Research Report

ASSESSMENT AND UPDATE OF TIB URBAN PROGRAM AND SMALL CITY PRESERVATION PROGRAM

PART 1: URBAN ARTERIAL PROGRAM

by

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1 Executive Summary

This study assesses and offers recommendations for improving the "Sustainability" category of the Washington State Transportation Improvement Board (TIB) Urban Arterial Program (UAP) rating guideline. Analysis of 2008-2012 grant applications found that:

- Average Sustainability category scores were 11-13 out of 15 points.
- The number of projects receiving all 15 points in the Sustainability category has been steadily decreasing beginning with 58.9% in 2008 and ending with 26.9% in 2012.
- The top scoring credits in the Sustainability category are: (1) hardscaping and climate appropriate planting, (2) on-site grinding and reuse of pavement material, (3) adopted GHG emissions policy, (4) LID drainage, and (5) low energy streetlightling.
- The lowest scoring credits in the Sustainability category are: (1) base treatment, (2) solar powered signage, (3) adds HOV lanes in each direction, (4) completes gap in HOV systems, and (5) adds queue jump or transit only lane.

Major findings from the interviews are:

- The TIB grant process is well known, satisfactory, and results in the funding of high-priority projects with good results.
- Safety is the most common reason for undertaking a project.
- A majority of projects are funded exclusively by TIB and local funds.
- The influence of TIB scoring on project attributes varies; with more influence for smaller cities.
- Economic feasibility is the number one criterion in pursuing credits.

Overall observations from the study are:

- The sustainability category score is trending downward for unknown reasons.
- The sustainability category is not a differentiator in project scores.
- Additional credits could be included.
- There is no discussion of credit weighting.
- There is no discussion of tradeoffs.

Recommendations are:

- Encourage broader thinking in regards to sustainability. The current guidelines imply a narrow and separate definition.
- Re-label the sustainability category as "Environment" and move the modal measures to the Modal band. Most items in the current Sustainability category are related to the environment.
- Cross-list credits to reinforce the integrative and synergistic nature of sustainability. This encourages broader thinking and makes synergies between credits more obvious.
- Include credits that address construction and more credits that address non-motorized transportation. Construction credits could be given as specification language to be used.
- Write short descriptions of each credit. This would assist applicants in understanding TIB intent with each credit.

2 Introduction / Background

The Washington State Transportation Improvement Board (TIB) distributes grant funding through a variety of programs, which comes from revenue generated by three cents of the statewide gas tax, to cities and counties for funding transportation projects. The primary purpose of the TIB is to select and administer transportation projects that best address the criteria established by the Board. Each funding program has its own set of criteria used to rate project applications. Typically, the projects TIB funds would be otherwise difficult for their owners to fund independently.

2.1 Urban Arterial Program (UAP)

The Urban Arterial Program (UAP) provides funding to cities with a population of 5,000 or more and counties with urban unincorporated arterials for urban agency roadway construction projects. Project applicants are evaluated competitively based on how a project scores in a 100-point rating system. Projects must be scored in one of four "bands" (i.e., categories) that represent the general project goal: safety, growth and development, physical condition, or mobility. The maximum achievable score in a project band is 65 points. These bands are defined as they are in order to map closely to statewide transportation priorities and TIB purposes outlined in the Washington Administrative Code (WAC). The remaining 35 points must come from the two additional categories of sustainability and constructability. Table 1 outlines the TIB UAP scoring criteria.

TABLE 1. Urban Arterial Program Rating Guideline Overview

Category	**Maximum Points**	**Notes**
Project Bands (only one can be selected and scored for a project)		
Safety	65	Correct unsafe conditions, prevents human injury and property damage. Based on *AASHTO Highway Safety Manual* ideas.
Growth & Development	65	Maximize development potential. Includes measures of public/private support, development parameters, and location.
Physical Condition	65	Correct physical/structural deficiencies and prevent failure. Includes pavement and surrounding infrastructure condition.
Mobility	65	Contribute to traffic and modal capacity and network connectivity. Based on *2010 Highway Capacity Manual* measures.
Additional Categories (all projects can score points in these two categories)		
Sustainability	15	Improve project quality through sustainable design. A variety of measures addressing modes, energy, environment, and recycling.
Constructability	20	Provide a reasonable expectation of completion through funding and construction readiness.

2.2 Former Program Designations

The UAP is the specific TIB program addressed by this report. Prior to 2013, this program was split into two separate programs: the UAP and the Urban Corridor Program (UCP) that had similar, but not identical, scoring systems. Historical data used in this report comes from these two programs; therefore they are referenced in this report where applicable.

3 Research

3.1 Scope

TIB wishes to assess the functionality of its sustainability category in assessing a project's sustainability merits. Thus, this research effort focuses specifically on the 15-point sustainability category and only makes recommendations for other categories if they are directly related to the sustainability category.

3.2 Outcome

This research will develop a recommended new set of sustainability scoring criteria for use in the UAP rating guidelines for 2014. Three levels of recommendations are made:

- Update the sustainability category only. Maintain the rest of the guidelines in their current state.
- Update the sustainability category and shift some of its measures to other categories/bands.
- Reorganize the entire rating guidelines to focus on a more broad definition of sustainability.

