Metro Interventions, using the following criteria:

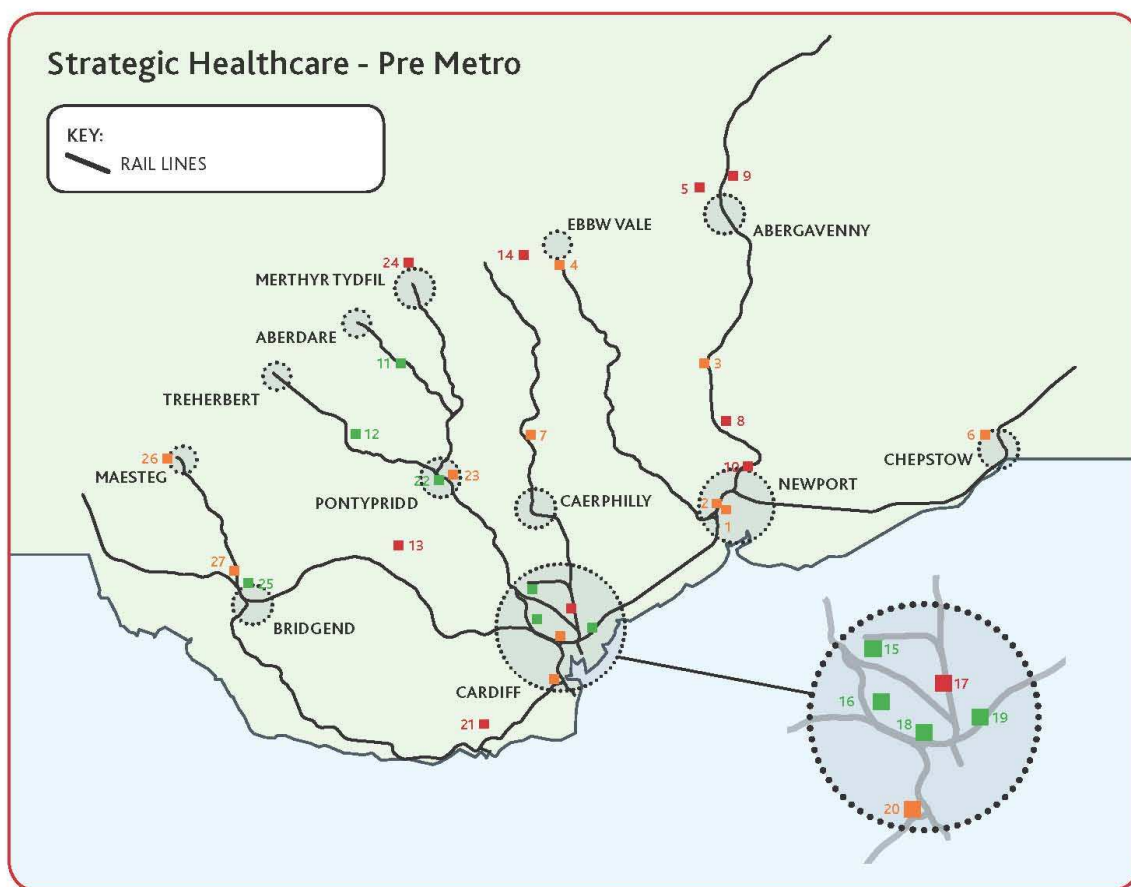
G	< 800m from an existing train station
A	Between 800m and 1.2km from an existing train station
R	>1.2km from an existing train station

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3. Model Outputs and Results

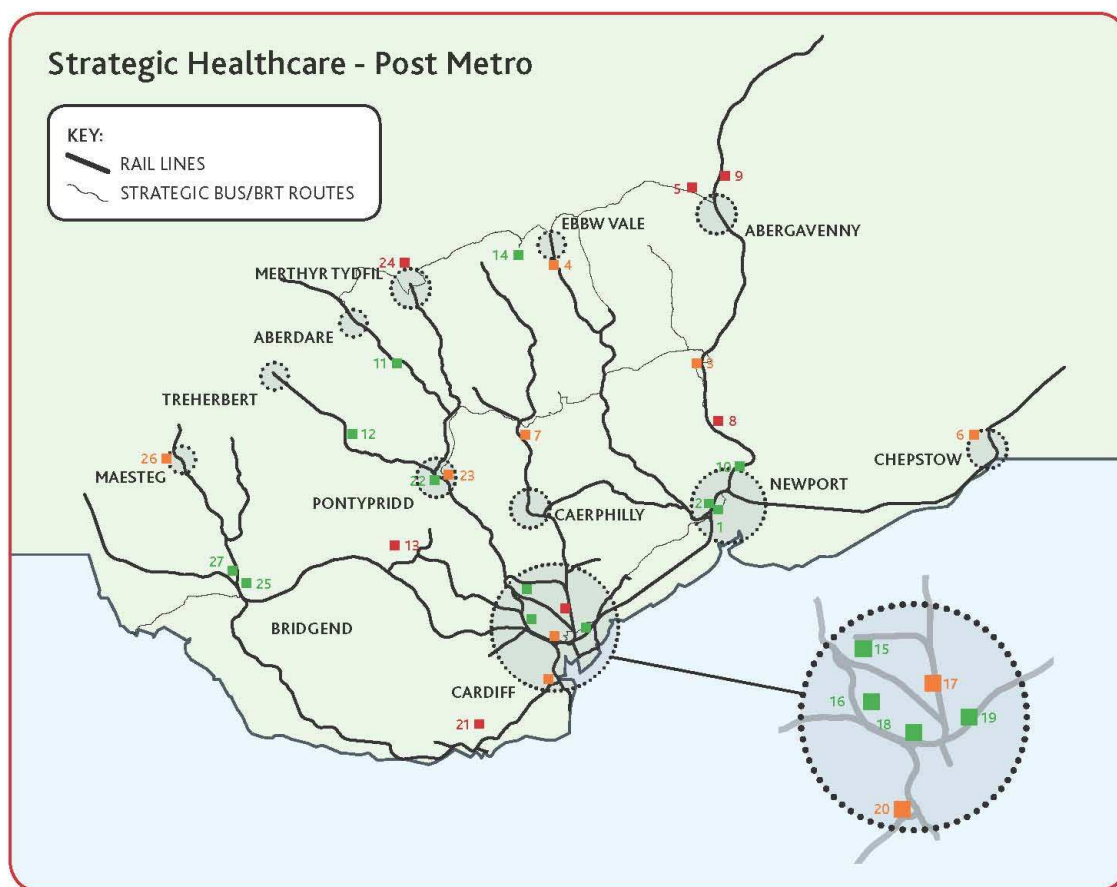
3.1 Strategic Healthcare facilities

- 3.1.1 A comparison of Figures 1 and 2 shows that the Metro Interventions make a noticeable impact on the regions accessibility to strategic healthcare facilities in South East Wales. Only eight of these facilities are within 800m of an existing train station, this number increases to thirteen with the implementation of the Metro Interventions.
- 3.1.2 The introduction of a strategic bus/BRT stop on Cardiff Road, linking up with Newport Station, will benefit both the Royal Gwent and St Woolos Hospitals changing their status from 'Amber' to 'Green'.
- 3.1.3 The status of Tredegar General Hospital will change from 'Red' to 'Green' with the introduction of a new Cross Valleys Express Service from Abergavenny through to Aberdare which will stop close to the hospital.
- 3.1.4 A new station in Caerleon on the existing Marches Line will change the status of St Cadoc's Hospital from 'Red' to 'Green'. In addition this new station would benefit from the frequency enhancements from Abergavenny to Cardiff.
- 3.1.5 A new station at Sarn Park on the existing Maesteg Line will change the status of Glanrhyd Hospital from 'Amber' to 'Green'.



