NCHRP 20-44(28)

DEVELOPMENT OF A TECHNOLOGY TRANSFER PLAN FOR STATE DEPARTMENTS OF TRANSPORTATION RESEARCH PROGRAMS

GUIDE FOR IMPLEMENTING TECHNOLOGY TRASFER

Prepared for:

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GUIDE FOR IMPLEMENTING TECHNOLOGY TRANSFER

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By CTC & Associates LLC and Arora and Associates, P.C.

DISCLAIMER

WHAT'S INSIDE

HOW TO USE THIS GUIDE

There is extensive national guidance in published literature for dissemination and implementation of transportation research results, not only from the National Cooperative Highway Research Program (NCHRP) and Transportation Research Board (TRB) but also from the U.S. Department of Transportation, the American Association of State Highway and Transportation Officials (AASHTO) Research Advisory Committee and many other organizations.

Making use of such guidance, however, can be challenging: Technology transfer options can be overwhelming, and effective dissemination requires understanding the recipient audience, the message and the desired outcome.

Nine Midwestern states comprise AASHTO's Region 3: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Ohio and Wisconsin. These states share many of the same challenges and opportunities. They have geographical similarities, four-season climates, a mix of large cities and small towns, and a central position at the crossroads of American passenger and freight transportation. They also have research programs that are well known nationally for their aggressive pursuit of innovation.

This guide is the direct result of the Region 3 states' desire to disseminate research regionally. However, the strategies and processes that have been identified can also be applied by states beyond the Midwest. With federal support as part of NCHRP project 20-44: Development of a Technology Transfer Plan for State Departments of Transportation Research Programs, this guide aims to identify impactful and cost-effective peer-to-peer technology transfer opportunities and step-by-step guidance for maximizing each strategy.

"TECHNOLOGY TRANSFER"

Definitions abound in and beyond the transportation world for the term "technology transfer." Lynne Irwin offered the following definition in TRB's *Transportation in the New Millennium* series nearly a quarter century ago, and it still holds up:

> **Technology transfer is the process of communication that results in
> putting research findings or new information into practice.**

Technology transfer has both a communication/dissemination component—getting knowledge from "point A" to "point B"—and an implementation component—putting that knowledge to work in the form of a new technology, practice or policy.

Both parts of this definition are necessary, and neither suffices without the other. This guide addresses the various aspects of planning for technology transfer with this definition and its multiple aspects in mind.

FROM BROAD TO NARROW

The guidance presented in this manual covers a spectrum of activities necessary for successful technology transfer. Each activity serves a different purpose and is targeted toward a different audience. The four sections of this manual follow a path from the broadest audience to the most narrow, envisioned pictorially as a funnel or inverted pyramid:

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WIDE DISSEMINATION

VIDEOS

WEBINARS

WORKSHOPS
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Section 1: Developing a Dissemination Strategy addresses the broadest technology transfer goals of communication, helping departments of transportation (DOTs) identify the different dissemination channels to reach diverse audiences and determine the kinds of investment each of those channels requires.

Section 2: Creating Product-Focused Videos zeros in on one such strategy identified in Section 1, the short video brief, and provides step-by-step guidance and tips for creating low-cost, high-value videos.

Section 3: Creating a Webinar provides guidance for a communication tool intended for a narrower audience, but with a greater impact: to inform other research stakeholders and present a path forward for possible next implementation steps.

Section 4: Creating a Workshop culminates with guidance for delivering a technical dissemination tool to a narrow audience of individuals best positioned to carry out implementation and complete the technology transfer cycle.

THE REGIONAL APPROACH

Throughout this guide, callouts to a "Regional Approach" highlight how regional states' common concerns and parallel efforts were leveraged to enhance the development and delivery of the technology transfer elements. This project focused on AASHTO Region 3, but these regional approaches could be applied to any states with common interests and goals.

SECTION 1: DEVELOPING A DISSEMINATION STRATEGY

GETTING STARTED

It's never too early to start thinking about dissemination. To make the most of every opportunity, discussions of how and where research will eventually be shared should be included as part of the project scoping process and other pre-project activities. These preliminary discussions should consider:

- **Impacts.** Which groups within the agency will be affected by the research and results?
- **Audience**. Who will be interested in learning about the project?
- **Relevance**. Why is the research important? Does it save time or money, improve safety, advance the state of practice, or accomplish something else?
- **Appeal**. Does the research coincide with other state or federal initiatives? If so, are there federal resources or opportunities that can be leveraged?
- **Resources**. What are the materials, costs and staff time that an agency has available and would need to complete each dissemination strategy?
- **Partners**. How can the investigating team or other external stakeholders support dissemination efforts?
- **Products**. What are the anticipated deliverables?
- **Timeline**. What are the significant milestones of this project and anticipated timeframe to implement research results? Are there opportunities for promotion in the interim?

By considering dissemination early on in the planning process, agency staff will have greater flexibility when it comes to making impactful and cost-effective decisions. If a presentation at a conference, workshop or other event is selected, keep in mind that travel logistics, as well as an event's specific submission criteria and deadlines, can require significant planning and preparation in advance.

IDENTIFYING OPTIONS

Just as every project is unique, no two dissemination plans will —or even should — be exactly the same. To help agencies identify and select the activities that will best suit their needs and resources, a menu of tried-and-tested activities is listed below.

Lower-investment strategies (1-2 hours to produce)

The activities identified below can likely be completed by a single agency staff person using tools and platforms the agency already has in place.

- ☐ Summary or post in internal agency newsletter
- ☐ Email announcement to external stakeholders
- ☐ Press release
- ☐ Social media post

Mid-range strategies (5-15 hours to produce)

The following strategies require more time to produce but could likely still be completed by an agency's in-house communications office or with the help of an outside contractor.

- ☐ Article in industry magazine or journal
- ☐ Article in trade publication
- ☐ Conference presentation
- ☐ Technical brief

Higher-investment strategies (20 or more hours to produce)

These strategies require more planning and preparation than typical and may require greater collaboration with the project's researchers.

