

Highways for LIFE: An Analysis of Survey Findings

**Report
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HIGHWAYS FOR LIFE
Accelerating Innovation for the American Driving Experience.



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16. Abstract This report summarizes the survey conducted as part of a Federal Highway Administration (FHWA) Highways for LIFE (HfL) initiative to collect feedback from key stakeholders as a program close-out activity. As part of the survey, the stakeholders were asked to provide input on how well the HfL program achieved its goals and provided potential ideas for the future. Although the HfL program is now ending, the feedback collected from the survey will be used to finalize the program's final report. It will also be used to improve and/or initiate future FHWA programs focused on innovation deployment. Additionally, this input will be used to validate or clarify the findings collected as part of the HfL focus groups and interviews conducted in September and October, 2012. The six overarching themes identified in the HfL Focus Group and Interview Report were used to analyze the quantitative survey data as a means of cross-comparing the survey results with those rendered from the two focus groups and six individual interviews. A sub-set analysis of specific questions was also conducted as a means of evaluating the data from another perspective. Due to the wealth of information collected, the survey team took care to adequately analyze all aspects of the data set both in conjunction with and separate from the data as a whole and depicted the various statistical findings within the report through a series of graphs and charts.			
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EXECUTIVE SUMMARY

BACKGROUND

This report summarizes the survey conducted as part of a Federal Highway Administration (FHWA) Highways for LIFE (HfL) initiative to collect feedback from key stakeholders as a program close-out activity. The Highways for LIFE program (HfL) was established in 2005 by the U.S. Congress to improve America's driving experience through innovative construction practices. The purpose of HfL was to advance longer-lasting highway infrastructure using innovations. An inclusive term used by HfL, innovation embodies all of the following concepts: technologies, materials, tools, equipment, procedures, specifications, methodologies, processes or practices used in the financing, design or construction of highways.

The Highways for LIFE program was established by the 109th Congress within Sections 1101 and 1502 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (Public Law 109-59). Under the topic, "Technology Transfer and Information Dissemination," the law states that, "The Secretary shall conduct highways for life technology transfer program." It further states that, "The Secretary shall establish a process for stakeholder input and involvement in the development, implementation and evaluation of the Highways for LIFE Pilot Program. The process may include participation by representatives of the State departments of transportation and other interested persons." It also states that, "The Secretary shall monitor and evaluate the effectiveness of any activity carried out under this section."

As part of the survey, the stakeholders were asked to provide input on how well the HfL program achieved its goals and provided potential ideas for the future to further:

1. Improve safety during and after construction.
2. Reduce congestion caused by construction.
3. Improve the quality of the highway infrastructure.
4. Speed up Construction.
5. Reduce Construction Costs.

Although the HfL program is now ending, the feedback collected from the survey will be used to finalize the program's final report. It will also be used to improve and/or initiate future FHWA programs focused on innovation deployment. Additionally, this input will be used to validate or clarify the findings collected as part of the HfL focus groups and interviews conducted in September and October, 2012.

One important aspect that became apparent after the survey was completed: Many survey respondents were concerned that, with the ending of Highways for LIFE, there would be no construction grant program as part of the innovation initiative. Actually, the new surface transportation act, P.L. 112-141, the Moving Ahead for Progress in the 21st Century Act (MAP-21), does, in fact include such a provision, and work is underway to institute the new grant program, using lessons learned from the Highways for LIFE program.

METHODOLOGY

Two focus groups were conducted on September 19, 2012 consisting of FHWA stakeholders from the following groups: owners, suppliers, users, and industry professionals. An additional six individual telephone interviews were conducted as a means of collecting data from FHWA stakeholders who were unable to participate in the focus groups.

Using the HfL focus group and interview analysis, the survey team, consisting of Jagannath Mallela, HfL's contract Program Manager from Applied Research Associates (ARA), Anna Grome with ARA, Stephanie Cultra with ARA, Janice Roper-Graham with Outreach Process Partners (OPP), and Alesia Za Gara with OPP, created a set of survey questions as a means of validating and/or clarifying the results.

The survey was created electronically using the online survey tool, SurveyMonkey®. Before deploying it to the target audience, the full survey was sent to a sample audience of approximately eight FHWA and ARA employees who were familiar with the FHWA programs to ensure its usability. Their changes and suggestions were used by the survey team to edit the questions as needed.

The final version of the survey consisted of 26 questions and took approximately 15 to 20 minutes to complete. It was open from December 4th through December 17th, 2012 and in order to encourage participation, two reminder emails were sent out during the two week period, one five days before the deadline (on the 12th) and one on the morning of the deadline (the 17th).

Although the survey distribution list consisted of FHWA stakeholders from the following groups: owners, suppliers, users, and industry professionals; of the 119 survey respondents, only three of them listed themselves as industry professionals while the remainder categorized themselves as owners. Additionally, not all questions were answered by 100 percent of the survey respondents and consequently some of the percentages noted are a reflection not of the total sample size, but of the total percentage of individuals who responded to a particular question.

The survey results were analyzed and then compared and contrasted with the HfL focus group and interview analysis.

RESULTS

The six overarching themes identified in the Highways for LIFE: An Analysis of Focus Group and Interview Findings report were used to analyze the quantitative survey data as a means of cross-comparing the survey results with those rendered from the focus groups and interviews. Themes address:

- Funding challenges
- Maintaining an environment for innovation
- The focus and scope of goals within the HfL program
- Doing more with fewer resources
- The lack of trust and competing priorities of both the public and policy makers
- The Federal-State relationship

A sub-set analysis of specific questions was also conducted as a means of evaluating the data from another perspective. The findings for this analysis are located after the overarching themes in the *Additional Respondent Perspectives* section.

Theme #1: Funding Challenges

All survey respondents agreed that the number one challenge facing the highways system in the United States is funding. Participants acknowledged that the seed funding provided under the HfL program created excitement, spurred the deployment of innovation, provided political cover, and increased opportunity for local media visibility¹.

Participants discussed that in order to achieve innovation; initial funding is needed to try something new. It generally costs more to do something for the first time because of the learning curve. Eventually, innovation can help reduce construction costs, but not until it has been tried a few times and worked into a streamlined procurement through construction and maintenance process, which takes time and up-front investment.

There was disappointment that follow-up programs to HfL, like the Every Day Counts (EDC) program, did not have a competitive grant component for innovative pilot projects. It was felt that this was one of the most successful aspects of HfL and a significant contributor to driving innovation that was lost when the program ended. One respondent commented, “HfL was a good program, well envisioned with innovative goals in mind.”

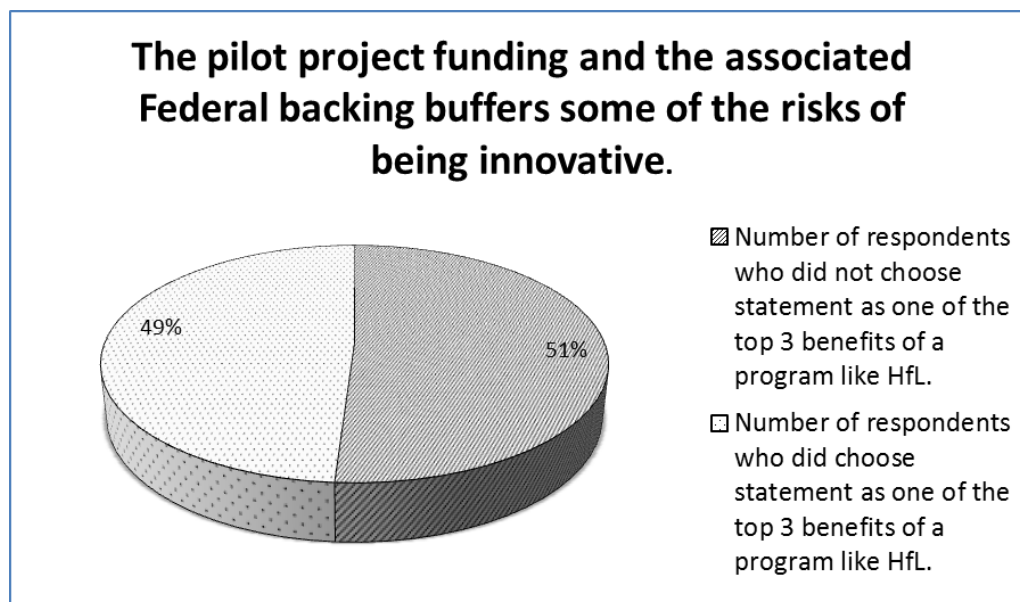


Figure 1. Pilot project funding statistic.

¹ Not all statements made within this report were quantifiable and/or represented as a percentage due to the fact that some of the statements are the result of a combination of multiple responses to a number of open-ended questions.


Rather than looking at innovation as something that is newly implemented, the focus group, interview, and survey participants suggested adopting a systems preservation program that would focus on lifecycle costs, making minimum maintenance investments through the service life of a highway system for total return on investment.

Participants expressed frustration that HfL was being discontinued and noted that the momentum to try innovation was consequently being lost. In response to the program coming to a close, one survey participant noted, “for all of the potential pitfalls and barriers, FHWA has done a great job in encouraging States to try new processes or products. I hope that a next generation of this program will continue with sufficient funding to be able to encourage the use of innovative products and ideas.”

Theme #2: Maintaining an Environment for Innovation

Some of those who participated in the focus group and interviews expressed frustration with the way in which the program’s “innovative” products were selected. This was especially true of participants whose applications for demonstration construction project grants were not successful. However, this was not necessarily the case among the survey respondents.

There was mixed response in regards to how the survey participants answered when asked on a rating scale how much they agreed with the statement: the HFL program pilot product/project selection process seems unfair and biased. Forty-seven percent of 67 respondents² either disagreed or strongly disagreed while 45 percent neither agreed nor disagreed. Of those who responded to the question, only 9 percent agreed with the statement (see Figure 2).



*“(HfL) promotes innovation with seed money.
--State DOT Official*

² Not all questions were answered by 100 percent of the survey respondents and consequently some of the percentages noted are a reflection not of the total sample size, but of the total percentage of individuals who responded to a particular question.

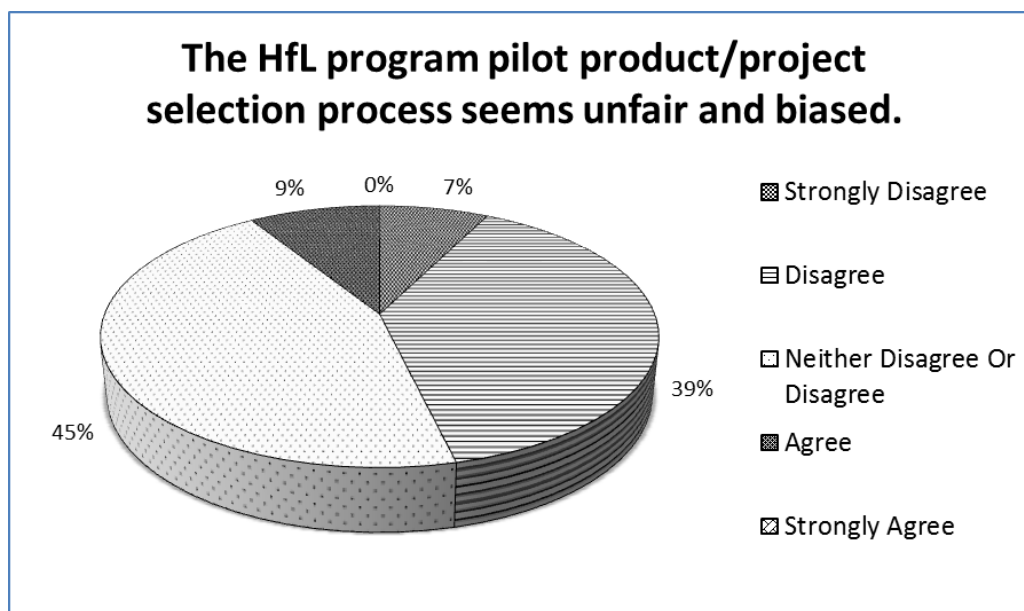


Figure 2. Pilot project selection process statistic.

