

## Memorandum

To: File  
From: Scott Sobiech, Erin Anderson and Greg Williams  
Subject: Summary of Envision-based project prioritization tool  
Date: November 18, 2016  
Project: 23270051-016-400

During the initial stages of its Watershed Management Plan (Plan) refresh, the Riley Purgatory Bluff Creek Watershed District (RPBCWD) solicited stakeholder input on watershed management issues through a public engagement process. The results of the public engagement process identified “project prioritization” as an issue of high importance to stakeholders. Comments received at public meetings highlighted the difficulty in developing a clear and equitable method for project prioritization.

To address this concern, the RPBCWD developed a proposed project prioritization method based on the Envision Sustainability Framework (Envision). This prioritization method allows relative comparison of watershed management projects spanning a range of benefits and locations. This memorandum summarizes the proposed method for scoring projects based on multiple benefits and prioritizing those projects with consideration for logistical factors. This method is applicable to District projects; District programs and ongoing operations (e.g., education program) are not subject to this prioritization method.

### Summary of Envision

The Envision™ rating system is a project assessment and guidance tool for sustainable infrastructure design developed by the Harvard Graduate School of Design, the American Society of Civil Engineers (ASCE), the American Public Works Association (APWA) and the American Council of Engineering Companies (ACEC). It is an objective framework of criteria and performance achievements that help users identify ways that sustainable approaches can be used to plan, design, construct, and operate infrastructure projects. Envision™ provides an opportunity for infrastructure owners and designers to be recognized for using a life cycle approach, working with communities, and using a restorative approach to infrastructure projects. Envision™ is also a useful tool in comparing project options that have different intangible benefits that can be hard to quantify through traditional means. Envision™ credits are divided into the following five categories:

- Quality of life
- Leadership
- Resource allocation
- Natural world
- Climate and risk

Using Envision, a project (proposed or constructed) is scored based on the degree to which the project achieves criteria applicable to each credit. Multiple criteria exist for each credit, resulting in a range of available scores for each credit. The more credits a project achieves, and the greater the degree to which they are achieved, the higher a project will score.

## Modifications to Envision

The Envision rating system uses a holistic approach to sustainability, and is thus applicable to a range of infrastructure projects across several engineering and public works disciplines. The RPBCWD proposes a project prioritization method based on Envision, but modified in the following three ways:

1. Criteria for credits were modified into yes/no questions (1 point for yes, 0 points for no)
2. Criteria language was modified to more closely align with RPBCWD goals and strategies
3. Some additional criteria questions were added to account for RPBCWD goals and strategies (most within the natural world category)

The first modification initially created a single, yes/no criterion for each credit. This modification was made due for two reasons: 1) to simplify the scoring process, and 2) to reflect the level of project definition that can be reasonably expected at the feasibility level, when it is anticipated that most projects will be scored.

The second and third modifications adapt the Envision framework more specifically to the vision, mission, and goals of the RPBCWD. The credits were not modified from the original Envision framework. However, the criteria language was revised to more closely align with specific goals and strategies developed by the RPBCWD. The goals and strategies will be included in the refreshed Plan, and are directly tied to the stakeholder input received during the public engagement process. For some credits, the criteria include a single question with language that is either: 1) based on Envision language and revised to most accurately represent the application of the Envision credit to RPBCWD projects, or 2) based on language from the RPBCWD goals and strategies rephrased as a yes/no question. For some credits, additional criteria were added to reflect increased focus of the RPBCWD on the resource or practice associated with that credit. For example, the original Envision framework includes a single credit for "manage stormwater." Four criteria were used to reflect the RPBCWD's multiple stormwater management objectives.

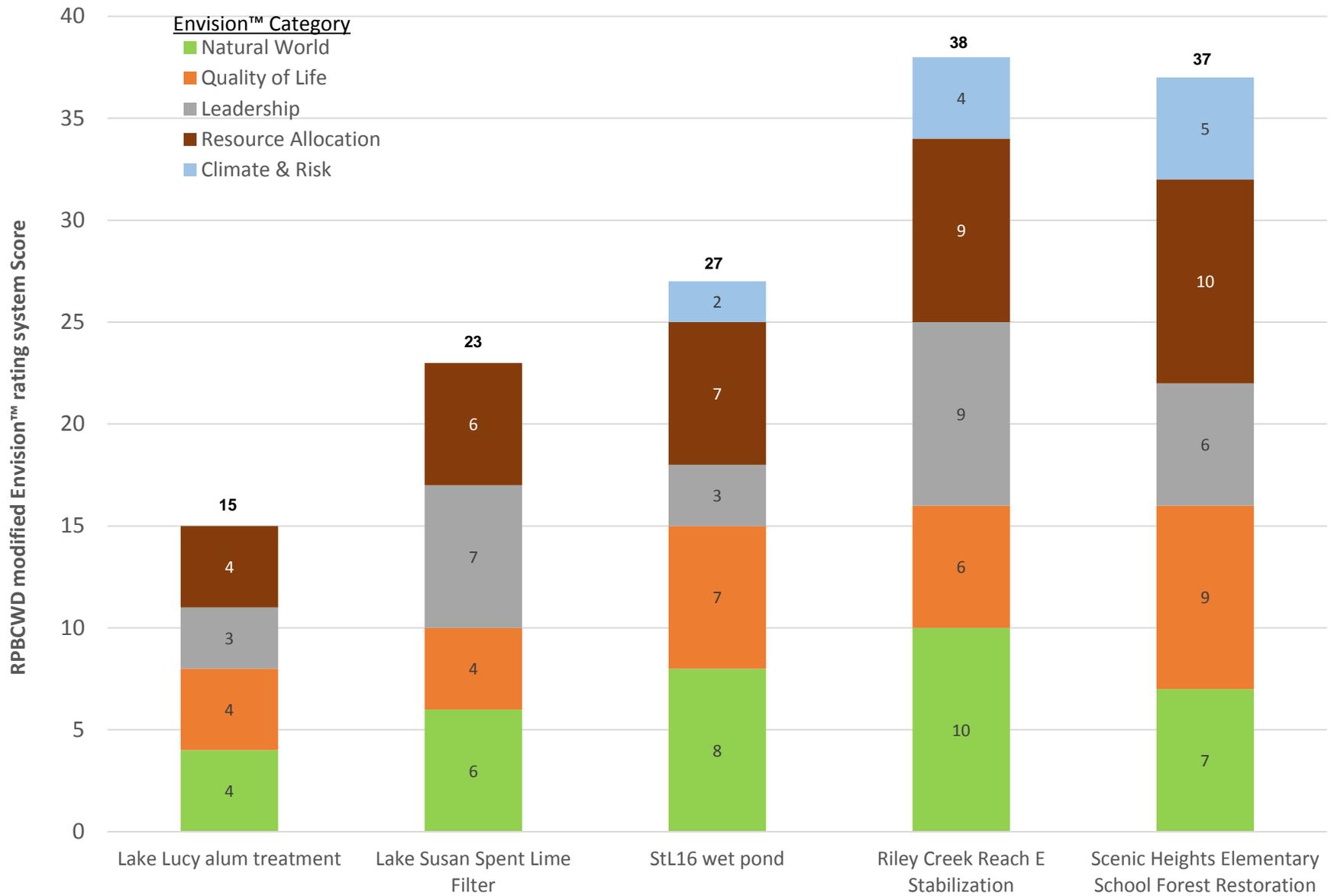
A list of the Envision credits and criteria questions developed for each credit are presented in a table included at the end of this memorandum. Most of the credits with multiple criteria questions are included within the natural world category. The criteria questions are phrased such that a "yes" is a positive response (i.e., a benefit); a "yes" answer earns 1 point. No points are earned for a "no" answer. In total, there are 56 credits and 81 possible points to be earned, distributed among the categories as follows:

<b>Category</b>	<b>Credits</b>	<b>Possible Points</b>
Quality of life	12	18
Leadership	9	10
Resource allocation	13	15
Natural world	15	30
Climate and risk	7	8
<b>Total</b>	<b>56</b>	<b>81</b>

**To learn more about the final prioritization tool used by RPBCWD please see Section 4.0**

ISI, inc.	Co-Benefits Profile using Envision Framework							
Category	Credit	Question the team will ask about individual BMPs in the CIP:	Lucy Alum Treatment	Lucy Spent Lime	StL16 Wet Pond	Riley Creek Reach E	Scenic Heights Elementary School Forest Restoration	Draft RPBCWD Goals/Strategies
Quality of Life	Improve community quality of life	Is the project aligned with community needs, goals, plans and issues (e.g., Comprehensive Plan)?						
		Has the affected community been meaningfully engaged in the project design process?	?	Y	Y	Y	Y	
		Is the project designed in such a way that improves existing community conditions and rehabilitates infrastructure assets?	Y	Y	N	N	Y	
	Stimulate sustainable growth and development	Does the project improve the community attractiveness for compatible businesses and industries, improve recreational opportunities, and generally improve the economic and social condition of the community						
	Develop local skills and capabilities	Does the project educate watershed residents about water resource management issues?						
		Does the project encourage residents to implement their own best management practices?						
		Does the project encourage residents to become watershed stewards (to implement best management practices and encourage others to do so)?						
	Enhance public health and safety	Has the design team assessed the project for health risk and made appropriate changes to reduce risk to public and worker health?						
	Minimize noise and vibration	Has the project been designed to markedly reduce ambient noise and vibration to levels that improve community livability?						
	Minimize light pollution	Has the project team designed lighting components in a way that reduces or eliminates lights spillage into sensitive environments?						
	Improve community mobility and access	Does the project consider and include improvements to long-term transportation infrastructure efficiency, walkability, and livability.						
	Encourage alternative modes of transportation	Does the BMP also help the City address any Complete Streets policy or plan?	N	N	N	N		
	Improve site accessibility, safety and wayfinding	Detailed design determines if the BMP has educational signage about sensitive areas, natural assets, etc.	N	N				EO5
	Preserve historic and cultural resources	Detailed design determines if the BMP is context sensitive and builds on the area's history, culture and art	N	N				
	Preserve views and local character	Does the BMP preserve or enhance views in the the community landscape?	N	N	Y	Y	Y	
Does the project incorporate natural materials and bioengineering for the maintenance and restoration of shorelines and streambanks where appropriate?		N	N	Y	Y	Y		
Enhance public space	Is the BMP next to a recreational or pedestrian trail? (education value)	N	N	Y	Y	Y	EO5	
	Does the project enhance established recreational use or public open spaces?	Y	Y	Y	Y	Y		
Leadership	Provide effective leadership and commitment	Does this BMP demonstrate a new tool in stormwater management (innovative, new idea, value of leading the pack)?	N	Y	N	N	N	WQP4
	Establish a sustainability management system	Has the project been assessed and optimized relative to achieving sustainability?						
	Foster collaboration and teamwork	Is their a perceived partnering opportunity (e.g., city, private entity)?	?	Y	Y	Y	Y	AD4, AD5, DC8, PL9, PL10, RG-G2, RG4,
		Is their a partner who is contributing funding to the project (e.g., city, private entity)?	?	Y	N	Y	Y	
	Provide for stakeholder involvement	Will stakeholder engagement be implemented during the design and construction of the BMP?	Y	Y	Y	Y	Y	EO1, EO4, EO6, EO9, PL11
	Pursue by-product synergy opportunities	Does the BMP make beneficial reuse of a waste product such as compost, wood mulch, spent lime?	N	Y	N	Y	Y	
	Improve infrastructure integration	Is the BMP designed to be low-impact and accommodate existing utilities, grading, roadways, trees, etc.?	Y	Y	N	Y	N	
	Plan for long-term monitoring and maintenance	Is there a plan, funding and responsible party identified for long-term O&M of the BMP ?	Y	Y	Y	Y	N	PL11
Address conflicting regulations and policies	Does the project provide results which may reduce barriers to future sustainable projects?							
Extend useful life	Is the project designed to be durable, flexible, and resilient?	N	N	N	Y	Y		
Resource Allocation	Reduce net embodied energy	Does this BMP minimize resource-intensive materials that are man-made and manufactured?	N	N	Y	Y	Y	
		Does the operation and maintenance of this BMP minimize reliance on resource-intensive materials (man-made and manufactured)?						
	Support sustainable procurement practices	Contracting and procurement will determine if these practices are used.	N					
	Use recycled materials	Does the BMP reuse materials such as mulch, compost, aggregates, recycled content materials?						
	Use regional materials	Does the BMP rely mostly on local materials, vegetation?	N	Y	Y	Y	Y	
	Divert waste from landfills	Does the BMP minimize the quantity of construction materials needing to be demolished and reconstructed at a future date beyond standard practice?						
	Reduce excavated materials taken off site	Does the BMP site appear to lend itself toward balancing cut and fill on-site?	N	N	Y	Y	Y	
	Provide for deconstruction and recycling	If the BMP is demolished and reconstructed at a future date, can materials be easily separated, recovered and recycled?						
	Reduce energy consumption	Does the BMP avoid ongoing pumping or electricity consumption during operation?	Y	Y	Y	Y	Y	
	Use renewable energy	Are there plans for renewable power generation at the BMP site? If electricity must be used for operation, is it from a renewable source?						
	Commission and monitor energy systems	Will the project be monitored for energy or resource consumption in an effort to optimize energy use, maintenance, or eventual replacement?						
	Protect fresh water availability	Does the project achieve a net positive impact replenishing the quantity of fresh water surface and groundwater?						
		Does the project further the understanding of groundwater-surface water interaction?	N	N	N	N	N	GW3
	Reduce potable water consumption	Does the BMP implement potable water conservation or stormwater re-use to offset potable water demand?						
Monitor water systems	Will performance of the BMP be monitored to optimize future operation and/or inform District decision-making?						DC7	

