U.S. Department of Transportation
Federal Railroad Administration

July 18, 2025

Subject: **FEDERAL RAILROAD ADMINISTRATION GUIDANCE ON DEVELOPMENT and IMPLEMENTATION of RAILROAD CAPITAL PROJECTS**

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I. INTRODUCTION

a. Purpose. This document provides guidance on the development and implementation of railroad capital projects that may be funded, in whole or in part, by the Federal Railroad Administration (FRA). The intended audience of this guidance includes Project Sponsors and partners, and the wide range of professionals who contribute to the planning, development, and implementation of railroad capital projects.

FRA's goal for this guidance is to assist Project Sponsors in developing effective and complete capital projects and in enhancing the management of capital projects to meet schedules and budgets. In developing this guidance, FRA is establishing a framework for project oversight that helps project sponsors prepare for funding opportunities and for successful grant funded projects. FRA has also sought to avoid highly detailed prescriptive processes that can create hurdles to project implementation and the diversity of railroad capital project types.

This guidance: (1) defines the stages in the railroad capital project lifecycle and project development process from inception to operation; (2) describes the project implementation tools, processes, and documentation that FRA may require when providing grants that fund the development or implementation of a railroad capital project; and (3) defines a "Major Project."

FRA strongly encourages Project Sponsors to use this guidance when developing railroad capital projects. The practices contained in this guidance draw from FRA's experience

administering grant programs and from the best practices of established programs under other Department of Transportation operating administrations that have enhanced the delivery of major highway and transit projects.

b. Applicability. This guidance document is not legally binding in its own right and will not be relied upon by the U.S. Department of Transportation as a separate basis for affirmative enforcement action or other administrative penalty. Conformity with this guidance document (as distinct from existing statutes and regulations) is voluntary only, and nonconformity will not affect rights and obligations under existing statutes and regulations. While conformity with this guidance is generally voluntary, FRA may require, in whole or in part, compliance with this guidance in an FRA grant agreement funding a railroad capital project. 2 CFR § 200.105(b)(2). When FRA requires compliance with this guidance in a grant agreement, the grant agreement will specify how FRA will review and act on the documentation identified in this guidance.

In addition, FRA may use this guidance to inform grant application reviews and decisions in accordance with a process described in the notice of funding opportunity (NOFO) for the relevant grant program. For some grant programs, the NOFO may require Project Sponsors to demonstrate readiness for a particular project stage in accordance with Section IV. of this guidance and the project implementation documentation defined in Section V., even if the Project Sponsor completed prior stages of the project with non-federal funding.

II. DEFINITIONS.

Definitions provided herein apply to this guidance and do not supersede definitions in Federal law or other guidance.

a. Major Project. — Major Project means:

   i. A capital project with a Capital Cost Estimate equal to or greater than $500 million and with at least $100 million in federal assistance to: improve railroad safety, efficiency, or reliability; improve capacity and mitigate passenger or freight rail congestion; enhance multi-modal connections; or improve or establish intercity passenger or freight rail transportation, or

   ii. A capital project that FRA determines to be a Major Project. FRA considers the complexity of a project and how additional procedures for project development and management will benefit the agency or the Project Sponsor.

b. Non-Major Project. – Non-Major Project means a capital project that is not a Major Project.

c. Project Sponsor. – Project Sponsor means the entity responsible for implementing a capital project that may also be an applicant seeking or a grantee receiving federal financial assistance.

d. Project Management Plan. – Project Management Plan means a document developed consistent with this guidance that is based on the information available at the relevant project lifecycle stage that describes how the capital project will be implemented, monitored, and controlled to help the Project Sponsor effectively, efficiently, and safely

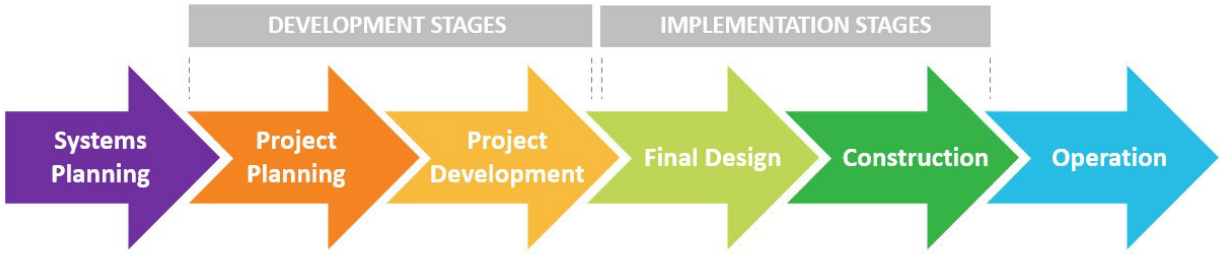
deliver the project on-time, within-budget, and at the highest appropriate quality. See Section V.(b) for additional information.