3.3 Method

This research involves three major tasks:

- **Analyze historical records of UAP/UCP grant applicants/awardees and their rating guideline scores**. This provides an understanding of how the sustainability category scored in the past and what criteria are typically pursued or not pursued.
- **Interview UAP/UCP funded projects in order to gain understanding of how the sustainability criteria are interpreted, received, and implemented**. Specifically, 13 interviews were conducted with representatives from 13 projects funded through the UAP/UCP programs and completed within the last 4 fiscal years of the program's operation (2008-2012).
- **Make recommendations for updating the rating guideline sustainability category**. Results from the first two tasks as well as in-depth sustainability knowledge provided by the Greenroads Foundation based on their experiences with the Greenroads Rating System will be used.

4 Background

This section provides background on the 2008-2012 UAP/UCP rating guidelines analyzed for this research. Note that these guidelines differ from the current 2013 UAP guidelines but remain substantially similar in content.

4.1 Structure of the 2008-2012 UAP and UCP Rating Guidelines

Prior to 2013, projects were funded by the UAP and UCP grant programs, which were identical in terms of the application and scoring process. These rating guidelines changed slightly over the historical analysis period. According to TIB, no grant program was offered in the 2009 year and thus there are no projects for that fiscal year. Therefore, only fiscal years 2008, 2010-2012 are included in this analysis.

The 2008-2012 UCP/UAP scoring criteria were divided into 5 categories which totaled 100 points and were weighted as shown in the Table 2. The values in the table represent category maximums, representing a limit to the number of points awarded in that category. For example, a city may have achieved 20 points worth of credits in the "sustainability" category, but the city would only be awarded 15, the category maximum. According to TIB, the logic behind this truncation is to encourage a balance among the categories, rather than allowing a city to concentrate on only one or two particular categories at the expense of others. Additionally, TIB does not intend for an 'ideal' project to achieve all (or nearly all) of the available credits. Rather, the TIB included a multitude of credits to accommodate the diverse needs of the hundreds of cities it serves – the cities pick the credits which are most appealing and relevant to their individual projects. For example, the Growth and Development, Sustainability, and Safety categories have about twice as many possible points to achieve compared to their respective category maximums. Clearly credits such as the HOV lane are not applicable to many cities; whereas for other cities, the upfront construction costs of LED lighting may preclude smaller cities from achieving these units.

TABLE 2. Primary Categories in TIB's 2008-2012 UCP/UAP Rating Guideline

Overall Categories	Points
Local Support	30
Mobility	30
Growth and Development	15
Sustainability	15
Safety	10
Total	100

There were several minor differences among the 2008-2012 versions of the UAP/UCP rating guidelines, including new, reweighted, or combined credits. For example, having a greenhouse gas (GHG) policy was not worth any points in 2008, was worth 3 points in 2009 and was reduced to only 1 point in 2011. Other changes include a decrease in the total number of possible credits between 2010 and 2011, as shown in the Table 3 below.

TABLE 3. Changes in UAP/UCP Credits Between 2010 and 2011

Category	Possible Points		Number of Credits	
	2010	2011	2010	2011
GHG Policy Adopted	1	1	1	1
Modal Measures	21	15	10	6
Energy Measures	9	4	4	2
Environmental Measures	11	4	5	2
Recycling Measures	16	5	8	3

The most substantial changes to the criteria system were made between 2010 and 2011, but the structure and weight of the primary categories remained unchanged.

5 Historical Analysis of 2008-2012 UAP/UCP Projects

This section presents the analysis of historical TIB UAP/UCP grant application scores. TIB provided historical grant application data for the sustainability category of the UCP/UAP guidelines four years between FY 2008-2012 (no projects were awarded in 2009). Since 2011-2012 were the most recent version of the system that had been awarded this section focuses on the trends inferred from these years.

5.1 Results

Table 4 and Figures 1-3 show results of the historical analysis.

TABLE 4. Summary of Sustainability Category Performance (UCP/UAP FY2008-12)

	2008	2010	2011	2012
Project Mean Score (15 pt max)	12.27	13.07	12.31	11.24
% Projects > 15 pts[a]	58.9%	55.1%	21.6%	26.9%
Total Number of Projects	112	98	106	78

Notes:

a. Projects can achieve more than 15 points in the category but their score is capped at 15.

