MUNICIPALITY OF ARRAN-ELDERSLIE
2024 Bridge Inspection Report & Bridge Infrastructure Master Plan

Council Meeting

February 10, 2025

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Agenda

- Bridge Inspection Report
  - Methodology
  - Recommendations
- Bridge Infrastructure Plan
  - Background
  - Methodology
  - Revised Evaluation Recommendations
  - Next Steps

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Bridge Needs Study

- Completion of bridge inspections are required to satisfy provincial regulations. It states bridges are to be inspected under the direct supervision of a Professional Engineer every two years in general accordance with the OSIM.
- Bridges defined as structures with total spans >3m in length.
- 62 bridges were inspected within the Municipality.
- OSIM – Ontario Structural Inspection Manual

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OSIM Process

The assessment process is divided into the following components:

1. Prepare an updated inventory of the bridges and their components to document existing features and bridge dimensions.

2. Complete a visual review of the bridges components looking for safety or structural deficiencies and assigning condition ratings of them to develop a Bridge Condition Index (BCI). Photographs are taken to illustrate overall feature and show status of defects. Also, measurements defects for cost estimates.

3. Develop probable cost estimates to address the recommended maintenance and rehabilitation needs. Provide suggested timelines for the needs.

4. Identify if additional investigation work is warranted to further assess the condition of the structures.

5. Although not a requirement of OSIM, we incorporate the information gathered and recommendations into a needs report with general comments and suggested priority list of the rehabilitation recommendations with probable cost estimates.

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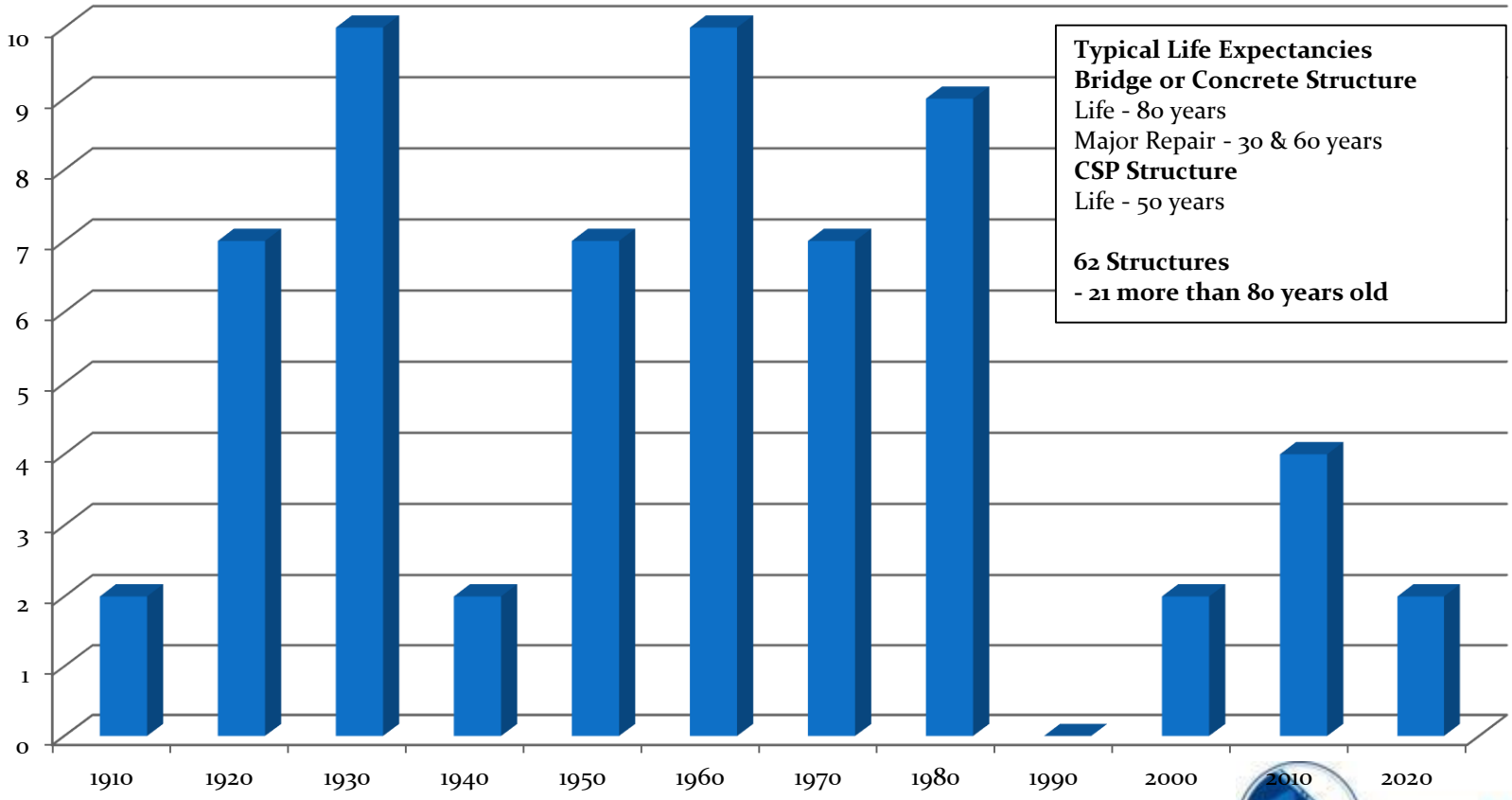
Arran-Elderslie Bridges

Figure No. 2
Age Distribution of Municipality Bridges
(Number of Bridges Built in the Decade)



