Grand Old Bridges:
The Grand River Watershed Bridge Inventory

Report Prepared for the Grand River Conservation Authority
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Section 1 - Introduction

With this report the consultant presents a listing of bridges from the Grand River Watershed Bridge Inventory which have significant heritage value and contribute to the Heritage River designation of the Grand, Speed, Eramosa, Conestogo and Nith Rivers. The report includes commentary on the project goals, the evolution of the methodology, scope and content, the achievements to date, and recommendations on elements requiring further investigation.

1.1 Background and Purpose of the Grand River Watershed Bridge Inventory

In his letter of October 17, 2003 to the Chairs, Wardens, Reeves and Mayors of the Municipalities of the Grand River Watershed, Peter Kraus (Chair, GRCA) described the background and impetus for a Grand River Watershed Bridge Inventory.

> *"Since a systematic evaluation of heritage bridges has not been carried out to determine those structures that are important to the Canadian Heritage River status, the GRCA is currently embarking on a bridge inventory as part of the 10-Year Monitoring Report. This information will be the first step in determining, in consultation with our member municipalities and watershed residents, which bridges are significant to the Heritage River designation in addition to those listed under the Ontario Heritage Bridge Program (many of which have already been replaced).*
>
> *The Canadian Heritage River designation provides national and international recognition for the Grand River. It has no regulatory or legal restrictions associated with it. The intent is to encourage all stakeholders to preserve and interpret the important features and values, which support the designation. The loss of one feature or value does not warrant the loss of the Heritage River status. It is the cumulative effect of the loss of many of these features, which would cause the Canadian Heritage Rivers Board to re-evaluate the status of the Grand River. Identifying those heritage bridges important to the designation provides a better context for consideration in this regard and will avert any debate about other bridges as they relate to the designation."*

1.2 Project Goal

The goal of the Grand River Watershed Bridge Inventory (GRWBI) is to identify and document all bridges within the watershed that support the designation of the Grand River as a Canadian Heritage River. These bridges will display qualities of architectural/engineering, historical or contextual heritage significance.

1.3 Scope of the Inventory

The GRWBI has created selection criteria designed to capture bridges with significant heritage value that cross one of the five Heritage Rivers in the Grand River Watershed - the Grand, Speed, Eramosa, Conestogo or Nith River. These bridges can carry roads, railways or walking trails. Extant bridges are the priority but significant abandoned bridges, significant bridge remnants and notable bridge structures lost since 1994 will also be documented whenever possible. When the consultant was aware of bridges with significant heritage value crossing other Grand River tributaries and waterways, these were documented and included when possible.

Section 2 - Methodology

2.1 Bridge Inventory and Evaluation Criteria Models

Discovering Heritage Bridges on Ontario's Roads (1983)
Although not presented as an inventory, David Cuming's book *Discovering Heritage Bridges on Ontario's Roads* was the first major study of the history and status of historic bridges across the province. Many references were made to excellent examples of bridge design within the Grand River watershed - especially the concrete bowstring arch.

Ontario Heritage Bridge Program (1991)
Under the direction of David Cuming, the Ontario Heritage Bridge Program was established to determine the most significant heritage bridge structures in the Province of Ontario. The OHBP criteria has been the basis of most evaluation inventories since.

Spanning the Generations: Old Bridges in Waterloo Region (2003)
The Heritage Planning Advisory Committee (HPAC) and the Planning, Housing and Community Development Department of the Region of Waterloo have recently completed a seminal example of bridge inventory design in *Spanning the Generations: A Study of Old Bridges in Waterloo Region* (Phase 1, Inventory; Phase 2, Heritage Assessment) August 2003. The Region of Waterloo has generously allowed the GRWBI to emulate aspects of its format and also to incorporate their bridge profile data and images when needed.

2.2 Development of Criteria for Heritage Evaluation

In their publication *Spanning the Generations: A Study of Old Bridges in Waterloo Region* (Phase 2, Heritage Assessment), the Region of Waterloo made minor modifications to the bridge evaluation criteria set created by David Cuming for the Ontario Heritage Bridge Inventory in 1991. These modifications were made so that the selection process would better reflect the nature of the Region of Waterloo's bridge heritage. Because many of the characteristics of Waterloo Region's bridges are seen generally across the watershed, the GRWBI has adopted their modified criteria for its purposes. This will make it easier to maintain consistency when comparing the GRWBI results with other studies that have used the Ministry's criteria model.

The authors of the Waterloo Region Bridge Inventory felt that the Ontario Heritage Bridge Program Criteria was comprehensive "…except for considering groups of bridges or the spectrum of bridge types. For this reason, HPAC chose to include a category [Bridge Group], although it was not given a numerical value."

2.3 Scoring the Criteria

As in the Waterloo Region's bridge inventory, the evaluation and rating criteria is used by the GRWBI "…as an analytical tool to quantify the heritage merits of every bridge in the study. The criteria are divided into 12 categories, and each category is given a numerical score. The numerical total represents the relative heritage potential of the bridge. The scoring ranges from 0-100 points and heritage bridges usually achieve a score within the range of 50 to 80 points."

