



Pilot Project Report



Papatawa Realignment

Version 1.5

PREPARED FOR
NZTA

DATE
February 28, 2014



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ABOUT THE ASSESSMENT

Greenroads Foundation spoke with authorized representatives New Zealand Transport Agency (NZTA) on several occasions to discuss the Papatawa Realignment Project for purposes of this Greenroads Pilot Project Assessment. The goal of the assessment is to determine the potential Greenroads Rating for the Papatawa Realignment Project located in Woodville, New Zealand. The Papatawa Realignment Pilot Project is the third of several assessments included in the NZTA Greenroads Pilot Program.

This Detailed Pilot Project Assessment summarizes our understanding of the Project, the potential Greenroads Rating, and our recommendations to the Project Team. More information on the process of Project Rating and eligibility is available in the *Greenroads Project Handbook* (greenroads.org/files/244.pdf).

As a Pilot Project, our findings in this report are based upon our understanding of the overall intent of both the design and construction practices identified during interviews with the project team and a tour of the project. The results of the Pilot Assessment are based on the *Greenroads Manual v1.5* (www.greenroads.org/manual).

A brief description of the Greenroads Rating System is provided in Appendix A, the evaluation method used in this Assessment is attached in Appendix B, and the completed and annotated Greenroads Scorecards for Papatawa Realignment Project are located in Appendix C.

PROJECT DESCRIPTION

The Papatawa Realignment project is located on State Highway 2 (SH2), near the northern approach to Woodville, approximately 3 kilometers north east of the town boundary. The project creates a 4.5 kilometer road alignment improvement that will provide safer and easier journeys for motorists traveling between Woodville and Dannevirke. The project includes a new passing lane, a new crossing over the rail line, new bridges and culverts over creeks, and a new intersection that provides a rural link into Woodville. Construction started in April 2010 and was completed in September 2013. The project cost was \$10.5 USD.

PURPOSE AND SCOPE

The scope of the Pilot Project Assessment (<https://www.greenroads.org/1368/pilot-project.html>) includes collection and a brief review of a listed Standard Project Documents (SPDs) and typical design reports that are commonly prepared for most roadway projects. Greenroads also conducts at least one interview with representatives of the Project Team and any necessary follow up discussions.

The specific objectives of this Detailed Pilot Project Assessment are to:

1. Understand the general intentions of the Project Team at NZTA.
2. Identify areas where the Project may achieve points based on Standard Project Documentation.
3. Identify other potential areas where the Project may achieve points.
4. Identify potential new ideas that can be considered as Custom Credits.

Using the information provided, a Greenroads Scorecard is completed for the Project that reflects the general state of the Project as well as its potential for certification.

PROJECT REFERENCES

This Assessment was based on a phone call with Rodney Calder of MWH New Zealand Ltd., other discussions with the Project Team, an in-person visit by Jeralee Anderson, and a brief review of the following Project documents:

- Greerods Papatawa Cover Note from Vanessa Brown.
- SH2 Papatawa Realignment Part 2: Erosion and Sediment Control Plan dated October 2012.
- SH2 Papatawa Realignment Notice of Requirement dated June 2008.
- Decision – Resource Consent Nos. 105074, 105075, 105076, 105077, 105182, and 105189 – Land Use Consents and Water Permit – State Highway 2, Papatawa, between Davey Road and Ball Road dated February 4, 2010.
- Resource Consent Application and Assessment of Environmental Effects for the Papatawa Realignment, State Highway 2 dated September 2009.
- SH2 Papatawa Realignment, Contract No. TRW 1721 Project Specifications, Relevant sections of Physical Works Contract Specification.
- <http://www.nzta.govt.nz/network/projects/project.html?ID=168>

SCORE SUMMARY

A Greenroads Scorecard is attached in Appendix C that reflects our understanding of the Project intent and potential achievement level in Greenroads. A minimum of 32 points is required for Certification.



Figure 1. Papatawa Realignment Summary Scorecard.

The highlights of the Scorecard are summarized below:

- The project has demonstrated intent to meet **6 of the 11 Project Requirements**.
- A total of **13 points do not appear to be practical** for Papatawa Realignment to achieve due to the nature of the Project and would probably be considered inappropriate design choices.
- Papatawa Realignment has demonstrated intent to meet **5 Voluntary Credits totaling 18 points**. This number of points does not meet the minimum requirements for a Certification award.
- **Ten credits were identified as economical opportunities to earn up to 16 additional points**. These credits are potentially feasible based on the documents provided and Greenroads believes may be possible to implement with minimal to no additional construction cost, or may require minimal design team effort or time. These credits are marked in **boldface orange** in the Scorecard in Appendix C. A few of these activities may actually be performed on the Project, but this was not clear in the documents reviewed for this report.
- **Twenty-one credits were identified as opportunities for Papatawa Realignment to earn an additional 61 points**; however, the majority of these activities are likely to add substantial cost or require significant scope changes. A few of these activities may actually be performed on the Project, but it was not clear in the reference documents for this report.
- **No Custom Credits were identified for this project**.