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Natural World	Preserve prime habitat	Does the project preserve or enhance habitat important to fish, waterfowl, and other wildlife?						WQ-G3
	Protect wetlands and surface water	Does the project preserve or enhance the quantity or function/value of District wetlands?						
		Does the project establish, preserve, or enhance buffer areas?	N	N	N	N	N	WQH9
	Preserve prime farmland	Does the BMP replace farm land?						
	Avoid adverse geology	Is the BMP sited to avoid karst conditions, wellhead protection areas?	N	N	N	N	N	
	Preserve floodplain functions	Does the BMP reduce impervious surface?						
		Does the project protect or enhance the ecological function of District floodplains to minimize adverse impacts?	N	N	N	Y	N	WQT1
	Avoid unsuitable development on steep slopes	Does the project minimize ongoing erosion and sedimentation ?						
		Does the project address an area of high erosion concern or risk?	N	N	Y	Y	Y	WQE2
	Preserve greenfields	Is the BMP a retrofit in a gray field or brownfield area?						
	Manage stormwater	Does the project reduce peak discharge rates?						WQT6
		Does the BMP provide any flood mitigation benefit?						
		Does the project reduce flood risk within the District?	N	N	N	N	N	WQT8
		Does the project reduce overall flow volume?						
	Reduce pesticide and fertilizer impacts	Does the project incorporate Low Impact Development (LID) practices						WQT7
		Does the BMP replace high-maintenance lawn with a low-maintenance naturalized landscape?						
	Prevent surface and groundwater contamination	Does the project positively influence more than one downstream water resources?						
		Does the project minimize the risk to groundwater quality?						
	Preserve species biodiversity	Does the project establish and preserve natural corridors for wildlife habitat and migration?						WQH4
		Does the project promote biologically diverse and appropriate plant and animal populations?						
	Control invasive species	Does the BMP project include removal of invasive species?						
		Does the project manage non-native aquatic invasive macrophytes to improve water quality and/or habitat in accordance with an approved lake vegetation management plan or as part of a rapid response control project?	N	N	N	Y	Y	DC5, WQH2, WQH7, WQH8
		Does the project minimize the spread or manage the adverse ecological impact of aquatic invasive species?	N	N	N	N	N	
Restore disturbed soils	Does the project amend/restore disturbed soils on the project site to minimize erosion and promote vegetation?							
Maintain wetland and surface water functions	Does the project address chloride loading/pollution						WQP1	
	Does the project reduce phosphorus loading to, or concentrations within, District managed water resources? Separate watershed vs. in-lake treatment	N	N	N	N	N		
	Does the project reduce sediment loading to District managed water resources?	N	Y	Y	Y	N	WQP2	
	Does the project reduce other pollutant (e.g., metals, bacteria) loading to District managed water resources?							
Innovation	Is the project included in a published feasibility study or plan (e.g., City study, UAA, WRAPS or TMDL implementation Plan)?	Y	Y	Y	Y	Y	WQP6	
	Does the project investigate treatment effectiveness of emerging practices?							
Climate & Risk	Reduce greenhouse gas emissions	Does the project consider mimization of greenhouse gas emissions?	N	N	N	N	N	
	Reduce air pollutant emissions	Does the construction, operation and maintenance of this BMP minimize use of fuel, electricity or resource-intensive materials (man-made and manufactured)?	N	N	Y	Y	Y	
	Assess climate threat	Has the BMP been sized and flow routing been designed to address the vulnerability and risk to nearby property during a severe weather event?	N	N	N	Y	N	DC4, PL2, PL3
		Has the project been assessed to determine the impact of climate change on project performance?	N	N	N	N	Y	PL2
	Avoid traps and vulnerabilities	Does operation, maintenance or replacement of the BMP avoid significant future electricity, fuel or man-made construction materials?	N	N	Y	Y	Y	PL3
	Prepare for long-term adaptability	Has the project been designed to accommodate impacts of potential climate change (through adaptive management or retrofit)?						PL3
	Prepare for short-term hazards	Has the project been designed to minimize the impact of natural or man-made hazards (in addition to managing stormwater)?						
Manage heat island effects	Does the project reduce the amount of impervious surface or shade existing impervious surface?							
<b>Total RPBCWD modified Envision™ rating system Score</b>			<b>15</b>	<b>23</b>	<b>27</b>	<b>38</b>	<b>37</b>	



# RPBCWD Board Workshop: Draft Prioritization Framework Discussion

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# Envision™



Developed by:



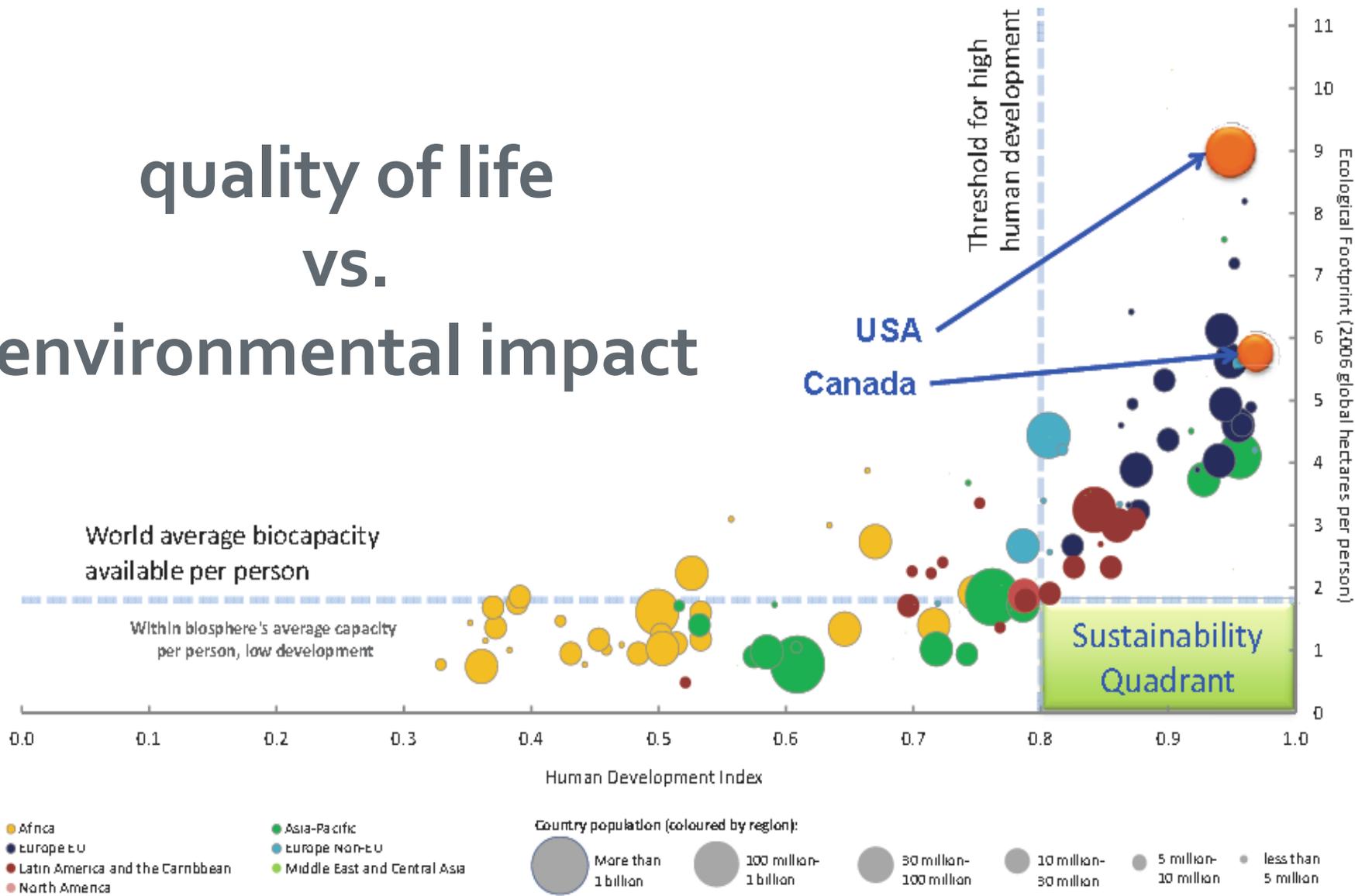
# Infrastructure built today must also serve our needs in **20 to 50 years.**

- a growing population
- a changing climate
- rising quality of life in growing nations
- resource scarcity
- cost of materials
- taxes and cash flow for infrastructure
- aging infrastructure

image source: Matt Metzger



# quality of life vs. environmental impact



Plotted by Irene Dhong, UFL ENV 6932

Figure 6: Human development index vs. ecological footprint by country (Source: Living Planet Report 2006, World Wildlife Fund).