Location	Strategic Healthcare	RAGPreMetro
19	Cardiff Royal Infirmary	G
22	Dewi Sant Hospital	G
25	Princess of Wales Hospital	G
16	Rockwood Hospital	G
18	St David's Hospital	G
15	Whitchurch Hospital	G
11	Ysbyty Cwm Cynon	G
12	Ysbyty Cwm Rhondda	G
1	St Woolos Hospital	A
2	Royal Gwent Hospital	A
27	Glanrhyd Hospital	A
3	County Hospital	A
4	Ysbyty Aneurin Bevan	A
6	Chepstow Hospital	A
7	Ysbyty Ystrad Fawr	A
20	Llandough Hospital	A
23	Pontypridd & District Hospital	A
26	Maesteg Community Hospital	A
10	St Cadoc's Hospital	R
14	Tredegar General Hospital	R
17	University Hospital	R
5	Nevill Hall	R
8	Llanfrecfa Grange	R
9	Maindiff Court Hospital	R
13	Royal Glamorgan Hospital	R
21	Barry Hospital	R
24	Prince Charles Hospital	R

Figure 1 – South East Wales Strategic Healthcare facilities RAG Pre Metro



Location	Strategic Healthcare	RAGPreMetro
19	Cardiff Royal Infirmary	G
22	Dewi Sant Hospital	G
25	Princess of Wales Hospital	G
16	Rockwood Hospital	G
18	St David's Hospital	G
15	Whitchurch Hospital	G
11	Ysbyty Cwm Cynon	G
12	Ysbyty Cwm Rhondda	G
1	St Woolos Hospital	G
2	Royal Gwent Hospital	G
27	Glanrhyd Hospital	G
10	St Cadoc's Hospital	C
14	Tredegar General Hospital	G
3	County Hospital	A
4	Ysbyty Aneurin Bevan	A
6	Chepstow Hospital	A
7	Ysbyty Ystrad Fawr	A
20	Llandough Hospital	A
23	Pontypridd & District Hospital	A
26	Maesteg Community Hospital	A
17	University Hospital	A
5	Nevill Hall	R
8	Llanfrechfa Grange	R
9	Maindiff Court Hospital	R
13	Royal Glamorgan Hospital	R
21	Barry Hospital	R
24	Prince Charles Hospital	R

Figure 2 – South East Wales Strategic Healthcare facilities RAG Post Metro

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3.2 Tertiary Education facilities

- 3.2.1 Figures 3 and 4 show that the Metro Interventions make a significant impact on the regions accessibility to tertiary education facilities in South East Wales. Six facilities currently recorded with a 'Red' status are located within 1.2km of a station or strategic bus/BRT stop following the proposed Metro Interventions.
- 3.2.2 It is reasonable to assume that the demographic catchment of tertiary education sites will be capable and likely to consider this distance acceptable for walking.
- 3.2.3 A new station at Gabalfa on the Taffs Vale Line will benefit Cardiff University (Heath Campus) and UWIC (Landaff Campus) changing their status from 'Red' to 'Amber' and providing a route for students and staff through Pontypridd to Treherbert, Aberdare and Merthyr Tydfil. Frequency enhancements planned for the Aberdare and Merthyr lines will provide added benefit.
- 3.2.4 The Heath Campus will also be within 1.2km of a new station at Roath Park on the Rhymney Line which passes through Caerphilly.
- 3.2.5 New stations adjacent to Cowbridge Road on the Vale of Glamorgan Line, and at Brackla on the SWML Line, with additional frequency enhancements planned for both these lines, will benefit both the Bridgend and Queens Road Campuses of Bridgend College, changing their status to 'Green'.
- 3.2.6 Reopening the line from Aberdare to Hirwawun will place Coleg Morgannwg (Aberdare Campus) close to a new station at Trecynon and improve its status from 'Red' to 'Amber'. This station will also benefit from the proposed frequency enhancements to Aberdare from Cardiff.
- 3.2.7 The introduction of a strategic bus/BRT stop in Pontypool Town Centre, linking up with Pontypool & New Inn Station, will benefit Coleg Gwent (Pontypool Campus) changing it from a 'Red' to 'Amber' status.