e. Schedule. – Schedule means a complete representation of the project's implementation in units of time, specifying a defined beginning and end for the capital project along with logical sequencing and duration information for activities needed to accomplish the project.

f. Capital Cost Estimate. – Capital Cost Estimate means an estimate of the cost to implement the capital project inclusive of the project development stage through completion of the construction stage that accounts for risk to the cost elements and the schedule to complete the project. See Section V.(d) for additional information.

g. Financial Plan. – Financial Plan means a comprehensive document that reflects the capital project's scope, schedule, cost estimate, and funding structure, based on the Capital Cost Estimate. The Financial Plan demonstrates that sufficient financial resources are available and describes how those resources will be managed through the completion of the project. For projects that involve financing, the Financial Plan identifies all project funds raised from debt proceeds or other financing methods and the anticipated revenue stream to repay the financing. See Section V.(e) for additional information.

III. PROJECT LIFECYCLE OVERVIEW.



FRA funding helps Project Sponsors plan, develop, and implement railroad capital projects following a typical project lifecycle. The project lifecycle described in this guidance has six stages, beginning with the identification of a railroad capital project during systems planning and continuing through development to implementation and then to project completion. Project implementation delivery approaches vary for different types of projects and circumstances. Project Sponsors may choose to use innovative contracting and delivery methods and to initiate procurement processes starting in the project development stage of the lifecycle. This guidance recognizes innovative delivery opportunities such as integrating Final Design and Construction stages and advancing some project elements ahead of others when necessary. Awareness of the project lifecycle stages can help Federal, state, regional, local, and private organizations and officials make informed decisions when managing railroad capital projects.

For FRA-funded activities, FRA may consider the readiness of a project for subsequent stages of the project lifecycle when evaluating a project for funding or when evaluating

grant agreement deliverables. As a condition of a grant agreement, FRA may require the Project Sponsor to obtain FRA concurrence that a project is ready to advance into project development, final design, or construction. Even if no FRA funds are used for a proposed project, FRA encourages Project Sponsors to follow the Project Lifecyle Model and to seek technical assistance from FRA, as appropriate, to ensure development of the appropriate studies and documents and enhance eligibility for future FRA funding.

IV. PROJECT LIFECYCLE STAGES.

a. Systems Planning. Systems planning is a high-level planning process that considers creating new transportation services as well as enhancing and maintaining existing transportation systems. This planning process promotes a safe, efficient, and comprehensive rail system within the multi-modal national transportation system. At its core, systems planning examines broad needs, challenges, and opportunities that can be addressed with a transportation-related solution, including capital projects.

A government agency (*e.g.,* a state department of transportation, authority, commission, or interstate-compact), railroad, or private entity may identify the need for a project through its systems planning processes. Systems planning involves analyzing empirical data to identify rail transportation needs and developing strategies and projects to meet these needs. Project Sponsors may, for example, accomplish systems planning through a railroad capital planning process, or through preparation of a regional rail study or State Rail Plan. Some projects may have multiple purposes and may also be identified through other highway or transit planning processes. The systems planning process should identify specific projects to address documented needs, challenges, and opportunities.

Comprehensive systems planning for a regional passenger rail network considers links with other transportation modes for safe, seamless, integrated transportation to carry travelers from origin to destination within and between megaregions. Comprehensive systems planning for freight movement considers how freight volumes and commodities move through the general rail system and are interconnected to other modes of transportation.

b. Project Planning. Project planning is the first development stage of a project when the Project Sponsor identifies capital project concepts to adequately address transportation needs and opportunities. The purpose of project planning is to identify and compare the costs, benefits, and impacts of project options as a means of providing private and government decision makers with information to reach transportation solutions. For railroad projects that may be utilized by multiple operators (*i.e.,* "shared infrastructure"), the Project Sponsor should consider and coordinate the needs of the various operators during project planning. FRA encourages Project Sponsors to identify potentially impacted environmental resources and engage with interested parties, agencies, and the public in order to link project planning to the subsequent environmental review process early-on.

i. Project Planning Objectives. A primary goal of project planning is to develop project concepts that establish the type and scope of capital improvements that best meet the goals and objectives identified in systems planning. Project planning elements may include railroad transportation market forecasting, operations analysis, fleet planning, station and facility planning, cost analysis, environmental resource consideration, resilience planning, and financial and economic analysis. Public disclosure of potentially impacted environmental resources and engagement of potentially affected communities, tribes and the public as part of project planning can allow for linking project planning to the subsequent environmental review in project development. In successful project planning, the Project Sponsor identifies one or more design concepts to advance during the project development stage. Key elements of project planning include:

   A. a description of the transportation needs and opportunities for the project;

   B. the goals and objectives, including environmental factors, that the Project Sponsor used to assess the performance of design concepts;