# link to animated graphic

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[http://www.footprintnetwork.org/en/index.php/GFN/page/human\\_development\\_index\\_graphic](http://www.footprintnetwork.org/en/index.php/GFN/page/human_development_index_graphic)



# Envision™



Developed by:



# how might Envision™ be useful ?

- a shared definition of sustainability
- a checklist of design considerations for every infrastructure project
- a resource library
- encouragement for innovative infrastructure projects
- a way to place (relative) value on aspects of a project whose benefits are difficult to quantify by traditional methods



# what types of infrastructure will Envision™ rate?



## ENERGY

Geothermal  
Hydroelectric  
Nuclear  
Coal  
Natural Gas  
Oil/Refinery  
Wind  
Solar  
Biomass



## WATER

Potable water  
distribution  
Capture/Storage  
Water Reuse  
Storm Water  
Management  
Flood Control



## WASTE

Solid waste  
Recycling  
Hazardous  
Waste  
Collection &  
Transfer



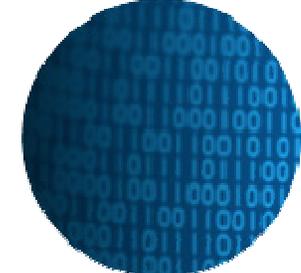
## TRANSPORT

Airports  
Roads  
Highways  
Bikes  
Pedestrians  
Railways  
Public Transit  
Ports  
Waterways



## LANDSCAPE

Public Realm  
Parks  
Ecosystem  
Services



## INFORMATION

Telecommunications  
Internet  
Phones  
Satellites  
Data Centers  
Sensors



# what types of infrastructure will Envision™ rate?



## ENERGY

Geothermal  
Hydroelectric  
Nuclear  
Coal  
Natural Gas  
Oil/Refinery  
Wind  
Solar  
Biomass



## WATER

Potable water  
distribution  
**Capture/Storage**  
**Water Reuse**  
**Storm Water**  
**Management**  
**Flood Control**



## WASTE

Solid waste  
Recycling  
Hazardous  
Waste  
Collection &  
Transfer



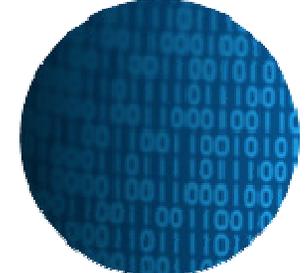
## TRANSPORT

Airports  
**Roads**  
**Highways**  
**Bikes**  
**Pedestrians**  
Railways  
Public Transit  
Ports  
**Waterways**



## LANDSCAPE

**Public Realm**  
**Parks**  
**Ecosystem**  
**Services**

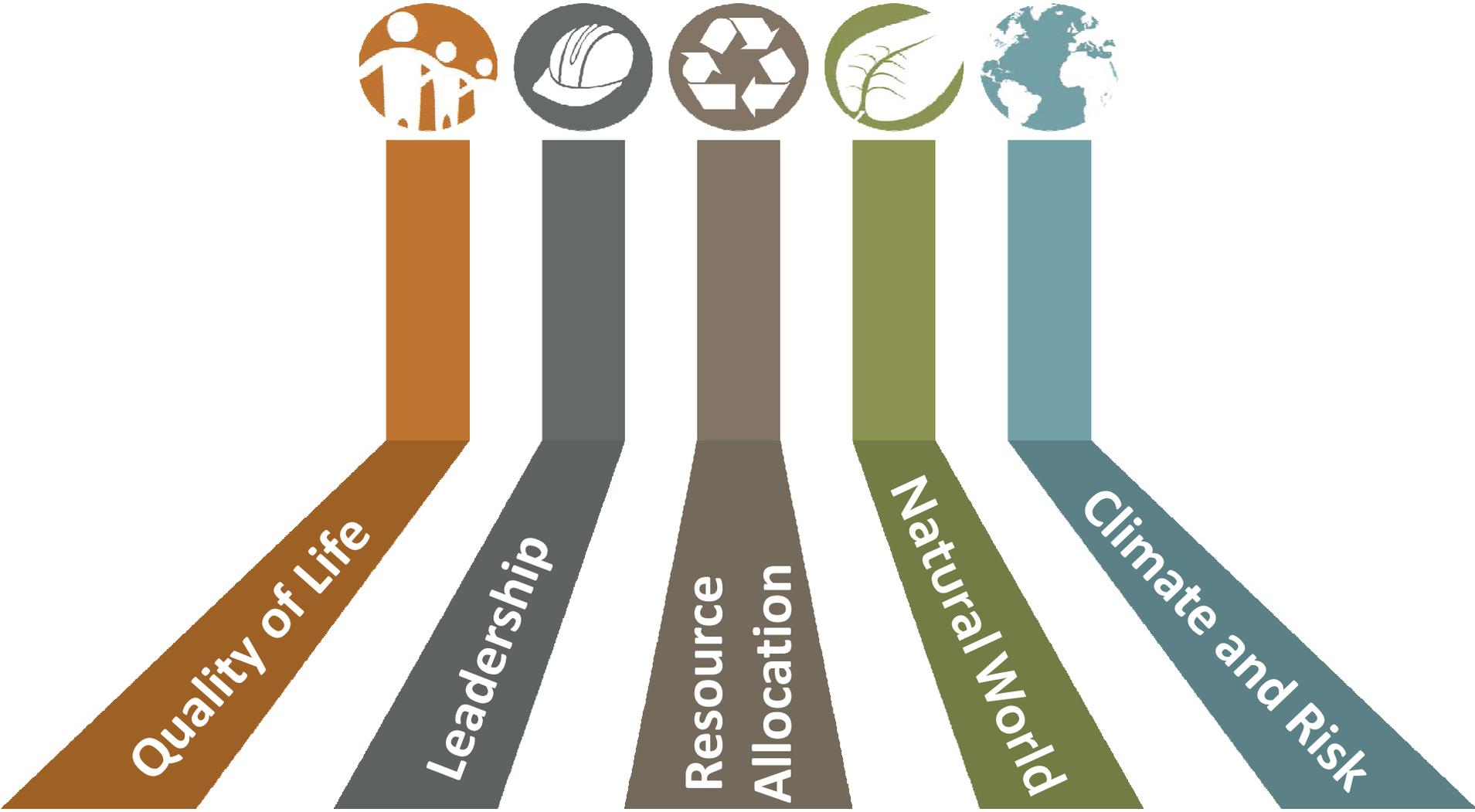


## INFORMATION

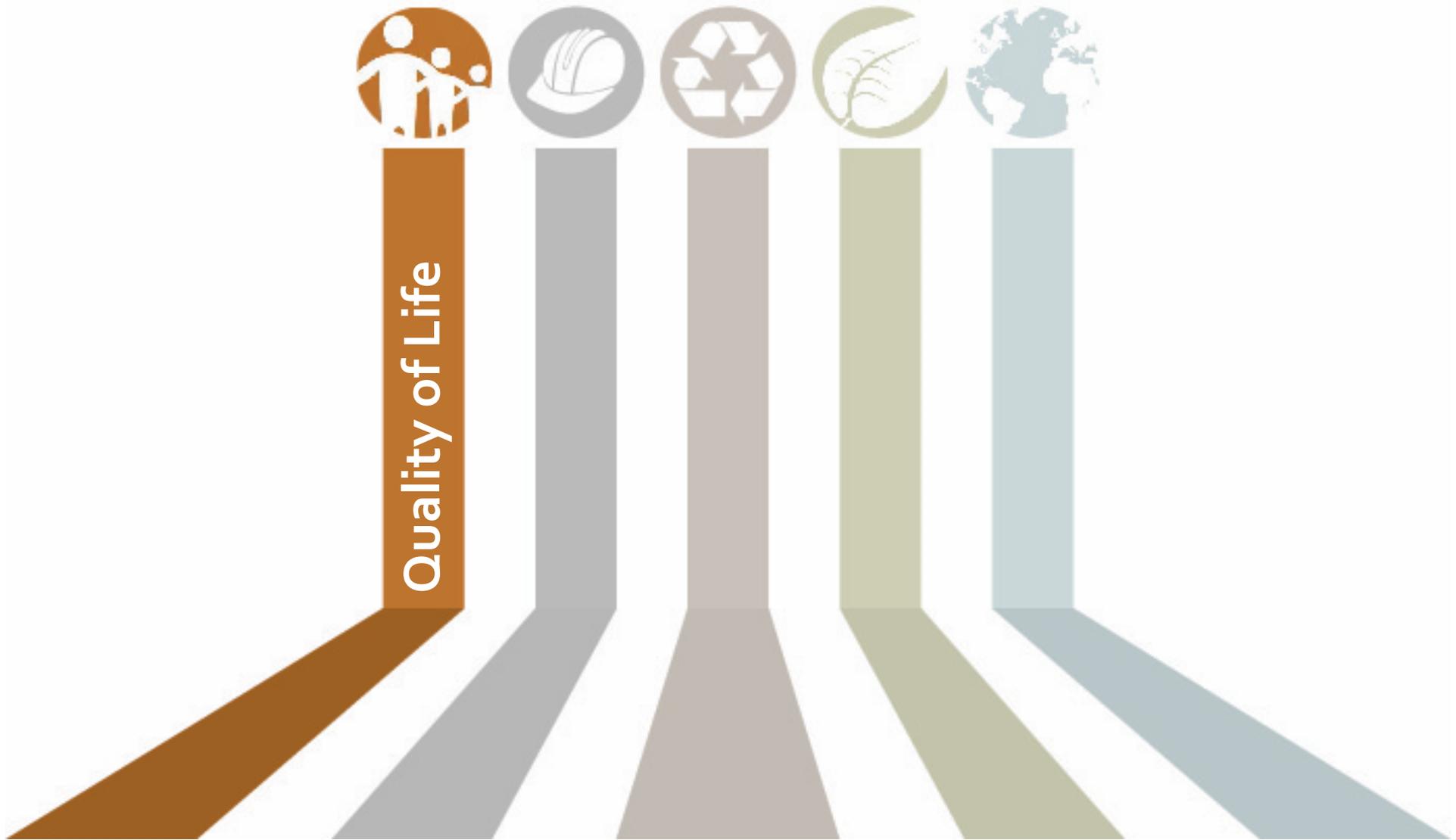
Telecommunications  
Internet  
Phones  
Satellites  
Data Centers  
Sensors