- ☐ Paper or poster for TRB Annual Meeting or similar event
- ☐ Video (3- to 5-minutes)
- ☐ Webinar (90 minutes)
- ☐ White paper

CUSTOMIZING A STRATEGY

In practice, an agency may repeat one or more of the same strategies — like posts on social media or email announcements to subscribers — for every completed project. Doing so can even be beneficial for developing the agency's recognizable voice and brand. However, the unique characteristics of each project will also provide opportunities to customize strategies.

THE REGIONAL APPROACH

For this NCHRP 20-44 implementation project, the AASHTO Region 3 states selected five recently completed research projects that presented unique dissemination challenges. The following pages include summaries and considerations for each of these projects, as well as a sampling of the dissemination activities that have been performed. The selected research projects include:

- **Commercial Production of Non-Proprietary Ultra High Performance Concrete** by the Michigan Department of Transportation
- **Holding Strategies for Low Volume State Routes: Phase I & Phase II** by the Iowa Department of Transportation
- **Development of an Intelligent Snowplow Truck that Integrates Telematics Technology, Roadway Sensors and Connected Vehicles** by the Indiana Department of Transportation
- **Highway Safety Manual Training** by the Missouri Department of Transportation
- **Streamlining Implementation of Sustainable Channel Maintenance Practices** by the Ohio Department of Transportation

SAMPLE RESEARCH PROJECT #1

Commercial Production of Non-Proprietary Ultra High Performance Concrete

Conducted by Michigan DOT (MDOT)

Project summary: A previous MDOT study developed a generic Michigan UHPC mixture (MI-UHPC). In this project, researchers developed a new procedure for successfully mixing MI-UHPC in the field, where it will provide outstanding performance for the lifetime of a bridge.

Impacts: Bridges and structures, construction, design, materials, pavements.

Audience: UHPC has a particularly high national interest.

Relevance: UHPC is gaining significant attention at the federal level as an Every Day Counts (EDC) initiative.

Appeal: Cost-savings, less maintenance.

Resources: Anticipated cost to implement research results: $100,000 - $250,000.

Partners: The University of Michigan researchers are experienced speakers and presenters with an active social media presence.

Products: New/updated technology, specifications.

Timeline: Expected time frame to implement research results: 6-18 months.

Select Dissemination Activities

Activity	Target Audience	Estimated Cost to MDOT	To Be Completed By	Location of Deliverable
Two-page Research Spotlight brief	Lawmakers, local agencies, research partners, industry and the public	$1,500 - $2,000	Agency staff or contractor	MDOT website
Announcement to MDOT's subscription email list	Public	Minimal	Agency staff	
3- to 5-minute video - agency perspective	Lawmakers, local agencies, research partners, industry, and the public	$2,500 - $3,500	Collaboration between agency staff, contractor and project investigator	NCHRP Project 20-44(28) page
Conference presentation	Industry experts	None	Project investigator	
Summary article	Lawmakers, local agencies, research partners, industry and the public	None	Project investigator	University of Michigan website
3- to 5-minute video - researcher perspective	Lawmakers, local agencies, research partners, industry and the public	None	Project investigator	University of Michigan YouTube channel

SAMPLE RESEARCH PROJECT #2

Holding Strategies for Low-Volume State Routes: Phase 1 & Phase 2

Conducted by Iowa DOT

Project summary: The first phase of this study evaluated the effectiveness of various holding strategies for low-volume roads after six years. The second phase focused on treatments for concrete pavements with asphalt overlays.

Impacts: Construction, maintenance, materials, pavements.

Audience: This topic requires tailoring information for use by local agencies.

Relevance: The asset management aspect of this project involves policy and decision-making components; these can present tech transfer challenges.

Appeal: Cost-savings, less maintenance, sustainability.

Resources: Anticipated cost to implement research results: $25,000 - $100,000.

Partners: Iowa State University researchers are experienced speakers and presenters with an active social media presence.

Products: Guidance and training, new/updated practice, new/updated policy.

Timeline: Expected time frame to implement research results: Less than 18 months.

Select Dissemination Activities

Activity	Target Audience	Estimated Cost to Iowa DOT	To Be Completed By	Location of Deliverable
Two-page tech transfer summaries	Lawmakers, local agencies, research partners, industry and the public	$1,500 - $2,000	Project investigator	University website
3- to 5-minute video - agency perspective	Lawmakers, local agencies, research partners, industry, and the public	$2,500 - $3,500	Collaboration between agency staff, contractor and project investigator	NCHRP Project 20-44(28) page
Conference presentation	Regional experts	None	Project investigator	
Technical journal article	Transportation professionals and industry experts	None	Project investigator	Transportation Research Record, Vol. 2474, Issue 1
Meeting presentation	Industry experts and specialized agency staff	None	Project investigators	

SAMPLE RESEARCH PROJECT #3

Development of an Intelligent Snowplow Truck that Integrates Telematics Technology, Roadway Sensors and Connected Vehicles

Conducted by Indiana DOT (INDOT)

Project summary: This research identified and developed tools INDOT could provide its snowplow operators to effectively perform winter operation de-icing activities.

Impacts: Intelligent technologies, winter maintenance.

Audience: Tech transfer must be done in the larger landscape of intelligent transportation and connected vehicles.

Relevance: Disseminating results about aspirational future products—such as a functioning intelligent snowplow—requires balancing high potential benefit with realistic expectations.

Appeal: Safety, technology, maintenance.

Resources: Anticipated cost to implement research results: $250,000 - $1,000,000.

Partners: The Joint Transportation Research Program is a partnership between INDOT, Purdue University and other stakeholders.

Products: New/updated technology.

Timeline: Expected time frame to implement research results: 6-18 months.

