Airport Cooperative Research Program

Research Field

Product Update Review Process

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1 Introduction

Since its inception the Airport Cooperative Research Program (ACRP) has published hundreds of products addressing various challenges in the airport industry, including guidebooks, technical reports, tools, databases, and web-based resources.

While many of the research products are still relevant, some are outdated due to new or revised regulations and federal guidance, evolving technologies and best practices. ACRP has completed development of research roadmaps for all research fields to identify research needs and high priority challenges for airports in the coming years. In addition to identifying and conducting research on new challenges facing the airport industry, ACRP recognizes the need to review the existing body of research to determine products that need updates to remain current. To accomplish this, ACRP sought to develop and apply a standard review process for existing products, across all ACRP research fields. This document describes the standard review process. Although the review process is general enough to apply to all research fields, it is also intended to be flexible and can be modified as needed to address unique needs of specific research fields or availability of resources. Furthermore, although ACRP staff can utilize this process, the methodology assumes that future research teams will have some subject matter expertise or a high level of familiarity within the field of ACRP research that they are reviewing. In most cases, this process will be overseen by an ACRP project panel. The panel will select a contractor, who will be referred to as the team throughout this document. The methodology for identifying and prioritizing the ACRP products in need of update in each research field follows a five-step process, described in this document. The steps are:

1. Compile research products spreadsheet;
2. Screen products for update with decision tree;
3. Obtain industry stakeholder input;
4. Score and prioritize products for update; and
5. Finalize recommended updates.

The five steps are described in Section 2. The methodology was developed and refined through discussions with ACRP staff and industry practitioners during implementation of the review process for all products in the ACRP Research Field 2 – Environment in 2020.

The review process developed for this project applies to any ACRP research field. It is intended to be a thorough, yet simple approach to determining which products require updates and to standardize the approach of research teams in the future.

2 Methodology

The review methodology provides a five-step process for identifying and prioritizing the ACRP research products in need of update in each research field. Due to the technical nature of ACRP research, the prioritization of the research products in each field of ACRP research is best conducted by a research team with subject matter expertise or significant familiarity with the topics. The methodology requires knowledge and understanding of regulatory, legal, technological and practice changes in the research field, and the information would be time consuming to gather for a research team with no experience in the given research field.

The review methodology follows a series of steps. First, the team collects key information and metrics for each product in an ACRP research area (for example, Environment, Operations, or Construction) to create a spreadsheet of research products. Next, the team uses a decision tree as a screening tool to categorize the research products into two groups: those potentially requiring an update and those that do not require an update. This step narrows the list of potential product updates. In the third step, the team gathers industry stakeholder input. In the fourth step, the team applies additional metrics and a simple scoring mechanism to prioritize and rank products for potential update. Finally, the team considers the nature, degree, and cost to prepare a prioritized list of products to update.

2.1 Step 1: Compile Products Spreadsheet

Step 1 involves development of a spreadsheet containing basic information about each research product in the specific ACRP research field. The spreadsheet serves as a tool for comparison and is necessary for use of the screening tool decision tree in Step 2. For research fields with a large number of products, such as ACRP Research Field 2 – Environment, it may be useful to categorize or organize research products by high-level topic. For example, high level topics for Field 2 – Environment include Air Quality & Emissions, Water Quality & Availability, Noise, Monitoring & Reporting, Resiliency, and Sustainability. If using high-level topic categories, use the list of 30 topic areas/categories that ACRP uses to categorize their products, although for research fields with fewer products this categorization may not be necessary.[1] The following steps describe how the team will create a spreadsheet for a particular research field.

Spreadsheet creation steps:

1. Navigate to "All Projects" on the ACRP website: http://www.trb.org/ACRP/ACRPProjects.aspx. Note that some projects may include multiple products (for example, a guidebook and an Excel tool) that should be included in the list. Also note that the project title does not always exactly match the subsequent

[1] The current topic areas or tags are Administration, Air Cargo, Air Quality, Air Service, Airport Planning, Airside, Construction, Customer Experience, Design, Emergency Management, Environment, Finance-Economics, General Aviation, Human Resources, Information Technology, Landside, Legal, Maintenance, Marketing, Noise Impact, Operations, Policy, Public Relations, Public Safety, Safety, Security, Sustainability, Synthesis, Terminal, Water Quality, and Workforce.

publication title; the project websites should be compared to ensure consistency.

