

APPENDIX D

Capability Maturity Model for Optimizing the Development of Resilience Business Cases and Communication Strategies

Capability Maturity Model (CMM) for Optimizing the Development of Resilience Business Cases and Communication Strategies

Introduction

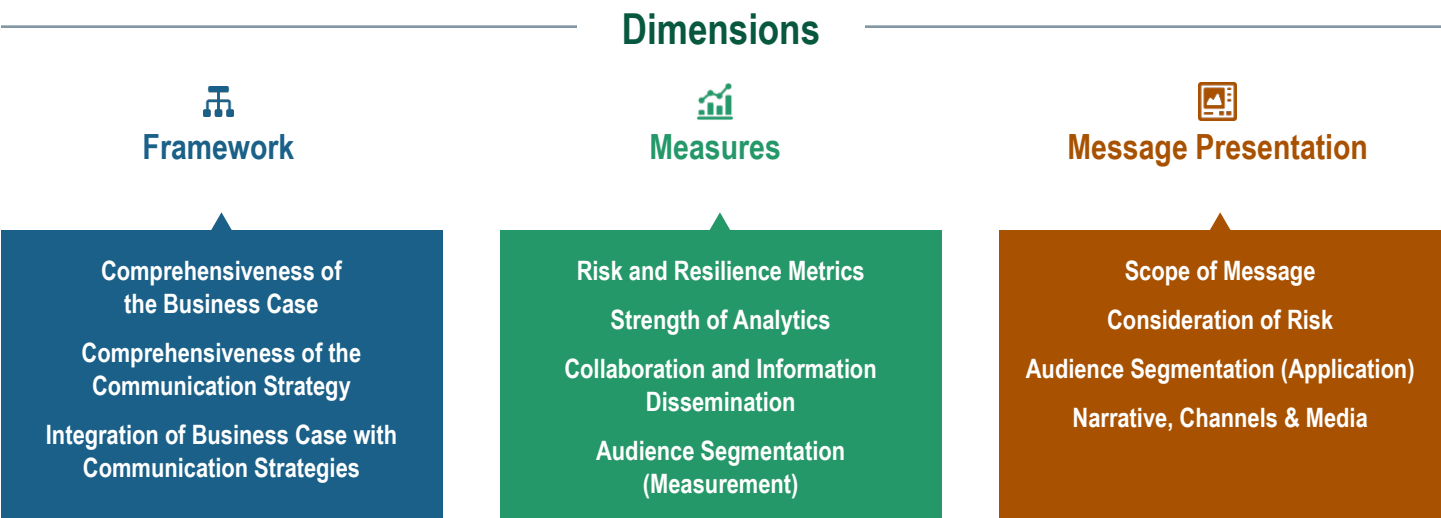
This draft Capability Maturity Model (CMM) will help state departments of transportation (DOT) and other transportation organizations assess their capability and need to (1) build a business case for resilience investments; and (2) communicate the results of that business case to diverse audiences.

The concept of a CMM was created for software development but has since been expanded to include any discipline where complex processes are codified and optimized over time. It is meant to provide a structured process to review and assess the agency’s capabilities, priorities, and improvements along different dimensions, with Level 1 processes indicating low capability and Level 4 processes indicating high capability. CMM Level 1 reflects ad hoc processes, meaning they have largely been created as needed to address a specific problem. CMM Level 4 reflects fully mature processes, meaning that they have been formally defined, use the organization’s available technical capacity, and are followed to deliver and communicate effective business cases for investing in resilience.

Through this CMM tool, transportation officials can assess their agency along three dimensions that are integral to establishing effective business case and communications processes. Those three dimensions and their subdimensions are shared visually on the next page and the remainder of this document goes into detail on what is included in each. The dimensions and subdimensions of the CMM assume that an agency has a foundation in the basics of resilience planning, such as learning the definition of resilience, the overarching goals of resilience planning, and how to analyze a transportation system through a resilience lens. Additionally, two appendices are included to assist agencies in understanding the elements of a communication plan (Appendix A) as well as an integrated business case and communication strategy for resilience investments (Appendix B).

