



South Wales Metro

Status, Challenges & Opportunities

For Rail Futures

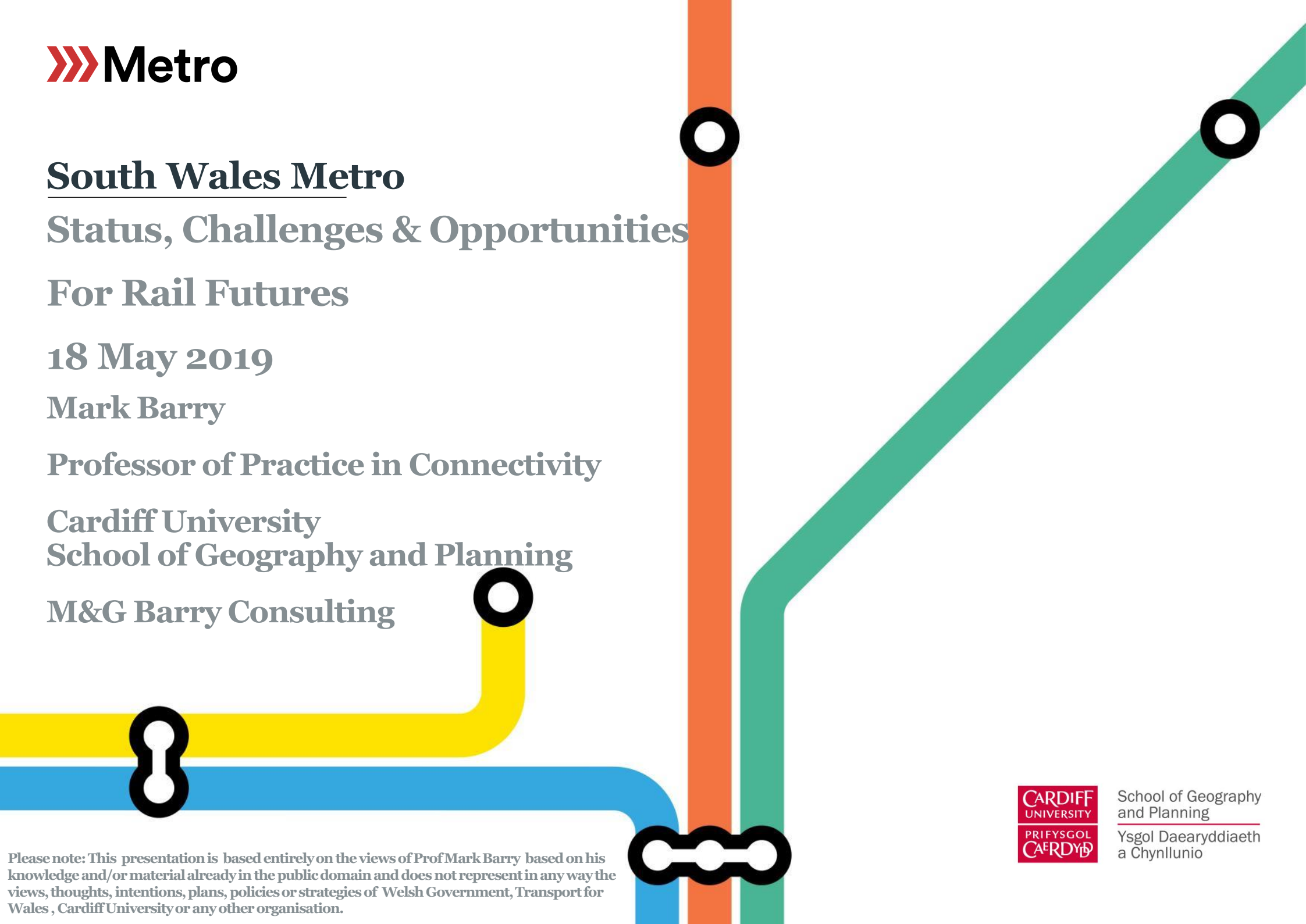
18 May 2019

Mark Barry

Professor of Practice in Connectivity

Cardiff University
School of Geography and Planning

M&G Barry Consulting



Please note: This presentation is based entirely on the views of Prof Mark Barry based on his knowledge and/or material already in the public domain and does not represent in any way the views, thoughts, intentions, plans, policies or strategies of Welsh Government, Transport for Wales, Cardiff University or any other organisation.



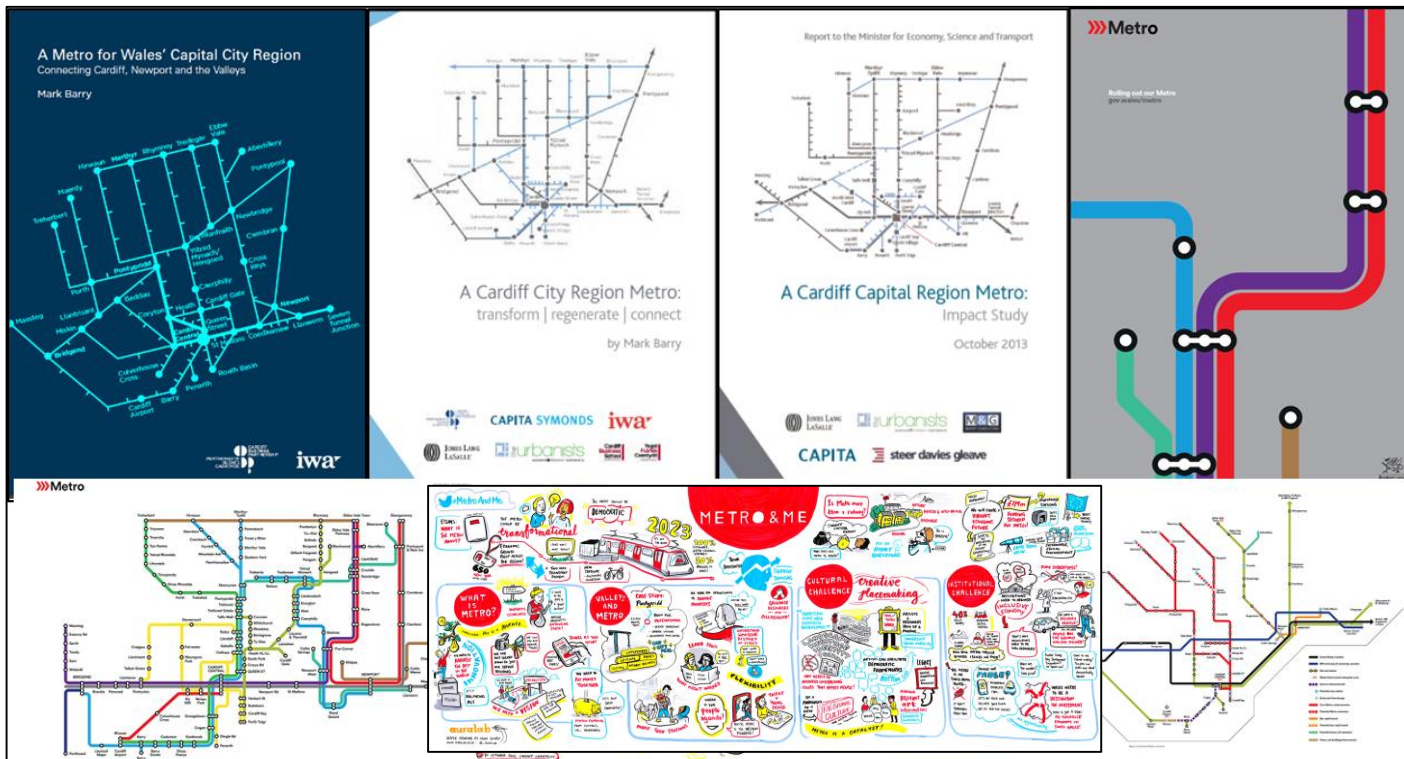
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Mark Barry, Professor of Practice in Connectivity (*part time*) at Cardiff University's School of Geography and Planning

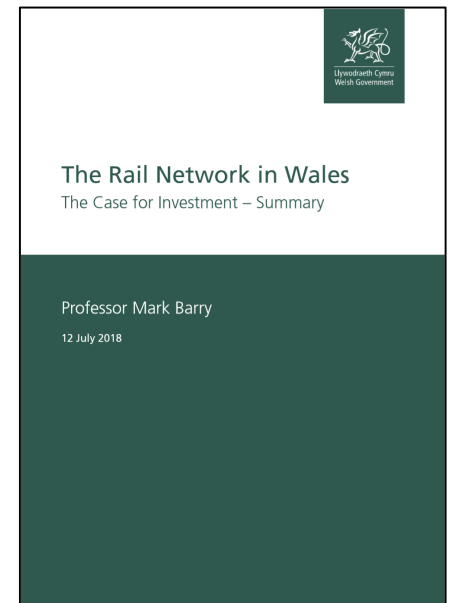
I have been working on #southwalesmetro since 2010

Led its development for Welsh Ministers 2013-2015

Now working with Welsh Government to develop the case for further investment in Welsh Rail



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<https://beta.gov.wales/sites/default/files/publications/2018-12/the-rail-network-in-wales-case-for-investment.pdf>

<https://swalesmetroprof.blog/2018/12/12/wales-rail-network-the-case-for-investment/>

What I'll try and cover today

- > A little history...
- > Strategic context
- > 2015 Metro Vision
- > What's happening now
- > Wider challenges and opportunities
 - Climate Change
 - Economic Development
 - Transit Oriented Development
 - Extendibility & TOD
- > The Case for Rail Investment

Why Metro...(from my 2012,13,14 etc...presentations)

- > Connecting more people, to more places
- > Enabling development & regeneration.
- > Modal shift & lower CO₂.

*To address issues of economic inactivity,
deprivation and poverty*

*And deliver a sustainable, economically
dynamic city region of 1.6 M people.*

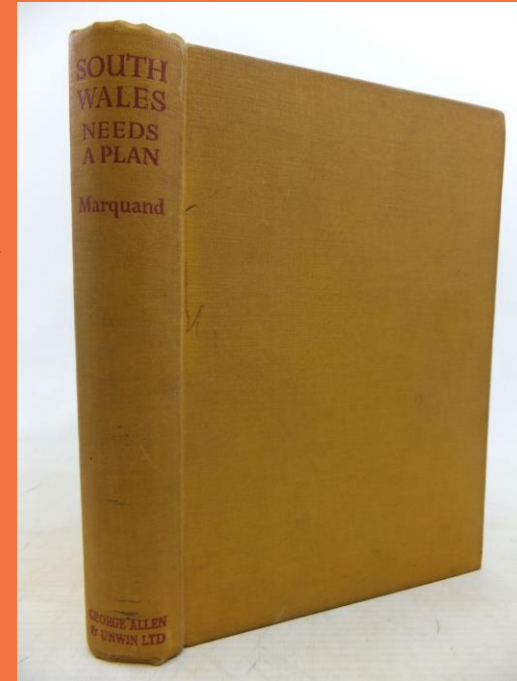
...not a new idea, from, “South Wales Needs a Plan”, by H A Marquand published by George Allen & Unwin Ltd in 1936!

“ ... a more rapid movement of population up and down the valleys must be encouraged, so as to save the inhabitants of the northern towns from economic isolation. How that rapidity of movement can best be secured should be decided by an authority responsible for a co-ordinated transport service throughout the Region. No such authority exists. (p48)

“... perhaps the Ministry of Transport could be asked to report whether it would be best to electrify the railways.”

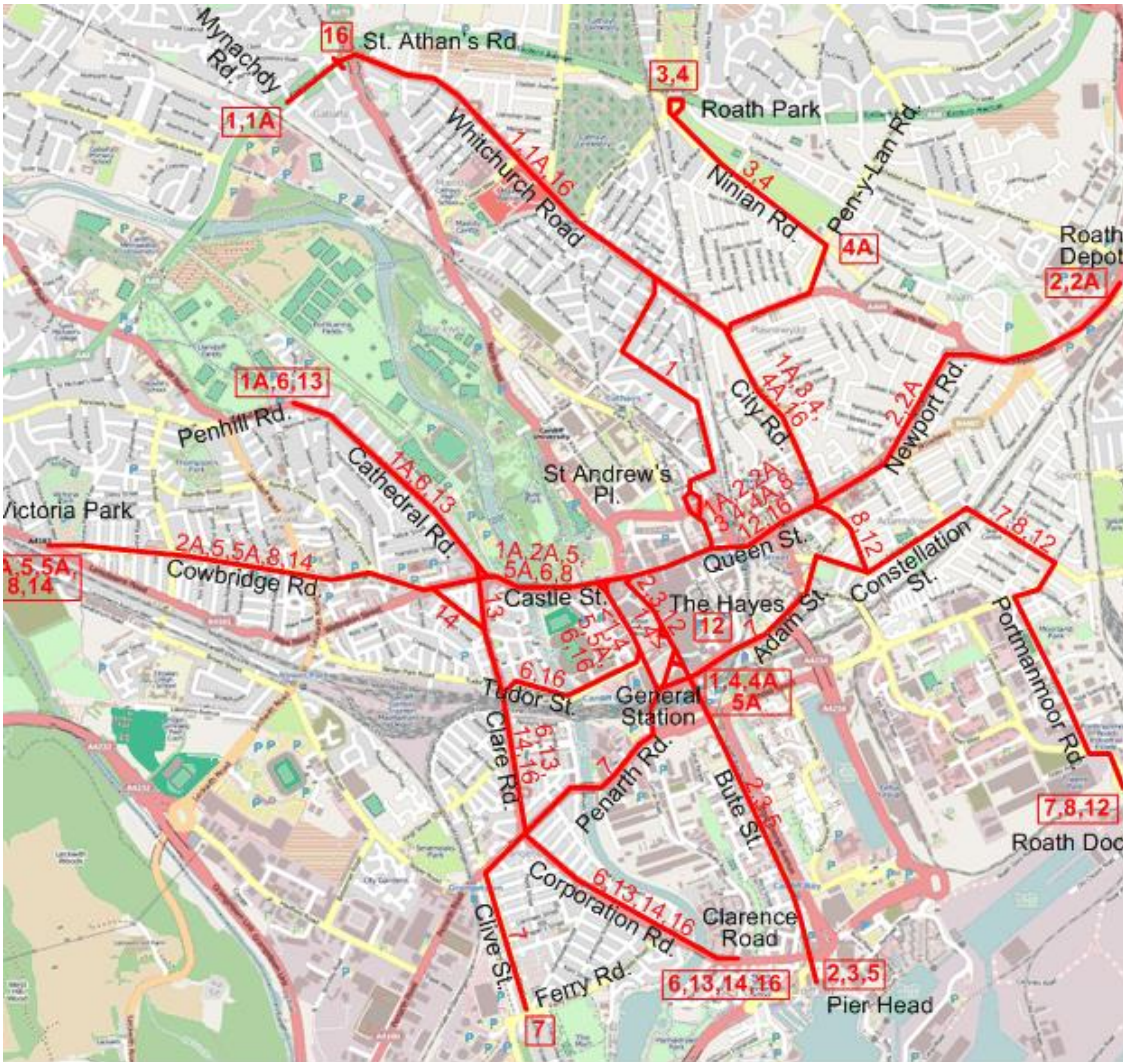
“With rapid transport, it should be no more difficult for workers from Aberdare or Ebbw Vale to reach Cardiff or Newport than it is for clerks to travel to their daily work in the City of London from Wimbledon or Ealing”

...” political and social institutions have failed to adopt themselves with sufficient rapidity to the economic changes that have taken place. One small symptom of this is the maintenance of local government boundaries which have long lost their significance and of authorities which are inadequate to the larger tasks which need to be undertaken.”(p209)



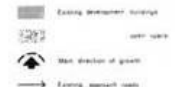
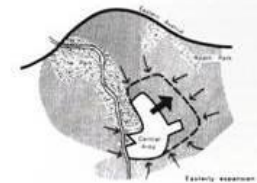
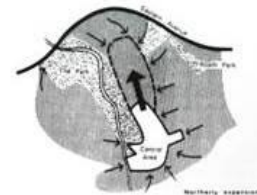
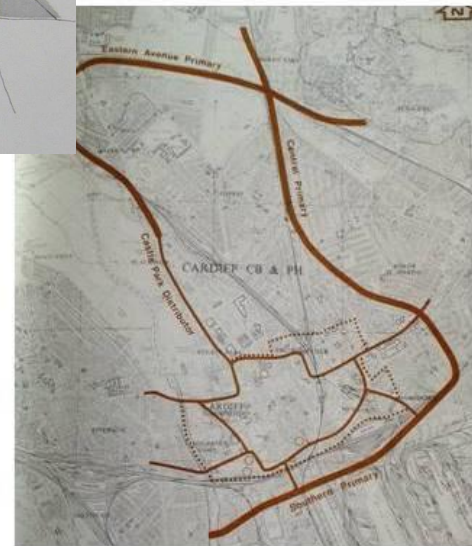
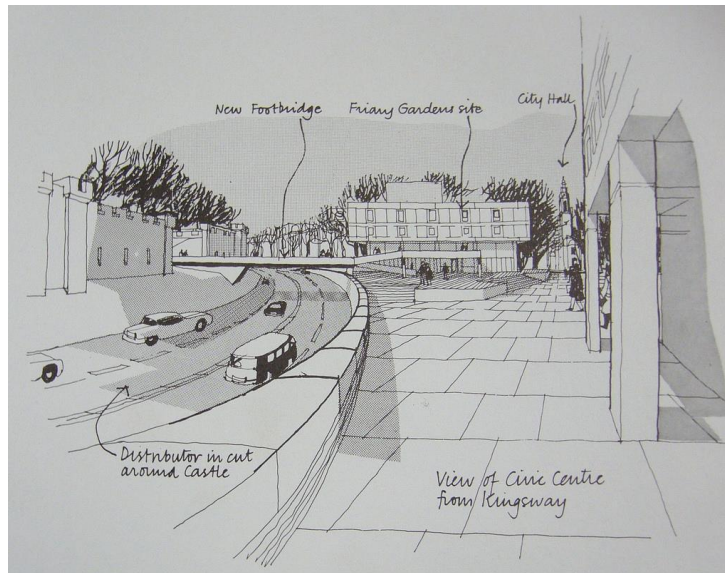
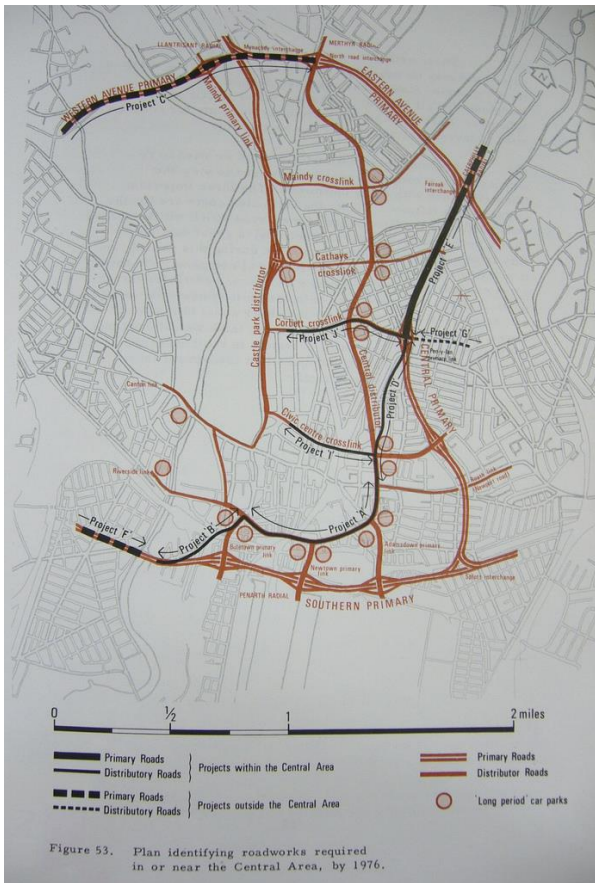
Cardiff Tram Network 1929 and South Wales Rail Network 1910

Doh!



