ARCADIS Design & Consultancy for natural and built assets

WELTAG STAGE TWO PLUS STUDY

Dinas Powys Transport Network

Environment and Regeneration Scrutiny Committee

16th March 2021

STUDY BACKGROUND

- Arcadis was commissioned by the Vale of Glamorgan Council in 2017 to undertake a WelTAG Stage One and Stage Two transport appraisal, considering **transport improvements for the Dinas Powys area**.

- The original options assessed at Stage Two and presented to the Review Group in **October 2018** included the following:

  - Bypass | Green Alignment (east of Dinas Powys interconnecting with the A4055 at Cardiff Road and the Merrie Harrier Junction)

  - Bypass | Pink Alignment (east of Dinas Powys interconnecting with the A4055 at Cardiff Road and the Merrie Harrier Junction, plus interconnecting Murch Road roundabout)

  - **Bypass | Blue Alignment (east and south of Dinas Powys, interconnecting between the A4055 at Merrie Harrier and the B4267 Sully Moors Road/ Hayes Road roundabout)**

  - Multi-modal

  - Bypass (Green Alignment) and Multi-modal

STUDY BACKGROUND

- Arcadis was commissioned by the Vale of Glamorgan Council to undertake additional transport appraisal of strategic transport improvements in Dinas Powys – **Stage Two Plus**.

- Vale of Glamorgan Cabinet resolved to progress with all Stage Two options, although **excluding the Blue route**.

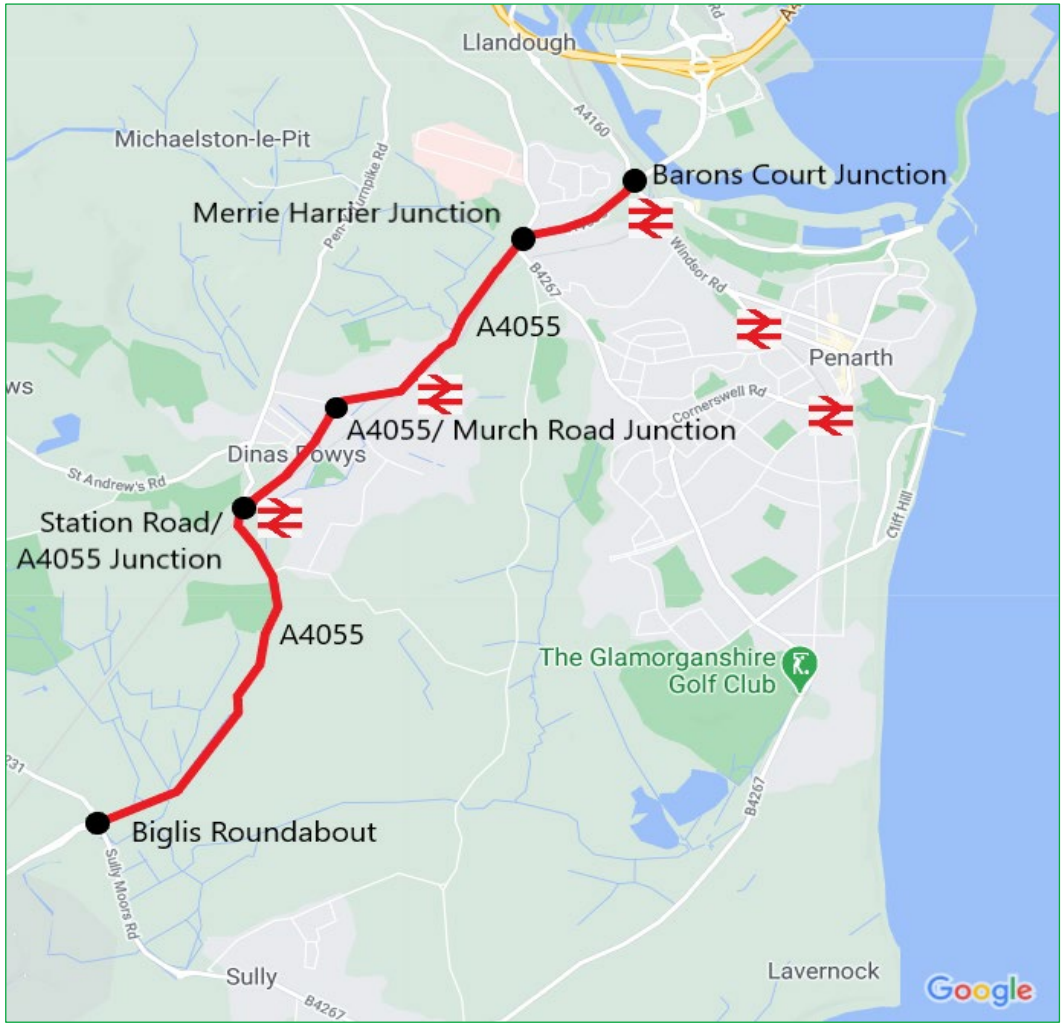
  - **TASK 1:** Engagement with Network Rail to understand the constraints and potential costs associated with the construction of a bypass and junction in the vicinity of Cogan railway tunnel.

