ScotlandTranServ
A Balfour Beatty Mouchel Joint Venture

Central Belt Barrier Strategy - Workshop

24th November 2014






Introduction

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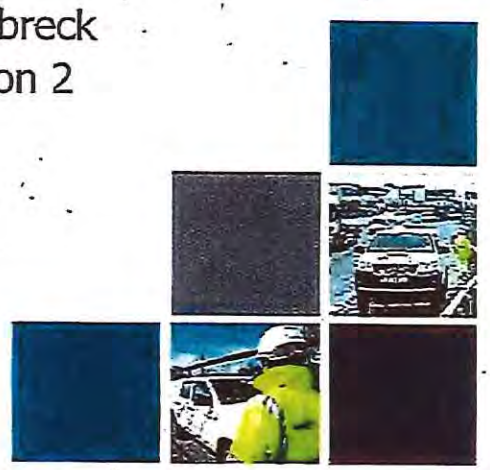
Following presentation in September 2013 Scotland TranServ were tasked with the following:

- Review the condition of the CENTRAL RESERVE barrier, quantify the problem, review possible solutions, identify constraints and present in report format
- Scope extended to include:
  - M8 between Junctions 10 and 31
  - M77 from its junction with the M8 at Plantation to Junction 1 Dumbreck
  - M80 from its junction with the M8 at Provan Interchange to Junction 2
- Push/pull tests on amber sections
- Mobile laser scan survey on the M8 between Junction 12 to 15



Section 2 – New Information

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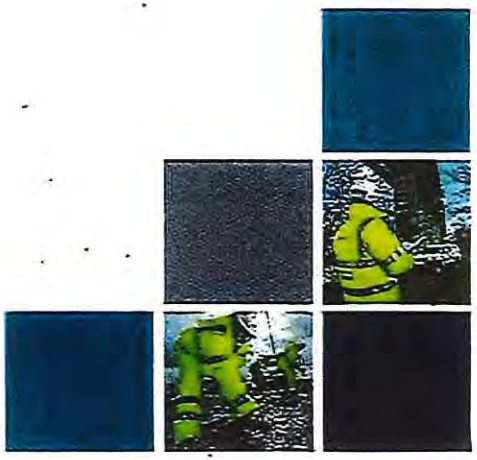
- 4.0 Push Pull Tests
- 5.0 Priority System – Maintenance Sequence
- 6.0 Engineering Assessment – Snap Shot at Junctions 12 to 15
- 7.0 Buildability Constraints
- 8.0 Possible Solutions
- 9.0 Construction Costs
- 10.0 Forward Planning
- 11.0 Conclusions



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M8 Central Reserve – Between Junction 13 and 14 (Note High Mast in background)

M8 Central Reserve – Between Junction 14 and 15

M8 Central Reserve – Between Junction 12 and 15

M8 Central Reserve – Between Junction 14 and 15

POOR - Evidence of obvious disintegration and perforations by corrosion, evidence of collapsed or collapsing beams and posts, clear failure of system.

2.0 Condition Surveys (continued)

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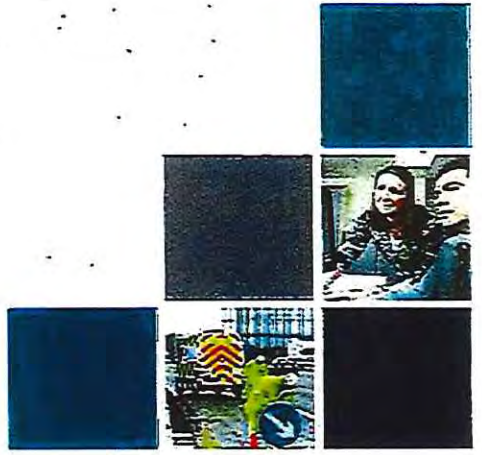
M8 Barrier Condition Results

Approximately 55.8km of centre reserve safety barrier on the M8

Site Observation Description	C/Res Barrier Length (m)
Poor	8,157 (15%)
Fair	26,242 (47%)
Good	21,377 (38%)
TOTAL	**55,776 m**