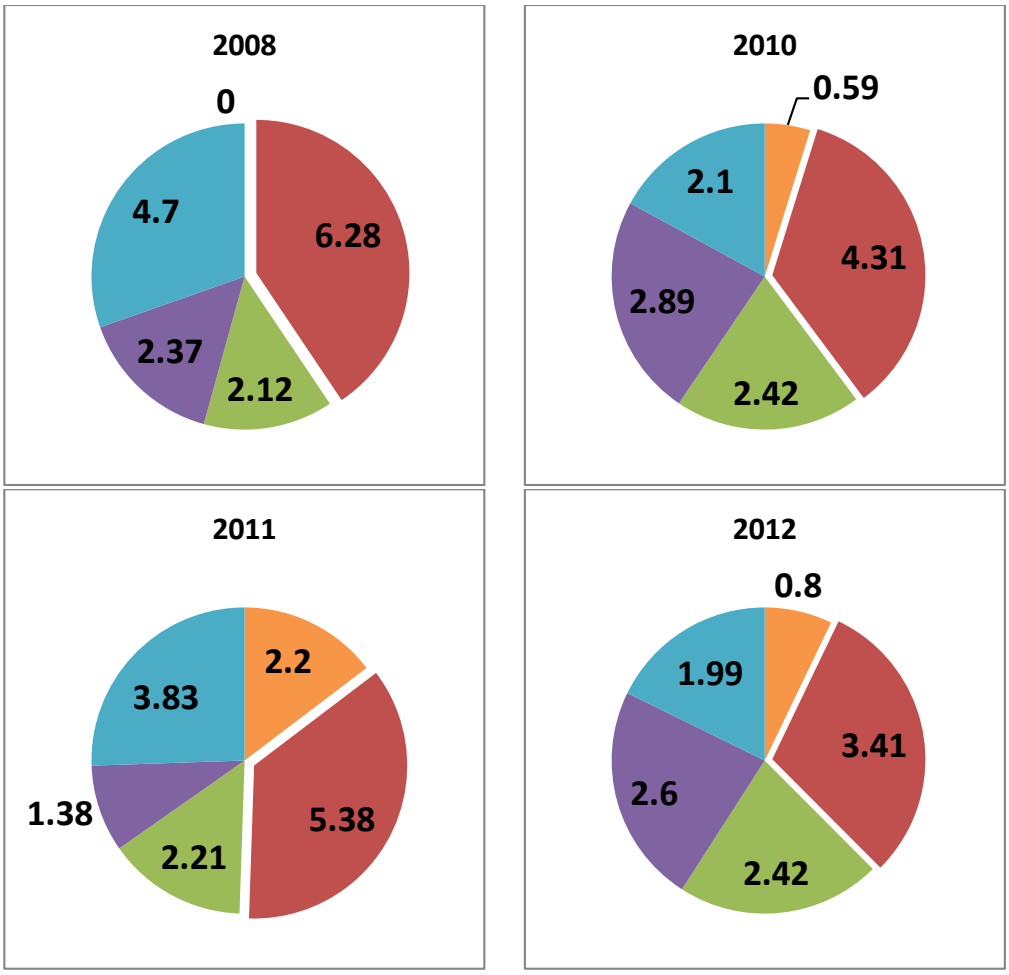

Figure 1 - Average Subcategory Performances (FY2008-2012)

Key: Red = modal measures
Green = energy measures
Purple = environmental measures
Blue = recycling measures

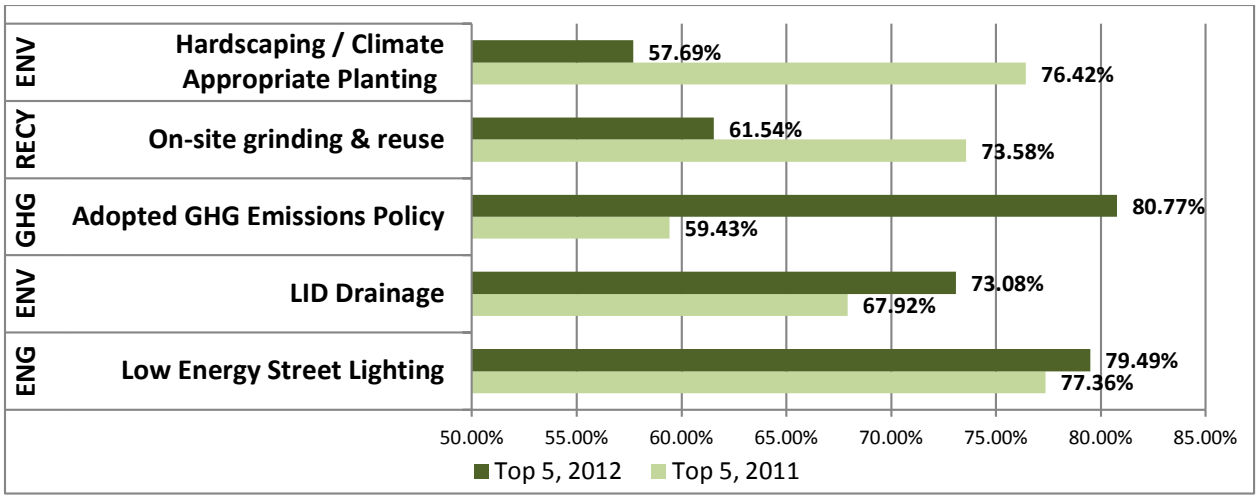

FIGURE 2. Top 5 Scoring Credits (UAP/UCP FY2011-12)