2. Click on the research field of focus, i.e., "ACRP Research Field 2 – Environment".

3. Copy all columns and rows into an Excel spreadsheet, including "Project Number, Project Title, Stage, Comments". Projects that are categorized as "Active" or "Anticipated Stages" will not be considered for update but should be retained in the spreadsheet to allow for comparison with older products.

4. Add columns to reflect points of interest such as: product type (guidebook, tool, web resource, etc.), publication title, additional resources, publication year, age category (←5 years, 5-10 years, →10+ years), high level topic/category (if using for organizational purposes), and number of downloads. Consider adding an additional column for principal investigator; this may be helpful when conducting industry outreach to prioritize product updates.

5. Add columns with the following questions as headers (these correspond to questions in the decision tree and prioritization scoring table):

   - Is there an approved project that is pending (i.e., projects that have been approved by the ACRP Oversight Committee (AOC) but for which research has not yet begun)? (Y/N).

     The team will consult the ACRP All Projects website to find this information: http://www.trb.org/ACRP/ACRPProjects.aspx

   - Was there a significant regulatory change that renders project or parts of the project obsolete? (Y/N)

     The team may add an optional column to list the specific regulatory changes.

   - Was there a significant technology and/or industry practice change that renders project or parts of the project obsolete? (Y/N).

     This may also include availability of new data that affects industry understanding of the specific research topic. For example, there are several projects in the Environment research field that rely on climate data to support tools. While much of the guidance in the original products is still relevant, there are several additional years of climate data that have become available since publication of the original products. Therefore, the original products would benefit from inclusion of more recent data to be more accurate and useful to airports.

   - Are there more recent ACRP research products that address this topic area? (Y/N)

   - ACRP Related Research (This column will include a list of related research products for each research product in the spreadsheet.)

- Other Related Research (For example, research or guidance from other TRB cooperative research programs, Federal Aviation Administration (FAA) Centers of Excellence, TRB TRID, industry trade association publications, other agencies, etc.)? (This column will include a list of related non-ACRP research).
- Is this topic included as an idea on the ACRP research roadmap?[2] (Y/N).
- Review the Problem Statement Indexes[3] for the last two fiscal years. You will be able to see every problem statement that was submitted; review comments submitted by staff, industry, and the ACRP Oversight Committee (AOC), if applicable; and find out if the project was funded or rejected by the AOC. Determine if the topic has been addressed or included in any problem statement that was submitted to the AOC in that time frame? (Y/N).
- Is this topic of national interest, significant regional interest (i.e., a hot topic in the industry?) (Y/N).
- Applicability of the product compared to other ACRP research products in the research field (Broadly applicable, Moderately applicable, Narrowly applicable)
- Team comments

  This column provides the team space to note any other relevant factors in determining if the product requires an update. For example, if the product is itself an update of an older ACRP product, or if the product is outdated but is not recommended for an update because the topic is no longer of interest to the airport industry.

6. Add columns to record the outcome of the decision tree screening tool, (described in Step 2), and a column to record the prioritization score (scoring process is described in Step 3).

7. Create validation lists for the age category, high level topic, and applicability. Validation lists allow the user to choose from a list of consistent terms. If using High-Level Topics to organize the research products, the team should consider using the 30 topics areas referenced in step 1. These topics or tags are consistent with the high-level themes used to categorize ACRP products and/ or within the research roadmap for the respective research field (if applicable).[4]

[2] ACRP research roadmaps can be accessed at: http://www.trb.org/acrp/researchroadmaps.aspx
[3] ACRP problem statement indices from past fiscal years can be accessed at https://www.trb.org/ACRP/ACRPProjects.aspx

[4] Please note that the list of topics that ACRP uses to tag research may not accurately reflect the number of topics in the field; tags are limited and the team should consider them a starting point as opposed to an inclusive list.