The rating criteria checklist used by the GRWBI (see Appendix B) is based on the Ontario Heritage Bridge Program Criteria and the Region of Waterloo's modified version. The GRWBI has added to the "Comments" column to reflect the Grand River Watershed context.

2.4 Interpretation of the Scoring Results

The criteria were designed by the Ontario Heritage Bridge Program to distinctly separate bridges according to their heritage value. Bridges with significant heritage value typically score above 50 points (usually averaging 60) because the categories are not weighted evenly. Those scoring points in both the *Design/Style* and *History* categories (26 points) attained significantly higher scores than those that did not receive those points. Small differences in scoring may occur due to the subjectivity of the question posed - e. g. Is this bridge visually appealing? Does it contribute to the character of the town? However, this subjectivity does not usually "make or break" a heritage bridge. Of course, there are exceptions, particularly if there is a lack of information.

A score of 50 points or more indicates a bridge with significant heritage value. The reasons for this are:

- It is empirically proven that, both in this evaluation and for those bridges tested by David Cuming, the creator of the criteria, that a properly researched heritage bridge is unlikely to score below 50 points

- When the criteria were applied to provincially designated bridges, the scores ranged from 50 to 78 points.

2.5 Gathering Information

Information for the GRWBI has been obtained from the following sources:

- Region of Waterloo's recent study of old bridges
- Ontario Heritage Bridge Program, 1991
- road superintendents
- previously commissioned bridge appraisals (usually in the form of Ontario Structural Integrity Manual Reports)
- public works departments
- GRCA files, data, GIS and image archive
- railway companies

2.6 Response Summary and Missing or Pending Information

The gathering of data for the bridge inventory generally went very well. The consultant has received positive and enthusiastic responses from most of the participating municipalities. Some of the rural areas perceived that this study may negatively influence their autonomy regarding bridge maintenanace/replacement and preservation.

To date, the collection of information about significant bridges of the watershed is incomplete in some areas. Generally the information is either not currently available or the information submitted by the municipality to the consultant is incomplete and requires further research. The preliminary list of significant bridges will change as this information becomes available. It is also important to note that individual rating scores may increase when new information is added to existing bridge inventory records.

The following is a list of municipalities that the consultant has contacted directly for bridge information. Municipalities within brackets do not have one of the five designated heritage rivers flowing through their part of the Grand River watershed. A single asterisk indicates the municipality had been contacted but the consultant did not have an opportunity to travel to the municipality offices to conduct the necessary research. A double asterisk indicates municipalities which (as of the date of this report) have not agreed to provide access to basic bridge information.

**	Amaranth	Township of
	Blandford-Blenheim	Township of
	Brantford	City of
	Brant	County of
	Cambridge	City of
	Centre Wellington	Township of
*	Dufferin	County
**	East Garafraxa	Township of
	East Luther Grand Valley	Township of
**	Erin	Township of
*	(Grey	County)
	Guelph	City of
**	Guelph-Eramosa	Township of
	Haldimand	County
*	(Halton	Region)
*	(Hamilton	City of)
	Kitchener	City of
	Mapleton	Township of
**	Melancthon	Township of
*	(Milton	Town of)
	North Dumfries	Township of
	Norwich	Township of
*	Oxford	County of
*	Perth	County of
*	Perth East	Township of
	Puslinch	Township of
	Six Nations of the Grand River	
	Waterloo	City of
	Waterloo	Regional of
	Wellesley	Township of
	Wellington	County of
	Wellington North	Township of
	Wilmot	Township of
	Woolwich	Township of

Section 3 - Creating a Preliminary List of Bridges with Significant Heritage Value Contributing to the Heritage Designation of the Grand, Speed, Eramosa, Conestogo and Nith Rivers

3.1 Presentation Format

The preliminary list of bridges with significant heritage value in the Grand River watershed is presented in Appendix B and is arranged (or sorted) according to their rating scores. It must be made clear that this preliminary listing does not present the entire Grand River Watershed Bridge Inventory - only the bridges that cross one the five heritage rivers within the watershed and that have scored 50 points or higher in the evaluation process described above. Some of the bridges scoring lower than 50 points which were not presented in this preliminary list may be added at a later date as their total score will likely rise when all pertinent information regarding these bridges has been received. The consultant has included some of the bridges with significant heritage value which cross other Grand River tributaries and waterways. Many more of these more remote heritage features would be added to this list when further study is undertaken.

3.2 Selection of Bridge Images

Whenever available, recent images provided by the municipality have been used in this inventory. When the consultant became aware that recent changes have been made to the bridge the consultant has tried to visit the site and take new photographs to update the record. The remainder of the bridges require images from the GRCA image library to complete the record. The entire GRWBI (data and photographs) is currently maintained within the Grand River Conservation Authority's computer database platform.

The photographic collage on the following page (page 11) presents a selection from these images that represent the variety of bridge structures documented in the inventory.