Furthermore, it was concluded that the idea of innovation itself involved a lot of risk and liability for State departments of transportation (DOT), which is a deterrent for States to get involved in the program. It was said that the leadership of organizations are reluctant to embrace innovations that might fail, but the seed money provided by HfL helped negate some of the risk. Forty-nine percent out of 96 participants commented that the pilot project funding and the associated Federal backing buffers some of the risks of being innovative (See Figure 1). Some sort of “safety net” from such a risk was felt essential to deploy innovation.

The HfL program, especially the pilot grants and the peer-to-peer demonstration projects, helped overcome State DOT reluctance to try something new. When questioned by executive leadership or the media on why they were trying something new and how is it being paid for, in addition to the benefits of the innovation itself, they could also cite the funding provided by the HfL program and point to peers in other States who were doing it already.

Participants noted that it is crucial to the success of a program to have buy-in by upper management and that the programs have a true champion that will ensure its long-term success. Out of 66 respondents, 76 percent agreed or strongly agreed that champions are necessary to implement beneficial innovations. Forty-seven percent out of 45 respondents noted that having a project selected via a competitive Federal program and come with seed funding provided “political cover” to embrace innovation under HfL that is lacking in the follow-on programs.

Theme #3: The Focus and Scope of Goals within FHWA Programs

The general consensus among both the focus groups/interviews and surveys was that the HfL program and its goals galvanized attention to innovation and provided political cover for States to take risks with innovative projects. Out of 66 survey respondents, 68 percent believed that HfL goals were broad and flexible enough to fit into State priorities (see Figure 3).

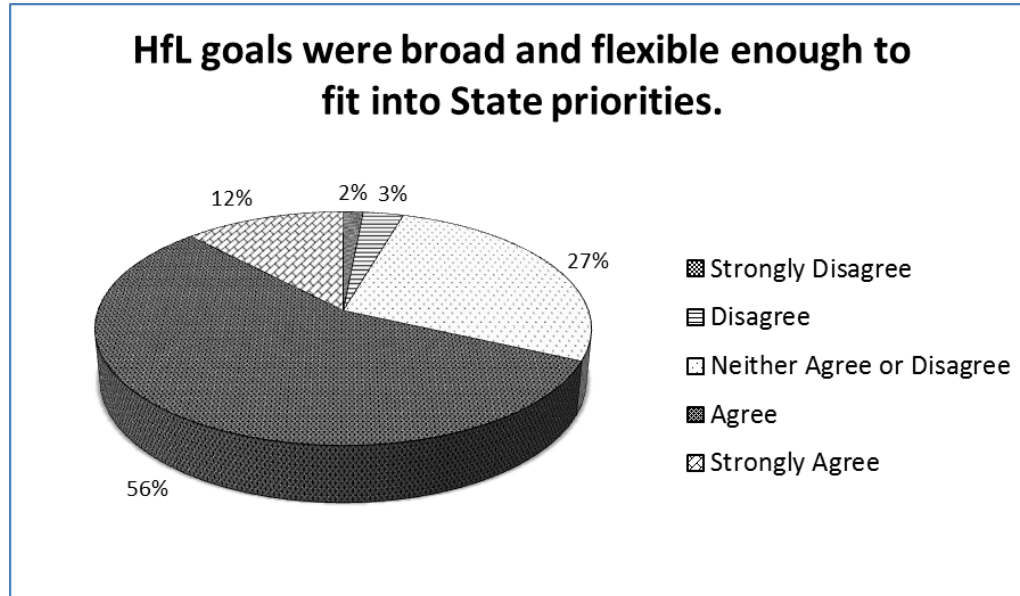


Figure 3. HfL goals broad and flexible statistic.

When asked an open-ended question about the pitfalls of HfL, a couple of survey respondents did note the need for a less prescriptive set of goals and scope. They commented that in their particular situation, they were unable to align the project HfL goals with that of their State and wished the innovations chosen by HfL had a wider range of application. In certain cases, this was a hindrance for States to apply for the Program.

In order to be more inclusive of State needs, survey respondents suggested choosing innovations that apply to the maximum number of States in the future. They recommended keeping the goals and objectives realistic which will in turn allow more States to adopt them to fit their needs. It is important to note; however, that HfL did not specify innovations for demonstration project grants. Only criteria were specified.

Theme #4: Doing More with Fewer Resources

Although funding was identified as the number one resource highway agencies needed, the lack of resources in general was acknowledged as a challenge among the focus groups, interviews, and surveys. Due to hard economic times, the participants stated that in addition to being underfunded, they are understaffed which leads to a decreased knowledge base among State agencies.

They believe that through partnership and collaboration, internally, regionally, and nationally, there will be more of an information exchange to help guide and achieve program goals. The demonstration projects under HfL provided this, at least domestically. The peer-to-peer Exchange program currently underway through EDC is carrying it forward to some extent, although without the pilot project funding to go along with the demonstrations, there is less enthusiasm to focus on EDC efforts as there was under HfL.

It was stated that programs like HfL provide technical assistance, field/office demonstrations, pilot project funding, and peer-to-peer exchanges for innovation that allow for the collection and re-dissemination of successful practices, help alleviate the lack of State resources, and create a new source of information exchange for States to use.

Theme #5: The Lack of Trust and Competing Priorities of Both the Public and Policy Makers

Focus group, interview, and survey participants all noted that the perception and attitude of both the general public and policy makers are a challenge to innovation. However, unlike the focus group and interview participants, the survey respondents felt as though HfL could have done more to market and promote innovation to the public.

Only 27 percent out of 75 respondents agreed or strongly agreed that the HfL program did a good job of marketing and promoting innovation to the public. In addition, when asked what the primary reasons that HfL achieved its goals were, only 3 percent out of 58 respondents attributed it to the fostering of public trust through positive local media coverage of HfL.

In comparison, 52 percent out of 72 respondents strongly agreed or agreed that the HfL program did a good job of marketing and promoting innovation to the highway *industry* (see Figure 4). Much of the program's success was attributed to the effect of HfL outreach efforts on the mindset and attitudes of policy makers and central leadership.

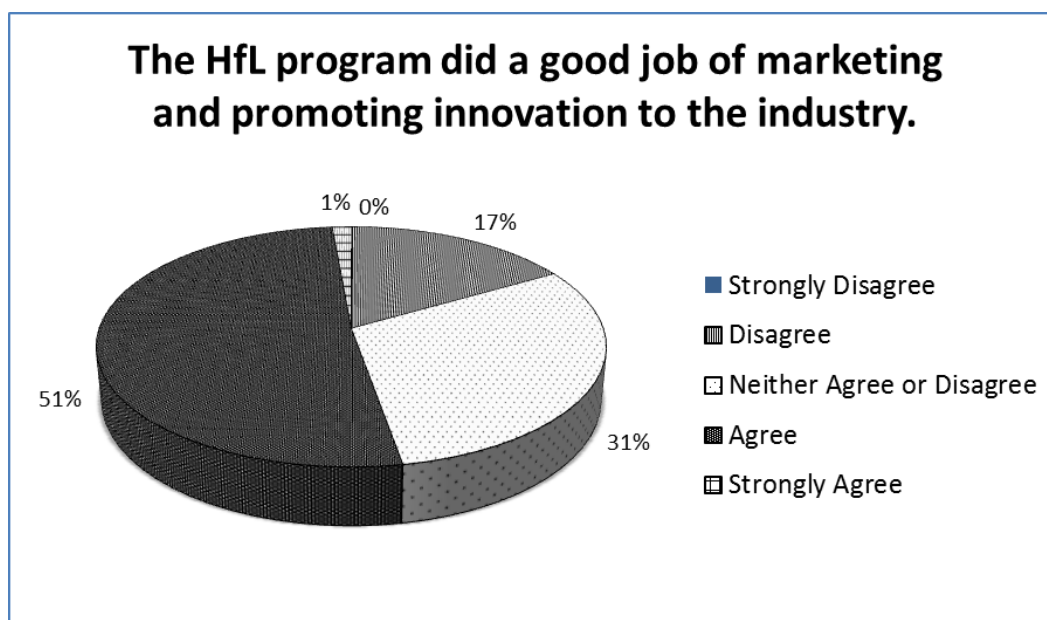


Figure 4. HfL marketing to industry statistic.

Theme #6: State-Federal Relationship

The majority of participants expressed a need for change of the current Federal regulation and control procedures. The overwhelming consensus among the participants in the focus groups, interviews, and surveys was that there needed to be more flexibility. All were disappointed that the flexibility provided under HfL has not been carried forward into other programs.

The example was given among the focus groups, interviews, and survey participants that FHWA Divisions have too much control and require many projects to go through a second level of questioning and/or review after they have already been approved once. Participants explained that FHWA should provide a central direction, not control. They believe that the way in which specific goals are achieved and projects carried out should be decided upon by the States based on their resources and agency needs. Although a second level of review was not a standard procedure for the HfL program it is noted in the report because it was a concern raised by participants.

Many participants believed States had very little say in what occurred and often times were mandated by so many requirements (e.g. user surveys for tech project and features, reporting process) that they spent more time on the mandates than they did on the actual projects.

Additional Respondent Perspectives

A sub-set analysis of specific questions was conducted as a means of evaluating the data from another perspective. Rather than evaluating the data based on themes, the survey team evaluated three questions individually to provide an in-depth look at the survey responses.

In response to survey question #15: what is the most important benefit that a Federal highway and bridge construction innovation program like HfL provides, 58 percent of the 97 respondents who answered the question stated that the most important benefit was the program's peer-to-peer exchanges and demonstrations because they enable States and the industry to learn from each other. The survey participants most valued the benefits of additional funding and resources that allow them to implement innovative technologies while minimizing the impact on State resources; both monetary and non-monetary.

When asked survey question #17: how well do you think the Highways for LIFE program achieved its set of goals, participants responded that the goal with the highest achievement rate was improve safety during and after construction. Out of the 60 participants who responded to the question, 25 percent stated that an enormous or significant amount of the goal was achieved and 65 percent stated that some of the goal was achieved (see Figure 5).

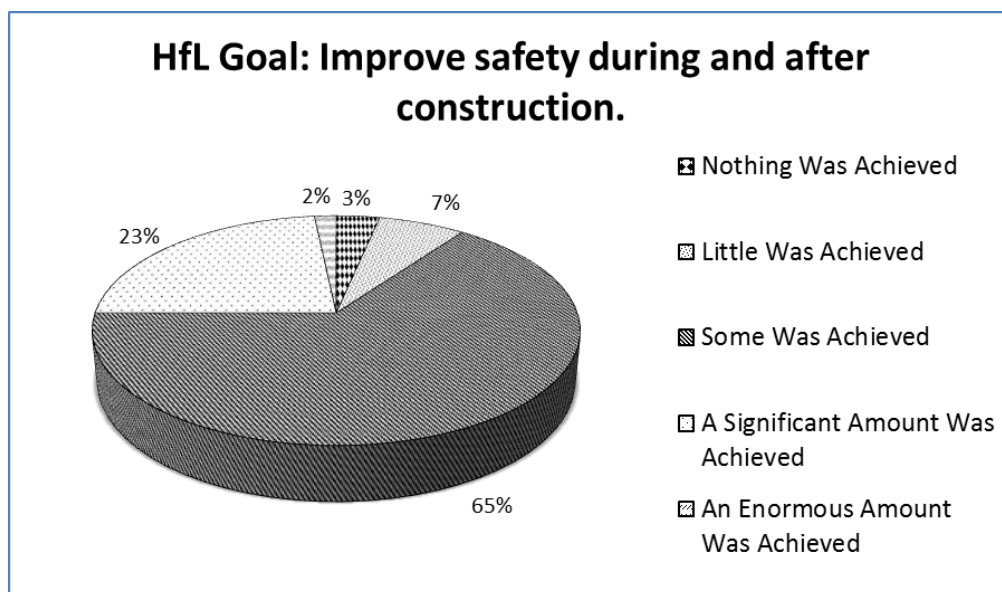


Figure 5. HfL goal with top achievement rate statistic.

When answering survey question #18: what do you think is the primary reasons that HfL achieved its goals, 55 percent of the 48 participants who responded to the question noted that the primary reason was that the pilot funding enabled the states to take risks. Similar to the results of the focus group/interview analysis and survey question 15, funding and resources are identified as why and what made HfL successful.