2.0 Condition Surveys (continued)

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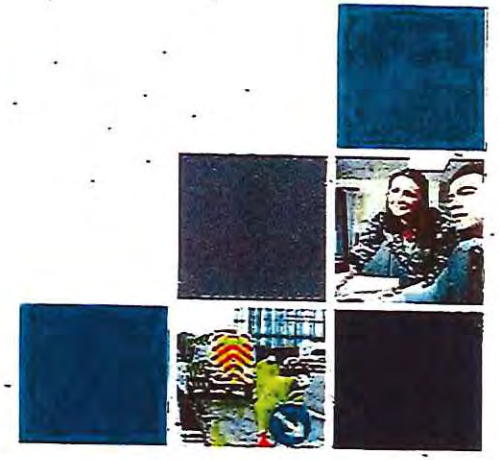
M80 Barrier Condition Results

Approximately 5.4km of centre reserve safety barrier on the M80

Site Observation Description	C/Res Barrier Length (m)
Poor	0 (0%)
Fair	5638 (100%)
Good	0 (0%)
TOTAL	**5368 m**



3.0 Red/Amber/Green System

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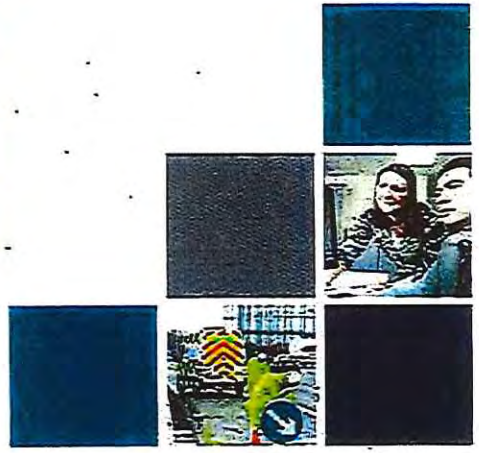
Location	Survey Condition Outcome
Junction 10 to Junction 12	Amber
Junction 12 to Junction 15	Red
Junction 15 to Junction 17	Green
Junction 17 to Junction 22	Amber / Red
Junction 22 to Junction 26	Green
Junction 26 to Junction 27	Amber / Red
Junction 27 to Junction 28	Green
Junction 28 to Junction 30	Amber
Junction 30 to Junction 31	Green
Junction 31	Amber

M8 Barrier Condition Survey Results



3.0 Red/Amber/Green System (continued)

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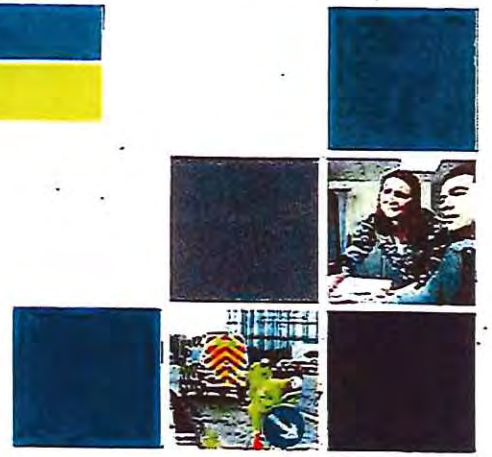
Location	Survey Condition Outcome
Jct 1 – South of Dumbreck Overbridge	Green
Jct 1 – North of Dumbreck Overbridge	Amber