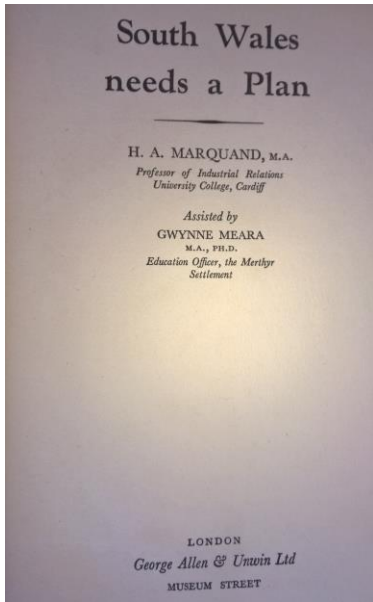
1950s...onwards!

> Then came cars, roads, motorways....

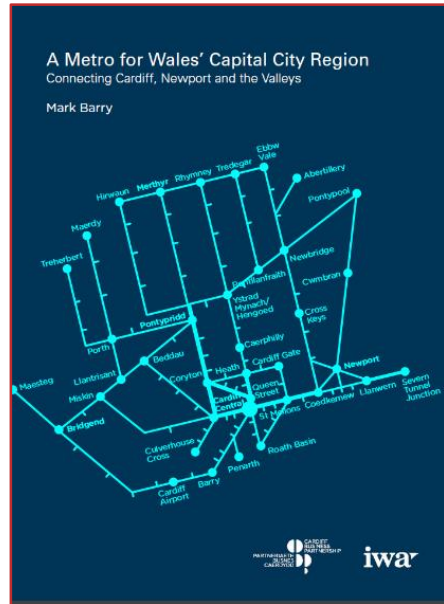


> ...and now reflections

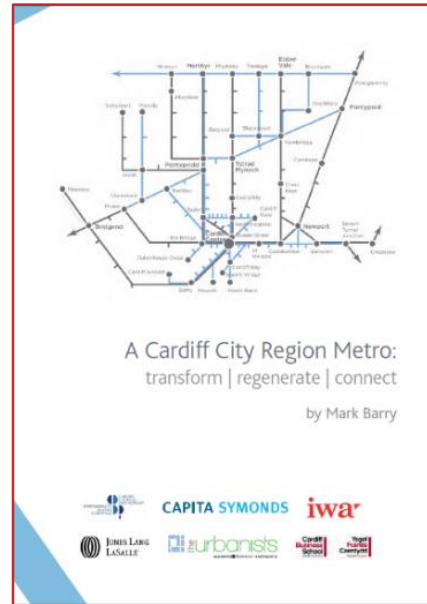
Metro, its been a long journey...



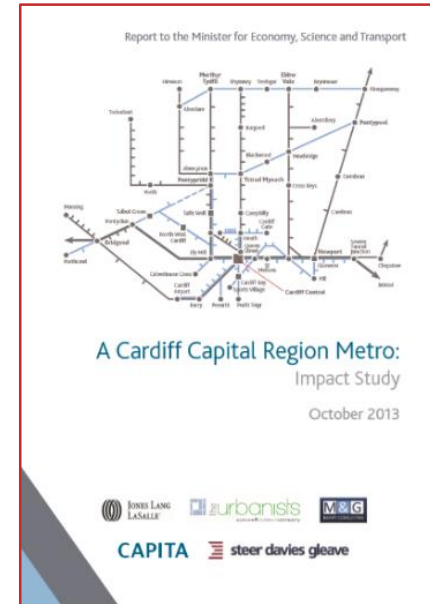
1936....



2011



2013



2013



2015.....



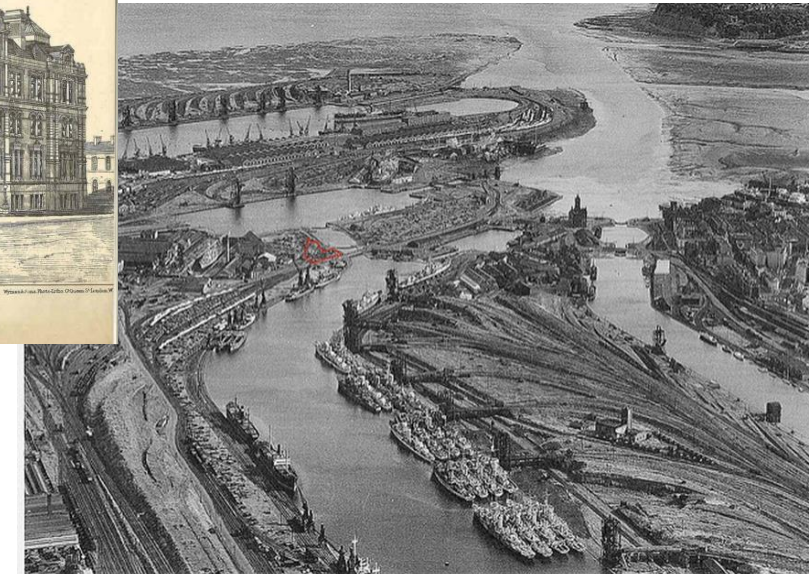
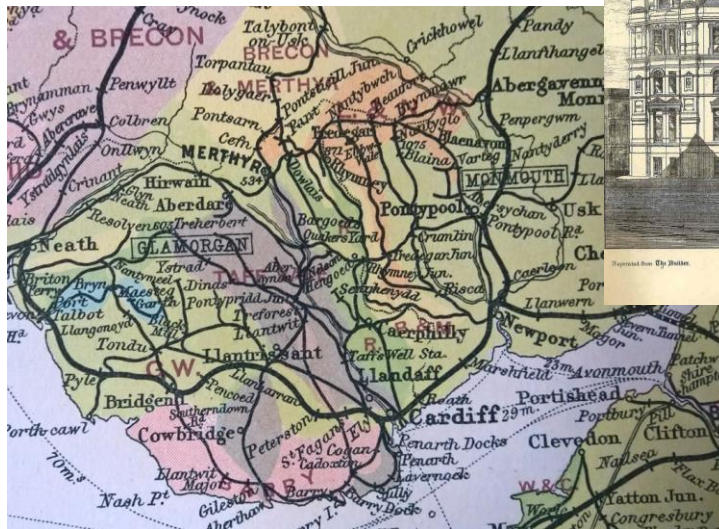
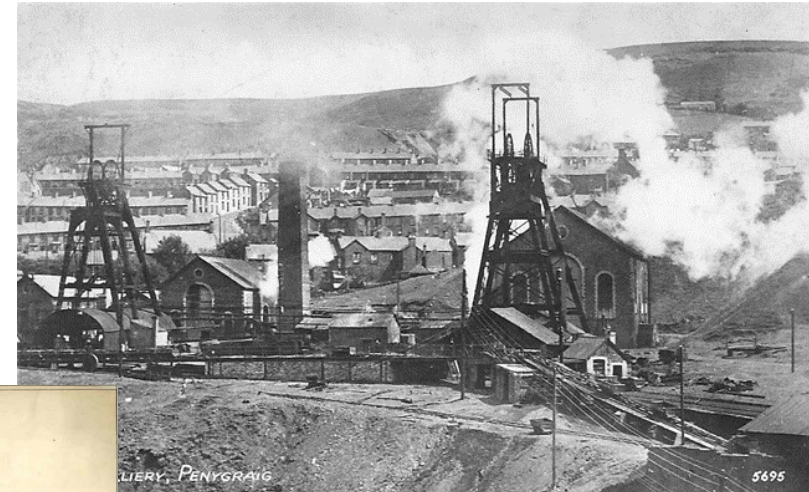
2018, 19....stuff is now happening!

Metro Strategic Context



Metro: *The regional and economic context*

- > Was industrial power house...
- > Coal
- > Whole region benefitted

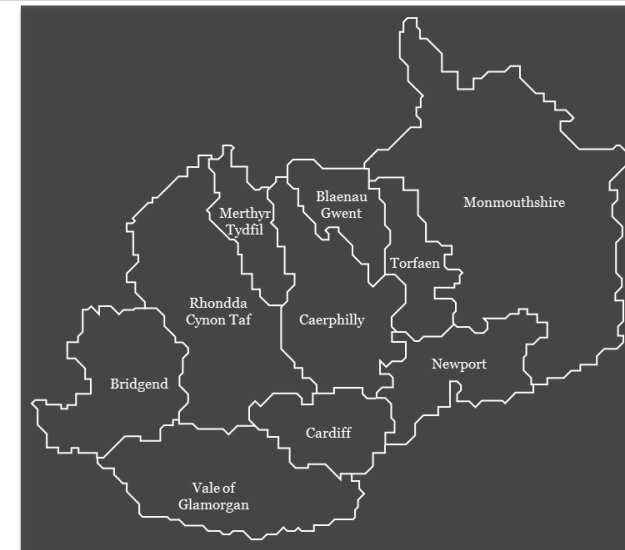
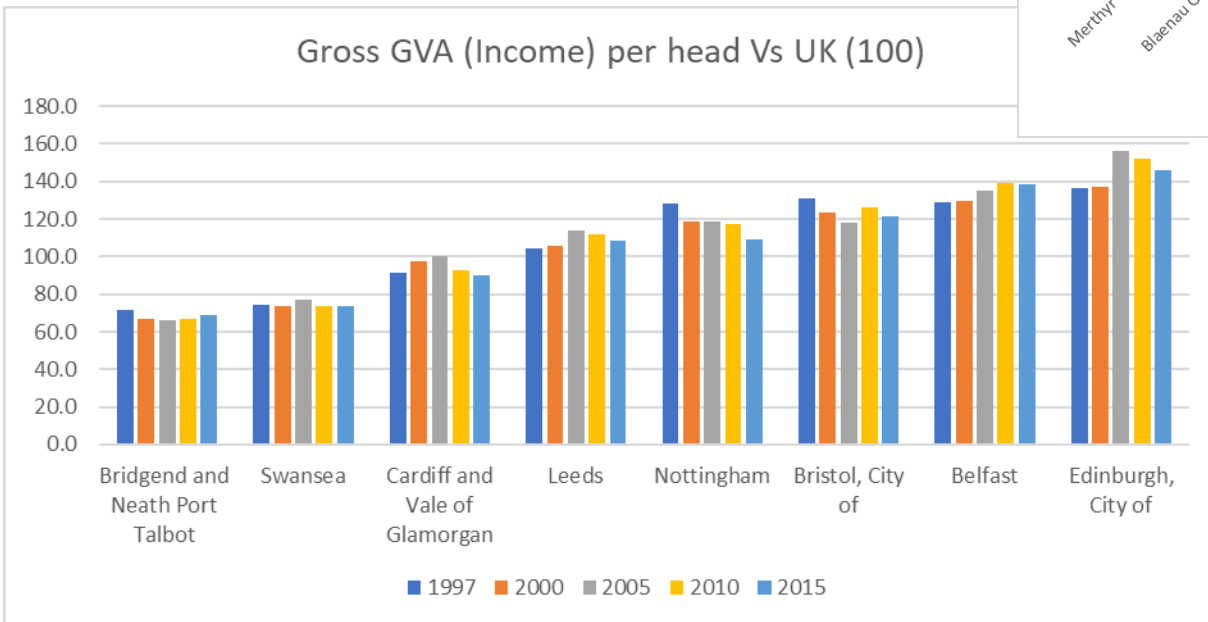
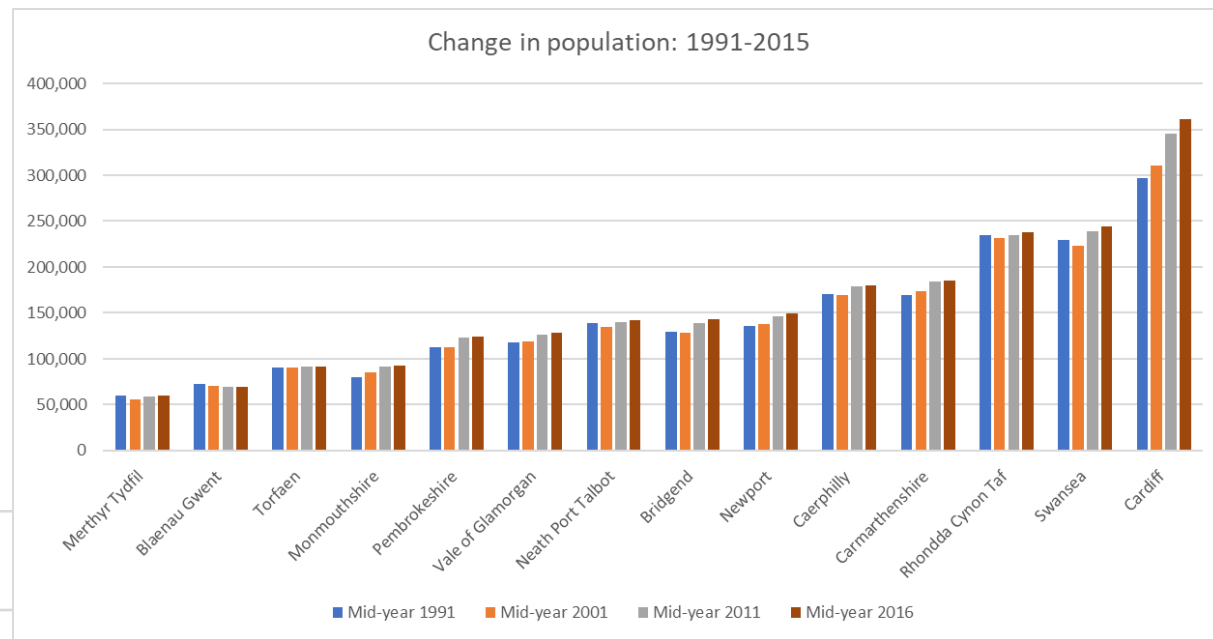


Metro: *Current regional and economic context*

- > Industrial decline in parts
- > Disengagement
- > Brexit
- > Local Government changes
- > Where am I from...
- > Valley Vs Valley Vs Cardiff
Vs Coast Vs Rural



Cardiff... ...not the “Emerald City”