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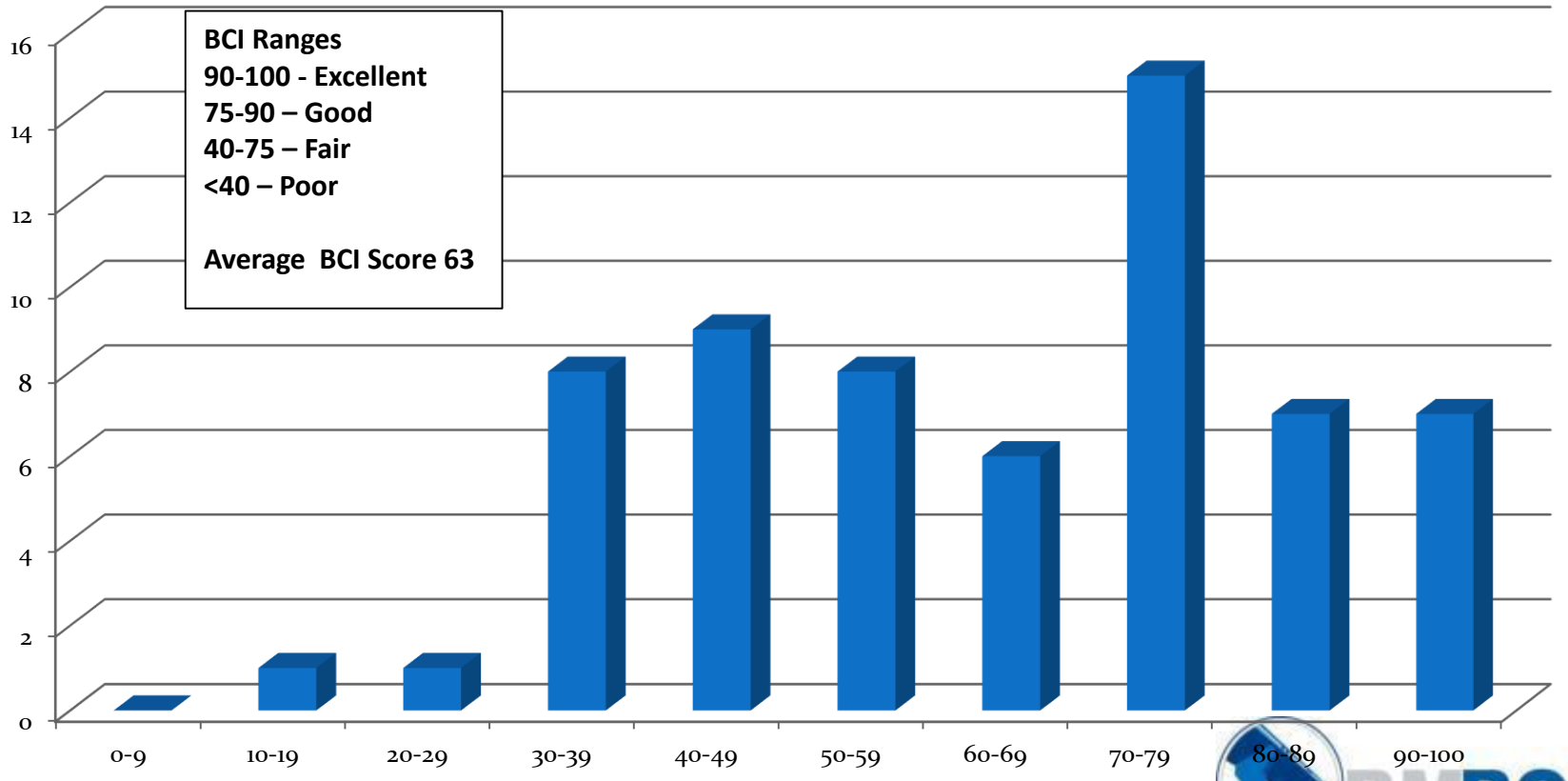
Bridge Condition Index - BCI

Figure No. 3
BCI Distribution of Bridges
(Number of Structures in BCI Range)



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Load Limit Bridges

Site Number	Road Name	BCI	Current Load Limit	Recommended Load Limit
A5	Concession 4	56	9	9
A8	Sideroad 25 South	57	14	14
A11	Sideroad 5 South	45	12	12
A13	Concession 4	66	9	N/A
A14	Mill Road	45	14	14
A30	Arran Elderslie Boundary	38	12	12
E1	Sideroad 25	34	10*	10*
E4	Concession 2	51	18/29/36	18/29/36
E10	Sideroad 5	39	11	11
E12	Sideroad 5	40	8**	**
E16	Concession 8	26	15	15
E17	Sideroad 25	38	11	11
E22	Sideroad 10	40	3	3
E24	B Line	52	10	10

*Recommended to reduce the load limit to 5 until repairs and analysis have been completed

**Bridge closed until repairs are completed or bridge is replaced

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Suggested Priority List - 1 to 5 Year Needs

Site #	Road Name	1-5 Year Repair Needs	Probable Cost of Recommended Work	BCI	Load Limit
E1	Sideroad 25	Replace concrete deck, stringers, misc. other steel and abutment repairs.	**$316,000**	34	10*
E12	Sideroad 5	Replace structure (bridge closed until it is repaired or replaced)	**$3,073,000**	40	8**
E17	Sideroad 25	Provide supplemental supports for two end stringers, Replace curb concrete, Replace 3 wingwalls, Patch repair under bearings, Bottom chord: replace two angles at southeast bearing, Provide concrete topper overlay	**$164,300**	38	11
A30	Arran Elderslie Boundary	Patch repair deck top, soffit, wingwall, Patch repair, Patch repair, Rip rap in front of east abutment	**$229,200**	38	12
A17	Sideroad 25 N.	Install compression seal to stop leaking, Rip rap in scour hole	**$102,000**	73	
E9	Concession 2	Patch repair deck soffit, beams, abutments, etc. Waterproof and pave, Alternatively delay doing repairs and replace bridge	**$244,800**	33	
E22	Sideroad 10	Stringers: prop at abutments, Repair damaged brace, Tighten tie rods, Remove gravel build up around ends of stringers, remove debris, Replace damaged boards	**$44,000**	40	3
A3	Concession 4	Rip rap placement, Reface abutments, repair deck ends, Environmental protection	**$97,000**	34	
E23	Sideroad 5	Replace curbs, Replace railings, Patch repair deck, Patch repair or reface wingwalls, waterproof and pave	**$304,500**	62	
E27	Concession 6	Replace structure	**$265,400**	16	
A4	Concession 4	Patch repair, waterproof and pave, Raise drains, Replace seals in expansion joints	**$116,000**	86	
A15	Concession 8	Clean and coat railings, Drains - sleeve from the bottom	**$192,000**	73	
E5	Sideroad 15	Waterproof and pave, Replace expansion joint seal	**$94,500**	78	
A18	Thomas St.	Replace seals	**$21,000**	80	
A13	Concession 4	Install guiderail, Install single lane bridge signage	**$56,000**	66	9
E16	Concession 8	Replace Bridge	**$950,000**	26	15
E14	Concession 8	Patch repair/re-face, Patch repair girders, Soffit: Patch repairs at east end	**$136,500**	31	
E15	Concession 8	Patch repair soffit, Reconstruct bottoms of girders	**$94,000**	37	
C1	Pedestrian	Patch repair concrete, Cut trees, Clean bearing seats	**$32,800**	40	
C2	2nd Street South west	Repoint masonry, Jack and replace bearings, Patch repair foundations, Spot replacement of boards, Cut tree branches in contact, Spot replacement of rails or pickets	**$154,500**	44	
		TOTAL	**$6,687,500**		