  - **TASK 2:** Undertake concept design, modelling and costing of suggested improvements to the Merrie Harrier junction to improve capacity.

  - **TASK 3:** Commission strategic traffic modelling of the bypass proposals using the South East Wales Transport Model (SEWTM).

  - **TASK 4:** Consider costs in context of the bypass scheme (Green route) and update the economic appraisal for the Green route.

STAGE TWO PLUS STUDY AREA



WHY ARE IMPROVEMENTS NEEDED?

- High local traffic flows leading to congestion, capacity issues at junctions, environmental impacts (air quality and noise pollution) and unreliable journey times.
- Residential land use development within Vale of Glamorgan will compound existing traffic issues and increase pressure on public transport services.
- Public transport services are overcrowded especially during peak commuting hours.
- Poor interchange facilities and public transport infrastructure throughout the Dinas Powys transport network.
- In the do minimum scenario, all of the issues will be exacerbated.

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WHAT ARE WE TRYING TO ACHIEVE?

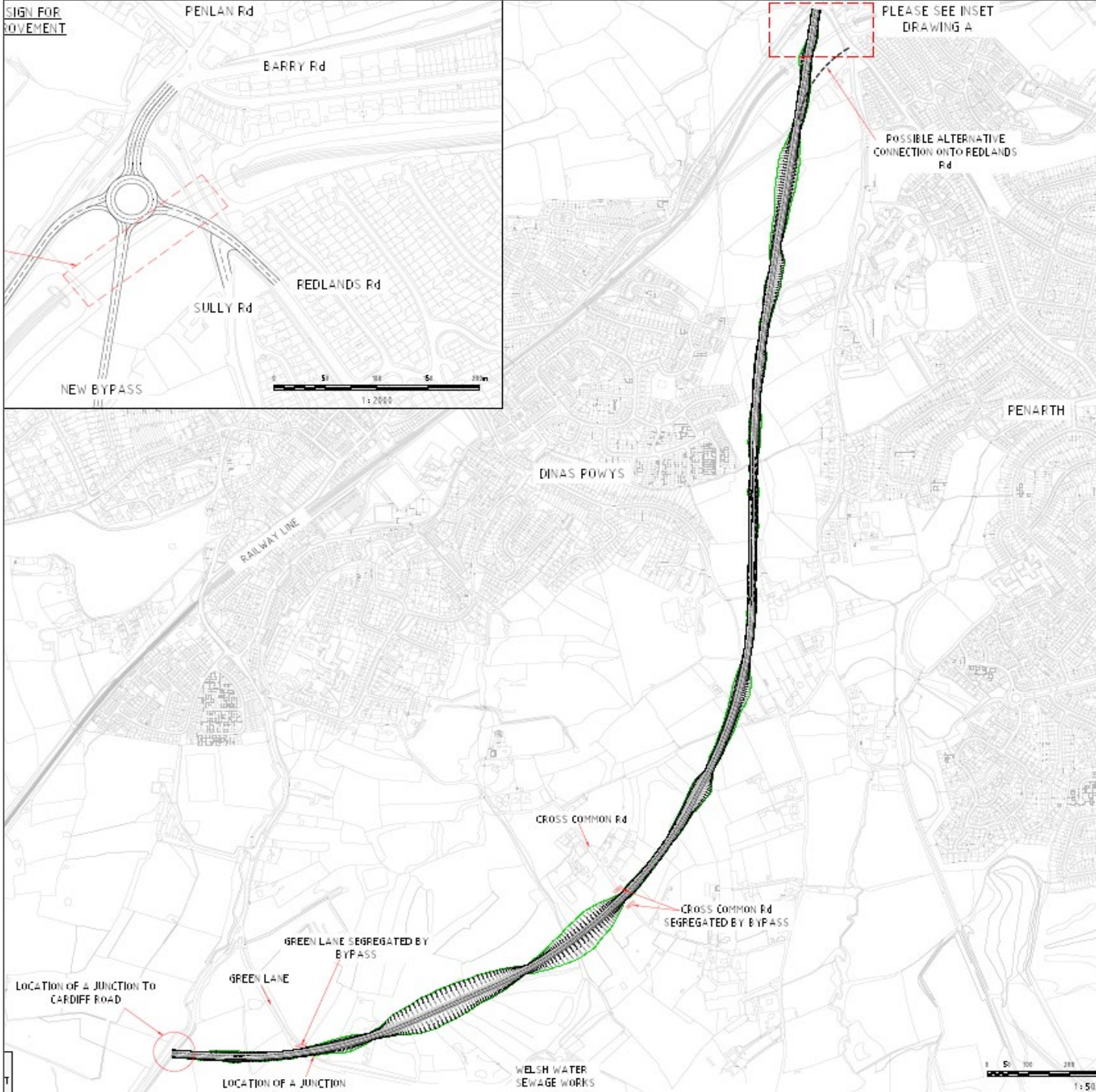
Objectives

Support sustainable connectivity in the Cardiff City Region	Facilitate and support economic growth	Improve Health and Well-being	Improved safety and security	Benefits and minimised impacts on the environment
Improved efficiency, reliability, resiliance and connectivity of movement (people and freight by sustainable modes). Reduced community severance in Dinas Powys including improvements to local connectivity.	Improved inclusive, integrated and affordable access to key services and employment. Reduce issues of over-capacity on travel modes.	Greater uptake of active travel (both recreation and necessary trips). Improved air quality and reduced noise pollution within the community.	Improved actual and percieved safety and security of travel by all modes.	Reduction in the negative impacts on the local and global environment (natural and built).