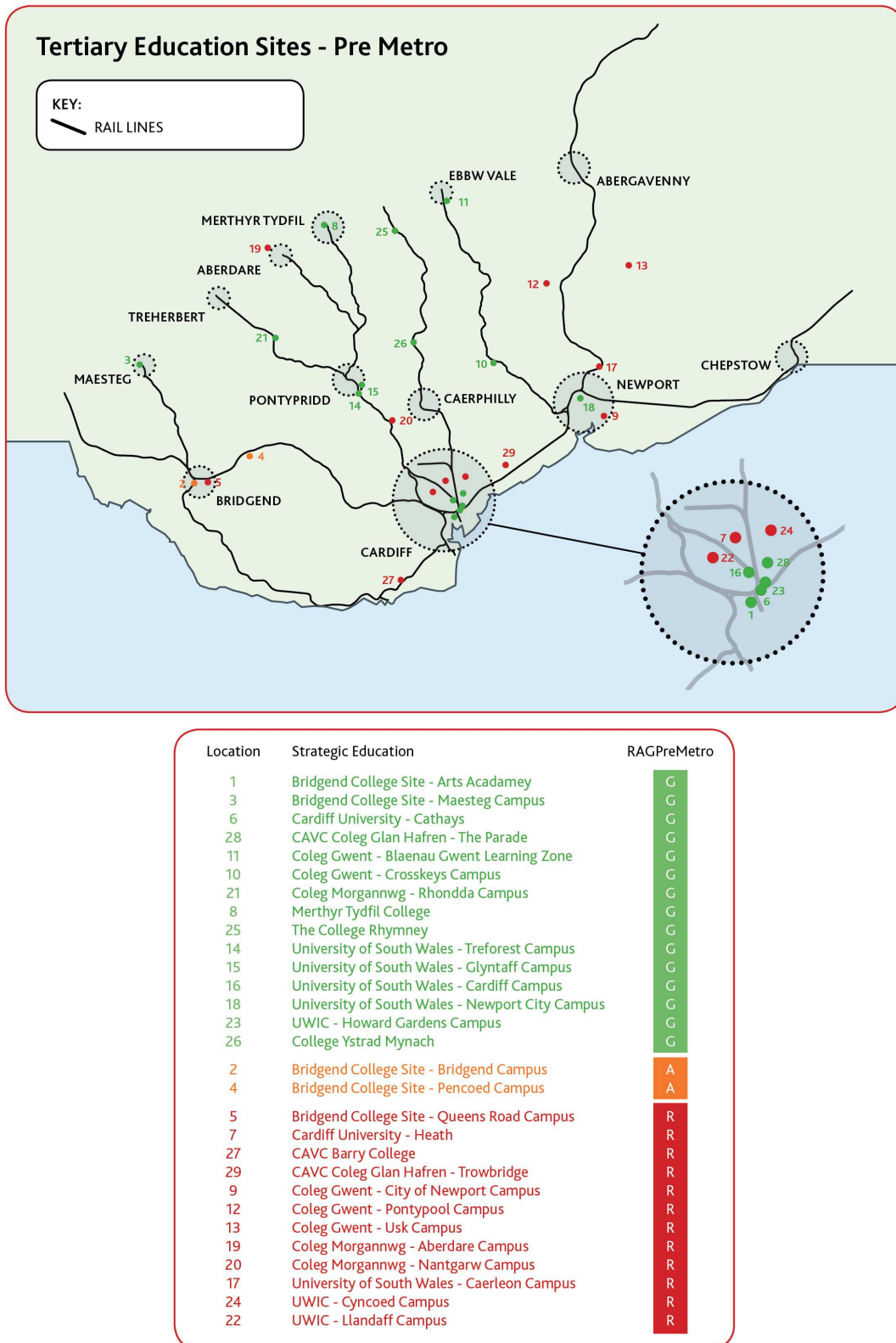


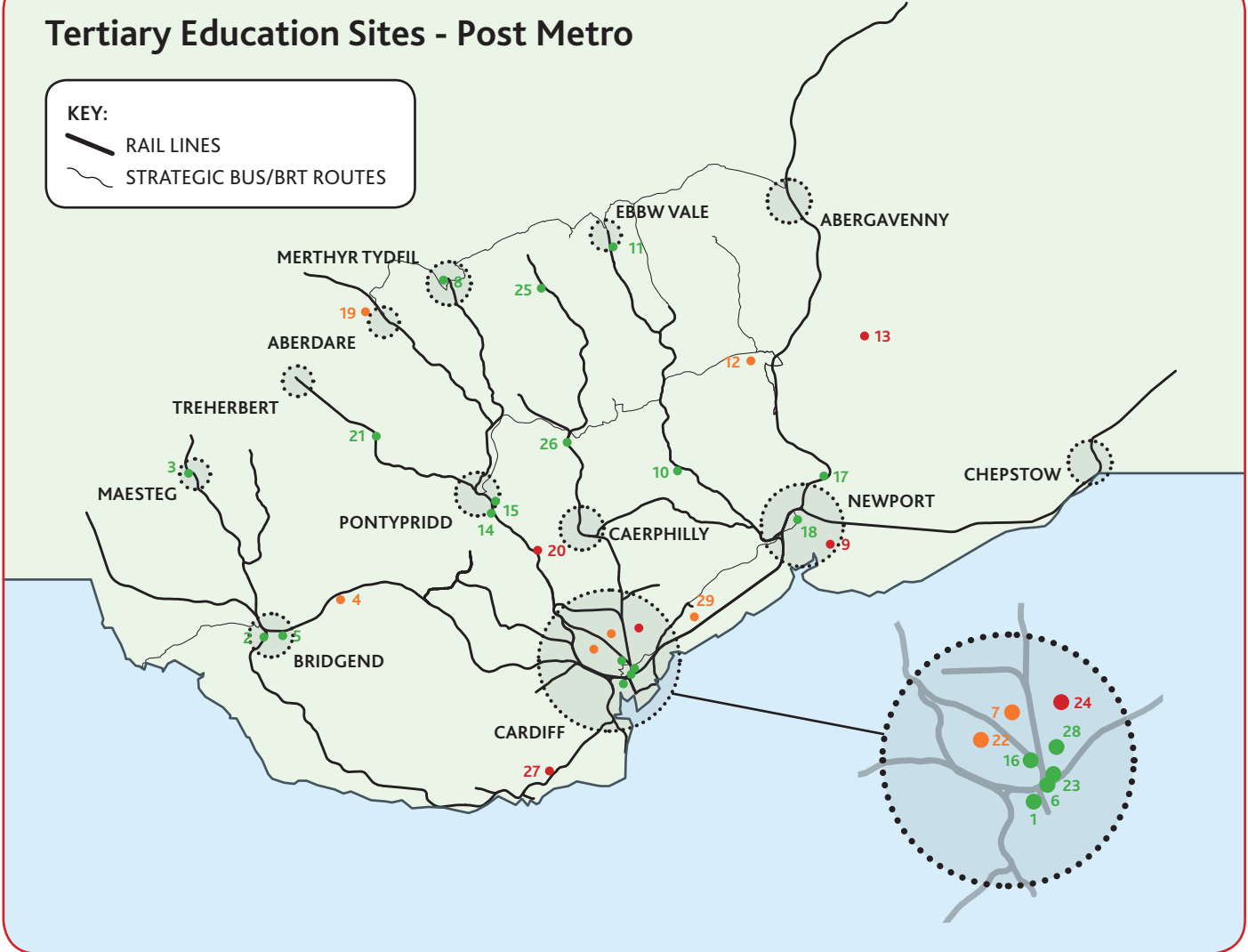


Figure 3 – South East Wales Tertiary Education facilities RAG Pre Metro

Tertiary Education Sites - Post Metro

KEY:
 RAIL LINES
 STRATEGIC BUS/BRT ROUTES



Location	Strategic Education	RAGPreMetro
1	Bridgend College Site - Arts Acadamey	G
3	Bridgend College Site - Maesteg Campus	G
6	Cardiff University - Cathays	G
28	CAVC Coleg Glan Hafren – The Parade	G
11	Coleg Gwent - Blaenau Gwent Learning Zone	G
10	Coleg Gwent - Crosskeys Campus	G
21	Coleg Morgannwg - Rhondda Campus	G
8	Merthyr Tydfil College	G
25	The College Rhymney	G
14	University of South Wales - Treforest Campus	G
15	University of South Wales - Glyntaff Campus	G
16	University of South Wales - Cardiff Campus	G
18	University of South Wales - Newport City Campus	G
23	UWIC - Howard Gardens Campus	G
26	College Ystrad Mynach	G
2	Bridgend College Site - Bridgend Campus	G
5	Bridgend College Site - Queens Road Campus	G
17	University of South Wales - Caerleon Campus	G
4	Bridgend College Site - Pencoed Campus	A
7	Cardiff University - Heath	A
29	CAVC Coleg Glan Hafren – Trowbridge	A
12	Coleg Gwent - Pontypool Campus	A
19	Coleg Morgannwg - Aberdare Campus	A
22	UWIC - Llandaff Campus	A
27	CAVC - Barry College	R
9	Coleg Gwent - City of Newport Campus	R
13	Coleg Gwent - Usk Campus	R
20	Coleg Morgannwg - Nantgarw Campus	R

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3.3 Existing Employment

3.3.1 In this section the sites highlighted in blue of each table fall within areas of regional strategic importance.

Town/City Centres

3.3.2 Table 1 shows that of the nine town centres further than 1.2km from an existing train station, only Monmouth will remain so following the Metro Interventions. The others will all be within 800m of a station or strategic bus/BRT stop.

3.3.3 Abergavenny will remain within a 1.2km catchment of the station but will benefit from the introduction of the Cross Valleys Express Service from Abergavenny through to Aberdare, as well as the frequency enhancements by rail from Abergavenny to Cardiff.

3.3.4 The four town centres identified as being within areas of strategic importance are already within 800m of accessing the existing network. Pontypridd and Barry town centres will also benefit from frequency enhancements on the Valleys and Vale of Glamorgan lines.

Retail Sites

3.3.5 Table 2 shows that of the five existing retail sites further than 1.2km from an existing train station, only Newport Retail Park will remain so following the Metro Interventions.

3.3.6 Western Avenue and Culverhouse Cross, along with Llantrisant Retail Parks are identified as being in an area of strategic importance and are all located within 800m of a proposed new station or strategic bus/BRT stop.

Industrial Sites

3.3.7 Table 3 shows that the Metro Interventions will improve accessibility for several industrial sites in the region, seven of which will change from either 'Red' or 'Amber' status to 'Green'.

3.3.8 In terms of regional strategic importance, only Llantrisant Business Park will still be outside of the 1.2km catchment of a station or strategic bus/BRT route.

Commercial Sites

3.3.9 Table 4 shows that following the Metro Interventions all of the Commercial sites identified will be within 1.2km of a train station or strategic bus/BRT route.

3.3.10 A new Cross Valleys Express Service from Abergavenny through to Aberdare will greatly improve accessibility to the Tredgar Park Office Clusters which fall within an area of regional strategic importance.

