

NCHRP 20-123(14)

**SCOPING STUDY FOR THE DEVELOPMENT
OF A PLATFORM FOR STATE DOT AND
AASHTO COMMITTEE SURVEYS**

FINAL REPORT

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1. Introduction

Background

Since 2003, the Research Advisory Committee (RAC) of the American Association of State Highway and Transportation Officials (AASHTO) has been facilitating surveys of state DOTs to gather and understand best practices, policies, specifications, and other information of interest from peers at other state DOTs. RAC members submit survey requests via the RAC listserv and use their network of contacts in their agencies to distribute surveys to the correct audience and collect meaningful responses. Results collected from these surveys are posted to a RAC survey database and displayed on a RAC survey results web page. The RAC survey capability has been valuable, but it has been limited to use within RAC. Other AASHTO committees and individual state departments of transportation (DOTs) routinely conduct surveys and share survey results in a variety of ways. There is no centralized platform available for sharing the results of these surveys.

The purpose of this research project was to conduct a scoping study for creating a platform for managing surveys and survey data for AASHTO committees and state DOTs. Potential benefits of a common survey platform include reducing duplication of survey efforts and expanded awareness across state DOTs of peer agency activities.

This report documents the work conducted for this project and presents recommendations for development and management of an AASHTO Survey Platform. These recommendations are based on stakeholder input, review of existing AASHTO survey activities, analysis of requirements and research into the features of available commercial software products supporting surveys.

Study Overview

This scoping study was accomplished through four substantive activities:

- **Current State Assessment** – Through surveys, interviews, and analysis of AASHTO web resources, the research team gathered baseline information about the volume and nature of surveys conducted by AASHTO Committees and State DOTs, pain points related to conducting and sharing results of surveys, and the level of interest in an AASHTO survey platform.
- **Platform Assessments** – Eighteen commercial survey and data repository products were reviewed to understand the availability and features of existing platforms to conduct and manage surveys. This review used four categories to characterize major platform features: survey development and distribution; survey results intake; survey post-processing and publishing; and survey results access, review and analysis.
- **Platform Options Evaluation** – To provide a framework for evaluating options, a detailed set of potential survey platform functionalities was developed. Then, five high-level options were identified, representing different sets of functionalities. A “Do Nothing” option was included as one of the five. Options were evaluated in a qualitative fashion based on initial and ongoing cost, administrative burden, reach, usability and ability to integrate the platform with other AASHTO systems. A stakeholder roundtable was held to gather feedback on specific functionalities of interest.

- **Recommendations** – Based on the evaluation of options and input from the stakeholder roundtable, recommendations were developed for a phased approach to platform development. Implementation activities and associated costs for each phase were identified. In addition, workflows for planning and conducting surveys, and summarizing and sharing results were designed to illustrate the nature and extent of stewardship and administrative support required for each phase.

Report Organization

Chapter 2 presents a summary of the platform recommendations and reviews implementation steps and estimated costs for three potential phases of development.

Chapter 3 defines stewardship and administrative roles for survey management and maps out specific workflows for conducting surveys – using features of the survey platform to be provided under the three potential phases of development.

Chapter 4 synthesizes key findings from the background research conducted to inform the scoping of the AASHTO Survey Platform.

Chapter 5 presents an evaluation of options for developing and managing AASHTO committee and state DOT surveys. Results of this evaluation informed the development of the recommendations presented in Chapter 2.

Appendix A presents the results of the analysis of prior surveys conducted by AASHTO Committees.

Appendix B presents the results of stakeholder consultation activities conducted to inform this scoping study, including a survey of AASHTO Staff Liaisons and RAC members, follow up interviews, and a stakeholder round table to obtain feedback on platform options.

Appendix C presents a review of commercial products supporting the process of conducting and sharing results of surveys.

2. Survey Platform Recommendations

Framework for Platform Scoping

To provide a framework for this investigation, a simple survey workflow was developed, as shown in Figure 1:

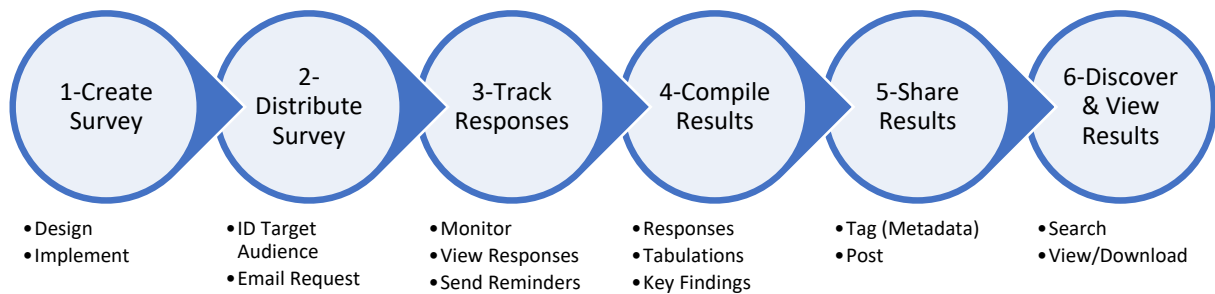


Figure 1. Survey Workflow Framework for Platform Scoping

1-Create Survey

The first step involves establishing the survey's objectives, identifying the target recipients, formulating the survey questions, creating and pre-testing the survey instrument, and drafting the language to be used for requesting people to complete the survey.

2-Distribute Survey

The second step involves distributing the survey to the intended respondents, using AASHTO committee lists and/or other available email lists.

3-Track Responses

The third step involves monitoring survey responses and sending periodic reminders to survey recipients to maximize the response rate. It also may involve responding to questions about the survey from recipients.

4-Compile Results

The fourth step involves closing the survey and compiling results to be shared. This may include downloading raw survey data, creating summary tables or charts, creating different views of the data (e.g. applying filters, grouping related questions, aggregating selected items, etc.), drafting a summary of key findings, and assigning topic tags to the overall survey results to facilitate discovery.

5-Share Results

The fifth step involves distributing and/or posting the compiled survey results for use by those requesting the original survey, those who responded to the survey and other interested parties.

6-Discover and View Results

The last step is performed by consumers of the survey data – it involves discovering surveys of interest by browsing, filtering and searching available results; and then viewing and downloading results of interest.

The current AASHTO Research Advisory Committee (RAC) survey site covers steps 5 and 6 of the workflow (Share and Discover/View). RAC established manual processes to facilitate step 2-survey distribution to RAC members.

For this scoping study, options for the expanded platform were investigated to cover the entire sequence of workflow steps.

Summary of Recommendations

Recommendation #1: Establish Stewardship and Administrative Support

Experience with the RAC platform has shown that it is critical to establish a solid stewardship model and provide sufficient administrative support to ensure that the different steps of the survey workflow outlined above are executed efficiently and expeditiously.

Therefore, concurrent with an initial set of enhancements to the platform (see Recommendation 3), AASHTO should establish the roles, responsibilities and support resources needed to make the platform successful.

To establish strong stewardship and administrative support, AASHTO should:

- Ensure that all AASHTO Committees are aware of the survey platform and the benefits of using it.
- Designate an individual within AASHTO's Information Technology group to oversee the phased enhancements to the platform and ongoing maintenance and technical support for the survey platform.
- Designate a single individual within AASHTO to be the business owner of the survey platform, with responsibility for signing off on requirements for enhancements; and maintaining policies, procedures, workflows and best practices for using the platform. Staff assigned to two AASHTO Committees: Research and Innovation (R & I) and Knowledge Management should be considered for this role – given their goals and areas of focus. Committee Staff can enlist the assistance of Committee members for this work.
- Designate administrative support resources (AASHTO Staff or contractors) for each committee or group of committees who plan to use the platform. Monitor the status of surveys (backlog for responding to requests, compiling results and posting results) and conduct a periodic (e.g., annual) review of the adequacy of administrative resources to support survey activity. Adjust as needed.

Recommendation #2: Pursue an Incremental Development Approach

An incremental development approach is recommended for the survey platform. This would allow for initial capabilities to be put in place expeditiously at relatively modest cost, and then expanded over time. It would also enable AASHTO to build a workable operating model and stewardship approach –

and verify that it is sustainable prior to making a larger investment in a more fully featured and integrated platform. The recommended approach consists of two initial phases, followed by a “go or no go” decision on a potential third phase.

Recommendation #3: Enhance the Existing RAC Survey Platform

The existing RAC Survey Platform has been used successfully and provides a solid starting point for an expanded platform that can serve multiple AASHTO Committees. An initial phase of work is recommended to make limited enhancements to the existing platform to improve usability and enable its use beyond RAC.

Recommendation #4: Plan for Additional Automation to Reduce the Administrative Burden

AASHTO should plan for a second phase of development to add automated workflows and connections to AASHTO’s email lists to facilitate administrative tasks related to managing the survey platform. Survey development and tracking would be accomplished outside of the platform, using available survey tools (such as SurveyMonkey – currently licensed by AASHTO, or Microsoft Forms).

Recommendation #5: Pursue a Fully Integrated Solution based on an Assessment of Likely Costs and Added Value

Once the stewardship model is in place and multiple committees are using the survey platform, AASHTO should consider a third phase of development to create a fully integrated survey platform including the ability to create and track surveys within the platform. This phase would cover all six steps of the survey workflow outlined in Figure 1. Given the likely development cost, a careful assessment of whether the value added would justify the investment should be conducted prior to proceeding with the fully integrated solution.

Phasing of AASHTO Survey Platform Development

Table 1 summarizes how various aspects of the survey workflow would be handled for each of the three phases:

- Phase 1: Base Platform for Sharing Survey Results (steps 5 and 6)
- Phase 2: Expanded Platform Supporting Survey Distribution (steps 2, 5 and 6)
- Phase 3: Fully Integrated Platform Supporting Survey Creation, Distribution, Tracking, Compilation and Sharing (steps 1-6)

Shaded cells indicate those that would be directly supported by the platform.

Table 1. Phased Implementation Approach

Activity	Phase 1 Base Platform	Phase 2 Expanded Platform	Phase 3 Integrated Platform
1-Create Survey	Guidance Provided – not directly supported by platform	Guidance Provided – not directly supported by platform	Integrated within platform

Activity	Phase 1 Base Platform	Phase 2 Expanded Platform	Phase 3 Integrated Platform
2-Distribute Survey	Manual process – not supported by platform (link provided to AASHTO Committee Liaison(s) who approve and distribute to their member list). Committees can, at their discretion allow members to do the distribution directly.	Platform supports workflow for survey request submittal, AASHTO Staff approval and distribution to member lists	Platform supports workflow for survey request submittal, AASHTO Staff approval and distribution to member lists
3-Track Responses	Not supported	Not supported	Integrated within platform
4-Compile Results	Not supported	Not supported	Integrated within platform
5-Share Results	Integrated within platform	Integrated within platform	Integrated within platform
6-Discover and View Results	Integrated within platform	Integrated within platform	Integrated within platform

Each phase is described in further detail below, including:

- **Overview** – description of platform capabilities and process to be followed
- **Implementation** – activities required to develop new capabilities and establish needed operational and stewardship support.

Phase 1: Base Platform for Sharing Survey Results

Overview

The first phase of the AASHTO Survey platform effort builds on the existing RAC survey database and website, providing capabilities for posting and sharing survey results. It creates guidance for the other activities to document best practices and address key pain points and lessons learned from the RAC survey process. It also (most importantly) establishes administrative support for the platform.

Subsequent phases build upon each of these elements. The components of the Phase 1 Survey Platform are shown in Figure 2.



Figure 2. Phase 1 Survey Platform Components

Implementation

Implementation activities are shown below, with estimated level of effort and cost. More accurate cost estimates will require further requirements gathering and design activities.

Table 2. Phase 1 Implementation Activities

Implementation Activity	Scope	Level of Effort
1.1 Design and Develop New Survey Database and Website	<p>Using the current RAC survey database as a base, develop a design for a new survey database. Ensure compatibility with the existing database to enable import of existing surveys.</p> <p>Work with AASHTO IT to determine whether to continue with the existing WordPress platform or switch to another one such as Microsoft/SharePoint. (If phase 3 is to be pursued integrating Microsoft Forms as the survey tool, then starting out with Microsoft as the platform would avoid the need for re-work.)</p> <p>Develop a website/UI (or enhance the existing RAC site) to be the landing page for AASHTO surveys, enabling posting surveys, creating metadata/tags for surveys, and features for searching/sorting/filtering/downloading surveys. The option to filter surveys by status would be included to enable users to view a list of currently open surveys. Include improved administrative and security features needed to support multiple AASHTO committees and for managing visibility of survey results.</p>	<p>80-120 hours (developer)</p> <p>\$32,000-\$48,000</p>

Implementation Activity	Scope	Level of Effort
1.2 Develop AASHTO Survey Manual	<p>Provide guidance on each step of the survey workflow. Include tips for designing an effective survey (including suggested standard questions), specifying the target audience, maximizing response rates, compiling and summarizing results, and timely posting of results. Outline roles and responsibilities and expectations. Identify pros and cons of different available survey tools, with an emphasis on those available for use by AASHTO Staff.</p> <p>The manual will also describe the standards that surveys should meet before a survey request is sent to AASHTO mailing lists and the standards that survey data and results should meet before being published to the AASHTO Survey Database. It should leverage and incorporate existing RAC survey guidelines.</p>	<p>80-120 hours (analyst) \$8,000-\$12,000</p>
1.3 Establish and Resource Survey Administrative Support	<p>Designate an AASHTO Staff member to provide ownership of the survey platform – responsible for its operation, enhancement and overall success. This individual would be responsible for monitoring platform use and pursuing platform enhancements.</p> <p>Designate and train one or more administrative staff members (and/or contract resources) at AASHTO to serve as survey managers, supporting AASHTO Committee liaisons in creating surveys, distributing surveys, distributing surveys, and posting survey results.</p>	<p>Lead: 24 hours initially, then 4-16 hours per month</p> <p>Administrative Support: 50 person-hours per month</p> <p><i>Support estimate assumes 200 surveys per year, 3 hours of staff time per survey.</i></p>
1.4 Develop AASHTO Survey Platform Administration Manual	<p>Provide guidance for AASHTO Staff on roles and responsibilities for supporting the survey process and utilizing the survey platform UI. Identify the administrative resources that will support each AASHTO committee to facilitate the survey process and ensure that each survey is distributed, collected, and uploaded to the database properly.</p>	<p>40-60 hours (Analyst) \$4,000-\$6,000</p>

Phase 2: Expanded Platform Supporting Workflow and Survey Distribution

Overview

The second phase of the AASHTO Survey tool augments the user interface created in Phase 1 to reduce the administrative burden on AASHTO Staff to support the survey process. It replaces email communication between the Requester and AASHTO Staff with automated workflow capabilities to manage requests and approvals. This phase enables the Requester to directly input information about the survey request into the UI, and directly upload survey results for AASHTO Committee Liaison approval and publication. It also provides an automated ability for AASHTO Staff to forward a survey request to AASHTO-maintained mailing lists for various committees and communities.

The components of the Phase 2 Survey Platform are shown in Figure 3. New UI features added in this phase are highlighted.



Figure 3. Phase 2 Survey Platform Components

Implementation

Implementation activities are shown below, with estimated level of effort and cost. More accurate cost estimates will require further requirements gathering and design activities.

Table 3. Phase 2 Implementation Activities

Implementation Activity	Scope	Level of Effort
2.1 Update Survey Platform	<p>Update the survey platform established in Phase 1 to add workflow and link to AASHTO mailing lists. Include the following features:</p> <ul style="list-style-type: none"> • Workflow defining a sequence of steps to request, approve, distribute, remind and post survey results • Ability to configure and assign access privileges for distinct roles • Ability for Requester to enter information about their survey – and for AASHTO Staff to approve or return request with comments • Ability to auto-generate survey request emails based on the information input into the survey request page • Ability for staff to select AASHTO mailing lists (one or more committees or communities) to include in survey distribution • Ability to generate automated survey reminders to be sent to recipients after a (configurable) specified period following survey distribution • Ability to generate automated reminders to Requester to upload results • Ability for Requesters to upload and annotate/tag survey results – and for AASHTO Staff to review and publish these 	<p>240-320 hours (developer)</p> <p>\$48,000 - \$64,000</p>
2.2 Update the AASHTO Survey Manual	<p>Update the AASHTO Survey manual to include instructions for using the new capabilities of the platform.</p>	<p>40-60 hours (analyst)</p> <p>\$4,000-\$6,000</p>

Implementation Activity	Scope	Level of Effort
2.3 Refine Administrative Support	Evaluate time requirements and adjust resourcing as needed. Following a period of adjustment, the administrative burden should be reduced due to increased automation and shifting the data entry load to survey requestors.	Lead: 40 hours initially, then 2-4 hours per week Administrative Support: 17 person-hours per month <i>Support estimate assumes 200 surveys per year, 1 hour of staff time per survey.</i>
2.4 Update the AASHTO Survey Platform Administration Manual	Update the AASHTO Survey Platform Administration Manual to reflect changes in the platform.	40-60 hours (analyst) \$4,000-\$6,000

Phase 3: Fully Integrated Platform Supporting Survey Creation, Distribution, Tracking and Sharing

Overview

The third phase of the AASHTO Survey tool creates a fully integrated platform supporting all six of the survey workflow steps from survey creation to sharing and viewing results. The Requester or Survey Manager can create a survey, track responses, and produce results all within the Platform. Emails distributing and collecting information are automated, and reminder completion emails can be individually targeted to non-respondents. This option can be implemented either through integration of commercial off-the-shelf survey software into the platform, or through a custom development effort. If AASHTO chooses to proceed with Phase 3, a buy-versus-build analysis should be conducted prior to determining the most appropriate approach.

The components of the Phase 3 Survey Platform are shown in Figure 4. New UI features added in this phase are highlighted.



Figure 4. Phase 3 Survey Platform Components

Implementation

Implementation activities are shown below, with estimated level of effort and cost. More accurate cost estimates will require further requirements gathering and design activities.