Image Key
top left: Covered wooden lattice truss bridge, Guelph, 1991; top centre: metal truss bridge southeast of Canning, early 20th century); top right: David Street Bridge (Elora), concrete open spandrel arch on limestone pier, 1867/1921; centre: Caledonia Bridge, nine-span concrete bowstring bridge, 1927 ; bottom left: Railway Viaduct (Cambridge), later 19th century; bottom centre: Nith River bridge (Paris), concrete solid spandrel arch, 1932; bottom right: Gow's Bridge (Guelph), stone masonry, 1897. Photos: Stephen Robinson, Robinson Heritage Consulting

Section 5 - Improvements, Deterioration or Loss of Bridges with Significant Heritage Value Since 1994

Improvements to Bridges with Significant Heritage Value Since 1994

Irvine Creek Bridge, Elora (1867 and 1921)
The first of six bridges in the same location over Irvine Creek was built in 1848 after the founding of Salem, just north of Elora. This was the first cantilever bridge in North America. The central stone pier was constructed in 1867. The first bridge on the pier was constructed in 1868. The current Irvine Creek bridge was built in 1921 as an open spandrel concrete bridge. The Irvine Creek bridge is slated for replacement in 2004. The 1867 stone pier that supports the current structure will be preserved. Although it is not being saved to provide structural support, it is being preserved for its heritage value. The new bridge will be designed to be similar to the 1921 structure.

Covered Lattice Truss Bridge, Guelph (1991)
The timber lattice frame covered pedestrian bridge across the Speed River was built by the Timber Framers Guild of America. It has historical design elements including the lattice trusses, which are a slightly evolved version of the Town Truss, patented by Ithiel Town in
1820 and successfully built hundreds of times since. It is located at the confluence of the Speed and Eramosa Rivers, and links the Eramosa River Trail and the Silvercreek Trail, at Gordon and Wellington Streets, downtown Guelph.

West Montrose Covered Bridge (Kissing Bridge), West Montrose (1881)
The West Montrose bridge is a two-span covered bridge. In January 1998, the Regional Municipality of Waterloo accepted ownership of the bridge from the province of
Ontario. Restoration work was completed in 1998. The bridge retains its original form and is the last covered bridge in Ontario.

Gow's Bridge, Guelph (1897)
Gow's Bridge crosses the Speed River just downstream of Gordon Street. It is one of the few remaining stone bridges in Ontario and used a structure called "falsework" to temporarily support the arch during construction. It was restructured and repaired in 1997.

Norwich Street Bridge, Guelph (1882)
The Norwich Street Bridge was designated as a heritage structure by the City of Guelph in 1998. Since 1998 the Norwich Street Bridge has been closed to vehicular traffic and now functions as a pedestrian link across the Speed River near the Goldie Mill Site and walking trails.

Gordon Street Bridge, Guelph (2001)
The previous Gordon Street Bridge was built about 1935 and was a 40 metre-long, 4-span steel beam design with masonry abutments and piers. The present bridge was constructed using pre-cast concrete in four spans with basket arches. Even though the replacement bridge does not attempt to replicate the previous structure, the new Gordon Street Bridge reflects the graceful stone masonry arches of Gow's Bridge visible downstream. The new Gordon Street Bridge won the Precast Concrete - Material Development & Innovation
Award at the 2001 Ontario Concrete Awards.

Neeve Street Bridge, Guelph (1920)
Reconstruction of the Neeve Street Bridge in 1998 retained the arched design but added a coursed, rock-faced concrete block exterior which reflects the traditional stone masonry buildings nearby and also the arches of Gow's Bridge (1897) further downstream.

Stone Road Bridge, Guelph (1916)
The Stone Road concrete bowstring bridge is listed in the province's Heritage Bridge Program and designated in 2003 as a heritage structure under the Ontario Heritage
Act. Built in 1916 and previously known as McQuillan's Bridge, the Stone Road
Bridge is an early and excellent example of concrete bowstring bridge construction by noted Fergus contractor Charles Mattaini. After an Environmental Assessment undertaken in 2000 for improvements to Stone Road East, the City of Guelph decided to reroute the existing
road north and to keep the bridge as a pedestrian bridge for the municipal trail system.

Freeport Bridge, Kitchener (1926, rehabilitated 2003)
Freeport Bridge is a seven span, concrete bowstring arch bridge located on King Street in Kitchener. Construction started in 1925 and took one year. The bridge was rehabilitated in 2003. The bridge deck, curbs, sidewalk, handrails and repairs to the concrete arches and hangers were authentically restored.

Park Hill Road Bridge, Cambridge (original bridge 1933, reconstructed 2002)
This bridge, formerly known as the Queen Street Bridge, was the last of its kind in the region. It was designed by A. B. Crealock, a well-known Ontario bridge designer during the 1920s and 30s, and completed in 1933. The structure is one of the three bridges credited with contributing to the development of early Galt. The bridge was reconstructed and widened to four lanes in 2002 retaining much of the original appearance.

Murray Street Bridge, Brantford (1921)
The Murray Street Bridge was built in 1921 over the Brantford Cut of the Grand River Navigation Company Canal and Lock System (now the Mohawk Waterway). Designed by Frank P. Adams, Brantford's City Engineer, the distinctive Beaux-Arts style balustrade design with cast concrete railing and balusters had been used earlier in the Alfred Street Bridge, Brantford (pre-1911) and later in the Lorne Bridge, Brantford (1924). In 2003, the original forms were used to make replacement balusters during the repair and rehabilitation of the upper level of the bridge.

