Steve Sisolak, Governor of Nevada

State Planning & Research Annual Work Program

Nevada Department of Transportation Planning Division Federal Fiscal Year 2023

SPR-PL-0001(058) (TBD)

Kristina Swallow, P.E., Director

1263 South Stewart Street, Carson City, Nevada 89712

Introduction

This State Planning and Research (SPR) Program for Federal Fiscal Year (FFY) 2023 has been prepared to outline the planning and research activities for the Nevada Department of Transportation (NDOT). The SPR program aims to define the continuing, comprehensive, and coordinated transportation planning efforts that NDOT will facilitate within the upcoming federal fiscal year, October 1, 2022 – September 30, 2023. The SPR Annual Work Program (AWP) is required by federal regulation.

The work detailed in this SPR AWP informs decisions through expertise and innovation in planning, policy, data, analysis, and research services to support a sustainable and integrated statewide multimodal transportation system. It supports performance-based decisions based on sound data and planning processes and ensures Nevada's residents and visitors have a safe and connected multimodal transportation system.

The SPR program proposal is divided into two sections. The first, *Part I - Planning*, outlines the planning activities for which NDOT undertakes. The second, *Part II - Research*, outlines the important research studies the NDOT will oversee.

Overview of the State Planning & Research (SPR) Program

The State Planning and Research (SPR) Program is a congressionally authorized and appropriated program that funds statewide transportation planning and research activities. The funds are used to establish a cooperative, continuous, and comprehensive ('3Cs') planning framework for making transportation investment decisions and to carry out transportation research activities throughout each State. These federal funds assist states in meeting their planning objectives in correlation with Federal Transit Administration (FTA) and Federal Highway Administration (FHWA) regulations and guidance.

The SPR Program reflects the partnership between the federal and state governments for the statewide transportation planning process as the primary mechanism for collaborative transportation decision-making throughout the State. Federal transportation programs require coordinating statewide planning with metropolitan planning, statewide trade/ economic development planning activities, and related multi-state planning efforts.

The Planning Division within the NDOT is made up of several program areas that all play essential roles in the Department's planning objectives and have the goal of meeting federally mandated planning, research, and data collection requirements. The SPR program tasks are implemented by appropriate planning program areas based on the responsibility of work and organization. While each proposed planning initiative may fall within the responsibility of a specific program area, there is synergistic collaboration throughout the planning division, ensuring that essential transportation planning goals are met.

The provisions of 23 U.S.C. 135, 23 U.S.C. 150, and 49 U.S.C. 5304, as amended, require each State to carry out a continuing, cooperative, and comprehensive performance-based statewide multimodal transportation planning process, including the development of a long-range statewide transportation plan and State Transportation Improvement Program (STIP).

Planning Emphasis Areas

In the letter dated December 30, 2021, the FHWA provided clarity regarding existing requirements for Planning Emphasis Areas (PEAs) for use in the development of Metropolitan and Statewide Planning & Research Work Programs. This section will summarize the incorporation of the PEAs into the 2023 SPR AWP for the Nevada Department of Transportation.

Tackling the Climate Crisis – Transition to a Clean Energy, Resilient Future
To "*help achieve the national greenhouse gas reduction goals of 50-52% below 2005 levels by 2030, and net-zero emissions by 2050, and increase resilience to extreme weather events and other disasters resulting from the increasing effects of climate change*", the Department includes considerations in their planning processes for tackling the climate crisis. Through 3609 Alternative Fuel Corridors, 3611 Climate Planning, 3616 Emerging Technology and Innovation, 3970 Corridor Planning, 3602

Tribal Consultation, 3955 County Consultation, 3961 Public Transportation Planning, 3613 Multistate Coordination & Planning, and 3957 Nevada MPO/RTC Coordination, the Department includes considerations to accelerate the transition toward electric and other alternative fueled vehicles, to plan for a sustainable infrastructure system, and considerations to prepare for, and adapt to, the impacts of climate change.