Select Dissemination Activities

| Activity	Target Audience	Estimated Cost to INDOT	To Be Completed By	Location of Deliverable
Training videos/materials	Local transportation officials and equipment operators	None	Project investigator	University website
Conference presentations	Winter maintenance professionals and members of the American Public Works Association, AASHTO, Snow and Ice Pooled Fund Cooperative Program (SICOP), TRB, FHWA, and Roads & Bridges	Minimal	Agency staff, project investigator	
Technical journal article	Transportation professionals and industry experts	None	Project investigator	Journal of Transportation Technologies, Vol. 11, No. 4
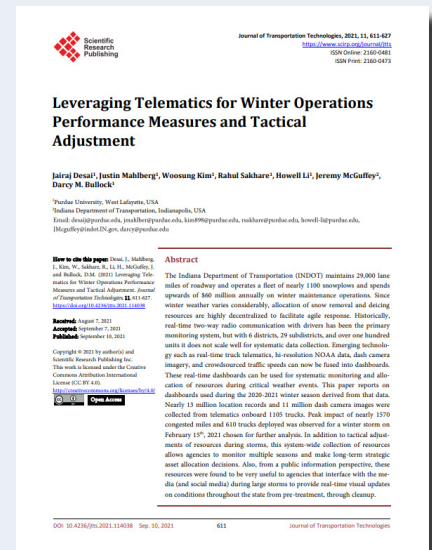
SAMPLE RESEARCH PROJECT #4

Highway Safety Manual Training

Conducted by Missouri DOT (MoDOT)

Project summary: This research produced data-driven safety training for MoDOT trainers. The project developed two training deliverables.

Impacts: Safety, traffic operations.

Audience: This project interfaces with a major national document (the Highway Safety Manual) that all states use. Any dissemination or tech transfer efforts have to work in concert with existing tools developed at the state and national levels.
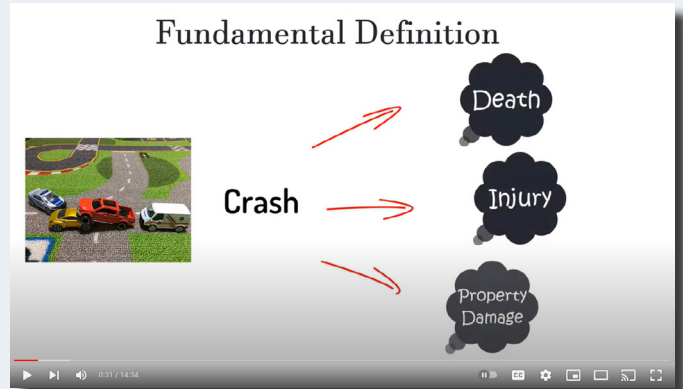
Relevance: The project deliverables are themselves dissemination (training) tools requiring unique dissemination and tech transfer strategies.

Appeal: Safety, training materials.

Resources: Anticipated cost to implement research results: $25,000 - $100,000.

Partners: Project investigators with the University of Missouri-Columbia are experienced speakers and presenters with an active social media presence.

Products: Guidance and training.

Timeline: Expected time frame to implement research results: 6-18 months.

Select Dissemination Activities

Activity	Target Audience	Estimated Cost to MoDOT	To Be Completed By	Location of Deliverable
Training videos	Agency staff at various levels	None	Project investigator	YouTube
Training modules	MoDOT trainers, safety staff and engineers	Minimal	Project investigator	MoDOT website
3- to 5-minute video - agency perspective	Lawmakers, local agencies, research partners, industry, and the public	$2,500 - $3,500	Collaboration between agency staff, contractor and project investigator	NCHRP Project 20-44(28) page

SAMPLE RESEARCH PROJECT #5

Streamlining Implementation of Sustainable Channel Maintenance Practices

Conducted by Ohio DOT (ODOT)

Project summary: Traditional channel maintenance practices often require permits and approval from environmental agencies and other governmental authorities. To streamline its efforts, ODOT worked to identify practices that are good for the environment and can be put into practice quickly.

Impacts: Bridges and structures, environmental, maintenance.

Audience: This topic requires tailoring information for use by local agencies.

Relevance: The research involves interfacing with complex state and federal requirements on environmental standards.

Appeal: Procedural efficiencies, cost-savings.

Resources: Anticipated cost to implement research results: $25,000 - $100,000.

Partners: Project investigators with Ohio State University are experienced speakers and presenters with an active social media presence.

Products: Guidance and training, new/updated practice.

Timeline: Expected time frame to implement research results: Less than 6 months.

Select Dissemination Activities

Activity	Target Audience	Estimated Cost to ODOT	To Be Completed By	Location of Deliverable
Videos of Sample Practices	State and local maintenance engineers	None	Project investigator	YouTube
3- to 5-minute video - agency perspective	Lawmakers, local agencies, research partners, industry, and the public	$2,500 - $3,500	Collaboration between agency staff, contractor and project investigator	NCHRP Project 20-44(28) page

SHARING ONGOING RESEARCH

Often, dissemination begins after the research has concluded; however, there are a variety of benefits to sharing research that is still in progress. By providing periodic updates on ongoing work, a research office can:

- Increase awareness of the role and impacts of the research office.
- Generate excitement about the project.
- Acknowledge the contributions of the project's champion and other stakeholders.
- Publicize the need for involvement in current and future research endeavors.

Following is an example of a one-page document that Iowa DOT produces to inform agency staff of new or ongoing research efforts:

ADDITIONAL RESOURCES

- Adapt this useful Dissemination and Engagement Planning Checklist for your agency's needs.
- Connect with the public by targeting messages to each social media platform.

BEST PRACTICES

- Do revisit plans frequently.
- Do lean on researchers and subject matter experts for dissemination ideas and support strategies.
- Do think like a consumer when customizing messages.
- Do arrange to have photos and videos taken on site and in the laboratory in case these are needed later.
- Do take the effort to find niche groups that would be interested in a particular research project.
- Don't wait until a project is complete to begin dissemination efforts.
- Don't discount research results with different-than-expected results.

SECTION 2: CREATING PROJECT-FOCUSED VIDEOS

BENEFITS OF THIS STRATEGY

Video can be a powerful storytelling tool, allowing viewers an inside look at a topic while making difficult-to-visualize concepts immediately clear. Videos featuring transportation research projects can give agencies the opportunity to share the value and potential application of research results in a highly engaging manner.

