FRA FY14 Grant Application Solicitation

PASSENGER RAIL CORRIDOR INVESTMENT PLAN OVERVIEW

1. SERVICE DEVELOPMENT PLANNING

The process of completing a Passenger Rail Corridor Investment Plan (PRCIP) consists of the preparation of (1) a NEPA environmental review in which the purpose and need of the improvements are defined and alternatives are analyzed and compared based on their environmental, socioeconomic, and transportation impacts and (2) a Service Development Plan (SDP), a detailed plan that defines the service improvements, transportation network, operational and financial aspects for the passenger rail service alternative selected through the NEPA process. FRA established the PRCIP as a key development threshold for implementation funding under the Passenger Rail Investment and Improvement Act of 2008 (PRIIA). The PRCIP is a foundation for future project development, including engineering design, project environmental reviews, environmental permitting and construction.

Service development planning is the technical analysis of new or improved intercity passenger rail service alternatives that are consistent with and address the NEPA Purpose and Need Statement, and will progressively narrow to a smaller set of reasonable alternatives that can best meet those needs. Each stage of development is tied to the program's NEPA Purpose and Need, and each development step reflects the available level of detail on alternatives from the supporting technical analysis. Service development planning involves the use of a number of technical tools to assess engineering feasibility, ridership, operational impacts, capital and operating costs, and public benefits. The level of technical scrutiny, and the tools with which to develop applicable data, increases as the NEPA process advances to identification of a preferred investment program and after selection through the NEPA process.

The SDP is prepared at the end of the planning phase for intercity passenger rail Service Development Programs. The SDP lays out the overall scope and approach for the proposed service alternative selected through the programmatic NEPA process. Among the primary objectives of the SDP are:

- Clearly demonstrate the Rationale for the proposed new or improved intercity passenger rail service;
- Summarize analysis for the proposed new or improved intercity passenger rail service and describe the alternative that would best address the Rationale and NEPA Purpose and Need as identified through the NEPA process;
- Demonstrate the operational and financial feasibility of the proposed new or improved intercity passenger rail service; and
- As applicable, describe how the implementation of the proposed intercity passenger rail Service Development Program may be divided into discrete phases.

A model outline for the SDP is included below in section 3, which describes the specific elements and content that would optimally be included in an SDP. While nearly all of the topics addressed in the major sections of this outline are necessarily interrelated, and should be addressed through an iterative analytical process, this outline's organization highlights the major disciplines and analytical capabilities that should be brought together in the development of an SDP.

2. ENVIRONMENTAL DOCUMENTATION

The environmental review process required by the National Environmental Policy Act (NEPA) applies to all Federal grant programs. NEPA requires Federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. NEPA also mandates that all reasonable alternatives be considered, and to that end, an alternatives analysis is typically conducted during the environmental review process. Agencies must also make information on these impacts and alternatives publicly available before decisions are made and actions occur.

2.1 Corridor-Wide Environmental Documentation ("Service NEPA")

As part of the planning phase for an intercity passenger rail Service Development Program, applicants must complete an environmental review, which addresses the full extent of the overall intercity passenger rail Service Development Program and its related actions. Within the context of FRA's programs, this evaluation is referred to as "Service NEPA."

Service NEPA involves at least a programmatic/Tier-1 environmental review (using tiered reviews and documents), or a project environmental review, that addresses broad questions and likely environmental effects in the entire corridor relating to the type of service(s) being proposed, including alternative cities and stations served, geographical route alternatives, service levels and frequencies, choice of operating technologies (e.g., diesel vs. electric operation and maximum operating speeds), ridership projections, major infrastructure components, and identification of major terminal areas or facility capacity constraints.

Service NEPA is intended to support a Federal decision concerning whether or not to implement an intercity passenger rail Service Development Program. For complex and long-term Service Development Programs, FRA generally prefers to use a tiered NEPA process and a Tier-1 environmental impact statement (EIS) to satisfy Service NEPA. Completion of Service NEPA precedes the Preliminary Engineering (PE) that is required to support a more detailed "project NEPA" document. Furthermore, completion of a tiered Service NEPA EIS allows for the significant narrowing of the alternatives to be considered in preparing subsequent project NEPA documents, allowing for reduced Preliminary Engineering costs.