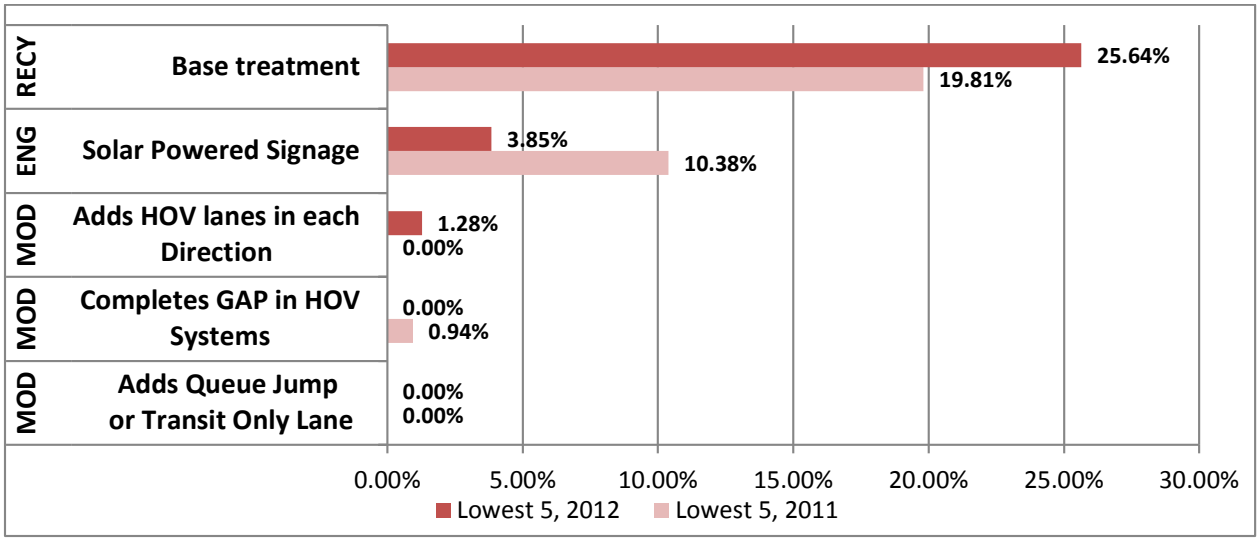

FIGURE 3. Lowest 5 Scoring Credits (UAP/UCP FY2011-12)

5.2 Observations

- In the last 2 fiscal years, the average score in each subcategory remains about the same with the most notable drop being Modal Measures (4.31 in 2011 to 3.41 in 2012). More notable is the drop in points acquired between 2010 and 2011, as well as the number of projects who max out the sustainability category in previous years.
- Although the average scores in the subcategories remained essentially the same between 2011 and 2012, there was no consistent pattern in terms of which credits were pursued.
- The same 5 top/lowest credits appeared in both 2011 and 2012, though their independent rankings within the group varied between years. This consistent popularity/unpopularity of the listed credits may indicate that these are the easiest/hardest or most/least relevant to typical city projects.

- The modal category has the highest number of credits available and many of them are not applicable for most projects (e.g., cue jump lane). Thus, it is not surprising they appear here in the lowest 5 scoring credits. Furthermore, it is interesting to note that the 5th from lowest credit (Recycle – Base Treatment) was achieved by ~20-25% projects, a significant margin higher than the next lowest category (Energy – Solar Powered Signage with 3-10%).

6 Project Interviews

This section presents the method and results from the project interview portion of the research. Overall, representatives from 13 projects funded in the FY2008-2012 period were interviewed.

6.1 Interview Selection Process and Response Demographic

TIB provided a list of 44 potential candidate projects that were geographically spread throughout the entire state. The University of Washington attempted to contact engineers from 27 different projects and received responses for 13 projects volunteering to participate in the interviews.

In order to capture a breadth of project experiences, a number of criteria were used in the selection process. The main criteria used include: population size, geographic location, project status, high/low overall scoring in sustainability, high/low scoring in subcategories within sustainability, or other rare/unique circumstances. Additionally, there is a special interest in projects who, in addition to applying for TIB funding, have also applied to become certified using the Greenroads Rating System. The rationale is that a diversity of project experiences will help reveal particular, general, and common challenges with the UAP/UCP rating guideline, application process, construction, and long-term maintenance. The final interview list is shown in Table 5 with project locations shown in Figure 4.

6.2 Interview Questions and Format

The interview process was approved by the University of Washington's Human Subjects Division (HSD) and entails phone interviews that are recorded via microphone. TIB-funded project representatives were contacted and asked whether they would be willing to share their experiences in implementing and managing a project through informed consent. To protect the anonymity of the interviewed engineers, their names are purposefully omitted and quotes or comments will be collectively referred to by city in this study. The interviews were structured around 7-10 core questions depending on the project, but some featured additional clarifying questions to encourage an elaboration of details.

The list of questions can be found in the Appendix. The questions are broadly separated into 3 categories which correspond to three broad themes:

- **Constructability and implementation**. How easy were features to implement in practice? Why were features pursued? How was 'sustainability' interpreted throughout the project?

- **Planning and documentation**. Was the rating guideline easy to follow? Was documenting evidence of implementation easy and straightforward? What factors were primary or merely considered in making decisions? How did 'sustainability' play a role in decision making?
- **Value**. Were the project features worth the financial investment? Will the maintenance procedure improve? How is the project received by the city and public? Who benefits most from the project?