CATEGORY SUMMARY

Figure 2 shows a summary of where points may be achieved with the current intent that has been shown and where economical additions may be made. This does not represent all credits which could be achieved on the project, but rather the credits that may not add significantly to the project cost or do not drastically change the scope of the project.



Figure 2. Papatawa Realignment Project

PROJECT REQUIREMENTS

The Papatawa Realignment project appears to intend to meet 6 of the 11 Project Requirements.

- Specific credit documentation was not provided for review in this Assessment.
- For Certification, each of the 11 PR items would need to be documented completely in order to qualify for Certification Award. Considering Certification early in project development will normally allow for proper planning to satisfy the Project Requirements.

ENVIRONMENT & WATER

The Papatawa Realignment project demonstrated intent to earn 6 of a total 21 possible in the EW Category.

- It appears long term stormwater performance of the facility was not a project design priority. It is possible traditional swales along the highway may be used to earn points towards credits EW-2 and EW-3; however, conventional management and treatment methods often do not meet the requirements of these two credits without additional effort.
- EW-4 Stormwater Cost Analysis could be considered an easy option to earn additional points and assist in stormwater management planning.
- Restoration of the original alignment could achieve credit EW-6 Habitat Restoration.
- The realignment included construction of new creek crossings that were designed with fish passage in mind.
- Lighting is not included on the Project.

ACCESS & EQUITY

The Papatawa Realignment project demonstrated intent to earn 5 of a total 30 possible in the AE Category.

- The project used Context Sensitive Solutions to determine the proper modal choices through the corridor. However, it was determined that pedestrian facilities were not appropriate. There are also no transit features in the corridor.
- The shoulder was widened and bicycles could be accommodated. The Project would need to demonstrate connectivity to an existing bicycle network or that the shoulders were appropriately signed and striped to allow such access for points.
- The project could earn additional points by performing safety audits on the Project.
- The project could potentially add points at a low cost by including facilities that draw attention to the nearby historical and cultural Iwi sites.

CONSTRUCTION ACTIVITIES

The Papatawa Realignment project did not demonstrate intent to earn any of a total 14 possible in the CA Category.

- CA-2 Environmental Training, CA-3 Site Recycling Plan, CA-6 Paving Emissions Reduction, and CA-7 Water Use Tracking should be considered as options for the Project to earn points.

MATERIALS & RESOURCES

The Papatawa Realignment project demonstrated intent to earn 7 of a total 23 possible in the MR Category.

- The project team stated that much of the existing pavement from the realignment was reused on-site as base material. The scorecard shows that 2 out of 5 points could be earned because it could not be determined to what extent the existing volumes of pavement were reused.
- The project team stated that fill material, aggregates, HMA, and concrete for structures all came from within a 50 mile radius. This is a majority of the project materials by cost, so the project was given the full 5 points for this Assessment.
- The use of Recycled Asphalt Pavement in the pavement mix could easily achieve the project 2 points for MR-4 Recycled Materials, or more.

PAVEMENT TECHNOLOGIES

The Papatawa Realignment project did not demonstrate intent to earn any of a total 20 possible in the PT Category.

- Long-life pavement may be achieved with the current pavement design. Calculations should be done to see if the Project is eligible for these 5 points.

CUSTOM CREDITS

No Custom Credits were identified for the Papatawa Realignment project. Several Custom Credits have been recently developed that may or may not be appropriate for this Project.

Some Custom Credits that may be applicable for this Project, or future similar projects, are:

- Sustainable Transportation Professional
- Workzone Safety
- Freight Access
- Pavement Smoothness
- Native Revegetation (potentially an alternate to EW-6 Habitat Restoration)
- Alternative Energy
- Low Emitting Materials

DISCUSSION

Based on our understanding of the intent of the Project Team, it appears that a Greenroads rating cannot be achieved by this project. Additional points could possibly be within reach since credit specific documents were not reviewed, but is likely to be somewhat challenging to achieve much more than is presented in this Assessment.

To achieve a certification award, all activities must be formally documented according to the current version of the *Greenroads Manual*. Importantly, all of the Project Requirements must be completed and documented. Due to the current stage of the Project, it is not likely the project could pursue further recognition. **At this time, Greenroads does not recommend Certification is pursued for the Papatawa Realignment project.**

HOW THIS PROJECT COMPARES

The Papatawa Realignment project scores about average compared to other typical highway projects. Most projects complete between 4-7 Project Requirements and earn between 15-25 points in Voluntary Credits. These statistics are based on a sample of about 120 projects from across the U.S. and Canada that use current best practices and design standards and were built within the last 10 years. Table 1 shows how Your Project compares to other projects within this sample set based on some of the descriptive characteristics of the project.