Suggested List of 6 to 10 Year Needs

Site #	Road Name	6-10 Year Repair Needs	Probable Cost of 6-10 Year Recommended Work	BCI	Load Limit
A24	Mill Road	Replace structure with CSP or box culvert	**$371,000.00**	41	
A8	Sideroad 25 South	Patch repair deck top, Patch repair wingwalls and abutments (8m^2), Place rip rap, Patch repair soffit (1m^2), Patch repair girders, Replace railings	**$228,000.00**	57	14
A14	Mill Road	Replace deck boards, HL-2 wear surface	**$35,000.00**	45	14
A29	Arran/Elderslie Boundary	Patch repair deck top and soffit	**$93,000.00**	54	
A5	Concession 4	Patch repair wall and barrel edges (7m^2), Patch repair soffit and abutment spalls (2m^2), Guiderail post replacement	**$167,800.00**	56	9
A17	Sideroad 25 North	Clean and recoat	**$80,000.00**	73	
E7	Sideroad 10 South	Patch repair curb	**$19,000.00**	67	
E4	Concession 2	Replace lattice railing with guiderail and hand rail	**$62,000.00**	51	18/29/ 36
E24	B Line	Repair with new steel and SBGR over deck, Concrete patch repairs for south abutment	**$28,000.00**	52	10*
E11	Concession 6	Waterproof and pave, Raise 8 drains, Patch repair	**$88,200.00**	88	
E29	Concession 6	Guiderail, Patch repair south end of deck	**$83,000.00**	70	
A1	Concession 6	Waterproof and pave	**$97,600.00**	91	
		TOTAL	**$1,352,600.00**		

General Comments

- The municipality has 62 bridges, 21 are more than 80 years old and 10 had a BCI score below 40, 14 bridges with load limits on them. Typically, when bridges enter one of these stages, recommend consideration to replacement of the bridge.
- Within the rehabilitation needs identified within the 1-5 year period, we have shown rehabilitation for some structures that may be more cost effective over the long term to be replaced.
- Probable cost of recommended bridge rehabilitation and replacement needs total almost $8 million (in 2024 dollars) over 10 years. This is based on inspections in 2024 but other needs will be identified in the future.

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Bridge Infrastructure Master Plan

Council Update

February 10, 2025

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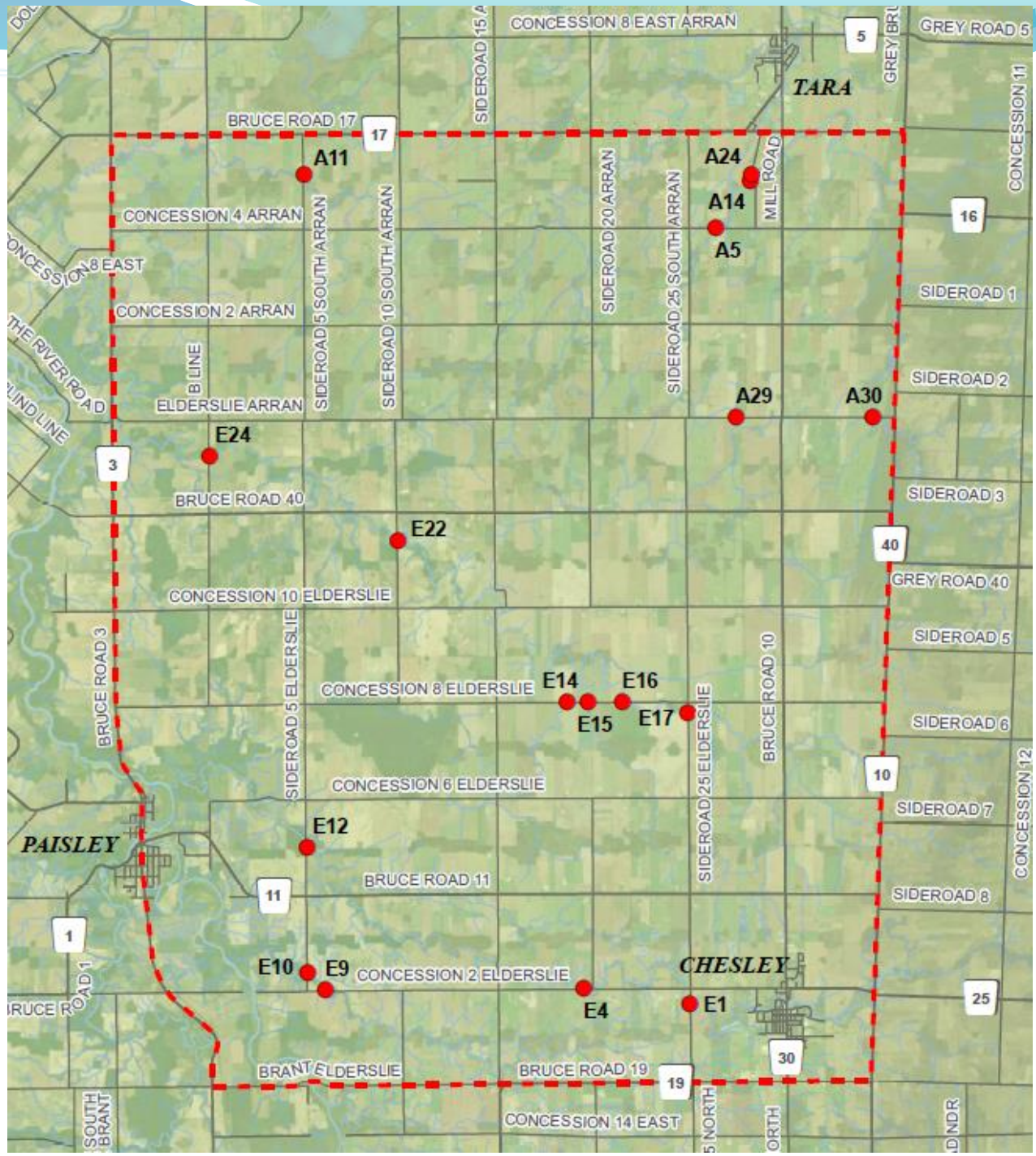
Study Bridges