   C. conceptual engineering and other design that defines project concepts;

   D. consideration of avoidance, minimization, and mitigation of potential environmental effects on the natural and human environment resources; and

   E. an evaluation of how the design concepts meet the goals and objectives, considering capital and operating cost implications, and whether they have stakeholder support and a rationale for implementation.

ii. Completion of Project Planning. A project is ready to enter the subsequent Project Development stage when project planning has demonstrated a practical project proposal to address a clear project need, and when the

Project Sponsor has the support of participant stakeholders (*e.g.,* host railroads and funding partners). FRA will review and consider applicable documentation[1] of the following factors when assessing whether a project is ready for the project development stage and initiation of the environmental review process:

A. identification of the project in a systems planning process, such as a railroad capital planning process, an interstate or regional rail study (typically led by FRA), or through State Rail Plans consistent with 49 U.S.C. § 227.[2] Documentation should also demonstrate:

    (1) the transportation market(s) to be served; and

    (2) the role of the capital project in the rail system and overall transportation network;

B. a well-developed draft purpose and need statement;

C. documentation showing that the project alternatives developed based on the project's purpose, need, and appropriateness for the type of project were considered. This may include operations, financial, economic, , resilience, , and other analyses as appropriate. Analysis of project alternatives may consider, as applicable:

    (1) route options for new or modified rail lines and services;

    (2) service options for new or modified rail operations;

    (3) physical infrastructure investment options and design options; and

    (4) the methodology and criteria for eliminating preliminary project alternatives screened out from further consideration.

D. completion of conceptual engineering and other design that identifies one or more preliminary project alternatives that fulfill the draft purpose and need and transportation goals and objectives, and that at a minimum, consist of:

    (1) the specific operational objectives and functional requirements of the project and the ability of the proposed design to fulfill them;

    (2) the location of the project;

[1] Documentation from the systems and project planning stages varies among project types and may include capital plans, regional or state rail plans, project study reports, design reports, demand studies, screening reports, condition reports, technical reports, etc.

[2] 49 U.S.C. § 227 sets forth requirements for state rail plans and is supplemented by FRA's Final State Rail Plan Guidance, September 2013, found at: https://railroads.dot.gov/rail-network-development/planning/state-rail-plan-guidance.

(3) the physical feasibility and general constructability of the design, including consideration of potential construction phasing and continuity of operations during the construction period; and

(4) scale design drawings of the proposed project.

a) For new track infrastructure, scale design drawings should include, as appropriate: turnout sizes and type (*e.g.,* powered, hand thrown); proposed signal locations; distance between signals; limits of signalization; and the extent of curves and curve geometry, gradients, and proposed speeds. For new track on existing rail lines, drawings should show both the existing and proposed track configuration.

E. completion of an environmental resource inventory and potential environmental concerns analysis that addresses:

(1) natural and built environmental conditions;

(2) identification of social, cultural, natural, and physical resources and environmentally sensitive areas;

(3) potential environmental effects, including the identification of resources of concern on those resources to both the natural and human environment; and

(4) potential minimization or avoidance measures;

F. public, stakeholder, tribal, and agency involvement;

G. completion of an order-of-magnitude project cost estimate; and

H. for Major Projects, Project Sponsors should complete an initial Project Management Plan that addresses project delivery strategy including consideration of alternative delivery contracting methods.

c. Project Development. After project planning, the project development stage is when the Project Sponsor conducts design, environmental, and other studies to ensure the project is ready for implementation.

i. Project Development Objectives. In the project development stage, the Project Sponsor completes preliminary engineering and advances other design disciplines to inform detailed estimates of risks, costs, benefits, and impacts, and to support completion of the environmental process required under the National Environmental Policy Act (NEPA) and other laws, to advance permitting processes as appropriate, and to inform economic benefits assessments such as benefit cost analysis.[3] The Project Sponsor prepares or updates the Project Management Plan addressing the intended project delivery strategy, including consideration of alternative delivery contracting methods, and establishing the status of agreements and the availability of implementation funding. For Major Projects, the Project Sponsor develops the initial Financial Plan. During project development, the Project Sponsor may advance the level of design of certain project elements to meet critical path milestones or mitigate procurement risks.

ii. Completion of Project Development. FRA considers a project ready for the final design stage following a review of documentation from the project development stage that indicates completion of certain milestones.

A. Environmental Review – A NEPA decision has been issued along with necessary documentation confirming compliance with other environmental laws, such as Section 106 of the National Historic Preservation Act and Section 7 of the Endangered Species Act.