# Envision framework considers five categories



purpose, community, well-being



# purpose, community, well-being



## QUALITY OF LIFE

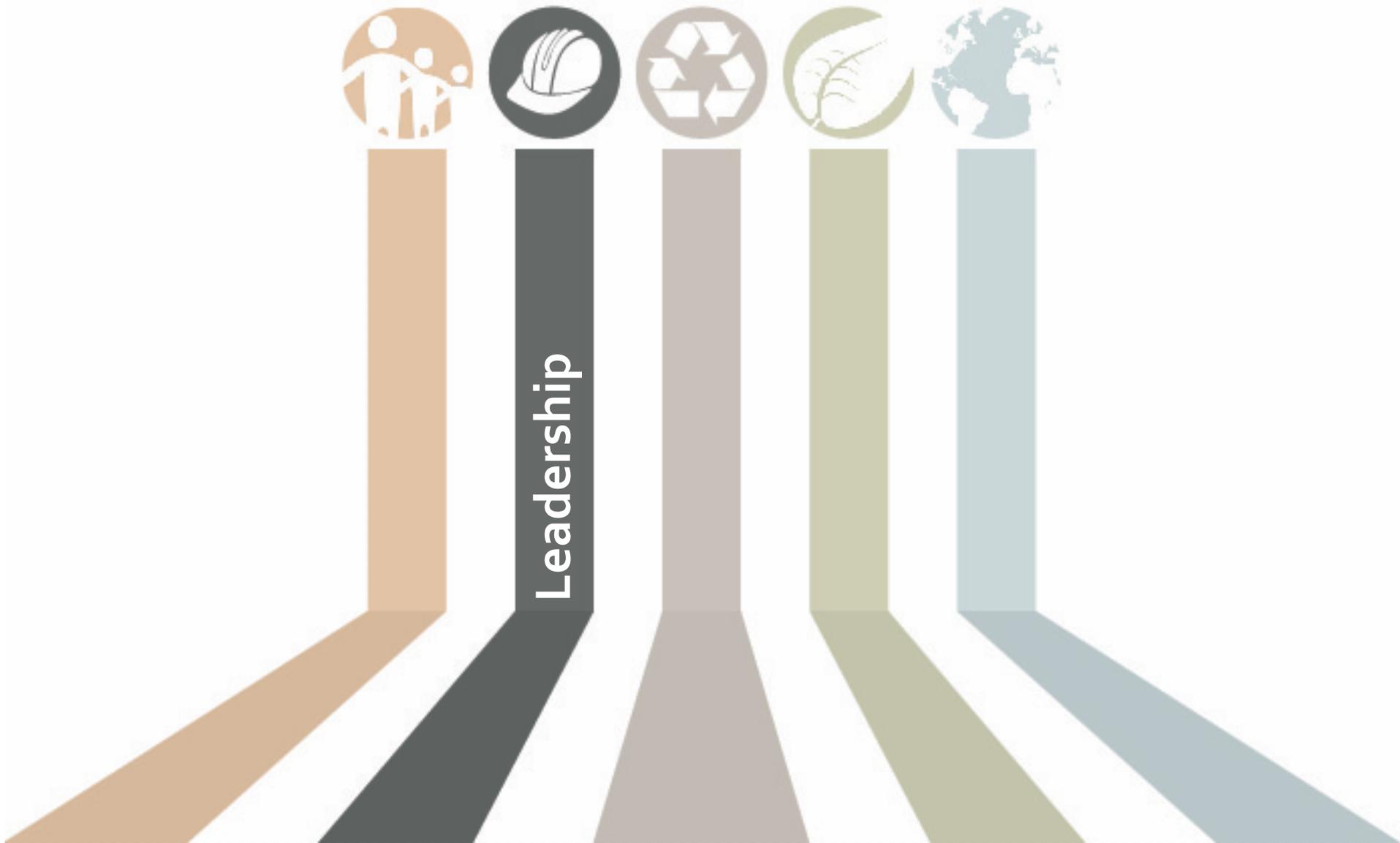
1	PURPOSE	QL1.1 Improve community quality of life
2		QL1.2 Stimulate sustainable growth and development
3		QL1.3 Develop local skills and capabilities
4	COMMUNITY	QL2.1 Enhance public health and safety
5		QL2.2 Minimize noise and vibration
6		QL2.3 Minimize light pollution
7		QL2.4 Improve community mobility and access
8		QL2.5 Encourage alternative modes of transportation
9		QL2.6 Improve site accessibility, safety and wayfinding
10	WELLBEING	QL3.1 Preserve historic and cultural resources
11		QL3.2 Preserve views and local character
12		QL3.3 Enhance public space



credits are like “building blocks”