Table 1. Project's Rating Position Compared to Other Projects

Your Project		Score (w/o CC)	Rating	
Papatawa Realignment		18	None	
Your Project's Reasonable Potential				
Papatawa Realignment		38	Bronze	
	No. Projects	Score (w/o CC)	Rating	Rating Range
<i>US Projects</i>	105	26 ± 1	None	None
<i>All Projects Reasonable Potential</i>	120	59 ± 17	Gold	Bronze – Evergreen
<i>Greenroads Projects Certified to Date</i>	9	39 ± 5	Bronze	Bronze – Silver
<i>DBB Projects</i>	98	25 ± 1	None	None

CONCLUSIONS & RECOMMENDATIONS

The results of this Detailed Pilot Project have provided valuable information on how Greenroads may be applied to New Zealand roadway design and construction projects. No further adaptation needs were noted beyond those previously discussed in the Pilot Project Reports for the Buckle Street Underpass in Wellington, New Zealand and Te Rapa Bypass in Hamilton, New Zealand. Additionally, recommendations for the Papatawa Realignment project are similar. The following section includes the recommendations for the benefit of the Project Team.

RECOMMENDATIONS FOR FUTURE PROJECTS

There are numerous design opportunities that should be considered throughout design and construction decision-making that may be helpful in positioning future projects for successful certification that are similar in size, purpose and nature to Papatawa Realignment. For this Project and most projects, additional sustainability opportunities appear to be available in the areas of increased environmental stewardship in design and creative materials management.

Below are some specific recommendations for the Project Team:

1. As with this project, we recommend that the 11 Greenroads Project Requirements are addressed early in project planning and design. Incorporating Project Requirements PR-4 through PR-7 into the specifications and technical drawings is an excellent way to ensure that they will be completed.
2. Often the greatest potential to earn points involves considering stormwater management beyond completion of construction. For this project, many of these practices were not performed but, generally, the Environment & Water category offers a huge potential for reducing environmental impacts over the life of roadway projects.
3. Materials management often provides great opportunities for innovation and cost savings, especially with increased use of recycled materials, reused site materials, and creative waste management activities.
4. This Project did not identify any Custom Credit opportunities. A sample of Custom Credit ideas on record with Greenroads are listed in the latest version of the Errata for the *Greenroads Manual*.

LIMITATIONS OF ASSESSMENT

- Documents provided were not reviewed for detailed compliance with specifications in the *Greenroads Manual*.
- The results and recommendations provided in this study are only applicable to the version of the Rating System used to complete this assessment: *Greenroads Manual v1.5* (dated February 4, 2011).
- The reported score is not intended to be interpreted as an actual earned Rating, completed Certification review, or Registration of this project. Rather, the score reflects the current potential score of the Project based on the documents provided for our review and verbal conversation with the Project Manager and other representatives of the Project Team. Successful completion of a Pilot Project Assessment does not indicate that the Project is Certified.
- The completed Scorecard is intended to serve as guidance and as a learning tool for the Project Team and may be publicized in accordance with the Greenroads Trademark & Copyright Policy as a “Pilot Project.” However, under no circumstances shall any Project Team member claim that this project has been certified by Greenroads Foundation as a result of this Assessment.
- Greenroads respects reasonable requests for confidentiality, and reserves the right to publish, distribute or otherwise use such confidential project data to assess the Project in aggregate with other projects, without exposing any distinguishing information about the Project’s identity. This means the Project information used for or created as a result of this Assessment may be used for internal business development and/or quality control purposes.

APPENDIX A

About the Greenroads Rating Program



BACKGROUND

The Greenroads® Rating System is a collection of sustainability best practices, called “credits,” that apply to roadway design and construction, much like the Leadership in Energy and Environmental Design (LEED®) Rating Systems for green buildings. Completing these activities can earn points toward a total score, called a “Rating,” that can be used as an indicator of the overall sustainability of the project.

A **Greenroad** is defined as roadway project that has been designed and constructed to a level of sustainability that is substantially higher than current common practice.

The Greenroads Project Rating Program is one of three charitable programs for transportation infrastructure administered by the 501(c)(3) non-profit organization, Greenroads Foundation. The Project Rating Program includes two core services for projects to get a Greenroads Rating: Project Certification and Project Assessment.

Certification is a rigorous, independent, third-party review of project documentation according to the standard in the most current *Greenroads Manual*. The Certification process is intended to be somewhat challenging in order to recognize projects that go far beyond the conventional practice for sustainable design and construction. Projects that successfully complete the Certification process are eligible for Certification Award and recognition as a “Greenroad.”

Greenroads Assessments are less stringent and shorter turnaround: they rely on standard project documentation at-hand and are used most often as stepping stones on the path to certify a project in the future. Assessments are also used for completed projects as a benchmarking tool and for all projects located outside of the United States as part of Greenroads Pilot Program efforts.

Since 2007, Greenroads has been tested on over 125 design and construction projects around the world of various types, shapes, sizes and stages of design and construction. Projects from all over the United States and internationally are participating in the Greenroads Project Rating Program and joining the Foundation in its efforts toward making our transportation infrastructure more sustainable.

RATING SYSTEM DETAILS

Greenroads sustainability credits are divided into two types: mandatory and voluntary. Projects pursuing Certification must complete 11 mandatory credits (Project Requirements) in order to qualify for a Certification Award. There are 37 other Voluntary Credits that when complete, earn points toward one of four Certification Awards: Bronze, Silver, Gold and Evergreen.