8. Once the spreadsheet is formatted, fill in the columns with information for each research product.
    - Confirm publication title, year, principal investigator, and number of downloads by searching for the project at the National Academies Press website (www.nap.edu), click on the publication URL link in the search results. Downloads can be found on the "Stats" tab of the www.nap.edu website for each product.
    - If using high-level topics to categorize research products, select the most appropriate topic based on the project contents (found in project overview). When considering the appropriate topic area, consider that these tags are intended to assist the team understand the relationships between projects and products, as well as identify linkages to related ACRP research. The tags enable the team to understand the evolution of research on a particular topic over time, and more easily identify items that may require updates.
    - Navigate back to the search results for the product on www.nap.edu to find similar titles and related research products. List the relevant products in the "Related Research" field. Determine if there other more recent research products that address this topic, which may eliminate the need to update the research product. The project overview may also identify other related ACRP products.
    - Search for other related research via the TRB TRID[5] database and/ or other applicable federal research databases or research programs such as FAA's Center of Excellence ASCENT (for environmental topics), PARAS (security topics), FAA William J. Hughes Technical Center, Aviation Research Division (FAA Tech Center)[6], etc. The purpose of this step is to identify if research already being undertaken elsewhere negates the need to update an ACRP product for a particular research topic or subject.
    - Determine if there have been any significant regulatory, legal, technological or practice changes in industry since the product was published, which make all or portions of the product obsolete. Regulatory information can be collected from federal agencies, (including guidance, orders, handbooks, advisory circulars, and standards), from the Federal Register[7] (search using Key Words and filter to final notices), and from industry trade association websites and publications. The related columns can be filled out based on this information and the team's knowledge of developments in the industry. Input from industry practitioners and other subject matter experts should also be obtained (for example, from airports

[5] TRB TRID is an integrated database that combines the records from TRB's Transportation Research Information Services (TRIS) Database and the OECD's Joint Transport Research Centre's International Transport Research Documentation (ITRD) Database. TRID provides access to over one million records of transportation research. Access TRID at: https://trid.trb.org/

[6] Airport Research Division website accessed at: https://www.airporttech.tc.faa.gov/

[7] The Federal Register is an official journal of the United States federal government, containing federal agency rules, proposed rules, public notices. The Federal Register can be accessed at: https://www.federalregister.gov/

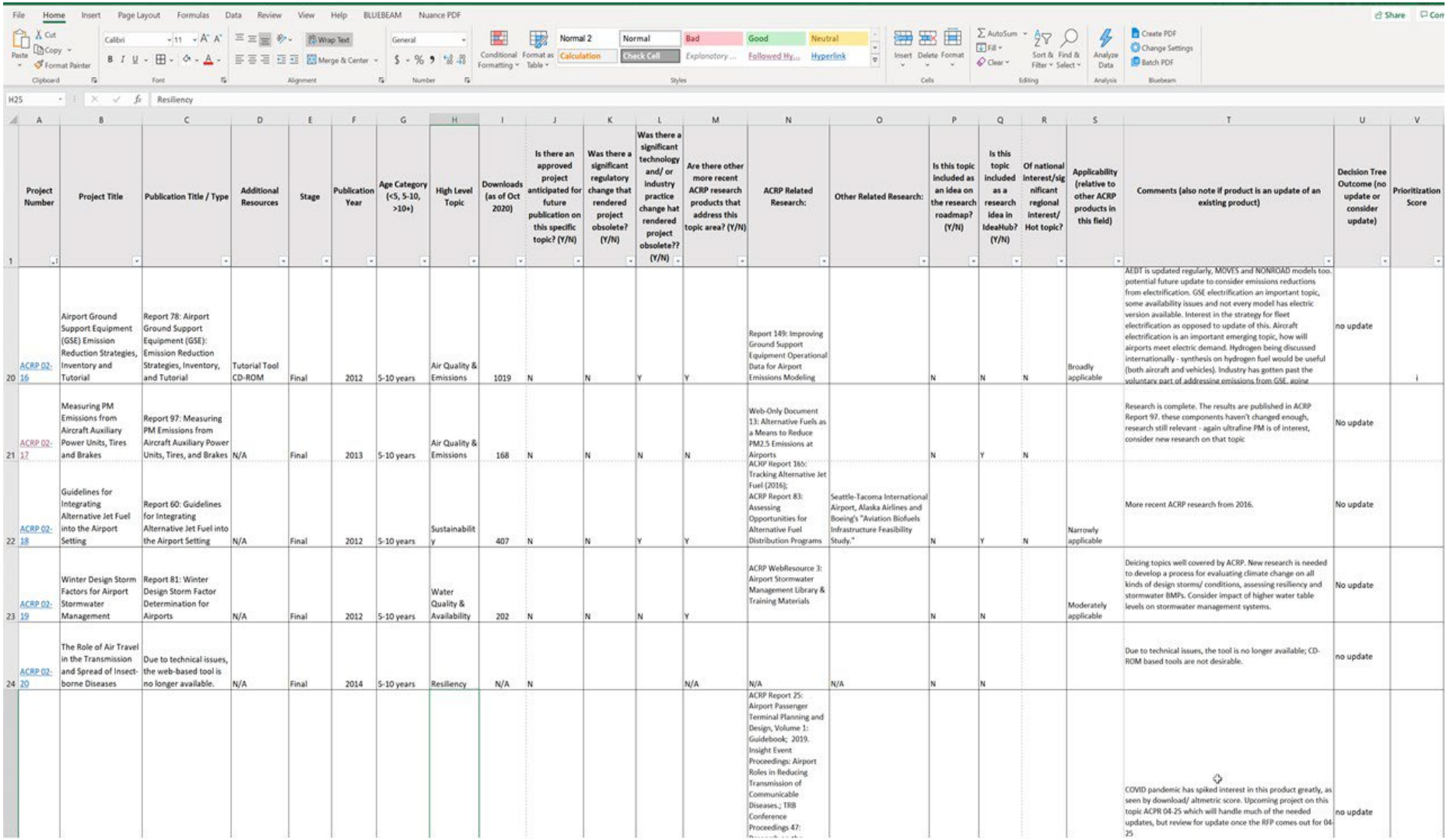
and consultant members of industry groups or relevant committees of airport or airline trade associations).