collaboration, management, planning



# collaboration, management, planning

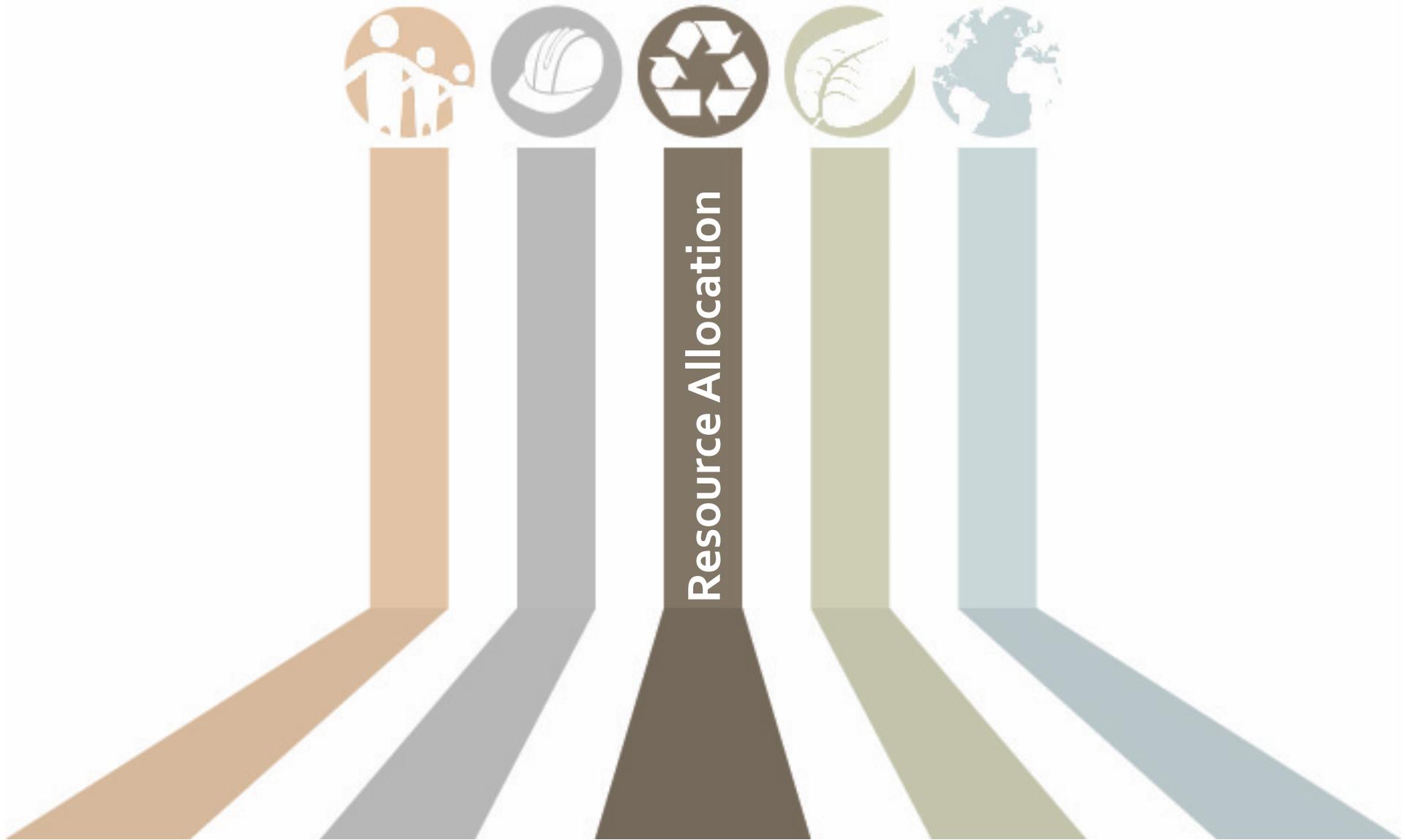


# LEADERSHIP

13	LEADERSHIP	COLLABORATION	LD1.1 Provide effective leadership and commitment
14			LD1.2 Establish a sustainability management system
15			LD1.3 Foster collaboration and teamwork
16			LD1.4 Provide for stakeholder involvement
17	LEADERSHIP	MNGMT.	LD2.1 Pursue by-product synergy opportunities
18			LD2.2 Improve infrastructure integration
19	LEADERSHIP	PLANNING	LD3.1 Plan for long-term monitoring and maintenance
20			LD3.2 Address conflicting regulations and policies
21			LD3.3 Extend useful life



materials, energy, water

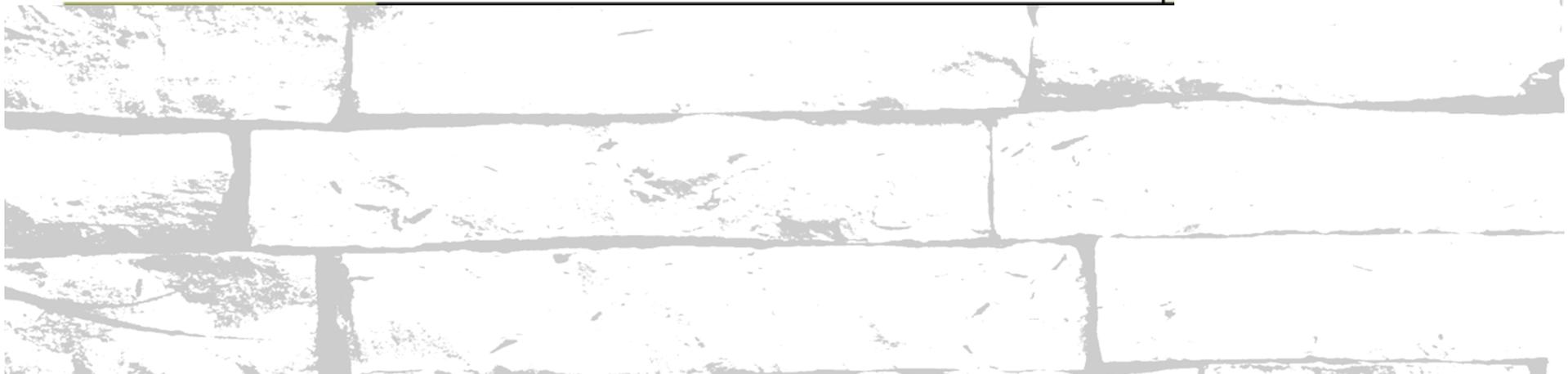


# materials, energy, water



## RESOURCE ALLOCATION

22	RESOURCE ALLOCATION	MATERIALS	RA1.1 Reduce net embodied energy
23			RA1.2 Support sustainable procurement practices
24			RA1.3 Use recycled materials
25			RA1.4 Use regional materials
26			RA1.5 Divert waste from landfills
27			RA1.6 Reduce excavated materials taken off site
28			RA1.7 Provide for deconstruction and recycling
29	RESOURCE ALLOCATION	ENERGY	RA2.1 Reduce energy consumption
30			RA2.2 Use renewable energy
31			RA2.3 Commission and monitor energy systems
32	RESOURCE ALLOCATION	WATER	RA3.1 Protect fresh water availability
33			RA3.2 Reduce potable water consumption
34			RA3.3 Monitor water systems

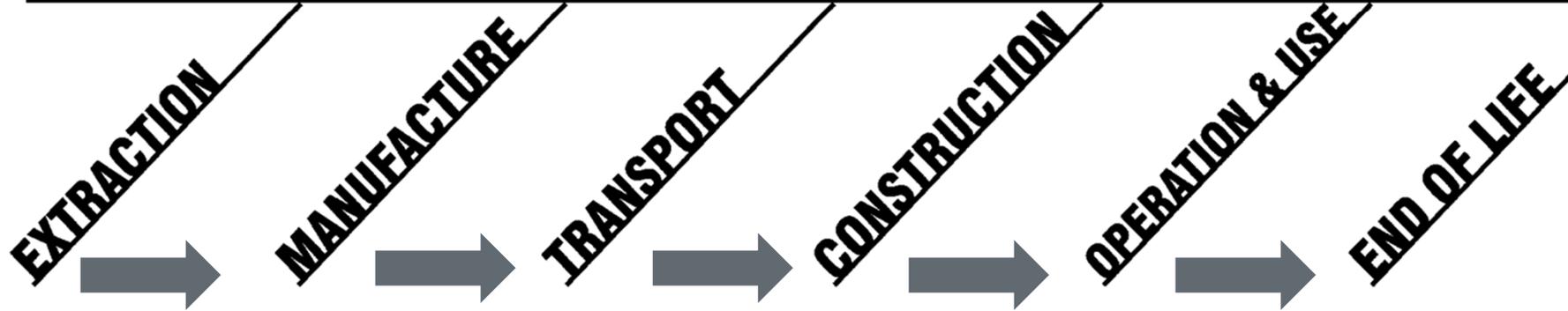
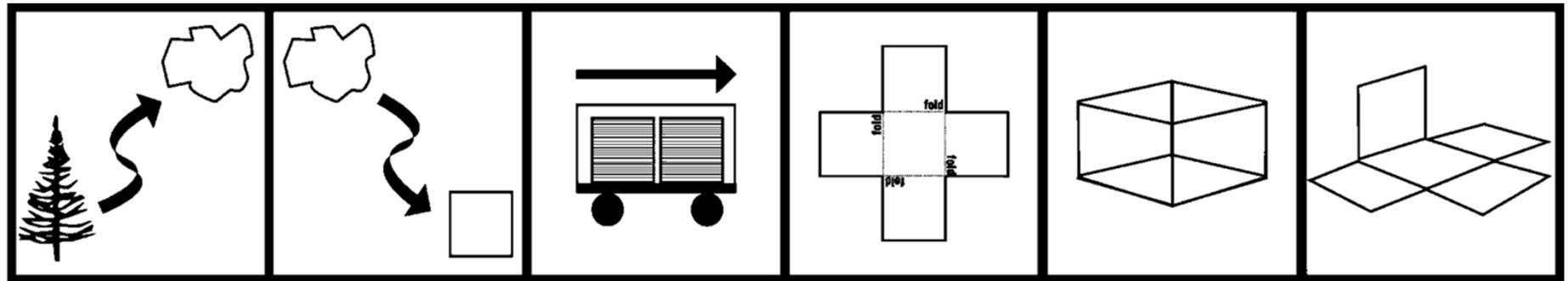