TABLE 5. Projects Interviewed

City	Project	Population	App Yrs.	Status
Bellingham	James St Bridge[a]	81,900	2010	Design[b]
Colville	Third Avenue	4,700	2010	Audit
Kennewick	Steptoe Street (Phase 2)	76,200	2011	Audit
Kirkland	NE 120th Extension[a]	49,800	2010, 2011	Design
Lacey	Carpenter Road SE	43,100	2010	Construction
Lynden	Kok Road	12,000	2008, 2010	Audit
Mount Vernon	Freeway Drive	32,100	2010	Audit
Renton	S Lake Washington Road	92,800	2011	Construction
Sedro Woolley	Moore St (SR-20)	10,700	2010	Audit
Spokane	Francis Avenue	210,000	2008, 2010	Audit
Steilacoom	Sequalish Street/Lexington St.	6,000	2008, 2011	Construction
Tacoma	Alaska Street Arterial Imp. [a]	201,000	2008	Audit
Wenatchee	5th Street	32,400	2010	Audit

Notes:

a. Project has also registered with intent to certify using the Greenroads Rating System.
b. At the time of review the project was delayed.

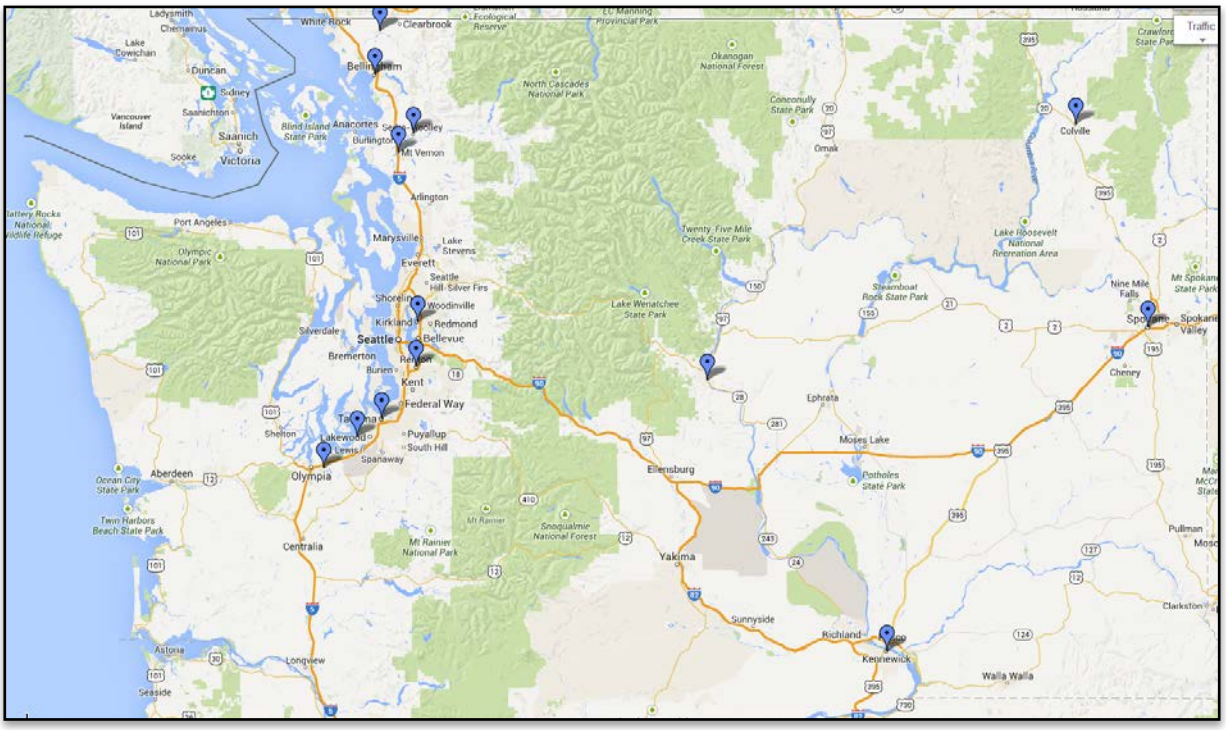

FIGURE 4. Map of interview projects.

6.3 Interview Response Summary

This section summarizes the main ideas expressed in the 13 interviews. For privacy and brevity, the transcripts of each interview are not included.

6.3.1 Cities are Generally Satisfied with the TIB Grant Process

Common among all responses were their appreciation for the TIB of Washington as an organizing, particularly noting that the grant application process was substantially easier than federal grants. Most interviewees did not recommend any substantial changes.

6.3.2 TIB-Funded Projects Are Well Received by the Public

Regardless of the projects current status (e.g. completed, in construction, or design), all cities claimed that their projects were well received by the public. Aside from emails or voice calls expressing positive opinions for projects, some cities also claimed to have received fewer complaints.

6.3.3 Most Cities Are Experienced in Using the TIB Application Process

All but one interviewee claimed to have substantial experience using the UCP/UAP rating system and writing the grant applications for them. Conversely, only the 3 cities pursuing Greenroads certification knew specifically what the Greenroads certification process involved. Some cities claimed to have heard of the system, but did not immediately see the relevance to TIB UCP/UAP rating system. 4 cities expressed their knowledge of Complete Streets, and almost all cities were familiar with LID practices.

6.3.4 Feedback for Approved Grants Is Desired

Many cities expressed that they would enjoy feedback from the TIB on approved grant applications, although cities do receive feedback for rejected applications. In other words, the cities would like to see constructive criticism for areas of improvement for future reference, even if the applications were approved. None of the cities who experienced delays (either in construction or design) attributed the delays to following the TIB guideline. One city attributed design delays to pursuing Greenroads certification for the first time too late in the design process because of the learning associated curve.

