PLANNING WORK PROGRAM

Federal Fiscal Years 2021 and 2022

SUBMITTED TO FHWA/FTA July 31, 2020

APPROVED BY FHWA/FTA August 18, 2020

New Mexico Division
4001 Office Ct. Dr., Ste. 801
Santa Fe, NM 87507

U.S.Department
ofTransportation
Federal Highway Administration

In Reply Refer To:
PPM-NM
TRAP-22

August 18, 2020

Mr. Michael Sandoval,
Cabinet Secretary
New Mexico Department of Transportation
PO Box 1149
Santa Fe, New Mexico 8 7 5 0 4

Dear Secretary Sandoval:

The NMDOT FFY 2021-22 Work Program was submitted on July 31, 2020, to both the Federal Highway Administration New Mexico (FHWA-NM) and the Federal Transit Administration (FTA) Region VI for review and approval. Upon our review, we have concluded that the FFY 2021-2022 Statewide Planning Work Program complies with the transportation planning and programming requirements under U.S.C. 134 and 135, 23 CFR 420, 23 CFR 450, 2 CFR 200, and with associated Federal and State requirements/laws.

This letter serves as the approval for the FFY 2021-2022 Statewide Work Program for the effective period of October 1, 2020 to September 30, 2022. The authorization is subject to the availability of Federal funds. In addition, recipients of Planning Funds need to comply with the suspension and debarment provisions of 49 CFR Part 29 and the lobbying restrictions set forth in 49 CFR Part 20.

FHWA-NM and FTA Region VI offices recognize NMDOT and regional transportation planning organizations in developing and implementing processes and procedures aimed at reducing risk in delivering the Federal-aid Highway Program (FAHP) and documented in the updated NMDOT Planning Procedures Manual (PPM).

Should you have any questions, please feel free to call Rodolfo Monge-Oviedo at 505-820-2037 or Tony Ogboli at 817-978-0566.

Sincerely yours,

For John Don Martinez
Division Administrator
Federal Highway Administration

Donald Koski
Director of Planning &
Program Development
Federal Transit Administration

cc:
Mr. Tony Ogboli, FTA
Mr. Jerry Valdez, NMDOT
Ms. Tamara Haas, NMDOT
Ms. Jessica Griffin, NMDOT Ms.
Rebecca Maes, NMDOT

Table of Contents

NMDOT TWO-YEAR PLANNING WORK PROGRAM FFY2021/2022

Introduction and Purpose

In accordance with 23 CFR 420.111, this two-year Planning Work Program (PWP) identifies the work the New Mexico Department of Transportation (NMDOT or Department) plans to accomplish in Federal Fiscal Years (FFY) 2021 and 2022. The primary purpose is to identify transportation planning activities for which NMDOT will request federal reimbursement. The NMDOT Planning Division is the lead Division responsible for administering the Federal Highway Administration (FHWA) planning and research funds. In 2020, NMDOT underwent a restructure resulting in establishment of the Planning Division (PD) comprised of three bureaus: Multimodal Planning and Programs (MPPB), Data Management (DMB) and Research (RB). The NMDOT organizational chart is included as Figure 1 and the PD organizational chart is included as Figure 2. FHWA funding included in this two-year PWP includes State Planning and Research (SPR)[1] funds, Local Technical Assistance Program (LTAP) funds and Metropolitan Planning (PL) funds, apportioned to New Mexico in Fixing Americas Surface Transportation (FAST) Act enacted on December 4, 2015. Other funding categories are referenced in the PWP, as the PD oversees other federal programs; however, these projects are not included in the PWP budget.

This PWP also includes the Research Work Program (SPR Part B funds) and projects in other NMDOT areas funded with SPR Part A funds. The five Metropolitan Planning Organizations' (MPOs) Unified Planning Work Programs (UPWPs) are included as Attachment A and the seven Regional Transportation Planning Organizations' (RTPO's) Regional Work Programs (RWPs) compose Attachment B.

The NMDOT PWP continues to focus on the Emphasis Areas provided in the FHWA guidance dated April 23, 2014 related to MAP-21 Implementation and additional guidance to implement the FAST Act. In addition, this PWP implements the NMDOT long-range statewide transportation plan (LRSTP), currently the 2040 Plan and in the process of being updated to the 2045 Plan.

The following is a general overview of the major work areas described in this PWP.

Planning Division Administration – The activities included in this section are funded from SPR Part A and provide for general administration of the planning function at NMDOT. Typical activities included in this area are operations, travel, and training for staff.

Multimodal Planning and Programs – The activities included in this section include: supporting metropolitan and non-metropolitan planning; developing plans; and administering several Federal Aid programs.

Data Management Program - The activities included in this section include the collection and analysis of roadway inventory data and traffic monitoring data, as well as maintenance of the New Mexico All Roads Network of Linear Referenced Data (ARNOLD).

[1] Per 23 CFR Part 420 (SPR) Two (2) percent of each State's Federal Aid apportionments of core programs is set-aside for State Planning and Research activities, after the apportionment to the individual States (includes both SPR Subpart A and Subpart B funding amounts). 23 U.S.C. 505(a). Not less than 25 percent of the funds set aside by 23 U.S.C. 505(a) each fiscal year shall be expended by the State for research, development, and technology transfer activities. 23 CFR 420.107 (SPR Subpart B).

Local Technical Assistance Program (LTAP) - This section describes the New Mexico LTAP, which provides transportation and safety trainings to New Mexico tribal and local public agencies. NMDOT contracts with the University of New Mexico to oversee and administer the NM-LTAP on behalf of NMDOT, providing trainings and serving as an information clearinghouse for transportation and safety topics.

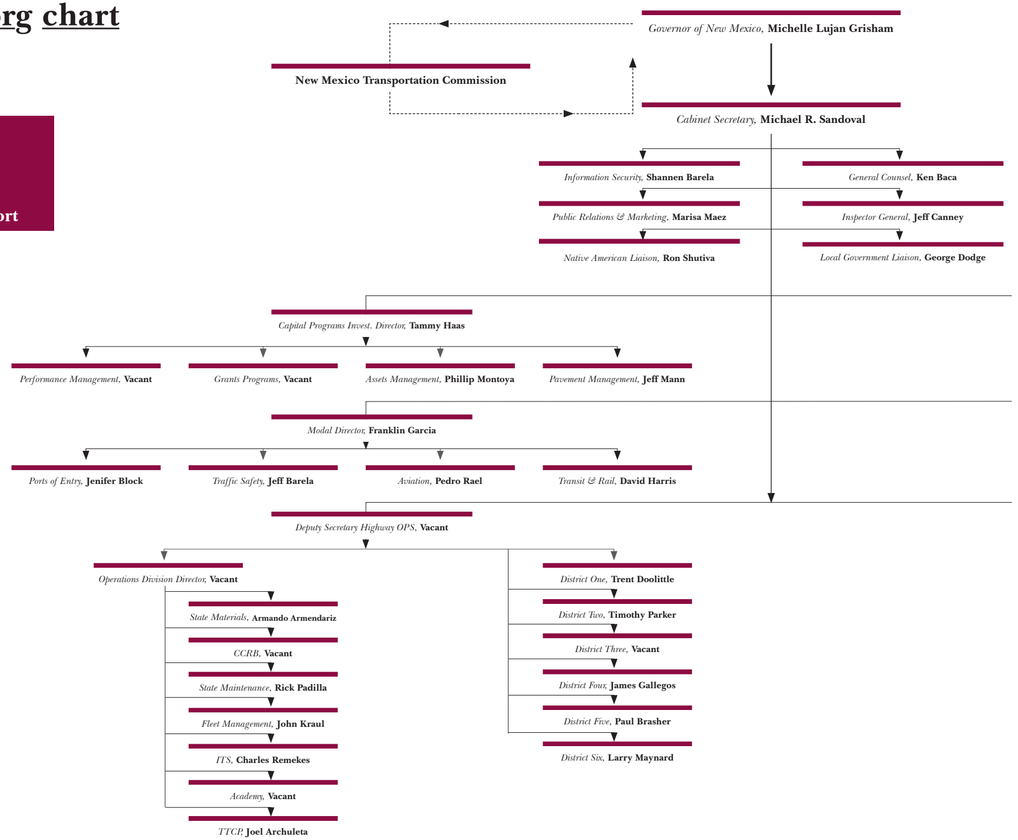
Research Work Program – This section describes the Research Work Program, including projects and administration, funded from SPR Part B.