CONCLUSION

Among 112 survey respondents, 84 percent stated that their level of awareness and knowledge of the HfL program ranged from somewhat familiar to completely familiar, with the majority of respondents at the higher end of the spectrum. Five percent had not heard of HfL before they were contacted for the survey. Those respondents were prompted to skip any HfL program specific survey questions.

Although the level of direct involvement in the program varied amongst the participants, their overall level of satisfaction with HfL fell in the moderate-to-high range. As was the case among the focus groups and interviews, survey participants who had received a competitive grant from HfL had a higher view of the program.

The largest number of suggestions for future improvement had to do with the selection of projects, Federal oversight, and need for more support and resources. Many of the comments made by survey respondents dealt with the current lack of State resources and the need for further monetary assistance to promote the use of innovative technologies.

When commenting on any future Federal highway and bridge construction innovation programs like EDC, the overwhelming majority stated that the absence of competitive grant funding for pilot projects was a large deterrent to most States' enthusiasm to participate.

The general consensus was that the HfL program and its goals galvanized attention to innovation and provided political cover for States to take risks with innovative projects. It was discussed that the seed funding for projects created excitement, spurred innovation, provided political cover, and increased opportunity for local media visibility.

Fortunately, the new surface transportation act, P.L. 112-141, the Moving Ahead for Progress in the 21st Century Act (MAP-21), includes a provisions for a construction grants program, similar to what was pioneered in the Highways for LIFE pilot program. At the time of this writing, efforts were underway to create the framework of the new program, using the lessons learned from Highways for LIFE.

Although participants had some suggestions for future improvements, the overall tone was that HfL was a good program and it will be a loss to taxpayers now that it is gone.

HfL PROGRAM BACKGROUND

The Highways for LIFE program (HfL) was established in 2005 by the U.S. Congress to improve America's driving experience through innovative construction practices. The purpose of HfL was to advance longer-lasting highway infrastructure using innovations. An inclusive term used by HfL, innovation embodies all of the following concepts: technologies, materials, tools, equipment, procedures, specifications, methodologies, processes or practices used in the financing, design or construction of highways. The five goals of HfL were to:

1. Improve safety during and after construction.
2. Reduce congestion caused by construction.
3. Improve the quality of the highway infrastructure.
4. Speed up construction.
5. Reduce construction costs.

Since 2006, HfL has provided over \$55 million in funding for 60 projects in 37 States, the District of Columbia and Puerto Rico.

As a means of combating the many challenges plaguing America's highway system, the HfL initiative focused on proven marketing approaches and dedicated teams to deploy innovation faster and more efficiently. Using the Vanguard Technologies effort, Federal Highway Administration (FHWA) established a technology deployment process that combined multidisciplinary teams, marketing techniques and focused effort to move innovations all the way through to the implementation phase of a construction project.

Incentivized by funding, HfL has assisted highway agencies with employing proven but little-used innovations that increase safety and quality while decreasing construction times and minimizing the impact on travelers. Since 2006, HfL has provided over \$55 million in funding for 60 projects in 37 States, the District of Columbia and Puerto.

In addition to promoting the idea of innovation, HfL aimed to change the highway community's attitude towards innovation. In today's challenging environment, highway agencies must figure out how to do more with fewer resources. With limited funds and fewer staff members, agencies often view innovation as something that would require more time, delay the project, increase cost, and/or increase the risk involved with already complex projects.

HfL sought to transform this attitude and get highway agencies to see innovation as an opportunity to provide a better highway transportation service, rather than just a highway construction program.

As part of this service focus, HfL required performance goals that serve the highway user and motorist. Each HfL project involved an integrated team approach to highway delivery. The most widely used performance goals among the HfL projects were:

- The cost of the projects;
- The time to develop and advertise the projects; and
- The time it takes to construct the projects

The HfL program not only promoted a strategy change for those directly involved in construction projects, it also aimed to create awareness, inform, and educate all State DOTs and their staff. In a National peer-to-peer exchange, many of the HfL projects entailed showcases in which transportation professionals from around the country came to view innovations in person and learn firsthand what is required to deploy them. A key strategy of HfL was getting the word out on innovations and success stories to the highway motorist; user and owner agency with the goals of changing the way the nation builds highways to improve the American driving experience.

With limited funds and fewer staff members, agencies often view innovation as something that will require more time, delay projects, increase cost, and increase the risk involved with already complex projects.

In accordance with the Federal mandate to collect feedback from stakeholders at the conclusion of a program, this report summarizes the survey findings conducted as part of the FHWA's HfL program review process. Although the HfL program is now ending, the feedback collected by the survey will be utilized to improve and/or initiate future FHWA programs such as the Every Day Counts (EDC) initiative and the Highway Innovative Technology Evaluation Center.

METHODOLOGY

The HfL survey was not only intended to collect additional feedback about the HfL program, but also to validate and/or clarify the results of the HfL focus groups and interviews and collect data from a broader sample of stakeholders. Two focus groups were conducted on September 19, 2012 consisting of FHWA stakeholders from the following groups: owners, suppliers, users, and industry professionals. An additional six individual telephone interviews were conducted as a means of collecting data from FHWA stakeholders who were unable to participate in the focus groups.

Using the HfL focus group and interview analysis, the survey team, consisting of Jagannath Mallela, HfL's contract Program Manager from Applied Research Associates (ARA), Anna Grome with ARA, Stephanie Cultra with ARA, Janice Roper-Graham with Outreach Process Partners (OPP), and Alesia Za Gara with OPP, created a set of survey questions as a means of validating and/or clarifying the results. The survey team took care to mitigate response bias by avoiding double-barreled questions, and including a balance of positively-keyed and negatively-keyed questions.

Respondents were asked to answer a series of demographic, rank order, rating scale, multiple-choice and open-ended questions. The questions all stemmed from the conclusions, attitudes, and opinions revealed from the HfL stakeholder focus groups and interviews.

The survey was created electronically using the online survey tool, SurveyMonkey®. Before deploying it to the target audience, the full survey was sent to a sample audience of approximately eight FHWA employees and ARA employees familiar with the FHWA programs to ensure its usability. They were asked to consider the overall flow of the survey, time for completion, and to note any questions or response formats that were confusing and unclear. Their changes and suggestions were used by the survey team to edit the questions as needed.

The final version of the survey consisted of 26 questions comprising a combination of likert-type, rank order, multiple choice, and open-ended response formats and took approximately 15 to 20 minutes to complete (see Appendix I). It was open from December 4 through December 17, 2012 and in order to solicit more responses, two reminder emails were sent out during the two week period, one five days before the deadline (on the 12th) and one on the morning of the deadline (the 17th).

The survey distribution list was provided by the American Association of State Highway and Transportation Officials (AASHTO) and consisted of approximately 650 individuals. As was the case with the HfL focus groups and interviews, four stakeholder groups were recruited:

1. **Owners:** AASHTO, National Governors Association, National Association of Counties, Surface Transportation Policy Project
2. **Industry:** American Road and Transportation Builders Association, Associated General Contractors of America, American Council of Engineering Companies
3. **Suppliers:** American Concrete Pavement Association, National Asphalt Pavement Association, Portland Cement Association's National Concrete Bridge Council, National

Steel Bridge Alliance, National Stone, Sand and Gravel Association, American Traffic Safety Services Association

4. **Users:** AAA (formerly American Automobile Association), American Trucking Associations, American Highway Users Alliance

Although the survey distribution list consisted of FHWA stakeholders from the owner, supplier, user, and industry professional groups; of the 119 survey respondents, only three of them listed themselves as industry professionals while the remainder categorized themselves as owners. The survey respondents represented 44 States, the District of Columbia, and Puerto Rico. While the average was two respondents from each location, Florida (12), Washington State (10), and Michigan (7) had the largest number of survey respondents. The survey was not completed by anyone from Arizona, Nevada, New Jersey, New Mexico, North Dakota, or Rhode Island.

Table 1 is a representation of how the survey respondents classified their involvement with the HfL program.

Table 1. How survey respondents were involved in HfL.

Explain how you were involved with the HfL program.	Industry	Owner	Percentage
Successfully submitted for a grant and conducted a pilot project.	0	39	32%
Unsuccessfully submitted for a grant.	0	20	17%
Provided input into program policies.	0	8	7%
Reviewed grant applications.	0	10	8%
Participated in a demonstration project.	0	28	23%
Other	1	15	13%

Table 2 depicts why respondents stated they did not get involved with the HfL program.

Table 2. Why survey respondents did not get involved in HfL.

Explain why you did not get more fully involved in HfL.	Industry	Owner	Percentage
Highway and bridge construction is not my focus area.	0	6	9%
There was too much paperwork and bureaucracy required to apply.	0	4	6%
The amount of Federal oversight we'd have to deal with was not worth the amount of funding provided.	0	1	2%
We didn't really need the money.	0	0	0%
I didn't think we could win a grant because FHWA already had their minds made up.	0	5	8%
I didn't think we could win a grant because our projects are not that innovative.	0	2	3%
I was too busy to get involved.	0	5	8%
I didn't see the point of getting involved in HfL when the program will be gone in the next Federal budget cycle.	0	2	3%
I just wasn't interested in getting involved.	0	2	3%
I didn't know anything about the program.	0	14	22%
Other	2	22	37%

In reference to the question represented in Table 2: explain why you did not get more fully involved in HfL, it is important to note that the option *Other* had the highest percentage of responses. Thirty-seven percent out of the 65 respondents who answered the question choose *Other*. Respondents were given the option to explain their reasoning for choosing *Other* and the top two responses among the 24 participants were:

1. Not my area of responsibility. (42 percent)
2. Unfamiliar with the specifics of HfL and/or found the pilot projects to be unclear or misleading. (29 percent).

After the survey closed, the survey data set was cleaned-up and transformed from string to numerical data so that it could be analyzed and compared it with the HfL focus group and interview grounded theory and discourse analysis. The open-ended questions were analyzed separately. In addition to the statistical data rendered, patterns and themes in the data set were noted and illustrative quotes were identified for use in this report.

LIMITATIONS

Although the research has reached its objectives, there were some unavoidable limitations. First, because of the time limit, this research was conducted on a relatively small sample of the FHWA stakeholder population. Although a variety of stakeholders were solicited to complete the survey, most of the survey respondents belong to the owner stakeholder group and consequently the perspectives of the other key stakeholder groups (which could be quite different) are not reflected within this analysis.

The percentages noted within the findings are based on all of the survey respondents; however, it is important to note that the owner stakeholder group outnumbered the other respondents, which made it impossible to perform statistical comparisons across stakeholder groups. It was noted separately if the responses provided by the three industry professionals were different than the majority as to ensure an accurate depiction of the stakeholder group's opinions and beliefs; however, given the small sample size of industry professionals, these differences cannot be assumed to be statistically significant differences. Additionally, not all questions were answered by 100 percent of the survey respondents and consequently some of the percentages noted are a reflection not of the total sample size, but of the total percentage of individuals who responded to a particular question, further reducing the sample size.

As a means of negating the effects of these limitations, it is recommended that future research be conducted over a longer period of time as to ensure a larger, more representative sample size is analyzed. Moreover, to avoid the omission of questions, survey respondents should be mandated to answer all relevant survey inquiries and unable to proceed through the survey until they complete all requirements.

DETAILED FINDINGS

To ensure a consistent analytical framework, the six overarching themes revealed amongst the two focus groups and six individual interviews were also used to analyze and organize the survey data (Table 3). Within each of the major themes, a number of sub-themes were identified. Sub-themes will be discussed within the presentation of each theme.

A sub-set analysis of specific questions was also conducted as a means of evaluating the data from another perspective. The findings for this analysis are located after the overarching themes in the *Additional Respondent Perspectives* section.

Table 3. Overarching themes.

