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FOR SUSTAINABLE INFRASTRUCTURE

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HIGHWAY VIAS NUEVAS DE LIMA, PERU



Figure 01: General photo of project. Source: Volante Vías Modernas y seguras, Rutas de Lima

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1. PROJECT INTRODUCTION

This case study outlines the evaluation of Vías Nuevas de Lima, a highway mega-project concession by Lima Metropolitan Municipality.

The infrastructure of 31.5 km of the Pan-American North Highway, 54.1 km of the Pan-American South Highway and 19 km of the Ramiro Prialé highway have been concessioned to the private developer Rutas de Lima to be retrofitted, operated and maintained for a period of 30 years. The project comprises two tasks: the design and construction of road interchanges, pedestrian bridges, bus stops, extension of auxiliary roads and the extension of Ramiro Prialé highway, as well as the operation and maintenance of roads providing 24 hours road emergencies services.

As this is an intervention for the development of infrastructure, the scope of the project included in the concession contract involved the implementation of activities related to the construction of the works, the operation and maintenance of the arteries of existing traffic, which provides for the incorporation of additional works or on demand when necessary.

The process for the granting of this project was carried out on the basis and under the framework of Public Private Partnership (PPP) Law, which was processed from the end of 2009 and May 3rd, 2012. The Metropolitan Council of Lima declared this private initiative of Public Interest. After the legal deadline of 90 days for the submission of proposals, on September 18, 2012 the Metropolitan Council awarded the concession of this project.

On January 9, 2013 the concession contract with Rutas de Lima S.A.C. was signed for a period of 30 years, and on February 10, 2013 the transition period begun, assuming the operation and maintenance activities of the Pan-American North and South Highways. Later on July 1, 2013, the operational phase begun, initiating the full operation phase of these pathways. In the case of Ramiro Prialé Highway, once the works of the extension of this route culminated, it will be delivered to the concessionaire Rutas de Lima for its operation and maintenance.

The Envision rating system allows us to demonstrate the path initiated by Rutas de Lima, which despite having several of its studies in process at the end of this evaluation, this project was selected as one of twelve finalists in the inaugural year of the IDB Infrastructure 360 Awards- a clear indication of the leadership of the project team and the significant sustainability practices implemented by the project, providing examples of best practices to follow in the Latin American region.

2. PROJECT DESCRIPTION & LOCATION

Presently, the project comprises the expansion and revitalization of 115 km of highway that provides access to the Lima Metropolitan Area.¹ Vías Nuevas de Lima itself is a component of a greater transit master plan that addresses the traffic infrastructure needs of contemporary Lima and Callao.

¹Periodico La Republica/Sociedad. *Alcaldesa de Lima dará inicio a megaproyecto 'Vías nuevas de Lima.'*

Last modified February 04, 2013. <http://www.larepublica.pe/04-02-2013/alcaldesa-de-lima-dara-inicio-megaproyecto-vias-nuevas-de-lima>

Vías Nuevas de Lima will affect 23 districts in Peru's capital territory, some of which have the highest population and density (3,008.8 Hab/Km²) in the region. As it snakes through the geography of Lima, the project addresses several residential growth patterns that have developed as a result of technological advancement and capital acquisition.

These changes in population settlement follow a main trend: higher populations within urbanized districts of Lima have resulted in a change in growth of 30.9% compared to the national growth. This is evidenced by the census, which shows an increased rate of population within the Lima Centro District, and a depopulation of surrounding settlements and districts.

This trend towards expansion of the metropolitan was a catalyst for the conception and construction of the highway megaproject and its typological components. It is estimated that 12.3 million journeys (excluding pedestrian trips) have a destination in Lima. Of these trips, 19.6% are work-related and 12.3 percent are education-related

The demand for transportation to Lima Centro, compared to other destinations, accounts for 43.7%. It is estimated that 84% of these trips originate in the northern, eastern, or southern districts of the capital city where most of the project intervention occurs. These traffic trends also reflect cargo and industrial transportation trends. The main cargo routes from/to Lima and Callao follow west to east and north to south axes. The volume of trips to the center of Lima exceeds the volume of trips that originate in the Lima Centro district. Nonetheless, while 70% of industry is outside of Lima, the majority of the population lives within the Greater Lima Area. As the data suggests, a high rate of commuting has created increased demand. The project seeks to address this by creating a safer and streamlined trip experience.



Figure 02: Diagram of the project. Source: Municipalidad de Lima

The distribution of the project components directly correlates with the urban form, population settlements, and traffic volumes and distribution.

The project aims to contribute to the sustainable growth of the Peruvian economy by responding to and anticipating further growth and travel demand for private and cargo vehicles. The project team has established a serious commitment to health and sustainability in the work, natural, social and management environments.

3. APPLICATION OF THE ENVISION RATING SYSTEM²

The *Envision* rating system is a set of criteria that assess and evaluate any specific piece of infrastructure. In this case the infrastructure to be assessed is Nuevas Vías de Lima, in the city of Lima, Peru. The main intent of this rating is to evaluate the design, construction, and maintenance operations of the Pan-American Norte and Sur Highways and the Ramiro Priale Highway, which will seek to facilitate travel between the periphery of Lima and Lima Centro. This project also aims to create more efficient connections of the communities and pedestrian to the transport activity.

² Anthony Kane, Zofnass program research director, and Salmaan Khan, research assistant, wrote most parts of this section.

Envision consists of 60 credits grouped into five categories: Quality of Life, Leadership, Resource Allocation, Natural World, and Climate and Risk. Each credit pertains to a specific indicator of sustainability such as reducing energy use, preserving natural habitat, or reducing greenhouse gas emissions. Those credits are rated on a five-point scale referred to as a ‘level of achievement’: improved, enhanced, superior, conserving, and restorative. Evaluation criteria are provided to determine if the qualifications for each level of achievement has been met for a particular credit. In each of the five categories there is a specific credit called “Innovative or exceed credit requirements”. This is an open window to reward exceptional performance or the application of innovative methods.

The criteria for the levels of achievement vary from credit to credit but generally an ‘improved’ level of achievement is awarded for performance that slightly exceeds regulatory requirements. ‘Enhanced’ and ‘superior’ levels indicate gradual improvement, while ‘conserving’ often indicates performance that achieves a net-zero or neutral impact. ‘Restorative’ is the highest level and is typically reserved for projects that produce an overall positive impact for the given credit criteria. The *Envision* system weighs the relative value of each credit and level of achievement by assigning points. Credit criteria are documented in the *Envision Guidance Manual*, which is available to the public on the ISI³ and Zofnass Program⁴ websites.

Appendix C provides a table with the detailed project assessment, specifications for each of the credits, and recommendations for the Vias Nuevas de Lima project.

³ www.sustainableinfrastructure.org

⁴ www.zofnass.org

4. EVALUATION CATEGORIES

4.1. QUALITY OF LIFE

The first category of the *Envision* rating system is Quality of Life. The assessment here mainly refers to the impact of the project on the surrounding communities and their well-being. As stated in the *Envision* manual, “Quality of Life particularly focuses on assessing whether infrastructure projects are in line with community goals, incorporated into existing community networks, and will benefit the community long-term.”⁵ It also determines if the project is aligned with the community needs.

This category is divided into 3 subcategories and 12 credits: Purpose (QL 1.1, QL 1.2, QL 1.3, and QL 1.4), Community (QL 2.1, QL 2.2, QL 2.3, QL 2.4, QL 2.5, and QL 2.6) and Well-Being (QL 3.1, QL 3.2, and QL 3.3).

CREDIT SCORING

			IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE
1	PURPOSE	QL1.1 Improve community quality of life	2	5	10	20	25
2		QL1.2 Stimulate sustainable growth and development	1	2	5	13	16
3		QL1.3 Develop local skills and capabilities	1	2	5	12	15
4	COMMUNITY	QL2.1 Enhance public health and safety	2			16	
5		QL2.2 Minimize noise and vibration	1			8	11
6		QL2.3 Minimize light pollution	1	2	4	8	11
7		QL2.4 Improve community mobility and access	1	4	7	14	
8		QL2.5 Encourage alternative modes of transportation	1	3	6	12	15
9		QL2.6 Improve site accessibility, safety and wayfinding		3	6	12	15
10	WELLBEING	QL3.1 Preserve historic and cultural resources	1		7	13	16
11		QL3.2 Preserve views and local character	1	3	6	11	14
12		QL3.3 Enhance public space	1	3	6	11	13
Maximum points possible:						181	

Figure 03: Quality of life category, credits distribution.

4.1.1. Purpose

In the **Purpose subcategory**, of the four credits, one was evaluated as No Score (QL 1.1 Improve Community Quality of Life), two were assessed as Improved (QL 1.2 Stimulate Sustainable Growth & Development, and QL 1.3 Develop Local Skills and Capabilities).

The project team has outlined an elaborate social and economic program. Some measures that directly affect this credit assessment include their goal of generating job opportunities through or without contracts. These opportunities prioritize regional residents for job openings with Rutas de Lima and its service and materials providers. Another initiative undertaken was ‘Productive Insertion’, which essentially are means by which the project’s social programs create or foster businesses that will generate self-sustaining jobs that outlive the construction of the project and that are not dependent on contracts with Rutas de Lima. Finally, the team promoted the adoption of sustainable practices such as respecting and prioritizing local culture, skills, and construction. The ‘productive insertion’ initiatives will

⁵ *Envision* Guidance Manual, p.30

be required to be compliant with these practices, in that functions and operations have to ensure that no harm will be caused to the environment or natural resources.

The project team has clearly identified a strategy to develop the local skills and capabilities of adjacent communities. Their aim is to integrate education and mobilization to increase productivity levels within the greater metropolitan area of Lima. The project encourages local communities to create new job opportunities and to increase participation.

4.1.2. Community:

In the **Community sub-category**, three credits achieved No Score (QL 2.2 Minimize Noise and Vibration, QL 2.3 Minimize Light Pollution, and QL 2.5 Encourage Alternative Modes of Transportation), one credit was assessed as Superior (QL 2.4 Improve Community Mobility and Access), and two credits were evaluated as Conserving (QL 2.1 Enhance Public Health and Safety and QL 2.6 Improve Site Accessibility, Safety & Wayfinding).

The project team made many design decisions based on the mobility and access needs of nearby communities. The project team modeled data and evaluated several design alternatives for the highway and interchanges using updated information from traffic flows. As the project images show, many designs were prepared to improve pedestrian mobility and access to public transportation on both sides of the highway. These measures are considered beneficial as they bridge communication and access between communities that had previously been isolated from each other, and make commute times between Lima and important production centers more agile. However, the lack of documentation regarding communication and input from key stakeholders prevents certain credits from achieving higher scores.

The team has prepared a manual on how to prevent environmental and work-related emergencies and distributed it to management and contractors. The manual outlines procedures for arranging and organizing safety barriers during work on the highway; procedures to prevent environmental and work-related hazards; and forms to be filled out when handling non-risk/risky materials, wastes, and liquids. In the case of an emergency, flowcharts have been distributed to corresponding work teams that depict an established action plan that includes important contacts and steps to follow. To address accessibility, safety and way-finding, the project team has created clear documentation directed at different education levels. In addition, electronic and physical brochures with icons, symbols and cartoons have been distributed to the general public to increase community awareness of the highway's safety signage, and protection plan in case of an accident or emergency. Thus, the team has been successful at developing and implementing a public safety plan and at making it accessible to every sector of the socioeconomic spectrum of Lima.

4.1.3. Wellbeing:

The **Wellbeing subcategory** suffered from a lack of detailed documentation. All the documents submitted were evaluated. Some level of information was supplied in relation to almost all of the credits, but in general there were not enough metrics on which to assess the project. In this category, the three credits were evaluated as No Score.

4.1.4. Summary of results, Quality of Life Category.

The project’s performance in the Quality of Life category can be improved. Opportunities for improvement can be found in all three subcategories (Purpose, Community, and Wellbeing). Considering all credits and the maximum possible values for each indicator, the percentage of achievement equates to 20.4%, or 37 points out of 181 maximum achievable points. Below, the project’s performance is assessed by comparing the points the project achieved to the maximum score achievable by credit.

VIAS NUEVAS DE LIMA, LIMA, PERU				PT.	Performance	% Total	max
1	QUALITY OF LIFE	PURPOSE	QL1.1 Improve Community Quality of Life	0	No score	0.0%	25
2			QL1.2 Stimulate Sustainable Growth & Development	1	Improved	6.3%	16
3			QL1.3 Develop Local Skills And Capabilities	1	Improved	6.7%	15
4		COMMUNITY	QL2.1 Enhance Public Health And Safety	16	Improved	100.0%	16
5			QL2.2 Minimize Noise And Vibration	0	No score	0.0%	11
6			QL2.3 Minimize Light Pollution	0	No score	0.0%	11
7			QL2.4 Improve Community Mobility And Access	7	Superior	50.0%	14
8			QL2.5 Encourage Alternative Modes of Transportation	0	No score	0.0%	15
9			QL2.6 Improve Site Accessibility, Safety & Wayfinding	12	Conserving	80.0%	15
10		WELLBEING	QL3.1 Preserve Historic And Cultural Resources	0	No score	0.0%	16
11			QL3.2 Preserve Views And Local Character	0	No score	0.0%	14
12			QL3.3 Enhance Public Space	0	No score	0.0%	13
QL0.0 Innovate Or Exceed Credit Requirements				0	N/A		
QL				37		20.4%	181

Figure 04: Quality of Life summary table

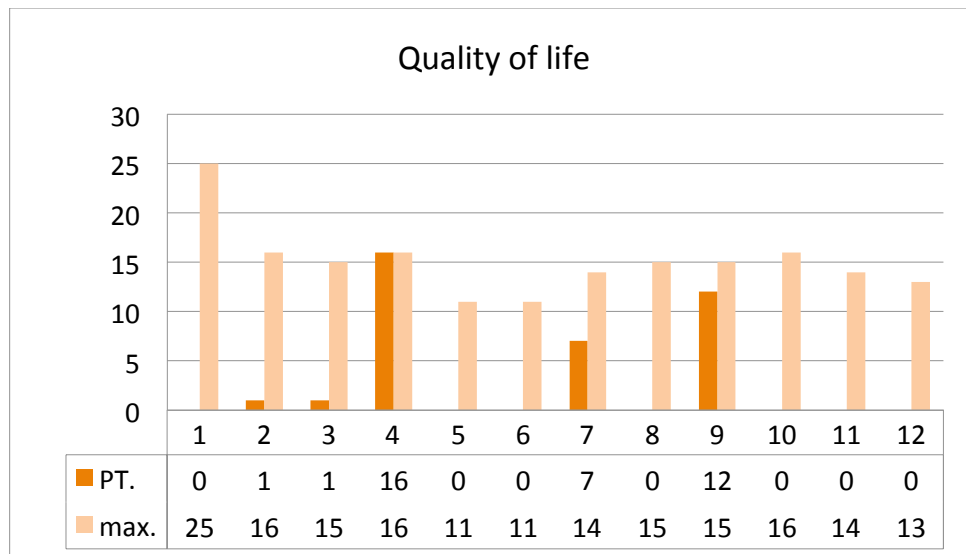


Figure 05: Quality of Life Performance Assessment Table

4.2. LEADERSHIP

Envision’s Leadership category evaluates the collaboration, management and planning of the project’s team, as well as its stakeholders. *Envision* states that “communicate and collaborate early on, involve a wide variety of people in creating ideas for the project, and understand the long-term, holistic view of the project and its life cycle.”⁶

The 12 credits in this category are: collaboration (LD 1.1, LD 1.2, LD 1.3, LD 1.4), management (LD 2.1, LD 2.2) and planning (LD 3.1, LD 3.2, LD 3.3).