		Pre Metro	Post Metro
Blaenau Gwent	Ebbw Vale Town	G	G
Caerphilly	Caerphilly Town Centre	G	G
Cardiff	Cardiff City Centre	G	G
Newport	Newport City Centre	G	G
Rhondda Cynon Taf	Pontypridd Town Centre	G	G
Vale of Glamorgan	Barry Town Centre	G	G
Blaenau Gwent	Brynmawr Town Centre	R	G
Blaenau Gwent	Abertillery Town Centre	R	G
Blaenau Gwent	Tredegar Town Centre	R	G
Bridgend	Bridgend Town Centre	G	G
Bridgend	Maesteg Town Centre	G	G
Bridgend	Porthcawl Town Centre	R	G
Caerphilly	Bargoed Town Centre	G	G
Caerphilly	Blackwood Town Centre	R	G
Merthyr Tydfil	Merthyr Tydfil Town Centre	G	G
Monmouthshire	Chepstow Town Centre	G	G
Monmouthshire	Abergavenny	A	A
Monmouthshire	Monmouth Town Centre	R	R
Rhondda Cynon Taf	Porth Town Centre	G	G
Rhondda Cynon Taf	Aberdare Town Centre	G	G
Torfaen	Cwmbran Town Centre	G	G
Torfaen	Pontypool Town Centre	R	G
Torfaen	Blaenavon Town Centre	R	G
Vale of Glamorgan	Penarth Town Centre	G	G
Vale of Glamorgan	Cowbridge Town Centre	R	R

Table 1 Existing Employment - Town/City Centres

		Pre Metro	Post Metro
Cardiff	Atlantic Wharf	G	G
Cardiff	Cardiff Bay/Capital Waterside	G	G
Rhondda Cynon Taf	Llantrisant Retail Parks	R	G
Blaenau Gwent	Festival Park, Ebbw Vale	A	A
Bridgend	Factory Shopping Outlet, Sarn, Bridgend	A	G
Cardiff	Crwys Rd/City Rd/Albany Rd retail area	G	G
Cardiff	Leckwith - Cardiff City Stadium & Retail	G	G
Cardiff	Lanishen Retail Park	G	G
Cardiff	Western Avenue	R	G
Merthyr Tydfil	Cyfarthfa Retail Park	A	A
Merthyr Tydfil	Dowlais Business Park	R	A
Newport	Newport Retail Park	R	R
Vale of Glamorgan	Culverhouse Cross Retail Parks	R	G

Table 2 Existing Employment – Retail Sites

		Pre Metro	Post Metro
Bridgend	Bridgend Industrial Estate	A	G
Merthyr Tydfil	Pentrebach Industrial Area	A	A
Merthyr Tydfil	Abercananaid / Candy Hoover	G	G
Newport	Imperial Park	R	G
Rhondda Cynon Taf	Treforest Industrial Estate	G	G
Rhondda Cynon Taf	Llantrisant Business Park	R	R
Torfaen	Mamhilad, Pontypool	R	G
Blaenau Gwent	Tafarnaubach Ind Estate	R	G
Blaenau Gwent	Crown Business Park	R	R
Blaenau Gwent	Rassau Industrial Estate	R	R
Bridgend	Village Farm Industrial Estate, Pyle	G	G
Bridgend	Brynmenyn Industrial Estate	A	G
Bridgend	Waterton/Eweny Industrial Estates	R	R
Caerphilly	Pontygwindy Industrial Estate	G	G
Caerphilly	Hawtin Park, Pontllanfraith	A	A
Caerphilly	Bedwas Industrial Estate	R	A
Caerphilly	Pantglas Industrial Estate	R	A
Caerphilly	Penallta Industrial Est, Ystrad Mynach	R	R
Caerphilly	Duffryn Industrial Est, Ystrad Mynach	R	R
Caerphilly	Oakdale / Pen-y-fan Industrial Estate	R	R
Cardiff	Penarth Rd/Leckwith	G	G
Cardiff	Lanishen Business Parks	G	G
Cardiff	Newport Rd Retail & Industrial	R	G
Cardiff	Wentloog/Capital Business Park	R	G
Monmouthshire	Gwent Europark, Magor	R	R
Monmouthshire	Newhouse Park, Chepstow	R	R
Newport	Llanwern Steelworks	R	A
Newport	South East Newport Industrial Area	R	R
Rhondda Cynon Taf	Pontyclun Industrial Areas	A	A
Rhondda Cynon Taf	Hirwaun Industrial Estate	R	R
Torfaen	Pontyfelin/Lower Mill Industrial Area	G	G
Torfaen	Springvale Industrial Estate, Cwmbran	R	R
Torfaen	Llantarnam Business Park, Cwmbran	R	R
Vale of Glamorgan	Barry Docks & Heavy Industrial Area	G	G
Vale of Glamorgan	Aberthaw Power Station & works	R	R

Table 3 Existing Employment – Industrial Sites

		Pre Metro	Post Metro
Cardiff	Cardiff Bay/Capital Waterside	G	G
Newport	Tredegar Park Office Clusters	R	G
Bridgend	Pencoed Business Park / Sony	A	A
Caerphilly	Tredomen Office Park, Ystrad Mynach	G	G
Cardiff	Cardiff Cathays Park/Maindy Campus	G	G
Cardiff	Forest Farm Business Park 1 of 2	G	G
Cardiff	Forest Farm Business Park 2 of 2	G	G
Cardiff	Butetown	G	G
Cardiff	Atlantic Wharf	G	G
Cardiff	Lanishen Business Parks	G	G
Cardiff	Ocean Park/Portmanmoor Rd Ind Area	A	G
Cardiff	Greenmeadow Business Park	A	G
Cardiff	Cardiff Gate	R	G
Cardiff	St Mellons Business Park	R	A
Merthyr Tydfil	Rhydycar Business Park	G	G
Monmouthshire	Magor Office Park Industrial Area	R	A
Newport	Celtic Springs	R	G

Table 4 Existing Employment – Commercial Sites

3.4 Proposed Development

3.4.1 In this section the sites highlighted in blue of each table fall within areas of regional strategic importance.

Residential Sites

3.4.2 Table 5a shows a significant improvement in the accessibility of proposed residential development sites in areas of regional strategic importance, with all of these sites being located within 1.2km of a station or strategic bus/BRT route following the Metro Interventions.

3.4.3 Accessibility to other proposed development sites is shown in Table 5b and shows particular improvements for Waterloo Works in Machen and the ITV Wales site at Culverhouse Cross, which will both change from a 'Red' to 'Green' status following the proposed improvements to the network.

Industrial Sites

3.4.4 Table 6 also shows a significant improvement in the accessibility of proposed industrial development sites with over 25% being changed from a 'Red' to 'Green' status following the Metro Interventions.

3.4.5 In particular, several of the Newport Industrial sites, Mamhilad and Bridgend Industrial Estate are all located with good access to the proposed Metro Interventions.

Commercial Sites

3.4.6 Accessibility for half of the commercial development sites would be improved following the Metro Interventions. Access to Roath Basin would be improved by the introduction of a new line between Cardiff Bay and Rover Way/Newport Road with a station at Roath Dock.

		Pre Metro	Post Metro
Blaenau Gwent	The Works, Ebbw Vale	G	G
Blaenau Gwent	Northern Corridor, Ebbw Vale	A	G
Cardiff	Sports Village, Cardiff Bay	G	G
Cardiff	Housing NW of Pontprennau Cardiff	A	G
Cardiff	Land in North West Cardiff	A	G
Cardiff	Land at J33/South of Creigiau	R	G
Cardiff	Housing NE of Pontprennau Cardiff	R	A
Merthyr	Pentrebach Hoover Site	G	G
Monmouthshire	Fairfield Mabey, Chepstow	G	G
Newport	Glan Llyn (ex Llanwern)	R	G
Newport	Monbank Sidings	R	G
Newport	Whitehead Works	R	G
Newport	Old Town Dock/George St	R	A
Torfaen	Sebastopol	R	G
Torfaen	Mamhilad, Pontypool	R	G
Vale of Glamorgan	Phase 2 Barry Waterfront	G	G