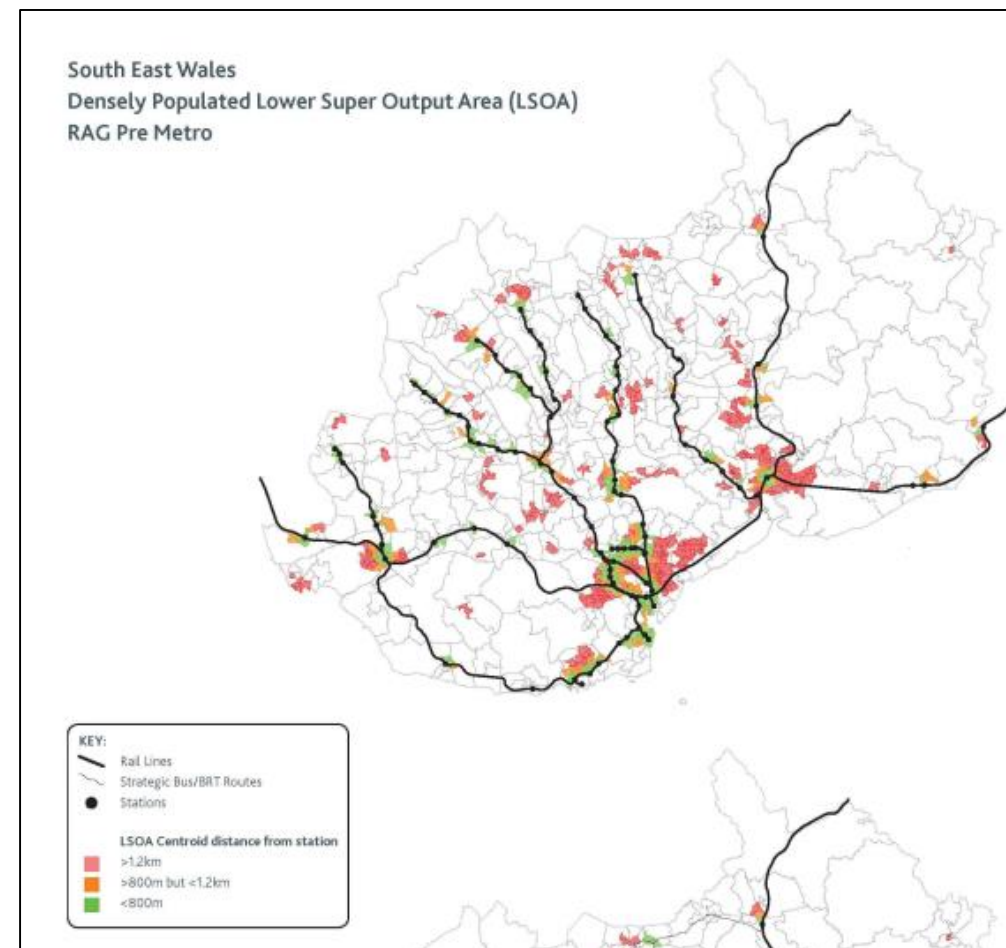
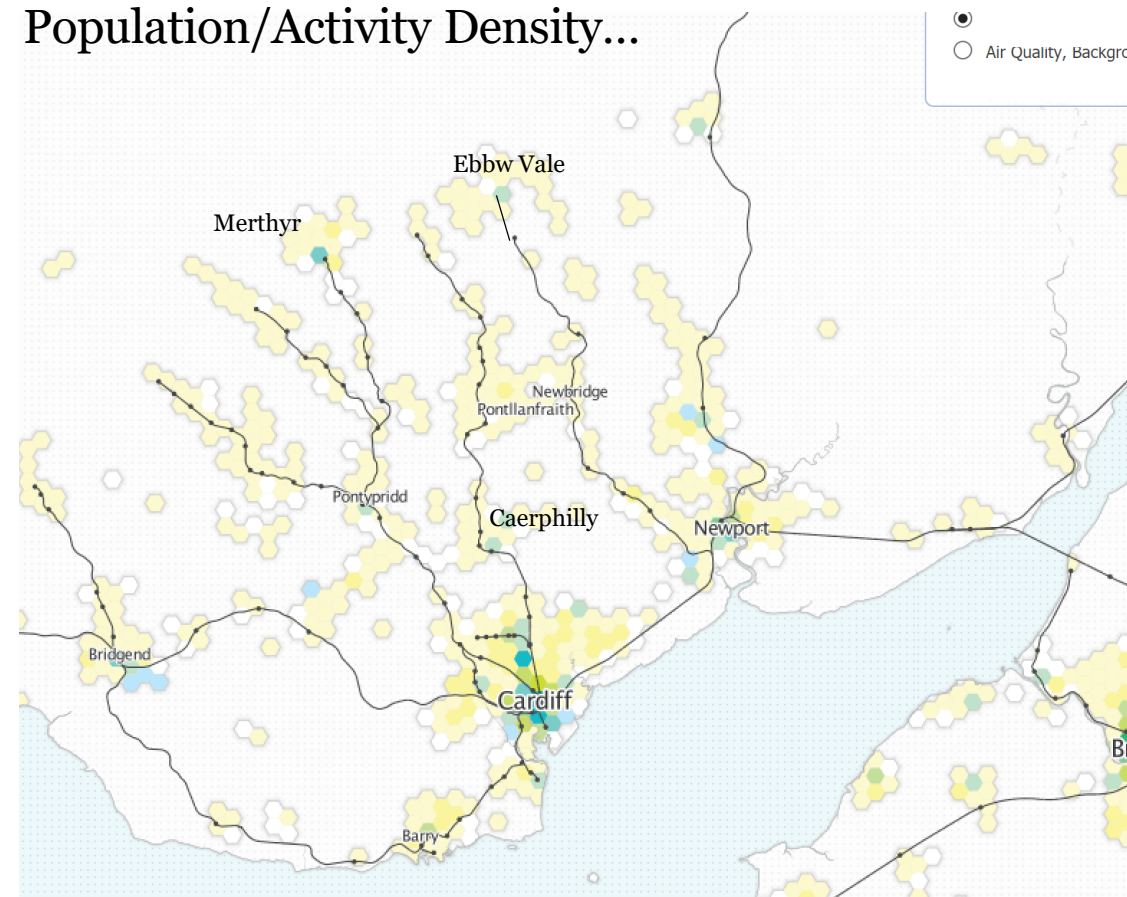


- > GVA/Capita low vs other UK cities
- > Fastest growing population...365k now and expected to exceed 400k in less than ten yers
- > Increasing congestion and accessibility issues
- > We need a regional response...

Metro: *To improve regional accessibility*

- > Need more efficient labour market across all SE Wales
- > To/from Cardiff, Newport, Pontypridd, Merthyr, Bridgend, etc - its not just about commuting to Cardiff
- > After next Phase of Metro LT 25% of pop. of Cardiff will be LT 800M from Metro station with GT 4 tph..
- > ...this constrains employment catchment of places like Newport, Bridgend, Barry, Pontypridd, etc...

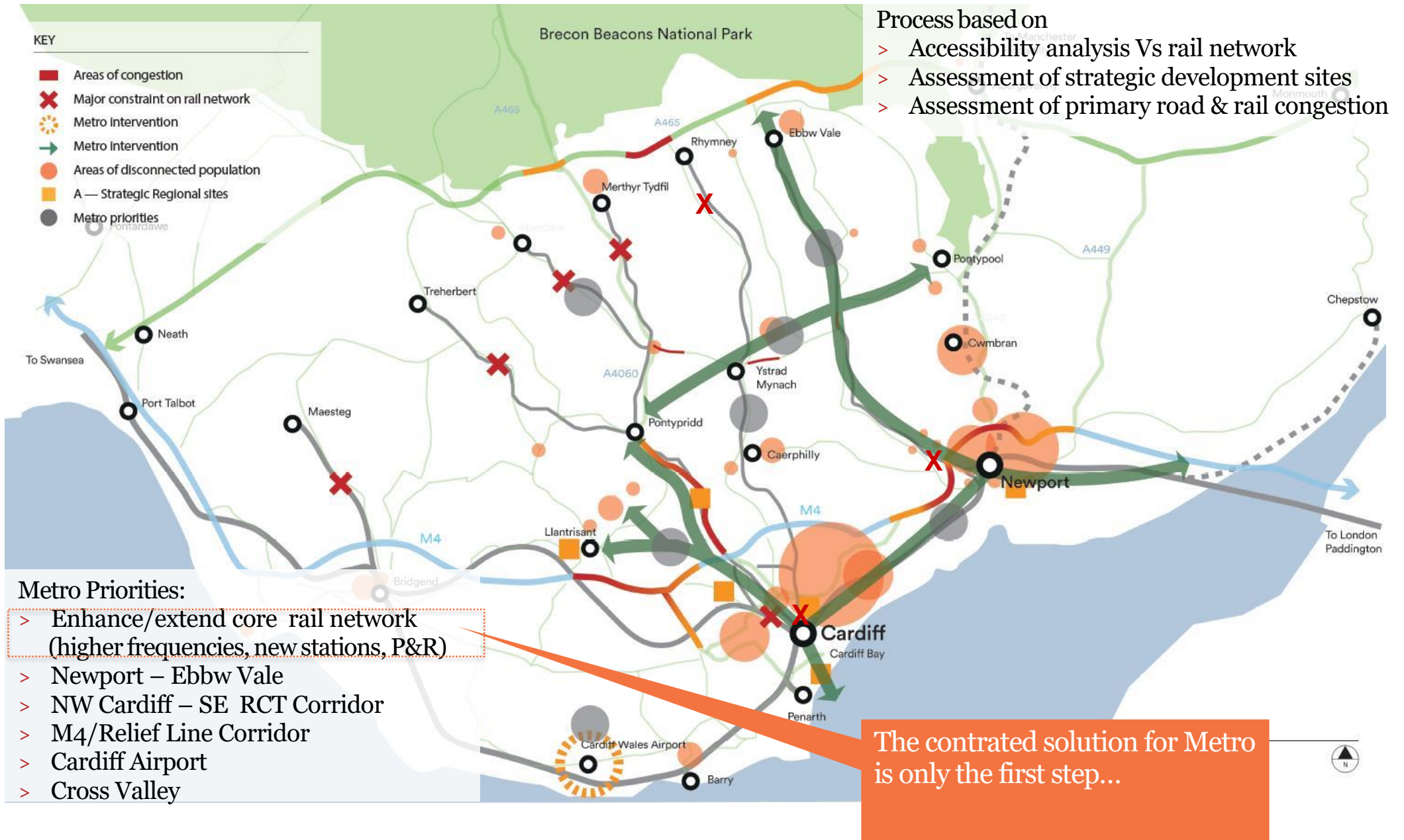
Population/Activity Density...



Credit: Duncan Smith, at the Centre for Advanced Spatial Analysis, University College London
Lumino City http://luminocity3d.org/indexRetina.html#population_density_2011/11/51.6998/-3.9579

Source, Metro Impact Study 2013, WG/Metro Consortium

2013 Metro Impact Study Priorities Vs current plan



South Wales Metro 2015 Vision...

Announced by
The First Minister
November 30th 2015

www.gov.wales/metro

BRIEFING FOR THE FIRST MINISTER : DC/FM-01076/15

Metro Public Awareness Campaign Launch – Pontypridd Station
Monday 30th November 2015, 14:03-15:25

Event
The First Minister will visit Pontypridd station to mark the start of the Metro awareness campaign (new website, brochure and marketing).
Speaking notes are provided at Doc 1.

Running Order

Time	Activity	Officials present
14:03	First Minister boards train at Cathays station. Broadcast media invited to travel with First Minister. Broadcast interviews on train.	Mark Barry
14:15	Guests arrive at Pontypridd Station and are directed to launch area between platform 1 and 2.	Matthew Penryman and Stephanie Ferry to meet and direct LA leaders. Anna Miller (Press Office) to meet/direct journalists.
14:25	First Minister arrives at Pontypridd Station. MB to direct FM to launch area.	Mark Barry, James Price, FM's press officers, Private Secretary.
14:30	First Minister's speech. Lectern and PA system will be provided.	
14:40	Meet and greet with LA leaders/photo opp.	
15:09	First Minister leaves Pontypridd Station by train to go to Llandaff	
15:25	First Minister arrives at Llandaff station	


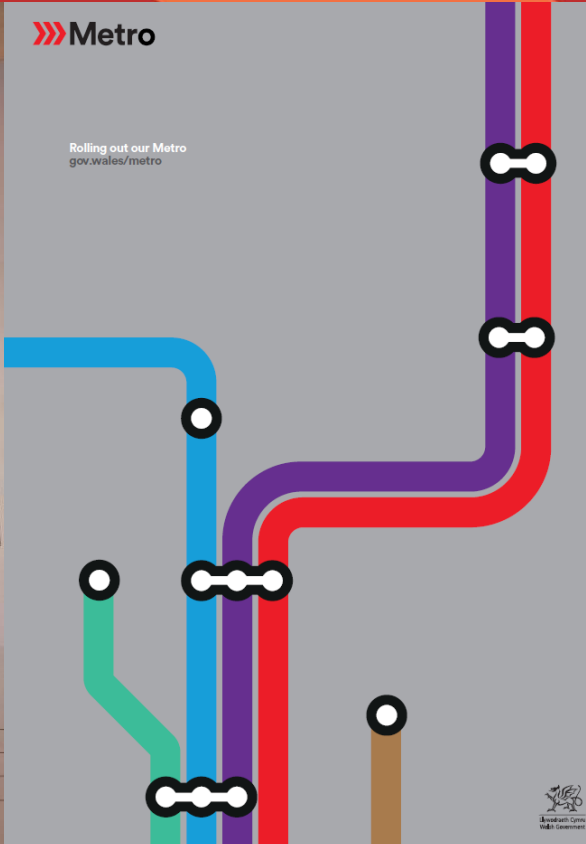
Attendees
Local Authority leaders from the Metro area are being invited to attend, along with Ian Bullock, Managing Director of Arriva Trains Wales.
Sam Hodge (MCA)

Additional information (amend as necessary)

Doc.1 Speaking notes

Drafted by (& contact number)	Mark Barry 07771 893292
Name & Mobile Number of Organiser at the event (on the day):	Mark Barry 07771 893292
Name & Mobile Number of Official Attending the event (on the day):	Mark Barry 07771 893292

Metro
Rolling out our Metro
gov.wales/metro

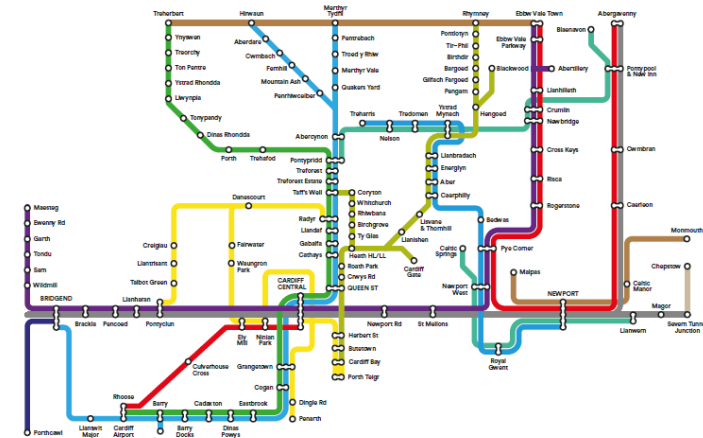
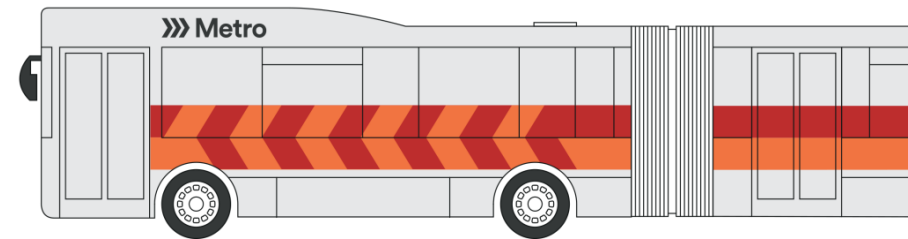
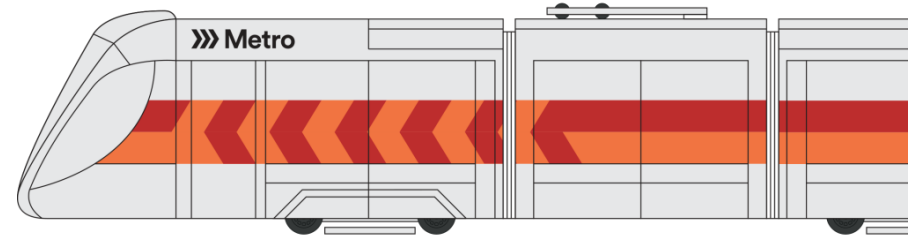
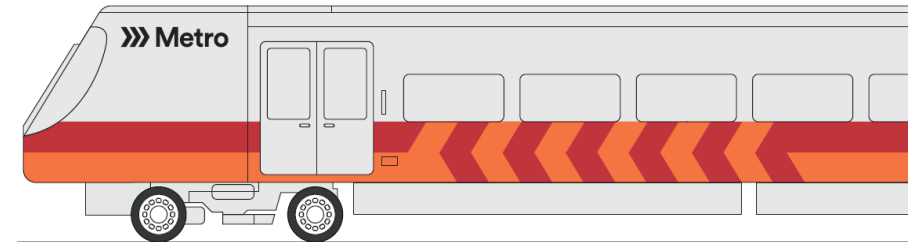


2015 Metro Vision...



Metro could include one/all of:

- > Heavy Rail
 - > Light Rail
 - > Bus Rapid Transit
-
- > Faster
 - > More frequent
 - > Extendable
 - > Integrated
 - > Enabling development & regeneration



***Metro is the pivotal City
Region Project***

What is happening now?



Metro Rolling Stock... Overview...

New trains summary - over 50% will be assembled in Wales



Requirement	Fleet Solution	Units	Depot
W&B	Rural and Suburban	CAF Civity DMU 51 x 2car 26 x 3car	Chester and Machynlleth
	South Wales Metro	Stadler Flirt DEMU 11 x 4car	Cardiff Canton
Central Metro	Rhymney Valley	Stadler Flirt Tri-mode MU 7 x 3car 17 x 4car	Cardiff Canton
	Treherbert, Aberdare and Merthyr Tydfil	Stadler Citylink Metro Vehicles 36 x 3car	MV depot



What are “Metro Vehicles”?