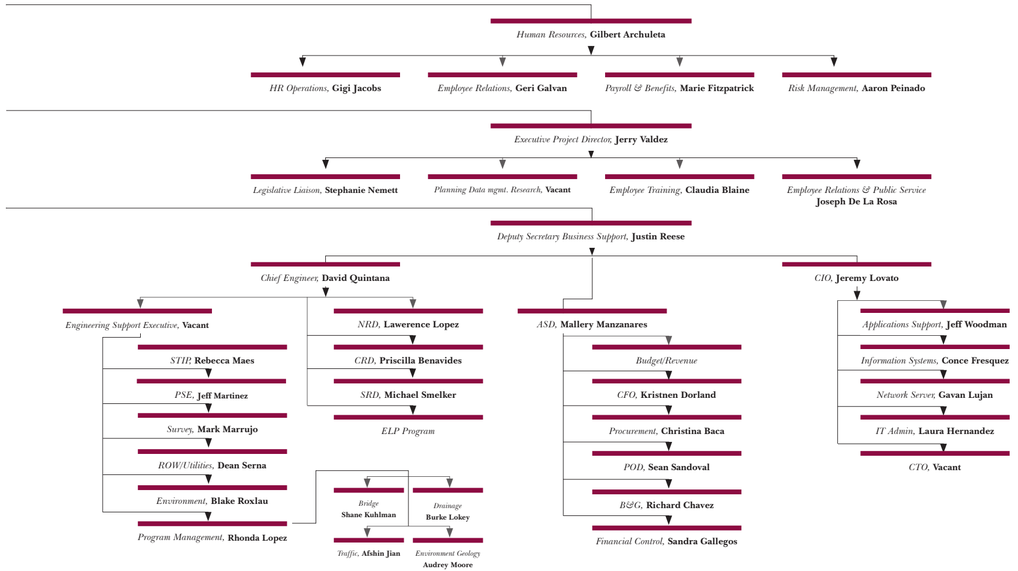
Metropolitan Planning Organization (MPO) Unified Planning Work Programs - This section includes the Unified Planning Work Programs developed by the five MPOs in New Mexico that are funded with FHWA Metropolitan Planning funds and Federal Transit Administration (FTA) funds.

Regional Transportation Planning Organization (RTPO) Regional Work Programs - This section includes the Regional Work Programs developed by the seven RTPOs in New Mexico. FHWA Statewide Planning & Research (SPR) funds are used to fund the activities in the Regional Work Plan.

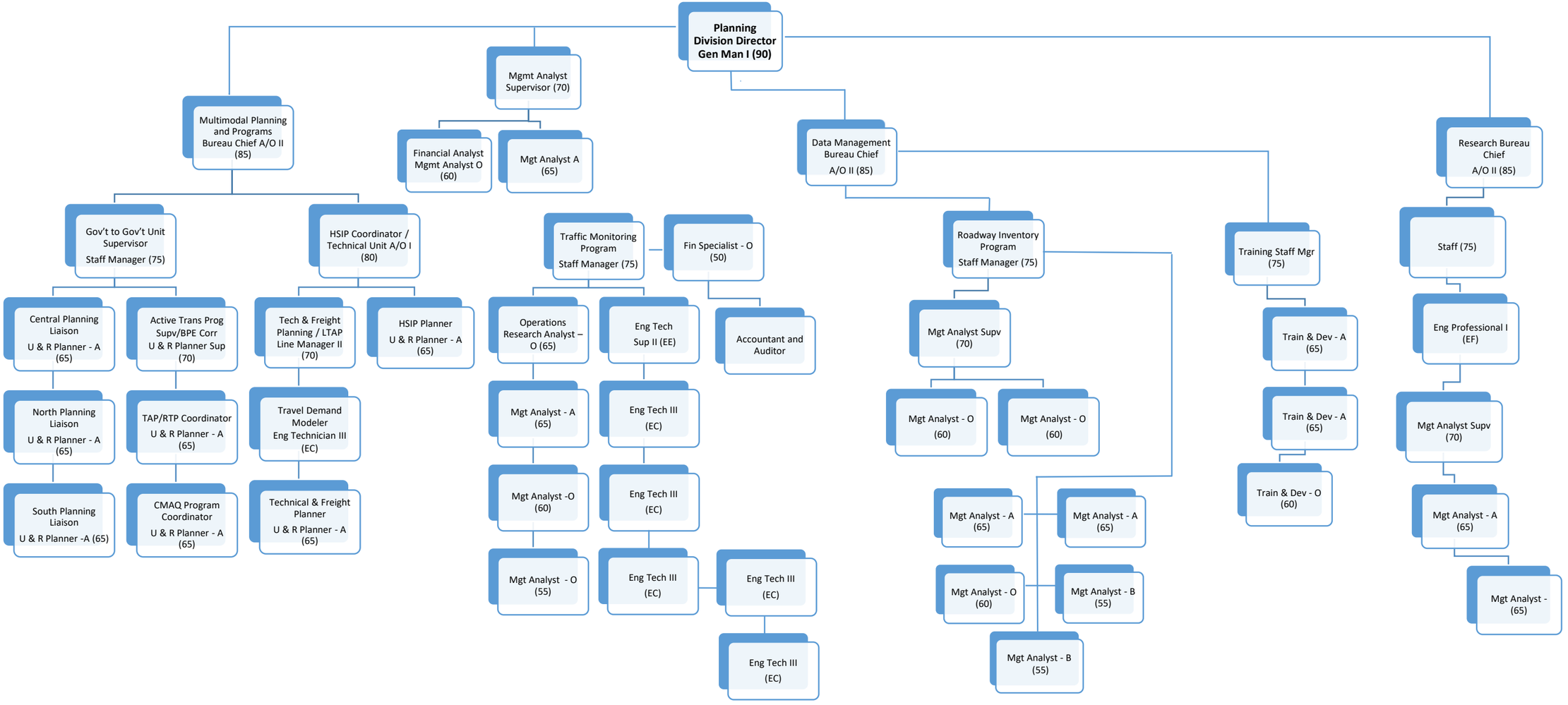
NMDOT org chart

100 Positions
50 POE
30 Districts
10 Highway OPS
10 Business Support





Planning Division Organizational Structure



Chapter 1- Planning Division Administration

Objective:

To provide for the general administration, oversight and coordination of SPR Part A activities undertaken in the Planning Division (PD) to support the Department in order to comply with federal and state laws and regulations related to transportation planning. Responsible for developing, updating and implementing the NMDOT long-range statewide transportation plan (LRSTP).

Methodology:

Transportation Planning related to the Federal-aid Highway Program is governed by Title 23 U.S.C. Requirements contained in Federal Transportation legislation are contained in the Code of Federal Regulations (CFR). 23 CFR 420 covers Planning and Research Program Administration and 23 CFR 450 contains the regulations governing the development of Statewide and metropolitan transportation plans and programs and the regulations for congestion management systems. The project managers identified for each product will carry out the projects and activities identified in this plan. The Project Manager identified for a task or activity is responsible for requesting authorization of federal funds, developing the project schedule, developing requests for proposals/contracts or agreements, managing the project budget, reviewing and auditing deliverables and invoices prior to payment and preparing the project closure documentation in accordance with NMDOT and federal procedures.

Staff will also review federal and state legislation in order to structure programs and develop policies for compliance, conduct research into best practices related to transportation planning, coordinate MPO/RTPO involvement in the State Transportation Improvement Program, and collect and report data as required for Performance Based Planning and Programming.

Work activities will also include attendance at training and conferences, printing of informational material, and operational expenses to fulfill all activities included in this plan.

The Planning Division's Public Involvement Plan (PIP), updated approximately every 5 years, provides information and strategies on how NMDOT will conduct public and stakeholder involvement for its planning products. The PIP includes information on how NMDOT will comply with required public and stakeholder involvement, as well as it provides other ideas for innovative involvement.

Products and Costs:

1	**Finalize the LRSTP (2045 Plan) and Other Planning Tasks** Finalize the NMDOT long-range statewide transportation plan (LRSTP), now known as the 2045 Plan. The update to the previous plan (2040 Plan) began in 2019 and is scheduled for finalization in spring 2021. High Street is the contracted consultant assisting with the update and provides on-call planning services to assist with planning tasks associated with meeting federally-mandated Performance-Based Planning and Programming (PBPP) requirements, including the System Performance Measure (PM 3).

	FFY21 Tasks: Work with High Street to finalize the 2045 Plan update, utilizing the public input from stakeholder meetings held July 2020, as well as input and guidance from the internal NMDOT Steering Committee. **FFY22 Tasks:** Work with High Street to implement the 2045 Plan and other on-call planning tasks, as needed. **Professional Services:** Planning Services On-call Contract **Project Number:** CN P920190 **Project Amount:** $495,000 (obligated in FFY2020) **Project Manager:** PD Director

Chapter 2 – Multimodal Planning and Programs Bureau

The Multimodal Planning and Programs Bureau (MPPB) consists of the Government to Government Unit and the Freight and Technical Planning Unit.