Table 4. Phase 3 Implementation Activities

Implementation Activity	Scope	Level of Effort
3.1 Update Survey Platform	<p>Update the survey platform to include capabilities to create and track surveys and further automate the process of posting tabulations and raw survey results for discovery and viewing/ downloading. The survey creation process would be added to the workflow included in the Phase 2 platform. This phase could also build in some standard templates to provide greater consistency in the survey result formats that are posted to the platform.</p> <p>These platform updates could be accomplished either through custom coding of a survey capability, through integration of a COTS (commercial off the shelf) tool such as SurveyMonkey or Qualtrics, or through use of the Microsoft Power Platform.</p> <p>If the integration option is selected, more sophisticated surveys and analysis capabilities could be supported (since the cost of duplicating high-end survey tool capabilities would be prohibitive). However, there would likely be a need for some re-work on the existing workflow features to ensure a streamlined user experience. There would also be a recurring license cost that could be avoided if the custom coding option were selected.</p>	<p>Custom: 240-360 hours (developer) \$480,000 - \$720,000</p> <p>Integration of COTS: 160-240 hours (developer) \$320,000 - \$480,000</p>
3.2 Update the AASHTO Survey Manual	Update the AASHTO Survey manual to include instructions for using the new capabilities of the platform.	40-60 hours (analyst) \$4,000-\$6,000

Implementation Activity	Scope	Level of Effort
3.3 Refine Administrative Support	Evaluate time requirements and adjust resourcing as needed.	<p>Lead:</p> <p>60 hours initially, then 3-6 hours per week (higher than earlier phases due to increased complexity of platform)</p> <p>Administrative Support: 17 person-hours per month</p> <p><i>Support estimate assumes 200 surveys per year, 1 hour of staff time per survey.</i></p>
3.4 Update the AASHTO Survey Platform Administration Manual	Update the AASHTO Survey Platform Administration Manual to reflect changes in the platform.	<p>40-60 hours (analyst)</p> <p>\$4,000-\$6,000</p>

3. Survey Management Roles and Workflow

This chapter defines roles and responsibilities for managing the survey platform and associated workflow for creating, tracking, summarizing, and sharing survey results. For each phase, activities to be undertaken for each defined role are called out.

Survey Management Roles

The following roles are defined for AASHTO survey management:

- **Requester** – the AASHTO committee member or friend who requests that a survey be conducted, identifies what information is needed and who the target recipients should be.
- **AASHTO Committee Liaison** – AASHTO staff member(s) assigned to support the committee to which the request was made. They have overall responsibility for responding to survey requests and making sure they are carried out (but can tap into administrative support).
- **Survey Manager** – the individual responsible for designing and creating the survey to meet the needs specified by the Requestor, tracking responses, and reviewing and preparing results. This role can be played by the Requestor, an AASHTO staff member, or another committee member or consultant, depending on the situation.
- **AASHTO Administrative Support Staff** – AASHTO staff (or contractor) responsible for supporting the survey process (as requested by the Committee Liaison), which may include creating a survey based on a provided list of questions, distributing the survey, compiling responses and posting survey results on the Survey Website.
- **User Interface (UI)** –used for activities that are performed by the survey platform’s user interface (UI) and back end functions to automate workflow.

Phase 1: Base Platform for Sharing Survey Results

Workflow

The survey workflow for this phase is shown in Figure 5. Each step of the workflow is further described in Table 5.

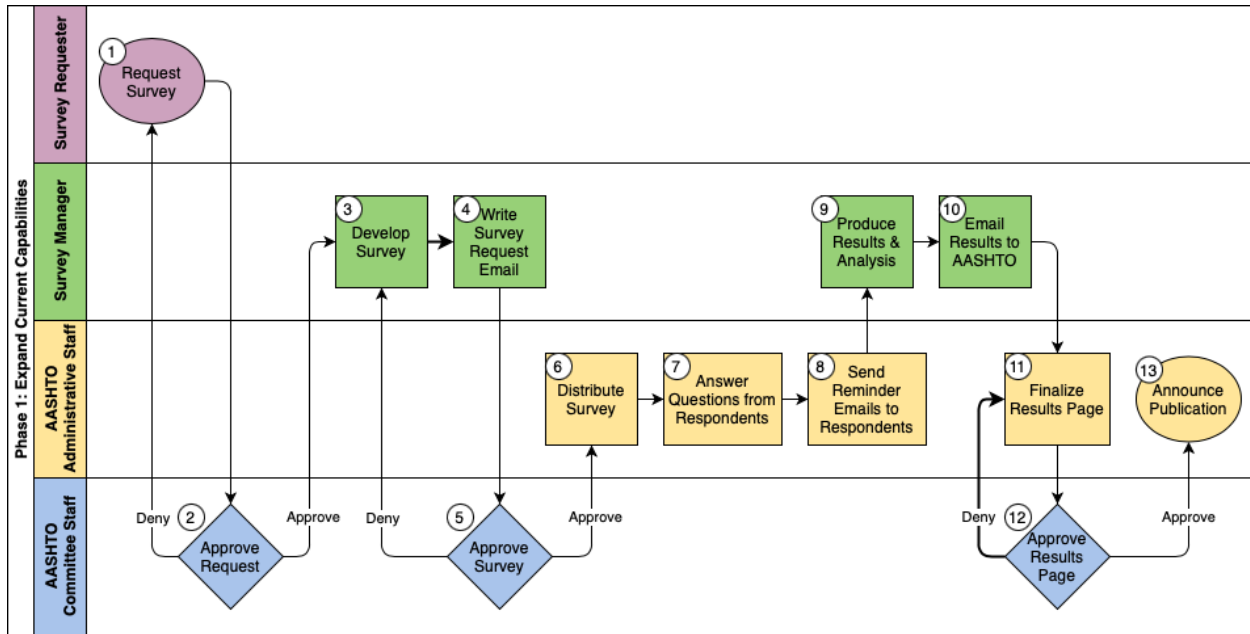


Figure 5. Phase 1 Workflow Swimlane Diagram

Table 5. Phase 1 Workflow Steps

Phase 1: Expand Current Capabilities			
Steps		Role	Step Description
1	Request Survey	Survey Requester	Requester checks existing surveys to see if there has already been a recent survey on their topic of interest. If not, they contact their AASHTO Staff Liaison (via phone call or email) to request a new survey. Requester provides: <ul style="list-style-type: none"> Target audience: list of committees to send the survey request (and/or custom list of survey recipients) Statement of survey purpose/information needs to enable AASHTO Staff to understand the request Instructions about whether single or multiple responses per agency are requested
2	Approve Request	AASHTO Committee Staff	AASHTO Committee Staff confirms that the requestor has checked the database for any surveys that cover the same topic. If not, they proceed to the next step. . AASHTO Committee Staff determines who will take the lead on the survey and play the <i>Survey Manager</i> role (may be Requester, AASHTO Committee Staff, or another designee depending on the situation).
3	Develop Survey	Survey Manager	Survey Manager chooses a survey tool (e.g. Microsoft Forms, SurveyMonkey), builds their survey (informed by the contents of prior related surveys, if any), and produces a link to their survey.

Phase 1: Expand Current Capabilities			
Steps		Role	Step Description
4	Write Survey Request Email	Survey Manager	Survey Manager writes a draft email to be sent to target survey recipients – including: <ul style="list-style-type: none"> • Survey purpose statement • Survey link • Instructions about whether single or multiple responses per agency are requested • Completion date: the day all responses must be received
5	Approve Survey	AASHTO Committee Staff	AASHTO Committee Staff reviews the survey request email. If changes are needed (e.g. information is not complete, survey link doesn't work, etc.), they request changes. Otherwise, they forward the request on to the Administrative Staff.
6	Distribute Survey	AASHTO Administrative Staff	AASHTO Administrative Staff sends the survey request email to the target audience specified by the Survey Manager. (Note: this step can be performed by the AASHTO Committee Staff).
7	Answer Questions from Respondents	AASHTO Administrative Staff	Recipients of the survey request (may) ask questions about the survey. The AASHTO Administrative Staff can forward these questions to the Requester (or AASHTO Committee Staff), or answer themselves. They can also choose to include a note in their email about who to contact with questions to encourage people to contact the Requestor directly. (Note: this step can be performed by the AASHTO Committee Staff)
8	Send Reminder Emails to Respondents	AASHTO Administrative Staff	Reminder emails are sent manually by the AASHTO Administrative Staff to the entire target email list. The reminder requests that non-respondents fill out the survey and reminds the list of the date the survey closes (completion date). (Note: this step can be performed by the AASHTO Committee Staff)
9	Produce Results and Analysis	Survey Manager	After the completion date, the Survey Manager collects the raw results and (optionally) produces summary tables and charts.
10	Email Results to AASHTO	Survey Manager	Survey Manager sends an email to the AASHTO Administrative Staff, including: <ul style="list-style-type: none"> • Summary of results: a paragraph detailing the main takeaways and interesting results • Suggestions for tags and metadata • All results files (If the Survey Manager is the AASHTO Committee Staff, this step is skipped.)

Phase 1: Expand Current Capabilities			
Steps		Role	Step Description
11	Finalize Results Page	AASHTO Administrative Staff	With the information provided by the Survey Manager, the AASHTO Administrative Staff creates a page for the survey in the AASHTO Survey Platform UI. The AASHTO Administrative Staff inputs the survey purpose statement, results summary, all metadata and relevant tags, and uploads results files. The AASHTO Administrative Staff then submits the results page for approval.
12	Approve Results Page	AASHTO Committee Staff	The AASHTO Committee Staff ensures that all information on the page for the survey in the AASHTO Survey Database is complete. If needed, they ask the AASHTO Administrative Staff to make revisions. Otherwise, they approve publication, which makes the survey information visible within the UI.
13	Announce Publication	AASHTO Administrative Staff	AASHTO Administrative Staff emails a link to the survey results page in the database to the requester and those responding to the survey (if this information is available) or those receiving the survey request (if the respondents cannot be identified) to inform them that the results are posted.

Notes

- This process can be expedited for time-sensitive surveys by:
 - Combining steps 1 and 2 – the Requester speaks with the AASHTO Liaison, they check the survey database together, decide on the questions to be asked, and select the target mailing list(s)
 - Combining steps 3-6 – the AASHTO Liaison (working with AASHTO Administrative Staff) creates the survey and sends it out.
 - Step 9 – the AASHTO Liaison (working with AASHTO Administrative Staff) compiles results and sends them to the Requestor.
 - Steps 10-13 can then be followed as above.
- When the AASHTO Staff distributes the survey link, they should:
 - Blind copy the recipient email lists. This will prevent reply-all accidents (which have been a problem in the past).
 - Note in the body of the request email which groups are being contacted (either in the greeting line or as a standard line in the request).
 - Clarify if a single agency response is desired or multiple agency responses are acceptable.
- In Phase 1, the process of distributing the surveys and collecting results is done with email. This results in a larger communication load for the AASHTO Staff than in subsequent phases.

Phase 2: Integrate Survey Distribution

Workflow

The survey workflow for this phase is shown in Figure 6. Each step of the workflow is further described in Table 6.

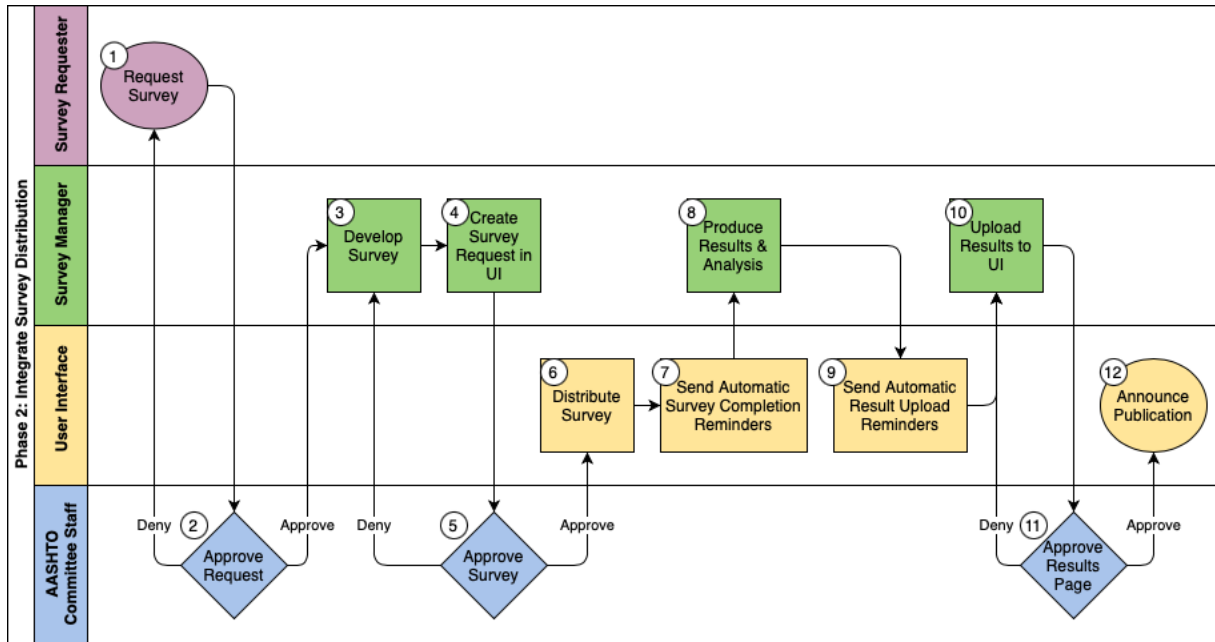


Figure 6. Phase 2 Workflow Swimlane Diagram

Table 6. Phase 2 Workflow Steps

Phase 2: Integrate Survey Distribution			
Steps	Role	Step Description	
1	Request Survey Survey Requester	Survey Requester checks existing surveys to see if there has already been a recent survey on their topic of interest. If not, they submit a survey request in the AASHTO Survey User Interface (UI). This request includes: <ul style="list-style-type: none"> Target audience: list of committees to send the survey request (and/or custom list of survey recipients) Statement of survey purpose/information needs to enable AASHTO Staff to understand the request instructions about whether single or multiple responses per agency are requested Link to any prior related surveys (or checkbox acknowledging that there are no related surveys) 	

Phase 2: Integrate Survey Distribution			
Steps		Role	Step Description
2	Approve Request	AASHTO Committee Staff	AASHTO Committee Staff receives a notification for a new survey. They enter the UI, and review the survey request to ensure that all needed information is present and reasonable. They approve the request or deny it with a note so that the Requestor can make revisions as appropriate. AASHTO Committee Staff determines who will play the Survey Manager role (may be Requester, AASHTO Committee Staff, or another designee depending on the situation).
3	Develop Survey	Survey Manager	Survey Manager chooses a survey tool, builds their survey (informed by the contents of prior related surveys, if any), and produces a link to their survey.
4	Create Survey Request in UI	Survey Manager	Survey Manager inputs information needed for the survey request email, including: <ul style="list-style-type: none"> • Target committees • Text of email request • Link to their survey • Instructions about whether single or multiple responses per agency are requested • Completion date: the day all responses must be received • Reminder date: The date/frequency of survey completion reminder emails Once all information is inputted, they click a submission button to store the information and launch a notification to the AASHTO Committee Staff.
5	Approve Survey	AASHTO Committee Staff	AASHTO Committee Staff ensures the Survey Manager's content is complete. If not, the Survey Manager will be asked to make changes and resubmit for approval. If the survey is acceptable, the AASHTO Committee Staff clicks the approval button in the UI. <i>This makes the survey request information viewable to expose information about both pending/active and completed surveys to others who may be planning similar surveys.</i>
6	Distribute Survey	User Interface (UI)	The UI sends an automated email announcing the survey to the email lists of the target audience specified by the Survey Manager. This email will include the email text, survey link, and requested completion date.
7	Send Automatic Survey Completion Reminders	User Interface (UI)	Reminder emails are sent automatically by the platform to the entire target email list, according to the frequency specified by the Survey Manager. The reminder requests non-respondents fill out the survey and reminds the list of the date the survey closes (completion date).
8	Produce Results and Analysis	Survey Manager	After the completion date, the Survey Manager collects the raw results and (optionally) produces summary tables and charts.

Phase 2: Integrate Survey Distribution			
Steps		Role	Step Description
9	Send Automatic Result Upload Reminder Email	User Interface (UI)	Platform sends an automated email to remind the Survey Manager to upload the survey analysis results. Reminders are sent after the completion date specified by the Requester, and continue until the results are uploaded. The email would include a link to the results upload page in the UI.
10	Upload Results to UI	Survey Manager	<p>Survey Manager inputs survey results into a results page in the UI. The page would collect the following elements:</p> <ul style="list-style-type: none"> • Summary of results: a paragraph written by the Survey Manager detailing the main takeaways and interesting results • Tags and metadata • All results files • Access control specifications (open access or committee members only) <p>They click a submission button to save results and notify AASHTO Committee Staff.</p>
11	Approve Results Page	AASHTO Committee Staff	AASHTO Committee Staff reviews survey results in the UI, checking the results summary, metadata and relevant tags, results files, and access controls. If the information is incomplete, the platform sends a notification to the Survey Manager to make changes and resubmit for approval. Otherwise, AASHTO Committee Staff click an Approve button, which loads the results into the Survey Database and publishes a formatted results page to the AASHTO Survey Website.
12	Announce Publication	User Interface (UI)	Platform sends an automatic email to the Survey Requester, the respondents (if known) or the email lists included in the request (if respondents are not known) to inform them that the survey results are published. The email would include the survey title and a link to the survey results page in the database.

Notes

- This process can be expedited for time-sensitive surveys by:
 - Combining steps 1 and 2 – the Requester speaks with the AASHTO Liaison, they check the survey database together, decide on the questions to be asked, and select the target mailing list(s)
 - Combining steps 3-6 – the AASHTO Liaison (working with AASHTO Administrative Staff) creates the survey, and uses the features of the UI to enter survey information and distribute the survey to the selected lists.
 - Steps 8-9 – the AASHTO Liaison (working with AASHTO Administrative Staff) compiles results and sends them to the Requestor.
 - Steps 10-12 can then be followed as above.
- The survey responses are not connected to the UI, so respondents cannot be easily tracked.

3. The survey UI could include multiple additional elements, such as tips for each element or progress bars.
4. The Requester maintains control of all the data and results since they create the survey.
5. The UI is responsible for communication and formatting, AASHTO Staff are only needed to approve submissions.

Phase 3: Fully Integrated Platform Supporting Survey Creation, Distribution, Tracking and Sharing

Workflow

The survey workflow for this phase is shown in Figure 7. Each step of the workflow is further described in Table 7.