B. Design – Preliminary engineering and architectural or other design and functional definition of the selected project alternative is complete and sufficient to define operational performance, resilience outcomes, construction duration, material quantities, domestic material and product sourcing strategy, practical construction methods, utility and road relocations, property acquisition, and risks, including third-party risks, that influence schedule and cost. For projects with track reconfiguration, FRA seeks documentation showing concurrence on the engineering track configuration to ensure that the Project Sponsor, host

[3] For more information on benefit cost analysis see the U.S. Department of Transportation Benefit-Cost Analysis Guidance for Discretionary Grant Programs, March 2022.

railroad, railroads with operating rights, and FRA all agree with the operationally relevant elements of the design (*e.g.,* track and signals).

C. Project Management Plan – The Project Sponsor has completed a Project Management Plan that addresses project implementation consistent with this guidance including agreements governing the construction, operation, and maintenance of the project such as those with governing bodies and partnering agencies.

D. Schedule – The Project Sponsor has completed a project Schedule that has been used for preparation of the Capital Cost Estimate and is summarized in other documents.

E. Capital Cost Estimate – The Project Sponsor has completed a Capital Cost Estimate prepared using the completed preliminary design consistent with this guidance. For Major Projects, an independent risk review informs the cost estimate.

F. Financial Plan – The Project Sponsor has completed an Initial Financial Plan.

d. Final Design. During the final design stage of implementation, the project design is advanced to be ready for construction and the Project Sponsor begins to implement the project. FRA considers the project for implementation funding after the completion of project development.

i. Final Design Objectives. In the final design stage, the Project Sponsor secures agreements and funding commitments necessary to construct and operate the project, completes acquisition of right-of-way, and produces the final engineering plans and specifications necessary for construction of the project. The Project Sponsor updates the construction cost estimate and the Project Management Plan, and for Major Projects, the Project Sponsor also prepares Financial Plan updates. The Project Sponsor may undertake early construction or relocations and procure equipment and materials during the final design stage, when such work is permissible under applicable law. The final design and construction stages may also be combined to utilize design-build contracting and alternative project delivery methods.

ii. Completion of Final Design. FRA considers a project ready for construction when the sponsor demonstrates completion of the following milestone activities:

A. Design – The Project Sponsor has completed final design documentation that is consistent with the environmental decision document, the

engineering track configuration concurred upon during project development, and with the operational performance and other objectives of the project. Complete final design documentation is supported by executed project agreements between the Project Sponsor and entities who must agree to the construction (*e.g.,* government entities and railroads). Capital projects on railroads require fully negotiated and executed agreements with the owning railroad prior to construction.

The Project Sponsor obtains response from FRA appropriate to support phased construction and early construction (*e.g.,* pre-construction activities, utility relocations and early work) during the final design stage.

With design/build or alternative project delivery methods, the Project Sponsor completes applicable final design activities as part of an integrated design and construction process.

B. Project Management Plan – The Project Sponsor has updated the Project Management Plan. See Section V.(b)(ii) for additional information.

C. Schedule – The Project Sponsor has updated the Schedule within the prior year.

D. Capital Cost Estimate – The Project Sponsor has completed a Capital Cost Estimate update within the prior year.

E. Financial Plan – The Project Sponsor has completed annual Financial Plan updates. See Section V.(e)(iii) for additional information.

e. Construction. During the construction stage of implementation, the capital project is completely built, installed, and placed into use.

- Capital Construction
- Equipment Acquisition
- Utility Construction
- Financing Costs
- Construction Oversight
- Testing and Commissioning

i. Construction Objectives. The construction stage includes physical construction and installation of the capital project, including procurement and manufacturing of vehicles and equipment, project administration, testing of equipment (*e.g.,* signal equipment and rolling stock), systems integration testing, workforce training, system certification, procurement of insurance, provision of warrantees, pre-revenue service, and start-up testing. At this stage, the Project Sponsor updates management plans as needed and completes Financial Plan updates for Major Projects. With commissioning and start-up testing, the Project Sponsor verifies that the project meets the contractual specifications by performing system, performance, and integration testing, and validates performance to commission new systems.

ii. Completion of Construction. FRA considers project construction to be complete when commissioning is complete, start-up testing has validated performance of the project, appropriate certifications have been issued, and the Project Sponsor turns the project over for operational use.

f. Operation. The operation stage is included in the lifecycle to recognize that the final stage of a project is its ensuing use. Project Sponsors operate and maintain the assets created and improved by the capital project. FRA may seek reporting on the performance of projects, particularly Major Projects, to further evaluate the benefits of investments through sponsor reporting on performance measures and outcomes.