- 1) Funding Challenges
- 2) Maintaining an Environment for Innovation
- 3) The Focus and Scope of Goals within FHWA Programs
- 4) Doing More with Fewer Resources
- 5) The Lack of Trust and Competing Priorities of Both the Public and Policy Makers
- 6) State-Federal Relationship

FUNDING CHALLENGES

The majority of survey respondents commented that the number one challenge facing the highways system in the United States is funding³. As was the case with the focus group and interviews, participants acknowledged that the seed funding provided for pilot projects under the HfL program created excitement, spurred innovation, provided political cover, and increased opportunity for local media visibility. In response to the question: what is the most important benefit that a Federal highway and bridge construction innovation program like HfL provides, 46 percent out of 96 survey respondents⁴ stated that getting a pilot grant allows States to stretch their limited resources further. Participants commented:

Owner: *“Promoted innovations via funding.”*

Industry: *“Provided funds that identified innovative programs in highway and bridge construction that enhance safety in the different stages of the construction projects, thus, improving the overall quality of the built highway infrastructure.”*

³ Not all statements made within this report were quantifiable and/or represented as a percentage due to the fact that some of the statements are the result of a combination of multiple responses to a number of open-ended questions.

⁴ Not all questions were answered by 100 percent of the survey respondents and consequently some of the percentages noted are a reflection not of the total sample size, but of the total percentage of individuals who responded to a particular question.

Owner: “Promotes innovation with seed money.”

Out of 66 participants who answered the question, 42 percent agreed or strongly agreed that without funding for State pilot innovation projects, there is no incentive for State DOTs to support FHWA's innovation programs. However, unlike the feedback collected from the focus groups and interviews, when asked to explain their main concerns or benefits about a Federal highway and bridge construction innovation program, 32 percent out of 97 respondents who answered the question thought that the amount of pilot seed money offered by HfL was not enough to really make a difference. Respondents stated:

Owner: “The seed money is too small. Cost of new innovations is very expensive. If the seed money is only 10 percent, we have to take all the risk.”

Owner: “Another pitfall is that the amount of funding opportunities or frequency of funding opportunities seemed to continue to decline.”

Owner: “1 million dollars HfL grant is not worth the effort for larger projects.”

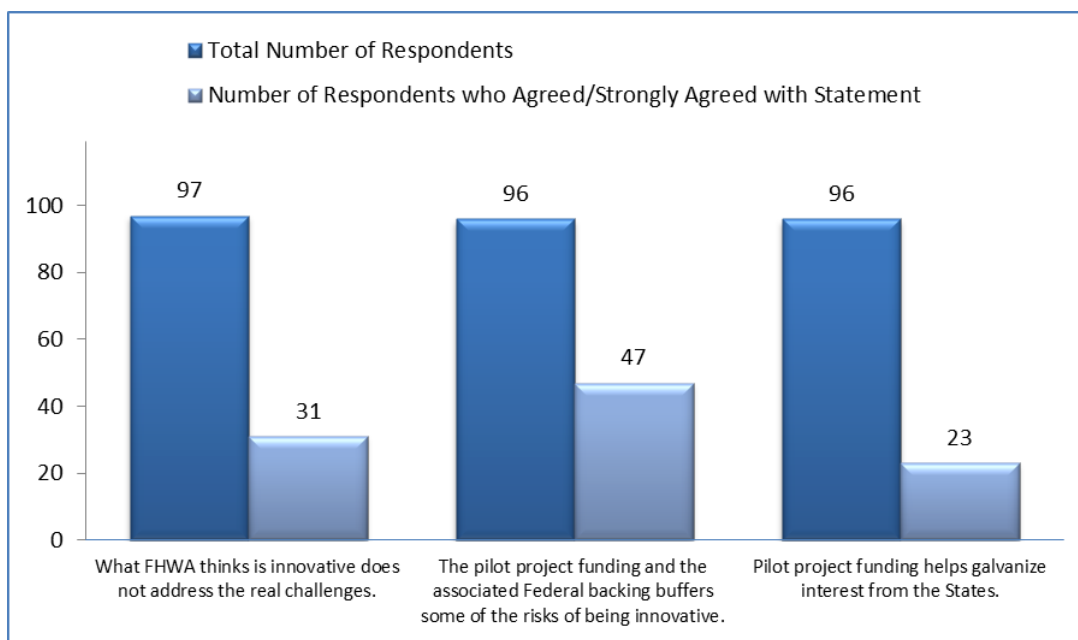


Figure 6. Funding challenges statistics-Part 1.

When asked to explain their main concerns about a Federal highway and bridge construction innovation program, 18 percent out of 97 survey respondents commented that funding for an innovation project takes dollars away from day-to-day projects. Similar to the focus group and interview participants who noted that the highway system is in a state of much needed attention and States are only being given enough resources to fix the issues in the short term, the survey respondents commented that the resources spent on programs such as HfL, take away from their

already dwindling budgets. When asked what the biggest barriers to pursuing the goals of the HfL program into the future are, respondents specified:

Owner: *“There is a high risk for States to pursue grants in such programs because there is a significant amount of money and commitment of resources that is fronted by the State which may be wasted if the grant is not given to the State.”*

Owner: *“Additional funding needed to pursue the innovated technologies.”*

Owner: *“We don't have money, resources, researchers, etc. The current "in" thing is to bleed our DOT dry.”*

Owner: *“Current State budgets do not foster support for potential participation in programs such as HfL.”*

Similar to the feedback gathered from the focus group and interviews, the survey respondents suggested that rather than looking at innovation as something that is newly implemented, the focus should be maintenance and adopting a systems preservation program that would focus on minimizing maintenance costs through the service life of a highway system so that States could preserve what they have rather than investing in a new infrastructure. In fact, when asked to explain their main concerns about a Federal highway or bridge construction innovation program, 32 percent out of 97 respondents stated that what FHWA thinks is innovative does not address the real challenges. Additionally, it was commented that the definition of innovation used as part of the HfL grant selection process was arbitrary and did not always address the needs of the State.

Respondents noted:

Owner: *“Projects should be selected on merit of need to solve a problem then innovative techniques should be a part of the project goals. Just because a bridge had been done before doesn't mean that another project in a different area shouldn't be eligible for consideration.”*

Owner: *“A pitfall of HfL was selecting acceptable projects. Many priority projects didn't meet enough of the criteria to be selected even though innovative ideas were included based on State priorities.”*

When asked: what is the most important benefit a program like HfL provides, 49 percent of 96 respondents listed pilot project funding and that the associated Federal backing buffers some of the risks of being innovative in their top three choices.

Respondents commented that the seed funding provided by HfL afforded States a form of political cover in which local politicians and the public refrained from questioning whether the

*“(HfL provided)
the invitation to
think outside the
box.”
--State DOT Official*

project should be done or not because the State already had the money to fund it without using local resources. Participants commented:

Owner: *“Programs like HfL help lay the foundation for top leadership and industry to accept and promote innovations driven contracts.”*

Owner: *“The invitation to think “outside the box”.”*

Owner: *“Changing the culture of the transportation industry for associating risk to each work item. Nobody wants the risk.”*

Twenty-four percent of the 96 respondents who answered the question commented that another important benefit of a program like HfL was that pilot project funding helps galvanize State interest. When asked an open-ended question about the greatest outcomes of HfL, participants stated:

Owner: *“The program highlighted innovative construction techniques on a project that otherwise would have gotten little recognition.”*

Owner: *“HfL program enables States to try something new.”*

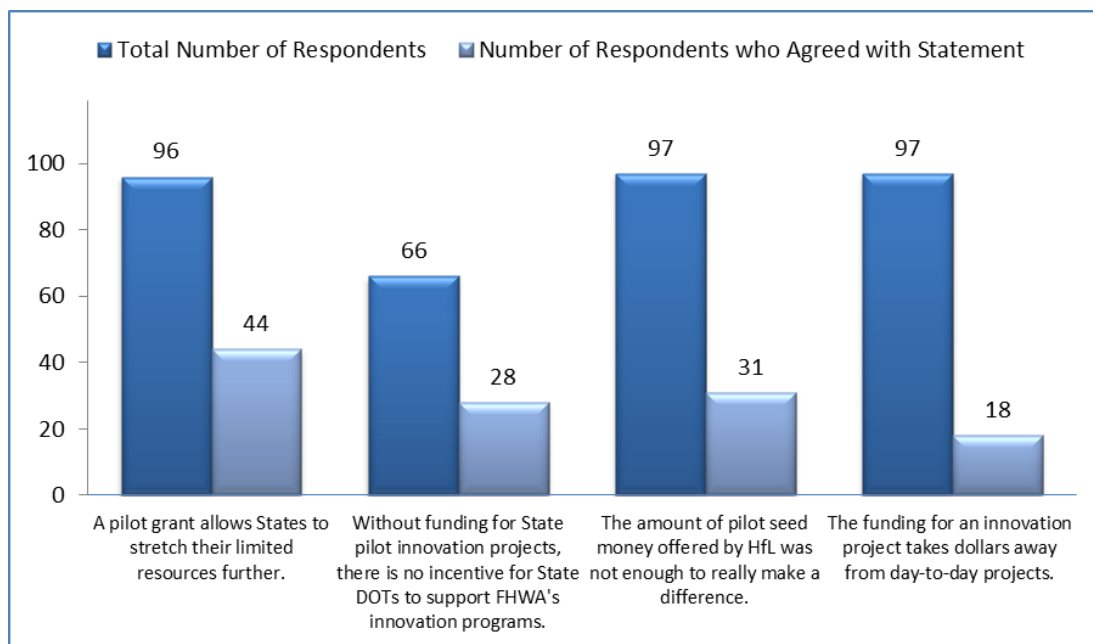


Figure 7. Funding challenges statistics-Part 2.

MAINTAINING AN ENVIRONMENT FOR INNOVATION

Some of those who participated in the focus group and interviews expressed frustration with the way in which the program's "innovative" products were selected. This was especially true of participants whose applications were not successful. However, this was not necessarily the case among the survey respondents.

There was mixed response in regards to how the survey participants answered when asked on a rating scale how much they agreed with the statement: the HfL program pilot product/project selection process seems unfair and biased. Forty-seven percent of 67 respondents who answered the question either disagreed or strongly disagreed while 45 percent neither agreed nor disagreed. Of those who responded to the question, only nine percent actually agreed with the statement which is in contrast to the opinions voiced during the HfL stakeholder focus groups and interviews.

Similar to that of the focus groups and interviews, 76 percent of 67 survey respondents agreed or strongly agreed that the HfL program should include all innovations, including proprietary product. However, in opposition to the opinions voiced in the focus groups and interviews, the survey respondents felt as though the selections were unbiased and that FHWA was inclusive of a wide range of products. The majority of participants commented the following when asked the open-ended question: what were the greatest outcomes of the HfL program:

“The (HfL) paperwork for submission is cumbersome.”
--State DOT Official

Owner: *“The implementation of processes or products that would not usually be considered.”*

Owner: *“The adoption of new technology or approaches.”*

There was one survey respondent who was in alignment with the views expressed in the focus groups and interviews. When asked what the main issues were that FHWA should consider in future highway innovation programs, he stated:

Owner: *“Exclusion of proprietary materials or methods does not seem to be in line with the intent of being innovative. Someone has to be the first to create something new.”*

When asked whether they agreed or disagreed (on a rating scale) that the HfL pilot competition, from submittal to award, took an appropriate amount of time, 51 percent of the 65 survey respondents who answered the question neither agreed nor disagreed and 22 percent agreed or strongly agreed. However, when asked to explain HfL pitfalls in open-ended question form, 52 percent of the 42 respondents who answered the question noted that the HfL application process took too long and was at times confusing. This sometimes deterred applicants from re-applying. They commented that the amount of paperwork required for a project submittal was too lengthy and reason enough not to apply. Survey respondents stated:

Owner: *“The process was time consuming and rigid for people providing applications that may not fit the mold.”*

Owner: *“There was a short time frame windows to apply for available funding, confusion about whether applying again after one project was awarded was an issue or acceptable and the application process was time consuming.”*

Owner: *“The paperwork for submission is cumbersome. Having one file with all the required forms would be helpful.”*

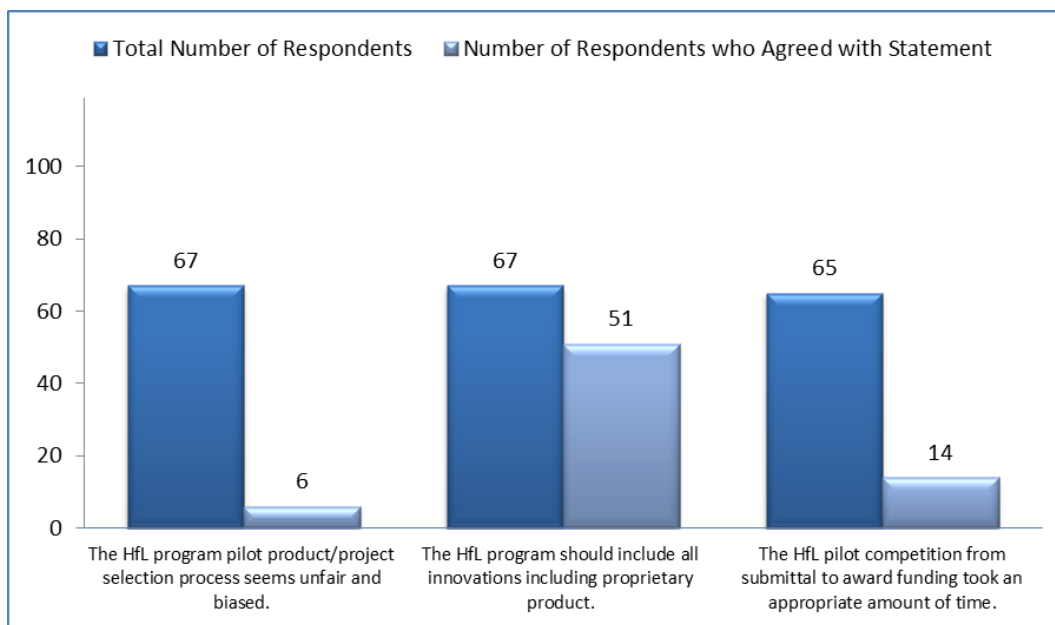


Figure 8. Maintaining an environment for innovation statistics-Part 1.