The purpose of this step is to consider whether regulatory, legal, technological, and/or practice changes has influenced practice in the field or invalidates part or all of a particular research product.

- Continue this process until data is collected for all projects in the entire research field.

Once the products spreadsheet is completed, it can be used to identify products that require update by following the steps outlined below. See Figure 1 and Appendix A for example spreadsheet.

Figure 1 Example spreadsheet created for Research Field 2 – Environment

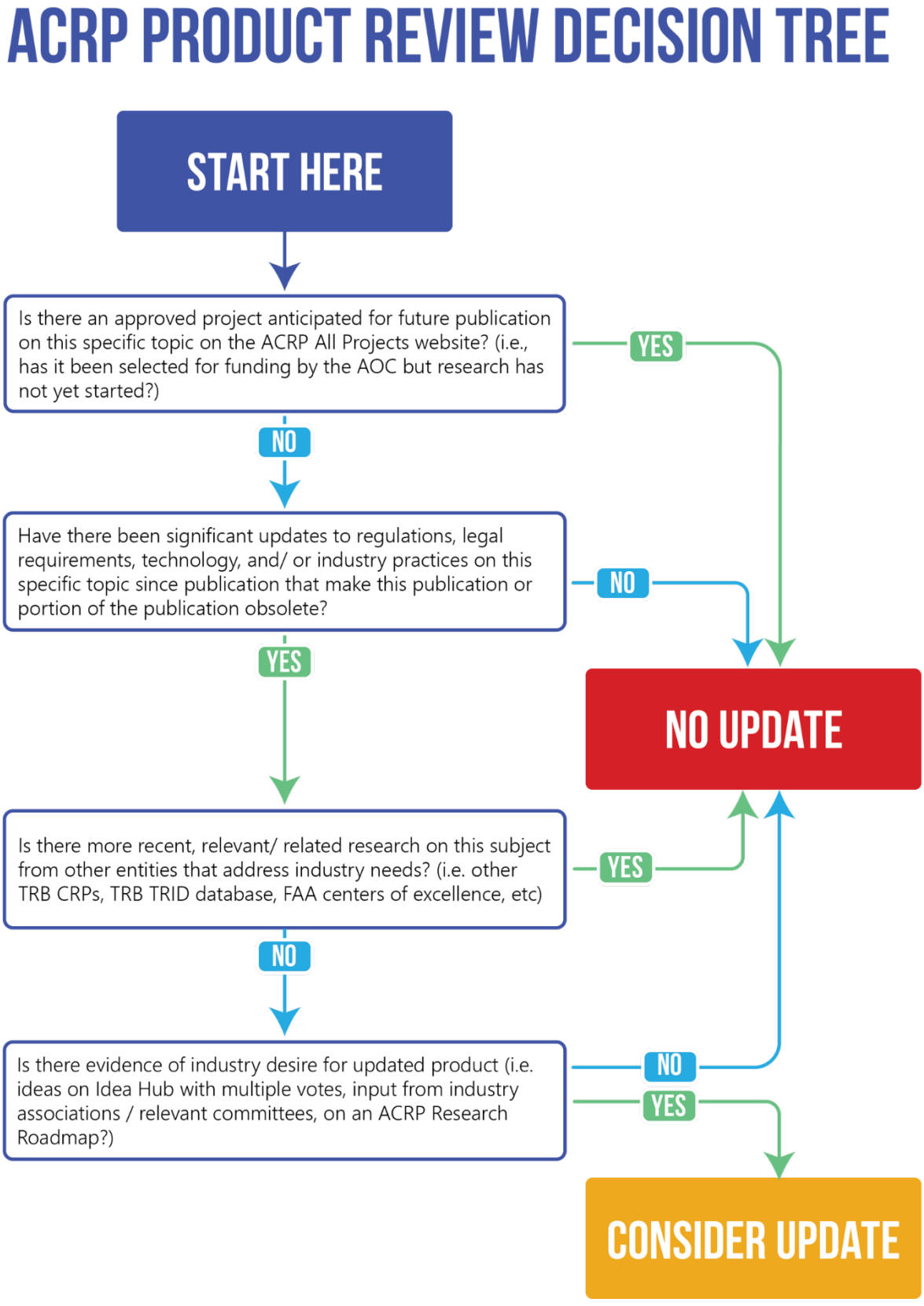


	Project Number	Project Title	Publication Title / Type	Additional Resources	Stage	Publication Year	Age Category (<5, 5-10, >10+)	High Level Topic	Downloads (as of Oct 2020)	Is there an approved project anticipated for future publication on this specific topic? (Y/N)	Was there a significant regulatory change that rendered project obsolete? (Y/N)	Was there a significant technology and/ or industry practice change hat rendered project obsolete?? (Y/N)	Are there other more recent ACRP research products that address this topic area? (Y/N)	ACRP Related Research:	Other Related Research:	Is this topic included as an idea on the research roadmap? (Y/N)	Is this topic included as a research idea in IdeaHub? (Y/N)	Of national interest/significant regional interest/ Hot topic?	Applicability (relative to other ACRP products in this field)	Comments (also note if product is an update of an existing product)	Decision Tree Outcome (no update or consider update)	Prioritization Score
20	ACRP 02-16	Airport Ground Support Equipment (GSE) Emission Reduction Strategies, Inventory and Tutorial	Report 78: Airport Ground Support Equipment (GSE): Emission Reduction Strategies, Inventory, and Tutorial	Tutorial Tool CD-ROM	Final	2012	5-10 years	Air Quality & Emissions	1019	N	N	Y	Y	Report 149: Improving Ground Support Equipment Operational Data for Airport Emissions Modeling		N	N	N	Broadly applicable	AEDT is updated regularly, MOVES and NONROAD models too. potential future update to consider emissions reductions from electrification. GSE electrification an important topic, some availability issues and not every model has electric version available. Interest in the strategy for fleet electrification as opposed to update of this. Aircraft electrification is an important emerging topic, how will airports meet electric demand. Hydrogen being discussed internationally - synthesis on hydrogen fuel would be useful (both aircraft and vehicles). Industry has gotten past the voluntary part of addressing emissions from GSE, going	no update	i