A11-Wilson
A24-Ruff
A14-Arranvale
A5-Hunts
A29, A30
E22, E24
E14, E15, E16, E17
E12-Pearces
E9, E10
E4-Allens
E1-Priebe



Bridge Economics

- Arran-Elderslie maintains 62 Bridges (>3m span)
- Bridge Needs Report prepared in 2024 listed repair or replacement needs to 20 structures over next 1-5 years
  - E1 – Priebe Bridge Repaired in Fall 2024
  - E12 – Pearce Bridge Closed
- Priority Repairs – 1 to 5 years - $6,371,500.00
- 6-10 Year Repair Priorities $1,352,600.00
- Total Priority Repairs – 1-10 years $7,724,100.00

  (Includes work to most of the study bridges)
- Concerns the Township can not afford to maintain all bridges.
- 2025 budget has $767,484 in reserves

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Master Plan Alternatives

Recommended Approach

- **Alternative 1** – Replace or repair all of the crossings, as required. This option means that each crossing would be either repaired or replaced, and none would be retired (closed).
- **Alternative 2** – Close some crossings and either replace or repair the remaining crossings. This option means that several bridges will be repaired as long as feasible and then eventually closed to traffic and removed, while the remaining crossings will be either repaired as required or replaced.
- **Alternative 3** – Do Nothing. The do nothing option, is a consideration during any Master Plan Class EA process. This option would propose that no commitment is made either way and improvements or changes to address problems will continue to be made on a case by case basis.

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September 2023 Public Meeting

- Held at the Chesley Community Centre
- From 6:00 p.m. to 8:30 p.m.
- Approximately 50 residents in attendance
- Display boards placed around perimeter of room
- Formal presentation by B.M. Ross & Associates
- Question and Answer session following the presentation
- 5 members of Council & 2 Arran-Elderslie staff in attendance
- Public comments submitted to BMROSS following the meeting

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Feedback from Residents

- 8 written comments received following the meeting
- Majority of comments were specific to an individual bridge
- A number of comments were received from the horse & buggy community identifying a bridge that is used often by their community to access a school and church
- Some concerns expressed about how the Public Meeting Notice was provided to residents
- Residents were concerned with timelines for when bridges would eventually be closed

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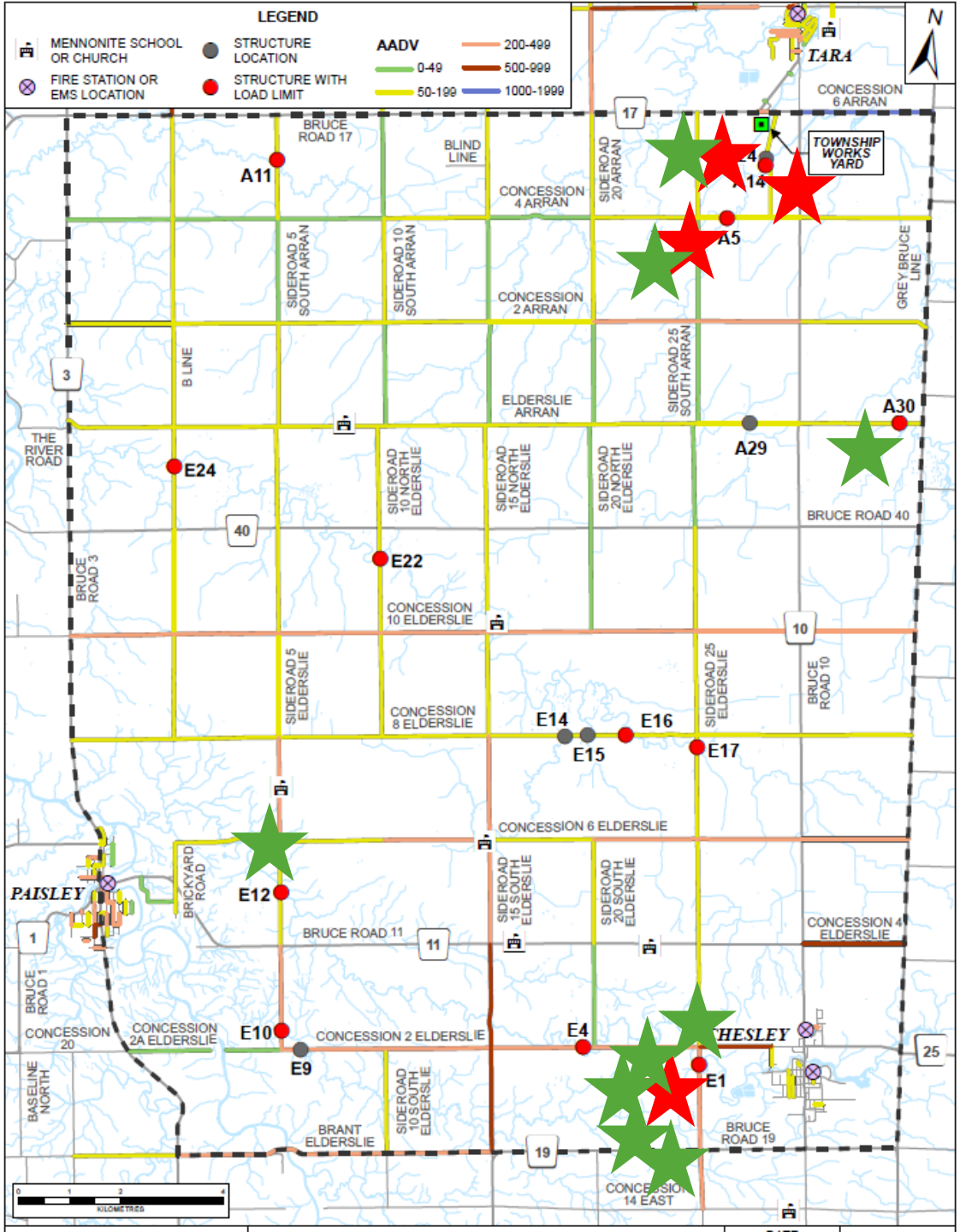