The CMM provides a list of specific actions that agencies can take to advance to a higher level of capability maturity within each dimension. These are made available in the subsequent “Advancement Strategies” tables. These strategies are targeted to each level of the CMM, i.e., to Level 1 and up (Level 1+), Level 2 and up (Level 2+), and Level 3 and up (Level 3+). Furthermore, accompanying each of these strategies is one or more tools listed in the separate *Resilience Business Case and Communication Strategies Tools-in-a-Box* Excel spreadsheet. These tools provide resources to help DOTs and other transportation organizations develop agency improvements and identify concrete actions for developing robust business cases and integrated and effective communications strategies to advance resilience investments and processes. The tools listed in the *Tools-in-a-Box* have also been compiled in Appendix C.

The following sections provide a context of the CMM construct, including a self-assessment tool to evaluate an organization’s capability, and actions that need to be implemented to advance along the dimensions. Members of a transportation agency can use this document to improve resilience planning at their organization. For instance, transportation agency leadership can use this document to define a vision for resilience business cases and communication strategies while staff can use it to dive into specific Advancement Strategies to achieve that vision.



- **Framework**

Is there an established process or structure to guide the development of the business case and communication strategy?

Three Subdimensions

- Comprehensiveness of the Business Case.
- Comprehensiveness of the Communication Strategy.
- Integration of Business Case with Communication Strategies.

- **Measures**

Is there an established process for analyzing risk and resilience, using relevant metrics, and understanding relevant audience segments?

Four Subdimensions

- Risk and Resilience (R&R) Metrics.
- Strength of Analytics.
- Collaboration and Information Dissemination.
- Audience Segmentation (Measurement).