21	ACRP 02-17	Measuring PM Emissions from Aircraft Auxiliary Power Units, Tires and Brakes	Report 97: Measuring PM Emissions from Aircraft Auxiliary Power Units, Tires, and Brakes	N/A	Final	2013	5-10 years	Air Quality & Emissions	168	N	N	N	N	Web-Only Document 13: Alternative Fuels as a Means to Reduce PM2.5 Emissions at Airports		N	Y	N		Research is complete. The results are published in ACRP Report 97. these components haven't changed enough, research still relevant - again ultrafine PM is of interest, consider new research on that topic	No update	
22	ACRP 02-18	Guidelines for Integrating Alternative Jet Fuel into the Airport Setting	Report 60: Guidelines for Integrating Alternative Jet Fuel into the Airport Setting	N/A	Final	2012	5-10 years	Sustainability	407	N	N	Y	Y	ACRP Report 165: Tracking Alternative Jet Fuel (2016); ACRP Report 83: Assessing Opportunities for Alternative Fuel Distribution Programs	Seattle-Tacoma International Airport, Alaska Airlines and Boeing's "Aviation Biofuels Infrastructure Feasibility Study."	N	Y	N	Narrowly applicable	More recent ACRP research from 2016.	No update	
23	ACRP 02-19	Winter Design Storm Factors for Airport Stormwater Management	Report 81: Winter Design Storm Factor Determination for Airports	N/A	Final	2012	5-10 years	Water Quality & Availability	202	N	N	N	Y	ACRP WebResource 3: Airport Stormwater Management Library & Training Materials		N	N		Moderately applicable	Deicing topics well covered by ACRP. New research is needed to develop a process for evaluating climate change on all kinds of design storms/ conditions, assessing resiliency and stormwater BMPs. Consider impact of higher water table levels on stormwater management systems.	No update	
24	ACRP 02-20	The Role of Air Travel in the Transmission and Spread of Insect-borne Diseases	Due to technical issues, the web-based tool is no longer available.	N/A	Final	2014	5-10 years	Resiliency	N/A	N			N/A	N/A	N/A	N	N			Due to technical issues, the tool is no longer available; CD-ROM based tools are not desirable.	no update	
														ACRP Report 25: Airport Passenger Terminal Planning and Design, Volume 1: Guidebook; 2019. Insight Event Proceedings: Airport Roles in Reducing Transmission of Communicable Diseases.; TRB Conference Proceedings 47:						COVID pandemic has spiked interest in this product greatly, as seen by download/ altmetric score. Upcoming project on this topic ACPR 04-25 which will handle much of the needed updates, but review for update once the RFP comes out for 04-25	no update	

