NCHRP Active Implementation

Moving Research into Practice

im·ple·men·ta·tion

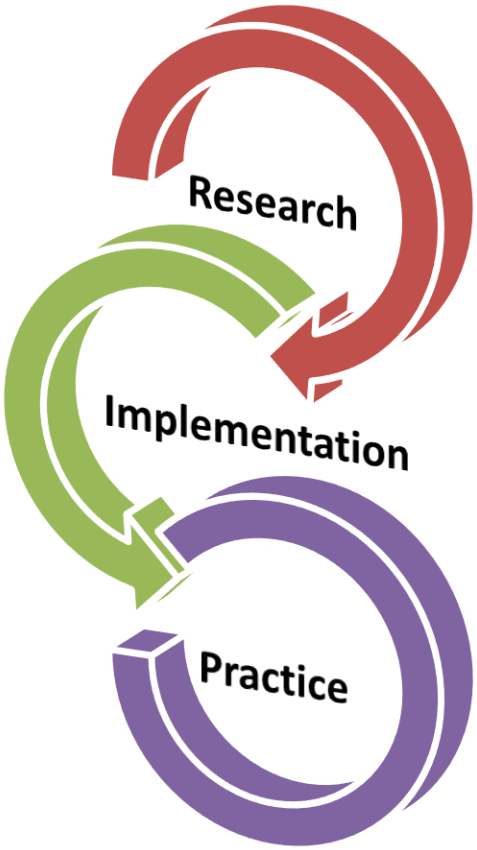
"A specified set of activities designed to put into practice an activity or products of known dimensions"

"**Implementation Science:** The systematic study of specified activities designed to put into practice activities or products of known dimensions"

National Implementation Research Network (NIRN): http://nirn.fpg.unc.edu/.

OUTLINE

- Research-to-Practice Gap
- Implementation Science
- National Implementation Research Network
- Active Implementation Frameworks
- Effective Implementation Process Flow
- Technology Transfer
- Implementation Strategies
- Implementation Approaches
- NCHRP Active Implementation Processes



Research-to-Practice Gap

Recent reports from groups such as the Institute of Medicine (2000, 2001, 2007) and The U.S. Department of Education (2011) have highlighted the gap between researcher knowledge of effective products and the services actually received by persons who could benefit from products. In fact, the lag time for translating research into practice has been documented as 20+ years.

The research-to-practice gap is a critical issue because practitioners cannot benefit from products they do not receive.

RESEARCH-TO-PRACTICE GAP

- Over the past decades the science related to developing and identifying evidence-based programs and practices has improved significantly.
- *<u>However, the science related to implementing these programs with high confidence in real-world settings has lagged far behind.</u>*

What We Tried

Experimental Data Show These Methods, **When Used Alone, are Insufficient**:

- Implementation by laws/mandates/regulations
- Implementation by providing funding or incentives
- Implementation without changing supporting roles
- Diffusion/dissemination of information
- Training alone, no matter how well done

Data: 5% to 15% Realize Intended Outcomes

Fixsen, Naoom, Blase, Friedman, Wallace, 2005

National Implementation Research Network (NIRN)

- In 2005, the National Implementation Research Network released a monograph synthesizing implementation research findings across a range of fields.
- Based on these findings, NIRN developed five overarching frameworks referred to as the Active Implementation Frameworks.
- **The Active Implementation Frameworks presented herein have been modified to implement research outcomes "products" instead of "interventions".**

Fixsen, D., S. Naoom, K. Blase, R. Friedman, and F. Wallace, "Implementation Research: A Synthesis of the Literature," University of South Florida, Tampa, 2005. HTTP://NIRN.FPG.UNC.EDU

Implementation Science

Implementation Science is the study of factors that influence the full and effective use of innovations in practice. This definition of implementation science emphasizes the study of factors that are action-oriented and mission-driven.

Active Implementation

What is Active Implementation?

- The formula for success involves multiplication. If any component is weak then the intended outcomes will not be achieved, sustained, or used on a socially significant scale.
- Like a serum and a syringe, innovations are one thing and implementation is something else entirely different. Doing more research on a serum will not produce a better syringe; doing more research on an innovation will not produce better implementation methods.

Active Implementation Frameworks

- **Framework 1: Effective Products**
  - *Well defined, effective products that are useable and implementable*
- **Framework 2: Implementation Stages**
  - *Development of implementation guidance specific to research results*
- **Framework 3: Implementation Drivers**
  - *Critical program and organizational support that is needed to implement products*
- **Framework 4: Implementation Teams**
  - *The group that guides and manages the implementation and scale-up process*
- **Framework 5: Product Feedback**
  - *The processes that support teams and organizations efficiently to solve problems and get better*