CREDIT SCORING

			IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE	
13	LEADERSHIP	COLLABORATION	LD1.1 Provide effective leadership and commitment	2	4	9	17	
14			LD1.2 Establish a sustainability management system	1	4	7	14	
15			LD1.3 Foster collaboration and teamwork	1	4	8	15	
16			LD1.4 Provide for stakeholder involvement	1	5	9	14	
17	MANAGEMENT	LD2.1 Pursue by-product synergy opportunities	1	3	6	12	15	
18		LD2.2 Improve infrastructure integration	1	3	7	13	16	
19	PLANNING	LD3.1 Plan for long-term monitoring and maintenance	1	3		10		
20		LD3.2 Address conflicting regulations and policies	1	2	4	8		
21		LD3.3 Extend useful life	1	3	6	12		
Maximum points possible:							121	

Figure 06: Leadership category, credits distribution.

4.2.1. Collaboration

In the **Collaboration subcategory**, one credit was assessed as Improved (LD 1.4 Provide for Stakeholder Involvement), one credit was considered to be Superior (LD 1.3 Foster Collaboration and Teamwork), and two credits were evaluated as Conserving (LD 1.1 Provide Effective Leadership and Commitment and LD 1.2 Establish a Sustainability Management System).

The project team has set forth both a clear sustainability policy as well as sustainability manuals and procedures for environmental and administrative work spaces. The team has created a robust system of procedures that integrate elements of sustainability, management, and social life. Each document provided is divided into two phases and offers initiatives or actions to be taken during these phases. The two phases that the project team has identified are: Design and Planning, and Construction and Operation. In addition, the project is providing “Seguridad y Salud en el Trabajo y Medio Ambiente” (SSTMA) education, as well as clear and precise procedures for attending to climate change related disasters. The project ensures that management, employees, and residents are not only transitioning to a sustainable lifestyle but can respond and restore order and functionality in different scenarios.

Section 5 and Section 6 of the *Gestión de Proveedores* document delineate the roles, procedures and authority of each team. The procedures are different for contractors, sub-contractors, and providers. The document’s annex details further information and requirements for the safety, environment, health, and mechanical components of the project. The *Política de Sostenibilidad* document defines the goals, objectives, and scope for sustainability in both management and operation. The *Gestión de Proveedores* document also explains the different business scales and management processes that will take place at

⁶ *Envision* Guidance Manual, p.60

different stages to ensure that SSTMA standards are met. This document also demonstrates an understanding that communication between ownership, management, and supervision is necessary to achieve overall sustainability. These processes are non-linear, and all teams collaborate to the extent needed.

There is a parallel and iterative process of interviewing, understanding and incorporating the needs of local people into the project, including residents who walk the highways, bus/truck/taxi drivers, and private drivers. In order to successfully incorporate the community into the design and construction process, the firm Gestionarse was hired to do some social studies. It is a non-profit consulting firm that engages the users and residents. For a diagram that represents how these processes will flow at each scale, refer to Section 2, Page 7, of the *Política sobre Sostenibilidad*.

4.2.2. Management:

In the **Management subcategory**, one of the two credits was evaluated as No Score (LD 2.1 Pursue By-Product Synergy Opportunities), and the other credit was evaluated as Conserving (LD 2.2 Improve Infrastructure Integration).

The nature of the concession for the project is to enhance infrastructure connectivity and efficiency. As such, the project design includes several interchange schemes that seek to improve and streamline connections between community infrastructure and the existing highway segments. Refer to the *Ingeniería Preliminar del Proyecto* of the project document *Proyecto Vías Nuevas de Lima* for all the preliminary plan diagrams and *Planos de implantación general* for aerial photographs of the neighborhoods with superimposed plans.

The project benefits and includes local communities through the creation and promotion of new job opportunities and increased participation. The strategy utilized is known as ‘productive insertions’, whereby communities are enhanced by means of education. The project promotes education with a focus on professional skills and productivity that will generate new self-sustainable businesses and enhance community competitiveness. This and other measures for community involvement can be found in the *Directriz de Programas Sociales*.

4.2.3. Planning:

The **Planning subcategory** shows varied levels of achievement. One of the three credits received No Score (LD 3.3 Extend Useful Life), one credit was assessed as Improved (LD 3.2 Address Conflicting Regulations & Policies), and one credit was evaluated as Conserving (LD 3.1 Plan For Long-Term Monitoring & Maintenance).

The project is centered on the operation and maintenance of the highways of Lima, Peru. Thus, detailed plans for monitoring and maintenance were put in place that identify possible services to be provided, the level and type of repairs to be done, and the length of time for each repair type. Monitoring stations are also mentioned; however, there is no monitoring of runoff waters, sound or light pollution. Personnel and resources have been allocated to each job, and clear authority and responsibility has been established for each teams and team manager. Refer to the *Operación y Mantenimiento* section of the project document *Vías Nuevas de Lima* for a detailed operation, monitoring and maintenance

narrative. Refer to the *Plan de acción en situaciones de emergencias operativas* for a detailed map of operation responsibilities and contacts.

To address any conflicting regulations and policies, the project team has only identified the regulations and policies with which they are required to abide. Each law impacting a particular element of the project has been described in a preamble, legal framework, or in a general statement. However, there is no evidence that the project team has worked with city or state officials regarding any conflicts between regulations.

4.2.4 Summary of results, Leadership category.

The project has performed better in the Leadership category than in any other category. Nonetheless, opportunities for improvement can be found in all three subcategories (Collaboration, Management, and Planning). Considering all credits and the maximum possible values for each indicator, the percentage of achievement equates to 59.5% or 72 points out of 121 maximum achievable points. Below, the project’s performance is assessed by comparing the points the project achieved to the maximum score achievable by credit.

VIAS NUEVAS DE LIMA, LIMA, PERU				PT.	Performance	% Total	max
13	LEADERSHIP	COLLABORATION	LD1.1 Provide Effective Leadership And Commitment	17	Conserving	100.0%	17
14			LD1.2 Establish A Sustainability Management System	14	Conserving	100.0%	14
15			LD1.3 Foster Collaboration And Teamwork	8	Superior	53.3%	15
16			LD1.4 Provide For Stakeholder Involvement	9	Improved	64.3%	14
17	LEADERSHIP	MNGMT.	LD2.1 Pursue By-Product Synergy Opportunities	0	No score	0.0%	15
18			LD2.2 Improve Infrastructure Integration	13	Conserving	81.3%	16
19	LEADERSHIP	PLANNING	LD3.1 Plan For Long-Term Monitoring & Maintenance	10	Conserving	100.0%	10
20			LD3.2 Address Conflicting Regulations & Policies	1	Improved	12.5%	8
21			LD3.3 Extend Useful Life	0	No score	0.0%	12
LD0.0 Innovate Or Exceed Credit Requirements				0	N/A		
LD				72		59.5%	121

Figure 07: Leadership Summary table

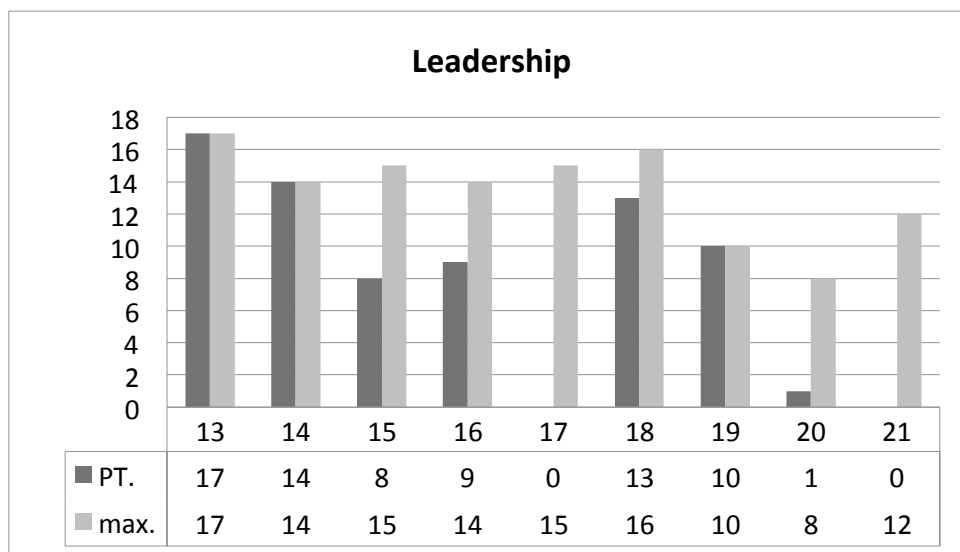


Figure 08: Leadership Performance Assessment Table

4.3 RESOURCE ALLOCATION

The Resource Allocation (RA) category deals with the quality and source of the materials used in the project during its construction and operation phases. Use and allocation of materials and other resources has a great impact on the overall sustainability of the project. The RA category is divided into 13 credits: materials (RA 1.1, RA 1.2, RA 1.3, RA 1.4, RA 1.5, RA 1.6, RA 1.7), energy (RA 2.1, RA 2.2, RA 2.3) and water (RA 3.1, RA 3.2, RA 3.3).

CREDIT SCORING

			IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE	
22	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce net embodied energy	2	6	12	18	
23			RA1.2 Support sustainable procurement practices	2	3	6	9	
24			RA1.3 Use recycled materials	2	5	11	14	
25			RA1.4 Use regional materials	3	6	9	10	
26			RA1.5 Divert waste from landfills	3	6	8	11	
27			RA1.6 Reduce excavated materials taken off site	2	4	5	6	
28			RA1.7 Provide for deconstruction and recycling	1	4	8	12	
29	RESOURCE ALLOCATION	ENERGY	RA2.1 Reduce energy consumption	3	7	12	18	
30			RA2.2 Use renewable energy	4	6	13	16	20
31			RA2.3 Commission and monitor energy systems		3		11	
32	RESOURCE ALLOCATION	WATER	RA3.1 Protect fresh water availability	2	4	9	17	21
33			RA3.2 Reduce potable water consumption	4	9	13	17	21
34			RA3.3 Monitor water systems	1	3	6	11	
Maximum points possible:							182	

Figure 09: Resource Allocation category, credits distribution.

4.3.1. Materials:

In the **Materials subcategory**, two credits were considered to be No Score (RA 1.1 Reduce Net Embodied Energy and RA 1.4 Use Regional Materials), two credits have been assessed as Improved (RA 1.2 Support Sustainable procurement Practices and RA 1.5 Divert Waste from landfills), and three credits have been evaluated as Conserving (RA 1.3 Use Recycled Materials, RA 1.6 Reduce Excavated Materials Taken Off-Site, and 1.7 Provide for Deconstruction and Recycling).

The project will utilize and remodel the existing toll plaza structures. The concession will maintain the existing stretches of highway so that only 20 km of the 115 km project comprises new construction. Thus, only 17.4% of the project is new construction; the remaining 82.6% is made up of reutilized, remodeled or maintained infrastructure.

The team has also identified strategies to limit the excavated materials taken off-site. Some of these strategies include employing excavation and cut methods that require less soil to be extracted, and creating storage facilities to store soil that will not be used immediately. These actions allow the team to have less impact during construction and to store soil for future use or mitigation on-site.

The project team has clearly specified materials that can be easily recycled or reused during and after construction. In addition, they have created a system that clearly facilitates procedures for separating materials, correctly disposing materials, and reusing materials in the future when possible. No distinction between structural materials or site-generated materials has been made. In such a cyclical system, items to be reused are identified by color and risk. Refer to figure one for the complete cycle of use, reuse, and waste (FIG. 1, page 9).

The project team has developed a Comprehensive Waste Management Plan to decrease overall project waste and to divert waste from landfills and incinerators during operations. The plan also identifies potential destinations for waste generated on-site. In terms of waste generation, the Plan requires the following: (1) waste should be managed according to the System of Environmental Action; (2) treatment of waste should minimize residue in order to achieve the lowest degree of pollution; (3) waste should be clearly identified and deposited in a receptacle according to its classification and characteristics for subsequent treatment; and (4) management and manipulation of hydrocarbons should be controlled. In terms of waste destinations, the Plan requires the following: (1) excess material disposal will occur at “Flor de nieve”; and (2) other waste disposal will occur at “Depósito San Martín”.

4.3.2. Energy:

The **Energy subcategory** suffered from a lack of detailed documentation. All the documents submitted were evaluated. Some level of information was supplied in relation to almost all of the credits, but in general there were not enough metrics on which to assess the project.

In this category all of the credits received No Score (RA 2.1 Reduce Energy Consumption, RA 2.2 Use Renewable Energy, and RA 2.3 Commission & Monitor Energy Systems).

4.3.3. Water:

The **Water subcategory** also suffered from a lack of detailed documentation. All the documents submitted were evaluated. Some level of information was supplied in relation to almost all of the credits, but in general there were not enough metrics on which to assess the project.

In this category, two credits received No Score (RA 3.1 Protect Fresh Water Availability and RA 3.3 Monitor Water Systems), and one credit was assessed as Improved (RA 3.2 Reduce Potable Water Consumption).

The team has tried to address the local shortage of potable water by implementing rations/restrictions for potable water consumption during the remodeling of the Toll Plaza Stations. In fact, during the construction phase, potable water will be brought to the site in tanks by a third party. During the life of the project, the project team will verify and implement mechanisms for water reutilization that include recycling gray water for irrigation.

4.3.4. Summary of results for the Resource Allocation category.

The project’s performance in the Resource Allocation category can be improved. Opportunities for improvement can be found in all three subcategories (Materials, Energy, and Water). Considering all credits and the maximum possible values for each indicator, the percentage of achievement equates to 22.5%, or 41 points out of 182 maximum achievable points. Below, the project’s performance is assessed by comparing the points the project achieved to the maximum score achievable by credit.