Objectives:

To meet the federally-mandated Performance-Based Planning and Programming (PBPP) requirements, including the System Performance Measures (PMs 1 and 3); continue to implement and finalize the 2045 Plan; continue improving the NMDOT Highway Safety Improvement Program (HSIP) into a more proactive, data-driven program, while meeting reporting requirements; improve travel demand modeling; enhance freight planning, including updating the NMDOT Freight Plan; implement the Statewide Prioritized Bicycle Network Plan; develop and implement the Pedestrian Safety Action Plan; coordinate with and manage the contracts for the MPOs and RTPOs; continue working on local Transportation Safety Plans; and conduct activities related to pedestrian/bicycle planning, programming, and project development.

Methodology:

The Government to Government (GTG) Unit of the MPPB monitors state and federal legislation pertaining to transportation appropriations and policies; works with the MPOs and RTPOs on long-range transportation planning activities; undertakes and encourages active transportation planning and programming through the Active Transportation Programs team. The GTG Unit administers contracts for seven RTPOs (eight contracts) and five MPOs, and works closely with NMDOT's District Offices, the Statewide Transportation Improvement Program (STIP) Unit, Design Regions and other Divisions to ensure proactive enforcement of state and federal laws. The GTG Unit developed the Planning Procedures Manual (PPM) in FFY2013 to consolidate business practices pertaining to MPO/RTPO oversight, and continues to amend the PPM as needed.

The Technical and Freight Planning (T&FP) Unit of MPPB maintains roadway classification systems, including the Functional System roadway classifications, National Highway System (NHS), and freight-specific classifications; performs statewide freight planning and coordinates with freight partners within the state as well as external partners; provides technical support, including maintenance of the Travel Demand Model (TDM); and oversees the Local Technical Assistance Program (LTAP).

The following is a description of each of the MPPB programs:

- **Bicycle, Pedestrian Equestrian (BPE):** The BPE Program is an ongoing effort to work with and educate NMDOT staff in order to integrate BPE facilities into projects as appropriate and is consistent with federal guidance and the New Mexico 2045 Plan. The BPE Coordinator also works with NMDOT staff, advocacy groups, and members of the public, on other BPE-related issues and projects, such as mapping, monitoring usage, and public awareness campaigns.
- **Congestion Mitigation and Air Quality Improvement Program (CMAQ):** The CMAQ Coordinator manages New Mexico's CMAQ funds. The Coordinator's responsibilities include: conducting calls for projects, working with the CMAQ committee to award projects, and tracking funds in the STIP, in coordination with the STIP Coordinator. The CMAQ Coordinator also assists the NMDOT with any federally-mandated tracking and reporting associated with the CMAQ funding program.

- **Freight Planning:** The Freight Coordinator manages freight planning efforts, including maintaining and guiding implementation of the New Mexico State Freight Plan; involvement in regional freight planning efforts to ensure coordination with State-level activities and goals; and participation in regional and national freight planning coordination efforts. The Freight Coordinator also serves as the NMDOT expert on federal regulations regarding freight.
- **Travel Demand Modeling:** The Travel Demand Modeler oversees the maintenance of and updates to the New Mexico Statewide Travel Demand Model (NMSTDM), to produce future vehicle volume projections, and coordinates with MPO modeling efforts.
- **Roadway Classification Management:** The Roadway Classification Coordinator works with local entities through the MPOs and RTPOs, and collaborates with other partners in NMDOT, to maintain Functional System and National Highway System classifications.
- **Local Technical Assistance Program (LTAP):** The LTAP Coordinator manages the contract with the University of New Mexico (UNM) for the New Mexico Local Technical Assistance Program (NM-LTAP) Center. The UNM NM-LTAP Center manages hands-on heavy equipment training, in-class and online transportation-focused trainings, developed in-house and offered by other agencies. These trainings are primarily available to tribal and/or local public agency staff. The LTAP program supervisor manages both staff and the UNM program, to ensure compliance with federal regulations. See Chapter 4, Local Technical Assistance Program, for a more detailed work plan for this program.
- **Metropolitan and Non-Metropolitan Planning Organization Liaisons:** There are three Liaisons who administer and oversee contracts for the seven RTPOs (eight contracts) and five MPOs, in compliance with the PPM.
- **Recreational Trails Program (RTP):** The RTP Coordinator manages New Mexico's RTP (a set aside of the Surface Transportation Block Grant Program), including: updating and maintaining all guidebooks and application materials; responding to public inquiries; managing calls for applications and the award process in coordination with the MPOs/RTPOs and the Recreational Trails Advisory Board (RTAB); administering non-infrastructure and non-construction RTP projects; producing annual reports; and oversight of the RTP funds in the STIP, in coordination with the STIP Coordinator. The RTP Coordinator also serves as the NMDOT expert on the program's federal regulations.
- **Safety:** The Safety Program is composed of the Strategic Highway Safety Plan (SHSP) and the Highway Safety Improvement Program (HSIP). Two positions, the HSIP Planner and HSIP Coordinator, staff the MPPB Safety Program, and professional services on-call contracts (funded by HSIP) provide engineering support and administrative assistance.
- **Transportation Alternatives Program (TAP):** The TAP Coordinator manages New Mexico's TAP (or Surface Transportation Block Grant Program Set Aside), including updating and maintaining all guidebooks and application materials; responding to public inquiries; managing calls for applications and the competitive award process with the assistance of the MPOs/RTPOs; administering non-infrastructure TAP projects; producing annual reports; and oversight of the TAP funds in the STIP, in coordination with the STIP Coordinator. The TAP Coordinator also serves as the NMDOT expert on the program's federal regulations.

Products and Costs:

1	**Safety Program** MPPB administers both the Highway Safety Improvement Program (HSIP) and the Strategic Highway Safety Plan (SHSP), and is responsible for developing the federally-

	mandated annual Safety Targets (PM 1). MPPB currently has two on-call contracts (U900301 and U900302) for HSIP and SHSP services. Both contracts are funded from HSIP thus are not included in the PWP budget spreadsheet. **FFY21 Tasks:** • HSIP Manual – finalize Manual and forms, spreadsheets and project database associated with the HIS.P • Network Screening (completed in 2019) – update database with most current crash data and continue identifying locations requiring Road Safety Audits and/or potential projects. • 2020 Annual HSIP Report (including PM 1 Safety Targets) – work with consultants to develop and submit report due August 31, 2021. • SHSP – start process to update the SHSP, including tasks related to the following Emphasis Areas. o Pedestrian/bicycle – coordinate with the Pedestrian Safety Action Plan work underway. o Tribal – utilize information gathered at the 2019 Tribal Safety Summit. **FFY22 Tasks:** • 2021 Annual HSIP Report (including PM 1 Safety Targets) – work with consultants to develop and submit report, due August 31, 2022. • Evaluation – start evaluation of HSIP, utilizing database and project information collected in Network Screening and HSIP database **Professional Services:** Safety On-call Contracts, U900301 and U900302 **Project Manager:** MPPB Chief until HSIP Planner and HSIP Coordinator positions are filled
2	**Statewide Bicycle Counts** The statewide bicycle counting program measures the quantity and, to some extent, the frequency of on-road bicycle use on selected roadways throughout the state. The data will help NMDOT plan for more effective bicycle facilities in the future, as well as determine the effectiveness of existing on-road bicycle facilities. **FFY21 Tasks:** Continue to conduct temporary bicycle counts at selected TAP, RTP, and other project locations statewide, with an emphasis on on-road facilities, including NMDOT District, MPO/RTPO, and T/LPA participation to improve data resources in support of bicycle investments. Research and coordinate data management tools and techniques with NMDOT Data Management Bureau and MPOs and RTPOs. **FFY22 Tasks:** Continue bicycle count program to inform bicycle investments and safety. Develop statewide guidance for bicycle and pedestrian data collection consistent with current practices and FHWA Traffic Monitoring Guide. **Project Manager:** GTG TAP/CMAQ Coordinator
3	**Statewide Prioritized Bicycle Network Plan Implementation** Continue implementing the Statewide Prioritized Bicycle Network Plan, adopted by NMDOT in FFY18.