Adapted from Dean Fixsen and Karen Blase

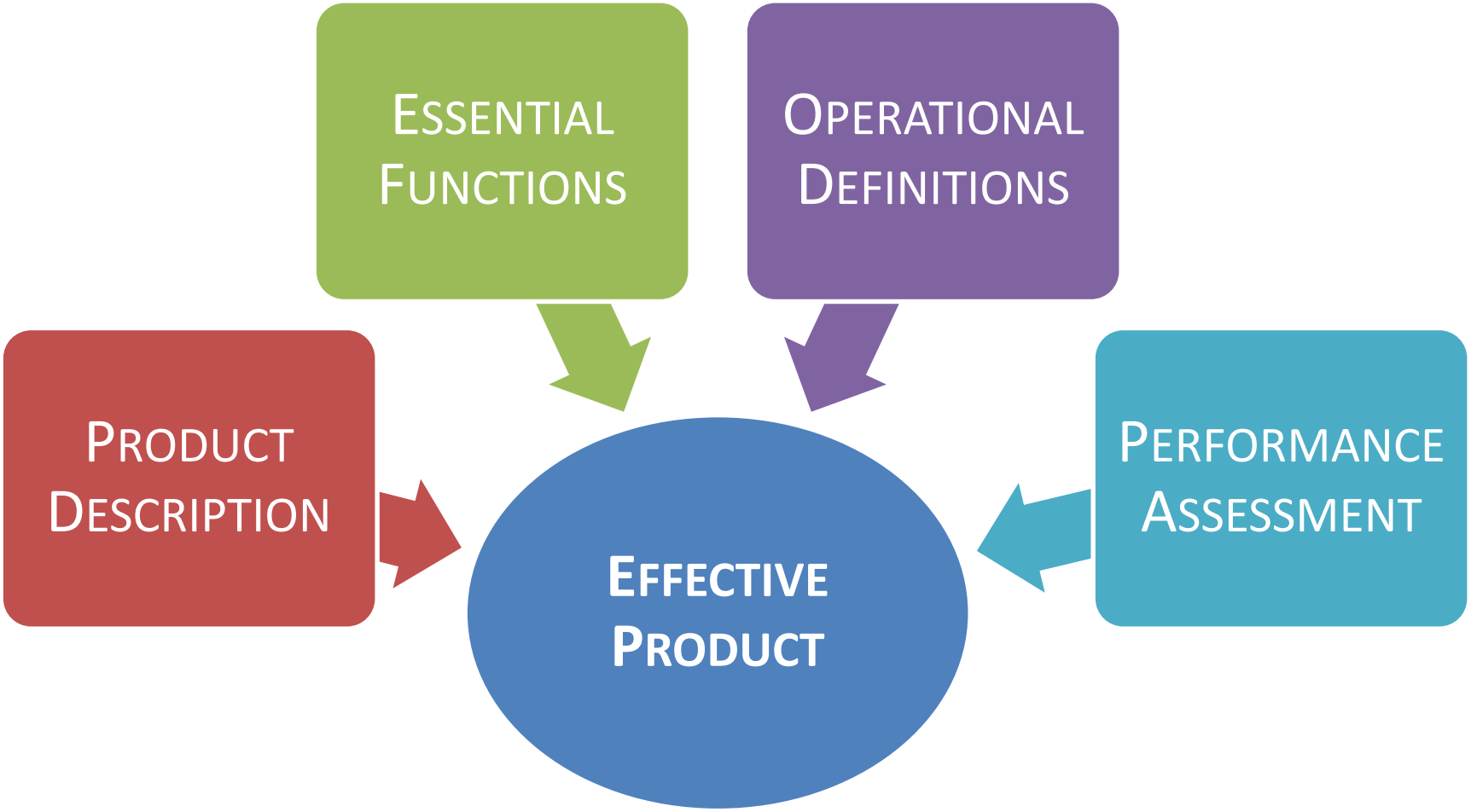
Framework 1: Effective Products

Framework 1: Effective Products

To be Implementable:

- It's necessary to have sufficient detail about a product.
- With detail, you can train staff to implement it with confidence and measure the use of the product.
- So, a product needs to be teachable, learnable, doable, and be readily assessed in practice.

Framework 1: Effective Products



How to Evaluate Usability of Products

The Hexagon Tool helps states, districts, and stakeholders systematically evaluate Usability of Products via six broad factors:

1. **Needs** of users; how well the product might meet identified needs.
2. **Fit** with current initiatives, priorities, structures and supports, and community values.
3. **Resource Availability** for training, staffing, technology support, curricula, data systems, and administration.
4. **Evidence** indicating the outcomes that might be expected if the product is implemented well.
5. **Readiness** for implementation
6. **Capacity** to implement as intended and to sustain and improve implementation over time.