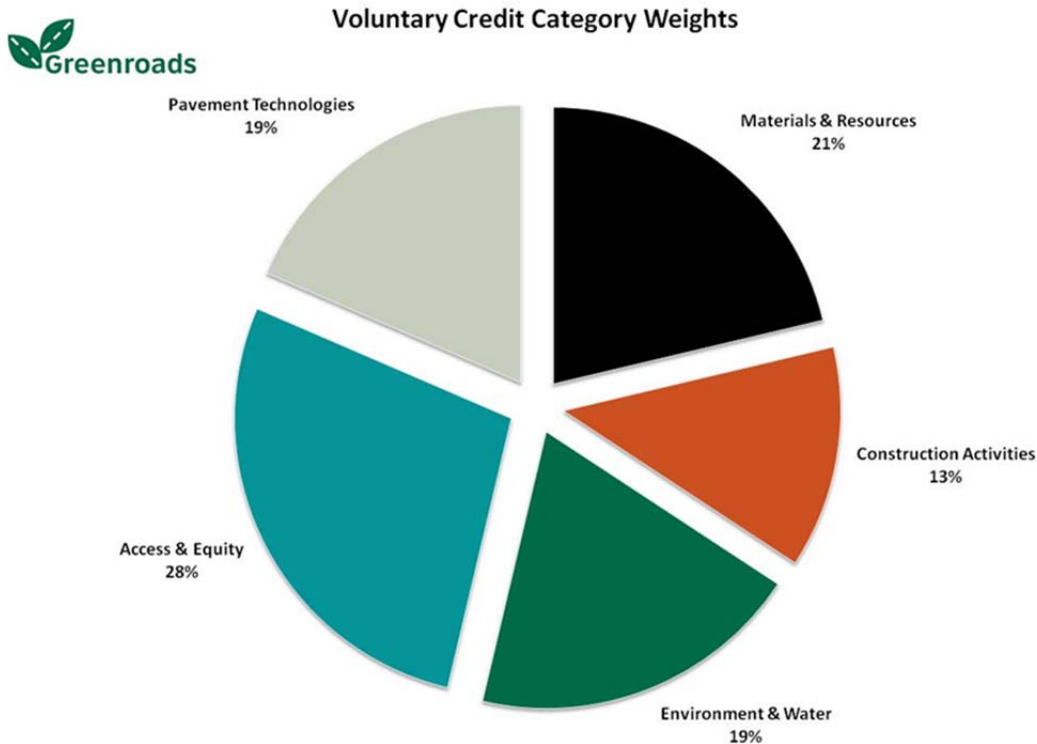
Credits are grouped into six Categories, with one additional Category that allows projects to earn points for innovative activities that are currently not recognized in the Rating System.

Important Notes

- Mandatory activities (Project Requirements) are not worth points
- All 11 Project Requirements must be completed to be eligible for a Certification Award
- Voluntary activities (all other credits) are worth between 1 to 5 points based on lifecycle impact

Table 1. Greenroads Credit Categories and Intent

Category Name	Intent
Project Requirements	Encourage environmentally responsible decision-making processes, have management plans in place for construction, establish a minimum baseline for every project that applies for certification.
Environment & Water	Promote best practices related to stormwater management and ecological resources within the project boundary
Access & Equity	Promote safety, access, and mobility improvements and features for users and operations of the roadway
Construction Activities	Promote responsible construction management, reduce use of fossil fuels and improve health and safety of construction workers
Materials & Resources	Promote responsible materials and energy management by combinations of recycling, reusing, and reducing both virgin and waste materials
Pavement Technologies	Highlight specific pavement engineering innovations and ideas or broad types of technologies or techniques which are well-established in practice and have direct sustainability benefits
Custom Credits	Recognize the implementation of sustainable or innovative ideas not included in the current version of the Rating System.


Figure 1. Relative Weights of Greenroads Credit Categories (108 Points Possible, Does Not Show Custom Credits)

MORE INFORMATION

More detailed information, including the full and abridged versions of the *Greenroads Manual*, which details the activities that are part of the Rating System, and the Project Handbook, which describes the details of the Project Rating Program, can be found on the Greenroads Website: <http://www.greenroads.org>.

CREDIT SUMMARY

The Greenroads Rating System v1.5 *Manual* has:

- 11 Project Requirements.
- 37 Voluntary Credits. 1 to 5 points each, 108 maximum possible.
- 118 total maximum points including 10 points for optional Custom Credit activities.

PROJECT REQUIREMENTS

To be eligible for a Certification Award, all 11 Project Requirements must be completed and documented. There are no points for any of these activities.