	FFY21 Tasks: Integrate document into the 2045 Plan, including a bicycle needs assessment in support of bicycle infrastructure investment. Identify opportunities to integrate document into NMDOT processes including State Access Management Manual. **FFY22 Tasks**: Continue implementation, including ongoing outreach and education at NMDOT Districts and Regional Design Centers. **Project Manager:** GTG BPE Coordinator
4	**Statewide Travel Demand Model** The New Mexico Statewide Travel Demand Model (NMSTDM), first developed in 2012 to forecast future year passenger and freight volumes, was updated in 2014 with some additional enhancements. A contract to update the NMSTDM, initiated in September 2019, includes updating the network and base year data, as well as improving the freight model. The following tasks will enable NMDOT to continue operating the model with software license maintenance and increase staff capacity with training and advanced technical support. **FFY21 Tasks:** • Maintain two PTV Visum licenses • Training and advanced technical support **FFY22 Tasks:** • Maintain two PTV Visum licenses • Training and advanced technical support **Professional Services:** Software License, Consultant Contract **Project Control Number**: P921050 **Project Amount FFY21:** $70,000 **Project Control Number:** P922050 **Project Amount FFY22:** $130,000 **Project Manager:** MPPB TDM Manager
5	**State Freight Plan Update** The New Mexico Freight Plan (NMFP) was developed as part of the New Mexico 2040 Plan, following MAP-21 (2012) guidance, and adopted by NMDOT in September 2015. In October 2017, the MPPB updated the NMFP according to the FAST Act (2015), which the FHWA – New Mexico Division Office reviewed and found complete in November 2017. Staff are reviewing the current NMFP in FFY2020-2021 to identify ways to make the plan more action-oriented and better support freight mobility. **FFY21/FFY22 Tasks:** Review, update, and implement State Freight Plan – ongoing **Professional Services:** Planning Services On-call Contract, as needed **Project Manager:** MPPB Freight Coordinator **Public Benefit/Applicable Federal Law:** 49 U.S.C. 70202(e)
6	**Local Transportation Safety Plans (LTSPs)** This is a project initiated under the prior PWP that will be continued. The Local Transportation Safety Plans (LTSPs) establish visions, goals, objectives, strategies, countermeasures and performance measures consistent with the LRSTP and SHSP for cities and tribal areas. Developing LTSPs offers a proactive approach for cities and tribes

	FFY21 Tasks: Work with High Street to finalize the 2045 Plan update, utilizing the public input from stakeholder meetings held July 2020, as well as input and guidance from the internal NMDOT Steering Committee. **FFY22 Tasks:** Work with High Street to implement the 2045 Plan and other on-call planning tasks, as needed. **Professional Services:** Planning Services On-call Contract **Project Number:** CN P920190 **Project Amount:** $495,000 (obligated in FFY2020) **Project Manager:** PD Director

	to address safety needs locally, building trust with elected officials, stakeholders and members of the public by building a transparent, comprehensive and systematic approach to identify and address transportation safety issues in their community/region. Through structured interactions with key stakeholders, public officials and the general public, partnerships are developed through the collaborative planning process that extends well beyond the development of an LTSP. The development of LTSPs is a coordinated effort to assist tribal or local public agencies in taking a proactive stance in identifying, reducing and eliminating injuries and fatalities. **FFY21 Tasks:** Create plans for identified project areas, by coordinating with the appropriate MPO/RTPO, local jurisdictions/stakeholders and members of the public. **FFY22 Tasks:** Complete outstanding planning efforts and close contract. **Professional Services:** Consultant Contract **Project Manager:** MPPB Chief and Staff **Total Amount:** $500,000; project funded with FFY17 HSIP
7	**Congestion Mitigation & Air Quality (CMAQ) Improvement Program** The CMAQ program is an FHWA program aimed at reducing congestion and improving air quality in conformity with the Clean Air Act. This competitive, application-based program started awarding CMAQ funds beginning in FFY2020. NMDOT receives approximately $9,000,000 per year in CMAQ funds. **FFY21 Tasks:** Issue a call for projects for funding starting in FFY2023. Review and award projects to T/LPAs and NMDOT Districts. Monitor awarded CMAQ projects as need to help ensure obligation. **FFY22 Tasks:** Monitor programmed CMAQ projects, making changes as needed. Track funds in the STIP, in coordination with the STIP Coordinator. Update program materials for next call. **Project Manager:** GTG CMAQ Coordinator
8	**I-10 Western Connected Freight Corridor Coalition continued participation** The I-10 Western Connected Freight Corridor Coalition is a voluntary coalition of state DOTs that are committed to coordination along Interstate 10, with its westernmost terminus at Long Beach/Los Angeles, CA and easternmost terminus at the Texas/Louisiana border, to improve freight movements through technical applications and support. The first project of the coalition is the Truck Parking Availability System (TPAS), funded in part by federal grant funding, starting in April 2019, extending to 2023. **FFY21/FFY22 Tasks:** Continue to collaborate and support TPAS project – ongoing **Project Manager:** MPPB Freight Coordinator **Federal Fund Grant:** Texas DOT Lead state **Public Benefit/Applicable Federal Law: 49 U.S.C. 70202(e)**
9	**Roadway Classification Management** The Roadway Classification Coordinator maintains the Functional System and National Highway System classifications by coordinating with local entities through the MPOs and RTPOs, and collaboration with other partners in NMDOT.

	FFY21, FFY22 Tasks: Receive and review Functional System Classification change requests from local and tribal agencies, through their MPOs or RTPOs, and submit supported requests to FHWA for review and approval **Project Manager:** MPPB Roadway Classification Coordinator **Public Benefit/Applicable Federal Law: 23 U.S.C. 103**
10	**Transportation Alternative Program (TAP)/Recreational Trails Program (RTP)** Conduct a call for project applications and select and program projects. **FFY21 Tasks:** Issue a call for projects in spring for funding starting in FFY23. Monitor application processes. TAP projects are selected by a committee comprised of NMDOT, MPO and RTPO staff. The RTP Advisory Board, which convenes at least once a year, recommends projects for selection. TAP and RTP Coordinators monitor awarded TAP/RTP projects as need to help ensure obligation. **FFY22 Tasks:** Announce awarded projects and coordinate programming into STIP/TIPs. Update Active Transportation and Recreational Programs Manual. Convene the RTP Advisory Board at least once annually. Monitor awarded TAP/RTP projects as need to help ensure obligation. **Project Manager**- GTG TAP/RTP Coordinator

Public Benefit/Applicable Federal Regulations Associated with Identified Tasks: 23 CFR Part 450 Subpart B – Statewide Transportation Planning and Programming Sections 200-224

Chapter 3 - Data Management

The Data Management Bureau (DMB) consists of the Traffic Monitoring Program (TMP), Roadway Inventory Program (RIP) and the Training Program.

Objectives:

Traffic Monitoring Program (TMP) and Roadway Inventory Program (RIP)
To record, process, analyze, track and report accurate and complete Roadway Inventory Data, Traffic characteristic data and Linearly Referenced Spatial data for NMDOT staff and external customers.

Training Program
To create an organizational culture of learning, knowledge sharing, environmental responsibility, and financial stewardship while cultivating the future workforce of the New Mexico Department of Transportation.

Methodology:

The Traffic Monitoring Program (TMP) is responsible for data and information on traffic volume, vehicle miles of travel (VMT), vehicle classification and truck weight. TMP accomplishes these tasks by conducting short-term traffic counts, continuous counts and weigh-in-motion data. The program tracks traffic trends, vehicle distribution including motorcycle, passenger car and several categories of trucks, and vehicle weight. NMDOT traffic data is collected in compliance with the FHWA Traffic Monitoring Guide (TMG) and the FHWA Highway Performance Monitoring System (HPMS) Field Manual. Data collected is used to determine Average Annual Daily Traffic (AADT), future growth factors, design hour volume (DHV), statewide VMT, vehicle classification, percent commercial vehicles, busses, motorcycles, and passenger vehicles. The TMP collaborates with MPOs, RTPOs and local and tribal governments that collect traffic data to supplement NMDOT's collection efforts.

Upon request, TMP staff conduct specialized traffic collection activities to meet federal and state requirements as needed by the NMDOT.

The TMP implemented a new Traffic Information System using Midwestern Software Solutions' MS2 web-based Traffic software package in 2017 for maintaining current and historical traffic data to support the Department's Safety, Pavement, and Bridge Management systems and to report to FHWA HPMS and Travel Monitoring Analysis System (TMAS).

The Roadway Inventory Program (RIP) is responsible for the collection, storage and use of various roadway data elements such as roadway ownership, number of lanes and widths, traffic characteristics, bridges and other structures, railroad grade crossings, guardrail, signs, signals, and intersection characteristics. The RIP is also responsible for maintaining the New Mexico All Roads Network of Linear Referenced (ARNOLD) data in order to provide a spatial reference for the Full Extent and Sample Panel data on selected highway functional systems. This spatial data coupling (i.e. representing roadway attribute data in a spatial format) enables the analysis of HPMS data in a GIS environment. Within the HPMS software, the State-provided linear referencing system represents all roadways in a given State's road network for a designated set of functional classifications.