The survey respondents also noted that there were a number of administrative requirements once an application was accepted into the HfL program. They commented that the application process and administration requirements consumed resources they had not anticipated needing.

Owner: *“Way too much documentation. Too many hoops to jump through.”*

Owner: *“Grant attachments. Applicants should know that HfL has many strings attached with the grant. Those are the costs that were not calculated at the application time.”*

Owner: *“Current HfL requests after grant it is not easy to meet. Most State organizations are not set up the way that requested information is readily available.”*

Furthermore, the focus group, interview, and survey respondents all concluded that the idea of innovation itself involved a lot of risk and liability for State DOTs, which can be a deterrent for

States to get involved in programs such as HfL. In today's economy, States are already low on funding and staff and the idea of innovation represents a ton of risk without guaranteeing any reward.

Participants noted that the more support the Federal government provides, the more willing States will be to explore the idea of innovation and risk. It was said that this could be done in a number of ways, but the easiest is to create an environment in which realistic goals are set and the possibility of failure as an outcome is accepted. It was commented that HfL did this by providing flexible goals that States could tailor to their needs. Sixty-eight percent of 67 survey participants responded strongly agree or agree to the statement: HfL enabled States to try something new in a climate where failure is generally not tolerated. Survey respondents stated:

Owner: "I think a national leadership role in encouraging innovation and providing some funding to support that position was probably the greatest outcome."

Owner: "Programs like HfL help lay the foundation for top leadership and industry to accept and promote innovations driven contracts."

Owner: "Money spurred States to take risk with innovative products."

It was said by the focus group, interview, and survey respondents that the leadership of organizations are reluctant to try innovations that may fail and consequently it is crucial to the success of a program that there is buy-in by upper management and that the program has a true champion that will drive its long-term success. Both Federal and State/local champions are needed.

When asked the question: what is the most important benefit that a Federal highway and bridge construction innovation program like HfL provides, 33 percent out of the 96 respondents who answered the question believed that a program like HfL provides the champions of innovation with much needed support to succeed. Respondents noted not only do champions ensure sustainability of projects; they take risk and fault off their State which in turn creates a more accepting environment.

Industry: In response to the question, what are the biggest barriers to pursuing the goals of the HfL program into the future? "A lack of champions throughout the duration of the project."

Owner: "Innovation was successfully promoted and implemented because of central leadership."

Industry: "Public private partnership and champions in the public sector are critical complemented with a good marketing program in the media."

"Money (provided by HfL) spurred States to take risk with innovative products." --State DOT Official

The issue of project feedback and monitoring was evident among the focus group, interview, and survey responses. When asked to select the top three reasons they believe HfL achieved its goals, only 12 percent of the 58 survey respondents who answered the question thought the evaluation and feedback following a pilot project was a plus. Respondents commented that the HfL program did not provide adequate feedback to States after a project concluded and consequently there was not a good gauge as to how well a project did. Survey participants stated:

Owner: *“I think the long- term monitoring or documentation is also important so that States know how the projects or processes continue to perform, once in place.”*

Owner: In response to the question, what are the main issues FHWA should consider in future highway innovation programs? *“Develop a measure(s) to demonstrate the outcome of the program/innovations.”*

Similar to the feedback from the HfL focus groups and interviews, it was commented that the States do not have the financial resources to measure a project’s long-term success, but that such reporting would be invaluable to the State’s ability to improve their infrastructure over the long term.

Longer-term monitoring would provide additional evidence of an innovative approach's success and thus make it easier to integrate into widespread operations. Likewise, if an innovation is not successful, it can be adjusted or abandoned proactively. When asked what are the main issues FHWA should consider in future highway innovation programs, participants noted:

Owner: *“Long term economics and direct application.”*

Owner: *“Not enough time to evaluate the performance.”*

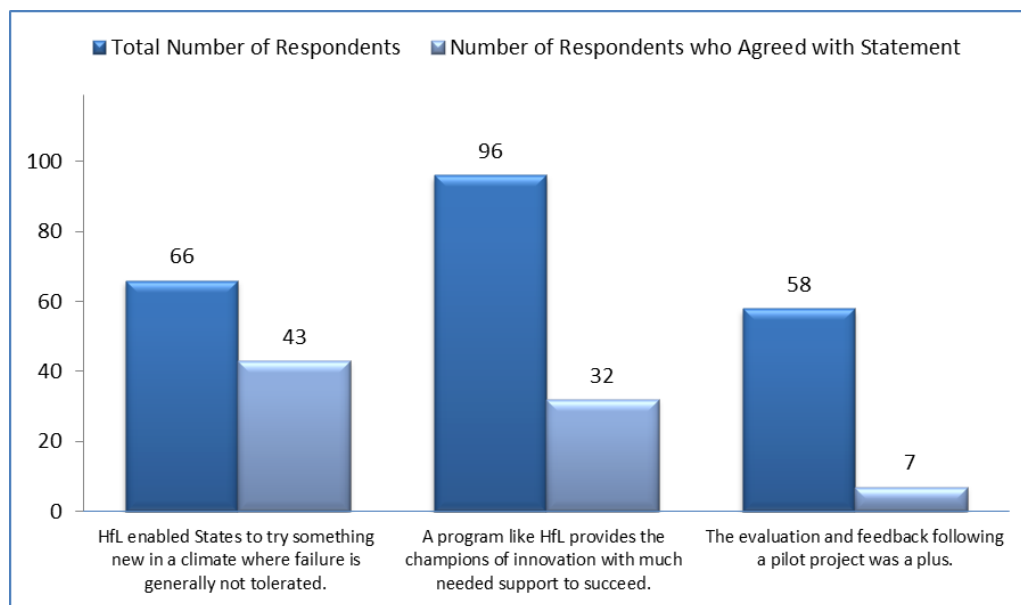


Figure 9. Maintaining an environment for innovation statistics-Part 2.

THE FOCUS AND SCOPE OF GOALS WITHIN FHWA PROGRAMS

The general consensus among the focus groups, interviews, and surveys was that the HfL program and its goals galvanized attention on innovation and provided political cover for States to take risks with innovative projects. Out of 66 respondents who answered the question, 68 percent believed that HfL goals were broad and flexible enough to fit into State priorities.

Interestingly, only nine percent out of 96 respondents choose the statement: the broad goals of such programs give participants the flexibility to focus on their own priorities while still meeting FHWA goals, as one of the top three benefits of a Federal highway and bridge construction innovation program like HfL.

This varying statistic to a similar question could be contributed to the fact that the first question specifically stated the goals of HfL were broad and flexible, while the second question referenced to FHWA programs in general and only reference HfL as an example. A participant's response could have changed based on their past experiences with FHWA programs other than HfL. Another possible interpretation is that while they agree that the HfL goals were broad and flexible, they do not see this as one of the main benefits of HfL; other factors take precedence.

When asked an open-ended question about the pitfalls of HfL, 12 percent of the 43 survey respondents who answered the question noted the need for a less prescriptive set of goals and scope. They commented that in their situation, they were unable to align the project goals with that of their State and wished the innovations chosen by HfL had a wider range of application. In certain cases, this was a hindrance for States to apply for the program.

Owner: *“Individual concepts may not apply well in certain States but those States were asked to try the concepts anyway.”*

Owner: In response to what are the biggest barriers to pursuing the goals of the HfL program into the future? *“Lack of alignment of HfL goals with those of the State DOT.”*

Owner: *“Finding a project that could fit all that the applications expected from HFL grant proposal and the allotted schedule to award was a pitfall of HfL. Documentation requirements are vague.”*

Owner: In response to the question, what are the main issues FHWA should consider in future highway innovation programs? *“Broader topics and areas for implementation.”*

“(FHWA programs should consider) broader topics and areas for implementation.” -- State DOT Official

In order to be more inclusive of State needs, survey respondents suggested choosing innovations that apply to the maximum number of States in the future. They recommended keeping the goals and objectives realistic which would in turn allow more States to adopt them to fit their needs. It is important to note; however, that the HfL program did not specify innovations for demonstration project grants. Only criteria were specified.

Owner: *“Innovations should be useful in the maximum number of States. Concepts should apply to the most common types of transportation uses and not uncommon ones.”*

Owner: *“Keep goals, objectives and expectations realistic.”*

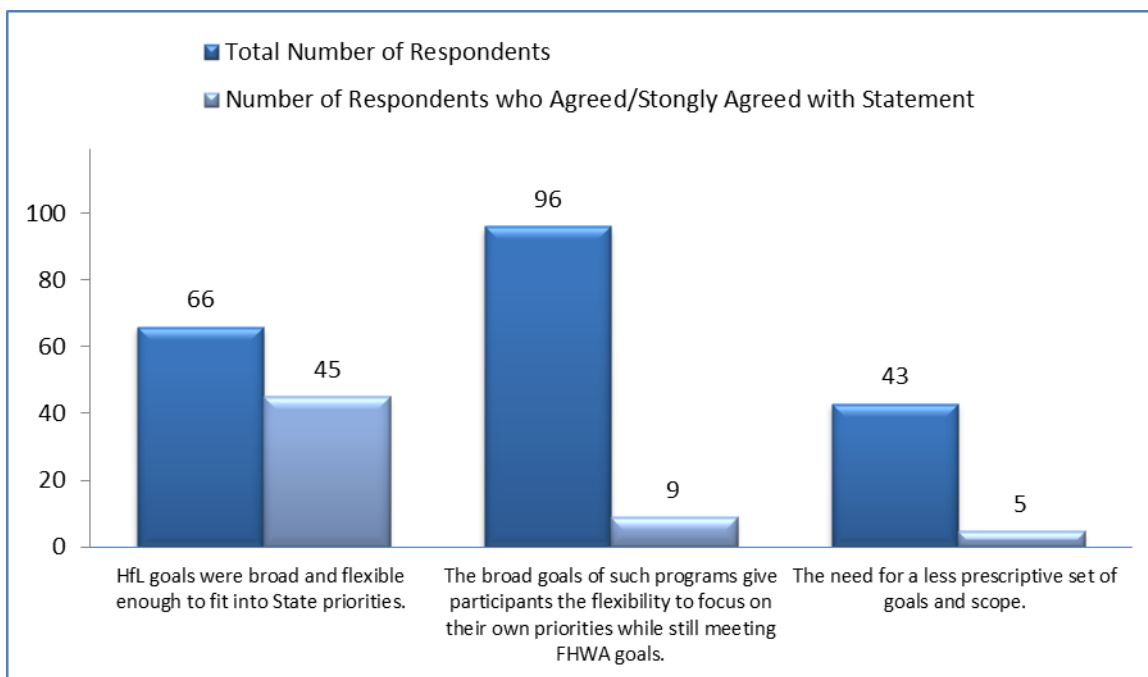


Figure 10. The focus and scope of goals within FHWA programs statistics.