Public Meeting Comments

★ Comments made at the Public Meeting

★ Comments received following the Public Meeting

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Evaluation of Alternatives

- Both Approaches modified following input from residents at the Public Meeting
- A 'Community Features' component added to the matrix to capture schools/churches/Fire/EMS/Works Yard
- Approach #1
  - Approach #1 utilizes BCI, Load Limit, Traffic Counts, Road Types, Detour Lengths (if closed), Road Connectivity, Replacement Costs, and **Community Features** to identify bridges for Closure.
- Approach #2
  - Approach #2 removes the BCI and Load Limit Scores and just focuses on Traffic Counts, Road Types, Detour Lengths (if closed), Road Connectivity, Replacement Costs and **Community Features** to identify bridges for Closure. With this approach you are focusing more on the location and function of the bridges, rather than their current condition.

Approach 1 – Updated Matrix

Table 2.1: Potential Bridge Closure Assessment Matrix – Recommended Closures Option A - Option B - +

Structure ID	Type & Age	Avg. Traffic Counts	Score X 2	Road Type[1]	Score	Detour	Score	Replace$	Score x 2	Community Feature	Score	Road Connectivity	Score	Revised Total
E4 - Allens	Truss-1920	390	10	HCB	5	8.2km	10	$2,659,230	30	EMS Route	5	Yes	5	65
E9	Beam-1930	235	10	LCB	10	12.2km	5	$1,108,013	20	EMS Route	5	Yes	5	55
E1 – Priebe	Truss-1938	175	20	Gravel	15	8.1km	10	$2,817,518	30	School (near)	5	Yes	5	85
E10	T-Beam-1930	294	10	LCB	10	12.2km	5	$1,297,958	20	EMS Route	5	Yes	5	55
E12– Pearces	Truss-1930	184	20	Gravel	15	7.6km	10	$3,073,000	30	School (far)	10	Some	10	95
A11 – Wilson	Conc. Arch-1910	104	20	Gravel	15	8.1km	10	$854,753	10	None	15	None	15	90
A29	Conc. slab-1930	97	30	Gravel	15	7.9km	10	$1,044,698	20	None	15	Some	10	10
A14–Arranvale	Truss-1920	150	20	Gravel	15	5.2km	15	$3,313,485	30	Work Shed	5	Yes	5	90
A24 – Ruff	Conc. slab-1920	150	20	Gravel	15	5.2km	15	$371,000	10	Work Shed	5	Yes	5	70
E24	Truss-1920	94	30	Gravel	15	8.2km	10	$2,110,500	30	School (far)	10	None	15	110
A5 – Hunts	Conc. Arc-1910	130	20	Gravel	15	7.1km	15	$1,487,903	20	Work Shed (far)	10	Some	10	90
A30	Conc. slab-1930	61	30	Gravel	15	8.8km	10	$2,089,395	30	None	15	Some	10	110
E22	Truss 1920	41	30	Gravel	15	8.1 km	10	$2,216,025	30	Schools	5	None	15	105
E16	T-Beam-1930	75	30	Gravel	15	12.2km	5	$950,000	10	None	15	Yes	5	80
E17	Truss-1930	70	30	Gravel	15	8.2km	10	$2,585,363	30	None	15	None	15	115
E14	T-Beam-1930	66	30	Gravel	15	12.2km	5	$1,139,670	20	None	15	Yes	5	90
E15	T-Beam-1920	66	30	Gravel	15	12.2km	5	$1,108,013	20	None	15	Yes	5	90

* If scores are tied for one or more structures, the structure with the highest traffic count is moved to the lower category

Scoring System: [1]LCB – Low Class Bituminous, HCB – High Class Bituminous

ic: <100 = 15, 100-200 = 10, > 200 = 5

Road Type: Gravel = 15, LCB = 10, HCB = 5

Detour Length: < 7.5 = 15, 7.6-10 = 10, >10.1 = 5

Replace Cost: < 1 mil = 5, 1–2 mil = 10, > 2 mil = 15

Road Connectivity: none = 15, some = 10, yes = 5

Community Feature: None = 15, Some = 10, Yes = 5

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Approach 2 – Matrix Results

*Evaluate based only on location; remove bridge condition components

Table 2.1: Potential Bridge Closure Assessment Matrix – Recommended Closures Option A - Option B - +