Adapted from Karen Blase, Laurel Kiser, & Melissa K. Van Dyke, 2013

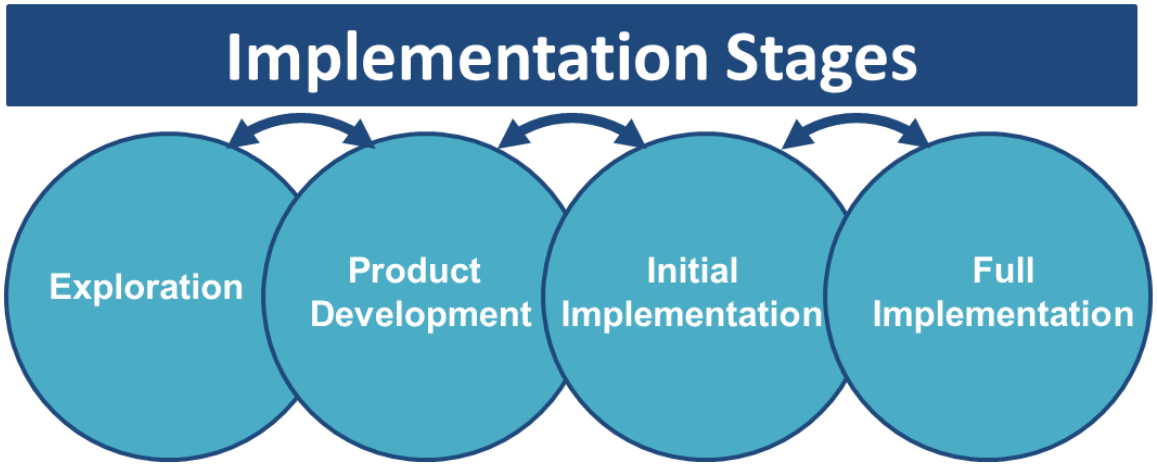
The Hexagon Tool

5 Point Rating Scale			
	High=5	Med=3	Low =1
Need			
Fit			
Resources			
Evidence			
Readiness			
Capacity			
Total Score			

Adapted from Karen Blase, Laurel Kiser, & Melissa K. Van Dyke, 2013

The scoring process is primarily designed to generate discussion and to help arrive at consensus for each factor as well as overall consensus related to moving forward or not. The numbers do not make the decision, the team does. Team discussions and consensus decision-making are required because different factors may be more or less important for a given program or practice and the context in which it is to be implemented.

Framework 2: Implementation Stages



Framework 2: Implementation Stages

- Implementation is not an event.
- Implementation is "a specified set of activities designed to put into practice an activity or product of known dimensions."
- These activities occur over time in stages that overlap and that are revisited as necessary.

It appears that most of what is known about implementation of practices and programs is known at the exploration and initial implementation stages.

EXPLORATION STAGE

Involves:

- Assessing the needs of users (e.g., problem statement development, participation of AASHTO and TRB Committees)
- Identifying possible programs and practices to meet those needs (e.g., current policy, knowledge gaps)
- Assessing the fit and feasibility of implementing and sustaining the developed Product (e.g., which problem statements to be selected by SCOR and how to develop an RFP by project panel)

Product Development Stage

Involves:

- Developing communication pathways (e.g., oversight panel, identifying stakeholders, AASHTO)
- Ensuring financial and human resources are in place (e.g., funding research projects and selection of research team)
- Awarding contracts
- Conducting research
- Developing effective product
- Evaluating Usability of developed Product (i.e., **Framework #1**)
- Analyzing implementation drivers (i.e., **Framework #3**)

Initial Implementation Stage

Involves:

- Planning technology transfer strategies that fit the developed product
- Monitoring implementation barriers and solving them rapidly
- Monitoring implementation drivers that were analyzed in the previous stage and addressing any unexpected problem
- Moving forward with product to adoption (e.g., working with AASHTO to adopt a product)
- Providing support before and after product adoption

Implementation is a process involving multiple decisions, actions, and corrections to change the structures and conditions necessary to successfully implement and sustain new products.

Full Implementation Stage

Involves:

- Practitioners skillfully employing new products (e.g., DOTs staff and consultants using the developed product)
- The product is implemented as it was intended
- Organizations provide infrastructure to support practitioners and provide feedback on the implementation outcomes for product assessment and future improvement