DOING MORE WITH FEWER RESOURCES

Survey participants explained that in addition to a lack of financial resources, many States faced a decrease in human capital. Participants stated that in addition to being underfunded, they are understaffed which leads to an increased need for non-monetary resource assistance. When asked what one of the most important benefits of a program like HfL was, 46 percent out of the 96 respondents who answered the question stated getting a pilot grant allows States to stretch their limited resources.

Owner: *“There is a lack of resources in States to manage.”*

Similar to the suggestions made during the focus groups and interviews, the survey respondents believed that through partnership and collaboration, internally, regionally, and nationally, there will be more of an information exchange to help guide and achieve program goals.

“Funding demonstration projects promotes the use of innovation.” -- State DOT Official

When asked: what are the most important benefits that a Federal highway or bridge construction program provides, 37 percent out of the 96 respondents who answered the question, stated that the program gives States access to experts who help to implement innovation more successfully. In addition, 60 percent out of 65 respondents strongly agreed or agreed that the HfL Program allowed experts from around the country to aid States in achieving their goals while utilizing fewer resources.

Fifty-eight percent out of the 96 respondents who answered the question commented that they thought the most important benefit of programs like HfL were peer-to-peer exchanges and demonstrations because they enable States and the industry to learn from each other. The participants explained how helpful that component of the program has been in providing an exchange of lessons learned and best practices.

Owner: *“Funding demonstration projects promotes the use of innovation.”*

They noted that it not only gave States the opportunity to see how projects worked first hand, it allowed for a network of experts to meet and become contacts/resources for one another. Respondents reported:

Owner: *“Ensure results are communicated and allow opportunity for States to learn from each other on demonstration projects.”*

Owner: *“Promoting innovative designs and construction methods through demonstration projects.”*

It was stated that programs that provided additional technical assistance, field/office demonstrations, peer-to-peer exchanges, and pilot project grants allow for the collection and re-dissemination of successful practices, help elevate the lack of State resources, and create a new source of information exchange for States to use.

Fifty-seven percent of 91 survey respondents stated that providing technical experts to support States and the demonstration projects/peer contacts to implement innovations are the two most important aspects of a future program to encourage innovation.

With fewer resources, survey participants noted that the more assistance provided to States by their peers and the Federal government the better. For example, it was suggested in the focus groups, interviews, and surveys that a database with example project reports, templates, and or systematic “how-to information” be created. Not only would this provide States with an idea of what has been done in the past, it would also allow them to quickly produce the required reports etc. so that they can focus on the more critical issues of their project without exhausting resources.

Owner: In response to the question, what are the main issues FHWA should consider in future highway innovation programs? *“Providing a central location for the distribution of the Nation’s best practices for innovation.”*

Owner: *“A summary of all projects and outcomes would be informative.”*

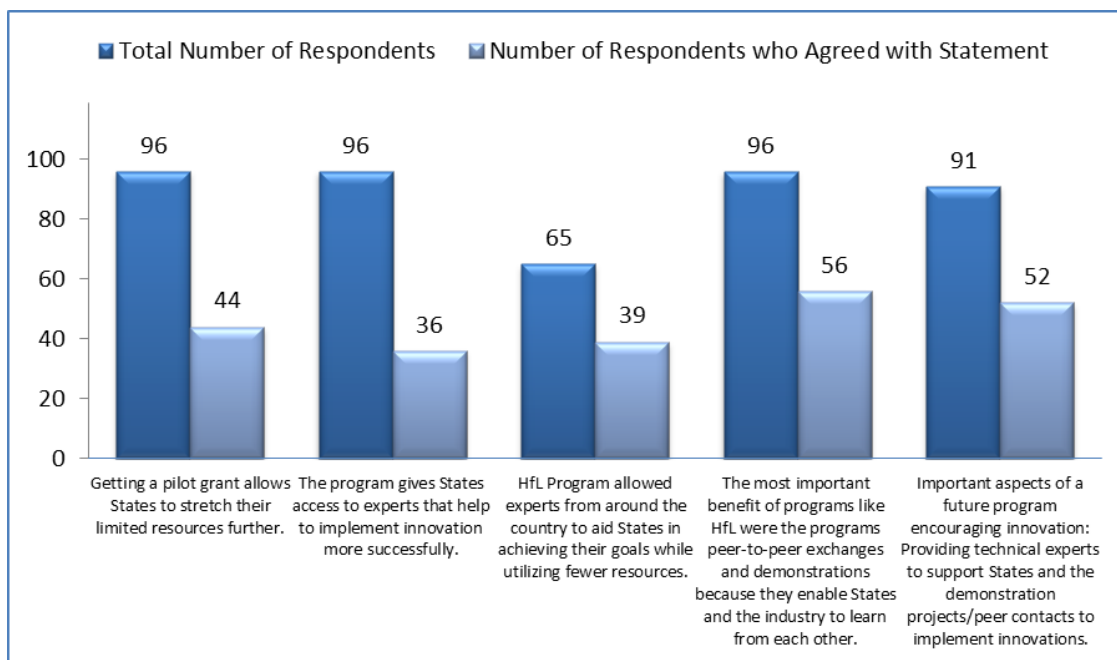


Figure 11. Doing more with fewer resources statistics.

THE LACK OF TRUST AND COMPETING PRIORITIES OF BOTH THE PUBLIC AND POLICY MAKERS

Focus group, interview, and survey participants all noted that the perception and attitude of both the general public and policy makers is a challenge to innovation. However, unlike the focus group and interview participants who stated that HfL did a good job marketing and communicating to the public, the survey respondents believed HfL could have done more to market and promote innovation to the public.

In fact, only 27 percent out of the 75 respondents who answered the question agreed or strongly agreed that the HfL program did a good job of marketing and promoting innovation to the public. When asked what the primary reasons HfL achieved its goals were, only 3 percent out of 58 respondents attributed it to the fostering of public trust through positive local media coverage of HfL. Respondent commented:

Owner: *“No matter how much FHWA feels like it was communicating and marketing the program, it’s difficult to maintain the momentum with all of the changes that States and industry go through over a decade.”*

Owner: *“Not enough education to general public and media to get support.”*

There was no further data collected as part of the survey to explain the difference of opinion in regards to the effectiveness of HfL’s public promotional efforts of the focus group/interview participants versus that of the survey respondents. This difference could be the result of unsuccessful marketing efforts within specific projects.

In comparison, out of the 72 respondents who answered the question, 53 percent strongly agreed or agreed that the HfL program did a good job of marketing and promoting innovation to the industry. Much of the program’s successes among the survey participants were attributed to the fact that the mind-set and attitudes of policy makers and central leadership was affected by HfL outreach efforts.

Owner: *“The program highlighted innovative construction techniques on a project that otherwise would have gotten little recognition.”*

Owner: *“Programs like HfL help lay the foundation for top leadership and industry to accept and promote innovations driven contracts.”*

Owner: In response to the question, what do you see as the greatest outcome of the Highways for Life Program? *“Knowledge and awareness.”*

As was discussed in the focus group and interviews, survey respondents believed the HfL program and its marketing efforts changed the way States thought about construction and afforded them the opportunity to do something other than business as usual.

Owner: *“Promotes innovation/construction techniques that may be unfamiliar to some States.”*

Owner: In response to what do you see as the greatest outcome of the Highways for Life program? *“The emphasis on innovative practices and trying something new to improve how we do projects.”*

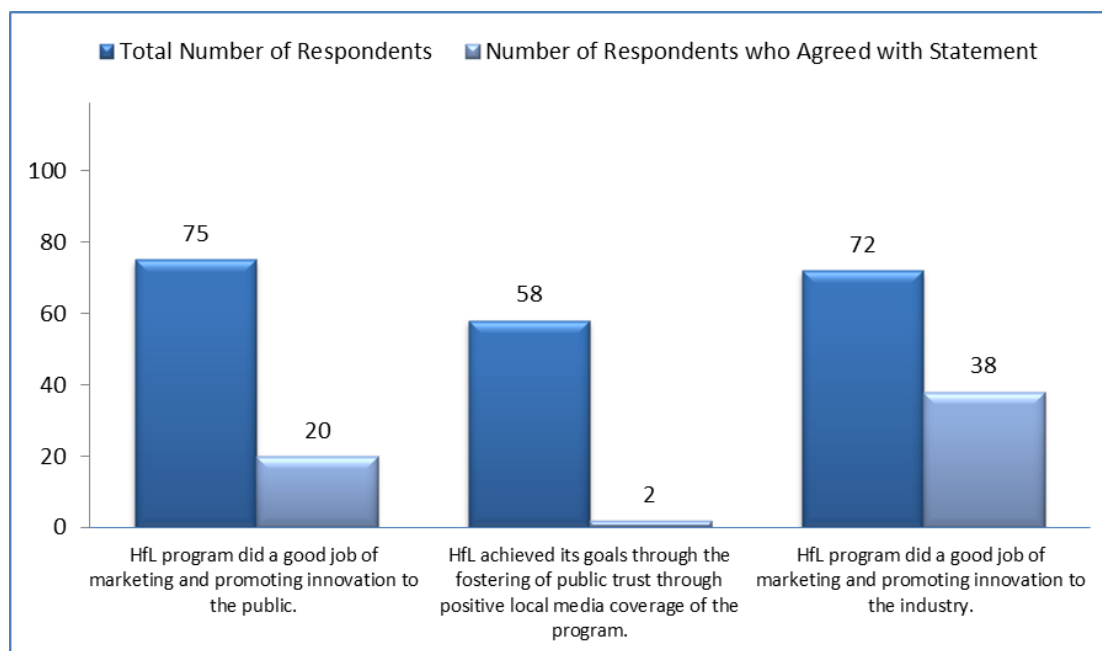


Figure 12. The lack of trust and competing priorities of both the public and policy makers statistics.

STATE-FEDERAL RELATIONSHIP

The majority of participants expressed a need for change of the current Federal regulation and control procedures. The overwhelming consensus among the participants in the focus groups, interviews, and surveys was that there needed to be more flexibility. All were disappointed that the flexibility provided under HfL has not been carried forward into other programs.

When asked about the main issues FHWA should consider in future highway innovation programs, 36 percent of the 42 survey respondents who answered the question noted that there needs to be less regulation and that there are too many requirements attached to several of the FHWA programs. Many participants felt as though States had very little say in what occurred and often times were mandated by so many requirements that they spent more time achieving the mandates than they did on the actual projects.

When asked to explain their main concerns or benefits about a Federal highway and bridge construction innovation program, 66 percent of 97 survey respondents believed programs like this are just another layer of Federal bureaucracy. Participants commented:

Owner: In response to the question, what were the greatest pitfalls of the HfL program?
“Strings attached.”

Industry: In response to the question, what are the main issues FHWA should consider in future highway innovation programs?
“Letting individual States lead the collaboration without the FHWA needed to control and take credit for innovation.”