		VIAS NUEVAS DE LIMA, LIMA, PERU		PT.	Performance	% Total
22	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce Net Embodied Energy	0	No score	0.0%
23			RA1.2 Support Sustainable Procurement Practices	2	Improved	22.2%
24			RA1.3 Used Recycled Materials	14	Conserving	100.0%
25			RA1.4 Use Regional Materials	0	No score	0.0%
26			RA1.5 Divert Waste From Landfills	3	Improved	27.3%
27			RA1.6 Reduce Excavated Materials Taken Off Site	6	Conserving	100.0%
28			RA1.7 Provide for Deconstruction & Recycling	12	Conserving	100.0%
29		ENERGY	RA2.1 Reduce Energy Consumption	0	No score	0.0%
30			RA2.2 Reduce Pesticide and Fertilizer Impacts	0	No score	0.0%
31			RA2.3 Commission & Monitor Energy Systems	0	No score	0.0%
32		WATER	RA3.1 Protect Fresh Water Availability	0	No score	0.0%
33			RA3.2 Reduce Potable Water Consumption	4	Improved	19.0%
34			RA3.3 Monitor Water Systems	0	Improved	0.0%
		RA0.0 Innovate Or Exceed Credit Requirements	0	N/A		
		RA	41		22.5%	

Figure 10: Resource Allocation Summary Table

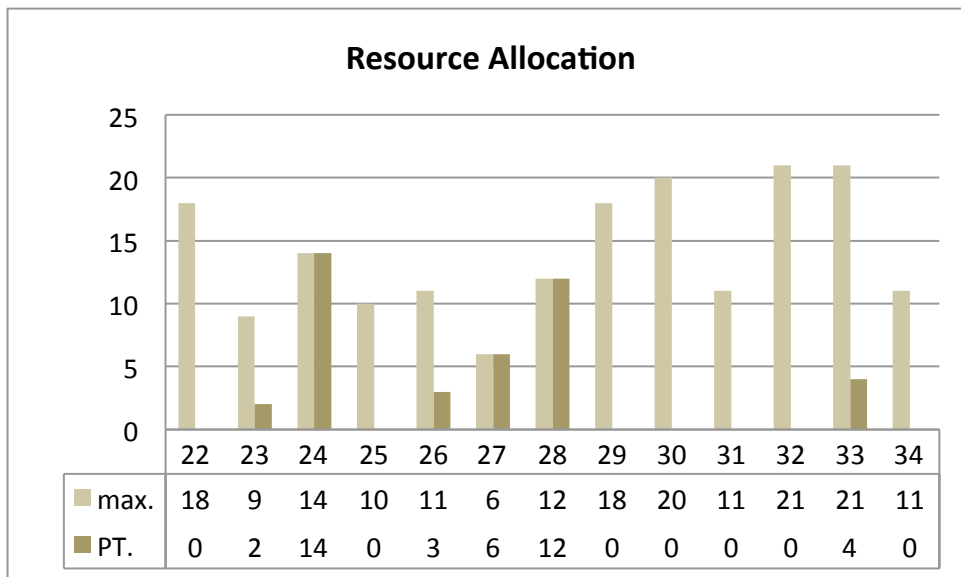


Figure 11: Resource Allocation Performance Assessment Table

4.4 NATURAL WORLD

The Natural World category addresses “how to understand and minimize negative impacts while considering ways in which the infrastructure can interact with natural systems in a synergistic, positive way.”⁷ The NW category is divided into 14 credits related to project siting (NW 1.1, NW 1.2, NW 1.3, NW 1.4, NW 1.5, NW 1.6, and NW 1.7), impacts on land and water (NW 2.1, NW 2.2, NW 2.3) and biodiversity (NW 3.1, NW 3.2, NW 3.3, NW 3.4).

CREDIT SCORING

			IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE	
35	NATURAL WORLD	SITING	NW1.1 Preserve prime habitat			9	14	18
36			NW1.2 Protect wetlands and surface water	1	4	9	14	18
37			NW1.3 Preserve prime farmland			6	12	15
38			NW1.4 Avoid adverse geology	1	2	3	5	
39			NW1.5 Preserve floodplain functions	2	5	8	14	
40			NW1.6 Avoid unsuitable development on steep slopes	1		4	6	
41			NW1.7 Preserve greenfields	3	6	10	15	23
42		LAND & WATER	NW2.1 Manage stormwater		4	9	17	21
43			NW2.2 Reduce pesticide and fertilizer impacts	1	2	5	9	
44			NW2.3 Prevent surface and groundwater contamination	1	4	9	14	18
45		BIODIVERSITY	NW3.1 Preserve species biodiversity	2			13	16
46			NW3.2 Control invasive species			5	9	11
47			NW3.3 Restore disturbed soils				8	10
48			NW3.4 Maintain wetland and surface water functions	3	6	9	15	19
							Maximum points possible:	203

Figure 12: Natural World credit distribution

4.4.1 Siting:

The **Siting subcategory**, as with the following Natural World Sub categories, suffered from a lack of documentation. All the documents submitted were evaluated. Some level of information was supplied in relation to almost all of the credits, but there were not enough metrics on which to assess the project.

The project team submitted an Environmental Impact Report that was in its preliminary stages and did not contain many of the details that the credit analysis asked for. For this reason, several credits were assessed as No Score. These include credits that evaluated the preservation of prime habitats, the protection of wetlands and surface waters, the preservation of farmland, and the preservation of floodplains. Two credits were assessed as improved (NW 1.4 Avoid Adverse Geology and NW 1.6 Avoid unsuitable development on steep slopes), and one credit was assessed Conserving (NW 1.7 Preserve Greenfields).

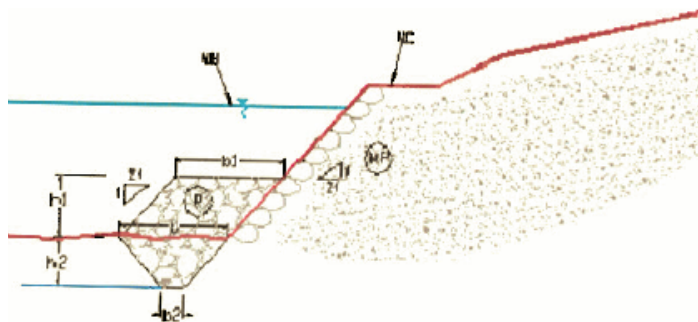


Figure 13: Slope design with engineering variables inscribed

The project straddles the banks of the Chillón River. For this reason, the project team has supplied diagrams of proposed construction efforts that will avoid the development of steep slopes in order to protect riverine ecosystems and prevent particulate matter from entering the water.

⁷ Envision Guidance Manual, p.116

4.4.2 Land and Water:

The **Land and Water subcategory**, also suffered from a lack of documentation. All the documents submitted were evaluated. Some level of information was supplied in relation to almost all of the credits, but in general there were not enough metrics on which to assess the project.

Of the three credits in this category, two were considered No Score (NW 2.1 Manage Storm Water and NW 2.2 Reduce Pesticide and Fertilizer Impacts), and one credit was assessed as Improved (NW 2.3 Prevent Surface and Groundwater Contamination).

The project is situated within less than 120 meters of three major bodies of water that feed or receive surface and groundwater. The project team suggested several measures to prevent chemicals and solid particles from reaching both surface and groundwater resources. For example, trucks and other vehicles must not drive at high speeds near these bodies of water or in construction sites near these bodies of water. As poorly maintained vehicles and on-site vehicles maintenance are potential sources of water pollution, the team has prohibited on-site repair operations and has established a set schedule for maintenance. The team has also designed appropriate drainage systems following industry standards to minimize interference with surface and groundwater resources.

4.4.3 Biodiversity:

In addition, the **Biodiversity subcategory** suffered from a lack of documentation. All the documents submitted were evaluated. Some level of information was supplied in relation to almost all of the credits, but again, there were not enough metrics on which to assess the project.

Of the four credits in this section, two were considered No Score (NW 3.2 Control Invasive Species and NW 3.4 Maintain Wetland and Surface Water Functions), one credit was assessed as Improved (NW 3.1 Preserve Species Biodiversity), and one credit was considered Conserving (NW 3.3 Restore Disturbed Soils).

The team has acknowledged the importance of identifying that there is a migratory bird that has made the construction site its home. The bird is identified within the project's environmental report, and directives have been put in place to ban egg collection. The team is also aware of the plants that inhabit the Chillón River and the 943 mi² Chillón River Basin⁸ and has taken steps to minimize the impact of chemicals on their habitats.

The team has established best practices for soil management and has drafted a document with specific diagrams for cutting, excavating, and infilling. All the soil that is cut or excavated will be recycled on site. If there is no reason to use the fill immediately, the team has a storage facility so that the soil can be used later on in project construction. It is estimated that 100% of the soil will be reutilized on-site.

⁸ The Nature Conservancy. Peru:Lima's Watershed. Last Modified February 11, 2011.
<http://www.nature.org/ourinitiatives/regions/southamerica/peru/placesweprotect/limas-watersheds.xml>

4.4.4 Summary of results, Natural World category:

The project’s performance in the Natural World (NW) category can be improved. Opportunities for improvement can be found in all three subcategories (Siting, Land and Water, Biodiversity). Considering all credits and the maximum possible values for each indicator, the percentage of achievement equates to 11.3%, or 23 points out of 183 maximum achievable points. Below, the project’s performance is assessed by comparing the points the project achieved to the maximum score achievable by credit.

VIAS NUEVAS DE LIMA, LIMA, PERU			PT.	Performance	% Total	max	
35	NATURAL WORLD	SITING	NW1.1 Preserve Prime Habitat	0	No score	0.0%	18
36			NW1.2 Preserve Wetlands and Surface Water	0	No score	0.0%	18
37			NW1.3 Preserve Prime Farmland	0	No score	0.0%	15
38			NW1.4 Avoid Adverse Geology	1	Improved	20.0%	5
39			NW1.5 Preserve Floodplain Functions	0	No score	0.0%	14
40			NW1.6 Avoid Unsuitable Development on Steep Slopes	1	Improved	16.7%	6
41			NW1.7 Preserve Greenfields	10	Conserving	43.5%	23
42	L & W	NW2.1 Manage Stormwater	0	No score	0.0%	21	
43		NW2.2 Reduce Pesticides and Fertilizer Impacts	0	No score	0.0%	9	
44		NW2.3 Prevent Surface and Groundwater Contamination	1	Improved	5.6%	18	
45	BIODIVERSITY	NW3.1 Preserve Species Biodiversity	2	Improved	12.5%	16	
46		NW3.2 Control Invasive Species	0	No score	0.0%	11	
47		NW3.3 Restore Disturbed Soils	8	Conserving	80.0%	10	
48		NW3.4 Maintain Wetland and Surface Water Functions	0	No score	0.0%	19	
NW0.0 Innovate or Exceed Credit Requirements			0	N/A			
NW			23		11.3%	203	

Figure 14: Natural World Summary Table

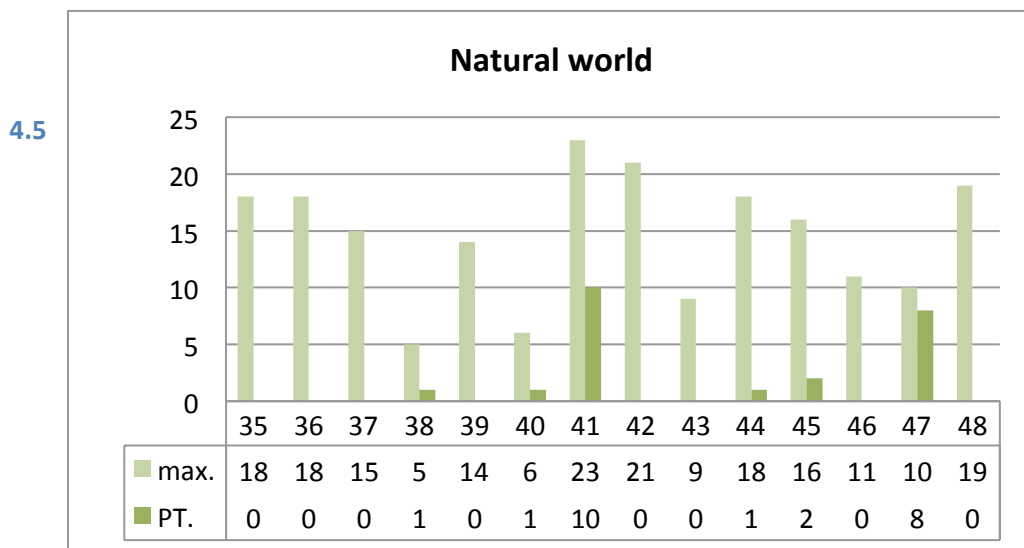


Figure 15: Natural World Performance Assessment Table

4.5 CLIMATE AND RISK

Envision’s Climate and Risk category is divided into two main sub-categories, emissions and resilience. The main goals of the category are to “minimize emissions that may contribute to increased short and long-term risks” and “to ensure infrastructure projects are resilient to short-term hazards or long-term altered future conditions.”⁹ The credits are distributed as: Emissions (CR 1.1, CR 1.2), and Resilience (CR 2.1, CR 2.2, CR 2.3, CR 2.4, CR 2.5).

CREDIT SCORING

			IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE	
49	CLIMATE & RISK	EMISSIONS						
50		CR1.1 Reduce greenhouse gas emissions	4	7	13	18	25	
51		CR1.2 Reduce air pollutant emissions	2	6		12	15	
52	RESILIENCE	CR2.1 Assess climate threat				15		
53		CR2.2 Avoid traps and vulnerabilities	2	6	12	16	20	
54		CR2.3 Prepare for long-term adaptability				16	20	
54		CR2.4 Prepare for short-term hazards	3		10	17	21	
55		CR2.5 Manage heat islands effects	1	2	4	6		
			Maximum points possible:				116	

Figure 16: Climate and Risk credit distribution.

4.5.1 Emissions

The **Emissions subcategory** suffered from a lack of documentation. All the documents submitted were evaluated. Some level of information was supplied in relation to almost all of the credits, but in general there were not enough metrics on which to assess the project.

In this subcategory, both credits were considered No Score (CR 1.1 Reduce Green House Gas Emissions and CR 1.2 Reduce Air Pollutant Emissions).