Engaging in Stage-based Implementation Activities

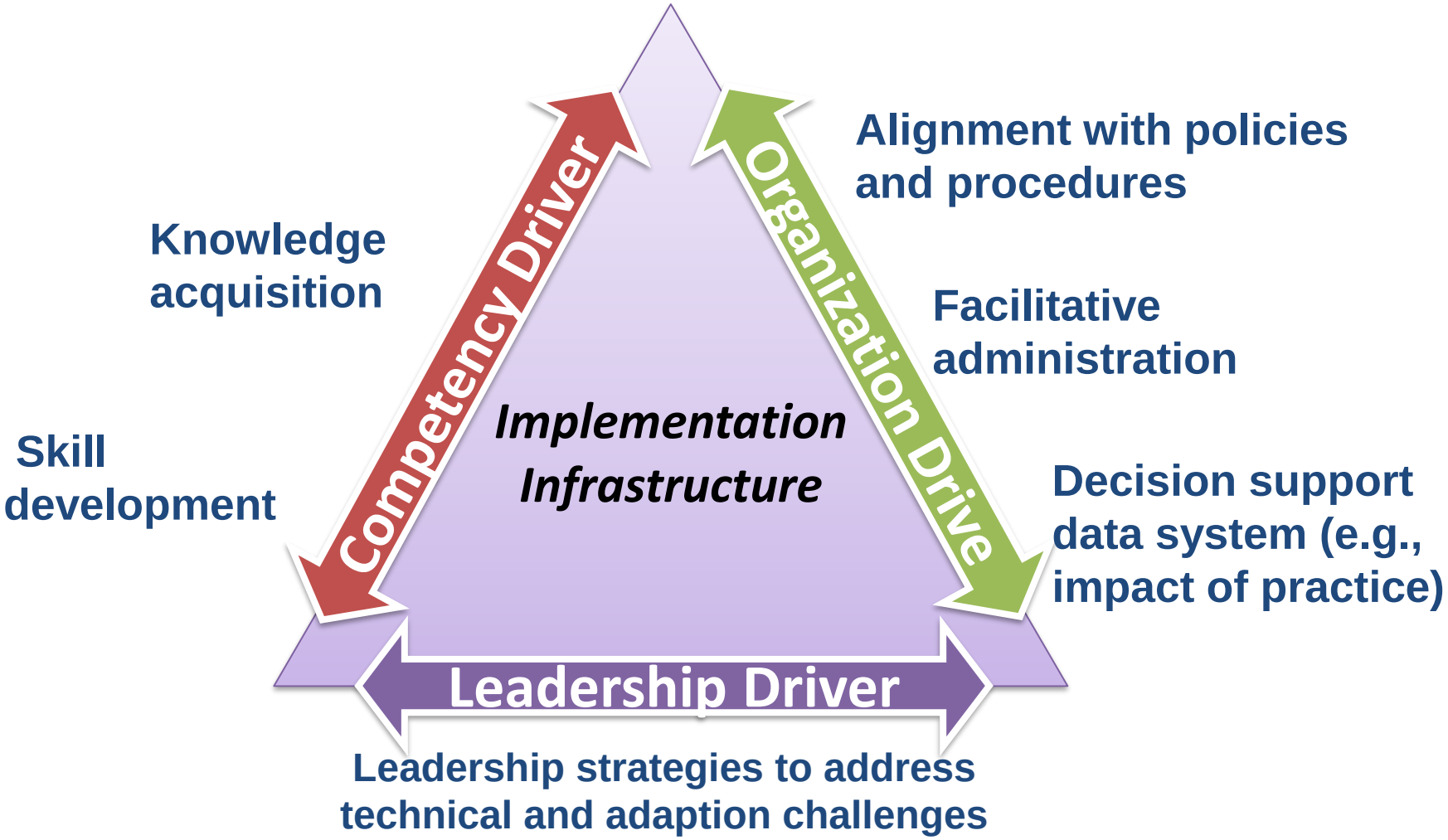
- Thinking about a current or upcoming initiative:
- How could you use a stage-based approach to the work?
- Would it be useful to develop a checklist for each stage of implementation? Why or why not?
- What data sources are important for each stage of implementation?
- What will facilitate the work in each stage?
- What barriers will need to be addressed during each stage?

Framework 3: Implementation Drivers

Framework 3: Implementation Drivers

- Implementation Drivers are key components of capacity and infrastructure that influence a program's success. <u>They represent the infrastructure needed to make use of effective and well-defined innovations</u>
- There are three types of Implementation Drivers. When integrated and used collectively, these drivers ensure effectiveness and sustainable program implementation:
  - Competency Drivers
  - Organization Drivers
  - Leadership Drivers

Framework 3: Implementation Drivers



Adapted from Dean Fixsen and Karen Blase

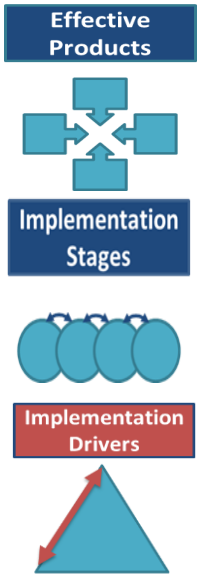
INDISPENSABLE

"The research, programs and innovations that TRB creates make it an indispensable supporting component of our nation's transportation infrastructure."

Dorval R. Carter, President
CHICAGO TRANSIT AUTHORITY

Competency Drivers

- How to develop, improve, and sustain practitioners‘ competence to improve effective products
- The four competency drivers include:
  - staffing,
  - training,
  - coaching, and
  - feedback on staffing, training, and coaching.



Organization Drivers

- Organization Drivers are used to develop the support and infrastructure needed to create a hospitable environment for new product implementation.
- The organization drivers include:
  - Decision Support Data System to asses the outcome of product implementation and related implementation strategies
  - Facilitative Administration
  - Alignment with policies and procedures
  - Identification of barriers and facilitators for using new products

Innovation for Results

"Since 2003, we have implemented 199 innovative ideas related to contracting methods, safety improvements, accelerated bridge construction, traffic management, and other areas discussed at TRB meetings. As a result, we have realized more than $198 million in savings."