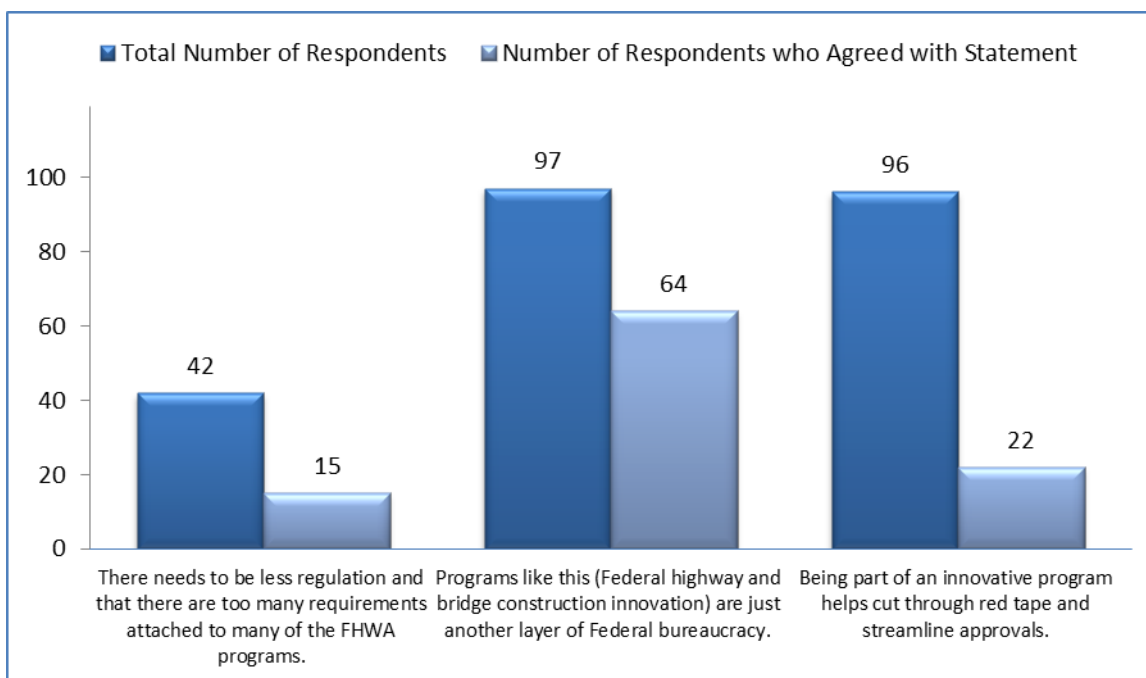


Figure 13. State-Federal relationship statistics.

The example was given among the focus groups, interviews, and survey participants that FHWA Divisions have too much control and require many projects to go through a second level of questioning and/or review after they have already been approved once. Participants explained that FHWA should provide a central direction, not control. They believe that the way in which specific goals are achieved and projects carried out should be decided upon by the States based on their resources and agency needs. Respondents explained:

Owner: *“Too many hoops to jump through.”*

Owner: *“Focus on streamlining.”*

Although a second level of review was not a standard procedure for the HfL program it is noted in the report because it was a concern raised by participants.

In contrast to the general sentiment of the State-Federal relationship, when asked what is the most important benefit that a Federal highway and bridge construction innovation program like HfL provides, 23 percent out of the 96 respondents who answered the question believed that being part of an innovative program helps cut through red tape and streamline approvals. Consequently, it would appear that although the consensus calls for less Federal regulation, HfL seemed to be heading in the right direction and made States feel as though there were some process improvements being made.

ADDITIONAL RESPONDENT PERSPECTIVES

A sub-set analysis of specific questions was conducted as a means of viewing the data from an alternative perspective. Rather than organizing the data by themes, three questions were analyzed individually to provide an in-depth look at the survey responses.

What is the most important benefit that a Federal highway and bridge construction innovation program like HfL provides?

The top three choices among the 97 respondents who answered question 15 were the following:

1. The programs peer-to-peer exchanges and demonstrations enable States and the industry to learn from each other. (58 percent)
2. The pilot project funding and the associated Federal backing buffer some of the risks of being innovative. (49 percent)
3. Getting a pilot grant allows States to stretch their limited resources further. (46 percent)

As was the case with the focus group and interview participants, the survey participants most valued the benefits of additional funding and resources because it enables them to implement innovative technologies while minimizing the impact on State resources; both monetary and non-monetary.

Evident through a multitude of the survey questions and open-ended responses, States need additional funding in order to mitigate the risk associated with innovation. Pilot programs such as HfL enabled States to take those risks and implement innovative initiatives quicker, saving State funds and time. Additionally, the peer-to-peer exchanges and demonstrations were seen as another cost savings method that enabled States to learn from one another and implement proven best practices. Table 4 shows the percentages of respondents who noted each of the options as one of their top three choices in response to survey question 15.

Table 4. Survey respondent's opinion of most important benefits.

What is the most important benefit that a Federal highway and bridge construction innovation program like HfL provides?	Industry	Owner	Percentage
The programs peer to peer exchanges and demonstrations enables states and the industry to learn from each other.	1	55	58%
The pilot project funding and the associated Federal backing buffer some of the risks of being innovative.	0	47	49%
Getting a pilot grant allows states to stretch their limited resources further.	0	44	46%
The program gives states access to experts that help to implement innovation more successfully.	1	35	37%
A program like HfL provides the Champions of innovation with much needed support to succeed.	2	30	33%
Being part of an innovative program helps cut through red tape and streamline approvals.	0	22	23%
The pilot project funding helps galvanize interest from the states.	1	22	22%
Winning a competitive grant for a pilot project results in positive visibility and support from senior leaders.	0	10	10%
The broad goals of such programs give participants the flexibility to focus on their own priorities while still meeting FHWA goals.	0	9	9%
When the local media covers our innovative pilot project, it helps educate the public about what we do, which raises their trust and confidence in us.	1	5	6%
When the local media covers our innovative pilot project it raises staff morale.	0	2	3%
Other	0	2	3%

How well do you think the Highways for LIFE Program achieved its set of goals?

In response to survey question #17: how well do you think the Highways for LIFE program achieved its set of goals, respondents ranked the HfL survey goals in the following order:

1. Improve Safety during and after construction.
2. Improve the quality of the highway infrastructure.
3. Reduce congestion caused by construction.
4. Speed up construction.
5. Reduce construction costs.

Participants responded that the goal with the highest achievement rate was improve safety during and after construction. Out of the 60 survey participants who responded to the question, 25

percent stated that an enormous or significant amount of the goal was achieved and 65 percent stated that some of the goal was achieved.

The goal with the lowest achievement rate was the HfL goal to reduce construction costs. Only 14 percent of the 59 respondents who answered the question noted that an enormous or significant amount of the goal was achieved and 46 percent stated that some of the goal was achieved. It was also noted among the focus group and interview participants that the implementation of innovation often causes increased construction costs; making the achievement of this goal unattainable. Table 5 represents how well the participants believed HfL achieved all of its goals.

Table 5. Survey respondent’s opinion of HfL goal achievement.

	Response	Industry	Owner	Percentage
Improve Safety during and after construction.	don’t know	0	0	0%
	nothing was achieved	0	2	3%
	little was achieved	0	4	7%
	some was achieved	0	39	65%
	a significant amount was achieved	1	13	23%
	an enormous amount was achieved	0	1	2%
Reduce congestion caused by construction.	don’t know	0	0	0%
	nothing was achieved	0	3	5%
	little was achieved	0	7	11%
	some was achieved	0	26	42%
	a significant amount was achieved	1	20	34%
	an enormous amount was achieved	0	5	8%
Improve the quality of the highway infrastructure.	don’t know	0	0	0%
	nothing was achieved	0	2	3%
	little was achieved	0	3	5%
	some was achieved	0	36	58%
	a significant amount was achieved	1	15	26%
	an enormous amount was achieved	0	5	8%
Speed up construction.	don’t know	0	0	0%
	nothing was achieved	0	2	3%
	little was achieved	0	5	8%
	some was achieved	1	28	45%
	a significant amount was achieved	0	18	28%
	an enormous amount was achieved	0	10	16%
Reduce construction costs.	don’t know	0	0	0%
	nothing was achieved	0	5	9%
	little was achieved	0	19	32%
	some was achieved	1	26	46%
	a significant amount was achieved	0	6	10%
	an enormous amount was achieved	0	2	3%

What do you think is the primary reason that HfL achieved its goals?

In response to survey question 18, the top three choices made by the 48 respondents who answered the question were the following:

1. The pilot funding enabled the states to take risks. (55 percent)
2. The funding enabled states to leverage their limited resources. (48 percent)
3. The demonstration projects gave states good ideas. (47 percent)

Similar to the results of the focus group/interview analysis and survey question 15, funding and resources were identified as why and what made HfL successful. As is identified by question 18, the pilot funding provided through HfL mitigates State risk while leveraging their limited resources.

Demonstration projects enable States to share ideas and learn from each other's successes and failures. Even with funding in place, States cannot afford to implement innovations unprepared. Demonstration projects allow States to learn first-hand how a particular initiative was implemented somewhere else. In such cases, States have a higher probability of not repeating similar mistakes which leads to a greater chance of success. Table 6 shows the percentages of respondents who noted each of the options from survey question 18 in their top three choices.

Table 6. Survey respondent's opinion of why HfL achieved its goals.

What do you think is the primary reason that HFL achieved its goals?	Industry	Owner	Percentage
The pilot funding enabled the states to take risks.	0	32	55%
The funding enabled states to leverage their limited resources.	0	28	48%
The demonstration projects gave states good ideas.	1	26	47%
The peer contacts enabled states to help each other.	0	23	40%
The program fostered and supported champions of innovation.	1	21	38%
The visibility of the program helped secure by in from senior leadership.	0	14	24%
The competitive grant got states innovative juices flowing.	0	9	16%
The evaluation and feedback following a pilot project was a plus.	0	7	12%
Not-applicable-I stated that HfL did not achieve its goals.	0	5	9%
The competitive process was fair.	1	2	5%
The positive local media coverage of HfL program fostered public trust.	0	2	4%
The quick turnaround time for grants to be awarded and funded was helpful to states.	0	1	2%
Other	0	1	2%

RECOMMENDATIONS

Recommendations that emerged from the survey research include:

- Innovation is best achieved when FHWA provides financial and technical support to State DOTs in the form of competitive grants.
- Partnering and collaboration within FHWA programs such as HfL is important:
 - Among FHWA and State DOTs as a way of ensuring the goals and measures set forth by the programs are flexible and benefit all parties involved. Participants recommend that FHWA use the HfL model over that of EDC.
 - FHWA headquarters and FHWA Divisions to simplify the regulatory demands set forth by both and bestowed upon the States.
 - State DOTs and local FHWA administrations to ensure the State's interests, needs, and resources are factored into all of the decisions made and products adopted. Additionally, a collaborative effort among the two would help combine local resources for the good of the State.
 - State DOTs and other State DOTs to create a peer-to-peer exchange in which they can share lessons learned, best practices, and a general knowledge base; improving the nation's infrastructure as a whole.
- Products should not be excluded merely because they are proprietary products, rather the best options available should be promoted.
- Future programs should streamline the application process and reporting requirements because they deplete scarce time and resources.
- FHWA should work to identify champions within States as a means of fostering advocacy in States that might not have an obvious champion for innovative initiatives. States would be more likely to take risk and welcome innovative techniques like those advocated by HfL if they had someone to champion the effort.
- A more comprehensive marketing/outreach plan to promote the successes of FHWA programs, like HfL, both on a National and local level is needed. Not only will this promote the idea of innovation among States, it would act as an education tool of lessons learned, and improve the National sentiment towards both the Federal and State highways. A competitive grant program that benefits taxpayers and road users provides a local news event that can help generate public attention.
- FHWA should invest in improving knowledge management infrastructure and processes for the sharing lessons-learned, best practices templates, and success stories (including the HfL report *Harnessing the Power of Innovation to Improve America's Driving Experience*).
- The regulatory requirements FHWA sets for programs like HfL, need to be simplified to allow States to take ownership and make projects fit their needs and resources.

- Future FHWA programs should have longer project timeframes to ensure sustainability of innovations. They should include long-term monitoring and a study of the projects' performance to gauge the true success of a program.
- FHWA needs to create a failure tolerant environment so that States are not fearful of taking risks. True innovation does not come without risk; however, State DOTs will be unwilling to take that risk and participate in programs such as HfL and/or EDC so long as they do not feel as though the rewards of participating in such programs outweigh the penalties of failure.
- Since the focus group, interview, and survey data were owner-centric, FHWA should collect additional perspectives/ideas for future programs from non-owner stakeholders.

CONCLUSION

Among 112 survey respondents, 84 percent stated that their level of awareness and knowledge of the HfL program ranged from somewhat familiar to intimately familiar, with the majority of State DOTs at the higher end of the spectrum. Five percent had not heard of HfL before they were contacted for the survey. Those respondents were prompted to skip any HfL program specific survey questions.

Although the level of direct involvement in the program varied among the survey participants, their level of satisfaction with HfL fell in the moderate-to-high range. Just as was the case with the focus groups and interviews, the survey participants who had received a competitive grant from HfL had a higher view of the program.