6.3.5 Cities View all of their Projects as High Priority

All projects were identified as high priority by their respective cities, many of them citing them as long-needed projects identified in their city's 6-year transportation improvement plan.

6.3.6 Safety is the Most Common Reason for Undertaking a Project

Almost all cities cited safety as the intent motivating the road improvement projects. The next most common answer was for upgrading the road to accommodate usage changes, or for urban growth and development.

6.3.7 A Majority of Projects Are Funded Exclusively by TIB and Local Funds

Most projects were financed exclusively by the TIB and local matching funds with only one quarter of the projects received federal funding.

6.3.8 The Influence of TIB Scoring on Project Attributes Varies

The funding structure of a project can impact how closely a city follows or considers the UAP/UCP rating guideline in their design process. For example, in one case a city needed to reduce the scope of their project based on the grant awarded by TIB and therefore felt the need to exhaustively scan the guidelines for appropriate credits to include. This implies that the features included may not have been included if they were not rewarded by the rating system. This approach is echoed by two other cities which claimed that they follow the guidelines carefully, performing the grant writing and design concurrently. In contrast, three interviewees claimed that the design of the project was substantially underway prior to applying for grant funds, suggesting that the rating guideline had little impact on their decision to pursue specific design features. The remaining cities generally expressed that they consider the rating guideline in their design process, conveying an attitude that falls between the previous extremes. These cities also cited city policy as a reason for including features, rather than attributing their inclusion to the TIB/UAP rating guideline. This may suggest that if these features were already part of city policy, it implies that their city design policy aligns with the intent of the UAP/UCP system: to distinguish projects for funding based for features which the organization places value on in terms of transportation sustainability, economics, access, equity, safety, and long term planning.

6.3.9 TIB Scoring has more influence with Smaller Cities

In general, smaller cities tend to follow the UAP/UCP rating guideline more closely, whereas larger cities tend to focus less on the guideline because many features that would earn them

credit are already included in their design. One explanation may be that smaller cities have smaller scopes and more limited funding and therefore they tend to set more modest design goals. Consequently, such cities will pay closer attention to the guideline to see how they may include enough features to be awarded funding. Ultimately, cities preclude credits based on applicability to their project both in terms of economics and necessity, albeit subjectively defined.

6.3.10 Economic Feasibility is the Number One Criterion in Pursuing Credits

All interviews ultimately implied that in pursuing credits, the bottom line is always economic feasibility. For example, about half the cities claimed to have excluded LED street lighting and signage due to upfront costs even though they were aware of the long term benefits such feature would provide. In terms of the rating system, the ratio of financial investment to points in the system is small, decreasing the potential motivation of a city to pursue such credit. Another city in Central / East Washington claimed that they did not include recycled material because it is more difficult to find local recycled material and the increased transportation distances for construction are substantial. The city also added that the practice of using recycled / reused material is not a common practice for cities in East or Central Washington. This is likely because such material must be transported much longer distances in non-urban areas. Based on the relative recycling scores of Eastern / Central Washington versus Western Washington cities, this is generally true East/Central cities score lower than their counterparts (with the exception of Spokane). In terms of recycled materials, most other cities provided an answer which suggested that they include recycled materials whenever it was economically feasible, or that they met the minimum WSDOT standards for recycled materials.

6.3.11 Some Sustainable Project Features were Inadvertently Omitted in the TIB Application

Some cities claimed to have added features they didn't realize could achieve credits, such as porous pavement and storm water management. These projects were awarded anyway, having scored sufficiently well overall in the UAP/UCP rating system. In contrast, two other cities admitted that they need to remove features from their project for which they were originally awarded when writing the grant application.

6.3.12 Some Cities Expedite Their Design Process for Grant Funding

To address competition for grant funds, several cities noted above have expedited their design process for grant applications by substantially completing a portion of design prior to applying for grant funding. Not only is this strategy rewarded directly by the rating guideline, but it also provides projects with greater slack time to address unforeseen potential delays. One city has claimed to even complete up to 60% of the design, including all major project features, prior to grant funding. The city believes that this helps them maximize their chances of being funded.

6.3.13 Sustainability is Poorly Understood

When asked to interpret how 'sustainability' was included in their projects, the interviewees provided a wide range of answers. Some answers suggested that sustainability was only interpreted in terms of the environmental and resource conservation. Others expressed belief that 'green' is still an expensive upfront cost and therefore impractical to include in design at

times despite knowing the long term benefits. Although all replies appeared receptive to the notion of engineering more sustainably, few were able to suggest how sustainability could be better incorporated into a road improvement project beyond what was described in the sustainability category of the TIB rating guidelines.

7 Observations

This section summarizes general observations based on the historical analysis and project interviews.

7.1 The Sustainability Category Score is Trending Downward for Unknown Reasons

The number of cities who obtain all 15 points in the sustainability category has dropped from about 50% in 2008-2010 to about 25% in 2011-2012. Unfortunately, the reason for such a drop is unclear. Three cities which applied for grant funding multiple years (i.e. a previous grant application was rejected) showed no consistency between applications: one did better, one did worse, and one performed the same. This general downward trend could be explained by more restrictive credits as written by TIB, cities realizing better value in other categories and shifting their focus there, or something else.