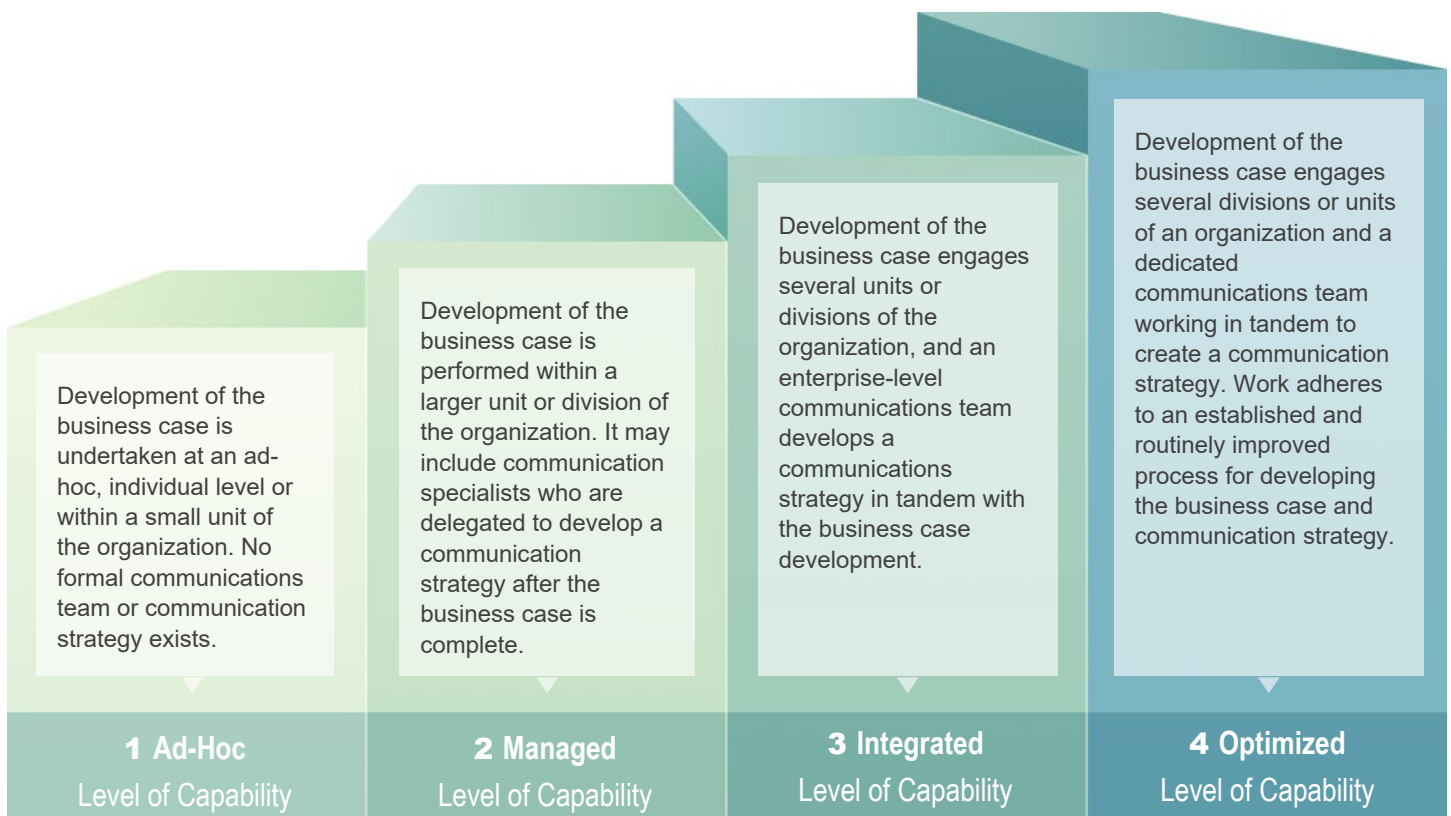
- **Message Presentation**

Is there an established process to uplevel analyses into key takeaways that are tailored to specific audience segments?

Four Subdimensions

- Scope of Message.
- Consideration of Risk.
- Audience Segmentation (Application).
- Narratives, Channels & Media.

Levels of the Capability Maturity Model



Framework

Is there an established process or structure to guide the development of the business case and communication strategy? Where is your organization in relation to the Elements of a Communication Plan (Figure 3-1) and the Conceptual Framework for a Business Case and Communication Plan (Figure 3-2)?

Comprehensiveness of the Business Case

LEVEL 1 – AD-HOC	LEVEL 2 – MANAGED	LEVEL 3 – INTEGRATED	LEVEL 4 – OPTIMIZED
No framework is in place and an ad-hoc approach is used to create a business case for justifying a resilience effort(s) and investment(s).	A framework is in place covering the basic elements of the Conceptual Framework, such as problem background, proposed solutions, costs, and high-level benefits.	A structured framework is in place covering most of the elements of the Conceptual Framework, including problem background, detailed solutions, costs and revenue sources, benefits, and value, expected challenges, implementation, and further recommendations.	A detailed and structured framework is in place covering all elements of the Conceptual Framework, and this framework is reviewed and optimized as needed. Framework includes defined elements for risk and resilience management, adaptation planning, and decision-making.
Structure is dictated by the end product (report or plan) and developed for a proposed improvement or resilience action.	Developing the business case is focused on arguing for a defined program or investment approach and proposing solutions.		

Comprehensiveness of the Communication Strategy

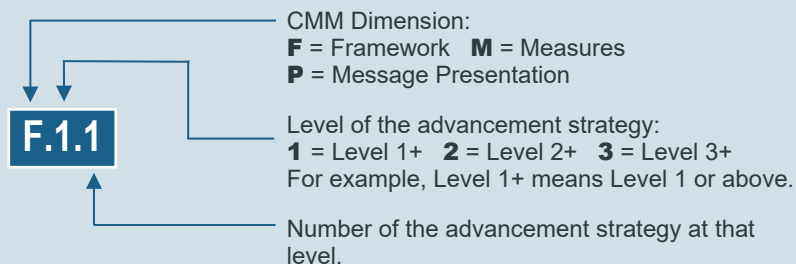
LEVEL 1 – AD-HOC	LEVEL 2 – MANAGED	LEVEL 3 – INTEGRATED	LEVEL 4 – OPTIMIZED
No formal communication strategy to guide the release, dissemination, or promotion of the business case.	Provides general communication guidelines that consider broad communication objectives for more than one audience groups.	The communication strategy shows an understanding of communication objectives, audience characteristics, and descriptions of various mediums and tools.	The communication strategy includes all elements of Level 3 with an understanding of how various mediums and tools interrelate to support the overall communication strategy.