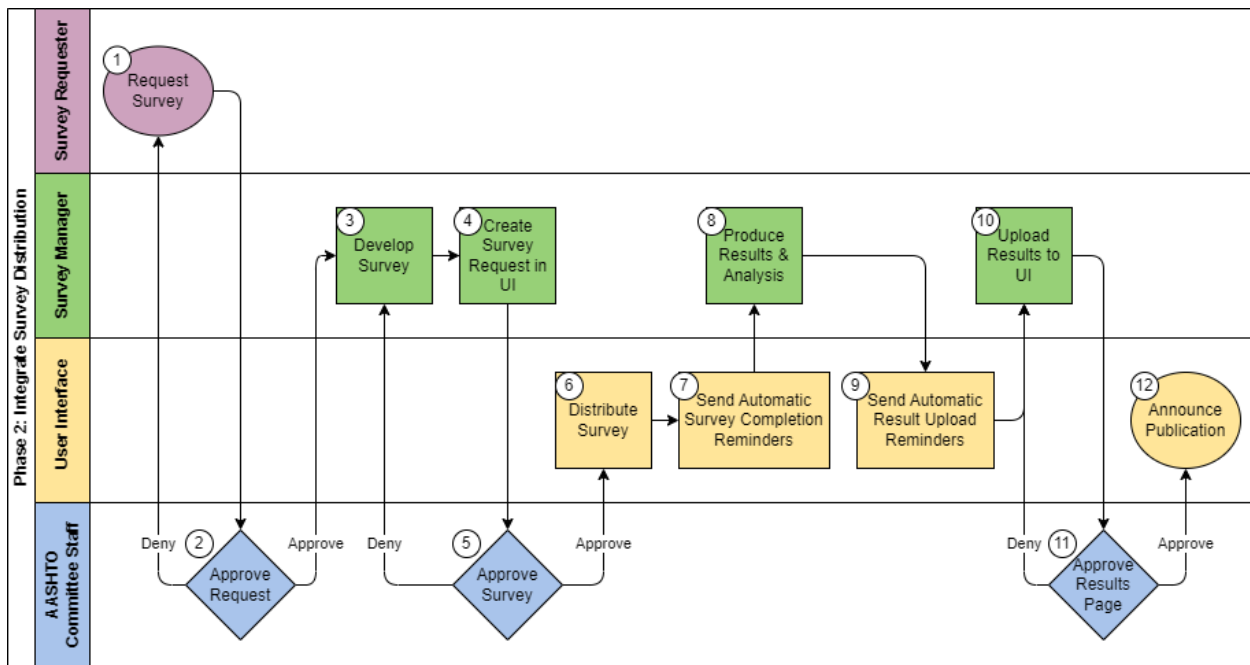


Figure 7. Phase 3 Workflow Swimlane Diagram

Table 7. Phase 3 Workflow Steps

Phase 3: Integrated Survey Tool			
Steps		Role	Step Description
1	Request Survey	Survey Requester	<p>Survey Requester checks existing surveys to see if there has already been a recent survey on their topic of interest. If not, they submit a survey request in the AASHTO Survey User Interface (UI). This request includes:</p> <ul style="list-style-type: none"> • Target audience: list of committees to send the survey request • Statement of survey purpose/information needs to enable AASHTO Staff to understand the request • Link to any prior related surveys (or checkbox acknowledging that there are no related surveys)
2	Approve Request	AASHTO Committee Staff	<p>AASHTO Committee Staff receives a notification for a new survey. They enter the UI, and review the survey request to ensure that all needed information is present and reasonable. They approve the request or deny it with a note so that the Requestor can make revisions as appropriate.</p> <p>AASHTO Committee Staff determines who will play the Survey Manager role (may be Requester, AASHTO Committee Staff, or another designee depending on the situation).</p>
3	Develop Survey	Survey Manager	Survey Manager builds their survey in the AASHTO Survey Platform (informed by the contents of prior related surveys, if any). A submission button will take the requester to the "Survey Parameters" page in the Platform.
4	Set Survey Parameters	Survey Manager	<p>Survey Manager writes a draft email to be sent to target survey recipients – including:</p> <ul style="list-style-type: none"> • Survey purpose statement • Survey link • Completion date: the day all responses must be received
5	Approve Survey	AASHTO Committee Staff	AASHTO Committee Staff reviews the survey request email. If changes are needed (e.g. information is not complete, survey link doesn't work, etc.), they request changes. Otherwise, they click the approval button in the UI. <i>This makes the survey request information viewable to expose information about both pending/active and completed surveys to others who may be planning similar surveys.</i>
6	Distribute Survey	User Interface (UI)	UI sends an automated email announcing the survey to the target audience specified by the Survey Manager. This email will include the email text, survey link, and requested completion date.

Phase 3: Integrated Survey Tool			
Steps		Role	Step Description
7	Send Automatic Reminders to Non-Respondents	User Interface (UI)	Reminder emails are sent automatically by the UI to non-respondents, according to the frequency specified by the Survey Manager. The reminder includes the survey link and the date the survey closes (completion date).
8	Produce and Compile Results	User Interface (UI)	After the completion date, the Integrated Platform collates raw results, augmented results, and produces tables and charts.
9	Send Automatic Result Finalization Reminders	User Interface (UI)	UI sends an automated email to remind the Survey Manager to review and finalize the results of the survey. Reminders are sent after the completion date specified by the Survey Manager, and continue until the results are finalized. The email would include a link to the results processing page in the UI.
10	Process Survey Results Page	Survey Manager	<p>Survey Manager reviews the results produced by the Integrated Platform. They select which charts and tables to highlight, note any interesting survey answers, and organize results in a "snapshot" page template in the UI. Elements in the results page would include:</p> <ul style="list-style-type: none"> • Summary of results: a paragraph detailing the main takeaways and interesting results • Tags and metadata • Access control specifications <p>A submission button submits the results to the AASHTO Staff.</p>
11	Approve Results Page	AASHTO Committee Staff	AASHTO Committee Staff reviews survey results in the Platform, checking the results summary, metadata and relevant tags, and access controls. If the information is incomplete, the Survey Manager will be asked to make changes and resubmit for approval. Otherwise, they click a submission button, which loads the results into the Survey Database and publishes a formatted results page to the AASHTO Survey Website.
12	Announce Publication	User Interface (UI)	UI sends an automatic email to the Survey Requester, the respondents (if known) or the email lists included in the request (if respondents are not known) to inform them that the survey results are published. The email would include the survey title and a link to the survey results page in the database.

Notes

1. This process can be expedited for time-sensitive surveys by:
 - Combining steps 1 and 2 – the Requester speaks with the AASHTO Liaison, they check the survey database together, decide on the questions to be asked, and select the target mailing list(s)

- Combining steps 3-6 – the AASHTO Liaison (working with AASHTO Administrative Staff) creates the survey within the platform, and uses the features of the UI to enter survey parameters and distribute the survey to the selected lists.
 - Steps 8-9 – the AASHTO Liaison (working with AASHTO Administrative Staff) compiles results and sends them to the Requestor.
 - Steps 10-12 can then be followed as above.
2. The Requester is responsible for survey creation and final results processing. If a Requester does not finalize survey results, raw results and tabulations could still be made available since all data is stored in the AASHTO Survey Platform.

Additional Potential Features

The following additional features can be considered for the platform as part of detailed requirements and design activities:

- **Subscription feature:** email notifications when new results are posted to certain tags or groups in the AASHTO Survey Database. A subscription feature would be connected to the database. (All phases)
- **Access controls:** restrict access to certain surveys to AASHTO members or individual AASHTO committee members. (All phases)
- **Link to similar surveys:** the survey results page could include a section for links to previous surveys that are related. These links could be dynamically created based on shared subject tags. (All phases)
- **Notifications:** configurable notifications at key points in the workflow (e.g. survey request sent, survey response received) (Phase 2 or 3)
- **Survey Close Options:** provide options for closing surveys based on elapsed time, a set date, a set threshold for # responses, combinations of these, or on administrator action only. (Phase 3)
- **Survey Collaboration:** Support surveys that allow for input from multiple respondents in an agency (as specified in the request email – e.g. please have unit X complete questions 1-3 and unit Y complete questions 4 and 5). (This functionality is not available in most survey tools.) (Phase 3)
- **Unique survey links:** unique survey links sent to each potential respondent to allow for advanced tracking of responses and reminders to non-respondents only. (Some commercial survey tools include this capability) (Phase 3)

4. Synthesis of Background Research

Current State of Survey Use and Management

To understand the current state of survey use and management, the research team conducted surveys of AASHTO committee liaisons and DOT research directors. We also reviewed and analyzed the contents of the existing RAC survey database and website, and the websites of other AASHTO committees and groups. Key observations were:

- **Use of DOT Peer Surveys.** Peer surveys are used as a valuable tool to understand current practices and inform the work of AASHTO committees and DOT staff. Based on questionnaire results from 30 DOTs, DOT research offices handle an average of 50 peer survey requests per year – with some DOTs reporting 100 or more. The actual figure is likely to be much higher, since many survey requests are not routed through the research office.
- **Volume of AASHTO Committee Surveys.** AASHTO committees send out an estimated 200+ surveys per year. This estimate is based on combining information learned from AASHTO liaison interviews and review of AASHTO public web sites.
- **Survey Activity by Committee.** At least 24 AASHTO committees, subcommittees and Technical Service Programs (TSPs) post surveys to their public web pages. Committees identified with the highest level of survey activity are:
 - Research and Innovation (50 surveys per year)
 - Construction (40 surveys per year)
 - Right of Way, Utilities and Outdoor Advertising Control (30 surveys per year)
 - Funding and Finance (10-20 surveys per year)
 - Materials and Pavement (15 surveys per year)
 - Traffic Engineering (12 surveys per year)
- **Types of AASHTO Committee Surveys.** AASHTO committees conduct/post a variety of different surveys including: simple meeting polls, best-practice questionnaires, resource or contact requests, and in-depth research surveys. Surveys are predominantly brief (under 10 questions), seeking information on what peer agencies are doing with requests for relevant resources to share. Some surveys are relevant for a brief time whereas others have more lasting value.
- **Survey Distribution Methods.** Surveys are conducted in diverse ways by different committees and rely on member agency staff and AASHTO staff support. The most common survey tools among AASHTO committees are email, SurveyMonkey, and Microsoft Forms.
- **Results Sharing Methods.** Twenty-four committees post survey results to their public web sites; about half of these use a dedicated survey page. Many committees may use their members-only portals to share results (these weren't accessible to the research team). Some survey results are shared via email distribution and not posted. There are multiple reasons why results may not be shared on a public website – they are only relevant for a brief time, they include sensitive information that respondents don't want to share widely, or they are only of interest to a limited audience.

- **Survey Results Accessibility.** Results are typically shared in spreadsheet or PDF files. Most survey results are posted as simple links with minimal metadata beyond the year that the survey was conducted. Forty percent of survey links posted to AASHTO websites other than the RAC survey site were inaccessible due to broken links, indicating challenges associated with maintaining accessibility of results.

Interest in an AASHTO Survey Platform

- Eighty-seven percent (27 of 31) of DOT research office survey respondents and all of the 13 AASHTO committee liaisons that responded indicated support for a future AASHTO survey platform.
- AASHTO Committee liaisons indicated several pain points around existing survey practices that might be alleviated by a new AASHTO Survey Platform:
 - Survey methods are predominantly email-based and involve time-consuming processes for tracking responses and compiling results.
 - It is difficult to search for prior surveys which makes it challenging to ensure that new survey requests are not duplicative of prior surveys.
 - It is difficult to coordinate survey efforts across committees.

Desired Features of an AASHTO Survey Platform

The five categories of potential features of a future AASHTO-wide survey platform were identified:

1. Survey development and distribution
2. Survey results intake
3. Survey results access, review and analysis
4. Survey results post-processing and publishing
5. Survey site administration

Table 8 summarizes key features of interest identified through the stakeholder surveys. There was interest in features from all five categories but interest was highest for category 3-features supporting survey results access, review and analysis. With respect to category 1-survey development and distribution, stakeholders expressed the need for flexibility to accommodate diverse types of surveys – one size of survey tool does not fit all. It appears that some of the current challenges related to survey distribution can be addressed through guidance on using widely available tools for simple surveys, and potentially, procuring additional licenses for full-featured survey tools. Given the predominance of relatively simple surveys with mostly open-ended responses, there does not appear to be a pressing need for survey analysis or visualization features.

Table 8. Desired AASHTO Survey Platform Features

Category	Features
1-Survey Development and Distribution	<p>Templates and simple survey creation tools that minimize effort to track and compile responses (e.g. use of Microsoft Forms instead of email responses)</p> <p>Automated reminders to maximize response rates</p> <p>Support flexibility to use a variety of survey tools – including SurveyMonkey or similar</p> <p>Survey distribution email lists (committee members, specialized lists, and custom lists created for individual surveys)</p> <p>Support surveys intended to gather a single response per agency or multiple responses</p>
2. Survey Review and Post-Processing	<p>Monitor distributed but not yet posted surveys</p> <p>Ability to link surveys conducted annually or periodically</p>
3-Data and Metadata Collected	<p>Capture basic, standard information for each survey – e.g. result summary and target and actual responses.</p> <p>Include NCHRP/Synthesis project surveys</p>
4-Content Access, Review, and Analysis	<p>Ability to search/filter prior surveys</p> <p>Ability to review results of prior surveys</p> <p>Access to supplemental resources provided by respondents</p>
5-Survey Site Administration	<p>Ability to restrict access to committee members only for selected surveys</p> <p>Integration with other AASHTO tools (committee member lists, balloting software; tie into digital transformation project)</p> <p>Guidance, standards and protocols for conducting and sharing survey results</p>

Available Survey Platforms

While this scoping study is not recommending a specific survey platform, a review of existing platforms was included to (1) inform decisions about whether to pursue a solution based on off-the shelf solutions and (2) provide a basis for estimating future costs of platform development and ongoing operation. Task 2 identified platforms of potential interest; task 3 defined and analyzed combinations of different platforms and features; and task 5 conducted a more in-depth review of selected commercial platforms based on interviews with technical sales representatives.

Eighteen different survey platforms were identified to support various aspects of survey design, collection, workflow, data analysis, storage, and sharing/discovery. The review focused on two types of platforms:

- Survey platforms – platforms for designing, developing, and distributing surveys and compiling results. These include specialized survey software such as SurveyMonkey, Qualtrics, and Alchemer and basic tools such as Microsoft Forms and Google Survey.
- Survey Repositories – platforms for storing, managing and sharing data sets and other content - including survey results. These include specialized repository software such as DSpace and Dataverse, and more generalized development platforms that could be used to build a searchable repository such as Wordpress and Salesforce.

In addition, two “assistive tools” in the Microsoft Power Platform were reviewed: PowerAutomate for survey workflow management and PowerBI for analytics/dashboard creation.

Note that many of the survey platforms provide capabilities to store and manage access to survey results; and at least one of the data repositories (Wordpress) offers integrations via plugins to support surveys.

While none of the specialized data repository options were selected for further consideration, it should be noted that there may be opportunities for AASHTO to establish a more general-purpose resource sharing platform which includes survey results as well as other types of resources.

Further details of the work conducted for this project are included in a series of appendices to this report.

5. Evaluation of Survey Platform Options

This chapter reviews the initial evaluation of options for developing and managing AASHTO committee and state DOT surveys. It includes descriptions of the evaluation criteria and each survey platform option.

Platform Alternatives

The following five alternatives were identified for consideration in this survey platform scoping study. The first three alternatives build off the existing survey platform maintained by AASHTO's Research Advisory Committee (RAC). The final two alternatives introduce a new survey platform with additional functionalities and different levels of integration with survey and content management software. The development of these platform alternatives was informed by the background research (summarized in Chapter 4) and the insights from stakeholder surveys and interviews (summarized in Appendix B).

Descriptions of each alternative are provided below, and the functionalities included with each option are shown in Table 1. Options are cumulative – i.e. each option includes the functionality of the prior one, but adds new capabilities.

1-Do Nothing

Each AASHTO Committee continues to conduct and publish their surveys individually as they see fit. The RAC survey database remains open to state DOTs and under the responsibility of RAC leadership. No changes are made to the functionalities available on the AASHTO RAC platform.

- Core platform software is WordPress.
- Survey email list managed/provided by RAC.

2-Expanded RAC

The current RAC survey platform is opened up for use by all AASHTO Committees. Minor modifications are made to support a greater number of users and enable committees to restrict access to content to committee members only. Each participating committee designates an individual to send out surveys to the committee email list and upload survey results. Guidance is developed and made available on available tools and best practices for conducting surveys.

- Core platform software is WordPress.
- Survey email lists managed/provided by each AASHTO committee.

3-Enhanced RAC

The current RAC survey platform is further enhanced to enable a broader set of registered users (e.g. at State DOTs) to send out surveys and upload results. Features are added to support new moderator workflow to review and publish results that are posted. In addition, updates are made to the user interface to improve usability and findability of posted content; enable bulk uploads of survey information; manage customized survey recipient lists (beyond AASHTO committee members), and enable people to subscribe to notifications about new postings related to topics of interest.

- Core platform software is WordPress.
- Survey email lists (standard committee members + custom lists) managed/provided by each AASHTO committee.

4-New Platform

A new survey platform is created using COTS software, adding integrations for survey development tools – Microsoft Forms (or similar) for simple surveys and SurveyMonkey or Alchemer for more complex surveys. This option would include establishing a database for managing survey responses at the question level, enabling data analysis and visualization features via the platform. This option would also add separate views of supplemental resources gathered as part of survey efforts (e.g. policies or reports), as well as commenting features.

- Core platform software is Microsoft with Salesforce as a second option.
- COTS survey development tools to be integrated include: Microsoft Forms and SurveyMonkey and/or Alchemer.
- Survey email lists (standard committee members + custom lists) managed/provided by each AASHTO committee.

5-Integrated AASHTO Approach

A new survey platform is created using a mix of COTS and custom software that is integrated with other AASHTO software for content management/portals, member list management, and polling. This option would treat survey results as one type of content to be managed in a holistic fashion within AASHTO. There would still be a centralized survey site (as in Option 4), but each committee would be able to contribute and manage resources to be shared (including survey results) and configure a committee-specific view of resources to its members.

This option would include the same features for conducting and managing survey distribution as Option 4, but would leverage and integrate AASHTO's polling/balloting software for conducting quick polls of members. It would also involve tighter integration with AASHTO's contact management system for survey distribution.

- Core platform software is a mix of Microsoft (or Salesforce) and custom development
- COTS survey development tools to be integrated include: Microsoft Forms and SurveyMonkey and/or Alchemer.
- Survey email lists (Committee and custom) provided through an interface with AASHTO's internal contact management system.

Comparison of Functionalities Across Alternatives
















































































In order to further define, compare, and evaluate the five alternatives, a list of potential survey platform functionalities was created based on the platform reviews and stakeholder engagement of the previous tasks. These functionalities are categorized into five groups:

1. **Survey development and distribution** - features for designing, building and sending out surveys and tracking responses
2. **Survey review and post-processing** - administrative features for reviewing uploaded results, creating value-added views (e.g. visualizations, trend lines), publishing results and archiving results
3. **Data and metadata intake and management** – intake and storage of survey results, related resources and metadata

4. **Content access, review and analysis** - features for end users to access, search, review, and download survey results and related content
5. **Survey site administration** - features for administration of the survey platform including user registration, management of access privileges, bulk uploads, usage monitoring and support

Table 9 provides a visual comparison of the alternatives and which functionalities are available. For each alternative, the included functionalities are indicated with a semi-circle for partial inclusion or a full circle for complete inclusion. Functionalities were assigned to each alternative by the research team with the intention of clearly distinguishing the five options.