M77 Barrier Condition Survey Results

Location	Survey Condition Outcome
Junction 1 to Junction 2	Amber

M80 Barrier Condition Survey Results



3.0 Red/Amber/Green System (continued)

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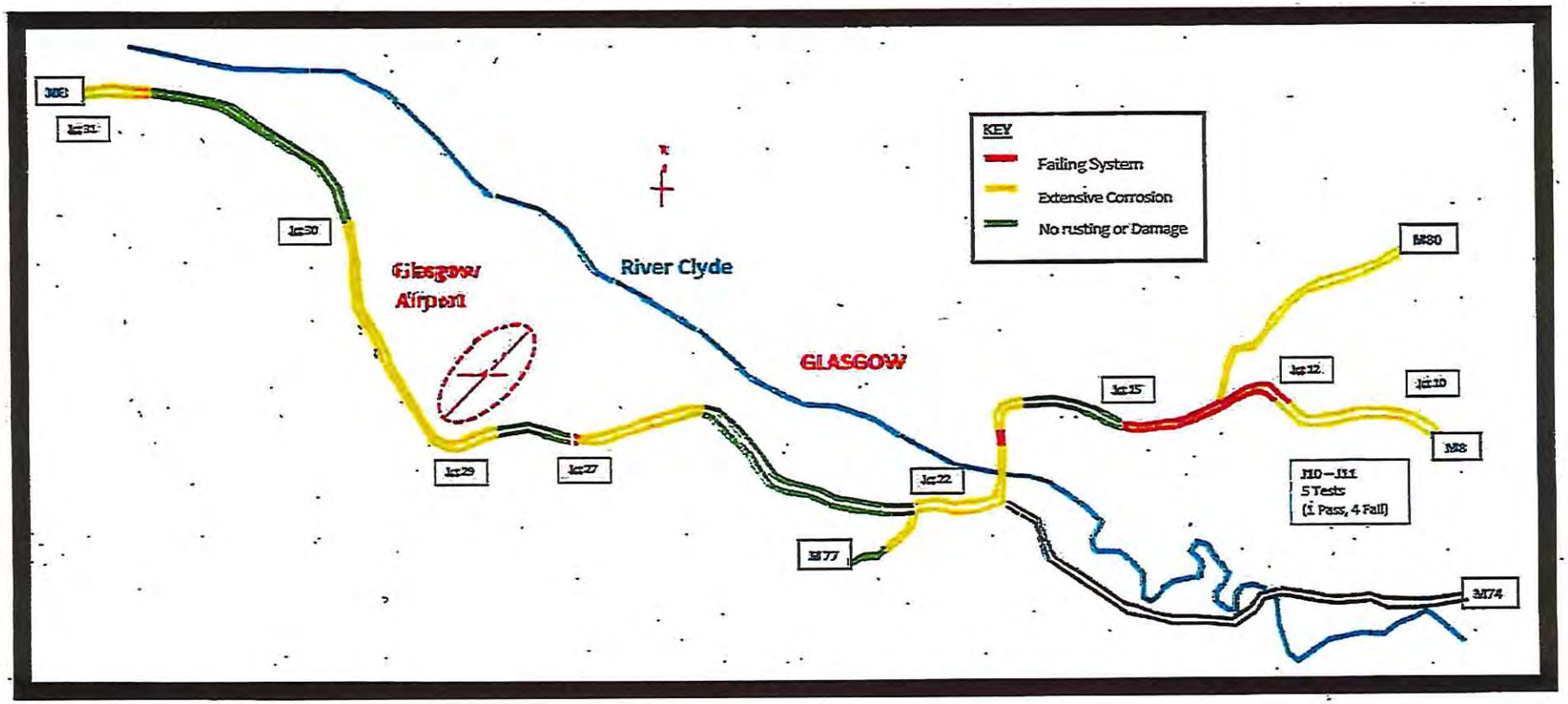

4.0 Push Testing

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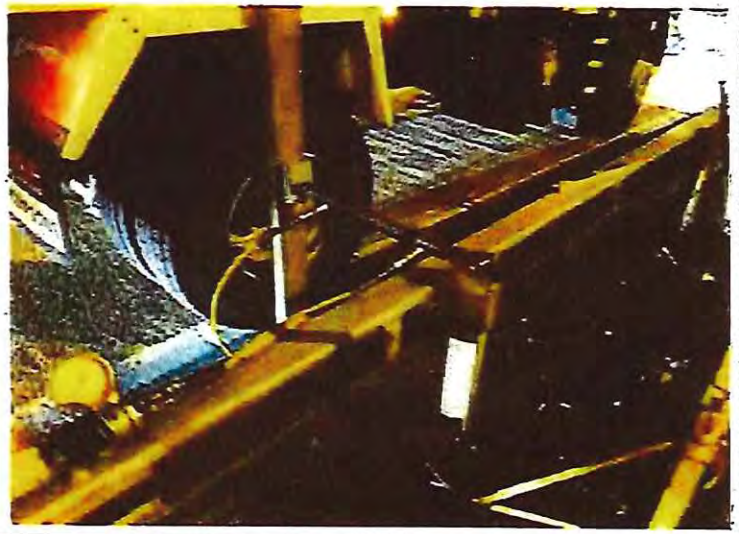