Integration of Business Case with Communication Strategies

LEVEL 1 – AD-HOC	LEVEL 2 – MANAGED	LEVEL 3 – INTEGRATED	LEVEL 4 – OPTIMIZED
Business case is not integrated with communication strategies/plan.	Resilience business case is loosely integrated with communication strategies/plan, and the communication team is delegated to develop a communication strategy following the business case development to propagate its findings.	Business case and communication strategies are primarily developed independently before being brought together and integrated into the final product.	Business case and communication strategy teams are integrated during the development process and continually work collaboratively.

How to advance to higher levels of capability

Use the ID to connect each Advancement Strategy with an accompanying tool in the Tools-in-a-Box: Resilience Business Case and Communication Strategies.



Advancement Strategies: Framework

LEVEL 1+	LEVEL 2+	LEVEL 3+
<p>F.1.1 Identify and establish an agency group or staff to be responsible for developing a resilience business case and accompanying strategies.</p> <p>F.1.2 Identify potential formal and informal resilience business case frameworks available and used either by the transportation or other sectors.</p> <p>F.1.3 Incorporate a framework covering the basic elements needed for the Conceptual Framework, such as problem background, that aligns with the agency's resilience goals and actions.</p> <p>F.1.4 Develop a communication plan with general communication guidelines and goals for major external and internal audience groups.</p>	<p>F.2.1 Revise the existing framework to incorporate all elements of the Conceptual Framework.</p> <p>F.2.2 Identify internal and external audience needs in the communication strategy.</p> <p>F.2.3 Plan for materials and messaging customized to each audience's needs.</p> <p>F.2.4 Collaborate with creatives to develop digital and print materials.</p> <p>F.2.5 Initiate regular meetings with the communication team and include a member of that team in strategy conversations.</p> <p>F.2.6 Encourage and establish a process for business case and communication teams' collaboration and communication.</p>	<p>F.3.1 Revise established and integrated framework to assess if further improvements are appropriate.</p> <p>F.3.2 Continuously assess the state of practice and use of resilience business case and communication strategy frameworks by other transportation agencies and sectors to identify if better frameworks are available.</p> <p>F.3.3 Communication strategy team works collaboratively with the business case team to distill internal and external audiences into more specific subgroups, identifying the needs, values, goals, priorities, and the optimal channels to reach them.</p> <p>F.3.4 Consider each audience's unique needs in the solutions, cost and revenue sources, benefits, value, and challenges.</p> <p>F.3.5 Assess if the established collaboration and communication process between the business case and communications teams is effective or needs further improvements.</p> <p>F.3.6 Develop shared objectives and goals between business case and communication strategy teams.</p>

Measures

Is there an established process for analyzing risk and resilience, using relevant metrics, and understanding relevant audience segments? Is the agency able to efficiently and rigorously conduct analyses, such as a benefit/cost analyses (BCA) or vulnerability assessments and understand the different stakeholders who may interpret their results (i.e. benefit/cost ratio (BCR) or return on investment (ROI))?

Risk and Resilience (R&R) Metrics

LEVEL 1 – AD-HOC	LEVEL 2 – MANAGED	LEVEL 3 – INTEGRATED	LEVEL 4 – OPTIMIZED
<p>No R&R metrics have been identified or used or, if used, are qualitative (e.g., low, moderate, high).</p> <p>R&R metrics are sourced from national research and broad evidence base as supporting narratives.</p>	<p>Multiple qualitative or semiquantitative R&R metrics are used which draw on existing, common, or mandated measures.</p> <p>R&R analysis incorporates multiple data sources to augment readily available data beyond what is minimally required by state and federal regulation to be collected.</p>	<p>Several R&R metrics are used, including metrics that reflect key study goals. Metrics allow for economic analysis to identify the return on investment of resilience improvement alternatives.</p> <p>R&R analysis includes multiple sources and builds an analysis to achieve a clear goal.</p>	<p>A mix of qualitative and quantitative R&R metrics are used that provide a complete picture of benefits and trade-offs. Metrics allow for calculating the return on investment of alternatives. Uncertainty analysis is considered.</p> <p>Metrics can be used to track the progress and impact of the investment recommended by the business case.</p>