Table 5a Proposed Developments –Residential Sites

		Pre Metro	Post Metro
Blaenau Gwent	Park Hill	R	A
Blaenau Gwent	Peace Haven	R	R
Bridgend	Budelpack/Coopers Standard, Masteg	G	G
Bridgend	Parc Derwen, Bridgend	A	A
Bridgend	North East Brackla	A	A
Bridgend	Porthcawl Waterfront	R	A
Bridgend	Parc Afon Ewenni, Bridgend	R	A
Caerphilly	Pontypandy Ind Est, Caerphilly	G	G
Caerphilly	Aberbargoed plateau	G	G
Caerphilly	Waterloo Works, Machen	R	G
Caerphilly	Land at Hawtin Park, Pontllanfraith	R	R
Caerphilly	Bedwas Colliery, Bedwas	R	R
Caerphilly	Penallta Colliery	R	R
Cardiff	The Mill (Former Arjo Wiggins), Cardiff	G	G
Merthyr Tydfil	Upper/Lower George Plateau	G	G
Merthyr Tydfil	Gethin Tip, Abercanaid	G	G
Monmouthshire	Deri Farm, Abergavenny	R	R
Monmouthshire	Crick Rd, Portskewett	R	R
Monmouthshire	Wonastow Rd, Monmouth	R	R
Monmouthshire	Valley Wood/Llanilid	R	R
Newport	Former Tredegar Park Golf Course	G	G
Newport	Former Alcan/Novelis, Rogerstone	A	G
Rhondda Cynon Taf	Robertstown, Abernant, Aberdare	G	G
Rhondda Cynon Taf	Phurnacite Plant, Abercwmboi	G	G
Rhondda Cynon Taf	Land South of Hirwaun	R	A
Rhondda Cynon Taf	Former Cwm Coking Works, Beddau	R	A
Rhondda Cynon Taf	Trane Farm, Tonyrefail	R	R
Rhondda Cynon Taf	The Ridings Tonteg	R	R
Torfaen	Canalside Regeneration	G	G
Torfaen	County Hall & Police HA	A	A
Torfaen	Former Police College, St Dials	R	R
Vale of Glamorgan	Land N of railway line, Rhoose	G	G
Vale of Glamorgan	Land Sth of Llandough Hill, Landough	G	G
Vale of Glamorgan	Land adj. St Cyres, Murch Rd, Dinas Powys	A	A
Vale of Glamorgan	ITV Wales site, Culverhouse Cross	R	G
Vale of Glamorgan	Fort Rd, Lavernock, Penarth	R	A
Vale of Glamorgan	South of Waycock Cross, Barry	R	R
Vale of Glamorgan	North of Waycock Cross, Barry	R	R
Vale of Glamorgan	West of Port Rd, Wenvoe	R	R
Vale of Glamorgan	St Athan Rd, Cowbridge	R	R

Table 5b Proposed Developments –Residential Sites

		Pre Metro	Post Metro
Bridgend	Plot G11, Bridgend Industrial Estate	R	G
Bridgend	Central Park, Bridgend Industrial Estate	R	G
Bridgend	Plot D9/14, Bridgend Industrial Estate	R	G
Caerphilly	Ty Du, Nelson	R	A
Newport	Celtic Springs Business Park	R	G
Newport	Celtic Business Park, Llanwern	R	G
Newport	Land Sth of NGD, Imperial Park	R	G
Newport	Land Sth of Quinn, Imperial Park	R	A
Torfaen	Sites C1/C2 Mamhilad	R	G
Torfaen	Usk Vale, Pontypool	R	G
Vale of Glamorgan	RAF St Athan	R	R
Blaenau Gwent	EnviroWales Site Rassau Ind Estate	R	R
Bridgend	Pencoed Technology Park	R	A
Bridgend	Waterton Industrial Estate (W of Ford)	R	A
Bridgend	Brocastle, Bridgend	R	R
Bridgend	Waterton Industrial Estate (E of Ford)	R	R
Caerphilly	Site A, Duffryn, Ystrad Mynach	R	R
Caerphilly	Plateau 1 Oakdale Business Park	R	R
Caerphilly	Plateau 2 Oakdale Business Park	R	R
Caerphilly	Plateau 3 Oakdale Business Park	R	R
Caerphilly	Plateau 4 Oakdale Business Park	R	R
Cardiff	Short's Land East Moors Rd	A	G
Cardiff	Capital Business Park (Aldi)	R	G
Cardiff	Land Adjacent G24i, Wentloog	R	A
Merthyr Tydfil	Rhydyar Business Park	G	G
Monmouthshire	Phase 3, Gwent Europark, Magor	R	R
Newport	Solutia, Corporation Road	R	R
Newport	Tatton Farm, Queensway Meadows	R	R
Rhondda Cynon Taf	Cwm Cynon North, Abercynon	G	G
Rhondda Cynon Taf	Hepworth Business Park	A	A
Rhondda Cynon Taf	Former Clariant Site, Church Village	R	R
Rhondda Cynon Taf	Coed Ely, Llantrisant	R	R
Torfaen	Craig-y-felin, Cwmbran	R	A
Torfaen	Former Ty Coch Tip, Llantarnam	R	R
Torfaen	Llantarnam Business Park	R	R
Vale of Glamorgan	Land fronting Millenium Way, Barry	G	G
Vale of Glamorgan	Former Ineos Land, Sully Moors Rd	A	A
Vale of Glamorgan	Cardiff Airport Business Park	R	G

Table 6 Proposed Developments – Industrial Sites

		Pre Metro	Post Metro
Cardiff	Roath Basin, Cardiff Bay	A	G
Rhondda Cynon Taf	Talbot Green New Town Centre	A	G
Blaenau Gwent	Rhyd-y-Blew, Ebbw Vale	R	R
Cardiff	Callaghan Square	G	G
Cardiff	Dumballs Rd, Cardiff	G	G
Cardiff	St Mellons Business Park (Site J)	R	G
Cardiff	Plot A Trident Park, Ocean Park	R	G
Merthyr Tydfil	Swansea Rd, Cyfarthfa	R	R
Monmouthshire	Quay Point, Magor	R	A
Monmouthshire	Westgate Business Park, Llanfoist	R	A
Newport	Berryhill Farm	R	G
Rhondda Cynon Taf	Parc Eirin, Tonyrefail	R	R
Torfaen	Llanfrechfa	R	R
Vale of Glamorgan	Land to the south of J34, M4, Hensol	R	R

Table 7 Proposed Developments – Commercial Sites

3.5 Lower Super Output Areas

3.5.1 As assessment of the change in RAG status for each of the 939 Lower Super Output Areas (LSOAs) is shown in Tables 9 and 10 below, along with the results of the 514 densely populated LSOAs.

All LSOA's	Total	<800m	800m-1.2km	>1.2km	>800m
		LSOA Centroid Distance from Station	939	275	132
Percentage of Population		29%	14%	57%	71%
Estimated number of people	1,481,742	433,950	208,296	839,496	1,047,792
Densely Populated LSOA's	Total	<800m	800m-1.2km	>1.2km	>800m
		LSOA Centroid Distance from Station	514	164	90
Percentage of Population		32%	18%	51%	68%
Estimated number of people	811,092	258,792	142,020	410,280	552,300