Table 9. Detailed Functionalities for Each Platform Alternative

Functional Area	1-Do Nothing	2-Expanded RAC	3-Enhanced RAC	4-New COTS Platform	5-AASHTO-Integrated
 Survey Development and Distribution					
Create and distribute simple online surveys					
Create and distribute complex online surveys					
Create and distribute online polls					
Manage email lists for survey distribution					
Track and review survey responses					
Guidance on survey development and distribution					
 Survey Review and Post-Processing					
Review and update survey submittal (admin/moderator function)					
Produce summary views (admin/moderator function)					
Archive existing survey record					
 Data and Metadata Intake and Management					
Survey Data Files					
Question-level responses					
Basic Metadata (Org, Date, Topic)					
Expanded Metadata					
 Content Access, Review, and Analysis					
Access Control/Privileges					
Search and filter surveys					

Functional Area	1-Do Nothing	2-Expanded RAC	3-Enhanced RAC	4-New COTS Platform	5-AASHTO-Integrated
Display survey information					
Download survey information					
Commenting					
Explore resource library (de-coupled from individual surveys)					
Integrated AASHTO survey and resources library					
Administration					
User Registration					
Subscriptions and Notifications					
Support for moderator workflow					
Bulk uploads of survey information					
Communications and User Support					
Site usage statistics and reporting					
Updates to website and back-end database					
Site security					
Does not provide functionality Provides partial functionality Provides functionality					

Evaluation Criteria

Six evaluation criteria were identified to highlight key tradeoffs across the different platform options:

1. **Initial Cost** - the cost required to implement the option, including platform design, software purchase/development, and initial configuration.
2. **Ongoing Cost** – the recurring cost of managing the selected alternative; including recurring license fees and support costs.
3. **Administrative Burden** - the effort required of system administrators and moderators to keep the site functional and up to date. Responsibility for maintaining the survey platform may be contracted out to system vendors or other third parties in exchange for a higher ongoing cost.
4. **Reach** – a measure of how many relevant stakeholders would be directly supported by the alternative
5. **Usability** - a measure of how easily users would be able to navigate and search the site, upload and edit their surveys, and conduct the survey process from survey development to the presentation of results.

6. **Integration and Extensibility** - a measure of how integrated the platform is with other AASHTO software and the ease with which new features and configuration changes can be made.

Each criterion is rated on a simple Low-Moderate-High scale.

Evaluation Results

The results for the platform evaluation are displayed in Table 10 and summarized below.

Table 10. Platform Evaluation Results

	1-Do Nothing	2-Expanded RAC	3-Enhanced RAC	4-New Platform	5-Integrated AASHTO Approach
Initial Cost	NA	Low	Moderate	High	High
Ongoing Cost	Low	Low	Low	High	High
Administrative Burden	Low	Moderate	High	High	High
Reach	Low	Moderate	High	High	High
Usability	Low	Low	Moderate	High	High
Integration and Extensibility	Low	Low	Low	Moderate	High

Initial Cost – Development cost increases as new features are added and changes to the underlying software platform are made.

Ongoing Cost – Ongoing costs for licensing and software support increase beyond the Do Nothing option due to the licensing of new platform software and survey tools in Options 4 and 5.

Administrative Burden – The administrative burden associated with user and site management increases beyond the Do Nothing option as the number of users increases. Option 2 involves a single user with edit/upload privileges per participating committee; Options 3-5 expand to a greater number of users and add a moderator role.

Reach – Option 2 extends the reach of the current platform by opening it up to other committees; options 3-5 open up the platform to a greater number of users.

Usability – Usability improves starting with Option 3 through user interface enhancements and other added features. Options 4 and 5 provide expanded capabilities for survey development, distribution and analysis, further improving overall usability.

Integration and Extensibility – Option 4 switches to a new underlying platform offering greater options for integration with survey tools. Option 5 provides seamless integration with other elements of AASHTO's portal and contact management software.

As the reach, usability, and extensibility of the platform options increase, so do the costs and effort required to implement and maintain them.

Based on this evaluation of options, recommendations were developed for a phased development approach, starting with the Expanded RAC option, then moving to the Enhanced RAC and New Platform options based on demonstration of sufficient interest, use and administrative support.

Appendix A. Review of Prior AASHTO Surveys

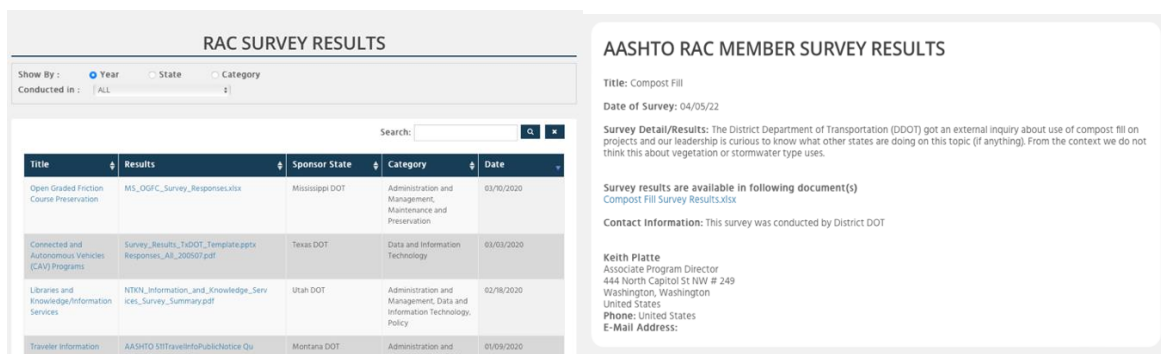
This appendix presents the results of an analysis of prior surveys conducted by AASHTO committees. It is organized into two sections. The first section covers surveys conducted via the AASHTO Research Advisory Committee (RAC). The second section covers surveys conducted by other AASHTO committees.

AASHTO RAC Surveys

Background

RAC is a subcommittee of the AASHTO Special Committee on Research and Innovation (SCORI). One of RAC's activities is facilitating surveys of state DOTs to gather and understand best practices, policies, specifications, and other information of interest from peers at other state DOTs. Survey requests are submitted via the RAC listserv. RAC members use their network of contacts in their agencies to distribute surveys to the correct audience and collect meaningful responses. Results collected from these surveys are posted to the RAC Survey database and displayed on the RAC [survey results page](#). This page is open to general public access.

Surveys on the results page are presented in a table that includes the survey title and link to more information, a direct link to the survey results, the sponsoring state or organization, survey date, and survey subject category. Individual survey pages include a description of the survey, one or more survey/results documents, and contact information for the survey conductor. Examples of the results page and individual survey pages are shown in Figure A-1.



Figure

A-1. The RAC Survey landing page (left) and a sample individual survey page showing results (right).

An analysis was conducted of the 458 surveys on the AASHTO-RAC results page. The purpose of the analysis was to document current survey practices and to understand the needs for an expanded AASHTO survey platform.

Methodology

The research team reviewed surveys posted to the AASHTO RAC web page, and compiled information on the following survey attributes:

- File formats of results (.xlsx, .pdf, .docx)
- Number of responses

- Number of questions (beyond contact information)
- Number of open-ended questions (long-answer, free-form or written-response questions)
- Number of bounded questions (questions with a limited subset of possible answers)
- Number of questions seeking resources
- Whether resources were shared
- Whether summarized results were provided
- Whether the survey was for a research project
- Survey tool used (if applicable)
- Target group (if specified)
- Notable practices

These attributes were summarized and analyzed to characterize the survey dataset and to identify trends in survey submittal, survey response, and the types of questions asked over time. The following section highlights the findings through a series of graphs and tables.

Findings

Organizations using the RAC Database

55 different organizations had surveys uploaded to the RAC-AASHTO survey platform. By far the primary users are state DOTs. 41 out of the 52 DOTs had surveys uploaded to the database. Figure A-2 highlights the how overwhelming majority of RAC surveys originate from state DOTs.

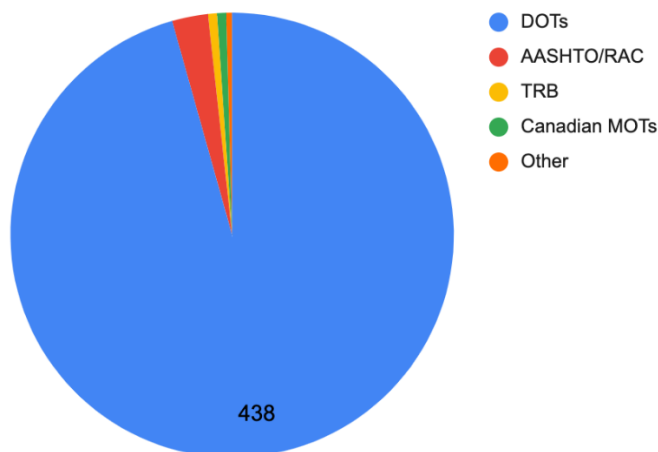


Figure A-2. Count of surveys submitted by DOTs, AASHTO, TRB, Canadian MOTs and Others.

Volume of Survey Submittals

In addition to the 458 published surveys on the RAC site, there were an additional 169 surveys labeled as pending results, with submittal dates from 2016 to October 2021. Figure A-3 tracks the number of surveys submitted per year, with pending surveys shown in red. When including all surveys listed as pending, there has been a fairly consistent volume of 45-60 surveys going through the RAC listserv annually from 2015 onward. The total number of surveys dropped in 2021, presumably related to the pandemic. In addition, the share of pending surveys not yet posted has steadily increased between 2016 and 2021. The staff position originally in charge of managing the surveys in the RAC database no longer exists within NCHRP, so the responsibility for maintaining the site has fallen to other NCHRP and AASHTO staff members who have extremely limited time available.

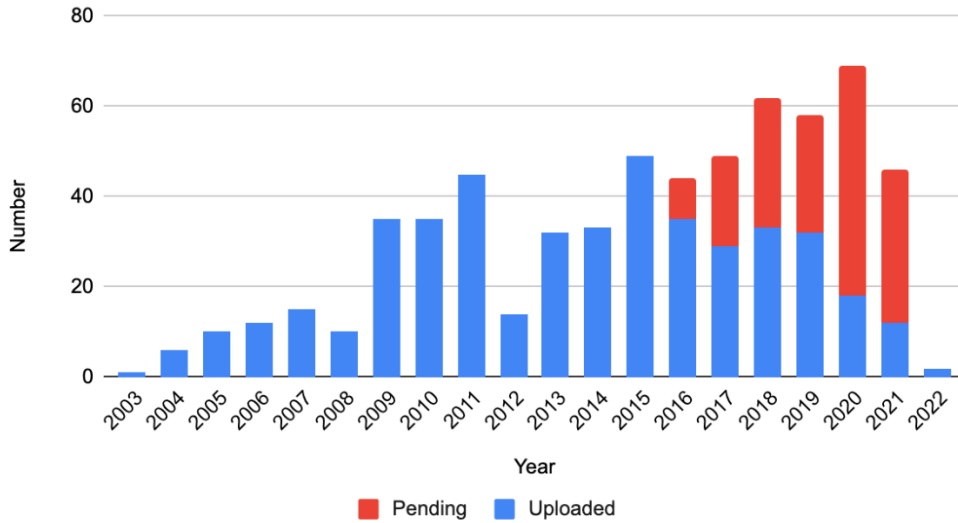


Figure A-3. The number of surveys submitted and uploaded per year from 2003-2022.

Number of Survey Responses

The two figures below, Figures A-4 and A- 5, show the number of responses to surveys conducted at different points in time, and the frequency of different numbers of responses. The clustering of responses between 0 and 52 reflects the number of state DOTs. Surveys typically obtained 15-25 responses.

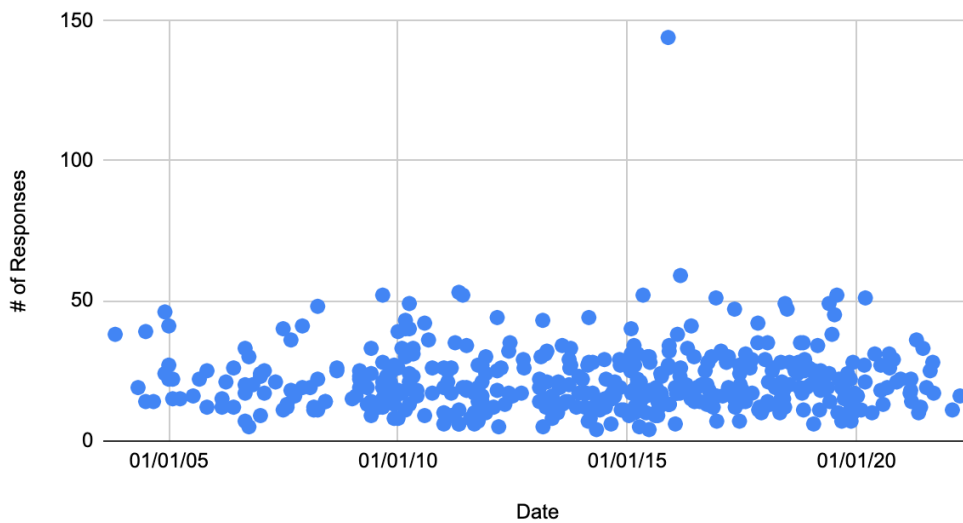


Figure A-4. Number of survey responses over time.

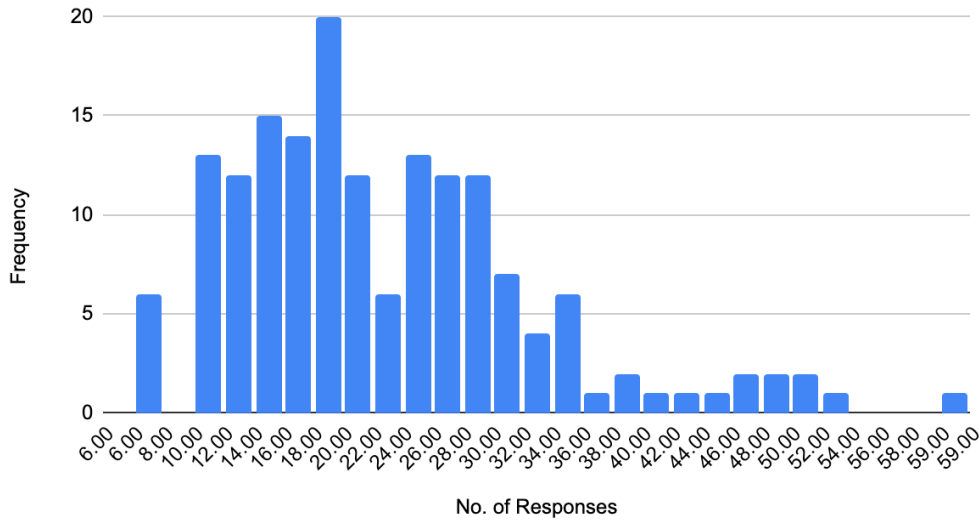


Figure A-5. Distribution of survey responses.

*An outlier survey with 144 responses was excluded from this histogram

Types of Surveys

Shorter surveys generally are informal, open-ended questionnaires sent to peer staff across DOTs to assess the state of the practice; these surveys often include a request for resources related to their questions. Longer surveys are often related to research projects or more formal studies conducted by DOTs, and usually include bounded questions.

Surveys in the RAC database are typically short (generally 2-6 questions.) Sixty-five percent of all surveys have fewer than seven questions, and about half of these surveys have two or three questions each. Longer surveys do occur, though there are few surveys with over 20 questions (about three percent of all surveys). Figure A-6 shows the frequency of each question count for all of the surveys conducted from 2013 to 2022. The sharp peak and long tail of Figure 6, indicates the prevalence of short-form questionnaires.

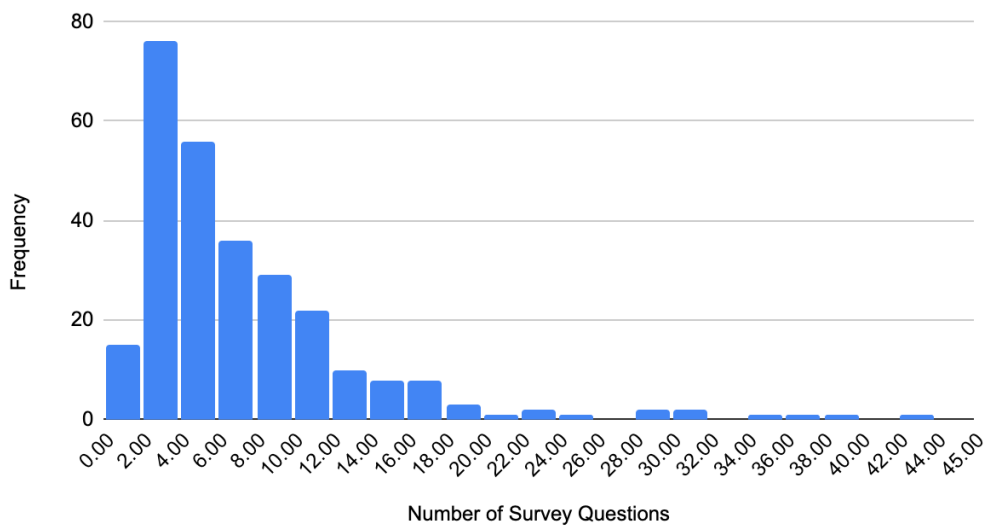


Figure A-6. A histogram of the number of questions per survey.

Types of Survey Questions

Questions in the RAC site surveys were categorized as:

- Open-Ended: with free-form text responses
- Bounded: with a limited subset of possible answers
- Resource: questions that asked for copies of state DOT policies or copies of other types of information

The use of different question types is demonstrated in Figure A-7 which displays the question make-up of 14 surveys from 2021 and 2022.