No.	Title	Pts.	Description
PR-1	Environmental Review Process	Req	Complete a comprehensive environmental review
PR-2	Lifecycle Cost Analysis (LCCA)	Req	Perform LCCA for pavement/bridge section
PR-3	Lifecycle Inventory (LCI)	Req	Perform LCI of pavement/bridge materials
PR-4	Quality Control Plan	Req	Have a formal contractor quality control plan
PR-5	Noise Mitigation Plan	Req	Have a construction noise mitigation plan
PR-6	Waste Management Plan	Req	Have a plan to divert C&D waste from landfill
PR-7	Pollution Prevention Plan	Req	Have a TESC/SWPPP
PR-8	Low Impact Development (LID)	Req	Complete a LID feasibility study
PR-9	Pavement Management System	Req	Have a pavement/bridge management system
PR-10	Site Maintenance Plan	Req	Have a roadside maintenance plan
PR-11	Educational Outreach	Req	Publicize sustainability information for project

ENVIRONMENT & WATER

No.	Title	Pts.	Description
EW-1	Environmental Management System	2	ISO 14001 certification for general contractor
EW-2	Runoff Flow Control	1-3	Reduce runoff quantity
EW-3	Runoff Quality	1-3	Treat stormwater to a higher level of quality
EW-4	Stormwater Cost Analysis	1	Conduct an LCCA for stormwater elements
EW-5	Site Vegetation	1-3	Use native low/no water vegetation
EW-6	Habitat Restoration	3	Restore habitat beyond what is required
EW-7	Ecological Connectivity	1 or 3	Connect habitat across roadways
EW-8	Light Pollution	3	Discourage light pollution

ACCESS & EQUITY

No.	Title	Pts.	Description
AE-1	Safety Audit	1-2	Perform roadway safety audit
AE-2	Intelligent Transportation Systems (ITS)	2-5	Implement ITS solutions
AE-3	Context Sensitive Solutions	5	Plan for context sensitive solutions
AE-4	Traffic Emissions Reduction	5	Reduce emissions with quantifiable methods
AE-5	Pedestrian Access	1-2	Provide/improve pedestrian accessibility
AE-6	Bicycle Access	1-2	Provide/improve bicycle accessibility
AE-7	Transit Access	1-5	Provide/improve transit accessibility
AE-8	Scenic Views	1-2	Provide views of scenery or vistas
AE-9	Cultural Outreach	1-2	Promote art/culture/community values

For credit details, including documentation requirements, visit greenroads.org/manual.

CONSTRUCTION ACTIVITIES

No.	Title	Pts.	Description
CA-1	Quality Management System	2	ISO 9001 certification for general contractor
CA-2	Environmental Training	1	Provide environmental training
CA-3	Site Recycling Plan	1	Have a plan to divert waste from landfill
CA-4	Fossil Fuel Reduction	1-2	Use alternative fuels in construction equipment
CA-5	Equipment Emissions Reduction	1-2	Meet EPA Tier 4 standards for non-road equip.
CA-6	Paving Emissions Reduction	1	Use pavers that meet NIOSH requirements
CA-7	Water Tracking	2	Develop data on water use in construction
CA-8	Contractor Warranty	3	Warranty on the constructed pavement

MATERIALS & RESOURCES

No.	Title	Pts.	Description
MR-1	Life Cycle Assessment (LCA)	2	Conduct a detailed LCA of the entire project
MR-2	Pavement Reuse	1-5	Reuse existing pavement sections
MR-3	Earthwork Balance	1	Use native soil rather than import fill
MR-4	Recycled Materials	1-5	Use recycled materials for new pavement
MR-5	Regional Materials	1-5	Use regional materials to reduce transportation
MR-6	Energy Efficiency	1-5	Improve energy efficiency of operational systems

PAVEMENT TECHNOLOGIES

No.	Title	Pts.	Description
PT-1	Long-Life Pavement	5	Design pavements for long-life
PT-2	Permeable Pavement	3	Use permeable pavement as a LID technique
PT-3	Warm Mix Asphalt (WMA)	3	Reduce production energy at plant for binders
PT-4	Cool Pavement	5	Contribute less to urban heat island effect (UHI)
PT-5	Quiet Pavement	3	Use a quiet pavement to reduce noise
PT-6	Pavement Performance Tracking	1	Relate construction to performance data

CUSTOM CREDITS

Up to 10 submittals for Custom Credits are allowed for all projects. Points for each credit range from 1 to 5 points, up to a maximum of 10 points possible to be earned on any project.

No.	Title	Pts.	Description
CC-1	Custom Credit 1	1-5	Design a new voluntary credit
CC-2	Custom Credit 2	1-5	Design a new voluntary credit

CERTIFICATION AWARD LEVELS

Level	Project Requirements	Minimum Pts.	Maximum Pts.	% of Voluntary Credits Achieved
Bronze	11	32	42	30-39
Silver	11	43	53	40-49
Gold	11	54	63	50-59
Evergreen	11	64	118	60+

For credit details, including documentation requirements, visit greenroads.org/manual.

APPENDIX B

Scoring Method



BASIC ASSESSMENT – STANDARD SCORECARD

The Greenroads Standard Scorecard (simply “Scorecard”) is completed using the approaches described below for Project Requirements, Voluntary Credits and Custom Credits.