While FRA anticipates that most intercity passenger rail Service Development Programs will follow a tiered approach towards NEPA document development (including preparation of a Service NEPA EIS during the planning phase), FRA will consider a non-tiered Service NEPA approach where appropriate and conducive to the efficient progression of the new or improved intercity passenger rail service and the consideration of environmental impacts. FRA will consider combining the planning and PE/NEPA phases of project development for Service Development Programs in certain circumstances where one or more of the following factors apply:

- There are few or no route selection decisions required for the proposed service;
- The projects necessary to implement the proposal are likely to be modest in scale;
- The Preliminary Engineering effort for the Service Development Program is likely to be modest in scale, cost, and duration; and
- The project sponsor will be providing all necessary funding, from non-FRA program sources, to complete Preliminary Engineering and site-specific environmental analysis.

For Service Development Programs for which FRA has decided not to tier, NEPA will be satisfied through a unified project-level document developed during the PE/NEPA phase.

2.2 Project Environmental Documentation ("Project NEPA")

As part of the PE/NEPA phase of project development, a project NEPA document and other environmental documentation required to satisfy other Federal laws are prepared for the specific design alternative identified through Preliminary Engineering and other reasonable alternatives (integrated with the design alternatives analysis performed as part of Preliminary Engineering). Additionally, the design and engineering outputs of Preliminary Engineering will serve as inputs into the evaluation of environmental impacts just as identified impacts are inputs for design and engineering. Therefore, it is essential that Preliminary Engineering and project NEPA be closely coordinated and performed in tandem with one another.

2.3 NEPA Roles and Responsibilities

FRA, as the Federal sponsoring agency, has primary responsibility for assuring compliance with NEPA and related environmental laws for projects funded under FRA's financial assistance programs. While NEPA compliance is a Federal agency responsibility and the ultimate decisions remain with the Federal sponsoring agency, FRA encourages applicants to take a leading role in preparing environmental documentation, consistent with existing law and regulations.

FRA recognizes that no single approach to NEPA compliance will work for every proposal. Therefore, FRA will work closely with applicants to assist in the timely and effective completion of the NEPA process in the manner most pertinent to the applicant's proposal.

2.4 FRA NEPA Compliance

All NEPA documents must be supported by environmental analyses required by the National Environmental Policy Act (42 U.S.C. 4332) (NEPA) and related laws and regulations such as the National Historic Preservation Act (16 U.S.C. 470(f)) (NHPA), Clean Water Act, and the Endangered Species Act. NEPA analyses must be conducted in accordance with the Council on Environmental Quality's regulations implementing NEPA (40 CFR part 1500 et seq.) and FRA's ''Procedures for Considering Environmental Impacts'' (45 FR 40854, June 16, 1980, as revised May 26, 1999, 64 FR 28545).

3. SERVICE DEVELOPMENT PLAN OUTLINE

The following sections provide an outline for structuring a SDP and describe the elements and content that would optimally be included in an SDP.

3.1 Rationale, Goals, and Objectives

The fundamental starting point of any transportation planning effort, including SDPs developed for intercity passenger rail Service Development Programs, is the identification of the Rationale for an improvement to the transportation system service in a given geographic market. The Rationale supports the development of the NEPA Purpose and Need Statement. In outlining a transportation problem in need of a solution, the Rationale should consider current and forecasted travel demand and capacity conditions and provide, at a minimum, a description of the transportation challenges and opportunities faced in the markets to be served by the proposed service, the goals the proposed service are intended to address, and the objectives for the service.

The Rationale demonstrates how the proposed new or improved intercity passenger rail service would cost-effectively address transportation and other needs. Development of the program Rationale considers multimodal system alternatives (highway, air, other, as applicable), including a qualitative and quantitative assessment of the costs, benefits, impacts, and risks of the alternatives. The program Rationale also explores synergies between the proposed service and large-scale goals and development plans within its service region and communities.

3.2 Identification of Alternatives

This section describes the alternative transportation improvements, including intercity passenger rail improvements and improvements to other modes, which have been considered within the SDP as means of addressing the underlying Rationale.

3.3 Planning Methodology

The SDP should clearly describe the basic elements of the methodology used in developing the plan. This may address a wide array of topics, but at a minimum, it should address:

a. The planning horizon utilized;
b. Any major, cross-cutting assumptions employed throughout the SDP; and

c. The level of public involvement in developing the plan.