IN THIS SECTION

The following pages detail a low-cost production approach that has proven effective with multiple state DOTs. This approach requires some experience in video recording, video editing and voice-over recording; these are skills that often may be found within an agency or which may be outsourced. Technical guidance (for example, how to use video recording or editing software) is beyond the scope of this guide.

Other approaches to creating videos are possible as well, but incorporating high production-value features—such as animations and field interviews—would raise the cost considerably. The process described here, once established by a transportation agency, might require a total of 50 to 75 hours of staff and consultant time per video.

THE REGIONAL APPROACH

For this NCHRP 20-44 implementation project, the Region 3 states selected to develop videos for four of the five completed projects. The video created by Michigan DOT for its Commercial Production of Non-Proprietary Ultra High Performance Concrete project is used throughout this guide as an illustration of the points covered.

STAGES OF VIDEO PRODUCTION

There are four main stages of video production:

1. **Planning and pre-production** includes all of the selection, planning and coordination efforts needed to develop the necessary components of the video.
2. **Production** involves creating the on-camera interviews, compiling collateral video footage and still images, and creating a storyboard needed to create the video.
3. **Editing and post-production** involves assembling the various audio and visual materials to create and finalize the video.
4. **Publishing** is the final stage, where the produced video is shared with internal and external audiences.

PLANNING AND PRE-PRODUCTION

Select a Featured Project

Any type of project can inspire a great video. When deciding which project to choose, an agency should consider:

- Whether the project can be easily explained in three to five minutes.
- If imagery exists or can be gathered to supply visual interest.
- Who the anticipated primary audiences (practitioners, managers, and executives at state DOTs and other agencies) and secondary audiences (decision-makers and lawmakers; members of the public) will be.

By addressing these issues early on, an agency will be better positioned to develop a video that capitalizes on the project's visual potential and reaches its intended audience. Note that in some cases it might make sense to feature two or more related research projects in the same video.

Identify the Core Objective and Message

Like any story, the video should describe a challenge, introduce main characters, explain the efforts to address the challenge, and communicate the benefits. The video should answer a few basic questions:

- Who is or will be affected by this research?
- What is the challenge that is being addressed and what was learned from the research?
- Where did the research take place and where will the results be implemented?
- Why was this research needed, why is it important, and why now?
- When did the research take place and when will the results take effect?
- How did the researchers conduct their work and how will the findings be used?

Unlike traditional storytelling, however, a script is not written in the pre-production phase. It is typically written after conducting on-screen or off-screen interviews with practitioners, managers, or experts. See "Create a Storyboard" in the next section of this guide.

PRODUCTION

Conduct Video Interviews

By interviewing the individuals most familiar with the project, viewers will get to hear from those who know the topic best. Limit the on-camera interviews to just one or two people—such as the project manager or investigator—to reduce the number of people depicted in the video and avoid confusion. Interview times can vary, but plan to schedule each for 90 minutes. Additional considerations are presented below.

Set up

In addition to the interview subject, the video will require someone on-site to set up the camera and ensure good lighting and audio. A third person can ask the interview questions on-site, remotely over the phone, or even virtually with a computer.

Location

When interviewing, consider that experts are often most comfortable in their own environment. For some, that could be their office or on location in the field. Both indoor and outdoor interviews have benefits and drawbacks, and it's important to consider the options and prepare in advance.

Lighting

Natural sunlight can be great for an outdoor interview, but it can also result in distracting shadows from microphones or other equipment. If indoors, make sure any windows or light sources are behind the camera to illuminate the expert being interviewed.

Sound

When interviewing outdoors, be aware of wind, birds, traffic, and other sounds that can be more apparent on a recording and decrease the quality of the audio. Consider having the interview subject use a microphone. Schedule enough time for recording retakes in the event of unexpected noise. If indoors, be aware that interviewing in an empty room can result in echoes and turn off or mute all unnecessary devices to limit sounds. Indoor sounds, such as the hum of lab equipment, can also decrease the audio quality.

Filming

Interviews can be recorded with just a cellphone camera. Use a tripod or other stand to minimize shaking, which can be distracting for the viewer.

Additional considerations

Position the camera so that it records video horizontally. Frame the person being interviewed so that their face is slightly high and off-center. This will allow sufficient space to add their name and title during production. Suggest the interview subject remove any identification badges or distracting jewelry.

Share Raw Interview Video Files

Create a shared folder in the agency's preferred file-sharing platform and give access to the video producer and anyone else who will need it. Add the raw interview files here, as well as any other logos, videos, and photos that will be needed for the project.

Transcribe the Interviews

Before too much time has passed, view the recorded interview again. Type out what the person being interviewed said, noting the time stamp on the recording periodically. This will help when it comes time to finalize the storyboard and caption the video later.

Collect Supplemental Content

The research team may be able to provide additional photos or videos that were taken throughout the project. Additional content may be found in other videos the agency has produced (such secondary footage to provide context is sometimes referred to as B-roll footage) and images on the agency's social media accounts and online.

TIP: Do not use copyrighted material without proper permission.

Introductory and closing slides

Create two images to bookend the video and provide the title and agency's logo and any other branding that should be used. (These are sometimes called the title card and end card.) For best results, these images should be shown on screen for five seconds at the beginning and end of the final video. These might be similar to an opening slide of a PowerPoint slide deck. A sample title card is shown above.

CREATE A STORYBOARD

A storyboard is a shot-by-shot "map" for the entire video. It shows what on-screen content is paired with what audio for each shot of the video, and it keeps track of the total planned running time of the video. The start of a sample storyboard follows on the next page of this guide.

To create the storyboard, start with the introductory slide and pair video (still images, field video, interview video, and on-screen text and graphics) with audio (narration text, comments from the interview subject, and audio from field video) with estimated durations for each shot and ending closing slide. Include directions for the video producer, such as adding fades between a series of still images.

Continue in this fashion to map out the entire video.