7.2 The Sustainability Category Is Not a Differentiator in Project Scores

Out of a possible 100 points for a project, the sustainability category can only contribute a maximum of 15 points. On average, projects obtain at least 11 of these points and one-quarter of the projects achieve all 15. Therefore, the sustainability category provides little differentiation between projects. In essence, the sustainability category could be viewed by cities as a category where a high score is readily achievable and must be obtained to be competitive. This is consistent with the original intent of the category, which was to provide incentive to include certain sustainable features that were viewed by TIB as being feasible on a typical project. In essence, the intent was to create a category that was readily achievable in order to encourage sustainable practices.

7.3 Additional Credits Could be Included

The current TIB system tends to focus on design features, and, specifically, those related to vehicular traffic. A comparison to other rating systems (the most relevant being Greenroads and the FHWA's INVEST) suggest credits addressing construction activities (e.g., quality control, construction safety, construction emissions) and non-motorized modes of transportation (e.g., bicycle and pedestrian) could be included. Credits directly addressing the environment (e.g., habitat, preservation, improvement) could be expanded and added.

7.4 There is No Discussion of Credit Weighting

The current TIB system weights credits differently (i.e., some credits are worth more points than others). However, there is no discussion as to why such weighting is used or what the logic behind the weighting is. This risks the appearance that weighting is arbitrary, when it is most likely related to the strategies and goals of TIB.

7.5 There is No Discussion of Tradeoffs

The pursuit of most credits with the TIB system involves tradeoffs. For instance, the use of LED streetlighting costs more initially (to purchase new lights) but may return more money in the long run through lower electricity usage. Or, the use of recycled materials may not be warranted if their use would require long transport distances. Some interview responses hinted at cities discovering or already knowing of these tradeoffs, however it may be simpler to explicitly state them in the rating guideline itself.

8 Summary and Recommendations

This study assesses and makes recommendations for improving the Sustainability category of the TIB UAP rating guideline. The current Sustainability category makes up 15 points of a 100-point rating guideline and generally assesses items related to transportation modes, energy, environment, and recycling. Findings from an analysis of historical grant application scores from 2008-2012 found:

- Average Sustainability category scores were 11-13 out of 15 points depending upon the year.
- The number of projects receiving all 15 points in the Sustainability category has been steadily decreasing beginning with 58.9% in 2008 and ending with 26.9% in 2012.
- The top scoring credits in the Sustainability category are: (1) hardscaping and climate appropriate planting, (2) on-site grinding and reuse of pavement material, (3) adopted GHG emissions policy, (4) LID drainage, and (5) low energy streetlightling.
- The lowest scoring credits in the Sustainability category are: (1) base treatment, (2) solar powered signage, (3) adds HOV lanes in each direction, (4) completes gap in HOV systems, and (5) adds queue jump or transit only lane.
- The top scoring and lowest scoring credits are consistent from year-to-year.
- The modal sub-category has the most points available and scores the highest.

Major findings from the project interviews are:

- Cities are generally satisfied with the TIB grant process.
- TIB-funded projects are well received by the public.
- Most cities are experienced in using the TIB application process.
- Feedback for approved grants is desired.
- Cities view all of their projects as high priority.
- Safety is the most common reason for undertaking a project.
- A majority of projects are funded exclusively by TIB and local funds.
- The influence of TIB scoring on project attributes varies.
- TIB scoring has more influence with smaller cities.
- Economic feasibility is the number one criterion in pursuing credits.
- Some sustainable project features were inadvertently omitted in the TIB application.
- Some cities expedite their design process for grant funding.

Overall observations from the study are:

- The sustainability category score is trending downward for unknown reasons.
- The sustainability category is not a differentiator in project scores.
- Additional credits could be included.
- There is no discussion of credit weighting.
- There is no discussion of tradeoffs.

8.1 Recommendations

Based on interview responses, data analysis and the preceding discussion, the following are recommended.

8.1.1 Encourage Broader Thinking in Regards to Sustainability

Through carefully chosen terminology and text, TIB could encourage cities to adopt a broader, more inclusive definition of sustainability, which might contribute to better understanding and implementation of the concept. The current guidelines given the impression of a narrow definition to include only items in the sustainability category. The roadway industry is slowly progressing to a broad definition of sustainability (although many inconsistencies still exist).

In a broad sense, the "sustainability" of a human-devised system refers to its ability to (1) exist and function within a larger system without degrading it, and (2) provide for and meet the human needs for which the system was developed. Thus, , "sustainability" in the context of roads refers to a system characteristic of a road or road network that encompasses its ability to (1) achieve the engineering goals for which it was constructed, (2) preserve and restore surrounding ecosystems, (3) use resources (including money) wisely, and (4) meet basic human needs such as health, safety, equity, employment, comfort, and happiness. Using this broader definition, the entirety of the TIB rating system could be considered sustainable. The current sustainability category is more accurately labeled as best practices that do not fit in other categories; a sort of potpourri.