Structure ID	Type & Age	Avg. Traffic Counts	Score X 2	Road Type[1]	Score	Detour	Score	Replace$	Score x 2	Community Feature	Score	Road Connectivity	Score	Revised Total
E4 - Allens	Truss-1920	390	10	HCB	5	8.2km	10	$2,659,230	30	EMS Route	5	Yes	5	65
E9	Beam-1930	235	10	LCB	10	12.2km	5	$1,108,013	20	EMS Route	5	Yes	5	55
E1 – Priebe	Truss-1938	175	20	Gravel	15	8.1km	10	$2,817,518	30	School (near)	5	Yes	5	85
E10	T-Beam-1930	294	10	LCB	10	12.2km	5	$1,297,958	20	EMS Route	5	Yes	5	55
E12– Pearces	Truss-1930	184	20	Gravel	15	7.6km	10	$3,073,000	30	School (far)	10	Some	10	95
A11 – Wilson	Conc. Arch-1910	104	20	Gravel	15	8.1km	10	$854,753	10	None	15	None	15	90
A29	Conc. slab-1930	97	30	Gravel	15	7.9km	10	$1,044,698	20	None	15	Some	10	10
A14–Arranvale	Truss-1920	150	20	Gravel	15	5.2km	15	$3,313,485	30	Work Shed	5	Yes	5	90
A24 – Ruff	Conc. slab-1920	150	20	Gravel	15	5.2km	15	$371,000	10	Work Shed	5	Yes	5	70
E24	Truss-1920	94	30	Gravel	15	8.2km	10	$2,110,500	30	School (far)	10	None	15	110
A5 – Hunts	Conc. Arc-1910	130	20	Gravel	15	7.1km	15	$1,487,903	20	Work Shed (far)	10	Some	10	90
A30	Conc. slab-1930	61	30	Gravel	15	8.8km	10	$2,089,395	30	None	15	Some	10	110
E22	Truss 1920	41	30	Gravel	15	8.1 km	10	$2,216,025	30	Schools	5	None	15	105
E16	T-Beam-1930	75	30	Gravel	15	12.2km	5	$950,000	10	None	15	Yes	5	80
E17	Truss-1930	70	30	Gravel	15	8.2km	10	$2,585,363	30	None	15	None	15	115
E14	T-Beam-1930	66	30	Gravel	15	12.2km	5	$1,139,670	20	None	15	Yes	5	90
E15	T-Beam-1920	66	30	Gravel	15	12.2km	5	$1,108,013	20	None	15	Yes	5	90

* If scores are tied for one or more structures, the structure with the highest traffic count is moved to the lower category

Scoring System: [1]LCB – Low Class Bituminous, HCB – High Class Bituminous

ic: <100 = 15, 100-200 = 10, > 200 = 5

Road Type: Gravel = 15, LCB = 10, HCB = 5

Detour Length: < 7.5 = 15, 7.6-10 = 10, >10.1 = 5

Replace Cost: < 1 mil = 5, 1–2 mil = 10, > 2 mil = 15

Road Connectivity: none = 15, some = 10, yes = 5

Community Feature: None = 15, Some = 10, Yes = 5

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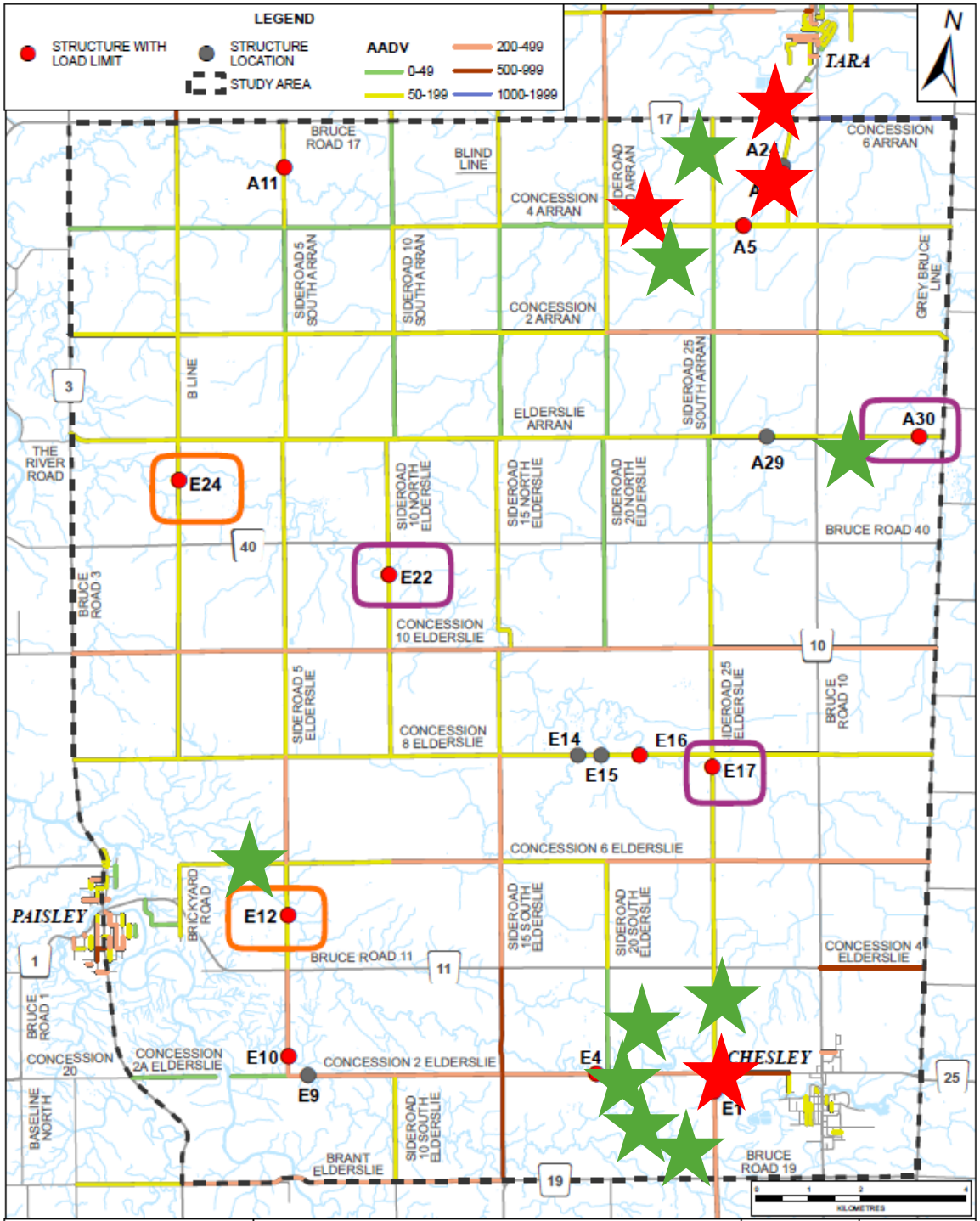