Shot #	Video Notes: • Text that appears onscreen is shown in **bold**	Audio	Shot Length	Running Length
1	Title Card: NCHRP logo, Michigan DOT logo **Making Better Concrete Available to Everyone: Michigan DOT's Nonproprietary Ultra High Performance Concrete** Faded background image: UHPC.png 	Background [music] (fade to background—but still audible-- during narration).	0:05	0:05
2	• Cheap UHPC (1:08 – 1:18) • CFRP Spotlight.mp4 (0:26 – 0:41)	Narrator: Ultra-high performance concrete, or UHPC, is four-to-five times stronger than regular concrete. It's also less permeable, making it harder for water or salts to penetrate, and less likely to crack under pressure. UHPC is a natural choice for infrastructure like bridges, which often have steel reinforcements that can easily corrode when cracks form and the steel is exposed to moisture. With fewer repairs, agencies can save significant costs over the life of the bridge.	0:25	0:30

Steven Kahl
Supervising Engineer
Michigan Department of Transportation
Structures Construction Section
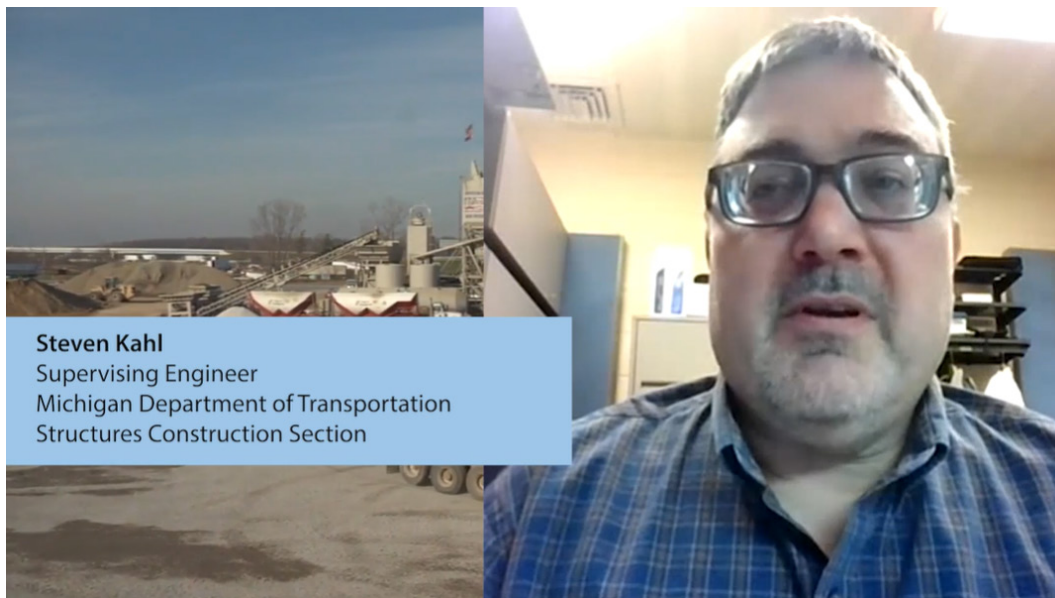
Adding Video to the Storyboard

The interview footage and supplementary photos and videos will constitute the bulk of the video used in the storyboard. Video may be enhanced with on-screen text and graphics. The interview subject's name and job title might be examples of added on-screen text, as shown above.

Adding Audio to the Storyboard: The Script

The audio column of the storyboard can be thought of as the video's script. The script includes all narration for the video, whether provided by the interview subject or a voice-over narrator. The transcribed interview will typically be the main source of content for the script. However, some introductory content, framing language and transition language may be necessary. This can be added to the script as voice-over audio.

Record Audio

Choose a narrator

A narrator could be a staff member or other professional who will read the role's designated lines according to the finalized script. The narrator will need access to a microphone, which could be stand-alone equipment or even a high-quality smartphone.

> **TIP: The agency's communications office may be able to provide guidance on securing a narrator.**

Record narration

Once the script has been reviewed and approved by the appropriate agency stakeholders, the narrator should read each of their lines clearly and directly into a microphone, re-recording as necessary and saving the recording as a single audio file.

Upload final files

Add the final version of the script and narration file to the shared folder.

EDITING AND POST-PRODUCTION

The video producer will use the final products in the shared folder to align the individual visual and audio elements to create the final video according to the final storyboard. Shot lengths may need to be adjusted based on the actual time required to play audio narration.

As part of this process, the producer should also:

Add Speaker Description

When the interview subject first appears on screen, a banner should appear to give their name and role so that viewers know who they are and their relevance to the project.

Add Background Music

A simple audio track adds a professional touch to any video. This can be selected and purchased from a variety of online retailers at minimal cost.

Create Captions

Using the script, create a new document the producer can use to add captions to every frame of the video to improve accessibility.

Finalize Two Versions

The producer should create two versions of the final video, one with captions and one without, both in 1920 x 1080 resolution or 16:9 aspect ratio. The captioned video can be useful at conferences or when played without sound. The uncaptioned video is great for viewing online.

PUBLISHING AND SHARING

Share the video with your agency's communications office to upload to the agency's official YouTube channel or other publishing platform like Vimeo.

Include a paragraph-long description that gives viewers an overview of what the video is about. If using YouTube, consider these additional recommendations:

- During the upload process, add a thumbnail image to serve as a representative image of the video.
- Remove the option for public comment.
- Allow the option for the video to be shared.

Once the video is posted to the agency's official account it can be linked and shared in a variety of additional locations.

ADDITIONAL RESOURCES

- A well-lit room can make a significant difference in the final video. Learn more about lighting.
- What should people see behind you? Consider these tips for creating a background that doesn't distract the viewer.
- A smartphone tripod makes the world of difference and can be found for under $20.
- Editing your videos in-house? Find the software that works for you. Options range from low-cost, low-frills products like Microsoft Photos that comes bundled with Microsoft Windows all the way to the high-power professional software like Adobe Premiere Pro.