V. PROJECT MANAGEMENT

a. General. Project management is essential to the successful delivery of all railroad capital projects. This section describes four key management tools and processes that FRA may require when providing grant funding. Specifically, the Project Management Plan (PMP), the Schedule, the Capital Cost Estimate, and the Financial Plan for Major Projects are significant tools in FRA's oversight of project implementation. Project Sponsors develop, update, and use these tools as a condition of federal financial assistance.

b. Project Management Plan. The PMP is an overarching plan that begins with the project planning stage and concludes with the construction stage. It is a guide for actions by the Project Sponsor and its project delivery partners. A PMP is prepared for all capital projects and evolves through the project lifecycle. Sample PMP tables of contents can be found for both Non-Major and Major Projects in Appendix X.

i. Content. The PMP describes policies, practices, and procedures related to the management, design, and construction of a capital project. The Project Sponsor should tailor the PMP elements to set forth a specific action plan for implementing the project, and effectively managing the cost, schedule, quality, and associated risks. Any intended use of public-private partnerships or innovative project delivery and procurement strategies should be addressed as appropriate in the PMP. The Project Sponsor may choose to add additional sub-plans.

A. Basic PMP Content. All PMPs should include the following two elements:

(1) Basis of Project – Describe the purpose, goals, objectives, and performance metrics of the capital project. This element should include the project history and an overview of the capital project scope, including design, construction, environmental permitting, and right-of-way activities.

(2) Organizational Management – Describe the organizational structure and resources for implementing the capital project. Define the roles, reporting relationships, statements of

functional responsibilities, descriptions qualifications of key jobs, and responsibilities of the Project Sponsor and other project team members. This element should include a graphic chart representing the organization.

B. Non-Major Projects. The following three additional elements should be included in the PMP for Non-Major Projects.

(3) Management Controls – Describe the procedures needed to control scope, cost, schedule, risk, quality, contracts, change orders, grants, documentation, and records. Also describe the Project Sponsor's procedures for dispute resolution, internal plan implementation, and reporting and visual documentation requirements.

(4) Procurement – Describe how the Project Sponsor will acquire services, such as environmental studies, design, and construction, and address contracting methods, how domestic materials and products will be sourced, and how procurement decisions are made.

(5) Project Execution – Describe the planned approach for completing the funded project work, including a Schedule described in V.(c) below, and a detailed project budget, based on the Capital Cost Estimate. Describe the workforce, including the railroad labor force, necessary to implement the project. This element should identify the agreements governing the construction, operation, and maintenance of the project.

C. Major Projects. The following additional elements should be included in a Major Project PMP that will also address the content required by 49 U.S.C. § 22903(a):

(3) Management Controls – Describe the procedures needed to control scope, cost, schedule, risk, quality, contracts, change orders, grants, documentation, records, dispute resolution, internal plan implementation, reporting and visual documentation requirements and the following subsections.

a) project budget information covering the project management organization and appropriate consultants, as well as project costs for property acquisition, utility relocation, systems demonstration staff, audits, and miscellaneous payments the Project Sponsor may be prepared to justify,

b) project Schedule information with detail for construction consistent with V.(c) below, and

c) procedures to manage significant project risks. Project risks include significant threats and opportunities regarding

schedule, cost, and funding, including operating and maintenance costs and consequences once the project is complete and placed into operation. Risks may be from various project activities including environmental, design, right-of-way acquisition, relocations, construction, and operation and maintenance during construction. Risks may also include impacts of potential funding and revenue changes. Address management strategies, including contingency or reserve funding, for factors identified during the capital cost and schedule Estimate risk review, risks related to funding, revenue, and financing, and any additional risks identified by the Project Sponsor.

(4) Relations Management – Describe the plans for management of legislative, government, intergovernmental, community, and public communications, relations, and involvement. Describe the plans to manage labor, railroad, and third-party agreements. Describe the agreements governing the construction, operation, and maintenance of the project such as those with governing bodies and partnering agencies. Describe compliance procedures with relevant labor requirements.

(5) Project Planning and Concept Design – Address completion of project planning and conceptual design, including establishment of project objectives and performance measures.

(6) Environmental Compliance – Address completion of the environmental review. Describe the management plans for securing applicable permits, environmental compliance of project changes, environmental commitments, and mitigation.

(7) Design Management – Address design management plans including design standards, design criteria, site and geotechnical surveys, materials investigations, preliminary design, final design, safety and security considerations, quality assurance-quality control, and change control.

(8) Project Delivery – Describe the project delivery strategy, consideration of alternative contracting methods, management procedures for procurement, domestic sourcing, contract administration, change orders, and claims.

(9) Construction Management – Describe the construction management resources, approaches, policies, responsibilities, and procedures for:

a) safety, site logistics, inspection, materials testing, quality assurance and quality control functions, independent verification, and validation,

b) contractor organization, skills, and staffing levels, and workforce required to implement the project, and

c) system component construction, installation, and integration.