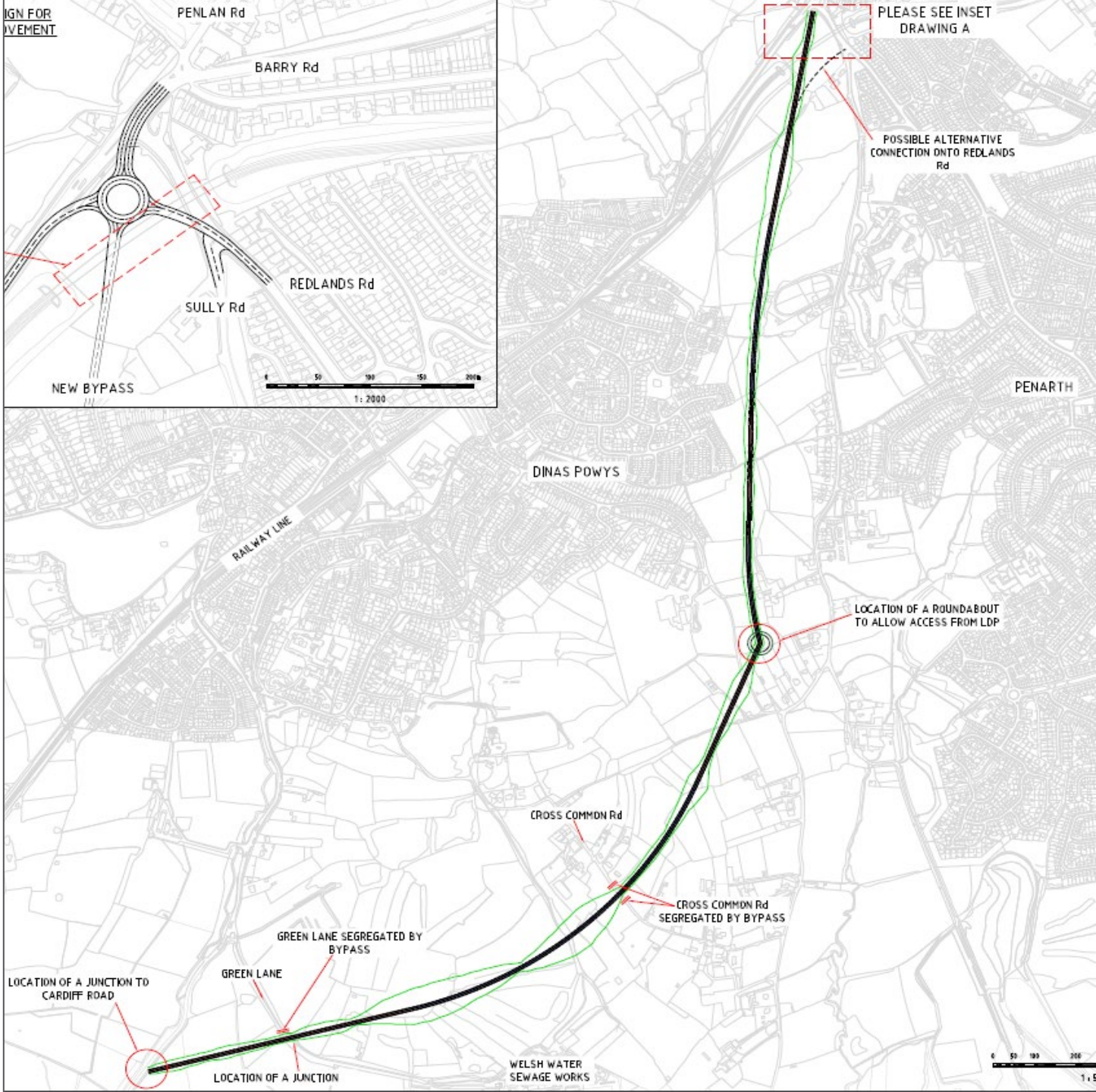
How will success be measured?

Journey times. Traffic Volumes. Bus journey times.	Frequency and provision of public transport.	Length of walking and cycling links provided or improved. Air quality and noise pollution measurement.	Accident rates per vehicle kilometre.	Number of ecological features affected. Air quality and noise pollution measurement.

BYPASS: GREEN ALIGNMENT



BYPASS: PINK ALIGNMENT



Item	Bypass Green Route	Bypass Pink Route
Length of New Bypass	3,565 metres	3,617 metres
Length of new Carriageway through the docks site	n/a	n/a
Length of existing carriageway upgrade (Hayes Road)	n/a	n/a
Cut and Fill Balance	Disposal of 53,300m³	Disposal of 21,600m³
Public Right of Way Impacts	2 Bridges/ 3 Culverts	2 Bridges/ 3 Culverts
No of Structures	0	0
Archaeology Affected	1	1
Houses Affected	0	0
Ancient Woodland	1 Area	1 Area
TPO	0	0
Construction Cost	**£20,234M**	**£19,810M**
Total Cost including WelTAG Stage Three	**£46,320M**	**£45,610M**