Strength of Analytics

LEVEL 1 – AD-HOC	LEVEL 2 – MANAGED	LEVEL 3 – INTEGRATED	LEVEL 4 – OPTIMIZED
<p>Economic analysis of resilience improvement strategies is not performed.</p> <p>Agency R&R analysis is limited to a vulnerability assessment of its transportation infrastructure based on high-level analyses using readily available data sources.</p>	<p>Analysis of economic benefits and costs are included.</p> <p>R&R analysis incorporate models and results conducted at the national level.</p>	<p>Analysis of economic benefits and cost is performed and considers certain elements such as life-cycle cost analysis and depreciation.</p> <p>R&R analysis involves jurisdiction-specific deterministic or probabilistic models but does not include uncertainty analysis.</p>	<p>Analysis of economic benefits and costs is performed, revised, and optimized and enhanced with updated data and models.</p> <p>R&R analysis is iterative, builds on results, includes uncertainty analysis, and incorporates many available data sources. It incorporates new and more advanced methodologies as needed.</p>

Collaboration and Information Dissemination

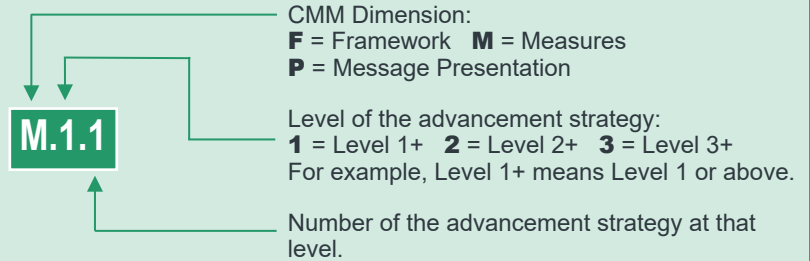
LEVEL 1 – AD-HOC	LEVEL 2 – MANAGED	LEVEL 3 – INTEGRATED	LEVEL 4 – OPTIMIZED
<p>R&R assessments include little or no collaboration with internal and external groups and information dissemination from those assessments do not consider their needs.</p>	<p>Collaboration with internal and external groups are being assessed and in process of enhancement. This includes consideration of how to disseminate information to those groups.</p>	<p>Collaboration with internal and external groups are established and include a large number of stakeholders and the public. Information dissemination considers the multiple audiences included in those groups.</p>	<p>Collaboration with internal and external groups are established, include a large number of stakeholders, and information dissemination are in constant optimization.</p>

Audience Segmentation (Measurement)

LEVEL 1 – AD-HOC	LEVEL 2 – MANAGED	LEVEL 3 – INTEGRATED	LEVEL 4 – OPTIMIZED
Communications do not define audiences.	Generalized audience understanding based on historical/existing knowledge.	Audience segmentation of stakeholder groups to develop a descriptive audience persona with a general connection to the results of the R&R analyses.	Audience segmentation of stakeholder groups to develop descriptive audience personas that connect results of R&R analyses with specific values, needs, priorities, and goals of each segment of the audience.

How to advance to higher levels of capability

Use the ID to connect each Advancement Strategy with an accompanying tool in the Tools-in-a-Box: Resilience Business Case and Communication Strategies.