PROJECT REQUIREMENTS

Project Requirements are evaluated based on the intent shown by actual Project documents or by verbal confirmation of intent. If clear intent is present, the Scorecard shows an “x” in the “Y(es)” column. If not, the “x” is placed in the “?” column. By design, it is *possible* to complete all 11 Project Requirements, so none will receive an “x” in the “N(o)” column. We recognize that this perspective is optimistic and that special constraints or local requirements may make some activities more difficult or onerous to document if certification is pursued.

- Demonstrating intent to complete a Project Requirement is sufficient for the purposes of this review. Most, if not all, Project Requirements can be addressed early in project decision-making. However, the complete documentation for all Project Requirements would be required if any future certification is to be pursued.
- For projects that are finalizing design or in construction at the time Greenroads is considered, it may be difficult or simply cost-prohibitive to meet the documentation requirements for certification (if desired). However, the goal of this review is to demonstrate the maximum project potential so that credits can be considered next time.
- Project Requirements carry no point value and do not add or subtract from the total score.

VOLUNTARY CREDITS

Voluntary Credits are evaluated based on the intent shown by actual Project documents or by verbal confirmation of intent. If clear intent is present, the Scorecard shows a number in the “Y(es)” column for the number of points achieved. If not, a number is placed in the “?” column, meaning that many points could be considered as feasible for the Project. A number for the remaining points is placed in the “N(o)” column only if those points would not be reasonable or practical for the Project based on known constraints and scope.

- Demonstrating intent alone to complete Voluntary Credits is sufficient for purposes of this review. This is because the elected Voluntary Credits can often change throughout the design and construction process and the purpose of this assessment is to demonstrate a potential score. Again, the approach used makes the required documentation needs very transparent for future certification efforts while also highlighting notable opportunities.
- Credits marked as “Y” or “?” in bolded text could potentially reduce cost or be completed at minimal or no additional cost to the initial construction price.
- Voluntary Credits carry a variety of values and range from 1 to 5 points. Please refer to the *Greenroads Manual* for further details on how Voluntary Credits are weighted.

CUSTOM CREDITS

Potential **Custom Credits** are evaluated similarly to the Voluntary Credits, but typically these are verbally described activities instead of documented activities. Custom Credits are submitted by registered projects pursuing certification and subjected to rigorous review prior to their approval for broad use in other projects. For purposes of this assessment, the Scorecard shows short titles that represent the basic concept of proposed Custom Credits as well as an estimated number of points. Points for Custom Credits are assigned according to the existing weighting scheme used in the *Greenroads Manual*.

DETAILED ASSESSMENT – ANNOTATED SCORECARD

An annotated version of the Standard Scorecard is provided for Detailed Assessments and Detailed Pilot Projects. The purpose of the Annotated Scorecard is to add depth to the information provided in the Standard Scorecard.

EFFORT TO COMPLETE

Greenroads estimates the level of effort that is anticipated or perceived to be needed to complete and document the credit given the context of the Project. The “Effort to Complete” section on the Annotated Scorecard reflects this estimate of effort the credit were to be pursued during Project Certification.

Specifically, Greenroads defines “effort” needed in the context of Project Certification by any of the following.

- Amount of documentation required by Greenroads
- Amount of time to provide and generate documentation that is in addition to standard project documentation
- Amount of resources that may or may not be physically available or accessible to complete a task, implement a technology or practice, or to document them
- Amount of money involved in earning and documenting a Greenroads credit
- Conflicts with existing regulatory standards, if any
- Conflicts with implementing Greenroads credits in the design process, if any
- Conflicts with implementing Greenroads credits in the construction process, if any
- Any learning curve that might be associated with a particular credit, requiring additional time investment

Scale

Effort is evaluated on a scale of low to high, and credits which were not appropriate or applicable to a particular project are marked as “N/A”. For Project Requirements, an “X” is used to indicate associated effort. For Voluntary Credits, points are shown according to their relative difficulty to achieve and their applicable point spread according to the *Greenroads Manual*.

Educated Estimate

The estimate of effort is based on our understanding of the Project, the existing research for a particular credit, experience with other projects, and the demonstrated intent to complete the credit based the stated goals of the Project Team in conversation or as otherwise demonstrated in documents provided for the Assessment.

However, estimated points in the Annotated Scorecard or the Standard Scorecard may not reflect actual Project conditions or its position for successful certification because documentation reviewed for Assessment purposes is limited. The estimates provided by Greenroads in no way imply that the Project *will* earn any particular credit and the information shown in the Scorecards should not be presumed to be a guarantee or statement of future approval under any circumstances.

NOTES

Specific comments about each credit are provided by the Greenroads Reviewer indicating where the intent was identified in the provided documents (if any) and some special comments regarding the credit for the Project Team to consider. This section does not influence the final computation of Greenroads Rating.