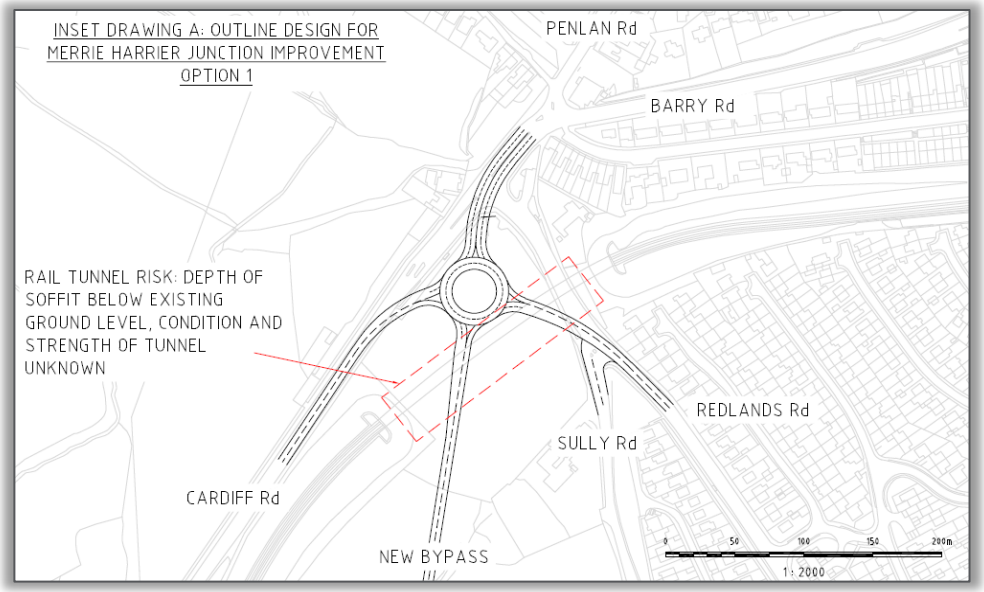
MULTI-MODAL

Item	Interventions
Park and Ride	• Bryn Y Don Park and Ride
Bus Service & Infrastructure Enhancements	• Bus Service Enhancements • Bus Stop Enhancements • Merrie Harrier Junction Enhancement • Merrie Harrier to Barons Court Junction Bus Lane
Rail Service and Infrastructure Enhancements	• Eastbrook Station Upgrade • Dinas Powys Station Upgrade • Vale of Glamorgan Line Service/ Capacity Enhancement
Walking and Cycling	• Barry to Dinas Powys Cycle Route • Merrie Harrier to Barons Court • Dinas Powys to Penarth Connections • Dinas Powys Network

STAGE TWO PLUS: TASK 1

COGAN RAILWAY TUNNEL ANALYSIS

- Proposed at grade, 4-arm roundabout at the intersection of the proposed highway, Cardiff Road (A4055) and Redlands Road (B4267.
- Potential constraint due to new loadings.



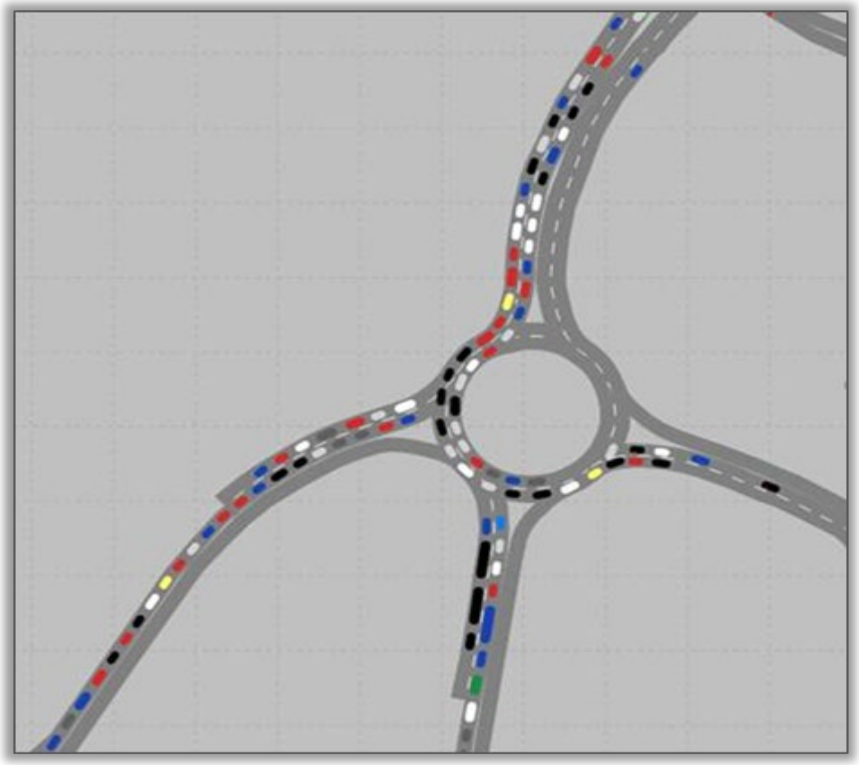
- Consultation completed with Network Rail.
- A structural assessment of the tunnel will not be required as any increase in loading from the proposal can be considered negligible.