Areas for improvement include more effective communication with FHWA local offices, Federal oversight, streamlined requirements, local champion recruitment and technical support, longer-term monitoring/feedback on projects, and additional outreach and marketing of program activities. Many of the comments made by survey respondents dealt with the current lack of State resources and the need for further monetary assistance in order to promote the use of innovative technologies.

*“It (HfL) served
as an innovation
incubator.”
--State DOT Official*

When commenting on any future Federal highway and bridge construction innovation programs like EDC, the overwhelming majority stated that the absence of competitive grant funding for pilot projects was a large deterrent to most States' enthusiasm to participate.

The general consensus was that the HfL program and its goals galvanized attention on innovation and provided political cover for States to take risks with innovative projects. It was discussed that the seed funding for projects created excitement, spurred innovation, provided political cover, and increased opportunity for local media visibility.

Although participants had some suggestions for future improvements, the overall tone was that HfL was a good program and it will be a loss to taxpayers now that it is gone. When asked how important it is for FHWA to have a program focused on innovation in highway and bridges construction, 89 percent out of 91 respondents stated that it was important, very important, or extremely important to have a program like HfL in place. As one participant said about the HfL program, “It served as an innovation incubator,” and it will be missed.

APPENDIX I: SURVEY QUESTIONS

Highways for Life Stakeholder Feedback Survey

OMB Control Number is 201008-2125-001

Thank you for taking part in this survey. The purpose of this survey is to collect feedback from key transportation industry stakeholders on the Federal Highway Administration's (FHWA's) Highways for LIFE (HfL) program, which is now ending. The purpose of HfL was to advance longer-lasting highway infrastructure using innovations. The feedback collected from this survey will be used as input to improve and/or initiate future FHWA programs.

The survey is divided into 2 main segments:

- 1) Background and
- 2) Impressions of the Highways for LIFE Program.

The survey will take approximately 20 minutes to complete.

OMB Control Number is 201008-2125-001

Section I: Background The first set of questions will address your professional background and experience

1. How many years have you worked in the transportation industry?

2. Please select the group most descriptive of your current role within the transportation industry (pick one).

- Owner Agencies and their Representatives:** Highway Agency/Department of Transportation, Local Government, AASHTO, National Association of County Engineers, and similar
- Industry and Industry Representatives:** contractors, academia, consultants, American Road and Transportation Builders Association, Associated General Contractors, American Council of Engineering Companies, and similar.
- Suppliers and Supplier Representatives:** product suppliers, material suppliers, technology suppliers, American Concrete Paving Association, National Asphalt Paving Association, Portland Cement Association/National Concrete Bridge Council, National Steel Bridge Alliance, National Stone, Sand and Gravel Association, American Traffic Safety Services Association, and similar.
- Highway User Representatives:** American Automobile Association, American Trucking Associations, American Highway Users Alliance, and similar.
- Other (please specify)

3. What is your current role or position?

4. How many years have you spent in this role?

Highways for Life Stakeholder Feedback Survey

5. Please select any additional role(s) you've held during your career.

- Owner Agencies and their Representatives:** Highway Agency/Department of Transportation, Local Government, AASHTO, National Association of County Engineers, and similar
- Industry and Industry Representatives:** contractors, academia, consultants, American Road and Transportation Builders Association, Associated General Contractors, American Council of Engineering Companies, and similar.
- Suppliers and Supplier Representatives:** product suppliers, material suppliers, technology suppliers, American Concrete Paving Association, National Asphalt Paving Association, Portland Cement Association/National Concrete Bridge Council, National Steel Bridge Alliance, National Stone, Sand and Gravel Association, American Traffic Safety Services Association, and similar.
- Highway User Representatives:** American Automobile Association, American Trucking Associations, American Highway Users Alliance, and similar.
- N/A- I have worked in the same role for my entire career.
- Other (please specify)

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6. How many people do you supervise?

- 0
- 1-10
- 11-50
- 51-500
- over 500

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7. What is the total budget you or your unit manages?

- Under \$500,000
- \$501,000 - \$999,999
- \$1 million - \$4,999,999
- \$5 million - \$19,999,999
- \$20 million - \$49,999,999
- \$50 million - \$250 million
- Over \$250 million
- My responsibilities do not include budget management.

Highways for Life Stakeholder Feedback Survey

8. What is the primary focus-area for your position or department? Please pick one.

- Design
- Planning
- Maintenance
- Project Management
- Safety Inspection
- Construction Management
- Technical/Engineering Review
- Procurement and/or Contracts Management
- Research
- Administration and Reporting
- Public Relations and/or Stakeholder Liaison
- All of the above
- Other (please specify)

9. What is the primary geographic area covered by your organization?

- tribal
- local (city or County/Parish)
- regional/multi-jurisdictional
- State
- National
- International

10. In what state are you currently working?

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Section 2: Impressions of the Highways for Life Program

11. How familiar are you with the Highways for LIFE program?

- | | | | | |
|-----------------------|---|-----------------------|-----------------------|-----------------------|
| completely unfamiliar | heard of it, but don't know much about it | somewhat familiar | very familiar | completely familiar |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Highways for Life Stakeholder Feedback Survey

12. (If you are unfamiliar with the HfL program, please skip this question)

Please explain how you were involved with the HfL program. Please check all that apply.

- Successfully submitted for a grant and conducted a pilot project
- Unsuccessfully submitted for a grant
- Provided input into program policies
- Reviewed grant applications
- Participated in a demonstration project
- Was not involved in the HfL program
- Other (please specify)

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13. Please explain why you did not get involved in HfL. Please check all that apply.

- Highway and bridge construction is not my focus area
- The application process seemed too complicated
- I prefer to conduct projects without Federal involvement
- We didn't really need the money
- I didn't think we could win a grant because our projects are not what FHWA was looking for
- I didn't think we could win a grant because our projects are not that innovative
- I was too busy to get involved
- The program didn't provide 100% of the project cost
- I wasn't sure that HfL program would be continued so I didn't want to make the investment in it.
- I just wasn't interested in getting involved.
- I didn't know anything about the program
- Other (please specify)

14. How important is it for FHWA to have a program focused on innovation in highway and bridge construction?

not important at all just slightly important important very important extremely important

Highways for Life Stakeholder Feedback Survey

15. What is the most important benefit that a Federal highway and bridge construction innovation program like HfL provides? Please choose your top three benefits.

- A program like HfL provides the Champions of innovation with much needed support to succeed
- Winning a competitive grant for a pilot project results in positive visibility and support from senior leaders
- Getting a pilot grant allows States to stretch their limited resources further
- When the local media covers our innovative pilot project, it raises staff morale
- When the local media covers our innovative pilot project, it helps educate the public about what we do, which raises their trust and confidence in us
- The pilot project funding helps galvanize interest from the States
- The program gives States access to experts that help to implement innovation more successfully
- The pilot project funding and the associated Federal backing buffers some of the risks of being innovative
- Being part of an innovative program helps cut through red-tape and streamline approvals
- The program's peer-to-peer exchanges and demonstrations enables States and the industry to learn from each other
- The broad goals of such programs give participants the flexibility to focus on their own priorities while still meeting FHWA goals
- Other (please specify)

16. Explain your main concerns about a Federal highway and bridge construction innovation program. Please choose the top three concerns.

- The FHWA doesn't allow the participation of an individual vendor with innovative products
- The amount of paperwork and coordination required to participate is cumbersome
- Innovations that focus on "reducing costs" push people to cut corners
- Funding for an innovation project takes dollars away from day-to-day projects
- The time required to get through the review, approval, and funding process can stall momentum
- The competitive process isn't open and transparent enough
- It is disappointing when programs like HfL get cut. It makes me hesitate to invest in it
- The amount of pilot seed money doesn't seem like enough to make a difference
- Innovative programs seem too risky due to the potential for failure
- We should be spending our resources on Intelligent Transportation Systems instead
- We don't need to focus on innovation because the way we do things now is fine
- We don't really know if the innovation offers true value over the long-term. We need to study this.
- We should be spending our resources on mass transit or carpooling/biking efforts to reduce traffic
- Other (please specify)

Highways for Life Stakeholder Feedback Survey

Several of the following questions pertain to how well HfL achieved its goals. The primary objective of HfL was to advance longer-lasting highway infrastructure using innovations to accomplish fast, efficient construction and safe highways and bridges. Specifically, the goals of HfL were to:

- Improve safety during and after construction
- Reduce congestion caused by construction
- Improve the quality of the highway infrastructure

Please keep these goals in mind as you answer the next set of questions.

17. (If you are unfamiliar with the HfL program, please skip this question)

How well do you think the Highways for LIFE Program achieved its set of goals to:

	nothing was achieved	little was achieved	some was achieved	a significant amount was achieved	an enormous amount was achieved
Improve safety during and after construction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduce congestion caused by construction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improve the quality of the highway infrastructure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Speed up Construction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduce Construction Costs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. (If you are unfamiliar with the HfL program, please skip this question)

What do you think is the primary reason that HfL achieved its goals? Please select your top three reasons.

- Not Applicable- I do not believe the HfL program achieved its goals.
- The competitive grant got States' innovative juices flowing
- The pilot funding enabled the States to take risks
- The funding enabled States to leverage their limited resources
- The competitive process was fair
- The quick turnaround time for grants to be awarded and funded was helpful to States
- The demonstration projects gave States good ideas
- The peer contacts enabled States to help each other
- The program fostered and supported Champions of innovation
- The visibility of the program helped secure buy-in from senior leadership
- The positive local media coverage of HfL program fostered public trust
- The evaluation and feedback following a pilot project was a plus
- Other (please specify)

Highways for Life Stakeholder Feedback Survey

19. What do you think were the reasons why the goals were not fully achieved? Please choose your top 3 reasons.

- Not Applicable- I believe the HfL program achieved its goals.
- The goals were too broad
- The funding was insufficient to offset the risk involved
- The timeline from application to funding was too long
- The pilot project selection process wasn't transparent enough
- Some innovative product suppliers weren't permitted to participate in the competition
- HfL did not include the right stakeholders, such as technical experts
- There wasn't enough cultivation and support of Champions for innovation
- There was no mechanism for long-term monitoring and feedback
- Peer-to-peer demonstrations were too few
- There wasn't enough guidance and/or templates
- The HfL program was eliminated before it could make a real impact

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Highways for Life Stakeholder Feedback Survey

20. (If you are unfamiliar with the HfL program, please skip this question)

Please evaluate the following statements.

	strongly disagree	disagree	neither agree or disagree	agree	strongly agree
The HfL program did a good job of marketing and promoting innovation to the public.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HfL goals were broad and flexible enough to fit into State priorities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The HfL pilot competition - from submittal to award funding - took an appropriate amount of time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HfL enabled States to try something new in a climate where failure is generally not tolerated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The HfL program did a good job of marketing and promoting innovation to the industry.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The HfL program pilot product/project selection process seemed unfair and biased.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The HfL program should include all innovations, including proprietary products.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To implement beneficial innovations, "champions" are <i>not</i> really needed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The HfL program did a good job of communicating with States and internally within FHWA so that everyone knew what was going on	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The pilot project seed money from HfL helped buffer States from risk.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Partnering and collaboration with FHWA and other State DOTs takes too much time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Without funding for State pilot innovation projects, there is no incentive for State DOTs to support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Highways for Life Stakeholder Feedback Survey

FHWA's innovation programs.

The HfL program allowed experts from around the country to aid States in achieving their goals while utilizing fewer resources.



21. Please select the most important aspect of a future program to encourage innovation.

- The competitive grants for States to implement innovative pilot programs
- The demonstration projects and peer contacts to implement innovations
- Monitoring and documentation of how innovation projects perform longer-term
- Providing technical experts to support States
- I don't think FHWA should have an innovation program.
- Other (please specify)

22. (If you are unfamiliar with the HfL program, please skip this question)

What do you see as the greatest outcome(s) of the Highways for Life program?

23. (If you are unfamiliar with the HfL program, please skip this question)

What were the greatest pitfalls of the HfL program (if any)?

24. What are the main issues FHWA should consider in future highway innovation programs?

25. (If you are unfamiliar with the HfL program, please skip this question)

What are the biggest barriers to pursuing the goals of the HfL program into the future?

26. What other comments or suggestions would you like to make about HfL or its successor programs?