Deterioration or Loss of Bridges with Significant Heritage Value Since 1994

Glen Allan Bridge, Mapleton (1915)
This unusual offset, camelback steel truss bridge and its reinforced concrete approach balustrade are deteriorating. At the time of construction, the names of the municipal officials, designer and builders were impressed into the reinforced concrete railings and are still clearly visible.

Eden Mills Bridge, Eden Mills (former bridge 1913, replaced in 1998)
In June 1998, the single-lane heritage Bowstring Bridge in Eden Mills was demolished and replaced with a two-lane bridge. After considerable community debate, the new bridge was designed with decorative arches that resemble the old bowstrings.

Victoria Street Bridge, Elora (1899)
The Victoria Street Bridge is one of the oldest surviving steel bridges in Ontario. The present bridge was built over the falls and close to Islet Rock. It has been closed to both motorized and pedestrian traffic.

King Street Bridge (Millrace section and Speed River section), Cambridge (1923 and 1987)
The larger portion of this bridge was replaced in 1987 with a similar concrete design, although with a solid balustrade. The smaller bridge section spans the north millrace is still original and currently under consideration for repairs.

Black Bridge Road Bridge, Cambridge (1916)
Black Bridge Road has been closed due to a railway overpass north of the Black Bridge Road Bridge.

Canning (South-East) Truss Bridge, Township of Blandford-Blenheim (not dated)
Used only as a scenic pedestrian crossing over the Nith River just north of the Canning CNR Bridge, this steel truss bridge is deteriorating. This type of steel truss bridge is disappearing in the area. A similar truss bridge over the Nith River in the hamlet of Canning, was replaced by a steel beam deck bridge in 1999.

Caledonia Bridge, Caledonia (1927)
Caledonia Bridge is a nine span concrete bowstring arch bridge is the only one of its kind in Canada. It is currently deteriorating. Heavy trucks are not permitted to use the bridge.

Haysville Bridge, Haysville (former bridge 1930)
The steel truss bridge in the village of Haysville was demolished and replaced with a wider, modern concrete deck bridge by the Township of Wilmot after 1994.

Section 6 - Recommendations

During the research and compilation of this report, the consultant has given consideration to issues regarding the current bridge inventory content, to issues of awareness and information management, and to the issue of sourcing additional funding for future development of the Grand River Watershed Bridge Inventory. The consultant offers the following recommendations.

Inventory Content

- As stated earlier in this report, significant bridge information is still missing in the GRWBI. Further research of bridges within the scope of this study is needed to achieve greater data consistency within the existing inventory.

- Consultation with heritage groups throughout the watershed should be undertaken. These groups specialize in their own geographic location and they hold wonderful archives of information that would enhance this inventory. The addition of cultural heritage "stories" augments the inventory with important social history.

- Expand the scope of the inventory to include bridge structures on all tributaries and related waterways. This would help to achieve greater data consistency and provide a more comprehensive appreciation of the bridge heritage within the watershed.

Awareness and Management

- That the bridge inventory become an accessible layer in the GRCA geographic information system. This makes the information from the inventory readily available to GRCA staff and, in turn, to municipal planning and public works staff.

- That the bridge inventory and associated mapping become integrated into the GRCA website for public view. This feature should allow the public to view, comment and contribute to the bridge inventory data through an e-mail feature.

- To regularly feature themes of general interest that emerge from the GRWBI through such vehicles as the Grand Actions newsletter, the GRCA website and the media across the watershed.

- Heritage Impact Assessments be carried out when changes are proposed for bridges that have been documented in the Grand River Watershed Bridge Inventory.

- That a forum or workshop be held to discuss the Province of Ontario's Heritage Bridge Guidelines, the requirements of the Environmental Assessment process and to encourage best practices regarding significant bridges in the watershed. The consultant encountered considerable frustration expressed by some municipal professionals, particularly in rural areas. The isolation and lack of adequate funding make it hard for alternative solutions to found instead of complete replacement of these heritage structures. This forum for discussion should encourage municipalities to support and mentor one another, collaborating to lobby for changes in funding and improvements to the Ontario Heritage Act and the Ontario Planning Act - all ways that government can better support the preservation of bridge structures.

Sources of Funding and Support for Future Development

- Encourage the Province of Ontario to provide appropriate support in preserving significant bridges within the Grand River watershed

- Explore opportunities to collaborate with others to fund further development of the GRWBI including but not limited to:
  Canadian National Railway Community Fund
  Trail groups and associated foundations
  Grand River Foundation
  Community foundations
  Watershed universities and colleges

Section 7 - Conclusion

This inventory allows municipalities to view bridges throughout the watershed and make decisions that include the relationship of their structure not only to those in their own geographic area but those of the watershed as a whole. Viewing bridges in the context of their heritage value adds another important tool to the municipal decision making team.
The rivers were our first mode of transportation and the reason for our particular pattern of settlement. Therefore, the ability to look at the watershed in its entirety will show a more complete and accurate history than portions thereof.