(10) Construction Close Out, Start-Up, Revenue Operation – Describe management plan for readiness testing and start-up of operations including criteria and procedures for testing operational systems and major components, training of operational staff, obtaining necessary certifications, and the administrative close out of the project delivery organization. Describe approach to obtaining warranties, test results, operations and maintenance manuals, spare parts, etc.

(11) Workforce Sub-Plan – Describe the plan for the workforce necessary to implement the project, including railroad labor forces if applicable.

(12) Real Estate Acquisition and Management Sub-Plan – Describe the plan for real estate acquisition and property management, if applicable.

(13) Rolling Stock Acquisition and Management Sub-Plan – Describe the plan to manage the acquisition of rolling stock, if applicable.

ii. Process. When receiving FRA financial assistance, Project Sponsors should prepare and periodically update the PMP as described below.

A. PMP Preparation. The Project Sponsor should prepare an initial PMP during project planning for Major Projects and should prepare a PMP for all capital projects during project development. When receiving FRA financial assistance for a Major Project, Project Sponsors must prepare and carry out a PMP in accordance with 49 U.S.C. § 22903(a).

B. Final Design and Construction Stage PMPs. The Project Sponsor updates the initial PMP during the project development stage with added detail about the final design and construction Stages. Project Sponsors receiving FRA financial assistance for final design should update the PMP prior to initiating final design and further update the PMP to describe management of the Construction Stage prior to initiating construction.

Once construction begins, the Project Sponsor should revise the PMP at the following key points in the project lifecycle:

C. Organizational Changes. When the Project Sponsor makes organizational structure changes to the project management team, including: the addition or removal of key consultant support; or significant changes in the size, key positions, or organization of the project management team.

D. Procedural Changes. When the Project Sponsor changes management procedures, including changes to implement project controls; addresses a specific contract requirement; addresses scope changes; or addresses substantial changes in project risks.

E. Major Project Updates. For Major Projects, when appropriate and consistent with updates to the Financial Plan.

c. Schedule. The Schedule is a management tool that describes the duration and interrelationship of all implementation activities of a project from beginning to completion. It is documented in the PMP and is an input to the Cost Estimate and Financial Plan. For Major Projects, the schedule is subject to the risk assessment and review described in Capital Cost Estimate sections V.d.iii. A. and B. The Schedule should address:

A. the activities needed to accomplish the project work along with duration of each activity,

B. logical sequence of the activities and major milestones,

C. relationships between the activities,

D. narrative description of schedule basis and assumptions in the schedule; along with a summary of schedule risk, and

E. project completion (month and year), which is usually the date when the Project Sponsor anticipates accepting all of the construction work.

d. Capital Cost Estimate. The Capital Cost Estimate includes all costs associated with developing and implementing the capital project. In developing a Capital Cost Estimate, Project Sponsors should consult, as appropriate, the FRA Capital Cost Estimating Guidance for Project Sponsors,[4] which discusses how to apply the U.S. Government Accountability Office best practices for capital cost estimating guidance[5] to railroad capital projects. A Project Sponsor should prepare a Capital Cost Estimate for both Non-Major Projects and Major Projects.

i. All Projects. A Capital Cost Estimate should include all costs and the value of any resources needed or incurred for the project development, final design, and construction stages of a capital project. This includes applicable costs for design, right-of-way activities, environmental mitigation, public outreach, construction, overall project management, appropriate contingency for unknowns, etc., as well as costs and resources paid to third parties for work related to the project such as utility relocations. At the conclusion of project development, a Capital Cost Estimate should be prepared by using the preliminary project design to estimate specific quantities for each work element. The Project Sponsor should consider when work is performed according to project schedule and account for anticipated cost escalation due

[4] https://railroads.dot.gov/rail-network-development/training-guidance/capital-cost-estimating-guidance
[5] U.S. Government Accountability Office, "GAO Cost Estimating and Assessment Guide -- Best Practices for Developing and Managing Capital Program Costs, GAO-09-3SP," Mar. 2009

to inflation. The Capital Cost Estimate should use a midpoint of construction or annual escalation to year-of-expenditure method to account for cost escalation. The estimate should include documentation of methodologies and sources used. Any financing costs to implement the project are not included in the Capital Cost Estimate and should be estimated separately.

ii. Non-Major Projects. In addition to the content for All Projects described in subsection (i) above, the Capital Cost Estimate for Non-Major Projects should address risks with clearly identified and appropriate contingencies.

iii. Major Projects. In addition to the content for All Projects described in subsection (i) above, the Capital Cost Estimate for Major Projects should incorporate a narrative describing and explaining the logic, methods, assumptions, and calculations used in the estimate, and should account for varying risks related to materials, labor, and project activities necessary for an independently conducted risk review. The Major Project risk review should use a disciplined and comprehensive method of assessing and reassessing project cost and schedule risk and uncertainty, and should incorporate costs associated with identified risks as contingency amounts.