# life cycle thinking



RESOURCE  
ALLOCATION

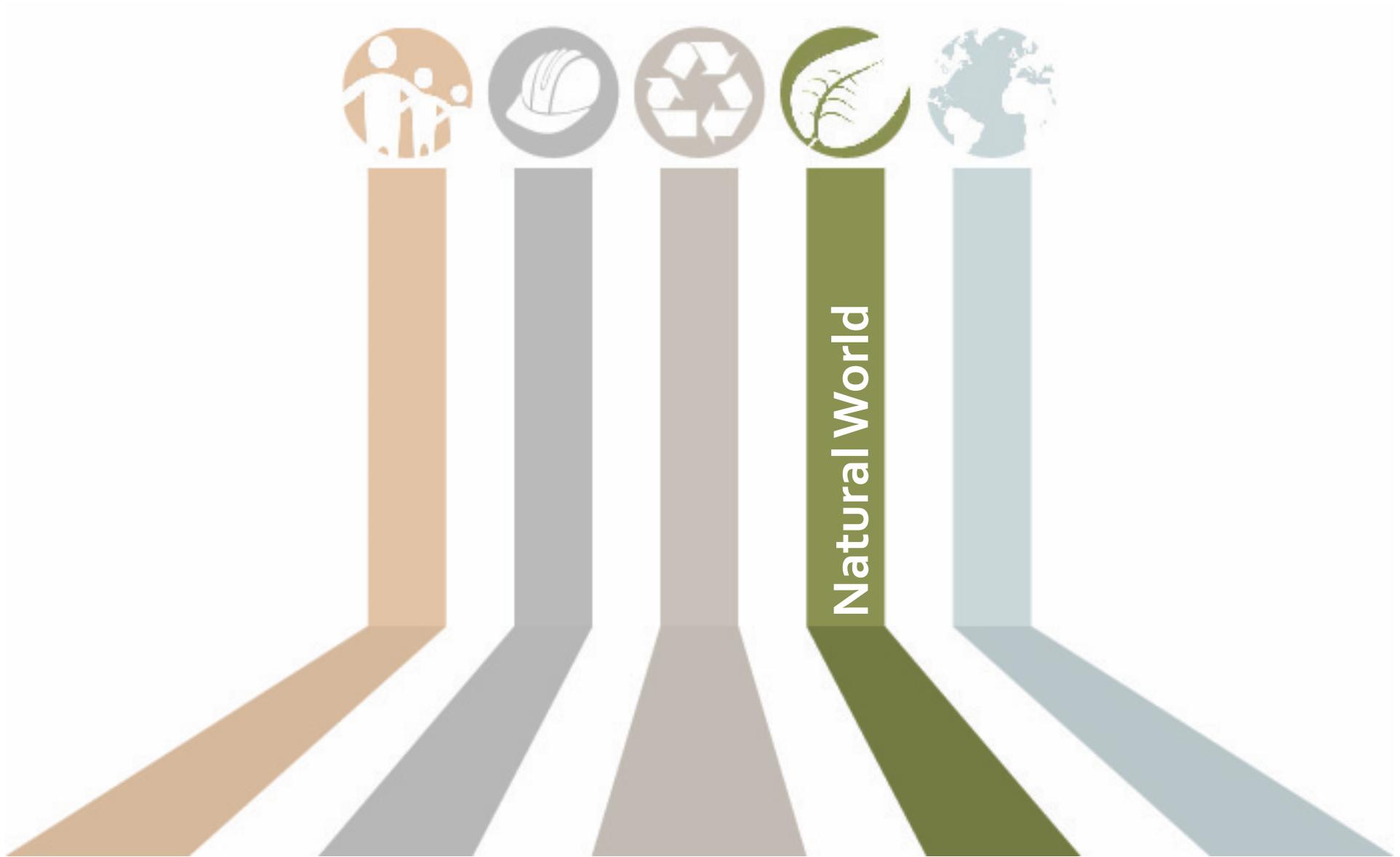
Energy, Water, Dollars, GHG, Impacts  
accumulate at each phase of a supply chain



Resources “flow” from upstream to downstream.



# siting, land & water, biodiversity



# siting, land & water, biodiversity



**NATURAL  
WORLD**

35	SITING	NW1.1 Preserve prime habitat
36		NW1.2 Protect wetlands and surface water
37		NW1.3 Preserve prime farmland
38		NW1.4 Avoid adverse geology
39		NW1.5 Preserve floodplain functions
40		NW1.6 Avoid unsuitable development on steep slopes
41		NW1.7 Preserve greenfields
42	L&W	NW2.1 Manage stormwater
43		NW2.2 Reduce pesticide and fertilizer impacts
44		NW2.3 Prevent surface and groundwater contamination
45	BIODIVERSITY	NW3.1 Preserve species biodiversity
46		NW3.2 Control invasive species
47		NW3.3 Restore disturbed soils
48		NW3.4 Maintain wetland and surface water functions



# emissions & resiliency



# emissions & resiliency



## CLIMATE AND RISK

49	CLIMATE	Emission	CR1.1 Reduce greenhouse gas emissions
50			CR1.2 Reduce air pollutant emissions
51	CLIMATE	Resilience	CR2.1 Assess climate threat
52			CR2.2 Avoid traps and vulnerabilities
53			CR2.3 Prepare for long-term adaptability
54			CR2.4 Prepare for short-term hazards
55			CR2.5 Manage heat islands effects