Like many of the participants contacted during the collection of the data, the consultant looks forward to using this inventory during the course of their work. There is a genuine interest and support for bringing the watershed's significant bridges into the spotlight as an important part of our built heritage. We are very pleased to have been involved in the creation of this important inventory.

Appendix A

Grand River Watershed Bridge Inventory

A Preliminary Listing of Bridges with Significant Heritage Value Contributing to the Heritage River designation of the Grand, Speed, Eramosa, Conestogo and Nith Rivers

Rating	Name	Date Built	Bridge Type	Materials	Spans	Watercourse	Community:	Municipality:	Owner:
94	West Montrose Covered Bridge	1881	covered	wood	2	Conestogo River	West Montrose	Township of Woolwich	Region of Waterloo
92	Gow's Bridge	1897	masonry arch	stone	2	Speed River	Guelph	City of Guelph	City of Guelph
84	Covered Lattice Truss Bridge	1991	lattice truss	wood	1	Speed River	Guelph	City of Guelph	City of Guelph
84	Stone Road Bridge	1916	bowstring arch (tied)	reinforced concrete	1	Eramosa River	Guelph	City of Guelph	City of Guelph
82	CPR Railway Viaduct, Guelph	1857	simple span girders on piers	steel and stone	7	Speed River	Guelph	City of Guelph	Canadian Pacific Railway
82	Mill Creek Bridge	1837	masonry arch	stone	1	Mill Creek	Cambridge	City of Cambridge	Region of Waterloo
80	Caledonia Bridge	1927	bowstring arch	reinforced concrete	9	Grand River	Caledonia	Haldimand County	Province of Ontario
80	Heffernan Street Footbridge	1914	open spandrel arch	reinforced concrete	2	Speed River	Guelph	City of Guelph	City of Guelph
78	Black Bridge Road Bridge	1916	Pratt through truss	metal	1	Speed River	Cambridge	City of Cambridge	City of Cambridge
78	Bridgeport Bridge	1934	bowstring arch	reinforced concrete	5	Grand River	Waterloo	City of Waterloo	Region of Waterloo
78	Freeport Bridge	1926	bowstring arch	reinforced concrete	7	Grand River	Kitchener	City of Kitchener	Region of Waterloo
78	Main Street Bridge	1931	bowstring arch	reinforced concrete	2	Grand River	Cambridge	City of Cambridge	Region of Waterloo
74	Black Bridge	1932	bowstring arch	reinforced concrete	1	Grand River	Grand Valley	East Luther Grand Valley	East Luther Grand Valley
74	Glen Allan Bridge	1915	Pratt camelback through truss	steel	1	Conestogo River	Glen Allan	Township of Mapleton	County of Wellington
74	Metcalf Street Bridge (Badley Bridge)	1953	Pratt camelback through truss	steel	1	Grand River	Elora	Centre Wellington	County of Wellington
74	Nith River Bridge	1932	solid spandrel arch	reinforced concrete	2	Nith River	Paris	County of Brant	County of Brant
73	David Street Bridge	1867/1921	open spandrel arch on masonry pier	reinforced concrete and stone	2	Irvine Creek	Elora	Centre Wellington	County of Wellington
73	Hartman Bridge	1936	Pratt through truss	steel	1	Nith River	New Hamburg	Township of Wilmot	Region of Waterloo
73	Park Hill Road Bridge	2002	t-beam and slab	reinforced concrete	4	Grand River	Cambridge	City of Cambridge	City of Cambridge
70	Lorne Bridge	1924	open spandrel arch	reinforced concrete	3	Grand River	Brantford	City of Brantford	City of Brantford
69	Victoria Street Bridge	1899	truss (pin joint)	steel	4	Grand River	Elora	Centre Wellington	Centre Wellington
68	Princess Elizabeth Bridge	1940	Pratt camelback through truss	steel	1	Conestogo River	Glen Allan	Township of Mapleton	County of Wellington
64	Centre Wellington Bridge 25-WG (Atkinson Bridge)	1924	bowstring arch (tied)	reinforced concrete	1	Irvine Creek	Centre Wellington	Centre Wellington	Centre Wellington
64	Elora Gorge Bridge	1980	cantilevered arch	reinforced concrete	1	Grand River	Elora	Centre Wellington	County of Wellington
64	Nithvale Bridge	1883	Pratt through truss (pin joint)	iron and steel	1	Nith River	Ayr	Township of North Dumfries	(unknown)
64	Stroy's Bridge	1908	Pratt through truss	steel	1	Speed River	Puslinch	Township of Puslinch	Township of Puslinch
64	Wellesley Bridge No.6	1910	Pratt through truss (pin joint)	steel	2	Nith River	Kingwood	Township of Wellesley	Township of Wellesley
63	Norwich Street Bridge	1882	pony truss	iron and steel	1	Speed River	Guelph	City of Guelph	City of Guelph
62	Conestogo Bridge	1886	Pratt through truss	metal	2	Conestogo River	Conestogo	Township of Woolwich	Township of Woolwich
62	Murray Street Bridge	1921	solid spandrel arch	reinforced concrete	1	Brantford Canal	Brantford	City of Brantford	City of Brantford
60	Blandford-Blenheim Bridge #20	1920	truss	steel	1	Nith River	Blandford-Blenheim	Blandford-Blenheim	Blandford-Blenheim
60	Blandford-Blenheim Bridge #21	1920	truss	steel	1	Nith River	Blandford-Blenheim	Blandford-Blenheim	Blandford-Blenheim
60	Blandford-Blenheim Bridge #24	1929	truss	steel	1	Nith River	Blandford-Blenheim	Blandford-Blenheim	Blandford-Blenheim
60	Blandford-Blenheim Bridge #25	1937	truss	steel	1	Nith River	Blandford-Blenheim	Blandford-Blenheim	Blandford-Blenheim
60	Blandford-Blenheim Bridge #39 (Silver Bridge)	1930	truss	steel	1	Nith River	Blandford-Blenheim	Blandford-Blenheim	Blandford-Blenheim