During FFY21 and FFY22:

- The TMP will continue and expand upon services previously provided by vendors to host data, facilitate short-duration traffic counts, and provide annual maintenance, as well as support internal staff who conduct short-duration counts and maintain Weight In Motion (WIM) equipment;
- the RIP will continue support for the Roadway Inventory System (RIS); and
- the Training Bureau will continue to facilitate, expand and improve upon the existing core training program.

Products and Costs:

1	**Traffic Monitoring Program: Data Collection** Maintain the statewide Continuous Count Station network and Smart Sensors, monitoring operational status, performing repairs and replacements when needed: conduct a minimum of 75 short-term volume/classification counts on a weekly basis to meet the requirements of annual HPMS submittal and NMDOT needs; complete traffic count requirements cycle on one-third of the National Highway System (NHS) annually utilizing portable traffic count. Maintain statewide network of Automatic Weight and Classification sites. Monitor operational status and perform repairs when necessary; continue upgrading of WIM sites to enable collecting continuous classification and weight data; **Project Goals:** • Distribute monthly reports • Complete traffic count requirements on one-third of the National Highway System • Complete analysis and recommendation of new sites and modifications to existing sites that began in SFFY 13; Develop cost estimates, maintenance and upgrade plan. **Professional Services:** Consultant Contract **Project Control Number**: P921030 **Project Amount FFY21:** $400,000 **Project Control Number**: P922030 **Project Amount FFY22:** $400,000 **Project Manager**: DMB Chief, TMP Staff Manager
2	**Traffic Monitoring Program: Statewide Short Duration Count** Continue contracted statewide short duration count collection using road tubes and radar, as well as turning movement counts to assist Department engineers to design intersections and respective traffic signals. The contractor shall conduct counts of roadways functionally classified 1 through 6 and select 7s to exclude roadways counted by the Mesilla Valley MPO and roadways counted by the Mid Region MPO. **Project Goals**: • Collection of essential traffic data. • Update data to comply with federal reporting requirements.

	• Disseminate updated data to Department users to support project planning and prioritization. **Professional Services:** Consultant Contract **Project Control Number:** P920200 **Amount FFY21:** $800,000 **Amount FFY22:** $800,000 **Project Manager:** DMB Chief, TMP Staff Manager
3	**Traffic Monitoring Program – MS2 Annual Support and Customizations** The TMP implemented the Midwestern Software Solutions' MS2 in 2017. Server licensing and cloud hosting provides unlimited system support to NMDOT via telephone, email and an online issue tracking portal. System issues and bug fixes are tracked and prioritized using the latest technology (e.g. Zendesk and Pivotal Tracker). MS2 will facilitate management, analysis and report generation of traffic data collected by Traffic Counters, Classifiers, and Weigh in Motion (WIM) Stations as well as preparation of annual calendar year traffic data for the annual HPMS report. **Project Goals:** • Upload Continuous Count Station data from NMDOT polling station to MS2 server • Process and upload short duration counts to MS2 server • Run data validation checks using MS2 built-in QA/QC checks **Professional Services:** Software License **Project Control Number:** P920040 **Project Amount FFY21:** $100,000 **Amount FFY22:** $100,000 **Project Manager:** DMB Chief, TMP Staff Manager
4	**Traffic Monitoring Program: US 550 WIM Station Annual Maintenance** Annual maintenance, calibrations, and replacement of equipment based on the product life cycle, training for the field technician and training for the office staff on using the polling stations. **Professional Services:** Consultant Contract **Project Control Number**: P921040 **Project Amount FFY21:** $103,000 **Project Control Number**: P922040 **Project Amount FFY22:** $103,000 **Project Manager**: DMB Chief, TMP Staff Manager and Field Supervisor
5	**Roadway Inventory Program: On Call Support for RIS** Issue a consultant contract to provide services as necessary to support the maintenance, configuration, enhancements, and updates to the NMDOT's Roadway Inventory System enterprise Geographical Information System database (RIS). Services would include Esri Roads and Highways database support, enhancements, quality assurance of data, and training on Esri Roads and Highways.

	Project Goals: • Make the Roadway Inventory System (RIS) database available across the Department via the eGIS viewer. • Improve safety for all system users by maintaining current and updated data that can be used to identify traffic hot spots and systemic safety concerns. **Professional Services**: Consultant Contract **Project Control Number**: P921090 **Project Amount FFY21:** $50,000 **Project Control Number:** P922070 **Project Amount FFY22:** $100,000 **Project Manager**: DMB Chief, RIP Staff Manager

Chapter 4 - Local Technical Assistance Program

Objective:

To provide training and technology transfer to tribal and local public agencies in accordance with federal mandates in support of four focus areas: 1) Safety; 2) Infrastructure Management; 3) Workforce Development; and 4) Organization Excellence.

Methodology:

In order to provide statewide training and support more efficiently, NMDOT partners with UNM to manage the NM-LTAP Center, to identify, develop and provide or facilitate technical trainings, including heavy equipment trainings, to tribal and local public agencies in New Mexico.

The NM-LTAP Center continues to accommodate both rural and urban audiences, as well as expand independent research and training opportunities, through online library resources and a current physical library of publications. The program relies on training available through the National Highway Institute, other Universities and online. The NM-LTAP Center staff also develop and deliver courses. The NM-LTAP Center will continue to provide a list of all technological and training resources in its resource library and will continue to develop the ability to provide web-based trainings.

The UNM NM-LTAP Center Program Manager provides outreach to clients through regular email communications; attendance at public meetings and conferences; participation in the National Local Technical Assistance Program Association (NLTAPA) meetings; and through on-site and virtual trainings. The Program Manager also attends MPO and RTPO meetings to provide outreach to clients.

Advisory Committee

The UNM NM-LTAP Advisory Committee provides another proactive approach to client engagement. The UNM Program Director recruits Advisory Committee members to reflect the diversity of the communities served by NM-LTAP. The Advisory Committee consists primarily of client representatives willing and able to provide insight into the training needs of tribal and local public agencies, thus providing the genesis for creating NM-LTAP's Training Plan. The Advisory Committee meets at least on a semi-annual basis in order to identify training and technology transfer needs and to ensure that implementing FHWA's national LTAP guidance supports the needs of NM-LTAP's clients and assess the NM-LTAP's effectiveness in meeting the needs of its clients.

2021-22 Course Overview

The proposed trainings for Federal Fiscal Years 2021 and 2022 (October 1, 2020 – September 30, 2022) were selected using historic course attendance data and the results of the course evaluation survey. Courses with higher attendance or requests are prioritized in the schedule.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Safety Training Program								
Pedestrian and Bicycle Safety Measures	1				1			
ADA Compliance Program	1	1			1	1		
Roadway Safety Data Collection and Safety Plan Development	1				1			
Road Safety Audits and Road Safety Audit Reviews		1				1		
Safety on the Job	1	1		1	1	1		1
Roadway Safety 365		1		1		1		1
Infrastructure Management Training								
Traffic Signal Design and Operation			1				1	
MUTCD Compliance Standards	1				1			
Pavement Preservation and Maintenance				1				1
Introduction to Online Mapping		1				1		
Roadway Drainage Structure Inspection and Repair			1				1	
Developing a Transportation Asset Management Plan				1				1
Introduction to Unmanned Airborne Systems (UAS) Mapping			1				1	
Workforce Development								
Succession Planning and Knowledge Transfer	1				1			
Developing Peak Performers: The Flexible Leader	1				1			
Temporary Traffic Control				1				1
AutoCAD Best Practices				1				1
Heavy Equipment Training	1	1	1	1	1	1	1	1
Introduction to Transportation/ Transit Planning			1				1	
Introduction to GIS	1				1			
Open Source GIS Software and Applications				1				1
Grant Writing Workshop	1	1	1	1	1	1	1	1
Total courses per quarter	10	7	6	9	10	7	6	9

NM-LTAP proposes to provide a minimum of four Heavy Equipment training sessions to local agencies per year. NM-LTAP will hire an external contractor to travel to training locations, lead both the classroom and on-site trainings, and to certify participants. Heavy Equipment training will take place in different locations across the state. Within this model, a local or tribal public agency hosts the training with all coordination handled by NM-LTAP through the external contractor.