3.4 Demand and Revenue Forecasts

The SDP should address the methods, assumptions, and outputs for travel demand forecasts, and the expected revenue from the service. It should provide information on the following topics and outputs:

a. **Demand Forecasts**
   - Methodology – Document the modeling methodology and approach used to forecast passenger rail demand from total travel demand (e.g., a four-step model), intercity passenger rail service alternatives and sensitivity factors considered, and the method for reflecting passenger capacity constraints (such as equipment, station, and station access capacity) within the intercity passenger rail service and other modes.
   - Study Area Definition – Describe the extent of the study area, road network, rail stations, airports, and intercity bus terminals considered.
   - Data sources – Provide the assumptions and data used to quantify the existing travel market and forecast year travel market.
   - Travel Model –
     i. Show the demand model structure including example equations and elasticities.
     ii. Describe the base and future year model, including specific travel network and service characteristics. This should include pricing assumptions (including the rationale and basis for including or excluding both revenue-maximizing and public benefit-maximizing pricing models) and travel time-related assumptions (including frequency, reliability, and schedule data for the service). Also include the manner in which exogenous growth (e.g., related to general economic, employment, or population growth) has been accounted for in the model.
     iii. Include the mode choice model structure such as logit nested diagrams.
     iv. Explain the model calibration and validation.
   - Model Forecasts – Present and explain the detailed base and forecast year ridership outputs (including trip-table outputs), along with the ramp-up methodology employed for determining ridership during the intermediate years between start of service and the model forecast year.

b. **Revenue Forecasts**
   - Ticket Revenue Forecasts – Explain base and forecast year ticket revenue forecasts.
   - Auxiliary Revenue Forecasts – If applicable, provide base and forecast year auxiliary revenue, including but not limited to, food and beverage revenue, mail and express revenue.

3.5 Operations Modeling

This section describes the underlying operational analyses, including railroad operation simulations and equipment and crew scheduling analyses, which in turn reflect such variables as

travel demand and rolling stock configuration. The modeling should include all rail activity in the corridor including freight and commuter rail.

If the new or improved intercity passenger rail service contemplated under the SDP makes use of facilities that would be shared with rail freight, commuter rail, or other intercity passenger rail services, the existing and future characteristics of those services—as developed cooperatively with the rail freight, commuter, and intercity passenger rail operators—should be included as an integral element to the SDP. In particular, the SDP should show how the proposed intercity passenger rail Service Development Program will protect the quality of those other services through a planning horizon year.

In general, operations modeling performed in accordance with FRA's publication "Railroad Corridor Transportation Plans: A Guidance Manual" would support an SDP (the guidance manual can be located at http://www.fra.dot.gov/eLib/Details/L04161). The section on operations modeling should provide information on the following topics and outputs:

a. **Modeling Methodologies**
   - Describe in detail the Service Network Analysis models and methodologies used, including the method through which potential infrastructure improvements were identified and incorporated into the modeling effort.
   - Specifically describe how stochastic operations variation, in terms of operational reliability of scheduled rail service, operational variability of non-scheduled rail service, and equipment and infrastructure reliability, has been incorporated into the modeling effort.

b. **Operating Timetables**
   - Provide base case and alternative-specific schedules for existing and new intercity passenger rail service and commuter rail service, and operating windows or schedules, if applicable, for rail freight and other activities (e.g., maintenance of way). Include both revenue operations and all scheduled or likely non-revenue (deadhead) movements.

c. **Equipment Consists**
   - Describe the equipment consists for all services included in the operations modeling, including motive-power (locomotive or multiple-unit) characteristics (e.g., weight, horsepower, tractive effort, etc.), non-powered equipment characteristics (e.g., consist lengths in units and distance, trailing tonnage, etc.), and any use of distributed power, electronically controlled pneumatic (ECP) braking systems, or other practices affecting train performance.
   - Provide baseline acceleration rates and braking curves for all trains included in the operations modeling, consistent with the consist characteristics described.

d. **Rail Infrastructure Characteristics**

- Describe the origin on the rail infrastructure network employed in the operations modeling, including whether or not it was provided by the infrastructure owner or independently developed.
- Describe any major infrastructure-related assumptions employed in the operations modeling, including signal system and train control characteristics, maximum unbalance, and turnout speeds.

e. **Outputs**
- Provide detailed outputs from the operations modeling of all base case and alternative scenarios, including stringline (time and distance) diagrams, delay matrices, and train-performance calculator speed and distance graphs.

f. **Equipment and Train Crew Scheduling**
- Provide outputs of intercity passenger rail service equipment and train crew schedule modeling, demonstrating how equipment and train crews will turn at endpoints, and the total equipment and train crew resources required to meet each modeled intercity passenger rail service operating timetable.

g. **Terminal, Yard, and Support Operations**
- Provide outputs of detailed modeling of operations at major terminals, demonstrating the adequacy of identified platform tracks, pocket tracks, yard capacity, and maintenance of equipment facilities to meet the requirements of each modeled intercity passenger rail service operating timetable.