Table 9 Pre Metro Accessibility Summary

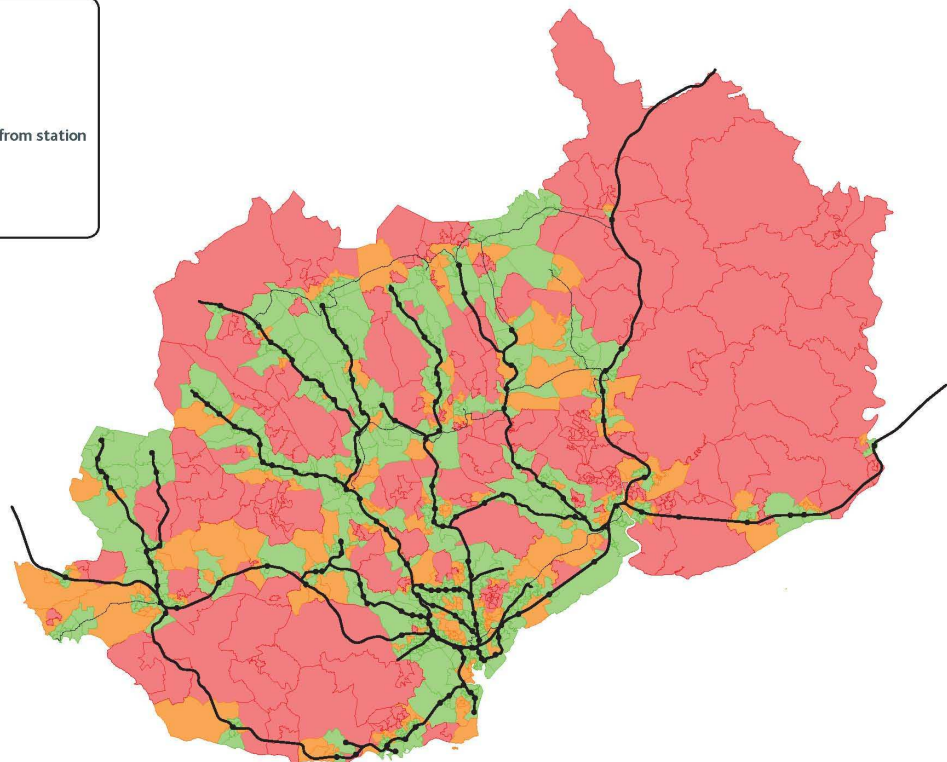
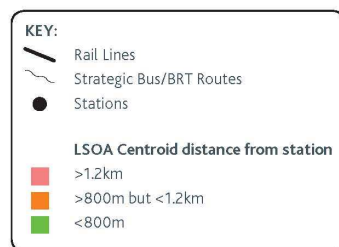
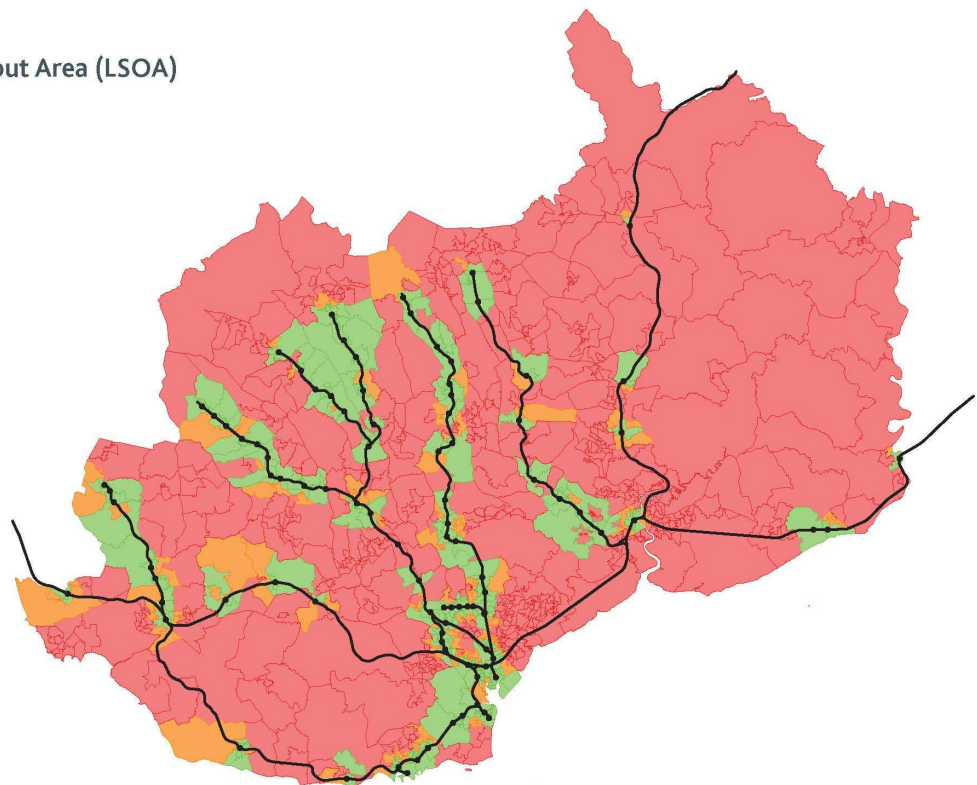
All LSOA's	Total	<800m	800m-1.2km	>1.2km	>800m
		LSOA Centroid Distance from Station	939	484	190
Percentage of Population		52%	20%	28%	48%
Estimated number of people	1,481,742	763,752	299,820	418,170	717,990
Densely Populated LSOA's	Total	<800m	800m-1.2km	>1.2km	>800m
		LSOA Centroid Distance from Station	514	298	114
Percentage of Population		58%	22%	20%	42%
Estimated number of people	811,092	470,244	179,892	160,956	340,848

Table 10 Post Metro Accessibility Summary

3.5.2 The results show a 23% increase of LSOA population centres being located within 800m of a train or strategic bus/BRT stop with a 26% increase in the densely populated LSOAs.

- 3.5.3 The number of LSOA population centres located within 1.2km of a train or strategic bus/BRT stop increases by 29%, with the densely populated LSOAs increasing by 31%.
- 3.5.4 Figure 5 shows where the accessibility to the network for residents in South East Wales improves through the introduction of the Metro Interventions.
- 3.5.5 Figure 6 shows where the accessibility to the network improves for the densely populated areas of South East Wales through the introduction of the Metro Interventions. In particular the areas around Cardiff, Newport, Bridgend, Beddau and Torfaen show a distinct change from 'Red' to 'Green' which demonstrates that accessibility to the rail network in these densely populated areas will improve significantly.