Product and Cost:

1	**UNM NM-LTAP Center** Continue to contract with UNM to develop and maintain the NM-LTAP Center, which will manage the NM-LTAP Resource Library, NM-LTAP web page, mailing list, and email NM-LTAP monthly update to include new information from FHWA and other sources; identify, coordinate and schedule trainings, secure training facility, assist with training registration, provide training materials, print certificates and training evaluations; schedule and conduct NM-LTAP Advisory Committee meetings, provide reports to the committee and develop the training program for endorsement by the committee. Additionally, the NMDOT LTAP Manager will work with UNM to develop an annual training plan and providing training to tribal and local transportation agencies throughout New Mexico. NM-LTAP will supply local government and related agencies with technology transfer and training materials upon request. The UNM NM-LTAP Center maintains and distributes a large number of free publications, as well as a lending library composed of up-to-date videos, publications, technical reports, and journals. **Project Control Number:** P919190 (both FFY 2021 and FFY 2022) **Project Amount FFY21:** $300,000 **Project Amount FFY22:** $300,000 **Project Manager**: LTAP Coordinator

Chapter 5 - Research Work Program

Objective:

The NMDOT Research Bureau administers a program of high quality applied transportation research and technology transfer activities that provide innovative, relevant, timely and cost-effective solutions to the increasingly complex problems confronting our customers in NMDOT, the people of the State of New Mexico, our Nation and the international community. The Bureau seeks to accomplish this mission through close coordination with our partners and customers, consistent with the strategic goals and key principles established by the Department.

The NMDOT Research Work Program is funded by SPR Part B funds, at 80 percent federal with a 20 percent state match. Under CFR 23 Part 420, Subpart A, Sec. 420.107, and Subpart B, Sec 420.207 a minimum of 25 percent of SPR funding must relate to research on the planning, design, construction and maintenance of highways, public transportation, and multimodal transportation systems.

Procedures:

The Research Bureau recently updated the procedures manual; the manual is intended to provide information and guidance on legal authorization, funding, agency functions, and our strategic plan. Furthermore, the manual details the different research process phases including solicitation, request for proposal development and issuance, project deliverable explanations and timelines, project administration, and project closeout.

Upcoming Research Bureau Activities

Research Peer Exchanges
The Research Bureau is committed to participation in the FHWA Peer Exchange process to identify and integrate best practices into its policies and procedures. Research Bureau staff participated in a Peer Exchange in February 2016 in Vermont. The Research Bureau hosted a Peer Exchange in August 2018.

Participation in National Activities
The Research Bureau strives to be an active participant in the Transportation Research Board (TRB), the National Research Council of the National Academy of Sciences and in the National Cooperative Highway Research Program (NCHRP). The annual membership costs for participation in the TRB, as well as annual membership for NCHRP, are paid from the SPR Part B funds. In addition, the Research Bureau participates in the American Association of State Highway and Transportation Officials (AASHTO) activities including the Research Advisory Committee. These activities permit review of applicability of research results with other transportation research organizations, and to ensure the program in New Mexico is directly involved in National research to support State Transportation Agencies.

TRB Site Visit
The Research Bureau will anticipate hosting TRB representatives for a site visit in FFY21.

Stewardship and Oversight Agreement
The Research Bureau plans to continue coordinating these activities during the FFY21-22 Work Program.

Library

As part of the T2 plan for FFY21-22, a major goal of the Work Program is to continue efforts to establish a greater awareness of the Research library, its mission, its resources and its services for Department staff and the external stakeholder community through extensive outreach. The Research Bureau is currently establishing a strong presence on the Department website that provides NMDOT staff with access to external databases, publications, videos and other state DOT websites, all designed to improve the transfer of innovative research results and effective technology alternatives to the State for immediate implementation.

Products and Costs:

1	**Personnel Services and Employee Benefits** Number of Positions — Position Title 1 — Administrative Operations Manager II 1 — Staff Manager 1 — Engineer Technician V 1 — Management Analyst Supervisor 3 — Management Analyst – Advanced **Project Control Number**: R921010 **FFY21 Project Amount**: $600,000 **Project Control Number**: R922010 **FFY22 Project Amount**: $600,000 **Project Manager:** Research Bureau Chief
2	**Research Operational Expenses** Purchase of: • Project specific supplies/equipment • Technology Transfer innovations • Eligible travel reimbursements • Eligible conferences/workshops • Library needs • Peer Exchange **Project Control Number**: R921020 **FFY21 Project Amount**: $301,900 **Project Control Number**: R922020 **FFY22 Project Amount:** $301,900 **Project Manager:** Research Bureau Chief
3	**Feasibility Analysis of Ultra High Performance Concrete for Prestressed Concrete Bridge Applications (NM09MSC-01 Phase 4)** Continuation of contracted research Project Summary Following the construction of Bridge 9706, designed with ultra-high performance concrete (UHPC) using materials local to New Mexico, the bridge will be monitored to identify the advantages of UHPC in bridge superstructure design. Key parameters will be investigated to improve the design, construction,

	economy, and applications of UHPC. Continued monitoring of this bridge will provide advanced knowledge of the long term bridge performance of a bridge utilizing innovative materials. Following the successful completion of Phases I-III and the construction of the first UHPC bridge in New Mexico, a symposium will be held to disseminate the results to engineers, designers, fabricators, and the public to highlight the results and research findings. Mixture proportions developed in Phase II of the project will continue to introduce new technologies (e.g., admixtures) to improve the strength characteristics, durability, economy, and casting and curing methods. Furthermore, new potential applications will be identified and investigated. Investigations on the field implementation of UHPC will be conducted. Laboratory and field studies will be conducted to study the cast-in-place behavior of UHPC. These studies will provide new tools and applications for the UHPC (e.g., field joints). <u>Justification</u> Not conducting the research will lose the momentum of the first three successful phases of research including the opportunity to monitor the first ultra-high performance concrete (UHPC) bridge in New Mexico, and potentially the first non-proprietary UHPC bridge in the U.S. Making use of the instrumentation installed during Phase III, the bridge will be evaluated for performance, durability, maintenance, and cost. This unique opportunity provides the direct comparison of two different types of materials to be directly studied to improve bridge design practices. Furthermore, the UHPC mixture proportions developed with local materials in Phase II will continued to be improved in Phase IV as well as new potential uses for UHPC identified (including key initiatives identified by FHWA's Every Day Counts initiative). UHPC has been identified as an innovative material that can be used for connections for prefabricated bridge elements leading to accelerated construction and improved long term performance. This research will continue to investigate new uses of UHPC to meet and exceed FHWA Every Day Counts initiative to provide greater efficiency and economy in projects with less impact on users. <u>Anticipated Benefits</u> The findings of this research will continue to develop more sustainable, durable, cost effective methods/materials for implementation into transportation infrastructure. Longer design life of bridges and structures will be demonstrated through the monitoring of Bridge 9706. Additionally, the data collected will provide additional information to improve life-cycle cost analysis for future projects (promoted by FHWA as an economic analysis tool). The project will also provide the additional uses of UHPC, including the use of UHPC for field cast joints, identified by FHWA as "Accelerating Innovation" through the Every Day Counts program. **Advocate/Sponsor:** State Materials Bureau, State Bridge Bureau **Project Control Number:** R917030 **FFY21 Project Amount**: $100,000

	FFY22 Project Amount: $100,000 **Project Manager:** Management Analyst Supervisor
4	**On-Call Research Services** Continuation of Contracted Research (NM17ADM-01) Project Summary This project establishes an on-call contract to be executed between NMDOT and one or more contractors. The contract will provide the means to leverage resources at the state's research universities to provide literature searches for relevant information requested by Department staff, and to perform short and medium term research. This is envisioned as a long-term, four-year project. Justification A wealth of information on topics related a broad variety of transportation issues is available through several sources, including the Transportation Research Board, AASHTO, NCHRP, and individual state DOT research divisions. Oftentimes, a question or concern raised by NMDOT staff was previously addressed through another agency, and a thorough literature search will reveal this information. This eliminates unnecessary and costly duplication of effort in finding solutions to these problems. Research Bureau staff regularly conducts literature reviews in response to requests from Department staff and subsequent to receipt of research project proposals. Anticipated Benefits An on-call contract for research services will improve the volume and quality of investigation of previously conducted research, as well as short and medium term research. Existing operational procedures require a project-specific contract to be executed for each problem statement. This is often a time consuming process, both in preparing a contract and conducting research. A common remark from Department staff is that research takes too long, and that an expedited process for addressing immediate problems would be beneficial. On-call research is authorized with a Task Order with a short timeline and a well-defined and limited scope of work. **Advocate/Sponsor:** Research Bureau **Project Control Number:** R917031 **Project Amount FFY21:** $100,000 **Project Amount FFY22:** $100,000 **Project Manager:** Management Analyst- Advanced/Engineering Technician V
5	**Secretary's On-Call Research Services** Project Summary This research project will establish an On-Call Research Program for the Cabinet Secretary's use. On-call contracts will be executed between NMDOT and one or more contractors. Short-term, limited scope task orders will be used to authorize research that is needed quickly to respond to a time-sensitive transportation-related problem that the Secretary faces. This is envisioned as a long-term, 4-year project.