BEST PRACTICES

- Do keep the video brief. Aim for a final product that's between three and five minutes—it should be short enough to hold viewers' attention but long enough to include all of the important details of the project.
- Do be conscientious of any sights, sounds, or shadows during recording that could distract viewers from the person being interviewed.
- Do add humor to the video when appropriate. This can provide levity to an otherwise technical topic.
- Do work with your agency's communications office. There may be requirements related to visual branding, word choice or publishing that are better addressed early in the process.
- Do make sure the content is not copyright-protected or that the agency owns the copyright.
- Do use high-resolution, horizontal images whenever possible.
- Do consider that project investigators can have varying levels of skill and comfort in front of the camera.
- Don't prepare the interview subject too much by providing in advance the exact questions that will be asked. The interview will sound much better if the expert is responding naturally to the questions as they're being asked.
- Don't be afraid to ask the person being interviewed for clarification or to repeat something—once the interview is over it becomes much more difficult to add more audio.
- Don't use a virtual background if interviewing via Zoom or other virtual meeting platform.

SECTION 3: CREATING A WEBINAR

BENEFITS OF THIS STRATEGY

Webinars offer a unique opportunity for large, geographically dispersed audiences to hear from the experts themselves. A recorded webinar can also serve as a useful training tool, giving agencies a resource to teach staff without incurring additional expense. A webinar can be conducted in real time, pre-recorded or both, and each option offers distinct benefits. Careful consideration will help in developing a webinar that meets the agency's needs.

PRELIMINARY CONSIDERATIONS

A successful webinar will require significant planning, preparation and collaboration among the project's stakeholders. Depending on the topic, number of presenters and format, a single webinar can take several months to develop and promote.

Regardless of how the webinar is conducted, one or more practice sessions will increase confidence and ensure everyone is familiar with the technology, their role and general expectations. Additional considerations for each type of program are outlined below.

Presenting Live

A webinar in real-time allows attendees to ask questions and receive immediate answers, which can ensure the material is well received and understood. However, a live webinar will also need to adhere to strict start and end times to accommodate attendees' and presenters' schedules. Remember to still record so that the information can continue to educate and disseminate after the program is over.

Resources for this approach include:

- A digital meeting platform such as Zoom or similar technology
- High-speed internet connection
- At least one presenter with a prepared presentation
- A host or facilitator to introduce the presenter(s) and monitor incoming questions
- A co-host or technical expert who can provide assistance in case of issues
- An account on YouTube or similar platform to store the finished webinar

Pre-recording Presentations

A webinar that has been pre-recorded provides greater convenience and flexibility than one that's held live. With the option to record and re-record their presentations in advance, presenters may be more comfortable and produce a more conversational finished product. When pre-recorded, the length of the webinar is also less important, giving presenters more flexibility to explain the research at their own pace. Finally, a pre-recorded webinar allows attendees to view and re-watch presentations when it's most convenient for them.

Resources for this approach include:

- Digital recording software
- A program or process to transfer large files
- At least one presenter with a prepared presentation
- Digital production to edit and finalize a cohesive webinar
- An account on YouTube or similar platform to store the finished webinar

Taking a Hybrid Approach

Combining elements of a live and pre-recorded webinar offers advantages as well. This could be a suitable option if a presenter's internet connection is unreliable or if they're unavailable to present at the scheduled time. In this scenario, for example, the facilitator could host and introduce each presenter in real time but play the pre-recorded presentations from his or her own computer. If available, the presenter could still attend and answer questions in real time to increase engagement.

Resources for this approach could include:

- A digital meeting platform such as Zoom or similar technology
- High-speed internet connection
- Digital recording software
- A program or process for transferring large digital files
- At least one presenter with prepared presentation
- A host or facilitator to introduce the presenter(s) and monitor incoming questions
- A co-host or technical expert who can provide assistance in case of issues
- An account on YouTube or similar platform to store the finished webinar

IN THIS SECTION

The following pages detail actions and considerations for developing a webinar. Depending on the approach selected some experience in video recording and video editing may be required; technical guidance (for example, how to use video recording or editing software) is beyond the scope of this guide.

THE REGIONAL APPROACH

The Region 3 states selected two of the completed projects to develop into webinars based on the topics' broad national appeal, potential for attracting and engaging a large audience, and the transferability of the research results. The two selected projects were:

- Michigan DOT's Commercial Production of Non-Proprietary Ultra High Performance Concrete
- Ohio DOT's Streamlining Implementation of Sustainable Channel Maintenance Practices

Both webinars were held live and featured presentations from key project stakeholders representing the sponsoring agency and research team, with facilitation and technical assistance provided by the consultant team.

STAGES OF WEBINAR PRODUCTION

Regardless of how the webinar will be conducted, thorough preparation and pre-production work are crucial. This includes all of the selection, planning and coordination efforts needed to develop the webinar.

If the webinar will be hosted live, presenters will need to attend at their scheduled time. If the webinar is pre-recorded or a hybrid, the process will require recording the presentations and collecting them for inclusion in the program.

Finally, recording and editing the webinar will ensure it can be published and shared with internal and external audiences.

PLANNING AND PRE-PRODUCTION

Select a Featured Project

Any type of project can make a great webinar, but technical topics are especially suitable when the researchers can be on hand to explain the research and answer questions. When deciding which project to choose, an agency should consider:

- Who from the agency would be willing and able to present why the research was needed and how the findings will be used?
- Who from the research team would be willing and able to present the research process and findings?
- Will a facilitator or host be needed and who would fulfill that role?
- Who will be interested in attending?

By addressing these issues early on, an agency will be better positioned to develop a video that capitalizes on the project's visual potential and reaches its intended audience. Note that in some cases it might make sense to feature two or more related research projects in the same video.

Determine the Logistics

Once the webinar topic has been selected, considering the format and technological issues early on can help to determine what additional resources will be needed.

- Will the webinar be live, pre-recorded or a combination of the two?
- If live, what platform should be used to host the webinar?
- Who will develop and review the presentations?
- How many people are likely to attend?
- What promotional efforts will be needed to raise awareness of the webinar and encourage attendance?

With the major logistical questions addressed, marketing can begin while the presentation is being developed.