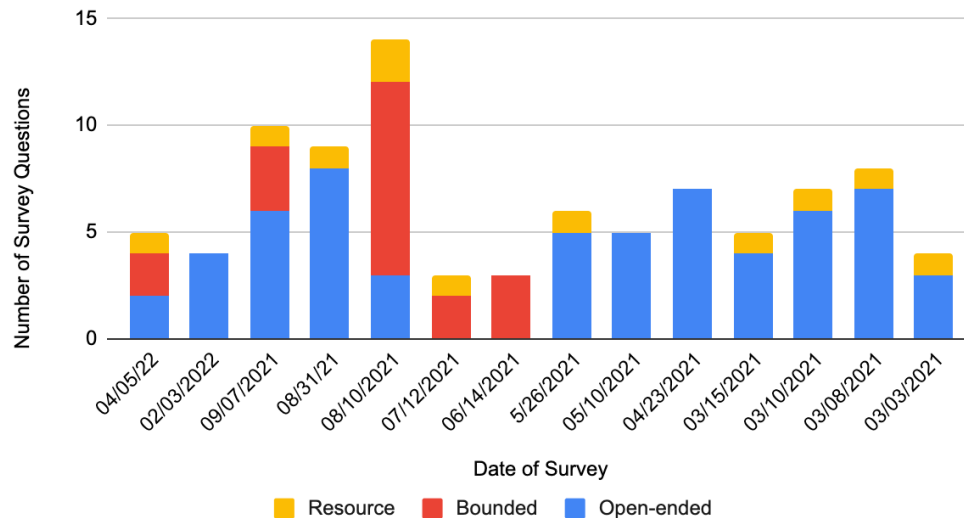


Figure A-7. Distribution of question types in each RAC survey from 2021-2022.

Overall, 56% of all survey questions in the RAC database were open-ended. just over a third were bounded questions, and the remaining questions were related to asking for example resources. The breakdown of survey questions is shown in Figure A-8; for the figure, survey questions from each survey were categorized and then summed.

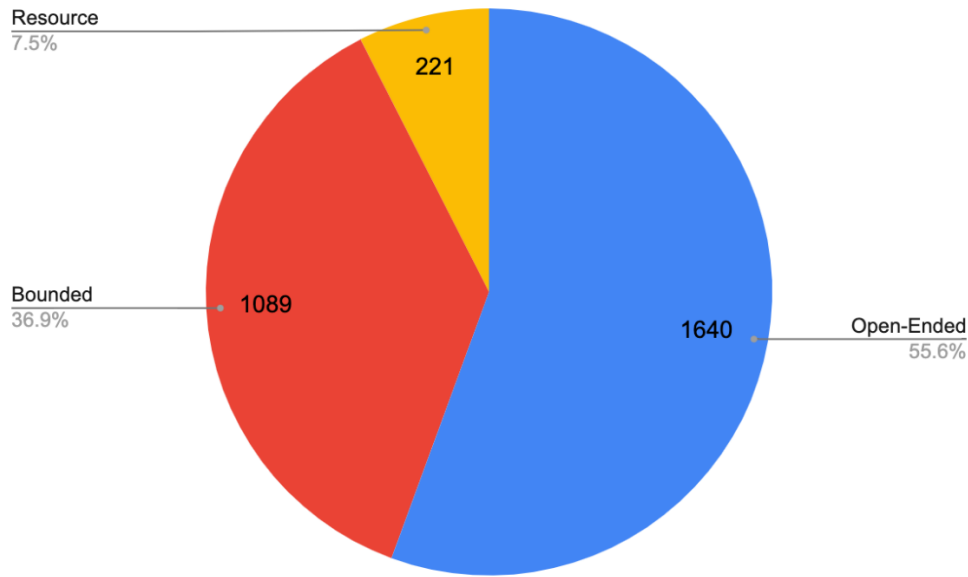


Figure A-8. The types of questions asked in RAC surveys.

Survey Subject Categories

When surveys are posted to the RAC results page, they are tagged with one or more of twenty-eight subject categories defined for the database. The site allows surveys to be sorted by these categories on the site. The top ten categories present across the surveys are as follows:

- Data and Information Technology
- Finance
- Maintenance and Preservation
- Materials
- Construction
- Operations and Traffic Management
- Safety and Human Factors
- Pavements
- Bridges and Other Structures
- Design

The number of surveys associated with each of the top ten categories is displayed in Figure A-9. Data and Information Technology is the most common survey category followed closely by Finance. The 17 survey categories outside of the top ten have fewer than 20 surveys each and account for a total of 109 surveys in the database. It is useful to know which categories are most relevant because that may inform the categorization of surveys in a potential future survey platform.

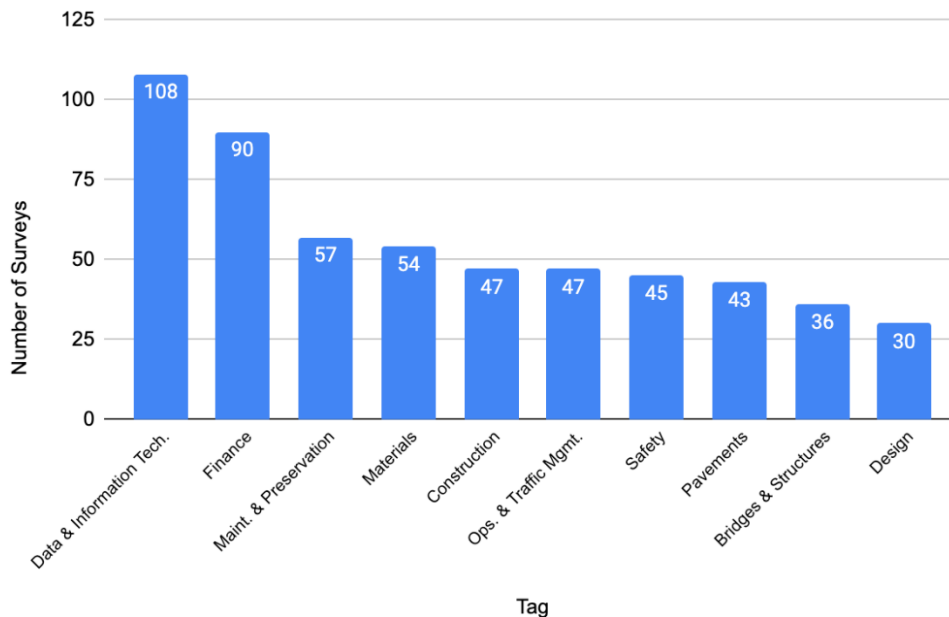


Figure A-9. The number of surveys in each of the top 10 subject categories.

Types of Survey Results

Each individual survey page on the RAC database includes a text-based “Survey Details/Results” section, and a “Results” section that includes links to any related files. As seen in Figure A-10, most surveys did not include result write-ups beyond a summary of the survey questions or the purpose of the survey, or any analyzed result files beyond the raw data of the survey results. The RAC database currently functions primarily as a data repository for raw survey results.

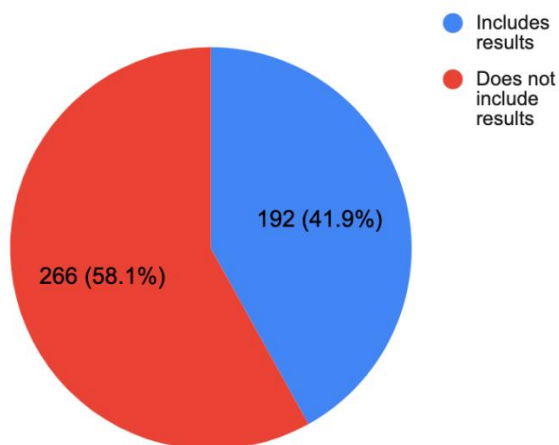


Figure A-10. The split of surveys which include analyzed survey results.

As shown in Figure A-11, most survey results were provided in spreadsheet or pdf format. Spreadsheets offer the potential for automated analysis, more easily extracted data and automated visualization. Results in text-based files like .docx/.doc/.pdf, are easy to view but not as usable for further analysis.

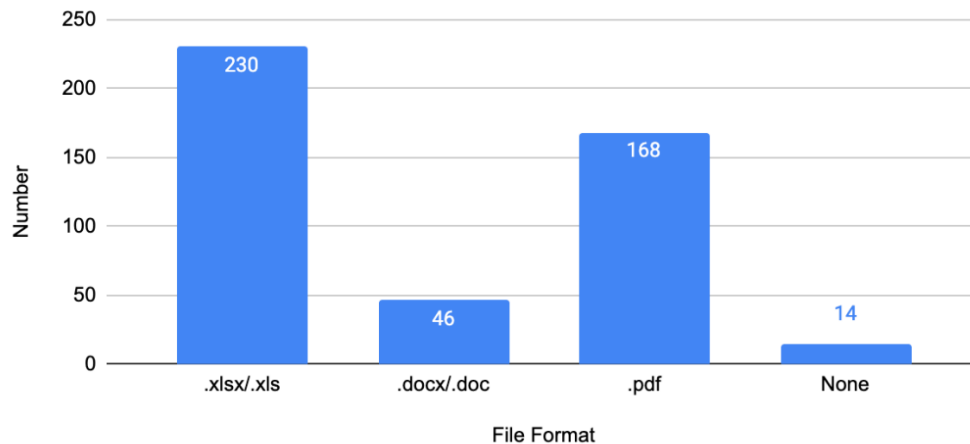


Figure A-11. The count of primary results provided in each file type.

Other AASHTO Committee Surveys

Background

AASHTO committees conduct surveys for a variety of purposes. They use surveys for quick polling, identifying best practices, requesting resources or contacts, and researching in-depth topics. There is no single method or platform for conducting or distributing surveys used by all committees; each committee has developed its own methods and standards for surveying its members. To understand the survey needs of the AASHTO community and how a survey platform might be useful, an analysis was conducted of the surveys published on the AASHTO committee web pages.

Methodology

The webpages of 36 AASHTO committees, councils, special committees and inter-committee working groups were reviewed to find published surveys. Another five subcommittees and technical service programs were included in the review because they have surveys posted to their websites. 41 groups were reviewed in total (including the Special Committee on Research and Innovation which hosts the RAC survey page). Other subcommittees were excluded from the analysis.

Surveys were identified by manually navigating through the webpages of each AASHTO committee searching for links to access or view surveys they conducted. For each committee, the research team compiled the following attributes:

- Contact information for the AASHTO liaison
- Whether they had a specific page for posting surveys (and its link)
- Number of surveys posted, classified by:
 - Inaccessible/Paywall (members-only portal)
 - Broken Links
 - Report
 - Poll
 - Presentation
 - Survey Results
 - Active/Pending
- Link to a clearinghouse/portal
- Notes on the surveys and committees (incl. approximate dates, topics, and notable practices)

These attributes were used to analyze and characterize the methods for sharing surveys online.

Findings

Table A-1 summarizes the results of the AASHTO website review. At least one survey was posted to the AASHTO websites for 24 of the 41 groups reviewed. Half of the groups posting surveys used a dedicated survey page. These pages typically included a set of links grouped or sorted by year. For thirteen of the groups reviewed, websites referenced a separate portal or clearinghouse site for posting various resources of interest. It is possible that these sites also included surveys, but they generally had access restrictions and were therefore not reviewed.

Table A-1. Summary of Website Review

Category	Count
Number of groups reviewed	41
Number of groups with at least one survey posted to an AASHTO website	24
Number of groups with a dedicated survey web page	12
Number of groups referencing a resource clearinghouse	13
Total number of surveys posted	488

Table A-2 lists information about each of the 24 groups that posted at least 1 survey. A total of 1118 surveys were identified - 630 on the RAC survey site and an additional 488 on other AASHTO web pages. SCORI, CRUO, Construction and Traffic Engineering account for over 90 percent of the surveys posted.

Table A-2. AASHTO Website Review Results

Group Name	Type of Group	Count of Surveys Posted	Dedicated Survey Web Page?	Comments
Special Committee on Research and Innovation (SCORI)	Committee	630	Yes	RAC survey site
Right of Way, Utilities and Outdoor Advertising Control (CRUO)	Committee	218	Yes	Survey page has tabular listing with date, subject and requestor
Construction	Committee	88	Yes	Survey page has series of links organized by year
Traffic Engineering	Committee	79	Yes	Survey page has series of links organized by year
Funding and Finance	Committee	20	Yes	Survey page has links sorted by year, restricted to committee members

Group Name	Type of Group	Count of Surveys Posted	Dedicated Survey Web Page?	Comments
Equipment Management Technical Services Program (EMTSP)	Technical Service Program	12	Yes	Survey page provides links to recent surveys; some have separate links for summary and raw results. Page also provides instructions on submitting SurveyMonkey requests to the NCPP webmaster at MSU
Snow and Ice Pooled Fund Cooperative Program (SICOP)	Technical Service Program	9	Yes	Survey page provides links to surveys on miscellaneous topics, sorted by year
Transportation Communications	Committee	8	Yes	Survey page provides links to annual social media surveys, sorted by year
Rail	Council	8	No	
Bridges and Structures	Committee	8	Yes	Survey page provides links to annual member surveys, sorted by year
Public Transportation	Council	6	Yes	Survey page provides links to annual surveys of state funding for public transportation sorted by year
Multi-State Transit Technical Assistance Program (MTAP)	Technical Service Program	5	No	
Materials and Pavements	Committee	5	Yes	Links to surveys on miscellaneous topics, organized by year
Environment and Sustainability	Committee	4	No	
Knowledge Management	Committee	3	No	
Professional Development (Committee on Planning)	Sub-committee	3	No	Projects page includes links to recent poll results
Water	Council	2	No	
Planning	Committee	2	Yes	Survey page includes links to summary results of 2 recent surveys

Group Name	Type of Group	Count of Surveys Posted	Dedicated Survey Web Page?	Comments
UAS and AAM: Uncrewed Aerial Systems/Advanced Air Mobility	Inter-committee Working Group	2	No	
Safety, Environment and Workforce Development	Technical Sub-committee	2	No	
Human Resources	Committee	1	No	2019 AASHTO Salary Survey
Wireless Communications Technology	Special Committee	1	No	2017 Communications Survey
Design	Committee	1	No	
SM/MoD/MaaS: Shared Mobility, Mobility on Demand and Mobility as a Service	Inter-committee Working Group	1	No	

Over half of the 24 publishing committees (13) posted five or fewer surveys, and another quarter (7) published fewer than 20. Figure A-12 illustrates the distribution of surveys posted by each committee.

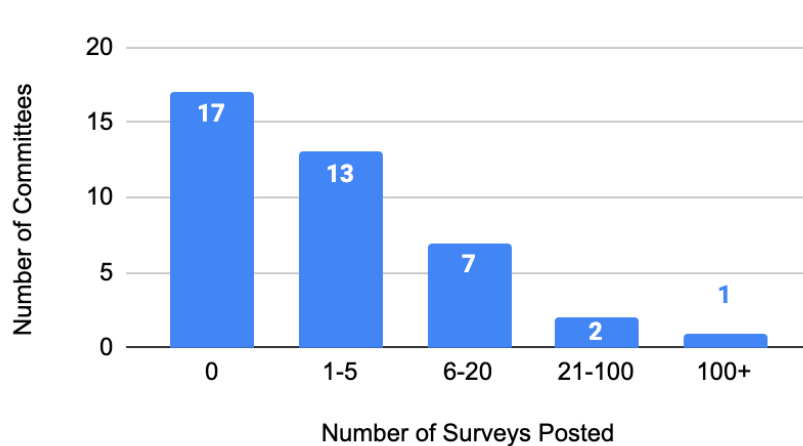


Figure A-12. Distribution of surveys posted by the AASHTO Committees and Groups.

Figure A-13 categorizes the 488 non-RAC surveys based on the types of results available. Half of the surveys (243) had accessible and viewable survey results, typically shared as PDFs or Excel files. Another 4 percent of the links led to presentations or reports that were based on the survey results. Forty percent of the survey links were broken and therefore not accessible. Another five percent had limited accessibility because they were restricted to committee members.

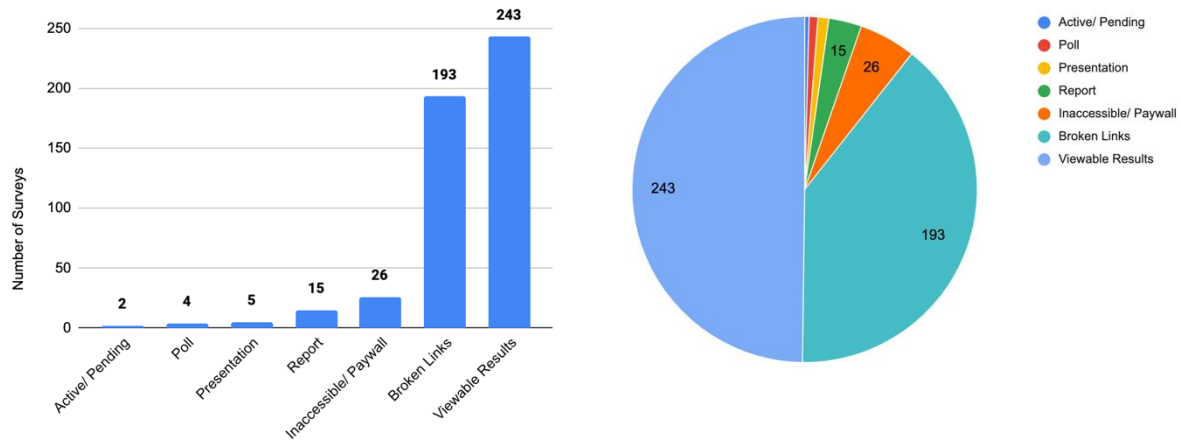


Figure A-13. The number of surveys available by category.

This analysis indicates that there is the potential for expanded use of an AASHTO survey platform given that there are at least 24 committees and other groups conducting surveys and a dozen maintaining dedicated survey pages to display results. It also indicates the opportunity to improve discoverability and accessibility of surveys conducted by AASHTO committees – based on the number of broken links and the lack of a consistent approach to storing and tagging survey results.

Appendix B. Stakeholder Consultation

This appendix presents the results of stakeholder consultation activities conducted throughout this project – including a survey of AASHTO Staff Liaisons and RAC members, follow up interviews, and a stakeholder round table to obtain feedback on platform options.

AASHTO Staff Liaison and RAC Member Survey

The research team developed two stakeholder surveys to understand how state DOTs and AASHTO Committees use, develop, distribute, analyze, and share surveys. One survey was sent to members of RAC, who lead state DOT research offices and manage and share surveys from inside and outside their organization. The second survey was sent to 23 AASHTO liaisons representing 30 committees and councils.

- The survey of state DOTs received 31 responses, two of which were partially incomplete. The responses cover 30 DOTs (63% of the targeted DOTs), as one DOT responded twice
- The survey of AASHTO liaisons received 13 responses (57% of the liaisons) who collectively represent 18 of the committees (60% of the committees and councils).