Although the project team has provided measures to monitor greenhouse gas emissions every six months, they have not provided an industry standard or self-analysis to properly assess their level of achievement. The team has not provided impact analyses and mitigation control methods for particulates and emissions, and no information has been provided on standards to which the project was designed or evidence that the project meets the California Ambient Air Quality Standards (CAAQS). Moreover, there is no reference to the South Coast Air Quality Management (SCAQM) rules.

4.5.2 Resilience

The **Resilience subcategory** also suffered from a lack of documentation. All the documents submitted were evaluated. Some level of information was supplied in relation to almost all of the credits, but again there were not enough metrics on which to assess the project.

In this subcategory, four credits received No Score (CR 1.1 Assess Climate Threat, CR2.2 Avoid Traps and Vulnerabilities, CR2.3 Prepare for Long-Term Adaptability, and CR 2.5 Manage Heat Island Effects), and one credit has been assessed as Improved (CR 2.4 Prepare for Short-Term Hazards).

The team has prepared for short-term hazards by differentiating between man-made and natural or climate-related hazards. Each category of hazards has been awarded a level of impact: mild, moderate,

⁹ Envision Guidance Manual, p.150

severe. By acknowledging their geographical position and distinguishing levels of impact and origin, the team has created an emergency reaction plan that is incorporated as a flowchart within several documents.¹⁰

4.5.3 Summary of results Climate and Risk category.

The project had its lowest level of achievement in the Climate and Risk (CR) category. Opportunities for improvement can be found in both the Emissions and Resilience subcategories. Considering all credits and the maximum points available for each credit, the percentage of achievement equates to 2.5 or 3 points out of 122. Below, the project’s performance is assessed by comparing the points the project achieved to the maximum score achievable by credit.

VIAS NUEVAS DE LIMA, LIMA, PERU			PT.	Performance	% Total	max
49	EMISSION	CR1.1 Reduce Greenhouse Gas Emissions	0	No score	0.0%	25
50		CR1.2 Reduce Air Pollutant Emissions	0	No score	0.0%	15
51	RESILIENCE	CR2.1 Assess Climate Threat	0	No score	0.0%	15
52		CR2.2 Avoid Traps And Vulnerabilities	0	No score	0.0%	20
53		CR2.3 Prepare For Long-Term Adaptability	0	No score	0.0%	20
54		CR2.4 Prepare For Short-Term Hazards	3	Improved	14.3%	21
55		CR2.5 Manage Heat Island Effects	0	No score	0.0%	6
CR0.0 Innovate Or Exceed Credit Requirements			0	N/A		
CR			3		2.5%	122

Figure 17: Climate Summary Table

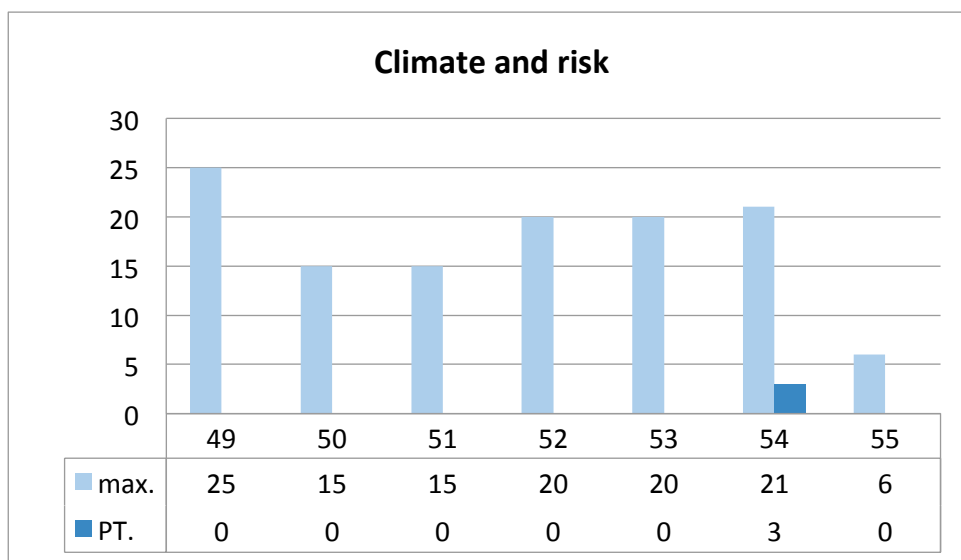


Figure 18: Climate Performance Assessment Table

¹⁰ Anonymous. 2013. “Flujograma de Acción para Situaciones climáticas Adversas”, “Flujograma de Acción para Deslizamiento de material”. Pages 1.

5. RESULTS AND CONCLUSION

The evaluation of the Vías Nuevas de Lima concession has evidenced that private investment can positively impact sustainable development and education of a region. The project is built by a public-private agreement and will reap a projected revenue of US \$21.76 million in 2013. That will escalate to US \$224.93 million in 2041.¹¹ This amount represents a 12.4% anticipated return on investment.¹² The main impact of the project will be the creation of healthier and sustainable environment for the neighborhoods and safer connections to the Lima Central District. This evaluation has pointed out which categories of analysis provide great opportunities for improvement.

The **Quality of Life category** represents the third best performance of the Vías Nuevas de Lima in the five categories of *Envision's* rating system. The project achieved a total of 37 points out of a maximum total of 181 or 20.4% of the points. The project will improve quality of life by establishing educational workshops for the employees and community at large and by promoting the creation of economically and environmentally sustainable businesses. This initiative will be a task that the project team is realizing with the help of some social studies realized by the non-profit social action consulting firm Gestionarse.

The project impacts mobility and connection by the creation of neighborhood hubs that allow streamlined pedestrian, private, and public transportation integration. Pedestrian bridges and landscapes have been designed to create a more hospitable environment for the non-vehicular traffic. Stops and stations have been constructed to allow easy access to public transport. Overall, the project shortens traffic times and congestion for all modes of transportation through the safer and efficiently operated Vías Nuevas.

The Vías Nuevas de Lima project's best performance was in the **Leadership category** of *Envision's* rating system. The project achieved 72 points out of the 121 total maximum, or 59.5% of the points. This project has deployed sustainability tactics to inform the design, construction, and management processes.

To ensure that sustainable goals are achieved, the project team has created a sustainability management team. This group is responsible of approving design and construction processes as well as the selection of suppliers and sub-contractors. The tasks involved in the responsibilities of this group ensure that sustainability is not only practiced in the chain of interactions that make up the design, construction, and operation phases but also in the office management and outside participators.

The project has its second best performance in the **Resource Allocation category** of the *Envision's* rating system. It achieved a total of 41 points out of a 182 maximum total, or 22.5% of the points. The project team has established clear procedures that will ensure that the natural resources extracted from the site are replenished. It has also delineated processes for retrofitting existing structures and inserting waste products into the cycle stream to be reutilized.

The project's engineering team has calculated maximum performance cuts and fills to ensure that excess soil is not extracted and that no water sources are polluted with particles. This soil will

¹¹ Martorelli et al., 99

¹² Martorelli et al., 124

immediately be used on-site. If there is any surplus soil material, it will be relocated to a soil storage facility to be utilized elsewhere on the site. The goal is to reuse 100% of the excavated soil on-site.

The project team has limited the impact of the project on the waste stream of the region by employing diverse tactics that will recycle waste generated on-site or reutilize existing structures. First, it has established a strong recycling program that will manage all of the site waste. For organic products there is a separate compost program. All non-recyclables will be diverted from regional or municipal waste management facilities. Protocols have been created to handle risky, non-risky and chemical wastes to safeguard the health and safety of employees and community.

One of the categories that has great potential for improvement is the **Natural World category** of the *Envision's* rating system. In this category the project achieved 23 points of the 203 maximum total, or 11.3%. The areas where the project best performed was at preserving green fields and restoring disturbed soils.

As mentioned earlier, the team devised a solid recycling plan that includes reutilizing, operating, and maintaining 100% of existing grey fields. Of the 115 km approximate project's length, only around 19 km are made of new construction. The toll station in this project will be remodeled, instead of demolished. The material to be discarded will be recycled following the protocols described in the Resource Allocation category. The project team has documented a strategy to limit the disturbance of ground and soil resources. Any extraction will be restored on-location or elsewhere on site to their natural state.

In the **Climate and risk Category** of the *Envision's* rating system the project achieved 3 points of the 122 maximum total, or 2.5% of the points. The project team has clearly identified the immediate climate and natural hazards and has delineated man-made hazards as well.

The project team has created a categorization of both natural, including geographic, and man-made hazards. They have keyed these categories as low, moderate, and high risk. Once the risk is assessed, the risk and damage can be catalogued as reversible or not reversible. Accompanying these tables of risks is a flowchart of actions to take in case of emergency or adverse climate conditions. Both documents as whole serve to safeguard employees and community of different case scenarios involving climate and man-made hazards. The assessment and monitoring of climatic threats and long-term adaptability of the project related with climate change are opportunities for improvement in this category.

The graphs below demonstrate the project's performance under the three Infrastructure 360^o Awards. The **People and Leadership Award** (figure 19) represents the QL and LD categories from the *Envision™* Rating System. The project received a score of 109 points out of a total of 302 combined points within these categories, which equates to a 36.1% level of achievement. The **Climate and Environment Award** (figure 20) represents the RA, NW and CR categories within the *Envision™* Rating System. The project received a score of 67 points out of a total of 507 combined points within these categories, which equates to a 13.2% level of achievement. Thus, the overall achievement of the Vías Nuevas de Lima project under the **Infrastructure 360 Award** (figure 21) is 176 out of 809 points, or 21.8% of the total score.

This report evaluates the sustainability performance of the Vías Nuevas de Lima project according to the *Envision™* Rating System. The report identifies areas in which the project scored highly, as well as low-

scoring areas that represent opportunities for which the project team can learn and improve on in future projects, as they strive to achieve sustainable project design and construction methodologies.

350 People and Leadership

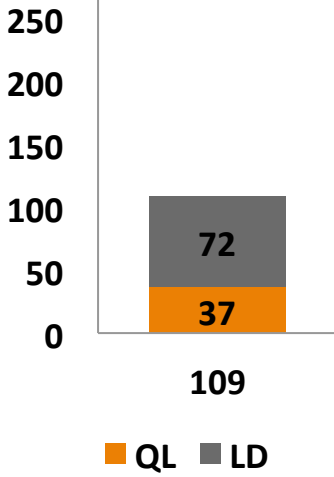


Figure 19: People and Leadership.

Score distribution



350 Climate and Environment

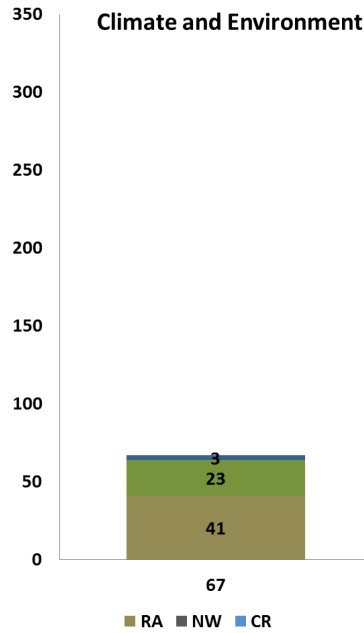


Figure 20: Climate and Environmental.

Score distribution



350 Infrastructure 360

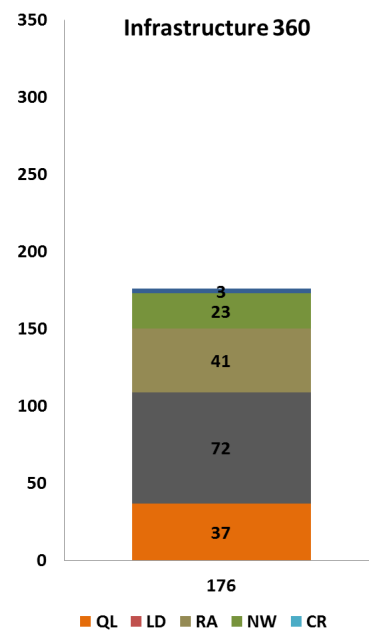


Figure 21: Infrastructure 360.