Develop the Presentation

After the presenters and other key participants have been identified, the work to develop each portion of the webinar can begin. Just like a video, the webinar should describe the challenge that prompted the research as well as the process and benefits of the research itself. Unlike a video, a webinar is a better forum for discussing details and technicalities and tailoring information based on attendees' questions and level of interest.

PowerPoint slides work well in a webinar format and can help the presenter organize their thoughts in advance. Adding video and images to the slides can add visual interest and illustrate key points.

> **TIP: Plan a technical dry-run with presenters before the webinar so they are comfortable with the web meeting platform selected.**

PRODUCING A LIVE WEBINAR

Fifteen to 20 minutes before the live webinar begins, presenters and participants should arrive to ensure audio and video are working properly. Then, the facilitator can share the welcome or title presentation slide on their screen while attendees log on.

Attendees and presenters who aren't speaking should ensure their cameras are off and their microphones are muted so that only the presenter appears on camera in the final recording.

FINISHING TOUCHES

If the webinar was held live, download the recording and review it to be sure it's complete. Edit the recording lightly to remove silences at the beginning or end, add a title slide and/or end slide, and upload it to YouTube, Vimeo or other site so that it can be shared broadly. If the webinar was pre-recorded or a hybrid, edit and combine the videos to create a comprehensive presentation. Once the finished webinar has been successfully created and uploaded, raw recordings can be deleted from the host platform.

EXAMPLES OF COMPLETED WEBINARS

Details of the two 90-minute webinars developed by Region 3 follow.

SAMPLE WEBINAR #1

Making Ultra High Performance Concrete Affordable for All: Research Results and Opportunities for Tech Transfer

Presented on March 27, 2023, from 11:30 a.m. to 1 p.m. (ET)

Summary

A county engineer who has already used MDOT's non-proprietary UHPC formula successfully in several projects shared his practical advice for working with it. Following the project-specific presentations, an overview of the different strategies used to disseminate the research was provided.

Logistics

90-minute live webinar on Zoom.

Presenters

- Michael Townley, Engineer of Research, Michigan DOT
- Steve Kahl, Engineer, Structures Construction Section, Michigan DOT
- Sherif El-Tawil, Professor, Civil and Environmental Engineering, University of Michigan
- Mike Clark, County Engineer, St. Clair County Road Commission

External Facilitator

Attendees

The webinar was attended by 67 individuals representing a variety of organizations and interests, including state and local transportation agencies, academia, and industry.

Resources

The recorded webinar, including details of the question-and-answer session, may be found on the NCHRP Project 20-44(28) web page. Presentation slides are available in the final report for this project.

SAMPLE WEBINAR #1

Streamlining Ohio's Sustainable Channel Maintenance Practices: Research Results and Opportunities for Tech Transfer

Presented on March 29, 2023, from 1 to 2:30 p.m. (ET)

Summary

A representative from Ohio DOT and the research team explained the need for sustainable channel maintenance practices and shared before-and-after images and videos of Ohio waterways where these practices have been implemented. Following these presentations, a detailed list of dissemination strategies was shared to showcase the potential avenues for technology transfer.

Logistics

90-minute live webinar on Zoom.

Presenters

- Jon Witter, Associate Professor, Ohio State University
- Matt Perlik, Assistant Environmental Administrator, Ohio DOT

External Facilitator

Attendees

The webinar was attended by 38 individuals from Ohio and other state and local transportation agencies, academia, and industry.

Resources

The recorded webinar, including details of the question-and-answer session, may be found on the [NCHRP Project 20-44(28) web page](). Presentation slides are available in the final report for this project.
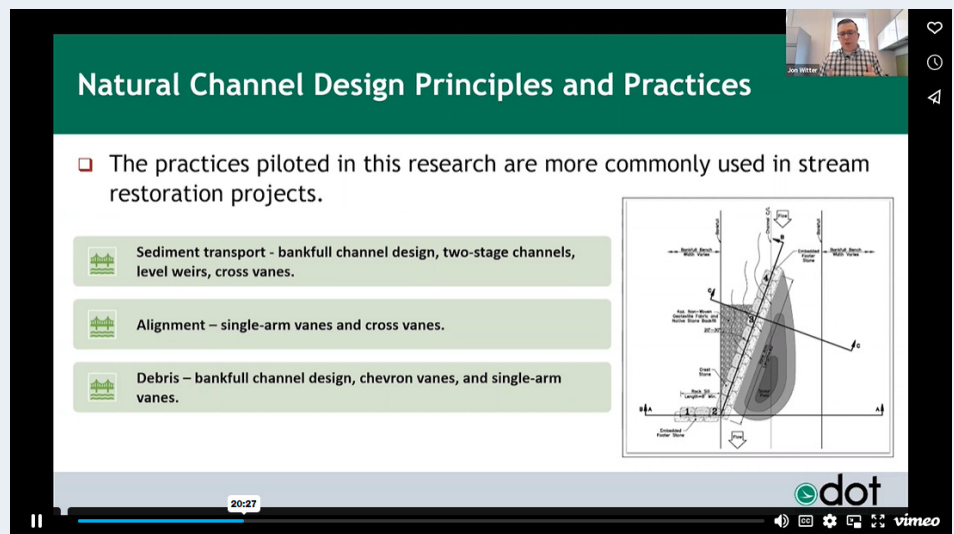
ADDITIONAL RESOURCES

- For webinars that need to accommodate hundreds of attendees, consider temporarily upgrading an account with Zoom, GoToMeeting or other virtual meeting platform to gain more functionality and features. Learn more about available webinar software.
- Share large files with external collaborators using a file sharing service. Learn more about file sharing.

BEST PRACTICES

- Do begin promoting the webinar as soon as the dates have been chosen so that attendees can mark their calendars.
- Do take advantage of opportunities to interact with the audience—use Mentimeter and other engagement tools to learn their familiarity and interest in the research.
- Do provide sufficient time for review and approval of presentation slides, if needed.
- Do schedule a test session with presenters to ensure everyone is comfortable and familiar with the technology.
- Do mute attendees automatically upon arrival or ask them to mute themselves to minimize interruptions.
- Do remember to hit the record button.
- Don't use a virtual background during presentations.
- Don't delete original recordings until the finished webinar has been successfully posted.