Approach 1 & 2 Results

★ Comments made at the Public Meeting

★ Comments received following the Closing

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Approach #1 & 2

Replace All Crossings
> $30 Million

Option A Closures

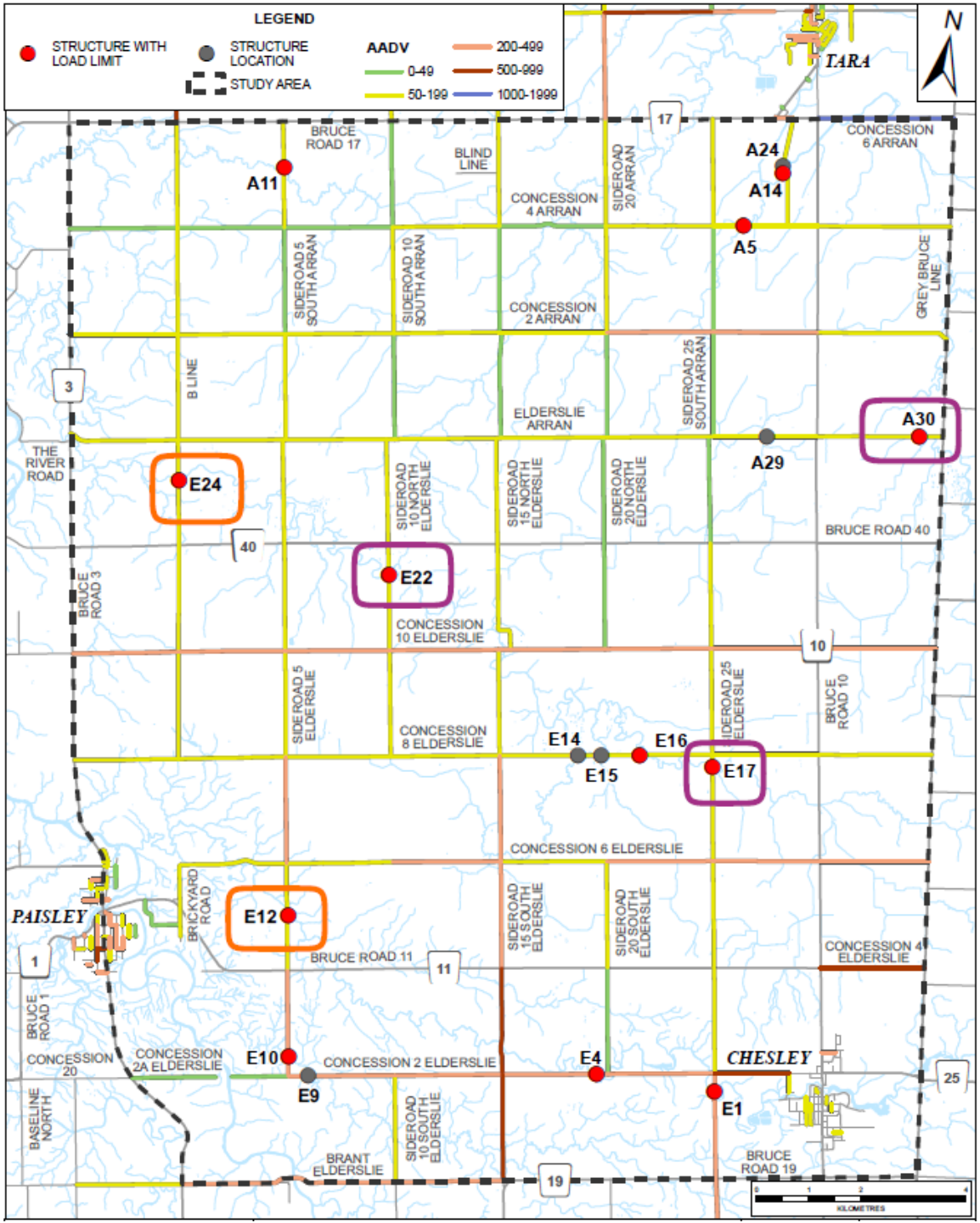
- E17, E22, A30
- $23.3 Million

Saves $6.9 Million

Option A&B Closures

- E12, E24
- E17, E22, A30
- $18 Million

Saves $12 Million



Recommended Approach

- Based on revised Matrix Results and input from residents recommend proceeding with Approach #1 & 2 but identify only 5 crossings for eventual closure.
- Majority of bridges identified for closure received no comments from the public related to potential closure
- Only minor repairs to E17 and then closed
- Suggested threshold of $50,000 in repairs for Initial Closures and $100,000 for subsequent closures
- Continue to Increase Bridge Reserves

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Approaches to Consider

The suggested bridges identified for closure are:

- E17–Truss (1930) – (BCI-38) – Repair 2025/26 – close 2040
- E22–Truss (1920) – (BCI-40) – Repair 2025/26 - close 2030
- A30–Conc. Slab (1930) - (BCI-38)– Repair 27/28 – close 2045

Initial Closures

- E12–Truss (1930) – (BCI-40)- Currently Closed
- E24–Truss (1920) – (BCI-52) – Repair 30/31 then close

Next Closures

*Savings of $12 Million

- Final closing dates subject to follow up inspections

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Suggested Outcomes and Timelines

Table 1.2: Recommended Outcomes for Approach #1 – Option #A - 3 Bridge Closures **Option #B – 2 additional closures**