Score distribution



APPENDIX A: PROJECT PICTURES AND DRAWINGS



Figure 22: View of rotunda and overpass.
Sources: Vías Nuevas de Lima



Figure 23: View of rotunda and overpass.
Sources: Vías Nuevas de Lima



Figure 24: View of Pedestrian Bridge
Sources: Vías Nuevas de Lima



Figure 25: View of Pedestrian Bridge
Sources: Vías Nuevas de Lima



Figure 26: View of new bus stop layouts
Sources: Vías Nuevas de Lima



Figure 27: View of new bus stop
Sources: Vías Nuevas de Lima



Figure 28 : View of Pedestrian Bridge
Sources: Vias Nuevas de Lima



Figure 28 : View of Pedestrian Bridge
Sources: Vias Nuevas de Lima



Figure 30 : View from Pedestrian Bridge
Sources: Vias Nuevas de Lima

Highway Vías Nuevas de Lima, Peru



Figure 31: View of highway underpass
Sources: Vias Nuevas de Lima

APPENDIX B :ENVISION POINTS TABLE

CREDIT SCORING

			IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE	
1	QUALITY OF LIFE	PURPOSE	QL1.1 Improve community quality of life	2	5	10	20	25
2			QL1.2 Stimulate sustainable growth and development	1	2	5	13	16
3			QL1.3 Develop local skills and capabilities	1	2	5	12	15
4		COMMUNITY	QL2.1 Enhance public health and safety	2			16	
5			QL2.2 Minimize noise and vibration	1			8	11
6			QL2.3 Minimize light pollution	1	2	4	8	11
7			QL2.4 Improve community mobility and access	1	4	7	14	
8			QL2.5 Encourage alternative modes of transportation	1	3	6	12	15
9			QL2.6 Improve site accessibility, safety and wayfinding		3	6	12	15
10		WELLBEING	QL3.1 Preserve historic and cultural resources	1		7	13	16
11			QL3.2 Preserve views and local character	1	3	6	11	14
12			QL3.3 Enhance public space	1	3	6	11	13
							Maximum points possible:	181
13	LEADERSHIP	COLLABORATION	LD1.1 Provide effective leadership and commitment	2	4	9	17	
14			LD1.2 Establish a sustainability management system	1	4	7	14	
15			LD1.3 Foster collaboration and teamwork	1	4	8	15	
16			LD1.4 Provide for stakeholder involvement	1	5	9	14	
17		MANAGEMENT	LD2.1 Pursue by-product synergy opportunities	1	3	6	12	15
18			LD2.2 Improve infrastructure integration	1	3	7	13	16
19			LD3.1 Plan for long-term monitoring and maintenance	1	3		10	
20		PLANNING	LD3.2 Address conflicting regulations and policies	1	2	4	8	
21			LD3.3 Extend useful life	1	3	6	12	
							Maximum points possible:	121
22	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce net embodied energy	2	6	12	18	
23			RA1.2 Support sustainable procurement practices	2	3	6	9	
24			RA1.3 Use recycled materials	2	5	11	14	
25			RA1.4 Use regional materials	3	6	9	10	
26			RA1.5 Divert waste from landfills	3	6	8	11	
27			RA1.6 Reduce excavated materials taken off site	2	4	5	6	
28			RA1.7 Provide for deconstruction and recycling	1	4	8	12	
29		ENERGY	RA2.1 Reduce energy consumption	3	7	12	18	
30			RA2.2 Use renewable energy	4	6	13	16	20
31			RA2.3 Commission and monitor energy systems		3		11	
32		WATER	RA3.1 Protect fresh water availability	2	4	9	17	21
33			RA3.2 Reduce potable water consumption	4	9	13	17	21
34			RA3.3 Monitor water systems	1	3	6	11	
							Maximum points possible:	182
35	NATURAL WORLD	SITING	NW1.1 Preserve prime habitat			9	14	18
36			NW1.2 Protect wetlands and surface water	1	4	9	14	18
37			NW1.3 Preserve prime farmland			6	12	15
38			NW1.4 Avoid adverse geology	1	2	3	5	
39			NW1.5 Preserve floodplain functions	2	5	8	14	
40			NW1.6 Avoid unsuitable development on steep slopes	1		4	6	
41			NW1.7 Preserve greenfields	3	6	10	15	23
42		LAND & WATER	NW2.1 Manage stormwater		4	9	17	21
43			NW2.2 Reduce pesticide and fertilizer impacts	1	2	5	9	
44			NW2.3 Prevent surface and groundwater contamination	1	4	9	14	18
45		BIODIVERSITY	NW3.1 Preserve species biodiversity	2			13	16
46			NW3.2 Control invasive species			5	9	11
47			NW3.3 Restore disturbed soils				8	10
48			NW3.4 Maintain wetland and surface water functions	3	6	9	15	19
							Maximum points possible:	203
49	CLIMATE & RISK	EMISSIONS	CR1.1 Reduce greenhouse gas emissions	4	7	13	18	25
50			CR1.2 Reduce air pollutant emissions	2	6		12	15
51			CR2.1 Assess climate threat				15	
52		RESILIENCE	CR2.2 Avoid traps and vulnerabilities	2	6	12	16	20
53			CR2.3 Prepare for long-term adaptability				16	20
54			CR2.4 Prepare for short-term hazards	3		10	17	21
55	CR2.5 Manage heat islands effects	1	2	4	6			
							Maximum points possible:	116

*The five innovation credits are bonus points and not included in total point tallies

803

APPENDIX C: CREDIT DETAILS

CATEGORY I, PEOPLE AND LEADERSHIP (PL)			
SUB CATEGORY: QUALITY OF LIFE			
	VIAS NUEVAS DE LIMA, LIMA, PERU		RECOMMENDATIONS
<p>PL1.1 Improve Community Quality of Life</p>	<p>0</p>	<p>No score</p>	<p>Provide lists and examples of documents obtained and received, minutes of meetings with key stakeholders, community leaders and decision makers, letters, and memoranda. This information should demonstrate comparisons between the project’s vision and goals and the needs, goals, plans, and issues of the community.</p> <p>Another more detailed level of information that can be provided are the minutes of meetings, letters, and memoranda involving key stakeholders, community leaders and decision makers, where the main purpose was to gain input and reach consensus regarding the impact assessment and planned actions of the project. A comprehensive impact analysis in which positive and negative impacts are identified and evaluated should also be provided.</p> <p>If the previous level of information is available, the next step would be to provide reports and documents of meeting results, design charrettes, and other activities conducted with representatives of the affected communities. There should be evidence of the processes for collecting, evaluating and incorporating community input into the project design. The project team should demonstrate the thoroughness such evaluation and incorporation into the design.</p> <p>If the above criteria are met, the team should provide acknowledgement and endorsements by the community that the design participation process was helpful and that their input was appropriately assessed and incorporated into the project, as well as evidence of community satisfaction.</p>
		<p>The project team has identified and prioritized community, commercial, and governmental organizations to which it has aligned its goals. The team has created bubble diagrams with connections to portray the community linkages. They convey both the strength of the linkage and the level of influence each group has on the project. However, the team has not provided sufficient information to support the nature of these interactions, or the metrics used to differentiate one level of influence from another, this credit is considered to be No score.</p>	
		<p><u>Source</u></p>	

<p>PL1.2 Stimulate Sustainable Growth & Development</p>	<p>1</p>	<p>Improved</p>	<p>Initially, the project team should be able to offer an analysis of the jobs that will be created in/out of the contracts for the design portion of the project. Once this is done, the team should provide reports showing how the delivered work expands the capacity or increases the quality of operating, recreational, or cultural capacity. The results should be verified against the references to official community plans, goals, needs assessments, minutes of meetings, or letters from community leaders and decision makers. This verification process should be provided in a detailed checklist manner. This verification should be able to render analyses on how the delivered work has affected local productivity, for example: Reduced traffic congestion, improved pedestrian traffic, lower operation costs, increased operating capacity, increased efficiency, and operating alternatives.</p>
		<p>The project team has failed to provide metrics and analyses on how the project will impact economic growth and development through a sustained method. For this reason they have not achieved a higher score. However, the project team has an elaborate social and economic program outline. Some measures that directly affect this credit are:</p> <ol style="list-style-type: none"> 1. Generate job opportunities through or without contracts: give priority to regional residents for job openings within Rutas de Lima and its service and material providers. 2. Productive Insertion: the project’s social programs should be able to create or foster businesses that will generate new jobs that will be self-sustaining and outlive the construction projects and that are not dependant on contracts with Rutas de Lima. 3. Adoption of sustainable practices: respect and prioritize local culture, skills, and construction. The productive insertion initiatives will be required to be compliant with these practice, in that functions and operations have to ensure that no harm will be caused to the environment or natural resources. 	<p>Another level of information that could be included is:</p> <ol style="list-style-type: none"> 1. reports or documents that show how the project improves community attractiveness for compatible businesses and industries, improves recreational opportunities, and generally improves socio-economic conditions in the community. 2. Evidence showing how the project will improve the overall business environment, for example: increases in productivity, improved access to facilities and infrastructure, increased use of alternative resources, facilities and infrastructure. 3. Evidence of new employment opportunities that will be created and will expand the skill base of the citizens. 4. Analyses showing how the project will improve community prospects for sustainable economic growth and development. 5. Evidence of efforts by the project team to work with the community in identifying community infrastructure assets, needs for improvement, prospects and plans for growth and development.
		<p><u>Source:</u> Anonymous. 2012. Directriz de programas Sociales. (anon., 2-3)</p>	

<p>PL1.3 Develop Local Skills and Capabilities</p>	<p>1</p>	<p>Improved</p> <p>The project team has clearly identified a strategy to develop the local skills and capabilities of adjacent communities. Their aim is to integrate education and mobilization to increase productivity levels within the environment of Lima. The project leads local communities towards creation of new job opportunities and increased participation. Another chosen strategy is ‘productive insertions’, community enhancement by means of education. The project promotes education with a focus on professional skills and productivity, generates new self-sustainable businesses and enhances community competitiveness. These new skills can then be transferred from the community into the region along the highway infrastructure. The credit analysis team has inferred that the project has a restorative goal within the community; however, the lack of documentation and evidence of this renders this credit Improved.</p> <p><u>Source:</u> Anonymous. 2013. Directriz de programas Sociales. (anon., 3-5)</p>	<p>Provide explanations and examples of how the project team identified community employment, training, and worker needs, including documentation of plans and commitments for hiring local workers, and including people from disadvantaged groups. Documentation of the extent and skill-level of work planned for local firms and the skill mix of local project hires in relation to overall project hires should be made available. Finally, a statement of the ratio of proposed local hires to overall hires should be provided.</p>
<p>PL2.1 Enhance Public Health And Safety</p>	<p>16</p>	<p>Improved</p> <p>The project clearly delineates man-made hazards during the construction and operation phases and catalogs them according to their risk magnitude and impact intensity. Tables 6-1 and 6-2 explain the characterizations; Table 6-4 lists the man-made hazards according to degree of magnitude/intensity related to the design, operation, and maintenance phases.</p> <p>The team has also prepared a manual on how to prevent environmental and work-related emergencies and distributed it to management and contractors. The manual outlines procedures for arranging and organizing safety barriers during work on the highway, procedures to prevent environmental and work-related hazards, and forms to be filled out when handling non-risk/risky materials, wastes, and liquids. In the case of an emergency, flowcharts have been distributed to the corresponding work teams showing an established action plan that includes important contacts and steps to follow.</p> <p>The team has also ensured public safety by distributing pamphlets and brochures both in hard copy and via the internet to the neighboring communities. These pamphlets detail the significance of safety signage and procedures during road work and inform them of what to do if they need assistance while on the road.</p> <p><u>Source:</u> Rojas, Sadith. 2012. Procedimientos de Gestión: Analisis Preventivo de Tareas. Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Sur.</p>	<p>Provide evidence of approval and sign-off by the appropriate public health and safety officials.</p>

<p>PL2.2 Minimize Noise And Vibration</p>	<p>0</p>	<p>No score</p> <p>The project team has not provided sufficient information regarding baseline studies of existing noise and vibration. For this reason, this credit is considered to be not-achieving.</p> <p><u>Source</u></p>	<p>Provide noise and vibration studies and field monitoring by individuals with acceptable credentials and qualifications that provide adequate baseline information and predictions of ambient noise and vibration levels during construction and operation. These baseline measures should be accompanied by submitted proposals for ambient noise and vibration mitigation and monitoring. Common best practices are not acceptable to satisfy this credit's requirements. Instead, comprehensive proposals that show information of coverage, detail and the dissemination of requirements to construction contractors should be provided. Analyses and documentation of estimates of ambient noise and vibration levels and efforts to reduce them to meet the community's needs and goals for livability will be considered for higher credit.</p>
<p>PL2.3 Minimize Light Pollution</p>	<p>0</p>	<p>No score</p> <p>No information has been provided regarding how the project minimizes the impact of light pollution on its surroundings compared to the industry standard. For this reason, this credit is considered to be No score.</p> <p><u>Source</u></p>	<p>Provide documentation on lighting assessments conducted for the project and the development and design of light zone levels according to appropriate needs of the project. Also, demonstrate that signage for the constructed work will meet the following standards for digital signs, digital billboards, electronic message boards or displays, electronic messages centers, marquees and other digital/electronic display systems: at all times there shall be no display such as twirls, swirls, blinking, videoclips or any other form of animation. Sign copies cannot change more than once per hour. During daylight times, during sunrise and sunset, luminance shall not be more than 2000 candelas per square meter. During all other times, before sunrise and after sunset, luminance shall not exceed 250 candelas per square meter.</p> <p>Plans, drawings, and specifications that show the use of energy-efficient lighting, removal of existing but unneeded lighting, use of automatic turnoff systems, and application of non-lighting alternatives will be necessary for higher credit analysis. In addition, plans, drawings, and specifications should show reductions in lighting intensity and the use of: high trees and shrubs Full cut-off lenses</p>

<p>QL2.4 Improve Community Mobility And Access</p>	<p>7</p>	<p>Superior</p> <p>The project team made many design decisions based on the mobility and access needs of nearby communities. The project team modeled data and evaluated several design alternatives for the highway and interchanges using information on 2009 traffic flows. As the project images show, many designs were made to improve pedestrian mobility and access to public transportation on both sides of the highway. These measures are considered restorative as they bridge communication and access between communities that had previously been isolated from each other, and seek to make access and commute times between Lima and important production centers more agile. However, there is a lack of documentation regarding communication and input from key stakeholders that prevents the credit from achieving a higher score.</p> <p><u>Source:</u> Martorelli, Eleuberto Antonio, and Guilherme Borges de Queiroz. 2010. Proyecto Vias Nuevas de Lima. (Martorelli et al, 0059-0099)</p>	<p>Provide complete studies and reports addressing the effects of the project on access and mobility. These studies should show the extent to which the project improves community transportation efficiency, walkability, and livability.</p> <p>Reports, memoranda, and minutes of meetings with managers, operators, and community leaders that discuss access to adjacent facilities, amenities, and transportation should be provided. Records of decisions made based on these meetings should be documented as well. These decisions should directly translate into specifications of requirements for the contractors and should contemplate alternative construction methods. Most importantly, information about the existence and comprehensiveness of programs within the affected communities should be submitted as well.</p>
<p>QL2.5 Encourage Alternative Modes of Transportation</p>	<p>0</p>	<p>No score</p> <p>The goal of the project is to construct, operate, and maintain a highway with transportation elements that ease the access of a higher volume of private vehicles to Lima. Although it improves walkability through the construction of pedestrian bridges, no metrics have been provided on projected increased use of alternative modes of transportation or initiatives taken to encourage their use. Moreover, no data regarding the projected volume of use of the bridges has been provided.</p> <p><u>Source</u></p>	<p>Document the extent of convenience that the pedestrian bridges offer to the communities, for example, distance and time to bridges and multimodal facilities. If parking is provided near or around the project, the location should be depicted; parking around the toll plazas and under highway passes is highly desirable. These parking areas should be proportional to the need and shall not exceed it as promoting the use of automobiles rather than alternative methods is not desirable. Design documents for bus stops, tram stops, and other shelters for alternative transportation methods should be provided. Before and after projections will be very helpful in understanding where topography and natural elements enrich the design. If any alternate transportation infrastructure is revitalized as part of this project, the design drawings should be provided for such. In addition, all the plans and construction drawings, including renderings, of community oriented planning and design, should be submitted.</p>
<p>QL2.6 Improve Site Accessibility, Safety & Wayfinding</p>	<p>12</p>	<p>Conserving</p> <p>Building upon credit 2.1, the team has implemented a clear system to prevent and handle emergencies. They have created documentation that is addressed to different education levels and is clear enough for each group. As far as community outreach programs are concerned, they have distributed electronic and physical brochures that incorporate icons, symbols and cartoons so that the general public can understand the safety signage. These brochures also inform the public of the highway protection plan in case they have an accident or emergency within the highway. Thus, the team has been successful at developing and implementing a public safety plan and at making it accessible to every sector of the socioeconomic spectrum of Lima.</p> <p><u>Source:</u> Anonymous. Esquemas de Señalización y</p>	<p>Provide evidence of how the project promotes substantial restoration of safety and access to adjacent neighborhoods by providing design documents and other illustrative materials. Also, provide design documents that show how the project integrates with the local community, environmental and cultural resources.</p>