Carlos Braceras, Executive Director
UTAH DOT

Leadership Drivers

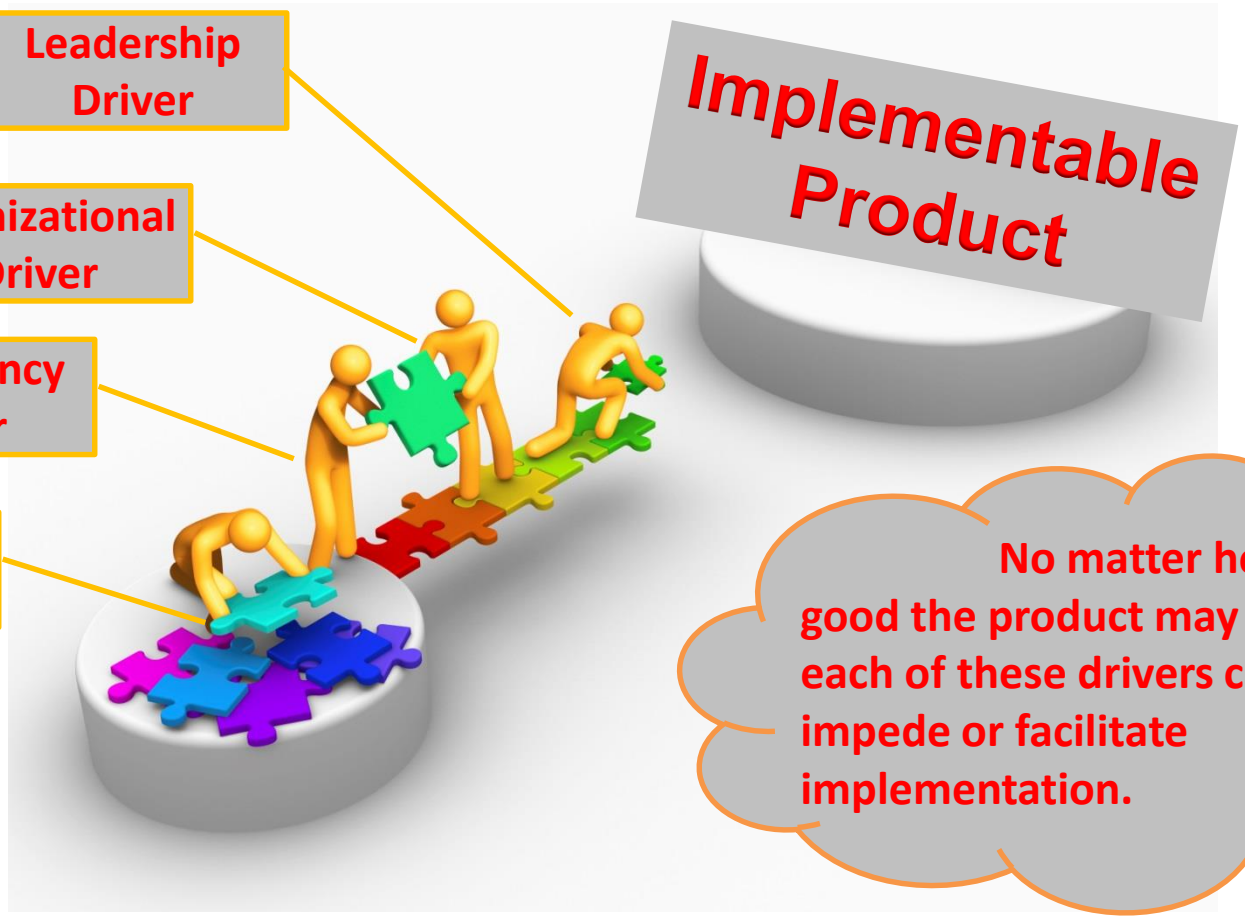
Help guide leaders to use the right leadership strategies to deal with Leadership technical and adaption challenges

AHEAD OF THE CURVE

"With the pace of innovation increasing daily, the research provided by TRB helps inform investments and guide decisions as we look to stay ahead of the curve."

Shailen P. Bhatt, Executive Director
COLORADO DOT

Relationship between Effective Product and Implementation Drivers



No matter how good the product may be, each of these drivers can impede or facilitate implementation.

Influence of Implementation Drivers on Effective Product Implementation

Leadership Driver	Organization Driver	Competency Driver	Effective Product	Possible Implementation Outcome
Generally Enabling	Strong	Strong	Strong	High
		Weak	Weak	Low
	Weak	Strong	Strong	Medium
		Weak	Weak	Low
Generally Hindering	Strong	Strong	Strong	Medium
		Weak	Weak	Low
	Weak	Strong	Strong	Low
		Weak	Weak	N/A

Leverage the Implementation Drivers Framework in Your Work

Thinking about a specific product:

- How are the Implementation Drivers relevant to program implementation in your organization?
- Which Drivers have received the most purposeful attention? The least? Why?
- How could the Implementation Drivers framework bolster the implementation infrastructure to improve outcomes?

Framework 4: Implementation Teams

Framework 4: Implementation Teams

- The **role** of Implementation Teams is to leverage implementation science principles and change management best practices to support the widespread use of developed products
- Implementation Team members have **special expertise** regarding programs, implementation science and practice, improvement cycles, and organization and system change methods.
- They are **accountable** for making it happen; for assuring that effective product and effective implementation methods are in use to produce intended outcomes.

FRAMEWORK 4: IMPLEMENTATION TEAMS

Implementation Teams **answers**:

- WHO does the work of implementation?
- WHO will assure practitioners and organizations are ready?
- WHO will help organizations to be supportive?
- WHO will help organizations to facilitate hospitable environment ?
- WHERE the new ways of work embodied in any product can be used fully and effectively?