SECTION 4: CREATING A WORKSHOP

BENEFITS OF THIS STRATEGY

While webinars provide a forum for a speaker to present and engage with a group, a workshop gives a small group of participants a more intimate and substantial opportunity to interact and discuss a topic of interest in greater depth. Whether held virtually or in person, a workshop's longer duration allows participants to get to know each other better so they can more comfortably learn and share their perspectives. It also allows sufficient time for technically complex questions (and answers) that may help attendees get past barriers to implementation. In-person workshops further allow for technical demonstrations and hands-on learning if appropriate for the topic. A workshop can be recorded, though this may influence participants' willingness to share freely.

THE REGIONAL APPROACH

The Region 3 states chose a six-hour virtual workshop, held over two days, to discuss one of the previously completed projects and the state's plans for expanded dissemination efforts. The project that was chosen was Michigan DOT's Commercial Production of Non-Proprietary Ultra High Performance Concrete, or UHPC.

It is noteworthy that other workshop participants have taken or are considering taking different steps in the area of UHPC. Being located in the same part of the country, these other states may be working with the same contractors and suppliers as Michigan and can benefit from learning about Michigan's specific obstacles and how the state overcame them.

A second workshop was originally planned with the aim of communicating project results to the national research community. It was later decided that an effective alternative approach would be multiple presentations at the joint in-person TRB and AASHTO research meetings in July 2023. One of these featured a portion of the UHPC workshop detailed in this section, and another summarized project findings and lessons learned from this project as a whole.

WORKSHOP PREPARATION

Determine the Logistics

Once a topic has been selected for a workshop, the host agency should consider the following questions.

- Will the workshop be held in person or virtually?
- If it will be virtual, what platform should be used to host the workshop?
- If it will be held in-person, where will it take place? Will refreshments be needed? Will access to laboratory or field equipment be needed?
- Who should be invited, and how can they be reached?
- Who will help to facilitate discussions so that all attendees are heard and engaged?

In-Person Versus Virtual

Both in-person and virtual workshops have their benefits. In-person workshops:

- Are often better at keeping attendees engaged and focused
- Allow for important side-discussions and conversation between sessions
- Present opportunities for technical visits and hands-on information exchange

Conversely, virtual workshops:

- Do not impose limits on the number of attendees
- Can include attendees who are physically located anywhere in the world
- Are less costly
- Need not be held on consecutive days for a multi-day event

TIP: There are pros and cons to in-person and virtual workshops. Hybrid workshops are particularly challenging, with online attendees often having a poor experience.

Develop the Agenda

To facilitate productive discussions, sessions should be brief, interactive, and of general interest. A presentation, possibly from the host agency, can set the stage and encourage others to think about how their own programs and processes compare.

Consider including on the agenda technical experts representing different angles of the research: the DOT champions and end users, the university or consulting firm investigators, other research users, such as local or county engineers, and members of industry. Take care not to let any stakeholder have too strong a voice or sway, since the goal is healthy information sharing that will enable the transfer of technology to be completed. Allow ample time on the agenda for Q-and-A and round-table discussions.

Inviting Attendees

Small groups — from five to 12 attendees — are optimal to ensure discussions are productive and informative. When requesting that an attendee develop a presentation to share during the workshop, provide an accessible template in advance to reduce the burden on their time.

HOSTING A WORKSHOP

During a virtual workshop, the facilitator should welcome attendees and encourage camera use so that everyone is more comfortable discussing the issues. For an in-person workshop, seats should be arranged so that attendees are facing each other. For both formats, a note-taker should be present to capture key points.

TIP: It is hard to run and participate in a meeting. Consider finding an internal or external individual to serve as meeting facilitator.

As a workshop unfolds, it is best to not be too strict in keeping to the agenda. While proper consideration must be given to each presenter who prepared a formal presentation, it is hard to predict how much time will be needed for each planned Q-and-A or round-table discussion. Allowing some flexibility to exceed the allotted time for on one topic and run short of another means that participants will be able to devote time to the issues that are most important to them.

SAMPLE WORKSHOP

Making Ultra High Performance Concrete Affordable for All

Presented on June 12 -13, 2023, from 10 a.m. to 1 p.m. (ET)

Summary

Drawing from MDOT's experiences with the non-proprietary UHPC project, attendees discussed the resources that agency research programs need to be successful, the challenges and opportunities of different dissemination strategies, and their own experiences with technology transfer.

Logistics

Two three-hour sessions over two days on Zoom.

Presenters

- Michael Townley, Engineer of Research, Michigan DOT
- Sherif El-Tawil, Professor, Civil and Environmental Engineering, University of Michigan
- DeWayne Rogers, Clare County Road Commission

External Facilitator

Attendees

The webinar was attended by representatives from 7 state DOTs, two universities and members of industry.

Resources

The recorded workshop, including details of the question-and-answer sessions and round-tables, may be found on the NCHRP Project 20-44(28) web page. Presentation slides are available in the final report for this project.

EXAMPLE OF A COMPLETED WORKSHOP

Details of the two-day NCHRP workshop follow.

Some participant takeaways, captured using the Mentimeter polling tool, are captured below.

ADDITIONAL RESOURCES

- Establish SMART goals to ensure the workshop is productive. Learn more about SMART goals.
- Keep attendees engaged with interactive polling using tools like Mentimeter or slido. These polling software tools have free and paid options with different features.

BEST PRACTICES

- Do consider preparing draft materials to lessen the burden on volunteer presenters.
- Do provide presentation templates and other materials in advance to encourage response.
- Do build flexibility into the agenda by taking breaks and allowing for longer or shorter presentations.
- Do add chapters or time markers to long videos to help others more easily locate the sessions that they are most interested in.
- Don't try to take notes or facilitate if you plan on being an active workshop participant.
- Don't discourage tangential discussion if attendees are engaged and conversation is productive.