Tram-train LRVs...

KEOLIS amey



TRAFNIDIAETH CYMRU
TRANSPORT FOR WALES



Metro-Vehicles

Electric LRVs for Treherbert/Aberdare/Merthyr Tydfil <> Cardiff Central/Bay

- 36x40m articulated Metro Vehicles that can be coupled to form 80m trains
- Main power source 25kV overhead line but also operates from battery
- Capacity of 257 with seats for 129
- Capable of on-street line-of-sight ‘tramway’ operation.



Metro Vehicles:

Light Rail Vehicles (level boarding, reduced dwell times, faster acceleration)

Able to operate on existing rail to HR Standards; on existing rail to “LR standards” and on street using “tramway standards”

Extensions easier and less costly than HR if applied using tramway standards (tighter radii and steeper gradients)

Bi-mode capability – est 4Km without catenary power

Journey Times/Frequency comparisons

Current Vs TfW Proposals...

What this means for passengers

A really big change in frequency, journey time and capacity



Journey	Trains per hour now	2023 Trains per hour	Journey time now (mins)	2023 Journey time (mins)	2019 AM peak capacity	2023 AM peak capacity	% change
Treherbert > Queen St	2	4	57	46	1206	2570	+113%
Aberdare > Queen St	2	4	57	43	1516	2056	+36%
Merthyr Tydfil > Queen St	2	4	56	44	1326	2313	+74%
Treherbert > Bay	-	2	72 inc. change	50 (direct)	-	-	-
Aberdare > Bay	-	2	72 inc. change	47 (direct)	-	-	-
Merthyr Tydfil > Bay	-	2	71 inc. change	48 (direct)	-	-	-
Pontypridd > Queen St	6	12	26	22	4048	6939	+71%
Rhymney > Central	1	4	61	48	2542	3495	+37%
Caerphilly > Central	4	6	19	16	2542	4452	+75%
Coryton > Central	2	2	18	20 (extra stop)	603	957	+59%
Penarth > Central	4	4	12	11	1856	1914	+3%
Barry > Central	4	5	24	23	2094	2857	+36%

TRAINS PER HOUR IS THE STANDARD WEEKDAY DAYTIME PATTERN. AM PEAK MEASURED 07:30 – 08:59. EXTRA STOP IS AT CRWYS ROAD.

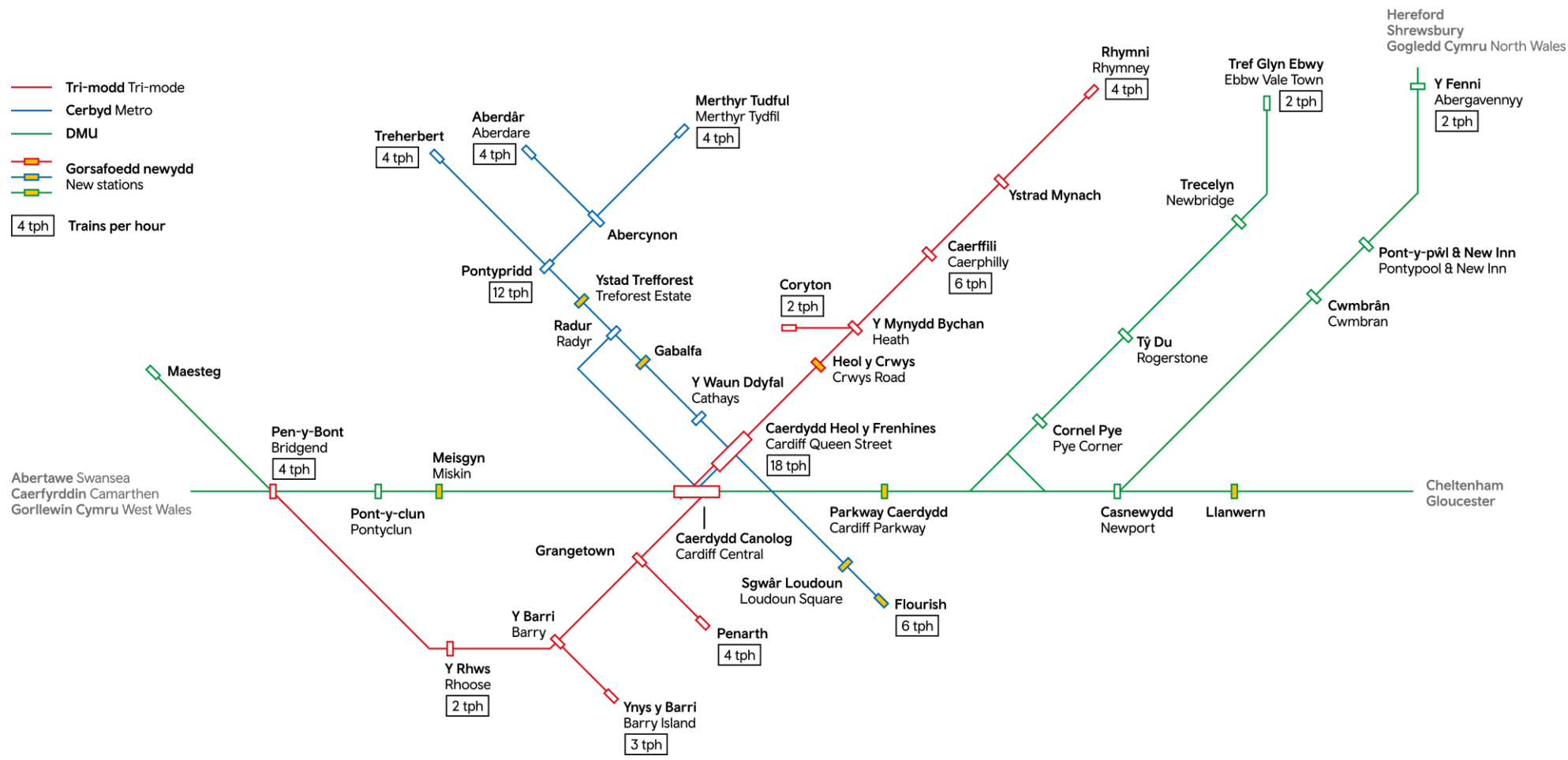
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***More frequent & faster servicesand about double network capacity
Is that enough?***

Metro Network...

Next Phase to 2023...

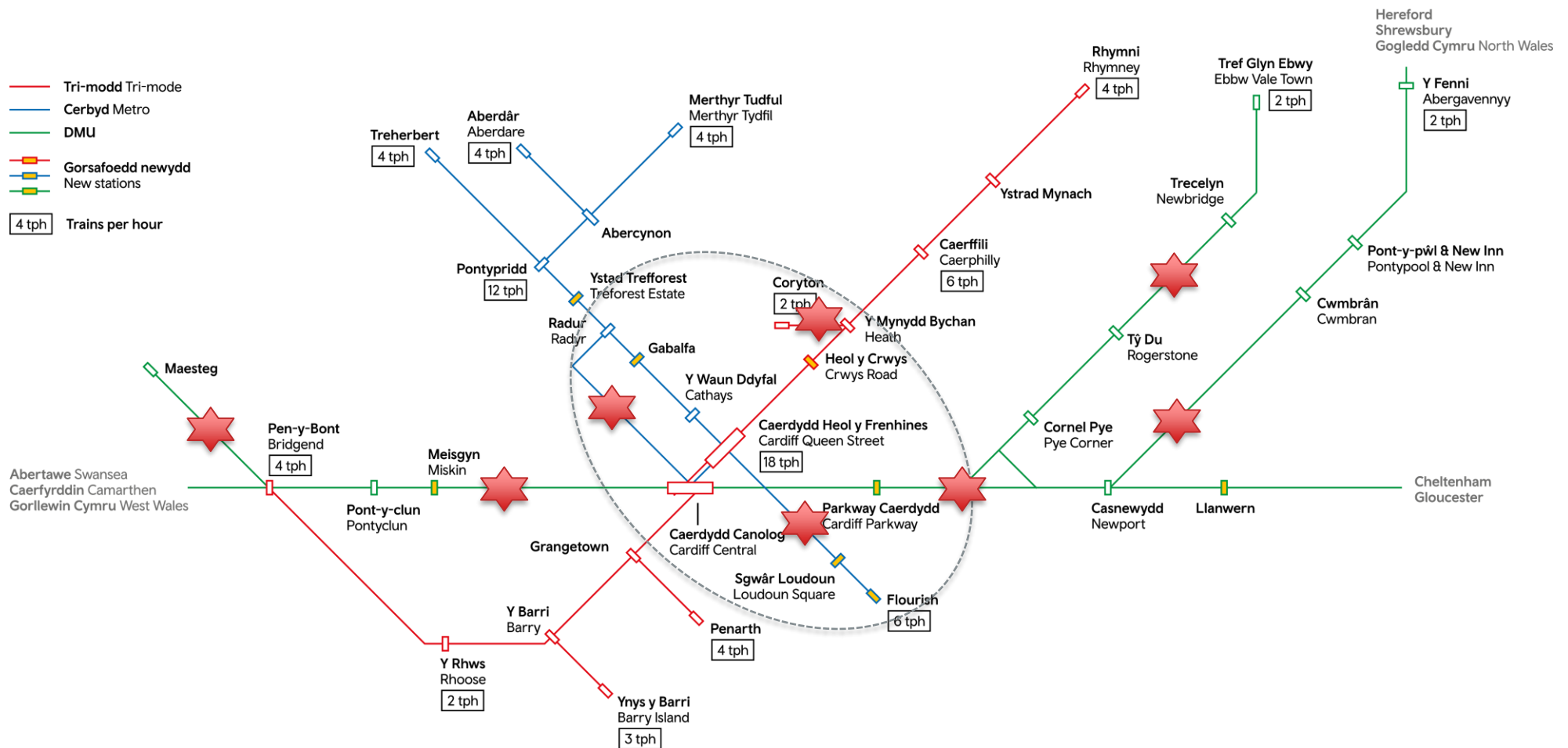
Metro De Cymru (rheilffordd) erbyn 2023 South Wales Metro (rail) by 2023



Metro Network...

Next Phase to 2023... but with some o/s challenges ★

Metro De Cymru (rheilffordd) erbyn 2023
South Wales Metro (rail) by 2023



Wider challenges...
and opportunities.



Climate Change

> Existential threat...

Commuting

Changes in commuting mode in Wales, 2003-2017

Mode	2017 Mode share	2003-2017 Percentage change in use of each mode and change in average journey time
Car	81%	↑ +9% ↑ +4 mins
Walk	8%	↓ -18% ↑ +5 mins
Bus	4%	↓ -7% ↑ +7 mins
Train	4%	↑ +212% ↑ +7 mins
Cycle	2%	↑ +46% ↑ +4 mins
Car share		Driver ↑ +24% Passenger ↓ -51% Sometimes driver, sometimes passenger ↓ -21%

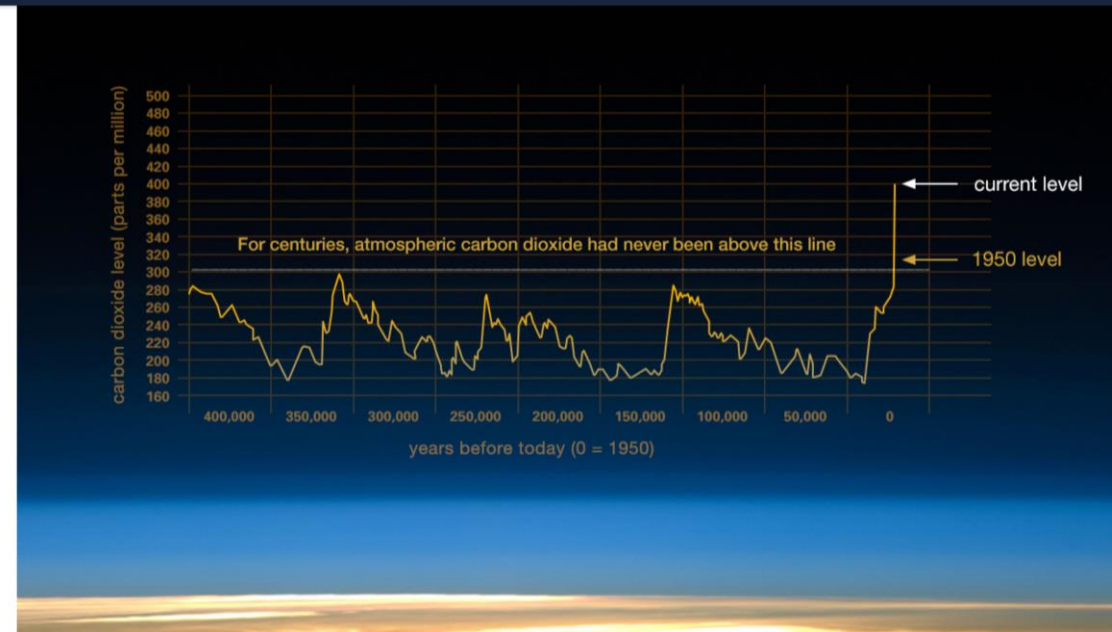
Source: Commuting Statistics, Department for Transport



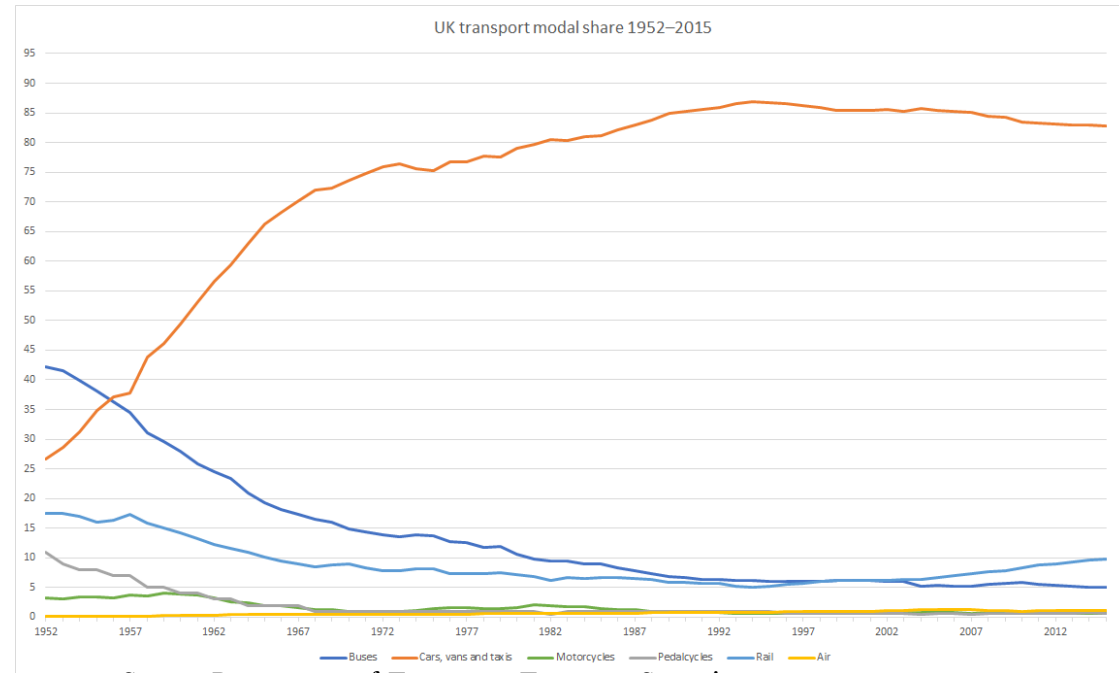
<https://senedresearch.blog/2019/04/30/devolution-20-travel-in-wales-is-there-a-revolution-still-to-come/>

> The answer is not replacing all our current cars with electric cars....

> But much, much more PT and AT



Source, NASA: <https://climate.nasa.gov/evidence/>



Source, Department of Transport, Transport Stats since 1952 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/482670/tsgbo101.xls

Metro: A Stratified Economic Development Strategy...



Focus on strategic locations most likely to engage private sector; each with its own regionally complementary proposition, perhaps:

- > Cardiff City Centre & Bay...
- > Pontypridd/Treforest
- > NW Cardiff to Talbot Green
- > Newport/Llanwern
- > Ebbw Vale
- > Bridgend
- > Merthyr
- > Barry
- > Mid Valleys

...and an innovative economic development / regeneration approach in communities that are not regional employment hubs

Role for innovation in ideas re foundational and circular economies

Transit Oriented Development... What is it?

Principles and Benefits...