2.2 Step 2: Screen Products for Update

After the research products and related information are compiled into a spreadsheet, a decision tree is used to identify the products that may qualify for update based on preliminary information (see Figure 2). The purpose of this step is to screen the entire list of products in the research field in a standardized manner. After completing all questions in the decision tree for each product, the initial result will be either "No Update" or "Consider Update". The decision tree outcome is recorded in the research product spreadsheet developed in Step 1. Subject matter expert and industry practitioner input can be considered after completing Step 2 to ensure agreement based on industry need.

Figure 2 ACRP Products Update Decision Tree



2.2.1 Obtain Panel Approval of Product Spreadsheet and Industry Stakeholder Review Group

The project panel will review and approve the spreadsheet. Additionally, the team will submit to the panel for approval a diverse list of recommended candidates with subject matter expertise for an industry stakeholder review group taking into consideration gender, race, career stage, and ethnic diversity. The group should also represent relevant industry perspectives, including airports of various sizes and locations, consultant expertise, and professional experiences.

2.3 Step 3: Obtain Industry Stakeholder Input

After conducting initial screening in Step 2 via the decision tree, the team will seek input from industry practitioners and subject matter experts to refine or revise the list of products considered for update. This step allows the team to confirm their understanding of relevant regulatory, legal, technological, and practice changes that have impacted the accuracy or usefulness of existing products, obtain feedback on which topics are of greatest interest to airports, determine whether any products should be combined in the update process, and assist in identifying other relevant research for each specific topic, etc. Most importantly, this step provides industry practitioners the opportunity to review and validate (or recommend a change) to the outcomes from the decision tree screening tool before products are prioritized.

Industry practitioners receive many requests for input on ACRP research projects and surveys through ACRP, TRB committees, trade associations, etc. For this reason, surveys are not recommended as the primary method to gather stakeholder input. To be efficient with industry representatives time, the team should consider organizing topic-specific discussions with groups of stakeholders to obtain their input in a coordinated fashion, rather than using electronic surveys or large group discussions. Industry trade associations such as Airports Council International – North America (ACI-NA), American Association of Airport Executives (AAAE), Airports Consultants Council (ACC), Airlines for America (A4A), state airport associations and other industry groups representing relevant stakeholders (for example aircraft manufacturers, pilots, state aviation officials, etc.), as well as the Federal Aviation Administration (FAA), can assist in identifying stakeholders.

To facilitate the discussions, the team should provide the spreadsheet and initial screening results to the industry stakeholders for their review in advance.

The following represent lessons learned from the stakeholder outreach process conducted as part of the update review for ACRP Research Field 2 – Environment:

- Industry outreach is best completed after initial review of products, so that industry practitioners can provide input on decision tree outcomes and add context where needed before prioritizing the products for update in Step 4.
- Targeted outreach by high-level topic is helpful to focus the discussion on one subset of projects at a time. For research fields with fewer products than ACRP Research Field 2 – Environment, this subcategorization may not be necessary.