		Operación.2013	
QL3.1 Preserve Historic And Cultural Resources	0	No score	<p>Provide reports, memoranda, and minutes of meetings with the community and required regulatory and resource agencies to identify historic and cultural resources. These inputs should translate into a feasibility analysis that documents how conflicts with community efforts to consolidate and reduce the cost of maintaining excess infrastructure have been addressed.</p> <p>Location and design drawings that demonstrate that the site avoids impacts to cultural resources, or makes efforts to mitigate negative impacts, should be provided. Drawings and plans of mitigation efforts included in the design should be provided as well. If the project positively affects any resources, documentation of such efforts to enhance or restore existing historic and cultural resources should be provided. Also, any evidence that the project construction was done in collaboration with historic or cultural preservationists to ensure minimal damage to the quality of existing historic/cultural resources should be presented.</p>
		The project team has not provided information on programs or initiatives to preserve historic and cultural resources. For this reason, the credit is considered to be No score.	
		<u>Source</u>	
QL3.2 Preserve Views And Local Character	0	No score	<p>Provide plans, drawings, and reports identifying important elements of the site including geographical formations, views, natural landscape, features, materials, planting, style/detailing, and landscape/village patterns. Documents of design decisions based on these criteria should prove responsiveness to existing policies and regulations regarding public views. The policies and regulations should also be made available.</p> <p>All landscape features and views to be protected should be inventoried and a plan for addressing public views should be incorporated into the project design. The plan should include: identification and location of the areas to be protected, identification of compatible land uses, development standards and establishment of policies for inappropriate development and land use. These should all translate into design guidelines written specifically for the project to preserve public views, important natural landscape features and local character traits. Provide reports, memoranda, or meeting minutes that show involvement of decision-makers and local officials in the development of the design. Also, evidence of programs for monitoring and enforcing protective measures should be provided, including a schedule of penalties for acts of non-compliance with the programs.</p>
		The project team has not provided any information on programs or initiatives to preserve views and local character. For this reason, the credit is considered to be No score.	
		<u>Source</u>	

QL3.3 Enhance Public Space	0	No score	Provide the following information: 1. Studies and assessments of the impact the project has on existing public space. 2. Design documents describing any new public space developed as part of the project. 3. Determination of benefits, improvements, and negative impacts. 4. Determination of risks to public health and safety. 5. Evidence that the above documents were accepted by the appropriate public agencies. 6. Evidence of stakeholder satisfaction 7. Plans and drawings showing the scope and extent of any restoration efforts to be made on the public space.
		The project team has not submitted any design documents or information on how the project enhances public spaces. For this reason, the credit is considered to be No score.	
		<u>Source</u>	
QL0.0 Innovate Or Exceed Credit Requirements	0	N/A	
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SUB CATEGORY: LEADERSHIP			
	VIAS NUEVAS DE LIMA, LIMA, PERU		RECOMMENDATIONS
LD1.1 Provide Effective Leadership And Commitment	17	Conserving	When the sustainability reports become available, compare them against past or projected reports to reveal important measures that can improve sustainable performance.
		The project team has set forth both a clear sustainability policy as well as sustainability manuals and procedures for environmental and administrative work spaces. The team has created a robust system of procedures that integrate elements of sustainability, management, and social life. For a deeper understanding and detailed explanations of the principles, refer to the Directriz de medio ambiente, Directriz de Cambios Climaticos, Directriz de Programas Sociales, Directriz de Salud, and Directriz de Seguridad documents. Each document is divided into two phases and offers initiatives or actions to be taken during these phases. The two phases that the project team has identified are: Design and Planning, and Construction and Operation. In addition, the project is providing “Seguridad y Salud en el Trabajo y Medio Ambiente” (SSTMA) education, and clear and precise procedures for attending to climate change related disasters. The project ensures that management, employees, and residents are not only transitioning to a sustainable lifestyle but can respond and restore order and functionality in different scenarios.	
		<u>Source:</u> Pereira Raul. 2013. “Politica Integrada de Sostenibilidad.” Anonymous. 2013. “Directriz de medio ambiente” Anonymous. 2013. “Directriz de Cambios Climaticos”	

		<p>Anonymous. 2013. "Directriz de Programas Sociales" Anonymous. 2013. "Directriz de Salud" Anonymous. 2013. "Directriz de Seguridad" INDECOPI.2005. "NTP 900.058.2005 Gestión Ambiental."</p>	
<p>LD1.2 Establish A Sustainability Management System</p>	<p>14</p>	<p>Conserving</p> <p>Section 5 and Section 6 of the referenced document delineate the roles, procedures and authority of each team. The procedures are different for contractors, sub-contractors, and providers. The document's annex details further information and requirements for safety, environment, health, and mechanical components of the project. The "Política de Sostenibilidad" defines the goals, objectives, and scope for sustainability in both management and operation.</p> <p>The Gestión de Proveedores document also explains the different business scale and management processes that will take place at different stages to ensure that SSTMA standards are met. For a diagram that represents how these processes will flow at each scale, refer to Section 2, Page 7, of the Política sobre Sostenibilidad.</p> <p><u>Source:</u> Rojas, Sadith. 2013. "Gestion de Proveedores." Lima. Marcelo Bahia Odebrecht. 2013. "Política sobre Sostenibilidad." Lima.</p>	<p>Provide evidence that there is contingency for addressing potential changes in averages, variances, and plausible extremes in key design variables.</p>
		<p>Superior</p> <p>The project owner and project team recognize the importance of working together to achieve high levels of sustainable performance. The processes and responsibilities outlined in Sections 5 and 6 of the Gestion de Proveedores demonstrate an understanding that communication between all components of ownership, management, and supervision is necessary to achieving overall sustainability. These processes are also non-linear, and all teams collaborate to the extent needed. The process of interviewing, understanding and incorporating the needs of local people into the project, including residents who walk the highways, bus/truck/taxi drivers, and private drivers, is iterative.</p> <p><u>Source:</u> Rojas, Sadith. 2013. "Gestion de Proveedores." Lima. Marcelo Bahia Odebrecht. 2013. "Política sobre Sostenibilidad." Lima. Gestionarse. 2013. Estudio de usuarios de las vías Panamericana Norte y Sur, Informe Final. Lima.</p>	
		<p>8</p>	
<p>LD1.3 Foster Collaboration And Teamwork</p>	<p>8</p>	<p>Improved</p> <p>Various social programs have been created through the work from organizations such as Gestionarse, hired to carry out social studies for the project. Gestionarse is a civil association that works toward the betterment of Lima and Peru. This organization has benefited the project through the creation of a detailed map that shows the location, influence, and importance of various stakeholders. The organization also took on the important role of interviewing people from different sectors - drivers, operators, pedestrians - and creating a stakeholder analysis that is published as part of a stakeholder profiling study. The creation of focus groups where stakeholders can provide input and discuss matters</p>	<p>Incorporate terminology about risk and reward sharing into project contracts and other official documents. Provide evidence of the extent to which the sharing of risk/reward is important to the owner, and how much of it the owner is willing to share.</p>
<p>LD1.4 Provide For Stakeholder Involvement</p>	<p>9</p>	<p>Provide evidence of planned or implemented stakeholder involvement programs as well as results of the input of stakeholders on modifications to the project design.</p>	

		<p>with the project team has enabled the team to come up with solutions to problems that affect each group. Refer to the figures on pages 34-35 of the Estudio de Usuarios de las Vías Panamericana Norte y Sur to see the input that was provided and analyzed (34) and the recommendations (35). This document also includes stakeholder input in the form of interview descriptions and follow-up forms.</p> <p><u>Source:</u> Gestionarse. 2013. Estudio de usuarios de las vías Panamericana Norte y Sur, Informe Final. Lima. Gestionarse. 2013. Mapeo de Actores RDL, Informe Final. Lima</p>	
LD2.1 Pursue By-Product Synergy Opportunities	0	<p>No score</p> <p>Although the project team has a strategy for recycling and reducing waste, it has not provided enough information regarding the use of unwanted byproducts or discarded materials and resources from nearby facilities.</p> <p><u>Source</u></p>	<p>Provide evidence of at least initial research into nearby byproducts, records of contacts and inquiries made to nearby facilities, and comparisons of these to the total number of potential opportunities. Also, identify the scope of the assessment process and records of any byproduct synergy opportunities identified, assessed, and pursued.</p> <p>An even higher level of achievement would include evidence of successful byproduct synergy opportunities captured and applied.</p>
LD2.2 Improve Infrastructure Integration	13	<p>Conserving</p> <p>The nature of the concession for the project is to enhance infrastructure connectivity and efficiency. As such, the project design includes several interchange schemes that seek to improve and streamline connections between community infrastructure and the existing highway segments. Refer to the Ingeniería Preliminar del Proyecto of the project document Proyecto Vías Nuevas de Lima for all the preliminary plan diagrams and Planos de implantación general for the aerial photographs of the neighborhoods with superimposed plans.</p> <p>The project benefits and includes local communities through the creation and promotion of new job opportunities and increased participation. The strategy utilized is known as ‘productive insertions’, whereby communities are enhanced by means of education. The project promotes education with a focus on professional skills and productivity that generates new self-sustainable businesses and enhances community competitiveness. This and other measures for community involvement can be found in the Directriz de Programas Sociales.</p> <p><u>Source:</u> Martorelli, Eleuberto Antonio, and Guilherme Borges de Queiroz. 2010. Proyecto Vías Nuevas de Lima. (Martorelli et al, 042-087 and 0391-0501) Anonymous. 2013. “Directriz de Programas Sociales”</p>	<p>Provide Clearer drawings of the connections, perhaps in color, and diagrams showing the relations.</p>
LD3.1 Plan For Long-Term Monitoring & Maintenance	10	<p>Conserving</p> <p>The project is based on operating and maintaining the highways of Lima, Peru. Thus detailed plans for monitoring and Maintenance are put in place that identifies possible services to be provided, the level and type of the repairs to be done, and the limit of days for each repair type. Monitoring stations are also mentioned, however there is no monitoring of runoff waters, sound or</p>	<p>Create a more detailed resource allocation plan where designations of the persons or organizations assigned to monitor and maintain the constructed works are evident. Explain with this designation how funding will be allocated, set aside and maintained at sufficient levels to fund necessary monitoring and maintenance. Although it is</p>

		<p>light pollution. The personnel and resources allocated for each of the jobs including a clear authority line and For more detailed information on the responsibilities each of the teams and team managers has. Refer to the “Operación y Mantenimiento” section of the project document “Vías Nuevas de Lima” for a detailed operation, monitoring and maintenance Narrative. Refer to “Plan de acción en situaciones de emergencias operativas” for a detailed map of operation responsibilities and contacts.</p> <p><u>Source:</u> Cesar Velarde. 2013. Plan de Acción en Situaciones de Emergencias Operativas. Lima.//Martorelli, Eleuberto Antonio, and Guilherme Borges de Queiroz. 2010. Proyecto Vías Nuevas de Lima. (Martorelli et al, 088-097) Rojas, Sadith. 2013. “Gestion de Proveedores.”Lima. (Rojas, 3-5)</p>	<p>clear that funding will be available for service and maintenance after the delivery of the project, make sure that there is a narrative that incorporates the three elements of this credit.</p>
LD3.2 Address Conflicting Regulations & Policies	1	<p>Improved</p> <p>The project team has supplied the regulations and policies with which they are required to abide. In the project documents, each law affecting the particular elements of the project is described in a first preamble, in a legal framework, or in a general statement. However, there is no evidence that the project team has worked with city/state officials regarding any conflicts between regulations.</p> <p><u>Source:</u> Humalo Tasso, Ollanta. 2012. “Ley 29783 - DS 005-2012-TR.” Lima.// INDECOPI.2005. “NTP 900.058.2005 Gestión Ambiental.”// Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Sur.//(Annon, 2-4) Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Norte.//(Annon, 2-4)</p>	<p>Provide documentation of any applicable laws, standards, regulations or policies that conflict with the goals and objectives of the project. Provide evidence of efforts taken to identify them and to assess their impact on the project’s sustainability performance. Provide memoranda, letters, and minutes of meetings with regulatory agencies to identify and resolve issues, and the results achieved by these efforts.</p>
		<p>No score</p> <p>The project team has not provided sufficient information on how the design and operation of the highway promote a more durable, flexible, and resilient project. The concession will last for 30 years, but other than contracts and maintenance/operation plans, there is no clear documentation of elements and designs that extend the useful life of the project. For this reason, this credit is considered to be No score.</p> <p><u>Sources:</u></p>	
LD3.3 Extend Useful Life	0	<p>Provide documentation of any elements intended to add durability, flexibility, and resilience throughout the useful life of the project that were incorporated into the design, and submit specifications of durable materials to show how they improve upon industry norms. Provide documentation on how the implementation of such elements was incorporated into construction contracts and operation and maintenance procedures.</p> <p>Another level of information that could be provided includes diagrams, plans and other documentation that shows that the project design allows for expansion, reconfiguration, or multiple uses. Submit any feasibility studies conducted to identify key areas for investment in extending the useful life of the project with a reasonable payback period.</p>	
LD0.0 Innovate Or Exceed Credit Requirements	0	N/A	
72			

CATEGORY II: CLIMATE AND ENVIRONMENT (CE)		
RESOURCE ALLOCATION		
	VIAS NUEVAS DE LIMA, LIMA, PERU	RECOMMENDATIONS
RA1.1 Reduce Net Embodied Energy	0	<p>No score</p> <p>There is no available information regarding any calculation or reduction in the net embodied energy of the materials. For this reason, the credit is considered to be non-achieving.</p>
		<p><u>Source:</u></p> <p>Provide Documentation on the results of the life cycle energy assessment. Provide evidence that this assessment was realized in accordance to recognized and accepted methodologies, data sources, and software. Also, provide a report on the selection of the life cycle energy assessment model used and/or databases referenced. This should include a narrative describing how strategies to reduce net embodied energy will not increase operational or maintenance energy of the project and will not shorten the lifespan of the project. Because of the relative newness of this assessment and the scarcity of information covering embodied energy, the scope of this objective is limited to the materials used in significant quantities and make the majority portion of the constructed works.</p> <p>Another level of information required would be design documents for elements that will reduce the net embodied energy of the project and the rationale of why they were chosen. In addition, calculations showing the overall reduction of net embodied energy over industry norms.</p>