Many examples of how these are defined

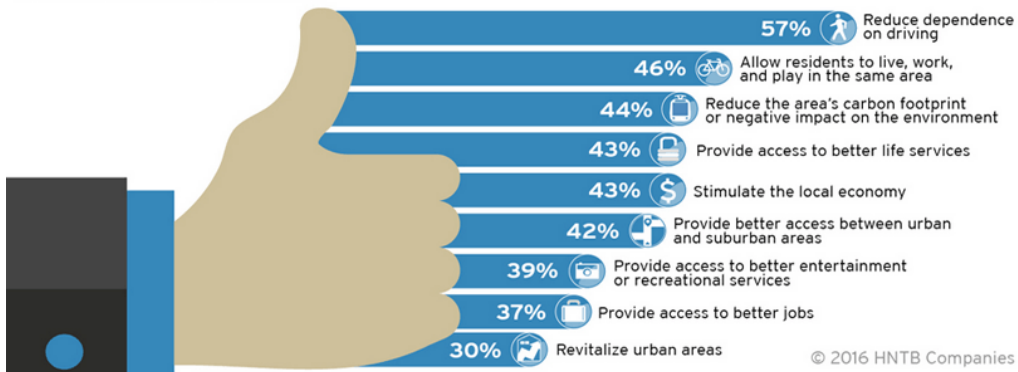


<p>Compact Development</p> <ul style="list-style-type: none"> • Ensure utilization of incentives • Avoid overloading of infrastructure • Extend benefits of incentives to areas with potential for growth • Meet market demands for residential and commercial development 	<p>Street Design and Access</p> <ul style="list-style-type: none"> • Improve quality of streets • Improve quality of public spaces • Strengthen proposals of the Safe Access Proposals 	<p>Area Character</p> <ul style="list-style-type: none"> • Protect existing character • Ensure a mixed income bracket for housing • Enhance the existing nodes • Reduce conflicts between auto-oriented and pedestrian-friendly uses and activities
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TOD Principles

BENEFITS OF TRANSIT ORIENTED DEVELOPMENT

Americans believe transit oriented development provides an array of benefits ranging from lifestyle to environmental to economic.



TOD Can Offer a Wide Range of Benefits Beyond Transit Ridership

<p>Economic development</p> <ul style="list-style-type: none"> • Increases productivity and saves time • Encourages concentration of business activity • Increases economic competitiveness and promotes a green economy • Increases property values and development potential 	<p>Fiscal benefits</p> <ul style="list-style-type: none"> • Savings on cost to build and maintain highways and roads • Generates stronger tax revenues 	<p>Household benefits</p> <ul style="list-style-type: none"> • Savings from reduced cost of driving • Improved access to jobs, schools and other destinations • Promotes health 	<p>Environmental benefits</p> <ul style="list-style-type: none"> • Reduces greenhouse gas emissions • Preserves agricultural land and assists with food security • Promotes energy independence
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Transit Oriented Development...

What is it?

- > No single definition...
- > But perhaps
 - Mixed use and higher density development around transport corridors and stations
 - Aligning new housing and employment sites with transit
 - Improving safety and quality of urban realm - especially streets
 - Integration with active travel
 - Integration with open/green spaces
 - Community engagement and involvement

Its about people, public spaces and public transport

- > Worth a look at:

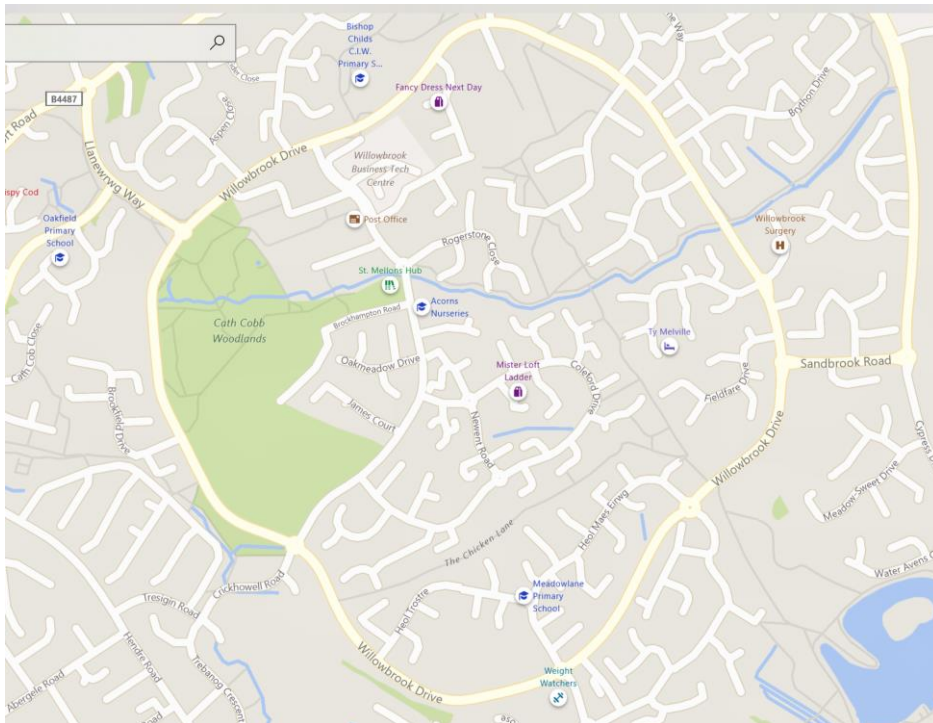
<https://swalesmetroprof.blog/2019/04/25/transit-oriented-development-in-the-cardiff-capital-region/>

<http://www.urbantransportgroup.org/system/files/general-docs/The%20place%20to%20be%20-%20Urban%20Transport%20Group%20FINAL%20WEB.pdf>

Housing in the UK...

This is not sustainable

- > The housing industry has set the agenda for decades
- > We have "bought" the image of the 3 and 4 bed house & garage
- > Many such developments sited away from jobs, services and depend on car ownership/access



Malaga

Like many European Cities – a different way of living

- > About twice the population as Cardiff
- > But smaller footprint
- > Much higher density
- > People comfortable with apartment living
- > Jobs, services, etc - all accessible via active travel or PT



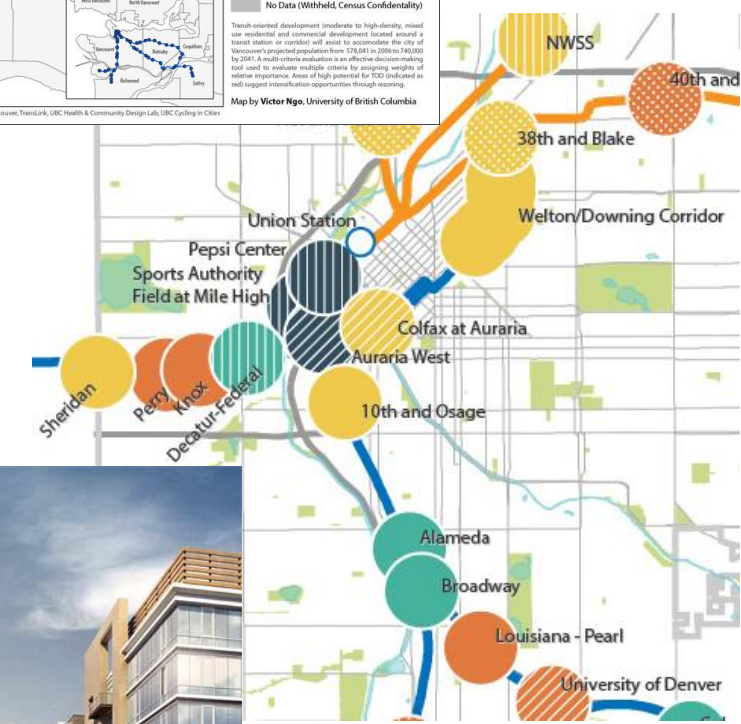
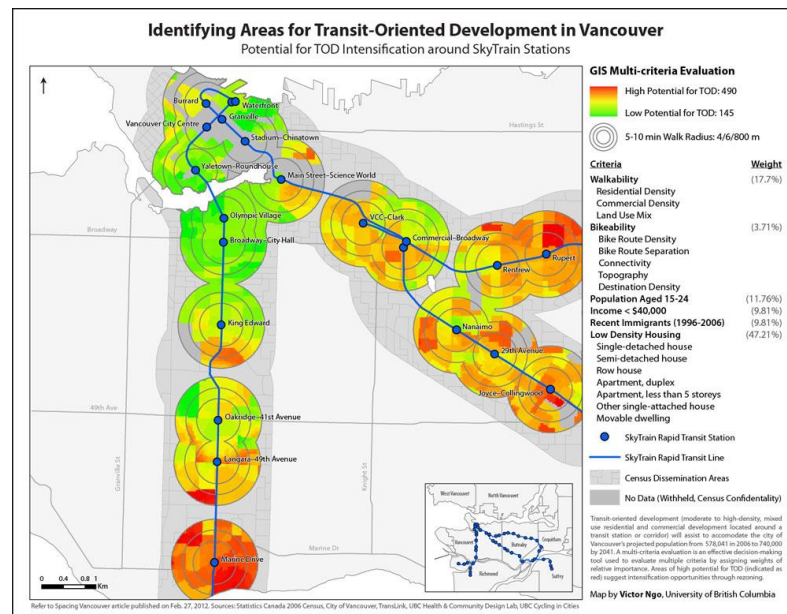
Paseo del Parque



Lessons for Metro... Transit Oriented Development

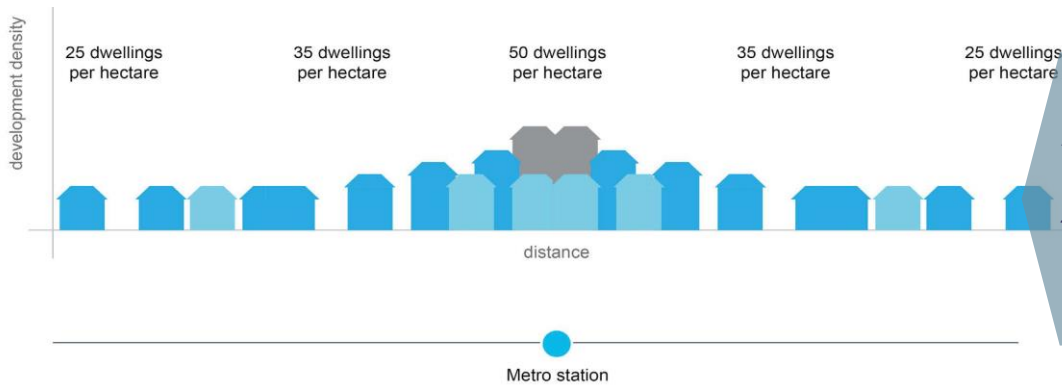
Plenty of examples world wide...

- > Barcelona
- > Vancouver
- > Denver... beginning to happen
(eg Belleview in S Denver)



Lessons for Metro

Better regional planning, urban design & architecture...



Increase development density around Metro stations/corridors – Transit Oriented Development (TOD)

Placemaking/ masterplanning to ensure stations integrate with their communities; Exploit footfall and commercial opportunities



High quality simple design guidelines for Metro stations

Climate Change & Transit Oriented Development...

Immediate impact on Metro thinking?

- > Climate Change and need for more TOD requires Policy direction from WG?
 - much higher PT target (at least 50% mode share ?!)
 - More fiscal measures to discourage car use
 - TOD based densification of existing urban extent
 - All greenfield must be Metro linked or they can't proceed
 - All new public sector/service sites must be on Metro

- > Overall network capacity needs to be looked at to provide headroom.

- > Current mode share into Cardiff ~12% rail and current Metro proposals only double that....do we need to at least double again?!
 - Add further stations to core CVL programme where demand/demographics justifies *dont get distracted by tactical operational or journey time concerns*
 - This will mean accelerated work on further network expansion (rail and bus) – and to exploit the capabilities of tram-train
 - Major network bottleneck's need to be addressed: Cardiff West & Ebbw Valley
 - Key high demand sections to >>4tph asap (inc Coryton & City.....Ebbw Valley, Maesteg)

So What does that means
for Metro...



Metro

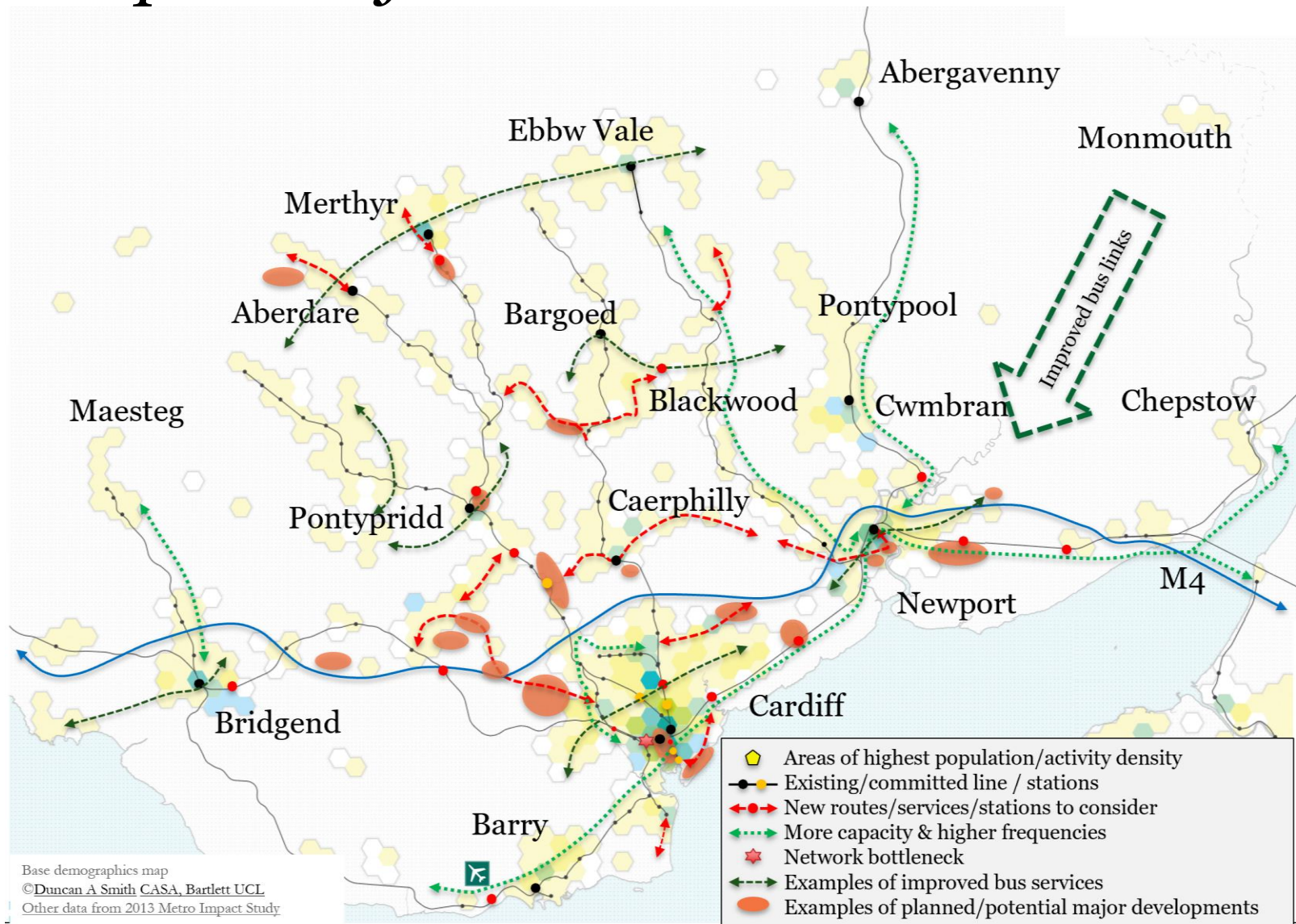
Accelerate Development of Potential Future Phases...?

Rail extensions and further bus integration measures extend reach of Metro network. Major benefits to places like Nelson, Hirwaun, Cardiff west, Cardiff east, Newport, Cardiff Bay, Penarth and Barry

- > Further employment accessibility benefits
- > Opens up new sites and locations for development and regeneration
- > Further model shift to Public Transport

This will deliver a truly joined up regional network that will enable a wide range of benefits set out in the 2013 Impact Study.

Needs to be linked to regional spatial plan...! (or not?)



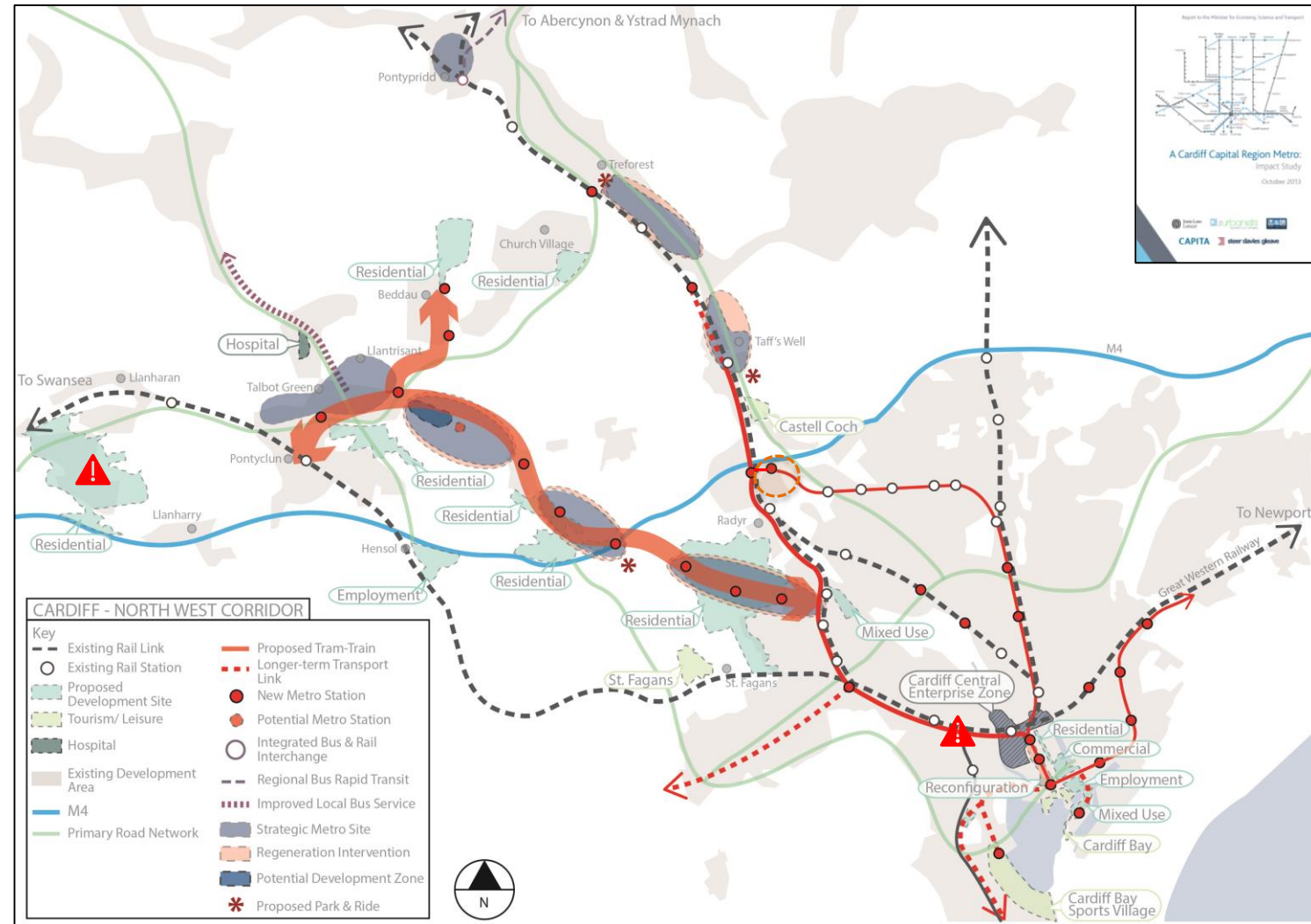
Some of this with City Deal Funding perhaps....?