APPENDIX C

Greenroads Scorecards





Project Name 13NZ00002 SH2 Papatawa Realignment
Location (City, State) Woodville, New Zealand
Project Manager Vanessa Browne
Project Budget 10.5 million (USD)
Current Status Construction

Project Requirements (PR)		PR Max: 11	6	5	0
No.	Title		Y	?	N
PR-1	Environmental Review Process	Req	X		
PR-2	Lifecycle Cost Analysis	Req		X	
PR-3	Lifecycle Inventory	Req		X	
PR-4	Quality Control Plan	Req	X		
PR-5	Noise Mitigation Plan	Req		X	
PR-6	Waste Management Plan	Req		X	
PR-7	Pollution Prevention Plan	Req	X		
PR-8	Low-Impact Development	Req	X		
PR-9	Pavement Management System	Req	X		
PR-10	Site Maintenance Plan	Req	X		
PR-11	Educational Outreach	Req		X	

Construction Activities (CA)		CA Max: 14	0	14	0
No.	Title		Y	?	N
CA-1	Quality Management System	2		2	
CA-2	Environmental Training	1		1	
CA-3	Site Recycling Plan	1		1	
CA-4	Fossil Fuel Reduction	1 - 2		2	
CA-5	Equipment Emission Reduction	1 - 2		2	
CA-6	Paving Emission Reduction	1		1	
CA-7	Water Use Tracking	2		2	
CA-8	Contractor Warranty	3		3	

Environment & Water (EW)		EW Max: 21	6	12	3
No.	Title		Y	?	N
EW-1	Environmental Management System	2		2	
EW-2	Runoff Flow Control	1 - 3		3	
EW-3	Runoff Quality	1 - 3		3	
EW-4	Stormwater Cost Analysis	1		1	
EW-5	Site Vegetation	1 - 3		3	
EW-6	Habitat Restoration	3	3		
EW-7	Ecological Connectivity	1 - 3	3		
EW-8	Light Pollution	3			3

Materials & Resources (MR)		MR Max: 23	7	10	6
No.	Title		Y	?	N
MR-1	Lifecycle Assessment	2		2	
MR-2	Pavement Reuse	1 - 5	2	3	
MR-3	Earthwork Balance	1			1
MR-4	Recycled Materials	1 - 5		5	
MR-5	Regional Materials	1 - 5	5		
MR-6	Energy Efficiency	5			5

Access & Equity (AE)		AE Subtotal: 30	5	21	4
No.	Title		Y	?	N
AE-1	Safety Audit	1 - 2		2	
AE-2	Intelligent Transportation Systems	2 - 5		5	
AE-3	Context Sensitive Solutions	5	5		
AE-4	Traffic Emissions Reduction	5		5	
AE-5	Pedestrian Access	1 - 2			2
AE-6	Bicycle Access	1 - 2		2	
AE-7	Transit & HOV Access	1 - 5		3	2
AE-8	Scenic Views	2		2	
AE-9	Cultural Outreach	1 - 2		2	

Pavement Technologies (PT)		PT Max: 20	0	20	0
No.	Title		Y	?	N
PT-1	Long-Life Pavement	5		5	
PT-2	Permeable Pavement	3		3	
PT-3	Warm Mix Asphalt	3		3	
PT-4	Cool Pavement	5		5	
PT-5	Quiet Pavement	2 - 3		3	
PT-6	Pavement Performance Tracking	1		1	

Custom Credit (CC)		CC Max: 10	0	10	0
No.	Title		Y	?	N
CC-1	Greenroads STP	1 - 2		2	
CC-2	Workzone Safety	1 - 2		2	

All 11 PR Met?		No
Greenroads Total (Max 118)		18 87 13



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Project Requirements (PR)			Intent		Effort to Complete				Verbal	Notes
No.	Title		Yes	No	Low	Med	High	N/A		
PR-1	Environmental Review Process	Req	X		X					Assessment of the Environmental Effects (AEE) was submitted.
PR-2	Lifecycle Cost Analysis	Req		X	X					No documentation was available for this credit.
PR-3	Lifecycle Inventory	Req		X	X					No documentation was available for this credit.
PR-4	Quality Control Plan	Req	X		X					Project Specifications indicate that this will be completed for the project.
PR-5	Noise Mitigation Plan	Req		X	X					No documentation was available for this credit.
PR-6	Waste Management Plan	Req		X	X					No documentation was available for this credit.
PR-7	Pollution Prevention Plan	Req	X		X					Documentation states that the contractor will be required to provide and monitor an Erosion and Sediment Control Plan (E&SCP).
PR-8	Low-Impact Development	Req	X		X					The submitted Appendices indicate that LID was taken into account in the project design.
PR-9	Pavement Management System	Req	X		X				X	The project will be monitored as part of NZTA's Pavement Management System.
PR-10	Site Maintenance Plan	Req	X		X					Documents suggest there is a master Construction Management Plan that will cover site maintenance.
PR-11	Educational Outreach	Req		X	X					The Project had an informational website and this Assessment would count as 2/3 educational elements required. The final item could be achieved very easily.
PR Max: 11					11	0	0	0		