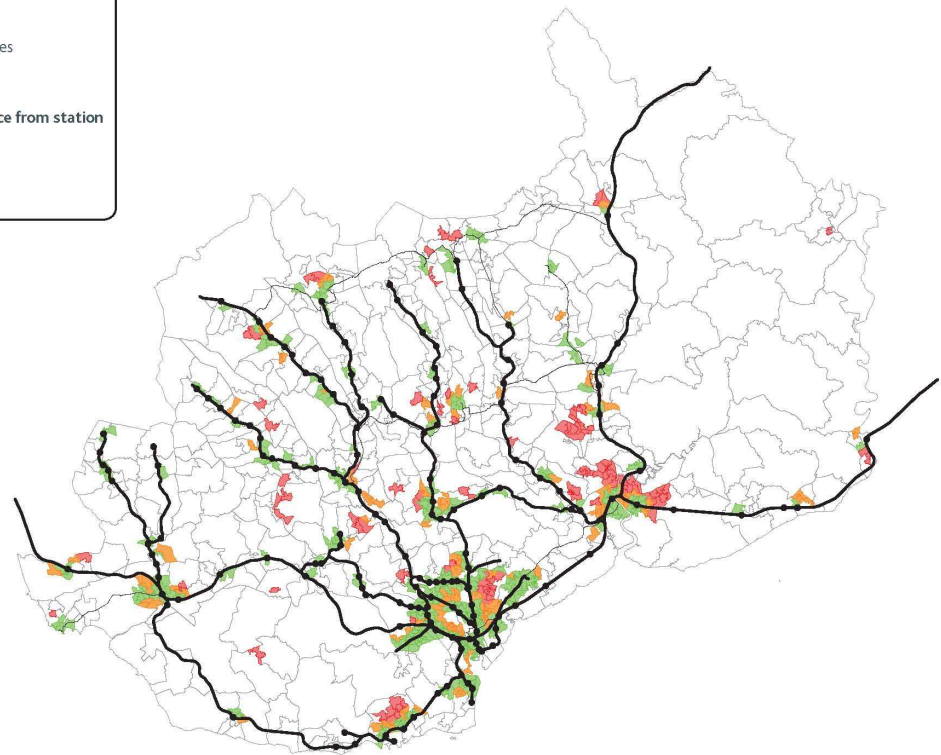
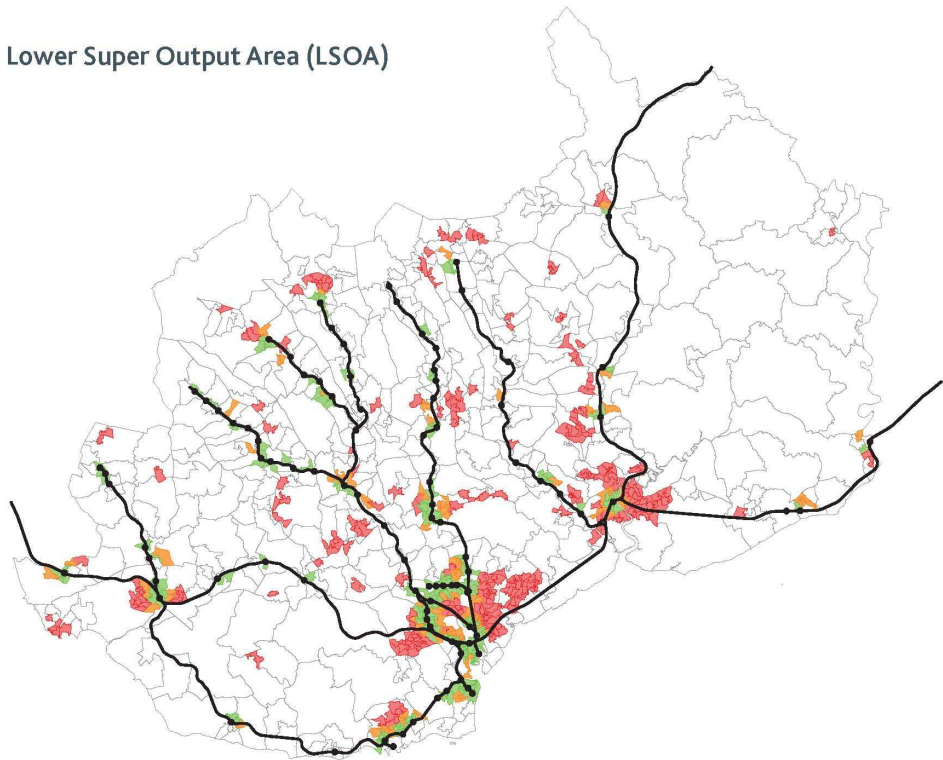
South East Wales
Lower Super Output Area (LSOA)
RAG Pre Metro



South East Wales
Lower Super Output Area (LSOA)
RAG Post Metro

Figure 5 Thematic Map of Lower Super Output Areas

**South East Wales
Densely Populated Lower Super Output Area (LSOA)
RAG Pre Metro**



**South East Wales
Densely Populated Lower Super Output Area (LSOA)
RAG Post Metro**

Figure 6 Thematic Map of Densely Populated Lower Super Output Areas

3.6 Welsh Index of Multiple Deprivation

3.6.1 Figure 7 shows where accessibility to the network improves, for the most deprived population areas in South East Wales, through the introduction of the Metro Interventions.

3.6.2 The LSOAs are approximately equal in population so in areas with high population densities the LSOAs are smaller such as in Cardiff and Newport. It can be seen that areas such as Western Cardiff contain as many LSOAs in the bottom 10% of WIMD as less densely populated parts of the Upper Valleys.

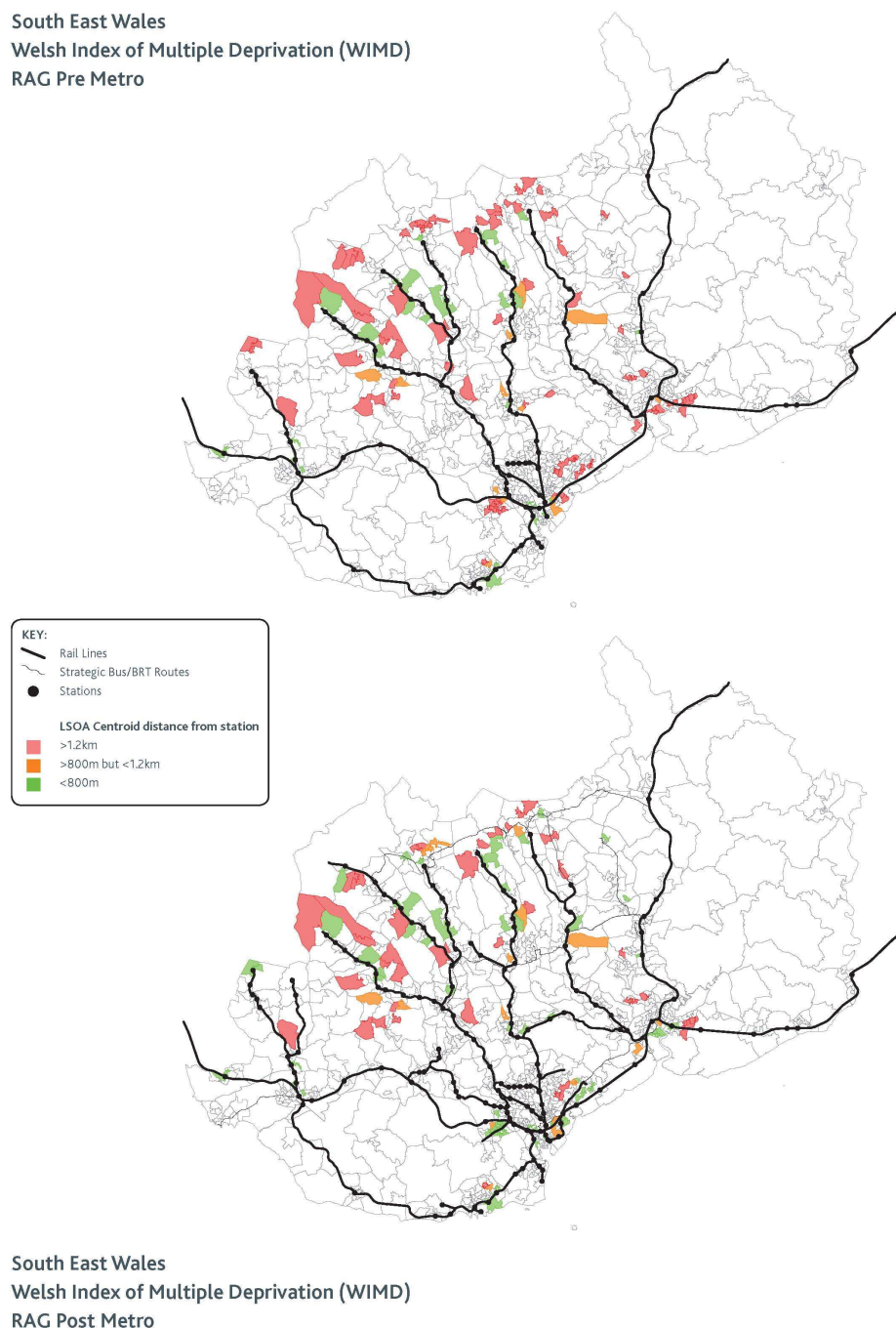


Figure 7 Thematic Map of Welsh Index of Multiple Deprivation

4. Conclusions

- 4.1 This report has provided an outline of the methodology used to create a thematic model to compare the likely changes in accessibility of strategic healthcare and tertiary education facilities; existing employment and potential development sites; and each of the Lower Super Output Areas in South East Wales, as a result of the Metro Interventions.
- 4.2 This report will form part of the Metro Regional Economic Impact Study which will be provided to Welsh Government for consideration.
- 4.3 It has shown that the Metro Interventions will improve public transport accessibility for a significant percentage of the residents, as well as providing greater accessibility to many of the employment sites and education facilities in South East Wales.
- 4.4 It is important to recognise the limitations of the model and it is recommended that a more detailed analysis would need to be undertaken to ascertain the true benefits of each Metro Intervention.