Metro: Transit Oriented Development opportunities

#1 Cardiff Bay - NW Cardiff - RCT (from 2013 Metro Impact Study)

Potential New “Tram-train” route from Cardiff to RCT

- > TOD Development at Talbot Green
- > New TOD housing in NW Cardiff and RCT
- > P&R at J33 to relieve M4 congestion
- > Enhanced access to Cardiff City Centre & Bay
- > Taffs Well to Pontypridd Corridor TOD opportunity
- > Repurpose the Treforest Industrial Estate?
- > Life Science Park at Coryton (ref Cardiff Council)



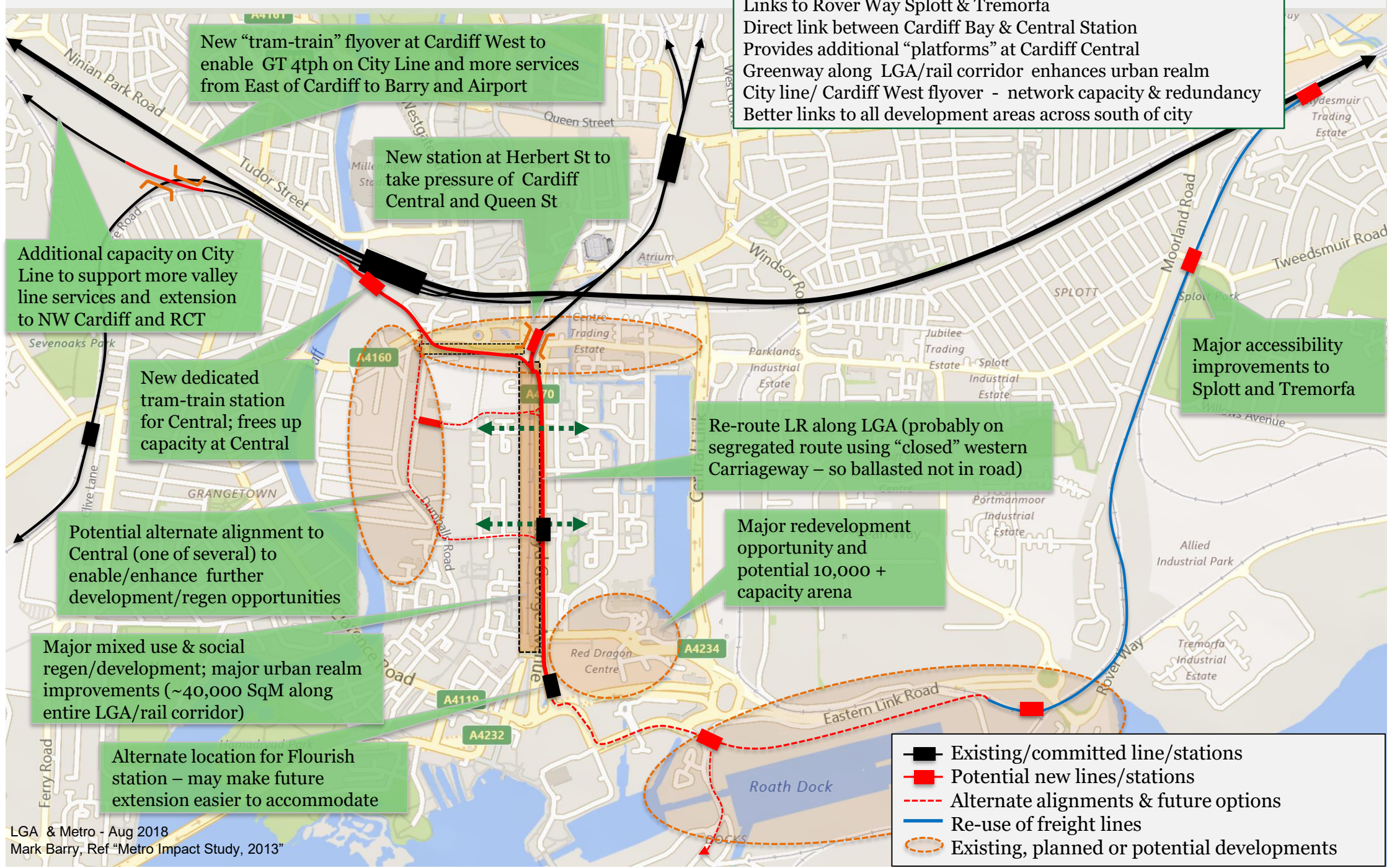
<https://beta.gov.wales/south-wales-metro-impact-study>
Metro Impact Study

Metro: Transit Oriented Development opportunities

#3 Cardiff Bay Tram-train opportunities..

Part of broader Cardiff Crossrail proposal

- Links to Rover Way Splott & Tremorfa
- Direct link between Cardiff Bay & Central Station
- Provides additional "platforms" at Cardiff Central
- Greenway along LGA/rail corridor enhances urban realm
- City line/ Cardiff West flyover - network capacity & redundancy
- Better links to all development areas across south of city



New "tram-train" flyover at Cardiff West to enable GT 4tph on City Line and more services from East of Cardiff to Barry and Airport

New station at Herbert St to take pressure of Cardiff Central and Queen St

Additional capacity on City Line to support more valley line services and extension to NW Cardiff and RCT

New dedicated tram-train station for Central; frees up capacity at Central

Potential alternate alignment to Central (one of several) to enable/enhance further development/regen opportunities

Major mixed use & social regen/development; major urban realm improvements (~40,000 SqM along entire LGA/rail corridor)

Alternate location for Flourish station – may make future extension easier to accommodate

Re-route LR along LGA (probably on segregated route using "closed" western Carriageway – so ballasted not in road)

Major redevelopment opportunity and potential 10,000 + capacity arena

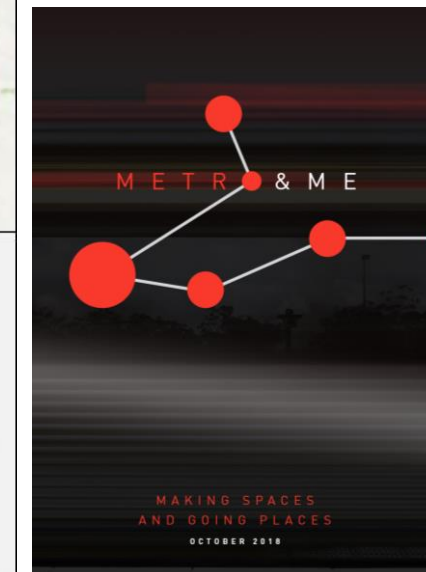
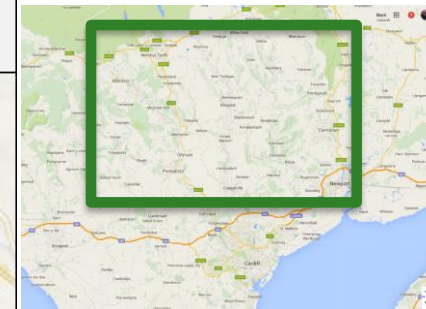
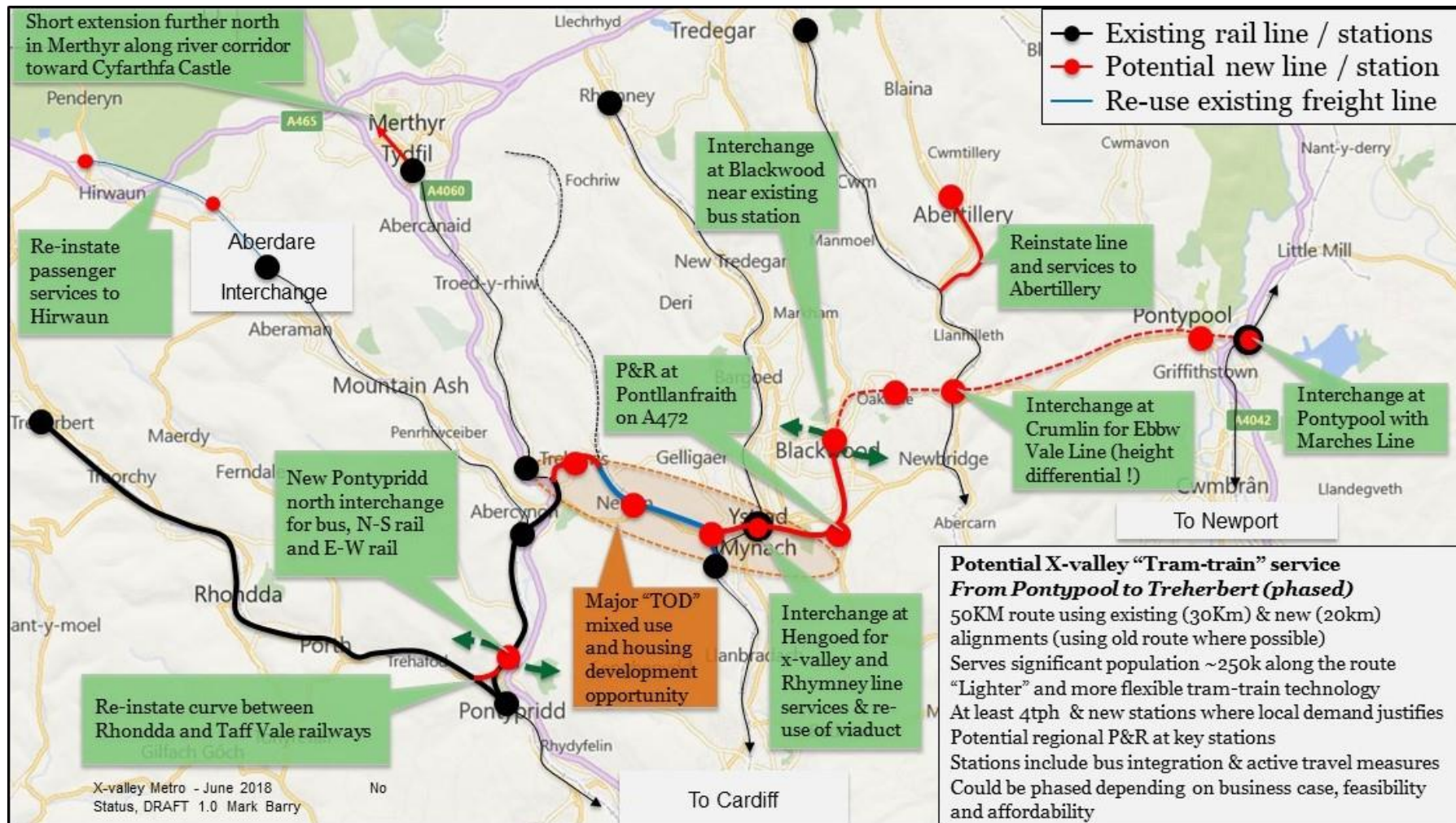
Major accessibility improvements to Splott and Tremorfa

- Existing/committed line/stations
- Potential new lines/stations
- Alternate alignments & future options
- Re-use of freight lines
- Existing, planned or potential developments

LGA & Metro - Aug 2018
Mark Barry, Ref "Metro Impact Study, 2013"

Metro: Transit Oriented Development opportunities

#2 Nelson-Ystrad Mynach-Maesycwmmmer-Blackwood?



<https://swalesmetroprof.blog/2018/10/02/metro-me-october-2018/>
<https://swalesmetroprof.blog/2018/06/04/making-metro-work-for-valleyscardiff/>

Metro: Transit Oriented Development opportunities

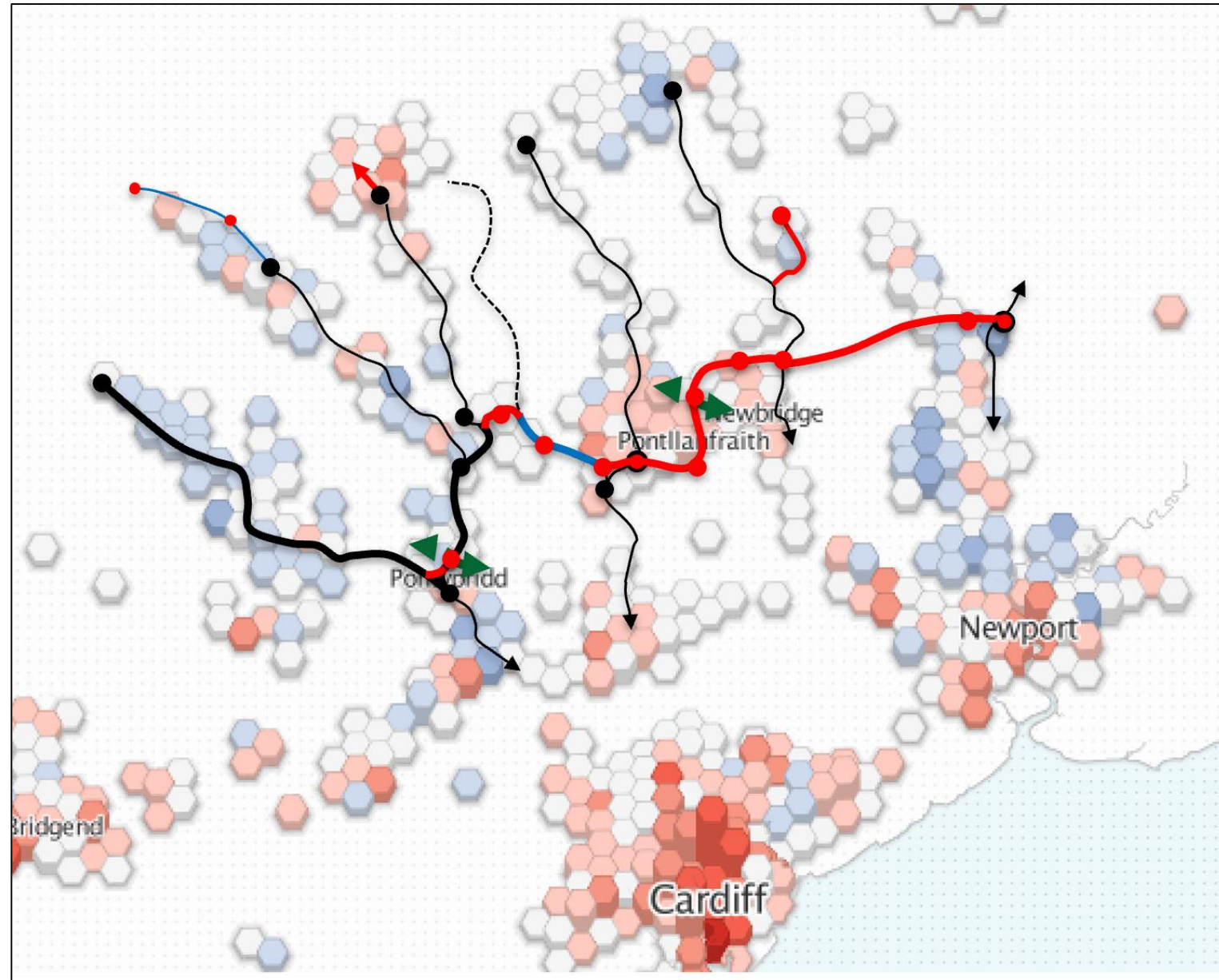
#2 Nelson-Ystrad Mynach-Maesycwmmmer-Blackwood?