STAGE TWO PLUS: TASK 2

MERRIE HARRIER JUNCTION | CONCEPT DESIGNS

Stage Two traffic modelling:

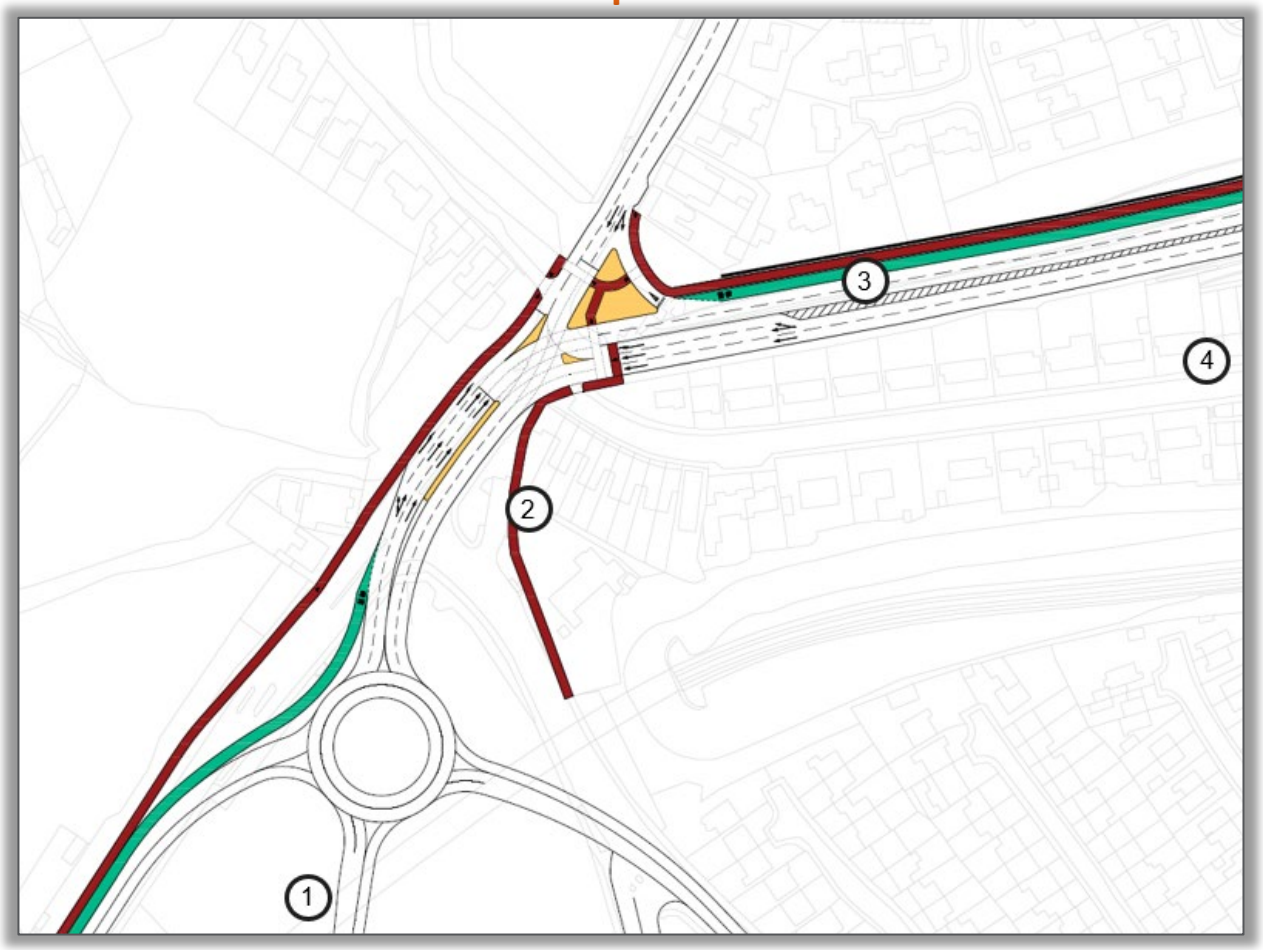
- The A4055 Barry Road northbound operated over capacity in both the 2036 AM and PM peak hours.
- The queue on the northbound approach to the Merrie Harrier junction is predicted to exceed the stacking capacity between the Merrie Harrier junction and the proposed Bypass Roundabout.
- The queuing resulted in blocking back through the roundabout and created a gridlock effect.