Advancement Strategies: Measures

LEVEL 1+	LEVEL 2+	LEVEL 3+
<p>M.1.1 Conduct a state of practice review to identify R&R metrics and assessment models and tools used by transportation agencies.</p> <p>M.1.2 Conduct an assessment of required agency resources to conduct R&R assessments (e.g., data availability and needs, tools, staff capability, funding).</p> <p>M.1.3 Identify and select metrics that are easily implemented based on the agency's needs and capability.</p> <p>M.1.4 Select R&R models and tools to help the agency generate selected metrics (qualitative or quantitative).</p> <p>M.1.5 Use identified metrics to incorporate a BCA of resilience alternatives even if at a qualitative level.</p> <p>M.1.6 Assess and enhance existing collaboration and communication practices among internal agency groups for conducting R&R assessments.</p> <p>M.1.7 Assess and enhance existing collaboration and communication processes among external agencies, stakeholders, and the public for conducting R&R assessments.</p> <p>M.1.8 Perform general audience segmentation by developing a list of stakeholders with which to communicate.</p>	<p>M.2.1 Identify and select metrics that align with agency resilience vision and goals, and agency needs and capability (e.g., complexity and data availability) and can be used to conduct more detailed BCA.</p> <p>Identify and incorporate more detailed models to conduct R&R analysis (e.g., probabilistic analysis, climate change models).</p> <p>M.2.2</p> <p>M.2.3 Identify and incorporate detailed data sources to support more complex R&R analysis.</p> <p>M.2.4 Conduct quantitative economic analysis of proposed resilience mitigation alternatives for identifying the best BCR or ROI.</p> <p>M.2.5 Establish a formal collaboration and communication structure with internal and external groups to discuss resilience initiatives (e.g., Resilience Working Group/Task Force).</p> <p>M.2.6 Update audience segmentation results by developing descriptions of each stakeholder group, including major concerns and priorities that inform R&R metrics and analyses.</p>	<p>M.3.1 Identify and select R&R metrics that allow explanation of uncertainty and incorporation of detailed economic analysis of resilience mitigation alternatives (e.g., BCR or ROI).</p> <p>M.3.2 Conduct evaluation of existing R&R analysis methodologies, tools, and data for continuous optimization of processes (e.g., new models, better data sources).</p> <p>M.3.3 Evaluate current collaboration and communication processes and participants for continuous optimization (e.g., additional groups).</p> <p>M.3.4 Continuously update audience personas for each stakeholder group, reflecting their concerns, values, and priorities as new information arises.</p> <p>M.3.5 Interview stakeholders or consistently make notes of their concerns and continuously update the personas.</p> <p>M.3.6 Research stakeholder groups like the public, government officials, state officials, business owners, nonprofits, or academia to further strengthen audience personas.</p>

Message Presentation

Is there an established process to uplevel analyses into key takeaways that are tailored to specific audience segments? Are agencies able to effectively implement a communication plan (see Appendix A) in a way that optimizes the results of the resilience business case analyses?

Scope of Message

LEVEL 1 – AD-HOC	LEVEL 2 – MANAGED	LEVEL 3 – INTEGRATED	LEVEL 4 – OPTIMIZED
<p>The recommendation for investments is provided with the minimum detail required on potential value or weighing of costs.</p> <hr/> <p>The case does not include a campaign to push for the investment recommendation, and thus no supporting narratives are developed.</p>	<p>A specific investment recommendation is made with supporting data explaining the value it will realize.</p> <hr/> <p>Investment recommendation is accompanied by a short-duration campaign with a single supporting narrative.</p>	<p>Specific investment recommendations are made that are supported by a thorough data analysis.</p> <hr/> <p>Medium-duration campaign with multiple supporting narratives tailored to audience segments.</p>	<p>Specific investment recommendations are made that are supported by thorough data analysis and clearly explain trade-offs and uncertainties.</p> <hr/> <p>Strategic multiphased campaign with a multifaceted narrative that considers positive benefits to a variety of audiences.</p>

Consideration of Risk

LEVEL 1 – AD-HOC	LEVEL 2 – MANAGED	LEVEL 3 – INTEGRATED	LEVEL 4 – OPTIMIZED
<p>Emphasizes positive benefits or avoided losses and does not consider negative risks and uncertainties to value realization.</p>	<p>In addition to positive benefits or avoided losses include some consideration of negative risks and uncertainties to value realization.</p>	<p>The argument for positive benefits or avoided losses is nuanced and based on a thorough economic analysis of several different options. Negative risks and uncertainties are explored.</p>	<p>Argument weighs positive benefits or avoided losses against possible uncertainties and negative risks to the return on investment.</p>

Audience Segmentation (Application)