Connect a significant population across the mid valleys

Re-enforces potential of Pontypridd as a major economic hub in the region

Opportunity for a major reconfiguration of the region's transport and economic geography

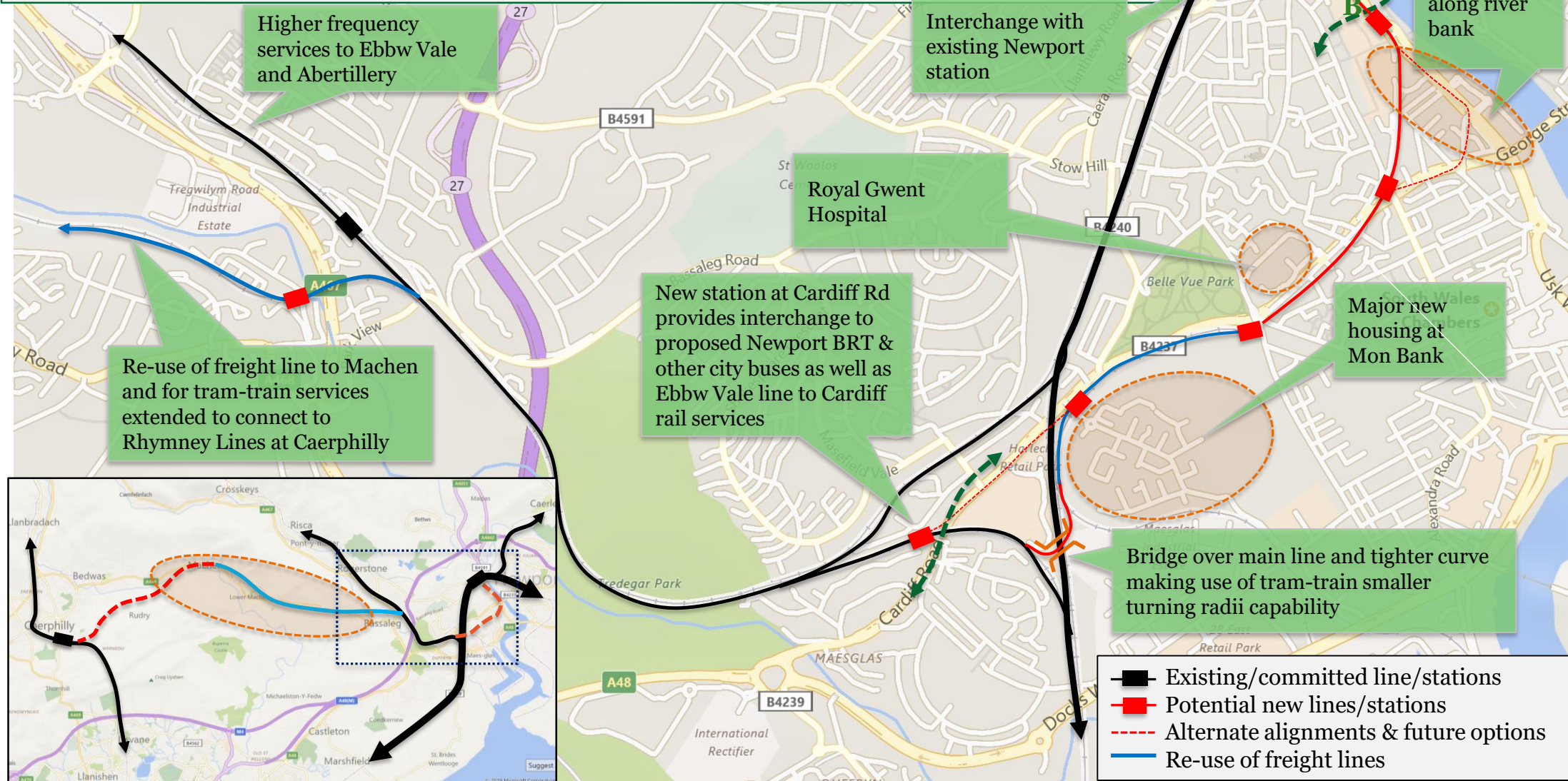
It really isn't about "everyone going to Cardiff"



Metro: Transit Oriented Development opportunities

#4 Newport Tram-train extension opportunities...

- New "on-street" tram-train alignment linking Ebbw Vale line from Cardiff Rd to Newport Station
- Avoids current HR route via Gaer curve and associated capacity constraints at Newport Station
- New route/stations: Royal Gwent Hospital, Pill, Uni South Wales, Friars Walk/Bus Station & Newport Stations
- Re-use of Machen freight line to provide direct connection to Caerphilly and Rhymney Line – linked to "TOD" plan
- On street route enables more capacity on Ebbw Vale line and re-instated Machen branches
- Use of tram-train could enable 4tph all the way to Ebbw Vale Town
- Avoids using up valuable SWML pathway



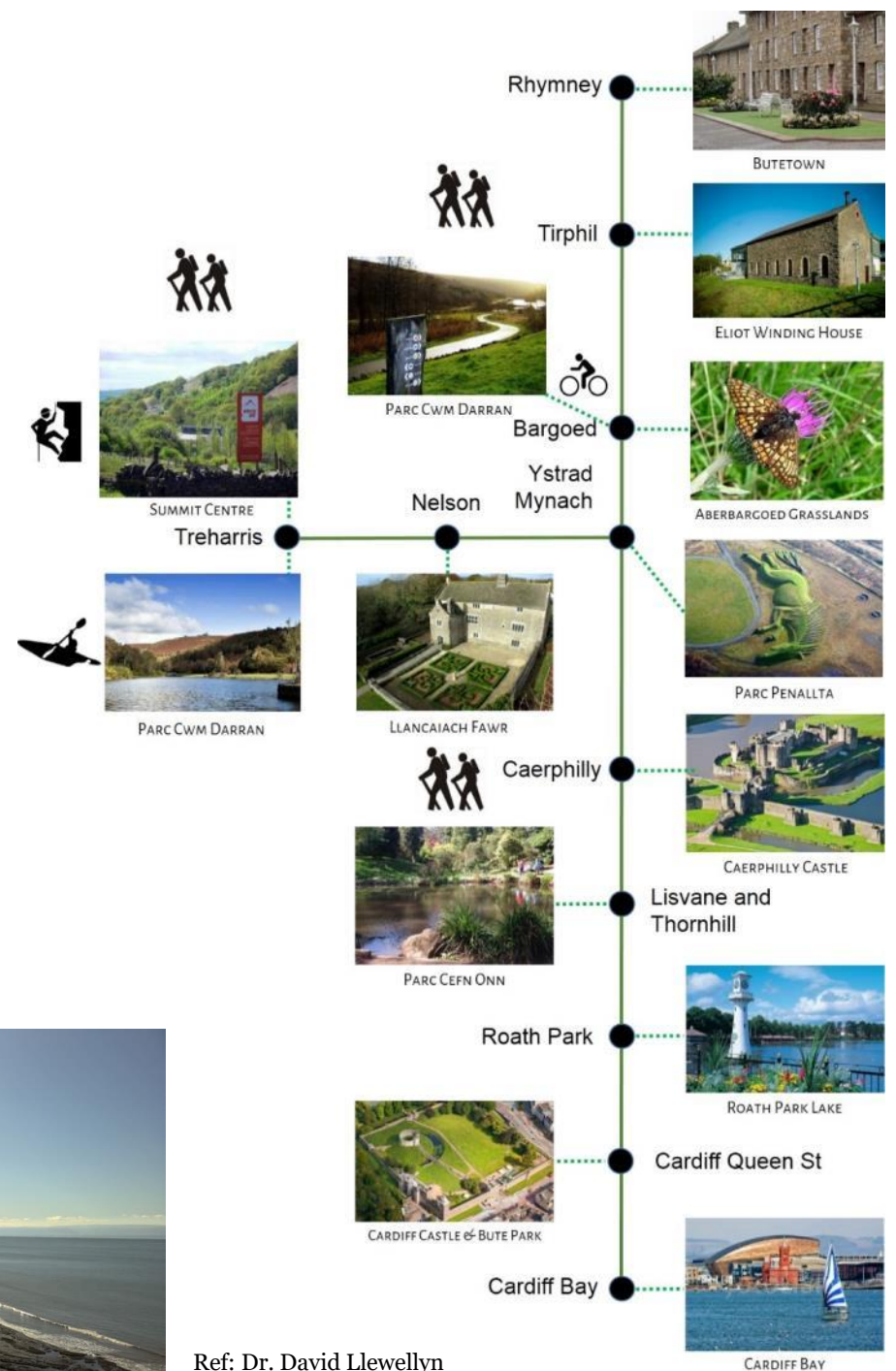
Transit Oriented Development...

How do we make it work in SE Wales?

- > Build stuff (homes, jobs, shops, services) around transit – NO COMPROMISES
- > Anything else conflicts with the intent of the “Well Being of Future Generations”
- > New housing types – more apartments and less “3 and 4 bed houses?”
- > More homes for rent, more build to rent
- > Bigger role for RSLs?
- > The £740M investment in the #southwalesmetro demands that we do this
- > For Cardiff Capital Region...
 - New radical vision for housing – develop the vision and “sell it”
 - Development Corporation Approach – public and private
 - Land use and transport planning needs to “integrate”!
 - CCR and WG ££ to help reduce barriers for private sector to adopt “vision”
 - Again – much stronger and proactive planning
- > ***If it was up to me -update the “Metro Impact Study” to frame approach***

Metro: *What is the role of our green infrastructure & industrial heritage?*

- > Green corridor that links major outdoor facilities from Rhymney to Cardiff Bay
- > Links to country parks, such as Parc Penallta, Parc Cwm Darran and Parc Taf Bargoed,
- > Links to major visitor attractions such as Cardiff Bay, Caerphilly Castle and Roath Park
- > Integrated with region cycle network
- > Drives demand from Cardiff into the Valleys



Ref: Dr. David Llewellyn

Rail Investment in Wales....? or lack of!



The Rail Network in Wales The Case for Investment – Summary

Professor Mark Barry

12 July 2018

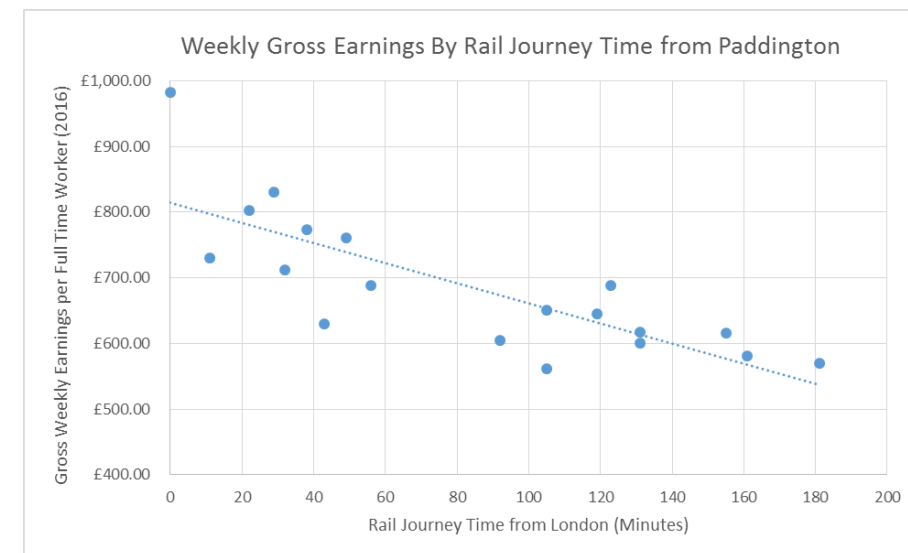
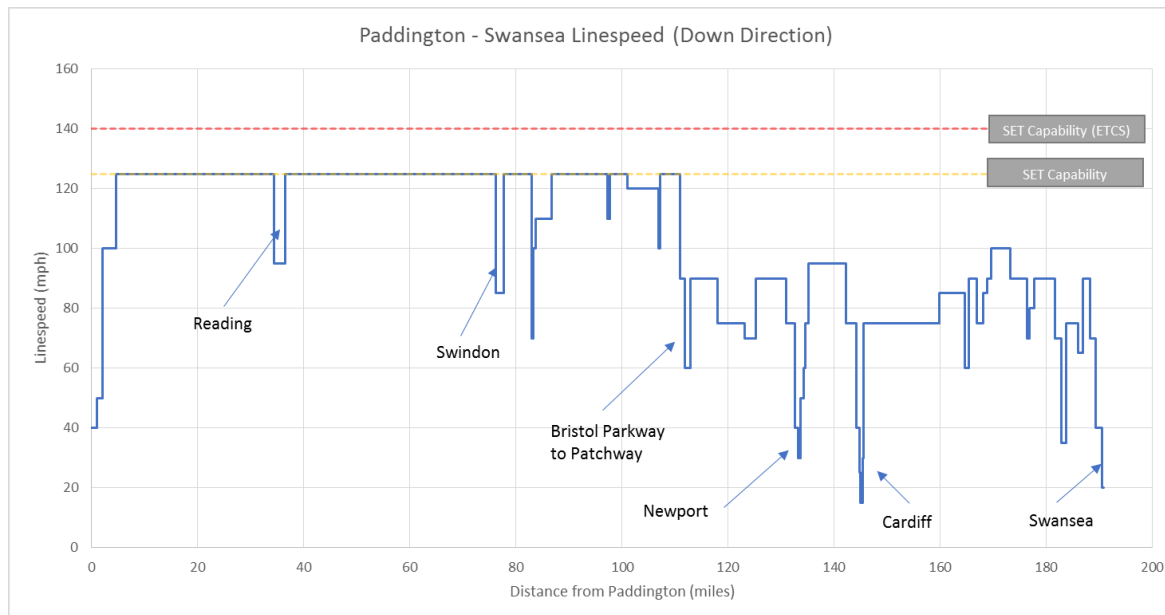
What is the capability of the rail network in Wales?

Current capability of SWML...

- > Capability of rail infrastructure falls away significantly west of Bristol
- > Not a “125mph” railway in Wales
- > Economic value of new IET fleet not fully realised!

Rail Speed (mph)

Swansea								
Bridgend	41							
Cardiff	52	48						
Newport	46	41	55					
Bristol	45	45	46	45				
Swindon	54	62	66	71	56			
Reading	61	65	68	74	66	84		
London	61	60	71	77	68	81	79	
To/from	Swansea	Bridgend	Cardiff	Newport	Bristol	Swindon	Reading	London