Task to identify potential improvements to the Merrie Harrier junction that could deliver the required capacity improvements needed to support the scheme.

STAGE TWO PLUS: TASK 2

MERRIE HARRIER JUNCTION | CONCEPT DESIGNS

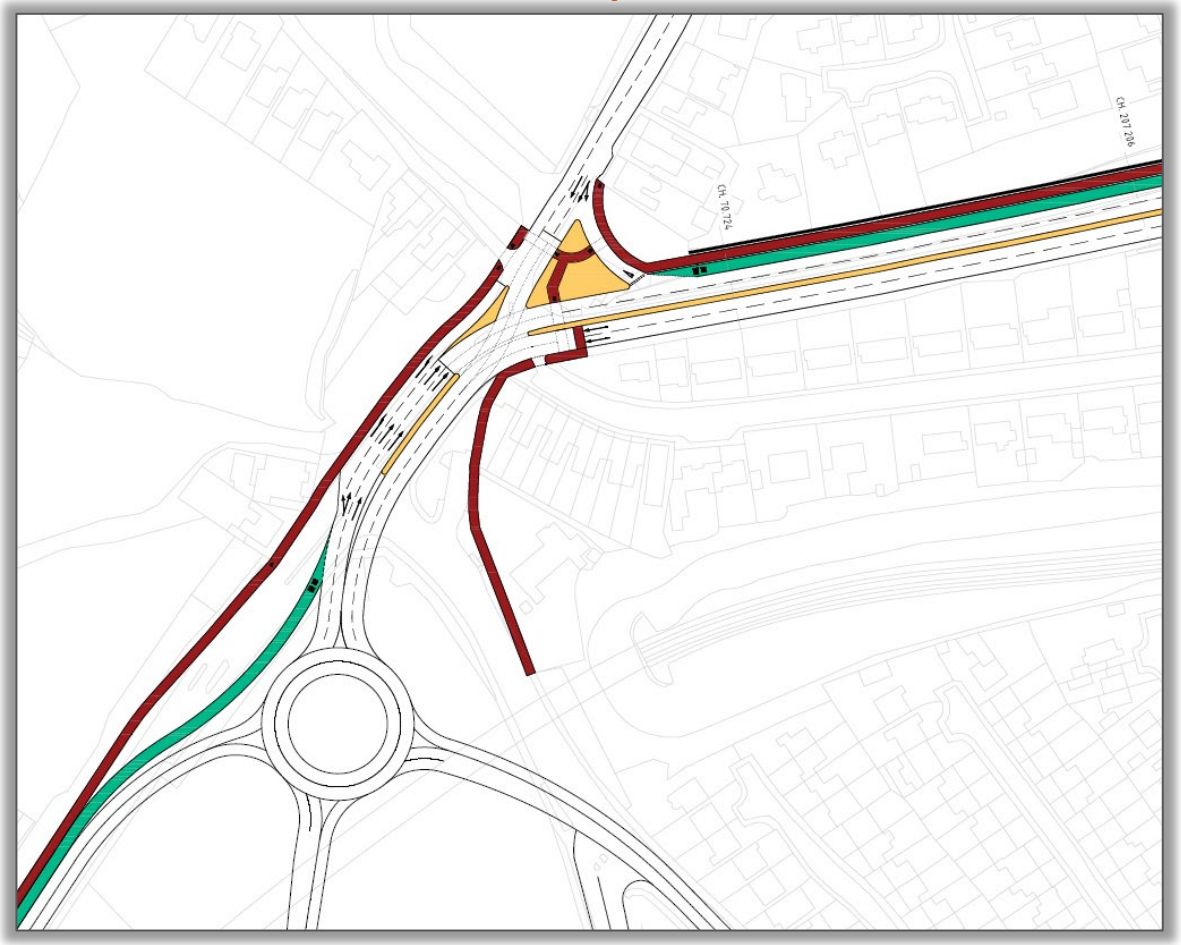


Option 1A

- Northbound priority bus lane.
- Two lane A4055 approach to junction, widening to three to provide left/ right lane filters.
- Signalised pedestrian crossings.

STAGE TWO PLUS: TASK 2

MERRIE HARRIER JUNCTION | CONCEPT DESIGNS



Option 1B

- Same as Option 1A, although with A4055 Barry Road Southbound Right Turn into Penlan Road banned.

STAGE TWO PLUS: TASKS 3 & 4

Task 3 | SEWTM Strategic Modelling completed by TfW

Task 4 | Updated Economic Appraisal

	Scheme costs (prices in £M)	Bypass | Green Route	Sensitivity Test
A	Accidents	-4.33	-4.33
B	Economic efficiency: Commuting	24.19	20.84
C	Economic efficiency: Other	25.34	21.61
D	Economic efficiency: Business	19.00	16.34
E	Wider Public Finances (ITR)	-1.03	-0.91
F	PVB (A+B+C+D+E)	63.17	53.55
G	PVC	31.37	31.37
H	**Net Present Value (F-G)**	**31.80**	**22.18**
I	**Benefit Cost Ratio (F/G)**	**2.01**	**1.71**

Impact	Do-minimum	Option A Bypass Green Route	Option B Bypass Pink Route	Option C Multi-modal	Option D Bypass and Multi-modal
Social					
Physical Activity	-	+	+	++	++
Journey Quality	--	+++	+++	++	+++
Accidents	-	-	-	+	0
Security	-	++	++	++	++
Access to Employment	--	++	++	++	++
Access to Services	--	++	++	++	++