60	Seneca Bridge	1912	Warren pony truss	line rod steel	1	creek	Caledonia	Haldimand County	Haldimand County
58	Blair Stone Arch	n. d.	masonry arch	stone	1	creek	Cambridge	City of Cambridge	City of Cambridge
58	Bosworth Bridge	1949	Howe camelback pony truss	steel	1	Conestogo River	Bosworth	Township of Mapleton	County of Wellington
58	Bridge Street Bridge	1913	Pratt camelback through truss	metal	1	Nith River	Haysville	Township of Wilmot	Township of Wilmot
58	Canning CNR Bridge	n. d.	steel girder on pier and abutments	steel, concrete and stone	2	Nith River	Canning	Blandford-Blenheim	Canadian National Railway
58	Chambers Bridge	1930	Pratt camelback through truss	metal	1	Grand River	Inverhaugh	Township of Woolwich	Township of Woowich
58	Holland Mills Road Bridge	1910	Pratt through truss (pin joint)	metal	1	Nith River	New Hamburg	Township of Wilmot	Township of Wilmot
58	King Street Bridge	1923	box girder	reinforced concrete	3	Speed River	Cambridge	City of Cambridge	City of Cambridge
58	Lot 10 Bridge	1915	solid spandrel arch	reinforced concrete (earth filled)	1	Eramosa River	Everton	Wellington County	County of Wellington
58	Oxford-Waterloo Road Bridge	1912	Pratt camelback through truss	metal	1	Nith River	Plattsville	Township of Wilmot	Township of Wilmot
58	Piper Street Steel Truss (abandoned)	1915	Pratt through truss	steel (riveted)	1	Nith River	Ayr	Township of North Dumfries	Private Owner
58	Centre Wellington Bridge 1-P	n. d.	truss (pin joint)	metal	1	Carroll Creek	Centre Wellington	Centre Wellington	Centre Wellington
56	George Street Underpass	1931	deck plate girder on pier and arch abutment	steel and stone	1	Grand River	Cambridge	City of Cambridge	City of Cambridge
56	Grand River Viaduct	n. d.	deck truss on piers and arch abutment	steel and stone	8	Grand River	Cambridge	City of Cambridge	Canadian Pacific Railway
55	Grand Trunk Railway Bridge	1877	truss and girders	steel	4	Grand River	Brantford	City of Brantford	City of Brantford
54	Blatchford Bridge	1949	Warren pony truss	steel	1	Speed River	Puslinch	Township of Puslinch	County of Wellington
54	Centre Wellington Bridge 19-P	n. d.	bowstring arch	reinforced concrete	1	creek	Centre Wellington	Centre Wellington	Centre Wellington
54	Centre Wellington Bridge 21-WG	n. d.	bowstring arch	reinforced concrete	1	Irvine Creek	Living Springs	Centre Wellington	Centre Wellington
54	Centre Wellington Bridge 24-WG (Gibson Bridge)	n. d.	bowstring arch (tied)	reinforced concrete	1	Irvine Creek	Centre Wellington	Centre Wellington	Centre Wellington
54	Centre Wellington Bridge 27-WG	n. d.	bowstring arch	reinforced concrete	1	Irvine Creek	Centre Wellington	Centre Wellington	Centre Wellington
54	Centre Wellington Bridge 29-WG	n. d.	bowstring arch	reinforced concrete	1	Irvine Creek	Centre Wellington	Centre Wellington	Centre Wellington
54	Centre Wellington Bridge 3-E (Shiloh Bridge)	n. d.	bowstring arch	reinforced concrete	1	Speed River	Centre Wellington	Centre Wellington	Centre Wellington
54	Centre Wellington Bridge 4-WG	n. d.	bowstring arch	reinforced concrete	1	creek	Centre Wellington	Centre Wellington	Centre Wellington
54	Centre Wellington Bridge 6-N	n. d.	bowstring arch	reinforced concrete	1	Irvine Creek	Centre Wellington	Centre Wellington	Centre Wellington
54	Centre Wellington Bridge 9-N	n. d.	bowstring arch	reinforced concrete	1	Irvine Creek	Centre Wellington	Centre Wellington	Centre Wellington
54	CPR Speed River Bridge	1880	deck plate girder and abutments	steel and stone	1	Speed River	Guelph	City of Guelph	Canadian Pacific Railway
54	Great Western Railway Bridge (piers)	1858	piers and abutments	stone	4	Grand River	Paris	County of Brant	County of Brant
54	McNabb's Bridge	1948	deck beam with concrete railing	steel and reinforced concrete	1	Conestogo River	Bosworth	Township of Mapleton	County of Wellington
54	Winterbourne Bridge	1913	Pratt camelback through truss	steel	2	Grand River	Winterbourne	Township of Woolwich	Township of Woolwich
54	Centre Wellington Bridge 20-P	n. d.	truss	steel	2	Grand River	Centre Wellington	Centre Wellington	Centre Wellington
52	Water Street Underpass	1931	pony plate girder and abutments	steel and stone	1	Grand River	Cambridge	City of Cambridge	Region of Waterloo
51	Canning (South-East) Truss Bridge	n. d.	Pratt through truss	metal	1	Nith River	Canning	Blandford-Blenheim	Blandford-Blenheim
51	Paris Railway Bridge	n. d.	deck truss on piers	steel and stone	5	Grand River	Paris	County of Brant	Canadian National Railway
50	Gordon Street Bridge	2001	solid spandrel arch	pre-cast concrete	4	Speed River	Guelph	City of Guelph	City of Guelph