Framework 4: Implementation Teams

Success Criteria: Enabling Contexts

http://hungerintohealth.com/tag/collective-impact

Framework 4: Implementation Teams

Implementation **Teams could be**:

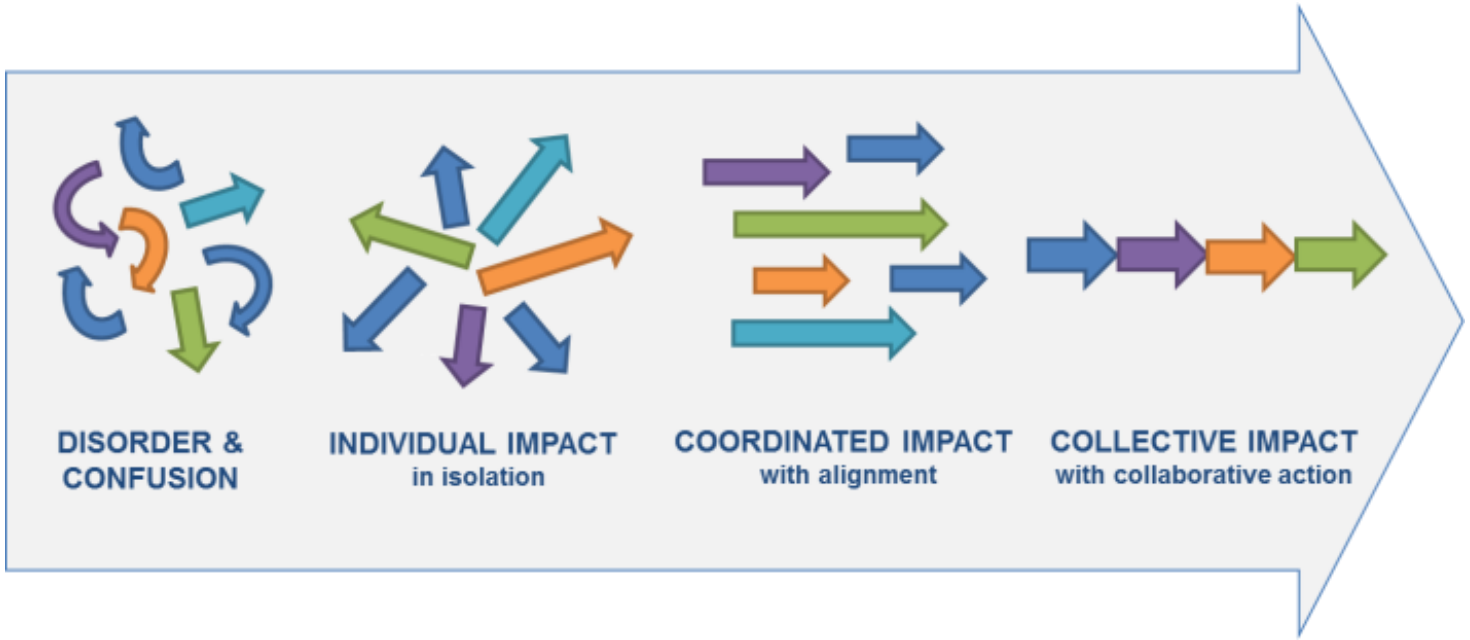
- Developers and purveyors of a product.
- Intermediary organizations that help others implement a variety of products.
- Agency staff with support from groups outside the organization or system.

FRAMEWORK 4: IMPLEMENTATION TEAMS

Implementation Teams **focus on**:

- Purposeful, active, and effective implementation work
- Increasing "buy-in" and readiness
- Installing and sustaining the implementation infrastructure
- Assessing and reporting on outcomes of product implementation
- Problem-solving and promoting sustainability
- Collective Impact with Collaborative Action

FRAMEWORK 4: IMPLEMENTATION TEAMS



Collective Impact with Collaborative Action

https://www.santafecf.org/birth-to-career

Framework 4: Implementation Teams

- Multiple teams need to be purposefully linked to support communication and engage in problem-solving.
- The functions of each team need to be clearly defined
- Champion(s) can move on to new challenges or burn out. Innovations come and go with individuals.
- Implementation teams collectively have the knowledge, skills, abilities, and time to succeed and sustain the work.
- The team embodies the capacity needed to implement well and maintain and improve products over time and across staff.

Framework 4: Implementation Teams

- Implementation Teams **don't have to wait for readiness**; they can help **create readiness** by using Implementation Stages and Implementation Drivers.
- Implementation Teams **don't have to wait for a champion** to appear; they can help organizations and systems change to provide more hospitable environments for effective innovations and for the necessary implementation supports.

LEVERAGE THE IMPLEMENTATION TEAMS FRAMEWORK IN YOUR WORK

Thinking about a current or upcoming initiative:

- How can you repurpose or expand existing teams to address implementation challenges?
- How might linked teams and communication protocols help your implementation efforts?
- How can staff and user be included in implementation decision making?
- What might be the benefits of planning around implementation frameworks from the beginning?

Framework 5: Product Feedback

FRAMEWORK 5: PRODUCT FEEDBACK

- Product feedback supports the purposeful process of change.
- Implementation teams use product feedback to maintain and improve products
- Measure product impact on practice and find the return of investment

Effective Implementation Process Flow

- Technology transfer—a communications process through which the results of scientific research are put into use; often including implementation strategies and activities
- Adoption—a decision to use an innovation (e.g., AASHTO Ballot Items and adoption of specifications)
- Implementation—putting an innovation to use

Rogers, E., M., *Diffusion of Innovations*, 5th ed., 2003

Technology Transfer—Implementation Strategies

Implementation Strategies: Ineffective Implementation Strategies

- As an implementation strategy, access to information alone appears to have little impact on practitioners' performance.
- Experimental studies indicate that dissemination of information alone does not result in positive implementation outcomes (changes in practitioner behavior) or product outcomes (benefits to consumers).
- Training (no matter how well done) by itself is an ineffective implementation method.