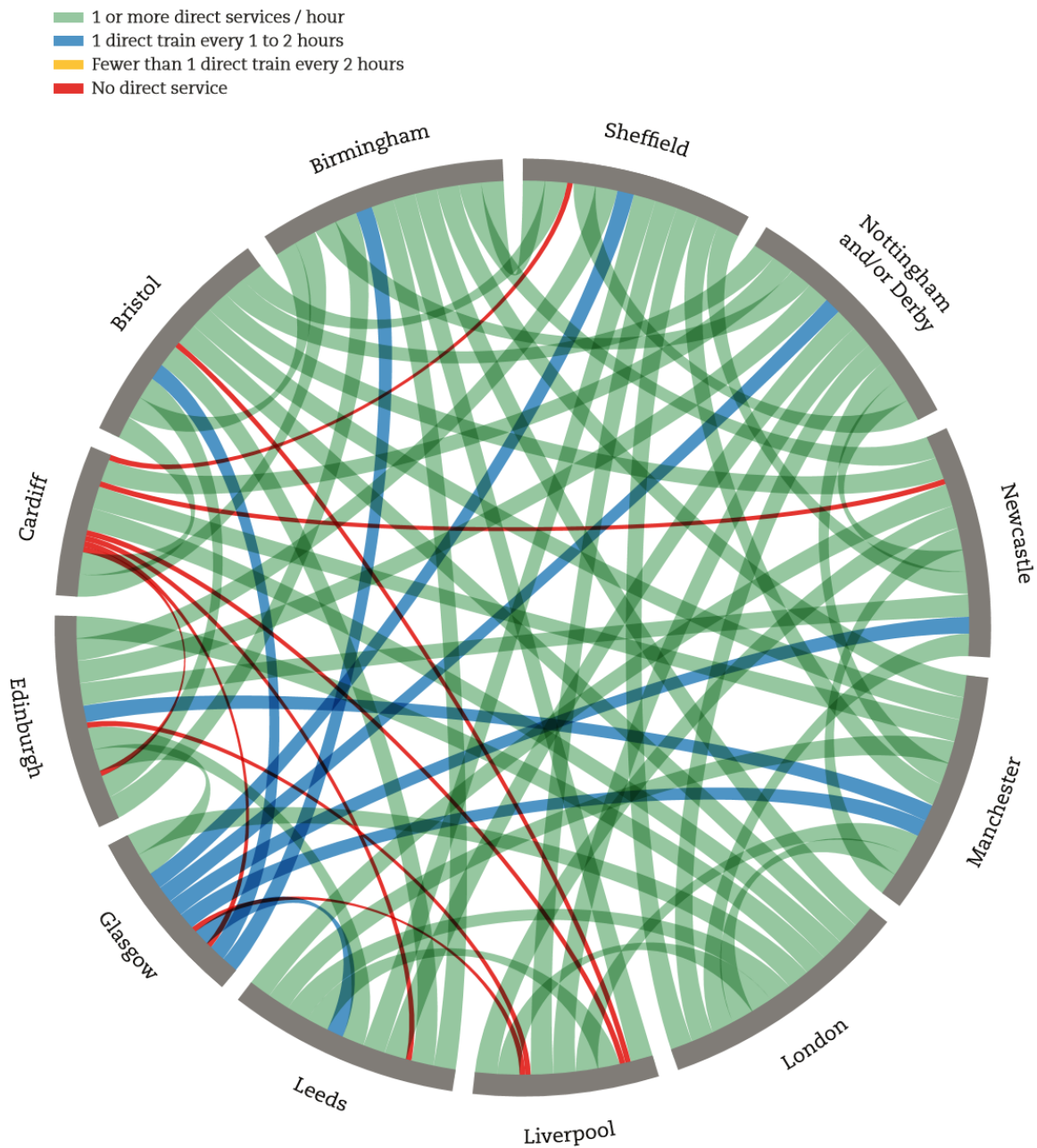


Source: Arup

Important as connectivity & accessibility correlates to economic performance

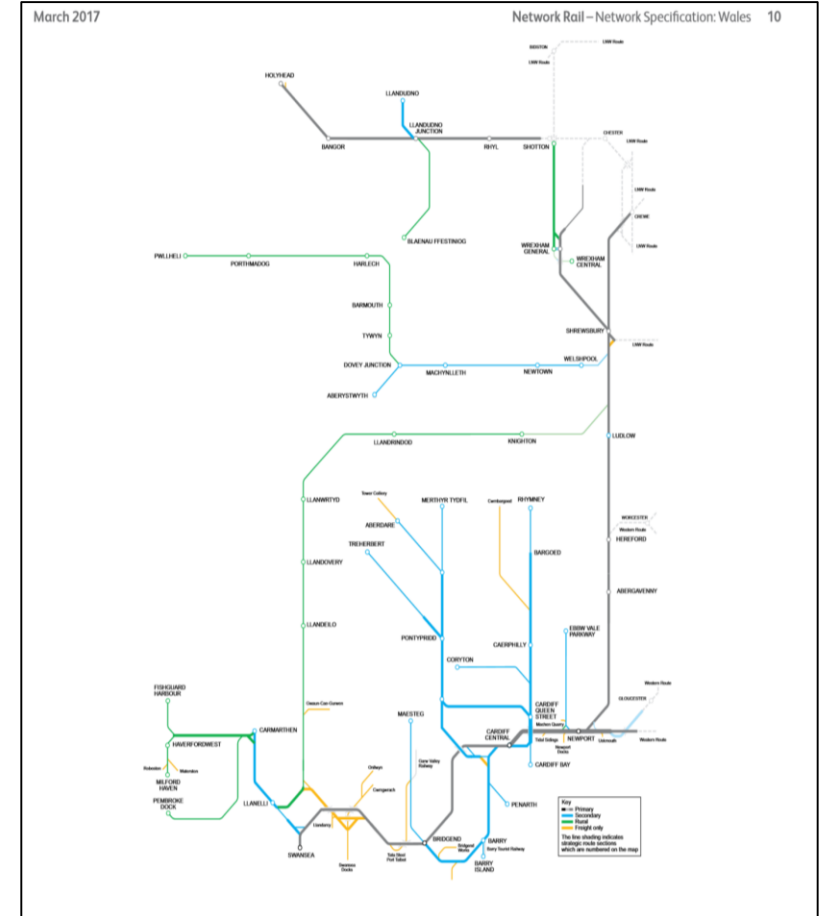
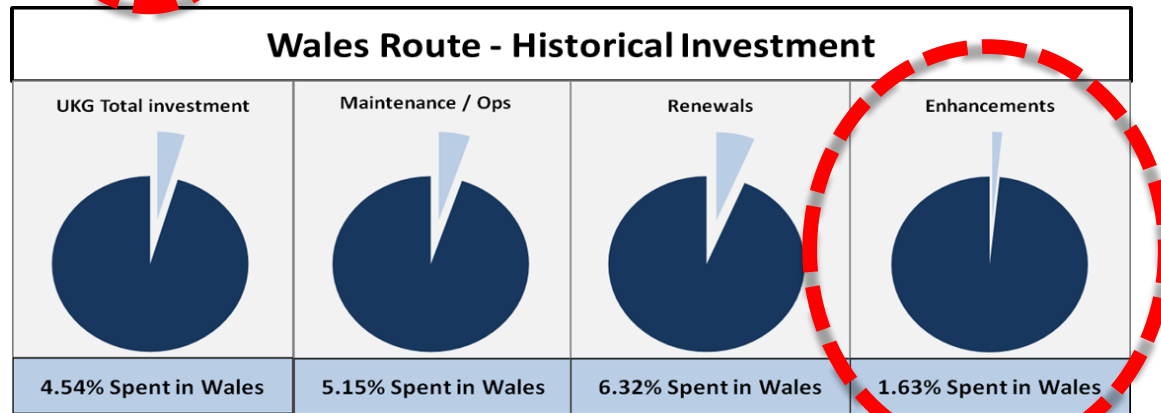
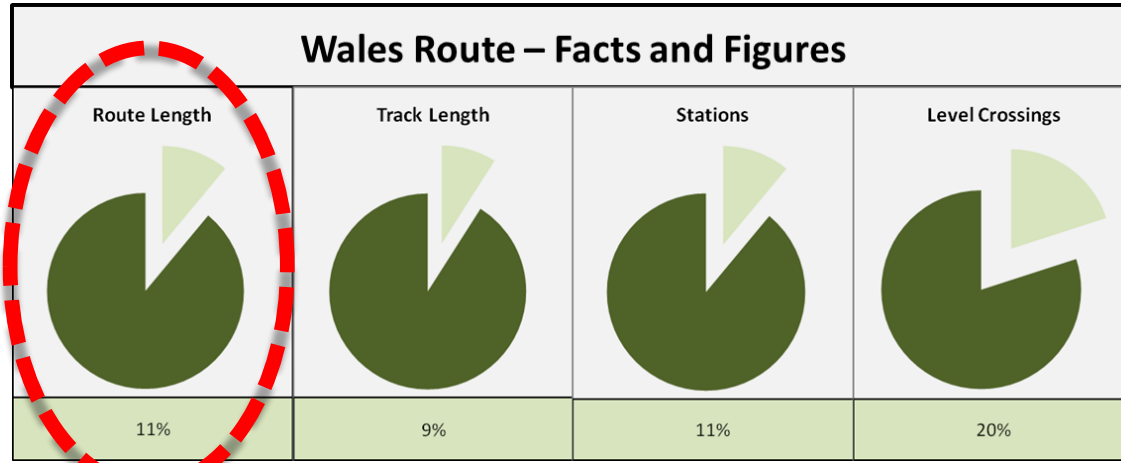
What is the capability of the rail network in Wales?

Cardiff City Region (1.5M) worst rail connected in UK



- > Cardiff rail connectivity vs major UK cities
- > *From Greengauge 21 - Beyond HS2, May 2018)*

Wales Route Vs Investment....(2011 - 2016 ORR)

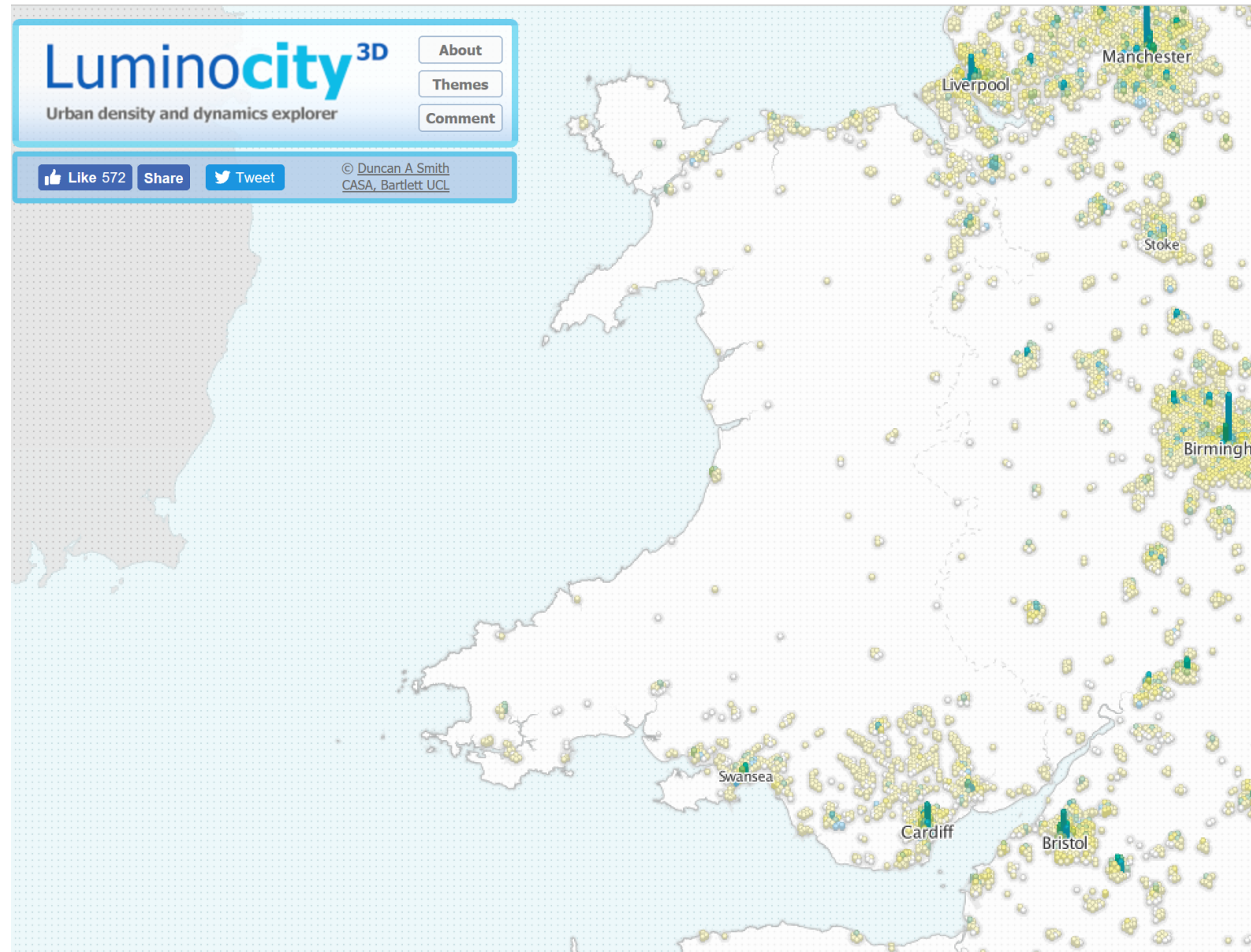


- > Rail infrastructure non-devolved UK Gov responsible on England/Wales basis
- > Enhancement spend lower in Wales Vs UK - on any measure
- > Just over 1% at best and goes back decades Perhaps less than £500M over last 20 years?
- > So over time line speeds & capacity fall behind UK average
- > Leading to less demand and higher subsidies Vs rest of UK network

Geographic Realities

Population and density cannot be ignored...

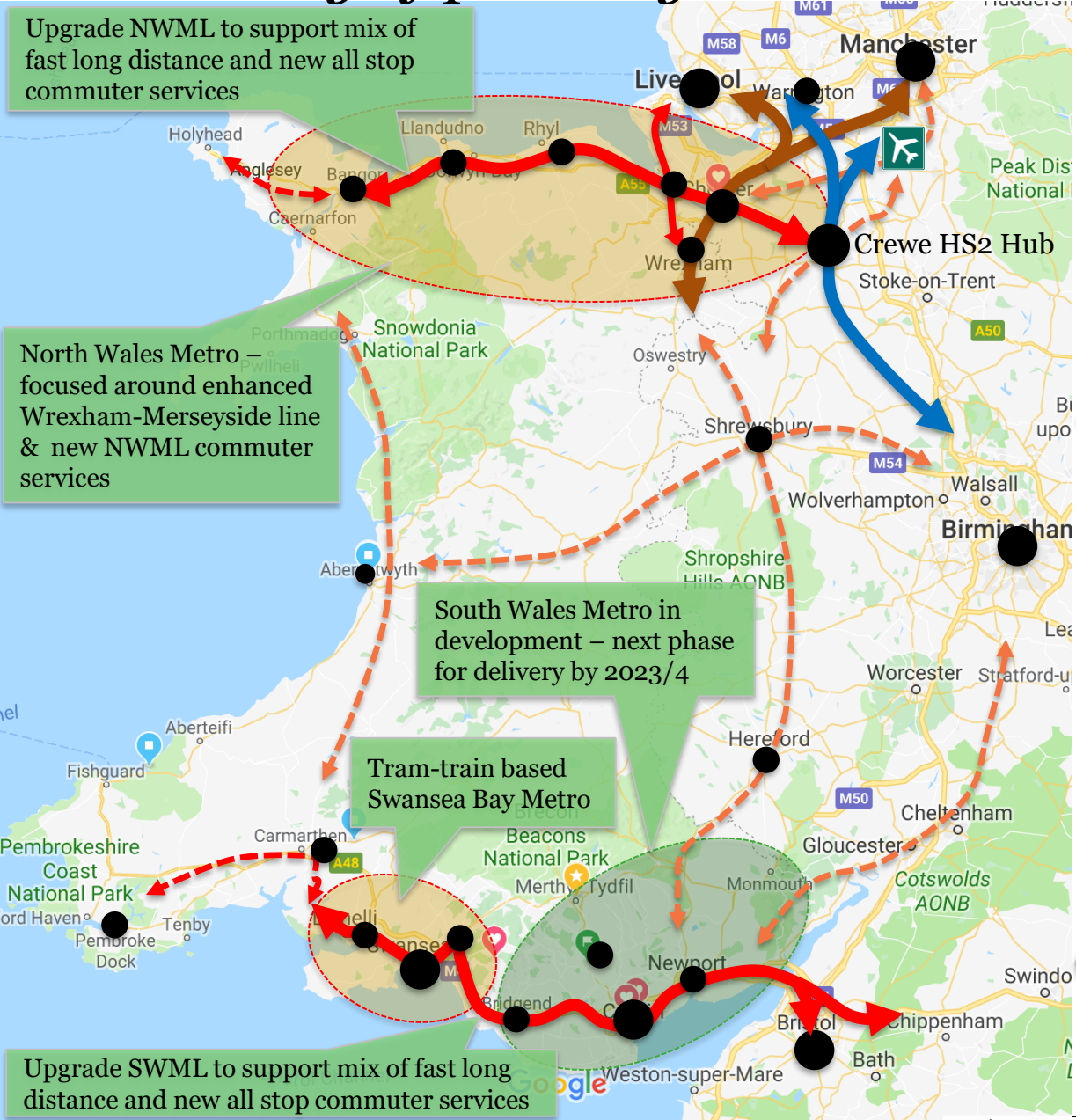
- > 3M Population in Wales not evenly dispersed
- > Concentrated in Cardiff/ SE Wales (1.5M), Swansea Bay (0.7M) and NE Wales (0.2M)



All Wales

Summary of primary Interventions

(see <https://beta.gov.wales/rail-network-wales>)



- Enhanced main line & services (100mph+ railway)
- Enhanced main lines services to/from NW England
- Key hubs & interchanges
- Upgrade line for local services (part of N Wales Metro)
- Improved services into west & north west Wales
- HS2
- For future development

Upgrade NWML to support mix of fast long distance and new all stop commuter services

North Wales Metro – focused around enhanced Wrexham-Merseyside line & new NWML commuter services

South Wales Metro in development – next phase for delivery by 2023/4

Tram-train based Swansea Bay Metro

Upgrade SWML to support mix of fast long distance and new all stop commuter services

- Faster journeys to/from north Wales and Chester, Liverpool, Manchester, Manchester Airport, Crewe, London, Birmingham and south Wales. Ambition of:
 - Llandudno to Crewe in 60 minute
 - Holyhead to Chester in 60 minutes
- New integrated local services between north east Wales & Merseyside

Direct transport user benefits of over £2bn
 Wider economic & agglomeration benefits
 More sustainable travel options
 Reduced road congestion & improved air quality
 Reduced CO2 emissions

- More capacity and reduced journey times between Cardiff & Swansea and to/from London, Heathrow & Bristol. Ambition of:
 - Cardiff to Paddington in 90 minutes
 - Swansea to Cardiff in 30 minutes
 - Cardiff to Bristol Temple Meads in 30 minutes
- New local commuter rail network for Swansea Bay

Overall Economic Benefits

Initial and conservative analysis... (£M)

- > Potential to secure **over £2.5Bn** in Transport User and Agglomeration Effects
- > Further agglomeration benefits to assess
- > Total Capital Cost of order of £2Bn
- > Deliberately conservative approach... more benefits to realise as work develops

	NWML	Wrexham-Merseyside	SWML	Swansea Bay	Total
Transport User and other L1 Benefits/Disbenefits £m	£840	£110	£770	£190	£1,910
Agglomeration Effects £m	£80	£40	£50	£30	£210
Total	£930*	£150	£820	£220	£2,120
Jobs	435	100	420	190	1,145
Regional GVA (per annum)	£23	£5	£18	£8	£54
Further Potential Level 1 Impacts £m	£20	NA	£490	NA	£510
Further potential agglomeration benefits £m	<£10	NA	£30	NA	£40
Total further benefits possible	£20	NA	£520	NA	£540
Further Jobs	125	NA	165	NA	290
Further Regional GVA	£4	NA	£7	NA	£11

Thank you.
Questions...





Mark Barry

Professor of Practice in Connectivity

Cardiff University, School of Geography and Planning

Glamorgan Building
King Edward VII Avenue
Cardiff
Wales
CF10 3WA

Mob: 07771 893292

Email: mark@mgbarryconsulting.com

barrym9@cardiff.ac.uk

<https://www.linkedin.com/in/mark-d-barry/>

<https://swalesmetroprof.blog/>