- A load is applied to the post in 1000N increments and the deflection of the post, in reference to a datum peg, is measured.
- For the type of barrier and size of posts on the network if a deflection of greater than 100mm is recorded then the post is deemed to have failed.

4.0 Push Testing (Continued)

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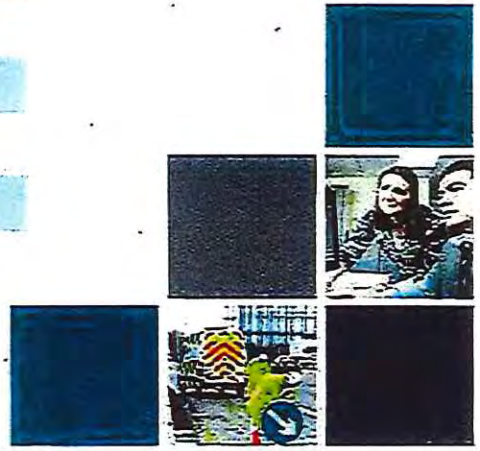
Push Testing

In total 48 push tests were carried out at various locations.

Route	Junction Location	Direction	Number of Tests	Number of Passes	Number of Fails
M8	20 - 22	EB & WB	6	5	1
M8	10 – 12	EB & WB	11	8	3
M8	31	EB & WB	4	4	0
M8	28 - 30	EB & WB	12	12	0
M80	1 - 2	EB & WB	9	9	0
M77	M8 to Jct 1	NB & SB	6	6	0



5.0 Priority System – Maintenance Sequence

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- Lots of debate as to how best to prioritise the system but especially relating to the visual condition and accidents.
- A priority rating system was developed to determine a sequence of replacement works.
- Decision – the visual condition of barrier has to take top priority.

5.0 Priority System – Maintenance Sequence

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M8 Accident Data

- 430 injury accidents on M8 in 5 yr period
- 89% "going ahead" or "slowing and stopping" or "changing lane"
- 14% resulting in a central reserve barrier hit
- Difficult to identify any trends
- Visual condition therefore takes precedence

5.0 Priority System – Maintenance Sequence

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Location	Total Number of Accidents	Length of section	Slip Roads /Junctions	Accidents per km	% Barrier Strike Accidents	Speed Limit (mph)	RAG Rating	Maintenance Sequence
M8 Jct 10 to Jct 12	25	5615	6	4.45	20	60 & 70		4
M8 Jct 12 to Jct 15	53	7062	10	7.50	23	50 & 60		1
M8 Jct 15 to Jct 17	67	4519	10	14.83	7	50		9
M8 Jct 17 to Jct 22	144	7025	13	20.50	9	50		2
M8 Jct 22 to Jct 26	60	11655	19	5.15	20	50 & 70		11
M8 Jct 26 to Jct 27	32	5344	5	5.99	9	70		3
M8 Jct 27 to Jct 28	19	2710	2	7.01	11	60		10
M8 Jct 28 to Jct 30	18	12925	9	1.39	28	50, 60 & 70		6
M8 Jct 30 to Jct 31	11	10347	2	1.06	18	70		13
M8 Jct 31	1	1437	4	0.70	0	70		8
M80 Jct 1 to Jct 2	9	5368	6	1.68	22	50		7
M77South of Jct 1	5	1250	2	4.00	0	50		12
M77 North of Jct 1	9	2224	3	4.05	22	50		5

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5.0 Priority System – Maintenance Sequence

Priority Matrix System – Going Forward

- Within each zone to allow further prioritisation for construction
- Rating System based on link/sections as follows:
  - Structure Condition
  - Function – Required Containment achievable
  - Safety
- Scoring system applied