3.6 Station and Access Analysis

This section of the SDP addresses the location of the stations to be served by the proposed new or improved intercity passenger rail service, how these stations will accommodate the proposed intercity passenger rail service, how passengers will access those stations, and how these stations will be integrated with connections to other modes of transportation and development plans for the station area. The topics addressed under this section will depend greatly on whether the SDP is intended to support the introduction of a new intercity passenger rail service on a new route, or whether it relates to the improvement of an existing intercity passenger rail service – generally, the latter, in serving existing stations, will not require detailed planning of station locations. This section of the SDP should provide information on the following topics and outputs:

a. **Station Location Analysis**
- An analysis of potential alternatives for station locations, with the identification of preferred locations.
- A description of the methodology employed in selecting station locations, including consideration of zoning, land use, land ownership, station access, demographics, and livable community factors (such the relative consideration of center-city and “beltway” type stations).

- A description of any planned joint use or development of each station facility by other passenger rail operators, other transportation operators (e.g., transit, intercity bus, and air transport), or commercial or residential real estate developments.

b. **Station Operations**
- An analysis to determine the adequacy of Station capacity to meet the needs of the intercity passenger rail service, including platform length, platform and concourse pedestrian capacity, ticketing capacity, compliance with Americans with Disabilities Act (ADA) requirements, and compatibility between station facilities and intercity passenger rail service equipment (e.g., platform and equipment floor heights).

c. **Intermodal Connectivity**
- A detailed description of all non-intercity passenger rail service passenger transportation operations and services to be integrated into each station.
- A description of the degree on integration of intermodal connections with each station facility (e.g., complete collocation, short distance proximity, distant proximity, etc.), including estimates of door-to-door passenger transfer times (excluding waiting, ticketing, and/or check-in time) from one mode to another (e.g., the time it would take to go from the intercity passenger rail service platform to a subway station entrance, or an airline check-in counter).
- A description of additional intermodal integration measures to be employed, such as integrated ticketing, schedule coordination, travel information integration, etc.

d. **Station Access**
- An analysis of how passengers will access each station and how these access options will provide sufficient capacity to satisfy forecasted ridership to and from the station, including public transportation, road network capacity, vehicle pick-up/drop-off, and parking.

3.7 Conceptual Engineering and Capital Programming

The SDP describes the rail equipment and infrastructure improvements (and other investments) required for each discrete phase of service implementation. If applicable, the SDP should prioritize improvements for each phase. The SDP presents estimated capital costs for projects and project groups, with documentation of assumptions and methods.

a. **Project Identification**
- The SDP should identify in detail each discrete project that will be necessary to implement the planned new or improved intercity passenger rail service, such as construction of specific stations, individual sections of additional or upgraded track, locomotive and rolling stock purchases.
- "Projects" should be defined at a level of detail sufficient to delineate between elements of the overall scope with differing geographic locations, different types of investments (e.g., track improvements vs. station projects vs. equipment purchases), and different implementation schedules. The manner in which the proposed scope is

likely to be divided into contracts for implementation may also be considered in identifying the scope of discrete "projects." In general, each "project" should be defined with the aim of making its scope easily comprehensible and identifiable to a layperson.

- The identification of discrete projects should likewise be consistent with proper usage of the Work Breakdown Structure (WBS) tool for project management – the "projects" themselves should constitute one of the top levels of the intercity passenger rail Service Development Program's overall WBS.

b. **Project Cost Estimates**

- The SDP should include project costs estimates in both the WBS and FRA's Standard Cost Category format.
- The SDP should include the documentation of the cost estimates in their original format, illustrating exactly how those cost estimates were calculated.
- The cost estimates should be supported by a detailed description of the methodology and assumptions used in developing the estimates, including values and sources of unit costs for labor, materials, and equipment; overhead costs or other additives; allocated and unallocated contingencies; credit value of salvaged materials; and cost escalation factors. The source of unit costs should be explained for cost estimates based on broad, top-down "indicative project" prices. Unless explicitly justified, total contingencies for cost estimates developed during the planning phase should be no greater than 30%.

c. **Project Schedule and Prioritization**

- The SDP should present the proposed schedule for the implementation of the intercity passenger rail Service Development Program organized in the format of WBS and consistent with the phases of projects development.
- The schedule should illustrate the duration of each activity within the WBS, the earliest date at which each activity could commence, and the dependencies between the various activities.

d. **Conceptual Engineering Design Documentation**

- The SDP should include basic visual depictions of the projects encompassed by the proposed intercity passenger rail Service Development Program, including maps, design drawings, and track charts.
- Track charts should clearly show the current and proposed future track configurations throughout the geographic area encompassed by the SDP (and any proposed interim configurations, if phased implementation is proposed). Track charts should be drawn to an appropriate linear scale for the level of complexity of the track configuration in a particular segment, and should clearly show turnout sizes, road crossings, overhead and undergrade bridges, station and yard locations, junctions, track curvature, grade, signal location, signal rule applicability (e.g., CTC, ATC, PTC, DTC, etc.) and maximum authorized speeds. The physical location of specific projects should be

shown clearly, including the limits of any linear-oriented projects (e.g., roadbed rehabilitation, rail replacement, tie replacement, etc.).