Appendix B

Grand River Watershed Bridge Inventory Rating Criteria

Appendix B- Grand River Watershed Bridge Inventory Rating Criteria

General Category	Points	Comments
A. Documentation		
1. Builder		
a) Unknown	0	
b) Known; undetermined contribution	2	Companies, engineers, builders about which there is little present information; may be elevated to categories c) and d) as knowledge increases.
c) Known: prolific builder-designer	4	Companies, engineers, builders responsible for large numbers of bridges in the Grand River watershed utilizing standard forms or elements.
d) Known: unusual builder-designer	6	Innovative companies, engineers, builders having major impacts on the development of bridge building in the Grand River watershed.
Maximum Score	**6**	

2. Age		
pre-1880	14	This criterion recognizes the value placed by society on the age of artifacts. Old structures, irrespective of whether they are ill- or well-designed, are often seen to have value simply because they still remain in our environment. Given the physical legacy of over 120 years of bridge building, radical changes in pace and form of physical development prove a threat to many bridges built as late as the 1950's.
1880-1900	12	
1901-1910	10	
1911-1920	8	
1921-1930	6	
1931-1940	4	
1941-1950	2	
1950-2003		
Maximum Score	**14**	Points may be awarded when date can be accurately determined from date plates, newspaper accounts, plans, etc. When date can only be estimated from design/materials it may be necessary to deduct one point.

B. Technology		
3. Materials		
a) Wrought Iron	4	Wrought iron and stone are afforded high priority because these materials are no longer in use. Category "Other" refers to materials that are not normally used in bridges in the Grand River watershed. These are examples that have not gained favor, are comparatively rare or present unique combinations of materials used in superstructure, piers or abutments. "Metal" signifies that the type(s) of metallic material(s) used over the course of construction could be iron or steel (or both) and that further investigation is needed to confirm.
or		
b) Stone	4	
or		
c) Other (not normally in use)	4	
Maximum Score	**4**	

4. Design/Style		
a) Unique	16	The only one of it's kind or unique to the Grand River watershed. It may be eccentric, odd, an exaggerated version by virtue of its size, sophistication or use of a particular truss type.
or		
b) Typical; but rare as a survivor	16	In any given period many bridges will be built which are typical of their age, being neither unique nor unusual. The ravages of time, climate and changing transportation requirements may have caused a number of these bridges to disappear. The survivors may now be rare.
or		
c) Unusual	16	Included here are bridges of which only a small number may have been built and perhaps an even smaller number now remain.
Maximum Score	**16**	
5. Prototype		
a) Prototype	10	A bridge may possess a technological or stylistic innovation or adaptation, which marks it as a first of a type, an early example or an important improvement to bridge building in the Grand River watershed.
or		
b) Early example	10	
Maximum Score	**10**	

6. Structural Integrity		
a) No significant modifications	10	Bridges are often modified to remedy a variety of deficiencies, i.e. structural, transportation, hydrological. Those that have escaped unchanged are more often than not a rarity and thus of importance in illustrating their original form. Many bridges may have been modified over the years to the extent that their original form is no longer recognizable.
b) Sympathetic Alterations	5	A few, however, may still be able to illustrate their original form because of sympathetic modifications.
Maximum Score	**10**	