8.1.2 Re-Label the Sustainability Category to be Consistent with a Broader Definition of Sustainability

While a wholesale change of the TIB categories to make them more consistent with this broader definition of sustainability is one solution, it is not advisable. Guideline categories were developed to correspond to specific statewide transportation priorities and TIB purposes outlined in the WAC. Drastically changing category themes would just muddle this correspondence. A less disruptive solution would be to split the sustainability category into two other categories: Multimodal Solutions, and Environment. One category addresses the basically human concerns with modal transportation, while the other address the environment to include recycling and energy use (both ultimately environmental concerns). The modal transportation credits could also just be included in the mobility band.

8.1.3 Cross-List Credits to Reinforce the Integrative and Synergistic Nature of Sustainability

The ultimate goal of this broader thinking is to shift the perception of sustainability as an add-on feature with separate and identifiable cost, to one of a basic characteristic of a project that should be the guiding principle in design and construction. To complete this idea, credits could

be cross-listed with other credits that are often achieved together. Additional points might be given if a series of related credits are all achieved, thus rewarding projects that provide more integrated solutions rather than piecemeal pursuit of individual credits.

8.1.4 Award More Points for Higher Levels of Achievement within Appropriate Credits

Sustainability is not a single threshold which a project either does or does not meet. Rather, it is a continuum of constant improvement. To reflect this, credits could be modified to award points in relation to the degree of achievement. For instance, the Greenroads rating system awards points for recycled material in accordance with the percentage of recycled material used. Ten percent achieves 1 point, 20 percent 2 points, and so on up to 5 points.

8.1.5 Include Credits that Address Construction and More Credits that Address Non-Motorized Transportation

These areas are generally underrepresented. Construction credits may be problematic since, by their nature, they cannot be verified until after construction. And, under the prevalent design-bid-build project delivery system an owner cannot guarantee the actions of an as-yet selected contractor unless such actions are expressly written into the contract, which is not common practice. For instance, a promise by the owner to achieve 20 percent recycled materials in the pavement structure is difficult to keep because (1) typical contracts do not require a contractor to achieve a specific amount of recycled material, and (2) if a contract did specify a specific amount, bids may be abnormally high to accommodate such a request. Additionally, funding for non-motorized transportation may not be well-received in some communities.

8.1.6 Write Short *Descriptions of Each Credit*

The current system has very little explanation of each credit beyond its title. This can lead to ambiguity and confusion regarding the intent of the credit and related scoring. A short description of each credit (no more than one page) may help with cities understanding (1) TIB's intent with the credit, (2) the credit's relationship with TIB's charter and sustainability, and (3) how the credit is scored.

9 Case Studies

This paper is accompanied by companion case studies of two cities that participated in this study: Kennewick's Steptoe Phase II project and Tacoma's Alaska Street Arterial Improvement project. These projects provide a narrative and discussion of the city's experience with planning, designing, financing, and building the project. The case studies highlight challenges and present the solutions adopted by the engineers to complete their projects. In particular, this study would like to express particular thanks to the engineers from these two cities for their time contributing their experiences.

10 Appendix – List of Interview Questions and Collected Data

10.1 Collection or Verification of General Project Data

- Project ID and Name
- City Information
- Population
- Status
- Project Intent / Scope
- Project size ($)
- Project length (mi)
- Score: [MOD / ENG /ENV / RECY]
- Year(s) Applied

10.2 Project Background (asked if needed)

- Funding Structure?
- Road classification? Project limits?
- Context in long-term transportation improvement plan?
- What challenges does your city face uniquely or uncommonly?
- What were the most sustainable features of the project (opinion)?
- What would you have done differently?

10.3 Interview Questions

1. Once a project is selected, how does a city determine which credits / points they will pursue in terms of the sustainability category?
   - Does a city determine which credits to pursue or conversely, not pursue? When is this determination made and how does the city document a credit?
   - What are the factors which motivate a city to pursue or not pursue a credit?
   - To what degree does the perceived ease of 'credit achievability' influence whether it is pursued?

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2. How does a city determine which credits NOT to pursue?
   - Have the interviewee describe and rank ~2-4 criteria that deterred them from credits
   - To what degree does the 'constructability' of the project impact this decision?

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3. For credits that a project does pursue, how well are the implemented features received by the city?
   - Are the implemented features 'working' or achieving the purpose they were designed for?
   - Is the city 'happy' with the implemented features? E.g. are the features a nuisance? Are they difficult to maintain? Is there value derived from the implemented features?
   - Who do you feel is enjoying the benefits of the features: the city? Its constituents? Both?

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4. For recycled measures, how does a project determine whether these credits will be pursued?
   - When is this determination made?
   - How does a project determine which materials are used?
   - How are these credits documented and verified?

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5. Were any delays or major project challenges introduced as a consequence of meeting TIB requirements or in attempting to achieve certain credits? (Do not include delays that are not related to criteria guideline) If so,
   - What caused the delays in your opinion?
   - How significant were the delays in terms of time and cost?
   - Could these delays have been avoided by changing the rating guideline?

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6. Does the city find the scoring system easy to use and easily to follow?
   - Is the system easy to read or comply with?
   - Do you feel that the numbers of points allocated to a credit are commensurate with the work involved in achieving it?

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7. Any suggestions for areas of improvement in criteria rating guideline? (i.e. are there credits not currently available which you believe would improve your ability to earn points?)
   - Documentation: what is your experience? How could this be made easier?
   - Verification process: same question