Structure ID	Type & Age	Avg. Traffic Counts	BCI	Recommended Outcome	Repair Costs	Repair Timeline	Replacement Costs	Replacement Timeline
E4 - Allens	Truss-1920	390	51	**Replace**	$62,000	**6-10**	$2,659,230	20-25 Years
E9	Beam-1930	235	33	**Replace**	$244,800	**1-5 Years**	$1,108,013	1-5 Years
E1 – Priebe	Truss-1938	175	34	**Repair then Replace**	Repaired in 2024	**N/A**	$2,817,518	20-25 Years
E10	T-Beam-1930	294	39	**Replace**	No Immediate Repairs	**N/A**	$1,297,958	15-20 Years
E12– Pearces	Truss-1930	184	40	**Closure**	Currently Closed	**N/A**	N/A	1-5 Years
A11 – Wilson	Conc. Arch-1910	104	45	**Replace**	No Immediate Repairs	**N/A**	$854,753	15-20 Years
A29	Conc. slab-1930	97	54	**Repair then Replace**	$93,000	**5-10 Years**	$1,044,698	20-25 Years
A14–Arranvale	Truss-1920	150	45	**Repair then Closure**	$35,000	**5-10**	$3,313,485	20-25 Years
A24 – Ruff	Conc. slab-1920	150	41	**Replace**	N/A	**N/A**	$371,000	5-10 Years
E24	Truss-1920	94	52	**Repair then Closure**	$28,000	**5-10 Years**	N/A	20-25 Years
A5 – Hunts	Conc. Arc-1910	130	56	**Repair then Replace**	$167,800	**5-10 Years**	$1,487,903	20-25 years
A30	Conc. slab-1930	61	38	**Repair then Closure**	$229,200	**1-5 Years**	N/A	20-25 Years
E22	Truss 1920	41	40	**Repair then Closure**	$44,000	**1-5 Years**	N/A	5-10 Years
E16	T-Beam-1930	75	26	**Replace**	$130,000	**1-5 Years**	$950,000	10-15 Years
E17	Truss-1930	70	38	**Repair then Closure**	$164,300	**1-5 Years**	N/A	10-15 Years
E14	T-Beam-1930	66	31	**Repair then Replace**	$136,500	**1-5 Years**	$1,139,670	10-15 Years
E15	T-Beam-1920	66	37	**Repair then Replace**	$94,000	**1-5 Years**	$1,108,013	10-15 Years

- Given these bridges are all close to 100 years old, we don't want to suggest any of them will still be in service beyond 2050 (25 years)

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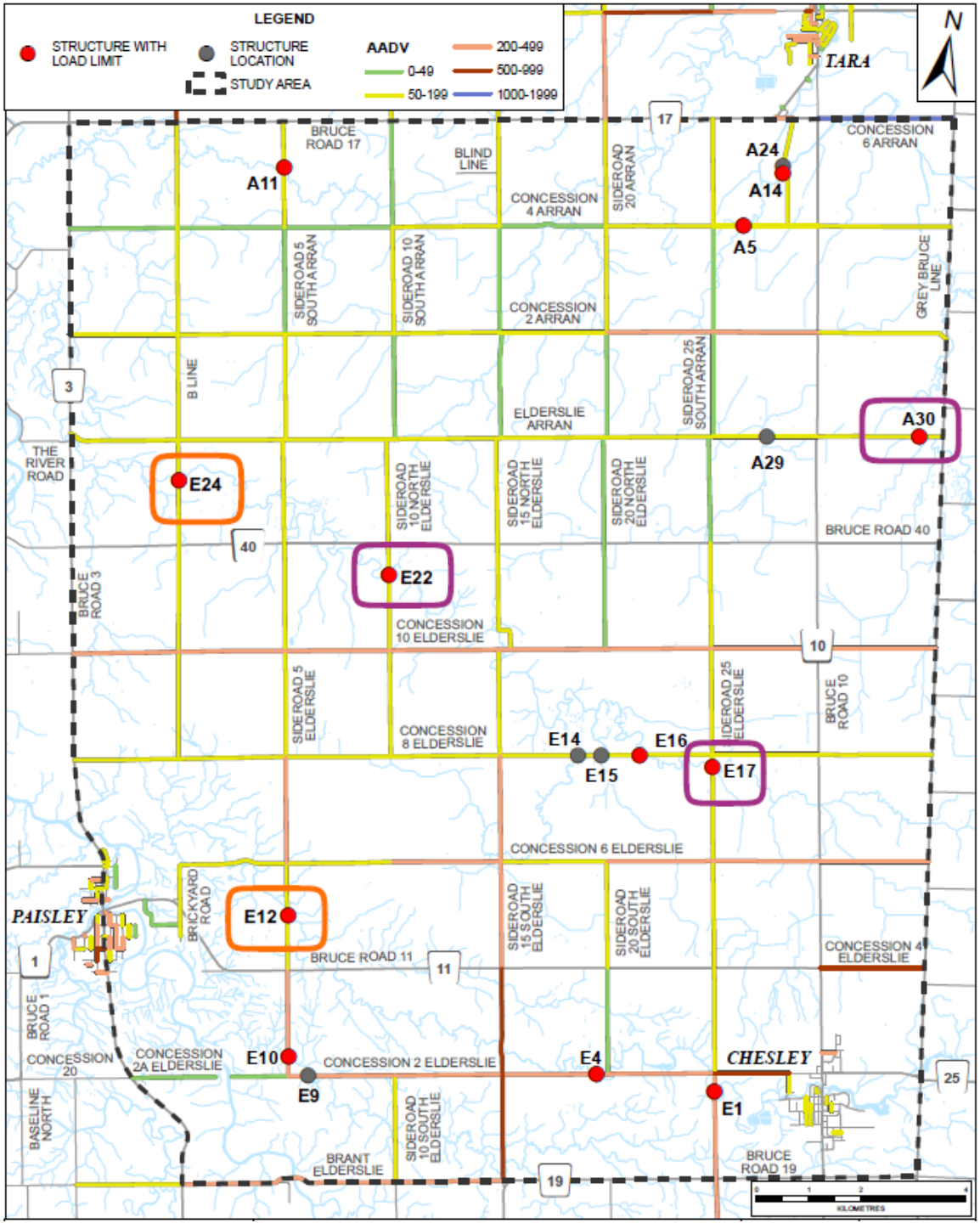
Recommended Future Closures



Next Steps

- Council to Select a Preliminary Preferred Approach
- Hold Second Public Meeting on Revised Approach
- Obtain Additional Input from residents
- Council to Confirm Preferred Approach
- Finalize Master Plan Report
- Publish Notice of Master Plan Completion

Questions?

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