	Uses may include the following: a. Support executive level projects in response to immediate or critical needs at NMDOT and for legislative and other governmental requests; b. Collect, develop and analyze data to support applications for funding such as TIGER Grants, the new FAST Act discretionary freight-focused grant program, the National Highway Freight Program and other opportunities, and; c. Participate in and organize in trainings, conferences, workshops and peer exchanges designed to enhance cooperation and increase the dissemination of innovative, timely and cost-effective solutions to transportation problems. <u>Justification</u> This project will improve the NMDOT Secretary's ability to respond to short-term, immediate research needs and problems. A wealth of information on topics related a broad variety of transportation issues is available through several sources, including the Transportation Research Board, AASHTO, NCHRP, and individual state DOT research divisions. Oftentimes, a question or concern arises that has been previously addressed by another agency, and a thorough literature search will reveal this information. This eliminates unnecessary and costly duplication of effort in finding solutions to these problems. Research Bureau staff regularly conducts literature reviews in response to requests from Department staff and subsequent to receipt of research project proposals. <u>Anticipated Benefits</u> The Secretary's on-call research services project will allow the executive management to be more responsive to immediate transportation-related problems by providing a mechanism to quickly collect information, analyze options, develop a plan and implement results. It will provide data, information, or solutions to time-sensitive issues and needs. **Advocate/Sponsor:** Office of the Secretary **Project Control Number:** R921030 **Project Amount FFY21:** $90,000 **Project Amount FFY22:** $90,000 **Project Manager:** Management Analyst- Advanced/Engineering Technician V
6	**Dust Mitigation Monitoring Project** Continuation of Contracted Research (NM17ENV-02) <u>Project Summary</u> This project originally focused on an approach to determine the effectiveness of land use interventions on mitigating blowing dust and the frequency of dust-related traffic crashes at two selected crash hotspots on Interstate 10 in southwest NM. Dust monitoring equipment will be used to monitor control areas and treated areas over the project period.

	Justification The revegetation project at the US 180 location has been successful beyond original expectations. There is little or no dust coming from the original problem site on US 180. The project will now shift resources to expand monitoring at the two revegetation sites in I-10. Additional control monitoring sites will be included at the two locations on the Lordsburg Playa. The State Climatologist at NMSU recommended experimental and control monitoring sites at each of the two dust mitigation projects at the Lordsburg Playa. This will allow ongoing monitoring of the effectiveness of the revegetation efforts. The NMDOT has a multi-faceted approach to reducing dust storm related crashes, injuries, and fatalities. These approaches range from educational strategies to site specific land use changes to mitigate dust. Anticipated Benefits This project will allow environmental scientists to determine which land use strategies are most effective in the respective selected locations. By reducing the dust load, there may be a reduction of dust related crashes. This benefits traffic safety and saves lives. In addition, it may have a positive impact on commerce if roads are closed less often due to blowing dust. **Advocate/Sponsor:** Environmental Design Division **Project Control Number:** R917035 **Project Amount FFY21:** $45,000 **Project Amount FFY22:** $45,000 **Project Manager:** Staff Manager
7	**Superpave 5: Constructing Asphalt Pavement with Road Voids Equal to Design Air Voids** Continuation of Contracted Research (NM17MSC-01) Project Summary This project concerns itself with a more robust H/WMA pavement section. The concept is to design and then compact the HMA to 5% air voids, vs. the current method of designing at 4% air voids; and compacting in the field to 7%, allowing traffic to further compact the material. This is a pavement innovation that is new and will decrease pathways for permeation of both water (freeze-thaw damage) and evaporable volatiles throughout the mix, which dries out the H/WMA and makes it more vulnerable to cracking Justification NMDOT Hot and Warm Mix Asphalts are designed at 4% air voids and placed in the field at lower densities, in some cases with air voids about 8%. These mixes are expected to be compacted to 4 or 5% air voids under roadway traffic within two years of construction and thus avoid shear rutting which sometimes occurs at below 4% air voids during the design life. In fact, such design of Superpave mixes have shown very little to no rutting. However, mixes with high air voids (before initial compaction by roadway traffic) show high permeation of water and volatiles with binders oxidizing significantly. If mixes can be designed at 5% air voids in the lab and placed at 5% air voids in the field, binder aging can be

	mitigated by reducing both initial and subsequent pathways for permeability due to kneading of the binder under traffic, therefore enhancing durability, including rut resistance. There is a need for changes in mix design parameters so as to design at 5% air in the lab and compact to 5% air in the field, and then keep the voids at that level (reduce traffic densification). Lower air voids in the field should improve durability by decreasing binder aging. <u>Anticipated Benefits</u> This will increase the life of the asphalt pavement through reducing permeability and increasing structural robustness at a minimal effort of increasing compaction, leading to cost savings, the magnitude thereof to be determined by this project as longevity of the product. **Advocate/Sponsor:** State Materials Bureau **Project Control Number:** R917037 **Project Amount FFY21:** $120,000 **Project Amount FFY22:** $120,000 **Project Manager:** Management Analyst – Advanced
8	**Testing Native Seed Germplasm From the Wild for Arid Lands** Continuation of contracted research (NM18ENV-01) <u>Project Summary</u> This research project will fund a study to assess the success of substituting alternative native species and local genotypes in the DOT standard seed mix. Native grasses, forbs, and woody shrubs play an extremely important role in roadside soil stabilization efforts following construction and during maintenance, and, further, in re-establishing critical habitats. <u>Justification</u> Alternative native species and local genotypes vegetation will be of increased importance due to the historic long-term "drying out" of New Mexico, which is being exacerbated by rapid climate change. The project will identify native species, sources, and plant material types appropriate for soils that are saline, sodic, gypsum, sand, and other soils, all of which are problematic as they are associated with dust-related crashes and extreme erosion. Vegetation that has the characteristics of being deep rooted, drought-tolerant and both quickly establishes and quickly spreads will be identified. Indigenous seeds with these characteristics will be collected from the wild and tested for potential establishment in critical locations. <u>Anticipated Benefits</u> Identifying, developing, and propagating indigenous seeds with the characteristics of drought resistance and quick establishment in problem soils could increase safety due to reduced dust in the highway environment, reduce

	economic losses due to road closures, and reduce costs associated with the frequency of roadside maintenance. **Advocate/Sponsor:** Environmental Bureau **Project Control Number:** R918031 **Project Amount FFY21:** $16,760 **Project Amount FFY22:** $16,760 **Project Manager:** Staff Manager
9	**UHPC Thin-bonded Overlay for Deteriorated Bridge Decks** Continuation of contracted research (NM19STR-01) <u>Project Summary</u> This research project will compare the performance of a pilot UHPC thin-bonded overlay on a bridge deck with a traditional polyester concrete overlay. NMDOT has been a leader in developing innovative UHPC applications. This project will examine a potential new application of UHPC on bridge decks. NMDOT has been a leader in developing innovative UHPC applications. <u>Justification</u> The most common bridge deterioration initiates with spalling and/or cracking of the deck surface followed by water and chloride infiltration into the core concrete and corrosion damage to steel reinforcement. Delamination can also occur at or near the outermost layer of reinforcing steel due to progressive freeze-thaw cycles and reinforcement corrosion. Among the various repair strategies, such as patching and crack repair, asphalt or concrete overlays, and partial or full deck replacement, one potential retrofit or preventive solution is to place a thin overlay of UHPC integrally on top of the concrete deck. Compared with high performance concrete and normal strength concrete, the specific material, mechanical and durability properties of UHPC make it a desirable material for use as a thin-bonded overlay on concrete bridge decks. UHPC has low porosity, low chloride ion permeability, high freeze-thaw resistance, and high scaling resistance, which indicate overall high ductility and long material service life. The high compression and tension strength of UHPC suggests that increased load capacity of the entire bridge structure may be possible, in addition to reduced risk of cracking under applied loads. <u>Anticipated Benefits</u> The results of the project will provide information to Bridge Engineers on the potential new application of UHPC overlays on bridge decks which will help NMDOT continue forward with new and efficient ways of addressing bridge deterioration. **Advocate/Sponsor:** Bridge Bureau **Project Control Number:** R919030 **Project Amount FFY21:** $25,000 **Project Amount FFY22:** $25,000 **Project Manager:** Management Analyst Supervisor