A. Risk Assessment. The Major Project cost and schedule risk assessment is an unbiased, risk-based, probabilistic analysis that verifies the accuracy and reasonableness of the current Cost Estimate and Schedule and results in a probability range that represents the project's cost. It also documents how the estimate accounts for the range of potential costs associated with project uncertainties. FRA recommends combining two approaches to cost and schedule risk assessment to provide the best estimate of project's risk exposure.

Project Sponsors should create and maintain a risk register and should estimate and account for risk in the cost estimate. Project Sponsors may account for risk using: (1) a traditional Monte Carlo risk quantification considering uncertainty around individual component estimates with robust parameters (*e.g.,* large number of simulations, avoiding a simplistic 3-point estimation of risk exposure in a Monte Carlo model, etc.); and (2) a top-down cost-risk assessment using broad parameters derived from historic parametric sources. These two approaches should provide similar results at around the 65th percentile confidence level (P65) of the range of Monte Carlo results.

B. Risk Review. The risk review of the Project Sponsor's risk assessment should be conducted by a qualified party independent of the Project Sponsor. FRA may conduct the risk review when providing federal funding. In all cases, FRA and the Project Sponsor should participate during the entire risk review. The risk review may involve changing the risk assessment cost models and assumptions. If results of multiple approaches to estimating risk are significantly different then FRA

would seek to establish the cause and seek remedies to the cost estimate.

e. Financial Plan. The development of a sound financial plan for Major Projects is critical in securing adequate funding and financing for a project. After cost estimates are defined during the project development phase, the preparation of an initial Financial Plan should document the availability of sufficient financial resources to implement the project as planned. When FRA provides funding for a Major Project, the Project Sponsor should prepare an Initial Financial Plan prior to initiating the final design stage. The Project Sponsor should also periodically update the Financial Plan as described below.

   i. Project Phasing. – In the event that the Project Sponsor determines that there are insufficient financial resources immediately available to complete the entire project, the Financial Plan may identify fundable incremental improvements or phases. For initial Financial Plans or Financial Plan updates that include phasing of the project, the cost of the overall project—not the cost of any single fundable incremental improvement or phase—is used to determine whether the project meets the cost threshold to be considered a Major Project. The Project Sponsor should prepare the initial Financial Plan and Financial Plan updates for the overall project and should detail any defined fundable increment or phase as appropriate.

   ii. Contents.

      A. Basic Sections. The initial and Financial Plan updates should include:

         (1) Project Description – This section presents the scope of the project, including a map of the project location.

         (2) Schedule – This section presents the schedule summary, including major milestones, for completing the project.

         (3) Project Cost – This section presents the current Capital Cost Estimate and the remaining cost-to-complete in year-of-expenditure dollars. This includes all costs and the value of all resources necessary to perform engineering, environmental permitting, right-of-way acquisition, environmental mitigation, construction, project management, public outreach, and external third-party work (such as utility and transportation infrastructure relocations).

            a) To complete an initial Financial Plan, at least one cost estimate risk review should have been conducted for the entire project. The estimated cost presented in the initial Financial Plan should reflect the results of the cost estimate risk review and the 65th percentile costs.

            b) Each Financial Plan update should show the cost estimate for the initial Financial Plan and each Financial Plan update.

(4) Funding – This section describes all project funding sources and amounts expected to be necessary to complete the project including contingency funds. It should also include an evaluation of the likelihood of the anticipated amounts becoming committed and reasonably available, including federal funding. This section documents the sources, amounts, and stability of each tranche of funds, including source documentation, to verify any funding sources that are already committed to the project.[6] This section should explain if the availability of these funds is limited to certain parts or phases of the project.

   a) This section should include a narrative that identifies all project funds raised from debt proceeds or other financing methods according to their financing source. The narrative should demonstrate the Project Sponsor's ability to borrow the needed funds, focusing on the adequacy of the revenue source(s) pledged for repayment. The narrative should also describe the revenue forecasts, including sources of information, methodology, assumptions, and any independent validation or sensitivity analysis.

   b) This section should address the potential for unanticipated changes in expected revenue and the impact on the project. Such changes might include delays or shortfalls in the receipt of project funding, changes in governmental rules impacting the project, etc.

   c) If the project is to be phased, funding documentation should only be provided for the funded phase covered by the Financial Plan.

(5) Financing – This section describes the cost of project financing, which should be estimated separately from the Capital Cost Estimate described above. Such costs include issuance costs, interest costs, and other costs of borrowing funds for the project.