Findings

Support for an updated survey platform

As shown in Figure B-1, there was strong support for an updated survey platform. Twenty seven DOT respondents (87%) stated that they would like a new or improved survey platform for sharing and distributing survey results. Only two responded negatively, and two did not answer the question. All of the 13 AASHTO liaisons responding to the survey indicated interest in a common survey platform.

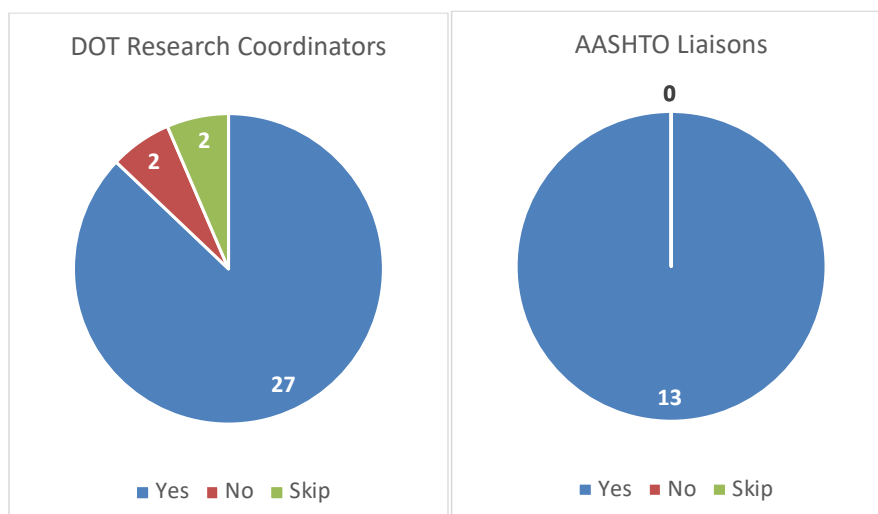


Figure B-1. Stakeholder interest in a new survey platform

Figure B-2 displays the count of DOT respondents who have used the RAC database to find and review past survey results. Five individuals were unaware of the AASHTO-RAC results website. A crucial element

of any updated survey system would be effective advertising and clear guidance for all current and future users.

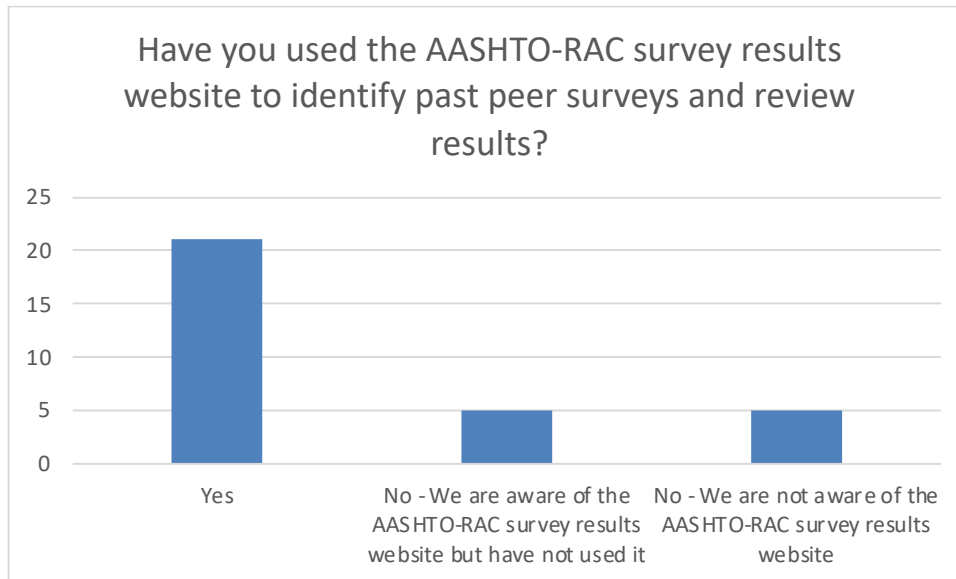


Figure B-2. DOT research coordinator responses to the survey question on their use of the RAC database.

Volume of surveys sent and received

The DOT research office survey asked respondents to report how many surveys they send out and receive each year. Respondents reported sending out an average of five surveys per year – individual responses ranged from 0 to 30. These include surveys posted to the RAC site as well as those shared in other ways. Respondents reported receiving an estimated average of 50 survey requests per year – individual responses ranged from 10 to 300. Respondents were also asked about surveys sent and received by business units other than the research office. A handful of respondents indicated that they were aware that surveys were in fact sent out by others, but could not provide an estimate of how many. Eleven indicated that they were aware of surveys received by others, but did not track these.

AASHTO committee liaisons were also asked how many surveys their committees send out each year. Responses from 13 liaisons account for 18 of the AASHTO committees. The number of reported surveys ranged from 2 to 50 per committee per year, with an average of 15.

Scope of AASHTO Committee Surveys

AASHTO Committee Liaisons were asked to indicate the type of surveys they conduct. As shown in Figure B-3, the 18 represented committees conduct a variety of survey types. Brief, best practice questionnaires was the most frequently selected type (12 of the 18 committees).

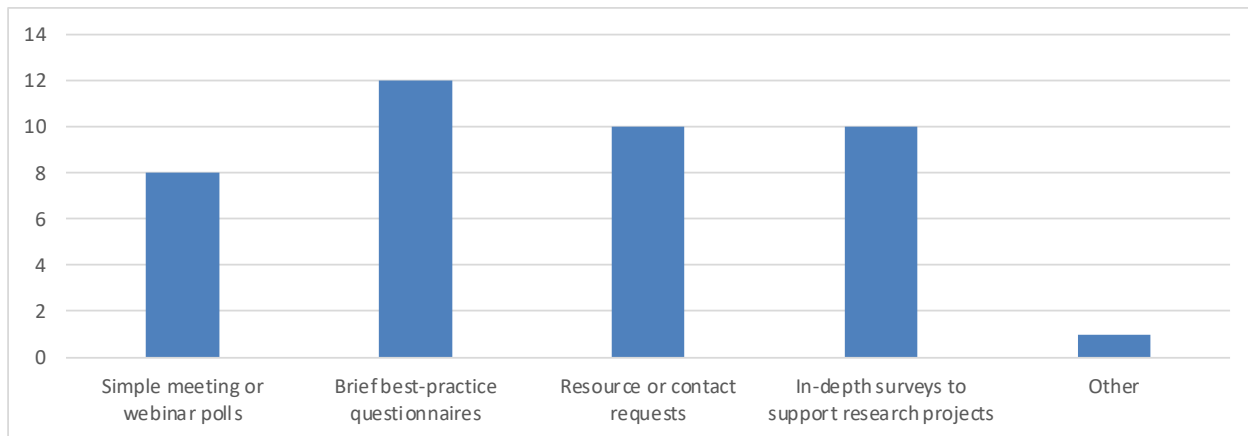


Figure B-3. The types of surveys conducted by AASHTO committees, excluding NCHRP projects

Tools and methods used to develop, distribute, and share surveys and survey results

Numerous tools exist to support survey development including: Google and Microsoft Forms, Qualtrics, Excel, ArcGIS Survey 123, various webinar polling tools, SurveyMonkey, and email. The most popular tools among DOT research practitioners were email (used by 84% of respondents) and SurveyMonkey (used by 61% of respondents).

The methods used by DOT research coordinators and AASHTO committees to share their survey results are shown in Figure B-4. For this question, respondents were able to select multiple answers and provide additional information if they selected “other.” Among DOT respondents, uploading survey results to the AASHTO-RAC website and sending direct emails to stakeholders were the most popular methods for sharing results. For survey distribution, DOT research leads primarily used the AASHTO-RAC listserv (84% of respondents), and occasionally used AASHTO/TRB committee email listservs, conference listservs, and other state and federal government mailing lists. Among AASHTO liaisons, sending emails to stakeholders and uploading survey results to their committee’s website were the most popular options.

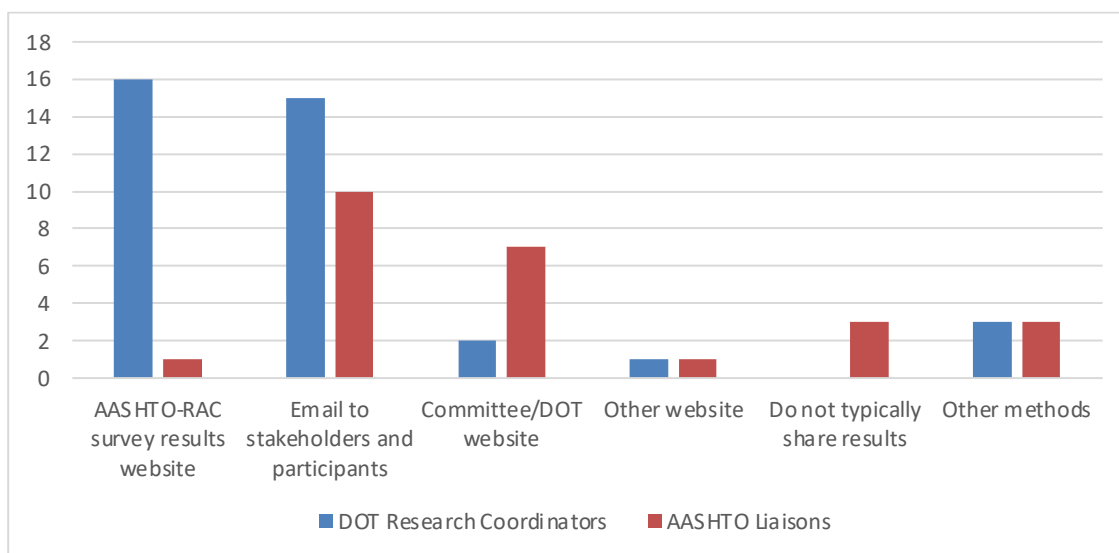


Figure B-4. Common methods for sharing survey results

Suggested features

Respondents of both the AASHTO and DOT surveys were asked to suggest features they felt would be most important for a potential new survey platform. Twenty-nine survey respondents provided suggested specific features. The results were grouped into the following five categories: survey development and distribution; results intake; post-processing and publishing; access, review and analysis; and administration. Figure B-5 shows the breakdown of respondent suggestions by category.

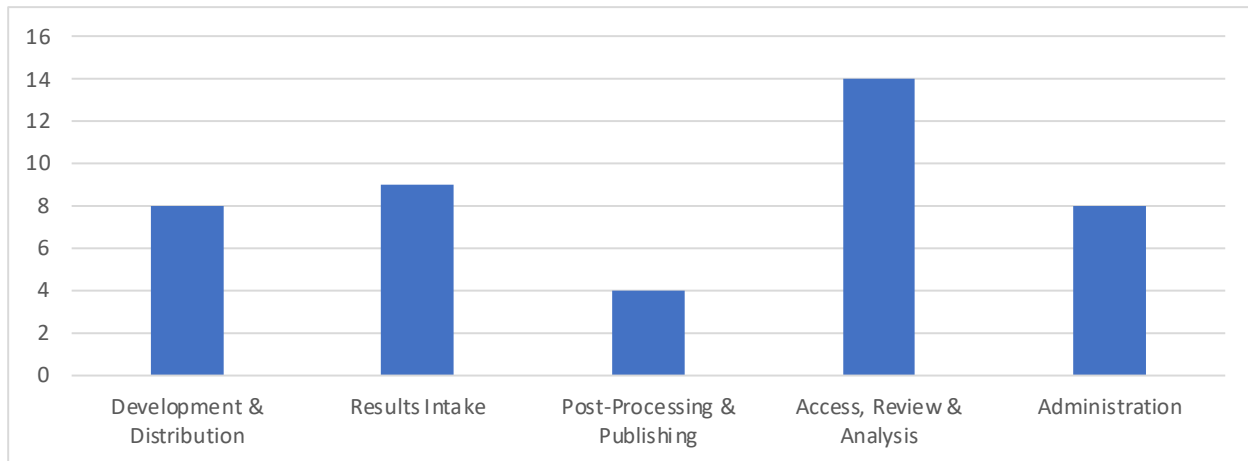


Figure B-5. Categories of survey features suggested by 29 survey respondents.

From the development and distribution category, the key feature requests were to provide survey templates and simple features to support the creation of questionnaires. For distribution, respondents would like assistance with managing distribution lists and reducing the need for forwarding. Under results intake, respondents suggested metadata elements for surveys in the system. These include: informative titles/summaries, target respondents, actual respondents, connections to previous versions of the survey, and survey background. The requested post-processing and publishing features were the maintenance of a list of distributed (but not yet posted) surveys and simple result reporting. Searchability, with a smaller focus on filtering, was the primary request under access, review and analysis. From the administration category, the requests were integration with the AASHTO website, an expansion of the platform to TRB partners and NCHRP projects, and the inclusion of guidance and best-practices for survey development and using the site.

Figure B-6 categorizes each of the survey feature requests into one of three buckets: a searchable database, survey support, and other. Overall, the most popular features (with 19 requests) were those relating to a searchable database of survey results with clear survey metadata. Requested metadata includes descriptive survey titles, target and actual respondents, background/NCHRP project information, survey date, and simple categorizations. The second main group of requests is under survey development support and guidance. Respondents would like a site that supports them as they develop and distribute surveys, collect responses, and analyze results. Ideal guidance includes survey templates, best practices, and a set of procedures to follow. The final group of platform requests covers a desire to integrate the platform with AASHTO sites, expand the site users to include TRB partners and NCHRP projects, and for additional special features such as tracking surveys completed by a specific audience and coordinating on surveys to avoid duplication.

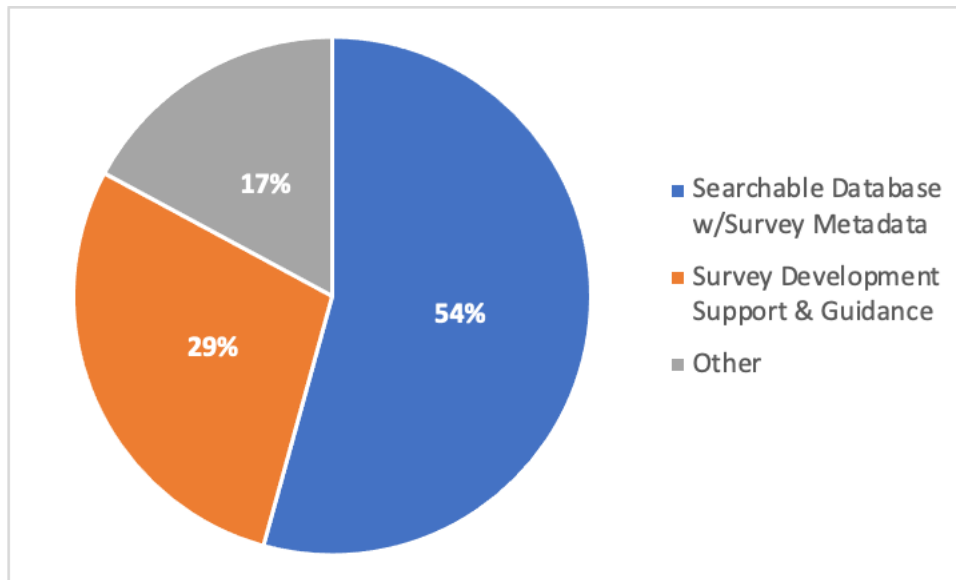


Figure B-6. Categorization of requested survey features from DOT and AASHTO surveys.

The results of the two surveys of state DOT research coordinators and AASHTO liaisons highlight a number of features which should be considered for an effective survey platform:

- Management of contacts and distribution lists
- Survey templates and simple design tools
- Email distribution templates
- Consistent survey metadata (title, background, target/actual respondents)
- Link survey updates with previous versions
- Track surveys distributed but not yet posted
- Response tracking
- Searchable results
- Result filtering
- Integration with AASHTO website
- Clear guidance for current and future users
- Effective site advertising
- Expansion of platform to TRB partners and NCHRP projects

Stakeholder Interviews

The research team used the results of the survey of AASHTO liaisons to identify individuals with experience conducting and managing surveys who could provide a well-informed perspective on these topics. Interviews were conducted using a standard set of questions, with flexibility to explore specific topics that arise in greater depth.

The objective of the stakeholder interviews was to:

- Understand ways in which AASHTO committees currently use and manage surveys
- Understand current challenges related to surveys
- Identify opportunities and priorities for an AASHTO survey platform

Individuals interviewed for this task are summarized in Table B-1. Four of them are AASHTO Committee liaisons, and the fifth manages the surveys for one of the committees.

Table B-1. Individuals Interviewed

Organization	Role	Committee(s)
AASHTO	Liaison	Funding and Finance
AASHTO	Liaison	Safety
AASHTO	Liaison	Construction; Right of Way, Utilities and Outdoor Advertising Control; Materials and Pavements
AASHTO	Liaison	Research and Innovation
Ohio DOT	Real Estate Program Administrator (supporting survey management for AASHTO CRUO)	Right of Way, Utilities and Outdoor Advertising Control

Findings

- **Surveys are valued.** Surveys are in wide use and are described as crucial sources of information that is of practical value to AASHTO members, particularly information on current peer practices.
- **Challenges.** Numerous challenges were reported related to the use of email messages to conduct surveys. Similarly, targeting the right respondents was described as a challenge. While some surveys are easily addressed to an entire committee or technical work group, others require input from a variety of stakeholders and must be addressed to multiple constituencies or simply forwarded to the desired respondents. Respondents also described significant challenges related to duplicative and redundant surveys and survey requests – and expressed a desire for an easily searchable library of past surveys.
- **Varied approaches.** Typically surveys are created and distributed via email as simple, open ended questions. Many of these surveys have a limited shelf life and limited audience – but use cases also include a wide range of other survey types and methods. While a number of dedicated survey tools are in use, no one-size-fits-all solution was identified which meets the needs of all users across all use cases. Respondents anticipated that flexibility to support

committees' established processes and workflows would be a valuable feature of a potential AASHTO survey platform.

- **Stakeholders indicated support for an AASHTO survey platform.** Interview subjects anticipate that an AASHTO survey platform would add value and improve the efficiency and effectiveness of AASHTO committees. Significant challenges were described related to the time and other resources required to manage surveys using existing tools, as described above.
- **Desire for guidance.** Consistent with the interest in maintaining committees' established autonomy and independence, there is a desire for guidance, protocols, and tools to support design and deployment of surveys – ranging from best practices for designing surveys to easy tools for conducting simple surveys.
- **Desire for Integration.** Interview subjects anticipated benefits to connecting an AASHTO survey platform with AASHTO's future updated AMIMS member management system - and potentially other related system implementation efforts, including a new balloting system.