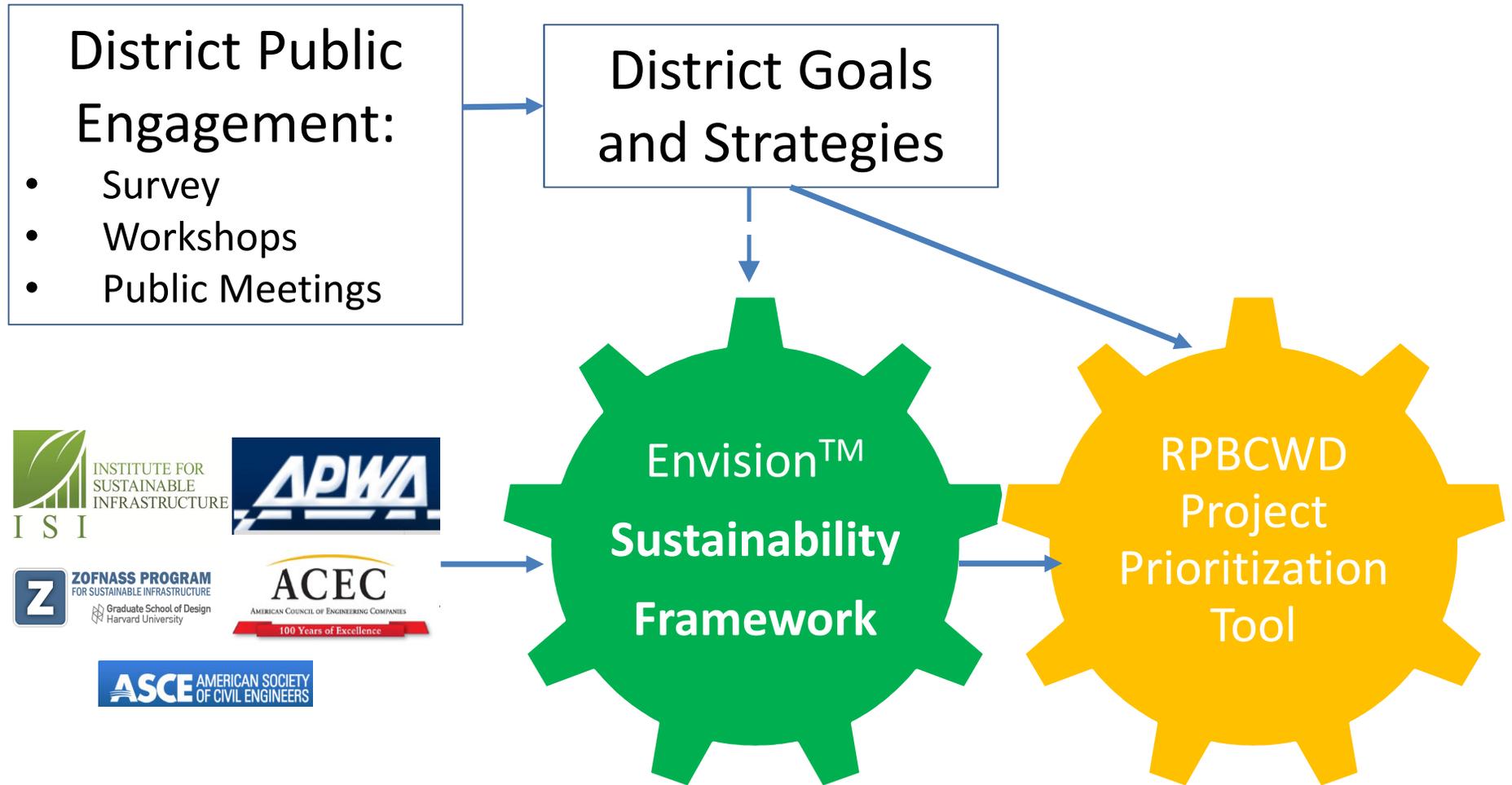
# RPBCWD's Goals and Strategies and Envision™

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- RPBCWD's Envision-based project prioritization tool is based off of a series of yes/no questions that cover all Envision credits.
- Many RPBCWD goals and strategies relate directly to Envision credits in the context of projects.
- Some do not (planning, data collection, administration)



# RPBCWD's Draft Project Prioritization Framework



Some Envision credits are “higher level” than RPBCWD strategies and warranted some extra attention

(and more possible points).

		District Strategy	Prioritization Questions
NW2.1	Manage stormwater	WQT6	Does the project reduce peak discharge rates?
		WQT8	Does the project reduce flood risk within the District?
		WQT6	Does the project reduce overall flow volume?
		WQT7	Does the project incorporate Low Impact Development (LID) practices

		District Strategy	Prioritization Questions
NW3.4	Maintain wetland and surface water functions	WQP1	Does the project address chloride loading/pollution
		WQP2	Does the project reduce phosphorus loading to, or concentrations within, District managed water resources? Separate watershed vs. in-lake treatment
		WQP2	Does the project reduce sediment loading to District managed water resources?
		WQP2	Does the project reduce other pollutant (e.g., metals, bacteria) loading to District managed water resources?
		WQP6	Is the project included in a published feasibility study or plan (e.g., City study, UAA, WRAPS or TMDL implementation Plan)?

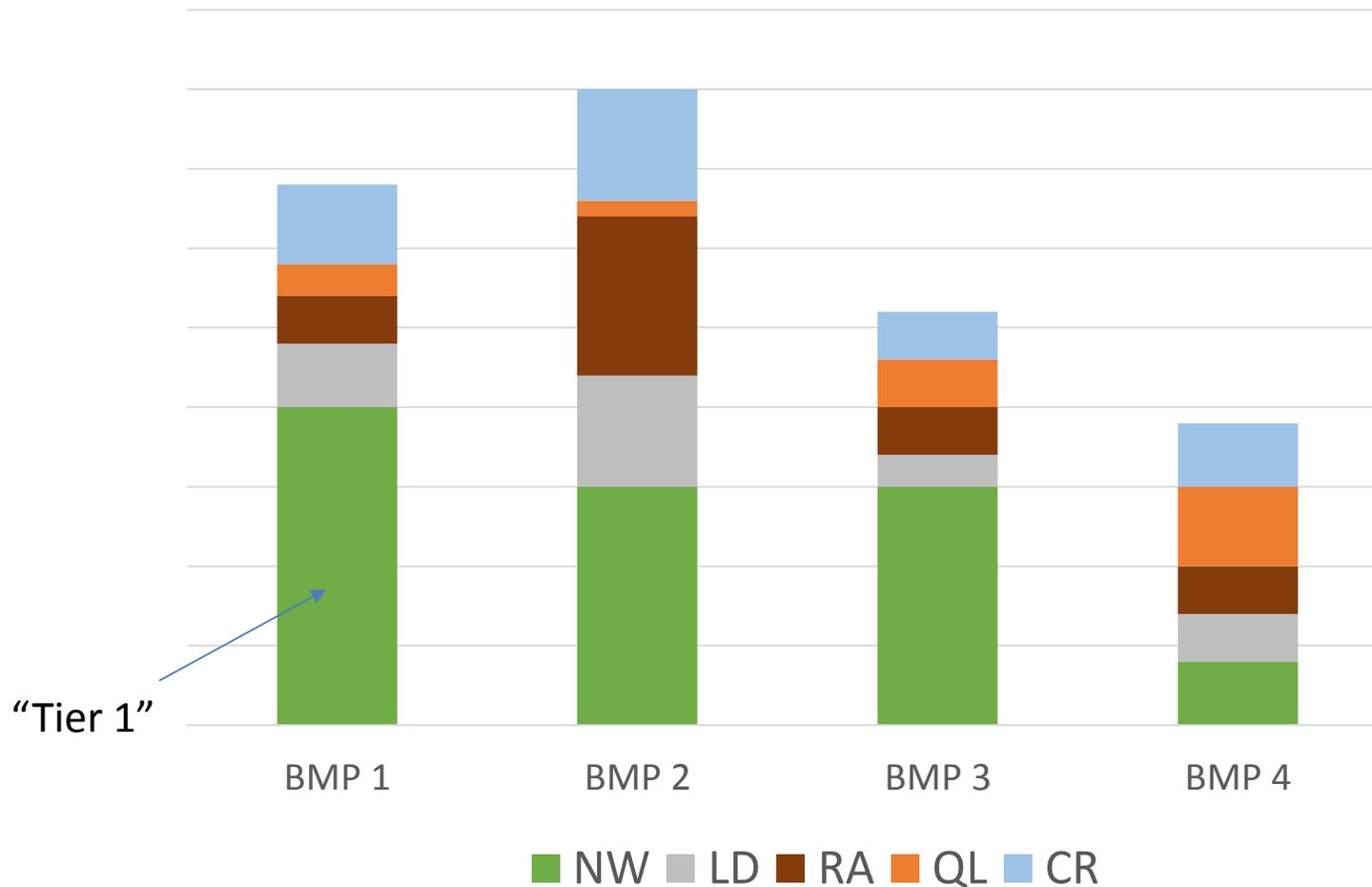


Some Envision credits are not as applicable to RPBCWD strategies, and warranted some slight modifications (e.g. Manage Heat Island Effects).

		District Strategy	Prioritization Questions
CR2.5	Manage heat island effects	<i>No District strategy</i>	Does the project reduce the amount of impervious surface or shade existing impervious surface?



# Example of RPBCWD Envision-Based Project Prioritization



# RPBCWD's Goals and Strategies and Envision™

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- RPBCWD's Envision-Based Project Prioritization Tool will not take the following considerations that affect project timing decisions:
  - Logistical considerations (coordination with LGUs and with timing of other projects)
  - Budgetary considerations



# Prioritization Process