<p>A1.2 Support Sustainable Procurement Practices</p>	<p>2</p>	<p>Improved</p> <p>The project team has defined a sound and viable sustainable procurement program. They have drafted guidelines for the Manager of Sustainability and Recommended Practices (RP) for Safety in the workplace and project environment. These guidelines include:</p> <p>Regarding the Sustainability Manager:</p> <ol style="list-style-type: none"> 1. Support the team in assessing suppliers of services and subcontractors in the concession. 2. Analyze the provided SSTMA (Seguridad, Salud en el Trabajo y Medio Ambiente, Safety, Health in workplace, and Environment.) documents and communicate any non-conformities to the contract administration, commercial manager, and Administration Manager. <p>Regarding the RP of safety in the workplace and environment:</p> <ol style="list-style-type: none"> 1. Analyze the validity of the SSTMA documents and communicate any non-conformities to the Sustainability Manager. 2. Analyze the robustness of the SSTMA documents and communicate any non-conformities to the Sustainability Manager. 3. Verify compliance with the SSTMA documents and communicate any non-conformities to the Sustainability Manager. <p>Regarding the Operations and Maintenance Manager</p> <ol style="list-style-type: none"> 1. Work with the Sustainability Manager to evaluate the service and equipment providers, suppliers, and subcontractors. 2. Work with the Sustainability Manager to guarantee through communication and training that the service and equipment providers, suppliers, and subcontractors are aware of the requirements of the Programa Integrado de Sostenibilidad de la Concesionaria (SSTMA-RS). <p>Source:</p>	<p>Provide information on the criteria for selection and its breadth of coverage of the triple bottom line. This should include documentation of the total weight or volume of materials. The sustainability management team should include a list of all materials being tracked for sustainable procurement practices including a description of the material and the manufacturer or supplier.</p> <p>Another level of information that could be provided is documentation from manufacturers or suppliers to demonstrate that sustainable practices are employed for a percentage of purchased products. Other documents to be submitted include: certifications of materials and supplies, and evidence of efforts to identify any unresolved worker health or environmental violations by the manufacturers or suppliers.</p>
<p>RA1.3 Used Recycled Materials</p>	<p>14</p>	<p>Conserving</p> <p>The project will utilize and remodel the existing toll plaza structures. The concession will maintain the existing stretches of highway so that only 20 km of the 115 km project comprises new construction. Thus, only 17.4% of the project is new construction; the remaining 82.6% comprises reutilized, remodeled or maintained infrastructure.</p> <p>Source: Martorelli, Eleuberto Antonio, and Guilherme Borges de Queiroz. 2010. Proyecto Vías Nuevas de Lima. (Martorelli et al, 43)</p> <p>Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Sur. (Annon, 1)</p> <p>Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Norte. (Annon, 1)</p>	<p>Provide or project the weight and volume of materials to be reused or recycled and an inventory of specifications for materials seeking inclusion as containing recycled content. Provide documentation that all materials meet the necessary quality and performance criteria required for the intended application.</p>

RA1.4 Use Regional Materials	0	No score	The project team has developed a Comprehensive Waste Management Plan to decrease overall project waste and to divert waste from landfills and incinerators during operations. The Plan also identifies potential destinations for waste generated on-site.
		There is no available information regarding the use of regional materials. For this reason, the credit is considered to be non-achieving.	In terms of waste generation, the Plan requires the following: (1) waste should be managed according to the System of Environmental Action; (2) treatment of waste should minimize residue in order to achieve the lowest degree of pollution; (3) waste should be clearly identified and deposited in a receptacle according to its classification and characteristics for subsequent treatment; and (4) management and manipulation of hydrocarbures should be controlled. In terms of waste destinations, the Plan requires the following: (1) excess material disposal will occur at “Flor de nieve”; and (2) other waste disposal will occur at “Deposito San Martin”.
		Source:	
RA1.5 Divert Waste From Landfills	3	Improved	Provide calculations of the total waste reduction measures and percentage of materials diverted to recycling or reuse.
		The project team has developed a Comprehensive Waste Management Plan to decrease overall project waste and to divert waste from landfills and incinerators during operations. The Plan also identifies potential destinations for waste generated on-site.	
		In terms of waste generation, the Plan requires the following: (1) waste should be managed according to the System of Environmental Action; (2) treatment of waste should minimize residue in order to achieve the lowest degree of pollution; (3) waste should be clearly identified and deposited in a receptacle according to its classification and characteristics for subsequent treatment; and (4) management and manipulation of hydrocarbures should be controlled. In terms of waste destinations, the Plan requires the following: (1) excess material disposal will occur at “Flor de nieve”; and (2) other waste disposal will occur at “Deposito San Martin”. The project is not awarded a higher score because the metrics and evidence used to determine amount of waste that is projected to be recycled/diverted is not provided.	
		Source: Martorelli, Eleuberto Antonio, and Guilherme Borges de Queiroz. 2010. Proyecto Vias Nuevas de Lima. (Martorelli et al, 138) Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Sur. (Annon, 8, 19) Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Norte.(Annon, 8, 10)	
RA1.6 Reduce	6	Conserving	Provide design projections of volume of land

<p>Excavated Materials Taken Off Site</p>		<p>The project avoids excavation or excessive excavation by establishing certain standards that protect the geographic soundness of the region. These measures include a set for excavation and another for fill procedures. For excavation, the procedures are: (1) no excavation should be more than 200m long when situated in or adjacent to paved roads; and (2) no excavation should be more than 600m long when situated in or adjacent to unpaved roads. For fill, the procedures are: (1) all cut material should be reutilized within the site; “selective elimination” will occur when authorized by the supervising engineer; and (2) if it can’t be immediately utilized, the material shall be stored in a storage site to be used as fill later in the project.</p> <p><u>Source:</u> Martorelli, Eleuberto Antonio, and Guilherme Borges de Queiroz. 2010. Proyecto Vias Nuevas de Lima. (Martorelli et al, 138) Vera, Jonathan. 2013. Corte y excavacion de Zanjas. (Vera, 2013. 8-9)</p>	<p>to be excavated.</p>
<p>RA1.7 Provide for Deconstruction & Recycling</p>	<p>12</p>	<p>Conserving</p> <p>The project team has clearly specified materials that can be easily recycled or reused during and after construction and they have created a system to clearly facilitate the procedures for separating materials, correctly disposing materials, and future reuse when possible. No distinction between structural materials or site-generated materials has been made. In such a cyclical system, items to be reused are identified by color and risk. Refer to figure one for the complete cycle of use, reuse, and waste (FIG. 1, page 9).</p> <p><u>Source:</u> Annon. 2005. Environmental Management: Waste Management. Colors for storage containers. (Annon, 2005. Pages 9-12).</p>	<p>Provide design documents that demonstrate efforts to limit adherence of recyclable materials to non-recyclable materials or materials that might contaminate the waste stream or limit recyclability. Provide design documents that show connections and the way they promote ease of disassembly and enable reuse.</p>
<p>RA2.1 Reduce Energy Consumption</p>	<p>0</p>	<p>No score</p> <p>There is no available information regarding the percentages of energy consumption reduction for the construction or concession phases. This is a transportation project, but no evidence of efficient transportation methods or fuel efficient vehicles is available. None of the minutes or plans show methods of energy consumption reduction in the construction, operation, or design of the remodeled toll plazas. For this reason, the credit is considered to be not-achieving.</p> <p><u>Source:</u></p>	<p>Provide reports, memoranda, or minutes of meetings regarding energy consumption reduction strategies. This documents should include an inventory of energy saving methods considered, results of feasibility studies, and design documents demonstrating the incorporation of energy saving strategies into the design.</p> <p>Another level of information to be provided should be the calculation of the industry norm to be used as a benchmark for comparison with the project’s energy consumption. All results should be provided in BTUs. Other calculations should be project’s estimated annual energy consumption over the life of the project. All results should be provided in BTUs.</p>

RA2.2 Use Renewable Energy	0	No score	Documentation of the project’s anticipated annual operational energy consumption broken down by type of source. Provide documentation that details if the project incorporates renewable energy means to its design. If it does, provide calculations that show the anticipated annual output of all renewable energy sources and the overall energy consumption of the project
		There is no available information regarding the use of alternate or renewable sources of energy. There is no evidence of the incorporation of such sources into the operation and maintenance phases. For this reason, the credit is considered to be not-achieving.	
		Source:	
RA 2.3 Commission & Monitor Energy Systems	0	No score	Supply a document that releases the project management from the responsibility of installing commission and energy monitoring systems.
		There is no available information regarding the monitoring of energy systems. A document that releases liability for energy consumption and monitoring is not available either. The project only incorporates monitoring systems for air and noise pollution, but not for energy consumption and water pollution. For this reason, the credit is considered to be not-achieving.	
		Source:	
RA3.1 Protect Fresh Water Availability	0	No score	Provide design documents for all features that are intended to reduce negative water impacts. The sustainability management team should provide an inventory of all water impacts that the project is not able to mitigate and a rationale as to how the integrated systems of the project will work together to achieve net positive recharge.
		The project will use water supplied by a third party and limit extraction from the rivers or other water sources. Use of water from natural sources and disposal of residues into them are prohibited. The project will minimize interference with surficial waterbodies and subterranean aquifers. If extraction occurs, it should be done in a way that does not create puddles, affect turbidity, or alter the ecosystem. If any water is drawn from or released into the river, analysis and tests will be run to ensure the quality of the water. Nonetheless, there is no specific documentation regarding this process or calculations that point to protecting the existing fresh water sources.	
		Source:	
RA3.2 Reduce Potable Water Consumption	4	Improved	Provide calculations of estimated water consumption over the life of the project and provide a comparison with the industry norm. Evidence the volume of water that will be injected to the local ecosystem by means of irrigation or treated discharge.
		Restrictions are put in place for potable water consumption during the remodeling of the Toll Plaza Stations. During the construction phase, potable water will be brought to the site in tanks by a third party to reduce impact on local potable water supplies. During the life of the project, the project team will verify and implement activities of water reutilization which include: 1. Gray waters for irrigation	
		Source:	
RA3.3 Monitor Water Systems	0	Improved	Supply a document that releases the project management from the responsibility of installing water monitoring systems.
		There is no available information regarding the monitoring of water systems. A document that releases liability for water pollution is not available either. The project only incorporates monitoring systems for air and noise pollution, but not for energy consumption and water pollution. For this reason, the credit is considered to be non-achieving.	
		Source:	
RA0.0 Innovate Or Exceed Credit Requirements	0	N/A	
41			

NATURAL WORLD			
	VIAS NUEVAS DE LIMA, LIMA, PERU	RECOMMENDATIONS	
NW1.1 Preserve Prime Habitat	0	No score	<ul style="list-style-type: none"> Situate the project in a manner that a 300 ft. buffer is established between the highway and prime habitats. A site map illustrating the buffer zone established between the three highways and prime habitat areas should include details on location, distance, and specific conservation strategies. Deploy a strategy of conservation and restoration of prime habitats. The project should seek to increase the area of prime habitat and connectivity. This new area can be part of the buffer zone, located on site or adjacent to the site. Documentation supporting this effort should delineate a restoration effort of the project and include, at a minimum, a site plan that indicates location, size, and type of restoration. This map should also include species of plants used in the restoration effort. The document must be signed by a qualified natural resource professional who assists with the restoration and monitoring plan.
		There is no clear delineation of prime habitats on or near the site and no drawings or plans showing how the project relates to them. For this reason, this credit is considered to be Not-Achieving.	
		Source:	
NW1.2 Preserve Wetlands and Surface Water	0	No score	<p>Provide documentation that clearly shows that the developments are situated within the distances established and that shows the Vegetation and Soil Protection Zone (VSPZ).</p> <p>Establish a Vegetation and Soil Protection Zone. Submit a site plan showing the final site design, the boundaries of the VSPZ, and the minimal VSPZ depth calculated as the shortest point between the VSPZ boundary and the identified body of water/wetland and coastline.</p> <p>In addition to these measures, the project should aim to restore previously degraded buffer zones to a natural state, marking them elements of the VSPZ, especially in the Ramiro Priale highway where the river runs parallel to the traffic artery. This should be accompanied by a restoration plan that outlines the efforts to restore wetlands, river banks, and shoreline. This plan should include, at a minimum, site maps outlining the location of restoration and proof that both required actions were taken. Efforts must include:</p>
		No information has been provided regarding design strategies used to protect and preserve wetlands and surface water bodies. For this reason, this credit is considered to be Not-Achieving.	
		Source:	
NW1.3 Preserve Prime Farmland	0	No score	<ul style="list-style-type: none"> Provide documentation showing how prime farmland is protected or development is protected or development is prevented. Provide documentation that no soils have been stripped from areas on the site defined as prime farmland.
		Although the project team suggests that the project is not situated near any prime farmland, there is no plan or image that demonstrates this. For this reason, this credit is considered to be Not-Achieving.	