Affordability	0	0	0	+	+
Severance	-	++	++	+	+++
Option and Non-Use Values	-	+	+	++	++
Cultural					
Cultural Facilities	0	0	0	0	0
Welsh Language	0	0	0	0	0

Impact	Do-minimum	Option A Bypass Green Route	Option B Bypass Pink Route	Option C Multi-modal	Option D Bypass and Multi-modal
Environmental					
Noise	-	--	--	0	--
Air Quality	0	-	-	+	0
Greenhouse Gases	0	+	+	+	+
Landscape	0	--	--	-	--
Townscape	-	0	0	0	0
Historic Environment	0	-	-	0	-
Biodiversity	0	--	--	-	--
Water Environment	0	-	-	-	-
Residential Amenity	-	--	--	-	--
Economic					
Journey Time Changes	-	++	+	+	++
Journey Time Reliability Changes	-	++	++	+	++
Transport Costs	-	0	0	+	+
Wider Economic Impacts	0	0	0	+	+
Land and Property	0	--	--	-	--

CONCLUSIONS

- **Option D (Green Route and Multi-modal)** has merit in being taken forward for further consideration in a Stage Three WelTAG.
  - Bypass appears to demonstrate value for money.
  - Pink route alternative may offer longer-term strategic benefits.
  - Key junctions will continue to pose a strategic constraint (notably at the Barons Court junction).
  - Full EIA would be required at Stage Three, including appraisal of greenhouse gas emissions.
  - Funding uncertainties remain a key risk to progression.

KEY NEXT STEPS

- Consideration by:
  - Vale of Glamorgan Council Environment and Regeneration Scrutiny Committee
  - Vale of Glamorgan Cabinet

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QUESTIONS

THANK YOU FOR LISTENING