10	**Long-lasting OGFC for Surfacing Roads** Continuation of contracted research (NM19MSC-02) Project Summary This research project will test and evaluate the use of different Performance Grade (PG) binders based on climatic conditions in different regions of New Mexico in Open Graded Friction Course (OGFC) and develop performance-testing criteria for OGFC mix design procedures. Justification Currently, OGFC designs are based on volumetric properties including oil absorption and drain down methods, followed by minimum permeability confirmation, and the use of only one PG binder (PG 70-28+); there are also no performance tests involved to determine the quality of mix designs produced. New Mexico has met challenges such as clogging due to the open grade of aggregates used, high air content which leads to accelerated aging due to air accessibility and faster freezing due to lack of insulation as compared to dense graded pavement. Furthermore, OGFC is also believed to play a considerable role in initial cracking in the underlying surface. Anticipated Benefits Testing can help explain some of the discrepancies in OGFC performance across the NM. The intended results for this request consist of developing an OGFC mix design procedure that allows incorporation of various PG+ binders based on climate/locations in NM. **Advocate/Sponsor:** State Materials Bureau **Project Control Number:** R919032 **Project Amount FFY21:** $132,000 **Project Amount FFY22:** $132,000 **Project Manager:** Management Analyst – Advanced
11	**Cost Effective Strategies for Repair and Retrofit of Metal Culverts Using Glass Fiber Reinforced Polymer PH II** Continuation of contracted research (NM18DSN-01) Project Summary Phase II for Cost-effective Strategies for Metal Culverts using Glass Fiber Reinforced Polymer (GFRP) will consist of field testing of the GFRP material for sliplining an existing metal culvert. The research will include the design, installation, and testing of the material through the placement of instrumentation sensors to determine material absorption and load capabilities. The District Six District Engineer has agreed to assist with identification of a culvert for the study and to have district staff help with installation of the GFRP retrofit.

	Justification The results of the laboratory testing for GFRP has exceeded expectations for the material and it is anticipated that field testing will also yield positive results. New Mexico could potentially be one of the first states to use GFRP for the proposed use if the field testing aligns with laboratory testing. GFRP could provide a new approach to address corrosion in corrugated metal culverts across New Mexico. Anticipated Benefits The development and design of a cost-effective technique for retrofitting corroded metal culverts using Glass Fiber Reinforced Polymer materials and of a new specification and standard drawing for sliplining of metal culverts at NMDOT. The proposed retrofitting technique may extend the life expectancy of retrofitted metal culverts beyond 75 years. **Advocate/Sponsor:** Drainage Design Bureau **Project Control Number:** R919033 **Project Amount FFY21:** $50,000 **Project Amount FFY22:** $50,000 **Project Manager:** Staff Manager
12	**Development of Technical Guidance for the Assessment of Oversize and Overweight Vehicle Permit Fees in New Mexico** Continuation of contracted research Project Summary The purpose of the study is to provide technical guidance on the assessment of the oversize/overweight (OS/OW) fee structure in New Mexico. The project objectives are 1) to determine whether the current New Mexico fee structure is comparable to neighboring states for the most common OS/OW load configurations, including the most common combinations of gross vehicle weight/size, distance traveled, and axle configurations; 2) to determine the impact of overweight trucks on New Mexico transportation infrastructure; and 3) formulate a draft fee structure for New Mexico that would generate revenues to maintain transportation infrastructure and address damage caused by OS/OW vehicles. Justification Increases in the allowable size and weight limits of vehicles traveling through New Mexico result in an increase in damage caused to pavements and bridges. This damage, in turn, leads to reductions in the infrastructure service life which triggers more frequent inspections, maintenance, repairs, rehabilitation, and reconstruction. New bridges and pavements must be designed to accommodate the increased weight and size demands to ensure public safety. The end result is an increase in the original construction costs and future preservation costs for the proper upkeep of the transportation infrastructure. If such costs are not adequately covered, the safety and serviceability of roads and bridges are jeopardized. In recent years, the impact of overweight trucks has been particularly acute to due increased oil fracking in the state.

	Anticipated Benefits The project will provide a scientific basis for assessing overweight and oversize truck fees to provide adequate revenues to address damage to highways and infrastructure due to these vehicles. **Advocate/Sponsor:** Modal Director **Project Control Number:** R920030 **FFY21 Project Amount**: $90,000 **FFY22 Project Amount**: $90,000 **Project Manager:** Staff Manager
13	**Study and Evaluation of Materials Response in HMA Based on Field Instrumentation- Phase III** Continuation of contracted research Project Summary This project is the next phase of the Mechanistic Empirical Pavement Design Guide (MEPDG) implementation and local calibration. This study addresses questions related to the material responses of Hot Mix Asphalt based on local conditions of load and environmental conditions. MEPDG depends on instrumented data from pavements as inputs for predictive equations and sub-routines. This study tracks pavement performance at a field instrumentation site on I-40 using ground penetrating radar, falling weight deflectometer testing, and other methods. Justification Understanding the stress-strain behavior of asphalt pavement under repeated traffic loads with varying climatic conditions can result in optimized design, thus reducing initial capital costs and future rehabilitation and maintenance costs associated with premature failures. In addition, the validation of locally (state) calibrated MEPDG requires instrumented pavement data. Anticipated Benefits This project is expected to be of high value to the Department. NMDOT spends a great amount of capital on pavements. The MEPDG is a more efficient and quality approach to pavement design as it considers mechanistic stress/strain principles in pavement design. In addition, by determining the stress/strain that our pavement sections are experiencing, we will be able to better predict necessary maintenance cycles and thereby extend the lifetime of the pavement infrastructure. **Advocate/Sponsor:** State Materials Bureau **Project Control Number:** R920040 **Project Amount FFY21:** $142,000 **Project Amount FFY22:** $142,000 **Project Manager:** Management Analyst Advanced
14	**Determining the Design Effectiveness of Constructed and Planned Wildlife-Vehicle Collision (WVC) Mitigation Projects Phase II** Continuation of contracted research

	Project Summary This project will determine the design effectiveness of wildlife crossings by estimating wildlife passage rates with covert infrared cameras at built crossings across the state. The monitoring of the planned crossings would establish pre construction baselines. These baseline rates could then be compared to post construction rates. The study will also analyze the effect of wildlife crossing warning signs on driver behavior. Justification NMDOT has designed and built wildlife crossings since 2008 but does not have adequate data to determine the effectiveness of any crossing. While the number of reported WVCs gives some measure of the safety hazard, researchers estimate that less than 50% of WVCs are reported to law enforcement. The standard practice in western states is to install battery-operated, motion-activated, covert infrared wildlife cameras at crossings. Camera images are date and time stamped and are used to determine the approach and passage rates of targeted species. From this data, crossing designs can be modified to improve passage rates and new crossings can be designed to be more effective. Over the past 10 years Arizona DOT has deployed over 500 such cameras. NMDOT has deployed none and has. As a result, the State has no data to determine design effectiveness. Anticipated Benefits • Better understanding of the comparative effectiveness of wildlife crossing designs; • Improved highway safety as research results are implemented in future projects; • Reduced WVCs and carcasses on roadways; and • Increased wildlife habitat connectivity and genetic diversity. **Advocate/Sponsor:** Environmental Bureau **Project Control Number:** R920050 **Project Amount FFY21:** $171,000 **Project Amount FFY22:** $171,000 **Project Manager:** Staff Manager
15	TRB Annual Dues - 100% Federally Participating • Estimate $104,000 – FFY21 • Estimate $104,000 – FFY22

Chapter 6 – SPR Part A Projects in Other Areas of NMDOT

The Multimodal Planning and Programs and Data Management Bureaus of the Planning Division (PD) use approximately $1 million annually of the SPR Part A funds for operations and training; $680,000 (federal) is allocated annually to the Regional Transportation Planning Organizations (RTPOs). The remaining funds total approximately $5 million (federal) per year. Beginning in FFY2020, the PD issued a call for SPR funded projects as part of developing the two-year PWP. Applications were reviewed by an internal committee which selected projects related to further studying or implementing a goal, strategy, or objective within NMDOT's LRSTP—currently the 2040 Plan. The projects, along with information on project manager and NMDOT area, are listed in the "FFY21-22 PWP Spreadsheet" which is Attachment A of this PWP.

Attachments

Attachment A - "FFY21-22 PWP Spreadsheet"

Attachment B – MPO UPWPs

Attachment C – RTPO RWPs