Implementation Strategies: Effective Implementation Strategies

- A high level of involvement by product developers on a continuing basis is a feature of many successful implementation programs.
- Multilevel approaches to implementation with clear and effective strategies.
- Implement only those attributes of a product or practice that are replicable and add value.
- The speed and effectiveness of implementation may depend upon knowing exactly what has to be in place to achieve the desired results for consumers and stakeholders: no more, and no less.

Implementation Approaches

Ad hoc Implementation

- Cumbersome or variable activities
- Lack of funding and expertise
- Champions
- Incremental change or no impact

Systematic Active Implementation

- Implementation infrastructure within the DOTs (policy, guidance, training, etc.)
- Dedicated funding and expertise (e.g., NCHRP 20-44, SHRP2, FHWA Every Day Counts)
- Implementation team
- Accelerating implementation

COOPERATIVE RESEARCH: NCHRP

TRB's National Cooperative Highway Research Program

- Responds to the practical needs of DOTs
- Ready-to-implement, sustainable solutions

NCHRP Implementation Teams

Implementation Frameworks		Exploration Stage	Product Development Stage	Initial Implementation Stage	Full Implementation Stage
Effective Product		Problem statement submitters, TRB RAC, SCOR, FHWA, NCHRP STAFF	Panel Members NCHRP Research Team FHWA AASHTO TCs	NCHRP Research Team FHWA AASHTO TCs	DOTs AASHTO FHWA
Implementation Drivers	Competency	Problem statement submitters, SCOR	Research Team NCHRP	AASHTO TCs FHWA, NCHRP	DOTs
	Organization	Problem statement submitters, SCOR	Research Team NCHRP	AASHTO TCs FHWA,NCHRP	DOTs
	Leadership	Problem statement submitters, SCOR	Research Team NCHRP	AASHTO TCs FHWA	DOTs
Product Feedback		N/A	N/A	NCHRP	DOTs, NCHRP

Technology Transfer—Example Implementation Strategy Evaluation

Strategy	Activities (Actions)	Potential User	Potential for Use for different implementation stage	Needed Recourses
Dealing with Technical Issues	Workshop for AASHTO committees	AASHTO to ballot the product for adoption	Could be used at initial and full implementation stages	• Requested funding • AASHTO member info • Recording the workshop
Demonstrations and Showcases	Pilot Study for 2 DOTs	Other DOTs	At initial and full implementation stages	Sponsoring DOTs, Travel, Training Material Development

FUNDING RESOURCES

There are at least 3 ways to fund implementation activities:

	Pros	Cons
Reserve certain amount from allocated project budget	• Panel discretion (i.e., at 1st panel meeting) • Guaranteed	• Limited funding
NCHRP 20-44	• Additional funding to allocated project budget • Submitted after evaluation of final product(s)	• NCHRP 20-44 panel discretion • Compete with other Projects (i.e., funding is limited) • Must conform to NCHRP Active Implementation Frameworks and Strategies
Continuation request submitted to SCOR	• No limit on requested funding	• SCOR discretion • Once a year (i.e., request in October, decision in March)

Implementation (Imp) Team Responsibility Matrix Grouped by Imp. Stage											
Actions	**Actors**										
	SPO	Imp. Coord.	Panel	Imp. Team	RT	RAC / SCOR	AASHTO	FHWA	DOT	TRB	20-44
Exploration Stage											
Problem Statement Development: considering barriers and impediments	◆	◆					◆	◆	◆	◆	
Problem Statement Review and Selection: considering barriers and impediments	◆	◆				◆ ▲	◆	◆	◆		

Accountable	▲	**Informed**	▲	**QA/QC**	■	**Submitter**	◆
Consulted	▲	**Oversight**	■	**Reviewer**	◆	**Supportive**	◆

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Actions	Actors										
	SPO	Imp. Coord.	Panel	Imp. Team	RT	RAC / SCOR	AASHTO	FHWA	DOT	TRB	20-44
Product development Stage											
1st Meeting (RFP) Stage: Discuss NCHRP Imp Plan	◆	▲									
2nd Meeting: Project Imp. Team Selection	▲	■									
Proposal Development: • A description of the "product" including essential functions that define the product • A realistic assessment of implementation drivers that will move the product implementation forward • A technology transfer plan that identifies effective implementation strategies to put the product in use.	◆	◆			▲						
Proposal Selection	◆		◆								

Accountable	▲	**Informed**	▲	**QA/QC**	■	**Submitter**	◆
Consulted	▲	**Oversight**	■	**Reviewer**	◆	**Supportive**	◆

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Actions	Actors										
	SPO	Imp. Coord.	Panel	Imp. Team	RT	RAC / SCOR	AASHTO	FHWA	DOT	TRB	20-44
Contract Pending: Outline the implementation plan	◆	■	◆	▲	◆		▲	▲		▲	
Project: Fully articulated plan as a task or work element to be including in IR #1 according to the developed outline by the implementation team	◆ ■	◆ ■	◆	◆ ■	▲						
End of Project: Evaluating Usability of Developed Product	◆	■	▲	▲	◆		▲	▲	▲		
End of Project: Planning technology transfer strategies	◆	■	▲	◆	▲		▲	▲	▲		
Other Activities (e.g., funding request for Imp.)	◆	■		◆							▲

Accountable	▲	**Informed**	▲	**QA/QC**	■	**Submitter**	◆
Consulted	▲	**Oversight**	■	**Reviewer**	◆	**Supportive**	◆