Results from each of the interviews are summarized below.

Liaison for Funding and Finance Committee

Committee	Estimated # Surveys Distributed per Year	# of Surveys Posted	Survey Page
Funding and Finance	10-20	20 from 2017-2020	Yes

Current Practices

- Surveys are typically member-initiated, but some outside requests too (e.g. National Congress of State Legislatures)
 - AASHTO liaisons are the gatekeepers for validating requests
- Most surveys are best-practice/info-sharing surveys; these are best suited to email
- Some surveys are engineering/data-related and better suited to excel spreadsheets
- Compiled survey results are usually posted to the Funding and Finance portal where members can check to see if their questions have already been answered
- Typical surveys have a limited shelf life and limited audience (usually only the questioner)
- Bigger “research report” surveys from the committee or via NCHRP projects have a wider audience and a higher desired response rate

AASHTO Survey Platform

- Challenges for licensing survey platforms means committees default to email-based surveys
 - If a committee has a Technical Service Program, they may fund a SurveyMonkey account, other committees need to work within a tight budget.
- Compiling results is a major pain point as it is a highly manual effort; approaches are not consistent across committees and sometimes mistakes happen
- Each committee has different needs for a survey system depending on the topic and volume of surveys they conduct; ideally if they survey often, they have a survey system
- A unified platform would benefit coordination between AASHTO members and staff and across committees
 - Committees need a way to collaborate w/o going through the liaison

- AASHTO’s “digital transformation” project will provide an updated member experience via AMIMS and an improved balloting system – surveys could be integrated with this
- Committees have developed their own solutions, but it is important to bring these back together and integrate the solutions into the larger AASHTO system

Liaison for Safety Committee and Technical Committee on Roadway Safety

Committee	Estimated # Surveys Distributed per Year	# of Surveys Posted	Survey Page
Safety	5-10	0	None

Current Practices

- Committee members submit survey requests to the liaison to share via the committee distribution lists to all other state DOTs
 - Requests are typically for copies of policy or opinions on specific practices
 - The surveys and their responses are distributed and collected via email
 - Survey requests received by Safety often need to be rerouted (to Traffic or Design)
- The current practice would benefit from formal procedures and expectations
 - Result compilation in particular is challenging; it is the responsibility of the member or DOT requesting the survey, but this does not always happen
- There is a loose system for sharing results via email; not all results are worth sharing
- AASHTO members-only areas are sometimes used to share results
 - It can be a lengthy process for committee areas to gain access to such an area. They are added on a one-by-one basis as requested.

AASHTO Survey Platform

- Greatest pain point is compiling the survey results
 - AASHTO does not have enough junior technical staff to pull together survey results, and liaisons do not have the time
- Need a system to manage the completion of surveys which requires input from multiple people in the same group
- A good system would track responses by state to eliminate repeated effort within a state
- Automated reminders would help collect more responses
- Guidance is needed on how to manage surveys and how to set timelines for receiving results
 - Quick responses are hard to deliver; longer timelines are necessary
 - Not enough staff to help with set up and management of surveys on short timelines
- SurveyMonkey may be a good tool for AASHTO (AASHTO had 2 accounts)
- About half of the survey traffic comes from NCHRP projects, especially Synthesis projects
- AASHTO committee websites often show much less than what the committee is actually doing because there isn’t bandwidth to update the site

Liaison for Right of Way, Materials and Pavement and Construction Committees

Committee	Estimated # Surveys Distributed per Year	# of Surveys Posted	Survey Page
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Right of Way	30	218 (107 broken links) from 2001-2018	Yes
Materials and Pavement	15	5 from 2016-2018	Yes
Construction	40	88 (50 broken links) from 1999-2020	Yes

Current Practices

- Conducts surveys via email sent to the committee listserv (comprised of voting members and other subgroups)
- Survey sender is responsible for compiling results and sharing with AASHTO liaison to post
 - Posting frequency depends on the liaison's bandwidth and whether the sender compiles the results
- Many challenges around posting survey results; some are not worth posting, sometimes states do not want their results posted; and sometimes it is improper to share results publicly
- CRUO surveys differently – a staff member of the committee's vice chair compiles the results and sends them to the survey requester; the liaison posts the final results
- Sometimes Construction uses a survey platform instead of an email survey for state-of-practice surveys since it can produce official results and easily collect responses

AASHTO Survey Platform

- Guidance on how to manage and conduct surveys is necessary, including when/how/where to post results and a risk assessment of whether posting responses is a liability
 - It would be much easier to collaborate with a common, streamlined survey process
 - Coordinating on which committee the survey should be sent to is key
- A major pain point is the use of "reply-all" when responding to email surveys
- The current website search function is not helpful for identifying surveys
- Survey platforms:
 - AASHTO has had challenges using a SurveyMonkey account with 2 seats
 - Google Forms are not accessible by all committee members
 - Microsoft Forms are more accessible and more commonly used when email isn't
- A survey platform should be accessible from the AASHTO system and not require a separate login
- AASHTO has an existing balloting tool which could be expanded for use as a survey tool
 - It does not have branching capabilities, but can have y/n questions, narrative responses, and upload attachments; plus it is linked to the membership system
 - Limitations are lack of familiarity across committees and more intensive to set up compared to an email
- Would be useful to tie a survey platform into the new vision for AASHTO's "digital transformation"

Liaison for Research and Innovation Committee

Committee	Estimated # Surveys Distributed per Year	# of Surveys Posted	Survey Page
Research and Innovation	50	630 from 2003-2022 (169 Active/Pending)	Yes

Current Practices

- Originally the RAC survey site was administered by a dedicated NCHRP employee who would upload new surveys sent to them by RAC members
- Currently, Glenn Page (AASHTO) and Sid Mohan (NCHRP) maintain the site. Glenn manages the roster (typically ~5 min of effort); Sid conducts limited content updates.
- The current level of support is unable to keep up with the survey site maintenance needs.

AASHTO Survey Platform

- A useful feature would be "SurveyMonkey-style" platform with features to support survey development and distribution and response collection and analysis.
- Need a central results repository to cut down the number of repeated requests
- Collect survey responses in an organized fashion (beyond emails and reply-all)
- The site should account for a fair amount of variety between committees with no expectation of being used by every committee
- An AASHTO survey platform would need to tie into the Web Services Digital Transformation Project – project updating the AASHTO Membership Information Management System (AMIMS) and supporting efficient information transfer between committee members; also includes: the development of a "Teams-style" platform for sharing resources between committees, server hardware updates, rebranding of committee logos and names.
 - Project brief anticipated in September and final project to be completed next year
- An AASHTO Innovation Platform (recommended via a previous NCHRP scoping study) is currently on hold until resources are available for development
- AASHTO is evaluating proposals and in the final stages of identifying a vendor to produce an updated balloting system which would connect with AMIMS
- The survey scoping project should provide the level of effort to implement, operate, and maintain a survey platform, from resource and cost perspectives

Ohio DOT Real Estate Program Administrator

(Manages Surveys for the Committee on Right of Way, Utilities and Outdoor Advertising Control)

Current Practices

- Supports the AASHTO Committee on Right of Way, Utilities and Outdoor Advertising Control (CRUO), managing surveys on behalf of the committee
- He typically manages 3-5 surveys a month for CRUO
- Each survey typically requires 2-4 hours of his time to format, distribute, collect responses, and compile and share results
- He has many other responsibilities so cannot prioritize survey support

Survey Development

- Typically, a survey is initiated when a CRUO member has a question
- The member sends an email with one or more question directly to him
- He confirms the intended audience (main committee or technical subcommittee) and timeframe for returning results (depends on need of requesting member)
- He also revises the organization and formatting as needed to simplify compiling survey results
- This process typically takes 1-2 hours

Survey Distribution

- Once revisions are complete, he emails the survey to the main CRUO email alias or to a sub-lists
- Completed surveys are returned as email replies to him
- Sometimes responses are emailed to the AASHTO committee liaison who forwards the responses to him
- Some issues with reply-all on these email responses
- He manually tracks responses

Post-Processing and Publishing (Sharing Results)

- Typically he will 'close' or compile the results of a survey after 2 weeks
- He collects responses by searching his email inbox for the relevant subject line
- Responses typically range from 10-25 individuals
- He copies and pastes each of the responses into a word document
- If responses include spreadsheets, he copies each response into a new tab on a single spreadsheet workbook
- After compiling the results he emails the compilation back to the member who requested it. This process typically takes 1-2 hours

Stakeholder Roundtable

Roundtable Planning and Participation

Two stakeholder roundtables were conducted on March 14th and 16th, 2023. The purpose of the roundtables was to share preliminary findings of the scoping study and obtain feedback on the platform options that have been identified to date. The stakeholder feedback was used to refine material presented in the Interim Report and develop a final set of platform recommendations.

Invitations to the two roundtables were emailed to:

- AASHTO Committee Staff Liaisons
- Members of the NCHRP 20-123(14) panel
- State DOT Research Directors (obtained from the AASHTO RAC list, supplemented by web research to identify research contacts missing from the RAC list)

Representatives of the following state DOTs participated in the roundtables:

- Arizona
- Connecticut
- Florida
- Iowa
- Maryland

- Mississippi
- Missouri
- Utah
- Washington DC

In addition, two project panel members and four AASHTO committee liaisons participated in the roundtable (representing the committees on research and innovation; safety; construction; right of way, utilities and outdoor advertising control; materials and pavements bridges and structures, and design.

Roundtable Discussion Summary

Each roundtable began with an introduction of the project purpose and scope, which was followed by a summary of what has been learned so far. Following the introduction, a facilitated discussion was conducted of (1) current pain points related to transportation agency surveys and (2) potential features of a common survey platform. The discussion of platform features was divided into four topics: survey development and tracking, survey distribution, sharing survey results and platform administration. Key discussion points of the roundtables are summarized below, organized by the major topics covered.

Pain Points Related to Surveys

Research staff talked about pain points related to their roles as recipients of surveys that had to be distributed to the right staff. Many pain points were mostly related to the nature and format of the surveys:

- Surveys that require responses from multiple units in a DOT are time consuming and sometimes difficult to identify who the right person is to send it to; some are reluctant to “be the official voice of the DOT”
- Some surveys are not designed to allow someone to go back after starting the survey – without having to restart
- If we just get a link to a survey without a PDF, we don’t know the survey length or amount of time needed to complete it. We also don’t know if we can answer all the questions or need to ask someone else.

Other pain points were related to the task of obtaining and compiling responses to surveys:

- It is difficult to get a decent response rate
- It takes a lot of effort to get people to respond– one needs to be very persistent and send a lot of reminders. Effective reminders let people know that “we’ve heard so far from these states, your response is needed...”
- We get a lot of spreadsheet surveys which are difficult to deal with – online surveys are easier to manage.

AASHTO staff talked about pain points around executing survey-related tasks and avoiding duplication:

- It is difficult to make time to manage survey efforts – we do what is needed to support our committees, but best practices in survey design and management are not always followed – e.g. sometimes surveys aren’t designed well and don’t end up answering the original question.
- Want to avoid situations where multiple committees decide to do similar surveys

- We would like to facilitate collaboration across committees on a given survey – e.g. one committee develops and then asks another to review and suggest edits based on their perspective and experience.
- We don't know if there has already been a survey on a given topic. Since many surveys are done in conjunction with NCHRP projects (especially synthesis projects), there was strong support for including these types of surveys in the common platform.

Participants noted that RAC protocols had been established that were very useful – including encouraging short surveys, specifying the target(s), and including a PDF. A future survey platform should build on these protocols.

Survey Platform Options – Survey Development and Tracking

The first discussion topic asked participants to weigh in on whether the platform should include features for developing surveys and tracking responses to the surveys.

Most participants agreed that tracking was an important feature – and that a platform that handles tracking would reduce the administrative burden needed to monitor responses and send out reminders. Opinions on survey development features varied. Some felt that this wasn't essential and there was a need for flexibility to accommodate different survey software solutions in use. Some felt that it would be very helpful to have a fully self-contained platform that handles both survey development and tracking. (One AASHTO staff participant suggested that the AASHTO balloting platform could be used as a model.) It was also acknowledged that it can be hard to separate survey development and tracking features. One participant reported that their agency is facing challenges related to licensing costs and restrictions for commercial survey software and they would support having survey development capabilities available (even if they were fairly basic.) Another participant reported that some DOTs have trouble using certain survey development platforms (e.g. Google Forms). A third noted that many agencies do not have survey software licenses. A compromise idea was suggested: having a basic survey development option built into the platform, but allow for embedding a link to an external survey form. This would enable tracking of responses while providing the flexibility to use more sophisticated survey development tools.

Survey Platform Options – Survey Distribution

The second discussion topic asked participants about the types of survey distribution capabilities that should be considered for the platform – and in particular, whether the platform should support distribution to AASHTO committee members and/or custom created lists of people in particular DOT functions. The general consensus was that the platform should have a feature to route surveys to AASHTO committees, but that the AASHTO committee liaisons should serve as gatekeepers rather than allowing for direct access to committee email lists. Ideally there would be workflow features to route the request to the liaison and enable them to approve it, which would then generate a request to the committee members to complete the survey.

The ability to create and manage custom email lists for survey distribution was viewed as valuable but likely too difficult to maintain given the high staff turnover rate in DOTs. A comment from the chat on this was: "I have difficulty getting appointments to committees and maintaining the lists. I don't see any way that a list of contacts of subspecialties could be maintained."

A DOT research participant suggested that if RAC members are to be responsible for distributing surveys to the right people in their organizations, a useful feature of the platform would be to have a set of standard DOT functions to select to ensure specificity in terms of the desired recipients.

One participant felt that the platform should house a link to the survey which could be shared through multiple channels – not necessarily within the platform.

Another participant suggested that sometimes surveys are time-sensitive, so it would be helpful to include a quick polling option in the platform.

Survey Platform Options – Sharing Survey Results

The third discussion topic concerned features for sharing survey results and covered search features, access controls, file formats and metadata to be provided.

Participants agreed that sharing of survey results was an essential requirement for a common survey platform. Suggestions included:

- Support sharing a variety of file formats including JPEG, XLS, PDF but don't support formats that require specialized software to open (e.g. Visio)
- Include a keyword search capability
- Require posted survey results to include background information on why the survey was done – keeping in mind that the survey initiators/designers may be different than those handling the mechanics of survey development and distribution.
- Include basic DOT statistics (e.g. miles of roadway or FTEs) that people could use to help identify peer agencies as they review survey results from different states.

Regarding access controls, DOT participants generally supported that viewing survey results be open to the public by default, with an option to make certain surveys viewable only by committee members or those who submitted responses. Several participants recommended that the platform not be used to post any survey results that are viewed as sensitive, even if access was restricted – given that public records laws could require that results be made available. Specific comments posted to the chat on this topic were:

- Either lock down to AASHTO members or have the ability to anonymize the results. If the questions are in any way related to what or how states are doing related to federal requirements, they don't want FHWA to be able to pin a response to a particular state.
- Very interesting about anonymizing but RAC results generally are not anonymous--they are tagged to particular states (we know which state said what).
- When we send surveys about things like MASH, our committee members are adamant about keeping their responses anonymous from FHWA. There are other sensitive topics where we need to get a sense of what states are doing without sharing the individual results with anyone else.

An AASHTO participant noted that if this platform were hosted by AASHTO, AASHTO leadership would need to weigh in on access restrictions, and there may be support for keeping the platform open to AASHTO members only.

Survey Platform Options – Administration

The final topic covered administration of the platform. Participants were asked for their thoughts on whether there should be a centralized model (single individual managing the platform), a Committee-based model (each participating AASHTO committee would take on certain administrative tasks for the

surveys they initiate), or a decentralized model (individual DOTs could designate one or more individuals to take on survey administrative tasks for the surveys they initiate).

Opinions were mixed on this topic. Many felt that the centralized model would be most efficient and straightforward. One AASHTO staff participant supported the Committee model, but noted that the ability to delegate responsibilities (and associated platform access privileges) for individual survey tasks to Committee members or consultants/researchers would be important.

Several DOT participants supported having some kind of agency administrative capability, noting that RAC members are already serving as point people for surveys.

It was agreed that resourcing for platform administration was essential for success – existing AASHTO resources are not sufficient to support a new common survey platform.

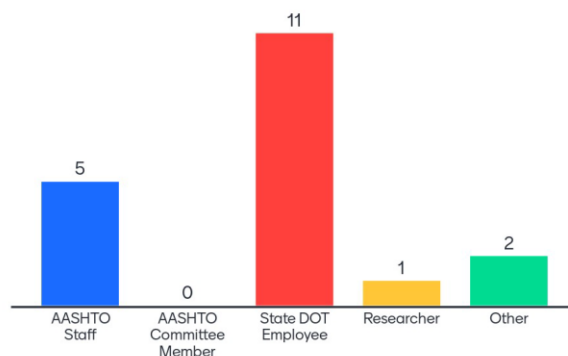
A final comment on this topic was that there will be a need to establish clear guidance. One participant commented in the chat that: “Some guidance up front on survey requirements (questions attached, SME suggestions, mandatory sharing of results, etc.) would be helpful.” It was also suggested (if possible) automated workflow be implemented for the entire process of searching for an existing survey, creating a new one, filling in required metadata, distributing the survey, tracking responses, posting auxiliary files, and reviewing results.

Participant Poll Results

Following the roundtable sessions, participants were asked to complete a short poll asking for their opinions on key platform features. Results of the poll are shown below.

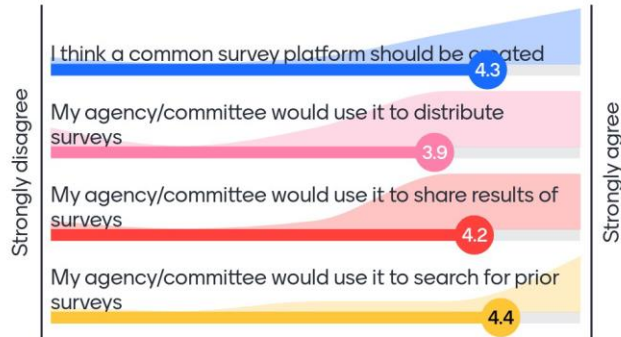
About You (Select the first one that is applicable)

Mentimeter



Overall Support for an AASHTO Survey Platform

Mentimeter



16

What features of a common survey platform are most needed?