(6) Cash Flow – This section demonstrates that sufficient cash will be available to fund obligations and expenditures based on the project schedule.

   a) This section should include an annual schedule of cash revenues and expenditures. This will demonstrate the ability to meet the payout schedules for contractors and in-house

[6] Documentation examples include an official board resolution or an adopted budget committing the funds to the project, or evidence that the project and funding amounts are included in the sponsor's adopted multi-year capital program.

costs. The cash flow analysis should show all expenditures through project completion.

b) Financial Plan updates should include the original projected cash flow updated for actual expenditures and revised estimates for future years. The narrative should explain significant deviations from the initial Financial Plan. Previously expended funds should be included so that the entire estimated cost is included in the cash flow analysis.

B. Update Sections. Financial Plan updates include the following additional sections:

(7) Summary of Cost Changes Since the Prior Year's Financial Plan – This section provides a listing of changes, including any project scope changes, that have reduced or increased the cost of the project and/or funded phase since the prior year's Financial Plan. The discussion should clearly identify the primary reason(s) for the change and should also include actions taken to monitor and control cost growth (such actions may include conducting an additional risk review).

(8) Cost and Funding Trends Since Initial Financial Plan – This section should identify the trends that have impacted project costs and funding since the Initial Financial Plan. This section should include the probable reasons for these trends and assess the implications for the remainder of project implementation.

(9) Summary of Schedule Changes Since Last Year's Financial Plan – This section should provide a listing of those changes, including project scope changes, that have caused the completion date for the project and/or funded phase to change since the last Financial Plan update. The section should clearly identify the primary reason(s) for the change and should include actions taken to monitor and control schedule growth.

(10) Schedule Trends Since Initial Financial Plan – This section should identify the trends that have impacted the project schedule since the Initial Financial Plan. This section should include the probable reasons for these trends and assess the implications for the remainder of the project.

iii. Updates. Financial Plan updates supplement the initial Financial Plan and serve as an important planning tool. In a Financial Plan update, the Project Sponsor should provide information on actual costs, expenditures, and revenue performance in comparison to the initial estimates, and track funding shortfalls. This will allow Project Sponsors to make the necessary financial adjustments to assure the completion of the project. The Project Sponsor should also describe the current project status and provide a comparison of

baseline information to actual performance and provide updated forecasts of future project performance in a Financial Plan update. The Project Sponsor should track the progress of the project over time using the Schedule by highlighting significant deviations from the initial Financial Plan and subsequent Financial Plan updates and explaining the mitigating actions or response strategies taken to address the deviations. With each update, the Project Sponsor should provide a comprehensive view of the project's background and status without requiring the reader to refer to previous submissions.

A. Update Cycle – A Project Sponsor should update the Financial Plan annually throughout the final design and construction stages. The Project Sponsor should include any changes to the nine initial Financial Plan sections in the update. The cost-to-complete estimate should be adjusted to reflect expended costs. The funding and cash flow sections should be revised to identify the funding sources used for actual expenditures and those proposed to fund the remaining cost-to-complete. Changes since the previously approved Financial Plan update should be clearly presented, and the major causes of such changes should be clearly described.

Appendix X – Sample Project Management Plan Tables of Contents

Sample Non-Major Project PMP Table of Contents	
1.0	**Basis of the Project** (Purpose, Goals, Objectives, Scope, Performance Metrics, History)
2.0	**Organizational Management** (Project Leadership, Team Organization, Capacity and Capability)
3.0	**Management Controls** (Control Procedures, Dispute Resolution, PMP Implementation, Reporting)
4.0	**Procurement** (Procurement, Domestic Sourcing, Contracting Methods)
5.0	**Project Execution** (Schedule, Budget, Cost, Agreements, Workforce)

Sample Major Project PMP Table of Contents	
1.0	**Basis of the Project** (Purpose, Goals, Objectives, Scope, Performance Metrics, History)
2.0	**Organizational Management** (Project Leadership, Team Organization, Capacity and Capability, Workforce)
3.0	**Management Controls** (Scope, Budget, Schedule, Risk, Reporting, Documentation)
4.0	**Relations Management** (Government, Community, Labor Relations, Railroad Agreements, Third Party Agreements, Agreements for Construction, Operation, and Maintenance)
5.0	**Project Planning and Concept Design** (Project Planning, Conceptual Design, Objectives, Performance Measures)
6.0	**Environment** (Environmental Review, Permitting, Project Changes, Commitments, Mitigation)
7.0	**Design Management** (Standards, Criteria, Surveys, Preliminary Design, Final Design, Safety & Security, QA-QC, Change Control)
8.0	**Project Delivery** (Procurement, Domestic Sourcing, Contract Administration, Change Orders, Claims)
9.0	**Workforce**
10.0	**Construction Close Out, Start-Up, Revenue Operation** (Readiness, Start-up, Training, Certifications, Closeout)
11.0	**Workforce Sub-Plan**
12.0	**Real Estate Acquisition and Management Sub-Plan** (If Applicable)
13.0	**Rolling Stock Acquisition and Management Sub-Plan** (If Applicable)