APPENDIX A

Spatial Model Metro Interventions

DRG. No. CS/060195/01

REVISION REF.

KEY

---	COUNTY BOUNDARY
[Blue hatched]	DEVELOPMENT SITE -- COMMERCIAL
[Pink hatched]	DEVELOPMENT SITE -- INDUSTRIAL
[Green hatched]	DEVELOPMENT SITE -- RESIDENTIAL
[White hatched]	DEVELOPMENT SITE -- UNIQUE
[Green diagonal]	ENTERPRISE ZONE
[Blue diagonal]	EXISTING EMPLOYMENT -- COMMERCIAL
[Pink diagonal]	EXISTING EMPLOYMENT -- INDUSTRIAL
[Green diagonal]	EXISTING EMPLOYMENT -- RETAIL
[Yellow diagonal]	TOWN AND CITY CENTRES

ISSUE	AMENDMENTS	DRAWN	CHECK	DATE



Llywodraeth Cymru
Welsh Government

PROJECT
CARDIFF METRO

TITLE
**SPATIAL MODEL
METRO INTERVENTIONS**

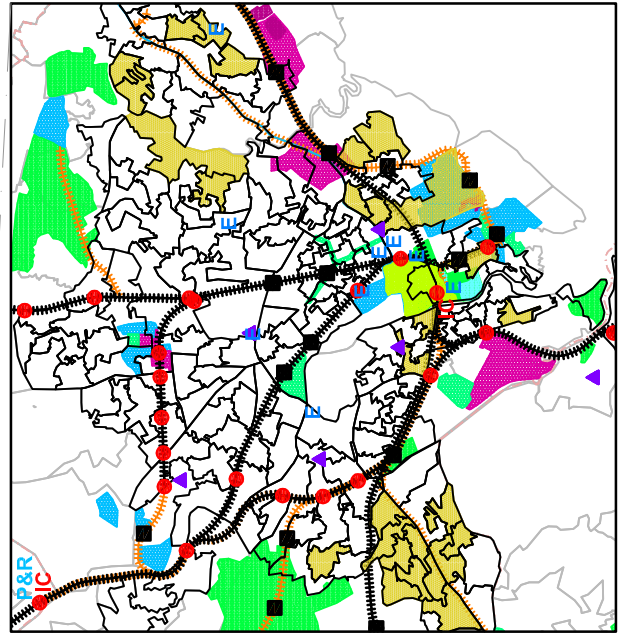
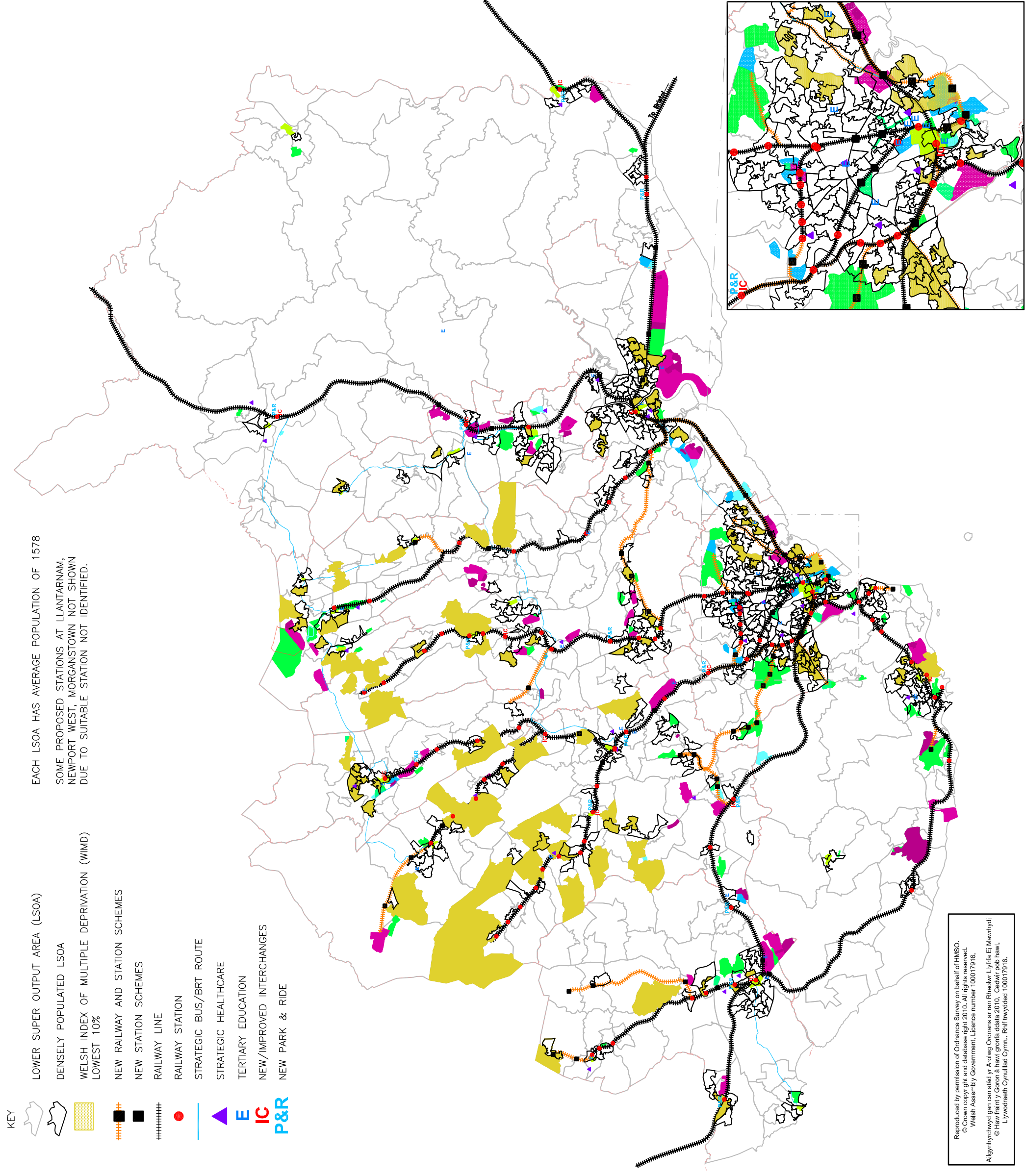
PURPOSE
INFORMATION

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CHECKED D. McCALLUM	DATE SEPTEMBER 2013	PROJECT No. CS/060195
DRG. No. CS/060195/01	REVISION REF.	



KEY

[White outline]	LOWER SUPER OUTPUT AREA (LSOA)
[Yellow outline]	DENSELY POPULATED LSOA
[Yellow hatched]	WELSH INDEX OF MULTIPLE DEPRIVATION (WIMD) LOWEST 10%
[Orange dashed]	NEW RAILWAY AND STATION SCHEMES
[Black dashed]	NEW STATION SCHEMES
[Black solid]	RAILWAY LINE
[Red dot]	RAILWAY STATION
[Blue line]	STRATEGIC BUS/BRT ROUTE
[Purple triangle]	STRATEGIC HEALTHCARE
[Blue triangle]	TERTIARY EDUCATION
[Blue triangle]	NEW/IMPROVED INTERCHANGES
[Blue triangle]	NEW PARK & RIDE

EACH LSOA HAS AVERAGE POPULATION OF 1578

SOME PROPOSED STATIONS AT LLANTARNAM, NEWPORT WEST, MORGANSTOWN NOT SHOWN DUE TO SUITABLE STATION NOT IDENTIFIED.

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Supporting documents:

- Appendices to Main Report
- Metro Interventions Appraisal Report
- Metro Modal Study
- Regeneration and The Metro
- Station Design Guidelines (Ebbw Vale)
- Metro Funding and Financing Independent Advice
- Metro Economic Impacts

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



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