		<p><u>Source:</u></p>	<ul style="list-style-type: none"> The project should take a proactive stance in restoring farmland to a productive state or establishing prime farmland sites.
<p>NW1.4 Avoid Adverse Geology</p>	<p>1</p>	<p>Improved</p> <p>The project team identifies the main geological faults and risks related to the project construction phase. However, the project does not address this issue in the operations and maintenance phase and no plan has been provided that shows how these features relate to the existing and new construction of the project. Recommendations are provided to the right.</p>	<ul style="list-style-type: none"> Provide documentation of site investigations to identify and delineate earthquake faults, tsunami susceptible coastlines and karst areas and aquifers, including the location of the project site relative to these features. Provide documentation of project design that illustrates strategies used to avoid damage to sensitive geology or damage from adverse geology. Provide documentation/plans that show the location of hazardous areas and illustrate buffers, runoff controls, spill prevention, and cleanup plans.
		<p><u>Source: Martorelli, Eleuberto Antonio, and Guilherme Borges de Queiroz. 2010. Proyecto Vías Nuevas de Lima. (Martorelli et al, 136)</u></p>	
		<p>Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Sur. (Annon, 9)</p> <p>Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Norte. (Annon, 9)</p>	
<p>NW1.5 Preserve Floodplain Functions</p>	<p>0</p>	<p>No score</p> <p>No information or plan drawings have been provided regarding the influence of the project’s design on the landscape, and how it is able to preserve floodplain functions. For this reason, this credit is considered to be Not-Achieving.</p>	<p>Initial documentation should include a plan showing the location of the project in regards to the 100-year or design floodplain and how project siting lowers the impact of these two situations. The documents should be able to show pre/post floodplain storage and floodplain elevations and show that the project does not increase flood elevations outside of the project easement and maintains floodplain storage.</p> <p>Supporting documentation should include estimates of pre-development floodplain infiltration capacity and estimates of post-development infiltration capacity using the above described strategies. For the pre-development phase, documents should include approaches to maintain the floodplain, for example: amount of impervious surface, established vegetation, and soil protection zones. Other approaches that allow for natural floodwater infiltration and filtration of pollutants are highly welcomes.</p> <p>Other levels of documentation include the provision of a flood emergency management plan to address the operation and/or evacuation plan for all infrastructure in the flood plain. Also, documentation should be provided that addresses measures to maintain or enhance aquatic habitat connectivity, fish and sediment transport, and the removal of barriers and traps.</p>
		<p><u>Source:</u></p>	

NW1.6 Avoid Unsuitable Development on Steep Slopes	1	Improved	<ul style="list-style-type: none"> · Design the project to minimize alterations and siting on hillside or steep slopes to avoid excessive erosion and the potential for landslides. Documentation of this should be made available, especially for the process used to identify and choose sites, which may include meetings with officials and other stakeholders, site options with benefits and shortfalls, and reasoning for final selection. · Institute management practices for the constructed works to control erosion and prevent landslides. These management and operation practices should include added protection to downslope buildings and facilities from erosion and landslides. Documentation of best management practices should be provided and may include examples/drawings of proposed protection measures for downslope buildings, facilities and infrastructures. · Acquire sites that are sufficiently suited for the project purpose and that minimize the possibility of excessive erosion and landslides.
		<p>The project team has mentioned that they will avoid development on unsuitable steep slopes to prevent erosion and impacts to aquatic habitats that surround the project. A construction detail demonstrating this is provided on page 057 of the project document.</p> <p>Source:</p>	
NW1.7 Preserve Greenfields	10	Conserving	<ul style="list-style-type: none"> · Provide documentation that shows how the concession is revitalizing the existing infrastructure including the remodeling of the toll plazas.
		<p>The project is based on an existing highway system, therefore most of the land used for the development is considered a greyfield. The concession for this project will maintain and operate 31.5 km of the Panamericana Norte Highway, 54.1 km of the Panamericana Sur Highway, 10 km of the Ramiro Priale Highway and will operate 20 km of new highway. Existing structures such as toll plazas are being recycled rather than demolished.</p> <p>Source: <u>Martorelli, Eleuberto Antonio, and Guilherme Borges de Queiroz. 2010. Proyecto Vias Nuevas de Lima. (Martorelli et al, 33-34)</u></p>	
NW2.1 Manage Stormwater	0	No score	<p>Provide documentation of the initial, final post-development, and target water storage, infiltration, evaporation, water harvesting, and/or cistern storage capacity using TR-55 CNs or other continuous simulation modeling methods to describe site conditions.</p>
		<p>No metric or data has been provided regarding the existing or projected impact of infrastructure on stormwater runoff quantity and quality. For this reason, this credit is considered to be Not-Achieving.</p> <p>Source:</p>	

NW2.2 Reduce Pesticides and Fertilizer Impacts	0	No score	<p>Provide operational policies for applying fertilizers and pesticides to the ornamental features of the highways and plans/drawings that show how runoff controls will be designed and installed.</p> <p>Another level of information is to provide documentation (plans, drawings, etc.) showing the mix of plants used in the landscape and the cocktail of pesticides/fertilizers used once the project is finished. These documents should provide level of toxicity, persistence and bioavailability.</p>
		<p>The project team has not developed a list of pesticides and fertilizers used or measures to mitigate their use. If no pesticides or fertilizers are used, the project team has not provided a statement that demonstrates this. For this reason, the credit is considered to be Not-Achieving.</p>	
		Source:	
NW2.3 Prevent Surface and Groundwater Contamination	1	Improved	<p>Provide hydrogeologic delineation studies, taking into consideration the complexity of the aquifers and wellhead protection areas.</p> <p>Provide evidence of groundwater quality monitoring programs</p> <p>-Provide documentation that the constructed work cannot reasonably have any impact on receiving waters through evidence that there is no connection to receiving waters from the site construction work or that pollutant BMP's are implemented. Both the discharges to receiving waters and receiving waters themselves should be monitored to verify pollutant load, biological impact, and impact on receiving water flow.</p> <p>-Please provide detailed spill/leak prevention plans.</p> <p>-Please provide plans and drawings showing the placement of material storage piles and where the handling of potentially polluting runoff occurs.</p> <p>-Show evidence of initiatives to reduce the use or replacement of hazardous and potentially polluting materials with non-hazardous and non-polluting equivalents.</p> <p>·Show plans to clean up any contaminated area and plans to prevent contamination from entering receiving waters or altering receiving water flows.</p> <p>· Show evidence of proposed land use controls.</p>
		<p>The project team mentions that preventative actions have been taken to eliminate risks of contaminating ground and surface water. These measures include:</p> <p>Ban the washing of machinery/transportation vehicles near or on the river banks and surrounding areas</p> <p>Prohibit the dumping of liquid and solid residues in the river and surrounding areas</p> <p>Install appropriate drainage systems following industry standards</p> <p>Minimize interference of the flows of surface and groundwater</p>	
		Source:	
NW3.1 Preserve Species Biodiversity	2	<p>Improved</p> <p>The project team does not provide any documentation of initiatives taken to upgrade existing habitats. It does, however, offer insight on strategies to mitigate the degradation of aquatic habitats where the highway crosses bodies of water. These include:</p> <p>Minimize the extermination of aquatic vegetation</p>	<p>· The project should be able to not only protect habitats but also upgrade habitats by expanding wildlife corridors and linking existing habitats it may disturb. Maps of existing wildlife settlements outlining preservation strategies should be provided. For each species a map showing important potential and/or likely movement should be</p>

		<p>Realize maintenance work far from the river and the riverbanks Avoid the formation of unstable drop-offs or inclined slopes so that no lateral erosion or sliding occur thus unbalancing the habitats.</p> <p>Other documentation has been provided that specifies that major fauna in the area is airborne and the risk of such species being affected is minimal.</p> <p><u>Source:</u></p>	<p>provided. The project should identify potential on-site barriers and delineate strategies to remove them. Ultimately, a descriptive narrative of both should be included.</p>
NW 3.2 Control Invasive Species	0	<p>No score</p> <p>The project team has not provided enough information regarding the control of invasive species. For this reason the credit is considered to be not-achieving.</p> <p><u>Source:</u></p>	<ul style="list-style-type: none"> · Provide a list of species and a site plan. · Identify and avoid use of invasive plants by referring to the State Noxious Weeds law or Federal Noxious Weeds law list. · Establish a multi-year management plan to control species and a system to control noxious plants. This plan should include: <ul style="list-style-type: none"> o Prediction and prevention: Strategies for minimizing potential for invasive species, both plants and animals, to reappear after initial removal and/or enter the site from nearby areas. o Detection and management: Strategies that monitor and remove invasive species emerging on-site in the future. · Invasive species should actively be eliminated. In addition to the elements above the plan should consider: <ul style="list-style-type: none"> o Removal: Elimination of any invasive species o Rehabilitation and Restoration: Methods to restore habitats to pre-invasion state.
NW3.3 Restore Disturbed Soils	8	<p>Conserving</p> <p>The project avoids excessive excavation by establishing certain standards that protect the geographic soundness of the region. Fill and soil re-utilization procedures are as follows: (1) All cut material should be reused within the site; “selective elimination” will occur when authorized by the supervising engineer; and (2) if it can’t be immediately utilized, the material shall be stored in a storage site to be used as fill later in the project.</p> <p><u>Source:</u> Martorelli, Eleuberto Antonio, and Guilherme Borges de Queiroz. 2010. Proyecto Vías Nuevas de Lima. (Martorelli et al, 137) Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Sur. (Annon, 17) Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Norte. (Annon, 10) Vera, Jonathan. 2013. Corte y excavacion de Zanjas. (Vera, 2013. 8-9)</p>	<ol style="list-style-type: none"> 1. Provide a document of soil restoration activities, areas of disturbance and areas restored (and to be restored). 2. Calculations that show the percentage of soils to be restored and/or that have been restored. 3. Document soil reuse 4. The project should restore disturbed soils as a result of previous highway development. The previously mentioned documents should be provided for this restorative effort.
NW3.4 Maintain wetland and	0	No score	<p>Provide documentation on hydrologic connections in the following manner:</p>

surface water functions.		The project team has not supplied drawings or information regarding the maintenance of wetlands and surface water functions. For this reason this credit is considered to be Not-Achieving.	For streams, rivers, and lakes, provide documentation showing how the waterways are connected or proposed to be connected to the riparian floodplain at a six month to two year frequency flow rate
		Source:	For wetlands, provide documentation showing that structures that drain the wetlands will be removed and/or appropriate sources of ground and surface waters are reconnected, diverted, or maintained.
	0	N/A	
	23		

CLIMATE AND RISK			
	VIAS NUEVAS DE LIMA, LIMA, PERU		RECOMMENDATIONS
CR1.1 Reduce Greenhouse Gas Emissions	0	No score There is no available information regarding a comprehensive life cycle carbon analysis that demonstrates that the project owners are attempting to reduce the anticipated amount of net greenhouse gas emissions. Though the project owners have provided measures to monitor greenhouse gas emissions every six months, they have not provided an industry standard and self-analysis to properly assess their level of achievement. For this reason, the credit is considered to be not-achieving.	Provide documentation that evidences that a life cycle carbon analysis has been made in accordance with available methodologies, data sources, and software. This assessment should include extraction, refinement, manufacture, and distance of transportation to bring materials to the site.
		Source:	Another level of information would be to provide documentation on the efforts to reduce carbon emission and calculations of percentage reduction as calculated with available methodologies, data, and software.
CR1.2 Reduce Air Pollutant Emissions	0	No score Although the project team has provided impact analyses and mitigation control methods for particulates and emissions, no information has been provided on standards to which the project was designed or evidence that the project meets the California Ambient Air Quality Standards (CAAQS). Moreover, there is no reference to the South Coast Air Quality Management (SCAQM) rules.	First, perform an analysis of air pollutant emissions and provide documentation of expected emissions following CAAQS protocol. Second, implement strategies to reduce air pollution to required levels using the CAAQS standards. In addition, documentation on monitoring and control programs should be provided as well as rules and strategies for compliance.
		Source:	Another level of information that could be provided is documentation on expected emissions of the six criteria pollutants and strategies to reduce air pollution to required levels. These strategies must include calculations and industry standards for comparison.

CR2.1 Assess Climate Threat	0	No score	<p>Please provide documentation that a plan, which takes into account the impacts of a changing climate on the range of operating conditions assumed in the design of the project has been completed.</p> <p>Also, documentation of community outreach programs during the process and documentation of consultation with local and regional emergency management officials.</p>
		<p>There is no information available regarding a comprehensive Climate Impact Assessment and Adaptation Plan. For this reason, the credit is considered to be non-achieving.</p>	
		<u>Source:</u>	
CR2.2 Avoid Traps And Vulnerabilities	0	No score	<p>Provide Documentation on the work done to identify and assess possible changes in key engineering design variables or documentation and mentioned in the previous credit. Also, documentation that outlines potential traps and vulnerabilities that are associated with costs and risk, and documentation that shows the extent to which project concepts, configuration and design have taken into account the need to reduce identified significant risks, traps, and vulnerabilities with substantial costs and other negatives.</p>
		<p>There is no information available regarding a plan that identifies and avoids traps and vulnerabilities that could create high, long-term costs and risks for the affected communities. For this reason, this credit is considered to be No score.</p>	
		<u>Source:</u>	
CR2.3 Prepare For Long-Term Adaptability	0	No score	<p>-Identification of specific measures taken to address the potential consequences of long term climate change including sea-level rise, intensity and frequency of extreme weather events. Provide specific measures take to address other potential long term threats such as water and energy shortages and shortages of other critical material.</p> <p>-Another level of information would be to provide plans, designs, and documents that show restoration and rehabilitation efforts in the case that the aforementioned threats come to happen.</p>
		<p>There is no information available regarding preparation for or resilience of the highway to the consequences of long-term climate change. For this reason, the credit is considered to be non-achieving.</p>	
		<u>Source:</u>	
CR2.4 Prepare For Short-Term Hazards	3	Improved	<p>Provide a list of expected natural hazards in the area and their predicted frequency and severity including, but no limited to:</p> <ul style="list-style-type: none"> -Eathquakes -Tsunamis -floods <p>An explanation of the strategies included in the project to cope with each event and how they surpass the existing codes and regulations should be provided. Subsequently, another level of information should be a documentation of strategies and how the minimize the risk of future hazards</p>
		<p>The project clearly delineates man-made hazards during the construction and operation phases and catalogs them according to their risk magnitude and impact intensity. Tables 6-1 and 6-2 explain the characterizations; Table 6-4 lists the man-made hazards according to degree of magnitude/intensity.</p>	
		<p><u>Source:</u> Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Sur.</p>	
CR2.5 Manage Heat Island Effects	0	No score	<p>Provide drawings showing all non-roof, non-vegetated areas of the site and its surfacing material. Drawings of roof surfaces and their materials should also be provided. Also, provide calculations demonstrating the percentage of hardscape surfaces that meet the requirements. Finally, provide documentation of all shaded areas, assumed at noon or summer solstice, and a list of</p>
		<p>There is no information available regarding the minimization of surfaces with high reflectance indices to reduce localized heat accumulation and manage microclimates.</p>	
		<u>Source:</u>	

Highway Vías Nuevas de Lima, Peru

			species used and expected growth rates showing shading five years from the initial planting.
CR0.0 Innovate Or Exceed Credit Requirements	0	<i>N/A</i>	
	3		
OVERALL:	176	VIAS NUEVAS DE LIMA, LIMA, PERU	

APPENDIX D: TABLE OF DOCUMENTS

DOCUMENTATION PROVIDED

General Information

Pereira Raul. 2013. "Politica Integrada de Sostenibilidad."

Anonymous. 2013. "Directriz de medio ambiente"

Anonymous. 2013. "Directriz de Cambios Climaticos"

Anonymous. 2013. "Directriz de Programas Sociales"

Anonymous. 2013. "Directriz de Salud"

Anonymous. 2013. "Directriz de Seguridad"

INDECOPI. 2005. "NTP 900.058.2005 Gestión Ambiental."

Rojas, Sadith. 2013. "Gestion de Proveedores." Lima.

Marcelo Bahia Odebrecht. 2013. "Política sobre Sostenibilidad." Lima.

Gestionarse. 2013. Estudio de usuarios de las vías Panamericana Norte y Sur, Informe Final. Lima.

Gestionarse. 2013. Mapeo de Actores RDL, Informe Final. Lima

Martorelli, Eleuberto Antonio, and Guilherme Borges de Queiroz. 2010. Proyecto Vias Nuevas de Lima.

Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Sur.

Annon. 2013. Plan de Manejo Ambiental Para la Remodelación de Estaciones de Peajes: Panamericana Norte.

Vera, Jonathan. 2013. Corte y excavacion de Zanjas.

Annon. 2005. Environmental Management: Waste Management. Colors for storage containers.