- Including a range of stakeholders is beneficial to obtain various viewpoints and expertise.
- The small group settings provided a collaborative environment and facilitated participation of every member of the group.
- Discussion of prior publications, filtered by topic and age of publication, allowed for clearer identification of research gaps. Participants brainstormed several suggestions for new research ideas in addition to providing input on update prioritization.

Based on feedback from the stakeholders, the team will refine the list of products for update and proceed to prioritization scoring in Step 4.

2.4 Step 4: Score and Prioritize Products for Update

After refining the list of products to update in Step 3, the team will answer the series of questions listed below for each research product that received a "Consider Update" outcome from the decision tree or industry outreach. The answers to each question in Table 1 correspond with a certain number of points. The points are summed to generate an overall score for each product reviewed. The scores help the team to prioritize the products recommended for update. Prioritization scores should be recorded in the spreadsheet created in Step 1.

Table 1 Prioritization Scoring

Ranking Question:	3 points	2 points	1 point	0 Points
Is topic identified on an ACRP research roadmap?	-	-	Yes	No
How integral is the obsolete or missing content to the integrity/ usefulness of the product?	Very integral / important	Moderately important	Marginally important	Not important
Has a research idea to update this product (or specific subject) been submitted as a problem statement in the last three years?[1]	Yes, with more than 10 votes	Yes, with 5-10 votes	Yes, with 1-4 votes	No
Is there interest in the original publication (demonstrated by number of downloads compared to other products in same research field)?	In the top tercile of downloads	In the middle tercile of downloads	In the bottom tercile of downloads	No downloads
How urgent is the need for an updated product to the industry (i.e., is this a hot topic? Is information needed for compliance with new regulations, to respond to a crisis, etc.)?	Updated product addresses an urgent need for industry	Updated product addresses a moderately important need	Updated product addresses a marginally important need	No urgent need exists
How broadly applicable will the updated product be (compared to the other products recommended for update)?	Applicable to a significant portion of airports	Applicable to a moderate number / type of airports	Narrowly applicable	-
How complex or costly are the required updates?	Relatively limited/ targeted updates to the product / tools required	Moderate updates to the product / tools required	Extensive updates to the product / tools required	-

Finally, prioritization score totals should be reviewed and revised, if needed, based on other factors such as subject matter expert input or industry feedback. The prioritization score informs decisions about which projects may be ripe for update, but the final recommendations should also be based on informed review of these various factors, along with the team's understanding of pressing knowledge gaps within the airport industry and industry input. The team should consider a balance of high-level topics when making final recommendations to ACRP.

2.5 Step 5: Finalize List of Products for Update

At the conclusion of Step 4, the team will finalize the list of products recommended to the panel for update based on the scores obtained from the prioritization tool. The team will identify specific components of the publications and associated products that require updates. The team will then determine the relative level of effort for the updates (for example, is the entire guidebook in need of update, or just individual chapters, appendices, addendum, data, or programming for Excel-based tools?). Another factor the team will consider is whether there are multiple products recommended for update within the same high level topic category. If so, the team should consider if any of the products are closely related, and if combining the updates into one publication would be more efficient.

Finally, the team will estimate the approximate cost to update each product on the priority list. Depending on the extent of the updates, the team can determine an approximate cost to complete the project updates by comparing the level of effort to the cost of the original research project.[8] A project that needs extensive updates will likely require a budget of similar magnitude to the original research project (ACRP products typically range from $250,000 - $600,000). Products that require more targeted updates will conversely require a smaller budget. For example, products that do not require extensive updates may have budgets similar to ACRP Synthesis projects (which are more limited in scope than traditional research projects and focus on documenting current practices on a particular subject). Recent Synthesis project budgets are approximately $45,000.

Once the standardized review process has been completed, the team will submit their draft update recommendations in the form of a spreadsheet. The updated recommendations should be sorted by priority and include a brief description of the type and degree of update for each product listed. Additionally, the team will submit a conduct of research and results report that discusses the review process, their recommendations, and rationale.

The panel will review the draft recommendations, along with the conduct of research and results report, and provide comments. An in-person meeting will be held to allow the team to review the recommendations with the panel and to discuss the panel comments. The team will submit a final version of the recommendations and the conduct of research results report that incorporates panel comments as appropriate.

[8] Cost information for each research project can be found by clicking on the Project Number hyperlink in the full project list accessed at ACRP's website: http://www.trb.org/ACRP/ACRPProjects.aspx