C. Bridge Aesthetics and Environment		
7. Visual Appeal		
a) Design Merits	10	This criterion addresses the intrinsic worth of a structure beyond its technological and functional characteristics. It may be an attractive structure because it is well-designed and admirably fitted to a particular site. It may also be unique to or in the Grand River watershed.
b) Ornamentation / Decoration	2	Decoration or ornamentation, whether discreet or ostentatious, adds visual interest to the structure. Decoration or ornamentation that is either rare in or unique to the Grand River watershed would score 2. Decoration or

		ornamentation may appear in sculpted forms, balustrading, light standards, piers, cross members, portals, etc.
Maximum Score	**12**	

8. Integrity		
a) At original location	4	Original locations of bridges are often benchmarks in the historical development of a particular environment. They often contribute to a strong sense of place.
Maximum Score	**4**	
9. Landmark		
a) Physical prominence	6	A bridge may be a visually prominent feature in the landscape, either from the road or some other vantage point. Landmarks may be used by people as guides for moving through an area, or more simply for adding interest in the environment.
or		
b) Public perception	6	Bridges may be perceived as landmarks in the community and have a symbolic importance rather than a purely visual or aesthetic value.
Maximum Score	**6**	

10. Gateway		
a) Entrance/exit occurrence	4	In some instances, particularly urban areas, certain bridges may assume the function of a gateway, albeit quasi, emphasizing to drivers and pedestrians that they are entering into specific area or the Grand River watershed itself.
Maximum Score	**4**	

11. Character Contribution	4	A bridge, together with other buildings or structures, may contribute to the particular character or atmosphere of an area. This is more readily identifiable in some areas than others.
Maximum Score	**4**	

D. Historical		
a) Associated with person/group	10	Associated with the life or activities of a person or group that has made a significant contribution to the community, Grand River watershed, province or nation (e.g. entrepreneurs, politicians, etc.).
or		
b) Associated with event	10	Associated with a significant event that contributed to the future activities of a community, the Grand River watershed, province or nation (e.g. road building programs, public work projects).
or		
b) Associated with theme	10	Associated with and illustrative of significant patterns of cultural, social, political, economic or industrial history in the Grand River watershed (e.g. depression era, urban growth).
or		
b) Associated with former bridges	10	Associated with former bridges that have served the same site or locale (i.e. a traditional river crossing).
Maximum Score	10	

E. Bridge Groupings		
a) Is this bridge part of a group of similar bridges/structures?	Yes/No	Bridge aesthetics and environment contribute to the particular "look" of the area. A group of historically associated bridges or theme of similar structures contributes to the aesthetic appeal of the environment. This group may be totally within a particular area or may be be part of a larger group within the context of the Grand River watershed as a nationally designated Heritage River. Similarly, a bridge might exemplify a bridge type in the spectrum of bridges along the Grand River watershed. **A "yes" response is particularly significant. Efforts must be made to retain and preserve bridges identified as part of this group.**

Appendix C

Contact Information

Appendix C - Contact Information

Roads, Public Works and Planning Departments

Township of Blandford-Blenheim
Bill Vance, Roads Manager

County of Brant
Dave Stanbridge, Mapping Technician

City of Brantford
Matt Reniers, Planning Department
Joe Amodeo, Roads Superintendent, Engineering
Bob Chabot, Engineering
Al Young, Public Works

City of Cambridge
Terry Dowling, Public Works

Township of Centre Wellington
Ken Elder, Director of Public Works

Dufferin County
Bill van Ravens, Senior Engineering Technician
Eric Carr, Engineering Technician

East Luther Grand Valley
John Graham, Roads Superintendent

Township of Erin
Frank Smedley, Works Superintendent

Grand River Conservation Authority
Barb Veale, Coordinator
Phil Lenoir, Database Designer

City of Guelph
Joan Jylanne, Senior Policy Planner

Township of Guelph-Eramosa
Larry Van Wyck, Roads Department

Haldimand County
Dave Anderson and Lloyd Rollinson,
Engineering and Physical Structure Services,
Caledonia Satellite Office

City of Kitchener
Rob Shamus, Engineering Services

Township of North Dumfries
Keith Schiedel, Roads Department

Norwich Township
Ron Smith

Oxford County
Tony Decou, Construction Manager

Municipality of Perth East
Glenn Schwendinger, Public Works Manager

Towship of Puslinch
James Howlett, Road Superintendent

Township of Wellesley
Willis McLaughlin, Roads Department

Region of Waterloo
Lucille Bish, Director Community Services
John Stephenson, Transportation Section

Wellington County
Rick Dale, Construction Manager

Township of East Garafraxa
Marvin Haliday, Roads Superintendent

Township of Wellington North
Gary Williamson, Roads Department

Heritage Organizations

Drumbo and District Heritage Society
Marion Harrington, Treasurer

Wellington County Historical Society
Ian Easterbrook, Secretary-Treasurer

Wellington County Museum & Archives
Karen Wagner, Archivist

Businesses and Individuals

Canadian National Railway
John MacTaggart, CN Engineering

David Cuming
City of Hamilton

Jean Haalboom
Councillor, Region of Waterloo

Pat Mestern (regarding Charlie Mattaini)
Fergus

Provincial Government

Marilyn Miller
Ontario Ministry of Culture

Ontario Ministry of Transport - Bridge Office
Ryan Clark and Richard Sadowski, Geomatics Office, St. Catharines