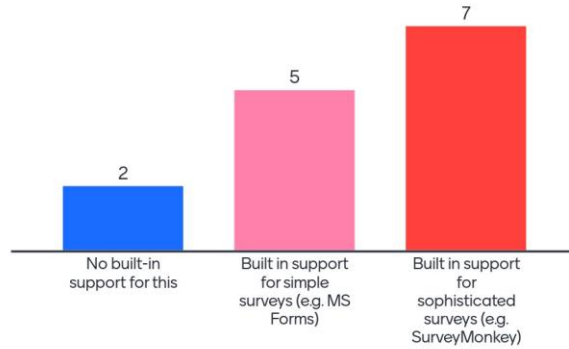
Mentimeter



14

Which option for Survey Development and Tracking would you choose?

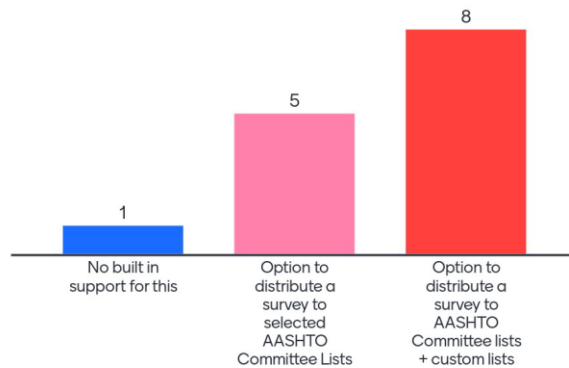
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14

Which option for Survey Distribution would you choose?

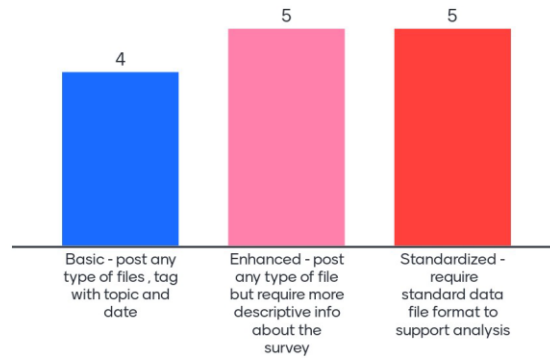
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14

Which option for Survey Sharing would you choose?

Mentimeter



14

How would you want to search for surveys (e.g. full text of title, topic, date conducted, etc.)?

18 Answers

Mentimeter



13

How would you want to search for surveys (e.g. full text of title, topic, date conducted, etc.)?

18 Answers

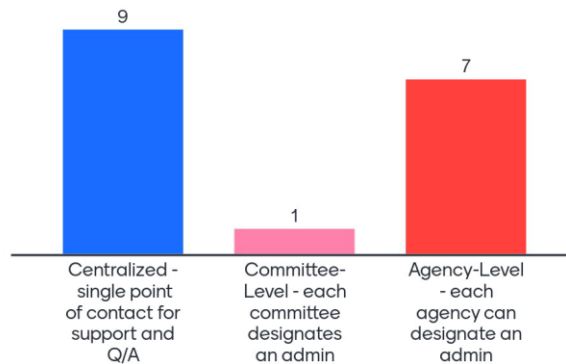
Mentimeter

All of the above and distributed by which committee/entity.	Agency or committee sending, if associated with a study—name of that, date, tags, text	title, keyword, topic, who (state/committee/etc.) distributed
topic/keyword, AASHTO committee, NCHRP project, transportation discipline (ie, design but not necessarily only surveys for the Committee on Design).	Discipline area; Topic; Title; Date conducted; Date results posted; State conducting; State contact email; States responding; Number of respondents; Search should support Boolean logic and wildcards.	Discipline area; Topic; Title; Date conducted; Date results posted; State conducting; State contact email; States responding; Number of respondents; Search should support Boolean logic and wildcards.
Discipline area; Topic; Title; Date conducted; Date results posted; State conducting; State contact email; States responding; Number of respondents; Search should support Boolean logic and wildcards.	Also should allow as wide and narrow a search as needed using single or multiple parameters with and/or function.	Tags/topic, date, committee

13

What option for Platform Administration would you choose?

Mentimeter



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Appendix C. Review of Commercial Survey Products

The research team conducted an initial review to identify survey software and data repositories for further assessment in subsequent project tasks. Based on this review, 18 platforms were initially identified as potentially applicable based on their stated functionality, testing and demonstrations by the research team, and a review of independent third-party assessments. Each platform identified was separated into one of three major categories: survey tools, data repositories, and assistive tools. Within these categories, further subcategories were identified for each platform. After reviewing each of these platforms for their potential usefulness in AASHTO committee and state DOT survey management and development, seven platforms were selected for further evaluation. Following this evaluation, additional information was gathered on four of the most promising commercial platforms through interviews with technical sales representatives.

Initial Platform Evaluation

Platform Category/Subcategory Definitions

Available commercial survey platforms and data repositories (that could be used to provide access to completed survey results) were analyzed and assigned to one or more functional categories based on their stated functionality. The six categories used were:

- **Survey Design** – develop surveys using question templates, with opportunity for additional question branching, logic, and design choices
- **Survey Collection** – assist the collation of responses via different collectors: email is the most common collector, but some platforms offer embedding surveys into websites, sharing via social media, and other less common methods
- **Survey Workflow** – support the transition of data from compiled results to analysis
- **Survey Data Analysis** – provide tools for creating graphs, figures, and other visualizations of the results
- **Sharing with Integrations** – offers connections to database and storage platforms through special system integrations
- **Storage, Sharing and Discovery** – maintains collection of survey results in a searchable database; customizations are available depending on the system

Platform Summaries

Eighteen products were analyzed to understand the availability and features of existing platforms to conduct and manage surveys. These products are classified into categories and subcategories in Table C-1. Additionally, the notes column highlights some of their key features or opportunities.

Table C-1. Summary of survey platform review.

Product (Platform)	Category	Subcategories	Notes
Microsoft Forms (Microsoft 365)	Survey Tool	Survey Design and Collection	Simple survey forms and collection. Integration with Teams.

Product (Platform)	Category	Subcategories	Notes
Power Apps (Microsoft Power Platform)	Survey Tool	Survey Design, Collection, Workflow and Data Analysis	Low code/no code development tool. Licensing restrictions complicate access.
Power Automate (Microsoft Power Platform)	Assistive Tool	Survey Workflow	Custom notifications and database linkages.
PowerBI (Microsoft Power Platform)	Assistive Tool	Survey Data Analysis	Dashboard creation.
Dspace	Data Repository	Storage, Sharing and Discovery	Open-source platform managing intake, metadata, and access. Supports search and hierarchies.
Dataverse	Data Repository	Storage, Sharing and Discovery	Manages intake, metadata, versioning, access, and privacy. Supports search and hierarchies.
Data Repository (Figshare)	Data Repository	Storage, Sharing and Discovery	Commercial platform managing intake, metadata, and access. Supports search, file previews, and hierarchies.
Zenodo	Data Repository	Storage, Sharing and Discovery	Open-source data repository. Metadata management and some access management. Search facets and keywords.
SurveyMonkey	Survey Tool	Survey Design, Collection, Workflow, Data Analysis, and Sharing with Integrations	Commonly used survey tool. Sophisticated survey design. Highly ranked.
Survey Software (Qualtrics XM)	Survey Tool	Survey Design, Collection, Workflow, Data Analysis, and Sharing with Integrations	Sophisticated survey design. Strong integration with Microsoft, Google, and other management systems. Highly ranked.
Google Surveys (Google Workspace)	Survey Tool	Survey Design and Collection	Intended for market research surveys.
Alchemer	Survey Tool	Survey Design, Collection, Workflow, Data Analysis, and Sharing with Integrations	Less user-friendly, more complex survey tool.

Product (Platform)	Category	Subcategories	Notes
TypeForm	Survey Tool	Survey Design, Collection, Workflow, Data Analysis, and Sharing with Integrations	Sophisticated survey design. Good integrations. Moderately ranked.
Google Forms (Google)	Survey Tool	Survey Design, Collection, Workflow, Data Analysis, and Sharing with Integrations	Simple survey design. Free use, limited analysis, interfaces with Google products. Some DOT IT departments restrict access to Google.
Zoho	Survey Tool	Survey Design, Collection, and Workflow with Integrations	Sophisticated survey design.
Wordpress.org (Wordpress)	Data Repository (with Survey Tool capabilities)	Storage, Sharing and Discovery (with optional plugins for Survey Design, Collection, Workflow, Data Analysis, and Integrations)	Well-suited to provide workflow management and storage. Various integrations to support other survey applications.
Salesforce	Data Repository	Storage, Sharing and Discovery with Integrations	Dashboard with access management, searching, filtering, and support. Offers non-profit license.
CKAN	Data Repository	Storage, Sharing and Discovery	Open-source software with paid hosting plans available. Supports some data visualization.

Table C-2 categorizes each survey product with the five survey platform functionality groups previously established by the research team. The five functionality groups are described below, and four of the five are included in the Table. Platform and Administration is excluded from the table because all of the products provide this functionality – at least in part – and so it is not useful for distinguishing the products without a more detailed definition of the desired functionality.

- **Development and Distribution** supports the process of creating a survey, sending it out to a listserv or other targeted lists, and collecting and collating the survey responses.
- **Results intake** supports the collection of survey results into a survey database.
- **Post-Processing and Publishing** supports the administrative review and final publication of survey results to a survey database.
- **Access, Review and Analysis** supports the searching, filtering, and displaying of survey information, metadata, and downloadable files.
- **Platform and Administration** supports the maintenance of the website and its users, including user registration, user subscriptions, site security and marketing, among others.

Table C-2. Survey products aligned with the survey platform functionality groups.

<i>Products Used by Committees Highlighted in Blue</i>				
Product (Platform)	Development and Distribution	Results Intake	Post Processing and Publishing	Access, Review and Analysis
Microsoft Forms (Microsoft 365)	X			
Power Apps (Microsoft Power Platform)	X			
Power Automate (Microsoft Power Platform)		X	X	
PowerBI (Microsoft Power Platform)				X
Dspace		X	X	X
Dataverse		X	X	X
Data Repository (Figshare)		X	X	X
Zenodo		X	X	X
SurveyMonkey	X			
Survey Software (Qualtrics XM)	X			
Google Surveys (Google Workspace)	X			
Alchemer	X			
TypeForm	X			
Google Forms (Google)	X			
Zoho	X			
Wordpress.org (Wordpress)	X	X	X	X
Salesforce		X	X	X
CKAN		X	X	X

Further Evaluation of Alternative Platforms

Seven of the platforms listed in Tables 3 and 4 were carried forward for inclusion in the evaluation of alternatives. These platforms were identified based on two basic criteria:

- Platforms which offer robust survey storage, search, and discovery features and can provide direct integrations with survey development tools
- Platforms currently or recently used by AASHTO committees for surveys and/or survey management

Robust survey storage, search, and discovery features were prioritized based on the input and findings of the stakeholder consultation (surveys and interviews). The platforms currently (or previously) used by AASHTO committees were also prioritized based on stakeholder input – as well as the likelihood that these provide at least some of the desired functionality and will offer advantages in implementation and integration with current business processes.

The platforms currently or previously in use are highlighted in blue in Table 4, and they include:

- Microsoft Forms
- SurveyMonkey
- Google Forms
- Wordpress

The four platforms differ in the functionality provided. The first three platforms are all survey development tools, which support survey creation, survey distribution, and response collection.

Microsoft Forms is used by several committees to create and share surveys with their members; it also integrates well with other standard Microsoft productivity applications. **Google Forms** has also been used and is well-integrated with Google’s corresponding productivity suite, but this presents certain challenges as a number of DOTs have firewalls or policies which block access to Google products (Google Forms, Google Sheets, Google Docs, etc.). SurveyMonkey, while in use by some committees, was also reported to have challenges. In contrast to these three platforms, Wordpress can support the full range of survey platform functions, from developing and distributing surveys to collecting and displaying results. The current RAC survey database is a product of Wordpress. Wordpress also offers basic built-in survey development and distribution capabilities, integrations with sophisticated survey tools, and flexible plug-ins for other platform options.

Detailed Review of Selected Products

Four platforms were identified for more detailed information gathering: the three leading specialized survey platforms (SurveyMonkey, Qualtrics and Alchemer) and the Microsoft Power Platform which includes Forms for conducting surveys and several related tools for managing workflow and contacts. Microsoft was included in this final review because AASHTO is already licensing Microsoft products. The review was based on meetings with technical sales representatives from each of the four product vendors.

The following assumptions were established to provide a common basis for comparison across the platforms:

- At least 5 AASHTO Staff with platform access, with ability to reassign licenses as needed
- Ability to allow non-AASHTO staff to design surveys and analyze results (at least on a temporary basis)
- 200 surveys per year; 4,000-5,000 survey responses per year

Platform Functionality

The functionality of each product was investigated based on its ability to provide the following refined set of capabilities as part of an integrated AASHTO Survey Platform:

- survey development
- survey distribution and tracking
- survey analysis and post-processing
- results distribution and database storage (ability to manage access to results, ability to automate export of results to an external database)
- administration (access controls, permissions, workflow, license management)

Survey Development

All platforms provide the capability to create simple and complex surveys. All platforms support permission controls for survey development contributors.

Survey Distribution and Tracking

Each platform is able to manage email lists for survey distribution to some extent. Microsoft and Qualtrics have directory functions; Microsoft's most straightforward solution for contact list management is by using a fully integrated directory. Alchemer, Qualtrics, and SurveyMonkey facilitate distribution by drawing lists of contacts from a separate directory platform. Each platform allows survey requesters to track and review survey responses as they come in, and to schedule and send reminder emails. Only Alchemer is able to send targeted reminders based on which unique links have been completed. Alchemer, SurveyMonkey, and Qualtrics use unique links for survey distribution, which allows for a survey to be completed in multiple sessions and for co-working on survey answers.

Survey Analysis and Post-Processing

All platforms support review and compilation of results, with varying options for customization and analysis. Alchemer and Qualtrics have text analysis capabilities.

Results Distribution and Database Storage

All platforms except for SurveyMonkey allow for access controls on who can view survey results. Alchemer protects results with a password, while Microsoft protects results based on SharePoint group membership. Alchemer and Qualtrics support integration with existing Single Sign-On (SSO) authentication. Microsoft SharePoint can support searching, metadata navigation, and filtering of a library hosted in the Microsoft system, and has security controls that make it complicated to channel results to a different platform. Alchemer, SurveyMonkey, and Qualtrics support simple data libraries searchable by keyword and date, and can use Application Programming Interfaces (APIs) to connect to a survey database hosted on a separate platform. Configuring API connections require backend programming for all platforms. APIs appear to be best supported by Qualtrics, followed by Alchemer and then SurveyMonkey.




















































Administration

All Platforms support moderator workflow. SurveyMonkey and Qualtrics include features for creating surveys based on externally prepared documents listing survey questions. Microsoft provides significant administrative controls within the Microsoft system, but is not designed to easily transfer information externally. Qualtrics and Alchemer both support API connections, but Qualtrics is a more versatile service. SurveyMonkey has a fairly limited workflow primarily contained to email distribution, and has OpenAPI but would require customization to transfer data to a separate AASHTO survey database.

Summary

Table C-3 summarizes the capabilities of the four survey products included in this review. While each product offers the basic functionality needed to support an integrated AASHTO survey platform, each product would require backend coding done to connect the survey platform, AASHTO directory, and AASHTO Survey Webpage together in a seamless workflow.

Table C-3. Summary of Platform Functionality

Functional Area	Alchemer	Microsoft	SurveyMonkey	Qualtrics
 Survey Development and Distribution				
AASHTO Directory integration				
Unique Links				
Targeted reminders				
Track and review survey responses				
 Survey Review and Post-Processing				
Produce report views				
Export report				
Open Text Analysis				
 Content Access, Review, and Analysis				
Access Control/Privileges				
External Database integration				
 Administration				
External platform integration				
Support for moderator workflow				
 Does not provide functionality  Functionality with customization  Provides functionality				

Platform Cost

Table C-4 compares platform costs across the four products. Costs vary based on the number of seats, number of surveys, number of responses, and number of API requests.

Table C-4. Platform Costs

	Alchemer	Microsoft	SurveyMonkey		Qualtrics
Plan Name	Enterprise Plan	Business Basic Plan	Option 1	Option 2	CoreXM
Cost (per year)	\$30,000 - \$40,000	\$1,440	\$8,000	\$15,000	\$7,000
Users	15	20	5 “Power” Users	5 “Power” Users	5
# of surveys (per year)	Unlimited	200	Unlimited	Unlimited	Unlimited
Responses	Unlimited	50,000 per survey	100,000	Unlimited	5,000
API Access	Unlimited	2,000 requests per day/ per user	500/year	Unlimited	Unlimited

Product Evaluation

Four evaluation criteria were identified to highlight key tradeoffs across the different survey products:

1. **Ongoing Cost** – the recurring cost of managing the selected alternative; including recurring license fees and support costs.
2. **Access** - a measure of how difficult it is for non-licensed users to access the survey platform workflow.
3. **Administrative Burden** - the effort required of system administrators and moderators to keep the site functional and up to date. Responsibility for maintaining the survey platform may be contracted out to system vendors or other third parties in exchange for a higher ongoing cost.
4. **Integration and Extensibility** – ability to integrate the product with other AASHTO software and the ease with which new features and configuration changes can be made.

Table C-5 presents ratings for each of the four products based on the four evaluation criteria. For each of these criteria, products are rated on a scale of 1-3 where 1 is most desirable (lowest cost, lowest administrative burden, greatest accessibility and ability to integrate) and 3 is least desirable (highest cost and administrative burden, poorest accessibility and ability to integrate).

Table C-5. Survey Product Evaluation

	Alchemer	Microsoft	SurveyMonkey	Qualtrics
Ongoing Cost	3	1	2	2
Access	2	3	1	2
Administrative Burden	1	1	2	1
Integration and Extensibility	1	1	3	1

Ongoing Cost – Alchemer is significantly more expensive than any of the other survey platforms. Microsoft would likely be the least expensive option for AASHTO (depending on their existing Microsoft product licenses).

Access – SurveyMonkey was highly rated because they have a free plan that can be used to create surveys. Alchemer and Qualtrics will require user accounts to be transferred to survey requesters. Access to Microsoft requires a Microsoft account and data is set up to be completely contained within the Microsoft ecosystem.

Administrative Burden – All of the platforms have a relatively low Administrative Burden. SurveyMonkey has the least developed workflow tools which means AASHTO Committee staff would need to spend more time on survey administration tasks.

Integration and Extensibility – Alchemer, Qualtrics, and Microsoft all support integrated workflows. Qualtrics is more versatile than Alchemer and will require less backend development, but both platforms have sufficient capability to meet AASHTO's parameters. SurveyMonkey would require significant backend work to incorporate workflow.

Based on this evaluation, Qualtrics and Microsoft appear to be the best options for creating an integrated survey platform using COTS survey software products.