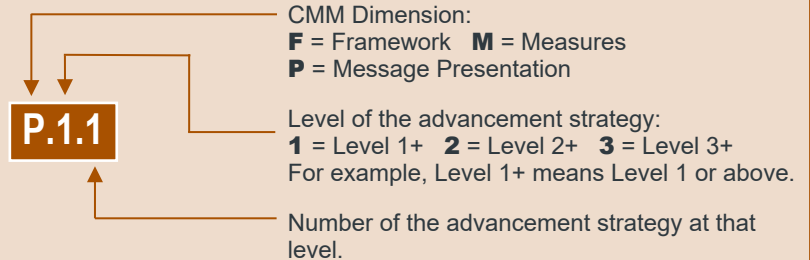
LEVEL 1 – AD-HOC	LEVEL 2 – MANAGED	LEVEL 3 – INTEGRATED	LEVEL 4 – OPTIMIZED
<p>Business case and communication recommendations are provided broadly without consideration for specific audience needs.</p>	<p>Messaging for recommendations is tailored for 1–2 audiences and considers few audience characteristics outside of immediate impacts.</p>	<p>Messaging for recommendations is tailored for 1–2 audiences with some consideration for audience characteristics beyond immediate impact, such as culture, values, or knowledge levels.</p>	<p>Messaging for recommendations is tailored for 3 or more audiences with thorough consideration for audience characteristics, including but not limited to; culture, values, or knowledge levels.</p>

Narrative, Channels & Media

LEVEL 1 – AD-HOC	LEVEL 2 – MANAGED	LEVEL 3 – INTEGRATED	LEVEL 4 – OPTIMIZED
<p>Technical and/or high-level information delivered in limited internal and external settings.</p> <hr/> <p>Complex or no narrative, imagery, and visualizations to assist in understanding and persuasion.</p>	<p>Communication platforms/tools are primarily meetings and presentations aimed at internal groups and limited external stakeholders with little attention to public-facing channels.</p> <hr/> <p>Inconsistent narrative elements supported by some imagery and visualizations to assist in understanding and persuasion.</p>	<p>Communication platforms/tools include content across internal and public-facing channels.</p> <hr/> <p>Cohesive and consistent narrative elements supported by user-friendly imagery and visualizations to assist in understanding and persuasion.</p>	<p>Communication platforms/tools are strategically selected and developed based on an understanding of the audience.</p> <hr/> <p>Cohesive, consistent, and strategically targeted narrative elements supported by customized imagery and visualizations to assist in understanding and persuasion.</p>

How to advance to higher levels of capability

Use the ID to connect each Advancement Strategy with an accompanying tool in the Tools-in-a-Box: Resilience Business Case and Communication Strategies.



Advancement Strategies: Message Presentation

LEVEL 1+	LEVEL 2+	LEVEL 3+
<p>P.1.1 Utilize R&R metrics and results from BCA to create a message justifying resilience investment.</p> <p>P.1.2 Develop a message explaining both positive and negative risks and possible tradeoffs.</p> <p>P.1.3 Identify the information needs of internal and external stakeholders.</p> <p>P.1.4 Develop key talking points for DOT leadership aimed at all audiences.</p> <p>P.1.5 Develop internal and external-facing communications materials.</p> <p>P.1.6 Use mass media channels, such as social media, to launch public materials.</p> <p>P.1.7 Share data visualizations highlighting key R&R metrics and results from BCA.</p>	<p>P.2.1 Utilize detailed R&R metrics, analysis outcomes, economic analysis of resilience alternatives as well as an explanation of the type and quality of data used in the analysis to provide a better picture of results.</p> <p>P.2.2 Highlight internal and external groups involved in the analysis and decision process to identify resilience alternatives.</p> <p>P.2.3 Incorporate narrative elements based on R&R analyses and audience segmentation results.</p> <p>P.2.4 Select appropriate print/digital mediums to reach each audience group.</p> <p>P.2.5 Create a short duration communications calendar covering internal and external communication utilizing at least one mass media channel.</p> <p>P.2.6 Develop professionally designed public-facing graphics and visualizations.</p>	<p>P.3.1 Include a discussion of the uncertainty of data and analysis results and how the uncertainty is included and considered in the recommendation process of resilience alternatives.</p> <p>P.3.2 Provide communication guidelines for internal stakeholders/promoters.</p> <p>P.3.3 Ensure messaging is cohesive and consistent with the communication strategy.</p> <p>P.3.4 Develop a long-term cross-platform communications calendar.</p> <p>P.3.5 Review communications calendar on a regular (e.g., quarterly) basis and revise the plan based on metrics.</p> <p>P.3.6 Work with design professionals to develop simple and strategic data visualizations that support the narrative.</p> <p>P.3.7 Implement metrics to measure the effectiveness of messaging efforts.</p>