3.8 Operating and Maintenance Costs and Capital Replacement Forecast

The SDP should include operating and financial projections for each phase of the planned intercity passenger rail service. The SDP should address the methods, assumptions and outputs for operating expenses for the train service including maintenance of way, maintenance of equipment, transportation (train movement), passenger traffic and services (marketing, reservations/ information, station, and on-board services), and general/administrative expenses. Cost-sharing arrangements and access fees with infrastructure owners and rail operators should also be included. Where applicable, allocation of costs across routes should also be discussed.

a. **Cost Methodology and Assumptions** – For each different cost area, the SDP should provide the basis for estimation (application of unit costs from industry peers or a detailed resource build-up approach) of operating expenses. The SDP should include documentation of key assumptions and provide back-up data on how unit costs and quantities and cost escalation factors were derived. Typical cost areas include:
   - Maintenance of way – Includes the cost of maintaining the track, signals, buildings, structures, bridges, etc.
   - Maintenance of equipment – Includes the cost of layover and turnaround servicing, preventive maintenance, wreck and accidents, and contractor maintenance.
   - Transportation (train movement) – Includes the cost of trainmen, enginemen, bus connections, train fuel, propulsion power, railroad access and incentive payments.
   - Marketing and Information – Includes the cost of advertising, marketing and reservations.
   - Station – Includes the cost of station staff (ticketing, baggage, red caps, porters, etc.), building rent, maintenance, utilities, and security.
   - On-board services – Includes the cost of on-board service staff, food and provisions.
   - General/administrative expenses.

b. **Summary of Operating Costs**

c. **Route Profit and Loss Statement** – Estimate the Profit and Loss Statement for the route based on revenue and operating cost forecasts.

d. **Capital Replacement Costs** – The SDP should provide detailed estimates of any additional capital costs, beyond those incurred in the initial implementation of the intercity passenger rail Service Development Program, that are anticipated to be required due to lifecycle replacement or other factors through the planning horizon of the SDP.

3.9 Public Benefits Analysis

The SDP should include a description and quantification of benefits, whether operational, transportation output-related, or economic in nature, with particular focus on job creation and retention, ‘‘green’’ environmental outcomes, potential energy savings, and effects on community

livability. Except where clearly impractical to monetize, the SDP should provide the estimated economic value of those benefits. At a minimum, this section of the SDP should include:

a. **Operational and Transportation Output Benefits** – The SDP should clearly identify the operational and transportation output-related benefits that will be generated by the project. Examples of operational benefits include trip-time improvements, reliability improvements (as measured by train delay-minutes), frequency increases, and passenger capacity increases (as measured by seat-miles). Transportation output benefits include increases in intercity passenger rail service passenger-trips and passenger-miles traveled, reductions in passenger-delay-minutes, and passenger-travel time savings resulting from faster scheduled trips times.

b. **User and Non-User Economic Benefits** – The SDP should include an analysis of the monetized economic benefits to user and non-user that will be generated by the project, regardless of how or where those benefits are generated. User benefits include items such as the value of travel time savings to rail users and the value of enhanced mobility and accessibility to centers of employment, education, and services. Non-user benefits include items such as the monetized value of emissions reductions, community development, and travel time savings due to congestion reduction for users of other modes from which demand is anticipated to shift to the new or improved intercity passenger rail service, as well as direct and indirect jobs created as a result of the intercity passenger rail Service Development Program.

c. **Benefits by Rail Service Type** – All user and non-user benefits should be delineated by the type of improved rail service (i.e., intercity, commuter, or freight) that will generate those benefits. For example, user benefits in the form of travel time savings generated by a project for intercity passenger rail service passengers should be delineated from those travel time savings accruing to users of a commuter rail service that will also benefit from the project. Likewise, non-user benefits in the form of emission reductions resulting from the shift of passengers to intercity passenger rail service should be separated from benefits resulting from a shift of road freight transport to rail freight service.