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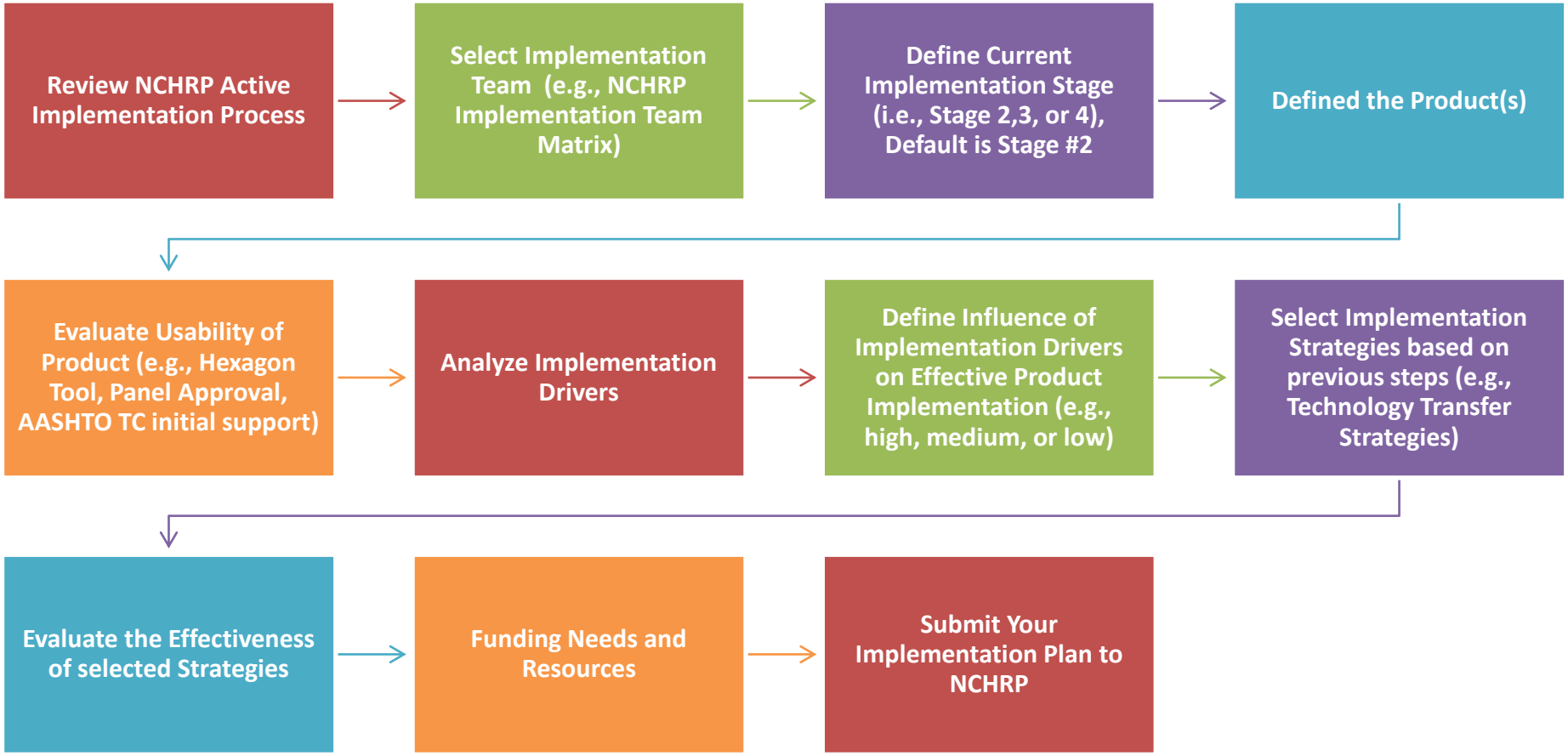
Actions	Actors										
	SPO	Imp. Coord.	Panel	Imp. Team	RT	RAC / SCOR	AASHTO	FHWA	DOT	TRB	20-44
Initial Implementation Stage											
Technology transfer strategies	◆	■	◆	▲			◆	◆	◆	◆	▲
Moving forward with product to adoption		■		■			▲	▲	▲	▲	▲
Providing support before and after product adoption		■		◆							▲▲

Accountable	▲	Informed	▲	QA/QC	■	Submitter	◆
Consulted	▲	Oversight	■	Reviewer	◆	Supportive	◆

Implementation (Imp) Team Responsibility Matrix Grouped by Imp. Stage											
Actions	Actors										
	SPO	Imp. Coord.	Panel	Imp. Team	RT	RAC / SCOR	AASHTO	FHWA	DOT	TRB	20-44
Full Implementation Stage											
The product is implemented as it was intended	◆	■				▲	◆	▲	▲		
Feedback on the implementation outcomes	◆	■				▲	◆	▲	▲	▲	

Accountable	▲	Informed	▲	QA/QC	■	Submitter	◆
Consulted	▲	Oversight	■	Reviewer	◆	Supportive	◆

NCHRP Active Implementation Processes



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NEED HELP?

Sid Mohan
NCHRP Implementation Program Manager
202-334-1249
smohan@nas.edu

Transportation Research Board
The National Academies of Sciences, Engineering, and Medicine