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Environment & Water (EW)			Intent		Effort to Complete				Verbal	Notes
No.	Title	Pts.	Yes	No	Low	Med	High	N/A		
EW-1	Environmental Management System	2		X		2				No documentation was available for this credit.
EW-2	Runoff Flow Control	1-3		X				3	X	Only standard drainage ditches were included on the project.
EW-3	Runoff Quality	1-3		X				3	X	Only standard drainage ditches were included on the project.
EW-4	Stormwater Cost Analysis	1		X	1					No documentation was available for this credit.
EW-5	Site Vegetation	1-3		X	3				X	Very little planting was done on the project. It would be easy to achieve these points as a result.
EW-6	Habitat Restoration	3	X		3					The project removed and restored the area of the old roadway alignment.
EW-7	Ecological Connectivity	1-3	X		3					Documentation suggests that all culverts and bridges will be replaced and was designed for fish passage.
EW-8	Light Pollution	3		X				3	X	Lighting is not included on the project.
EW Max: 21					10	2	0	9		



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Access & Equity (AE)			Intent		Effort to Complete				Verbal	Notes
No.	Title	Pts.	Yes	No	Low	Med	High	N/A		
AE-1	Safety Audit	1-2		X	2					No documentation was available for this credit.
AE-2	Intelligent Transportation Systems	2-5		X			5			No documentation was available for this credit.
AE-3	Context Sensitive Solutions	5	X		5				X	The project evaluated Context Sensitive Solutions.
AE-4	Traffic Emissions Reduction	5		X			5			No documentation was available for this credit.
AE-5	Pedestrian Access	1-2		X				2		Pedestrian facilities were determined to be out of the scope of this project
AE-6	Bicycle Access	1-2		X	2				X	Wider shoulders were paved for bicycle safety but no markings or dedicated areas were designated for bicycles.
AE-7	Transit & HOV Access	1-5		X		3		2	X	No transit or HOV facilities were included on the project.
AE-8	Scenic Views	2		X			2			No documentation was available for this credit.
AE-9	Cultural Outreach	1-2		X	1		1			Many of the documents indicate that there may be culturally significant Iwi sites nearby, but it has not been indicated whether the project includes any installations to recognize this.
AE Max: 30					10	3	13	4		



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Construction Activities (CA)			Intent		Effort to Complete				Verbal	Notes
No.	Title	Pts.	Yes	No	Low	Med	High	N/A		
CA-1	Quality Management System	2		X		2				No documentation was available for this credit.
CA-2	Environmental Training	1		X	1					No documentation was available for this credit.
CA-3	Site Recycling Plan	1		X	1				X	The project team indicated recycling was done on the project but there was no evidence of a formal Recycling Plan.
CA-4	Fossil Fuel Reduction	2		X			2			No documentation was available for this credit.
CA-5	Equipment Emission Reduction	2		X			2			No documentation was available for this credit.
CA-6	Paving Emission Reduction	1		X	1					No documentation was available for this credit.
CA-7	Water Use Tracking	2		X	2					No documentation was available for this credit.
CA-8	Contractor Warranty	3		X			3		X	A warranty was not included on the project.
CA Max: 14					5	2	7	0		



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Materials & Resources (MR)			Intent		Effort to Complete				Verbal	Notes
No.	Title	Pts.	Yes	No	Low	Med	High	N/A		
MR-1	Lifecycle Assessment	2		X			2			No documentation was available for this credit.
MR-2	Pavement Reuse	1-5		X	2	3			X	The project team stated that much of the existing pavement from the realignment was reused on-site as base material. It could not be determined to what extent the pavement was reused.
MR-3	Earthwork Balance	1		X				1	X	Documentation suggests that large quantities of soil will need to be imported for the creation of the bridge approaches. The project team stated that a fair amount of soil was brought in from a landslide nearby.
MR-4	Recycled Materials	1-5		X	2		3		X	The project team stated that RAP was not used in the project pavements.
MR-5	Regional Materials	1-5		X	5				X	The project team stated that fill material, aggregates, HMA, and concrete for structures all came from within a 50 mile radius.
MR-6	Energy Efficiency	5		X				5		Documents suggest that lighting is not included in the project.
MR Max: 23					9	3	5	6		



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Pavement Technologies (PT)			Intent		Effort to Complete				Verbal	Notes
No.	Title	Pts.	Yes	No	Low	Med	High	N/A		
PT-1	Long-Life Pavement	5		X		5				No documentation was available for this credit. It is possible that this credit could be achieved with the current pavement design. Proper calculations should be completed to see if the project merits these points.
PT-2	Permeable Pavement	3		X			3			No documentation was available for this credit.
PT-3	Warm Mix Asphalt	3		X		3				No documentation was available for this credit.
PT-4	Cool Pavement	5		X			5			No documentation was available for this credit.
PT-5	Quiet Pavement	2-3		X			3			No documentation was available for this credit.
PT-6	Pavement Performance Tracking	1		X			1			No documentation was available for this credit.
PT Max: 20					0	8	12	0		



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Custom Credit (CC)			Intent		Effort to Complete				Verbal	Notes
No.	Title	Pts.	Yes	No	Low	Med	High	N/A		
CC-1	STP	1-2		X	1		1			The project can earn points by taking the STP exam.
CC-2	Workzone Safety	1-2		X	2					Performing Job Hazard Analyses and designating a Safety Officer can earn the project points.
CC Max: 10					3	0	1	0		