Equity and Justice40 in Transportation Planning
In order to "*advance racial equity and support for underserved and disadvantaged communities*", the Department includes considerations in their planning processes to ensure equity and racial justice. Through 3679 Active Transportation Planning, 3970 Corridor Planning, 3602 Tribal Consultation, 3955 County Consultation, 3961 Public Transportation Planning, 3613 Multistate Coordination & Planning, and 3957 Nevada MPO/RTC Coordination, the Department includes considerations to ensure public involvement in the planning process and that plans and strategies reflect various perspectives, concerns, and priorities from impacted areas to advance racial equity and support for underserved and disadvantaged communities.

Complete Streets
In order to "*plan, develop, and operate streets and networks that prioritize safety, comfort, and access to destinations for people who use the street network*", the Department includes considerations in their planning processes for Complete Streets. Through 3679 Active Transportation Planning, 3970 Corridor Planning, 3602 Tribal Consultation, 3955 County Consultation, 3961 Public Transportation Planning, and 3957 Nevada MPO/RTC Coordination, the Department includes considerations not only for passenger vehicles, but also for pedestrians, bicyclists, transit users, micro-mobility users, freight, passenger vehicles, and future automated transportation needs in cooperation with the NV2X program.

Public Involvement
In order to "*ensure early, effective, and continuous public involvement*", the Department includes considerations in their planning processes in conjunction with our Public Information Office and Communications Division. Through 3679 Active Transportation Planning, 3970 Corridor Planning, 3602 Tribal Consultation, 3955 County Consultation, 3961 Public Transportation Planning, 3613 Multistate Coordination & Planning, and 3957 Nevada MPO/RTC Coordination, the Department includes considerations to promote and encourage meaningful public involvement by integrating in-person, virtual, multi-lingual, and accessible options for the public.

Strategic Highway Network (STRAHNET)/U.S. Department of Defense (DOD) Coordination
In order to "*coordinate with representatives from DOD in the transportation planning and project programming process*", the Department includes considerations in their planning processes for DOD coordination. Through 3970 Corridor Planning, 3602 Tribal Consultation, 3955 County Consultation, 3613 Multistate Coordination & Planning, and 3957 Nevada MPO/RTC Coordination, the Department works with MPOs, RTCs, and local agencies to coordinate with the DOD for infrastructure and connectivity needs for STRAHNET routes and public roads that connect to DOD facilities.

Federal Land Management Agency (FLMA) Coordination
In order to "*coordinate with FLMAs in the transportation planning and project programming process*", the Department includes considerations in their planning processes for FLMA Coordination. Through 3970 Corridor Planning, 3602 Tribal Consultation, 3955 County Consultation, 3613 Multistate Coordination & Planning, and 3957 Nevada MPO/RTC Coordination, the Department works with MPOs, RTCs, and local agencies to coordinate with FLMAs for infrastructure and connectivity needs related to access routes and public roads that connect to federal lands.

Planning and Environmental Linkages (PEL)
In order to ensure "*a collaborative and integrated approach to transportation decision-making that considers environmental, community, and economic goals early in the transportation planning process*", the Department includes considerations in their planning processes for PEL. Through 3614 Planning and Environmental Linkages, 3970 Corridor Planning, 3602 Tribal Consultation, 3955 County Consultation, 3613 Multistate Coordination & Planning, and 3957 Nevada MPO/RTC Coordination, the Department considers environmental, community, and economic needs early in the planning process and uses the information, analysis, and products developed during planning to inform the environmental review process to inform and improve project delivery timeframes.

Data in Transportation Planning

In order to "*address the emerging topics areas of data sharing, needs, and analytics*", the Department includes considerations in their planning processes for data sharing principles. Through 3603 Research Library, 3614 Planning and Environmental Linkages, 3609 Alternative Fuel Corridors, 3611 Climate Planning, 3616 Emerging Technology and Innovation, 3970 Corridor Planning, 3607 Roadway Inventory, 3660 Highway Performance Monitoring System, 3623 Continuous Traffic Counts, 3624 Short-Term Traffic Counts, 3627 Special Traffic Studies, 3602 Tribal Consultation, 3955 County Consultation, 3613 Multistate Coordination & Planning, 3957 Nevada MPO/RTC Coordination, and 3980 One Nevada Transportation Plan, the Department is continuing refinement of its data retention methods and ability to share data assets across multiple programs and agencies.

Acknowledgments

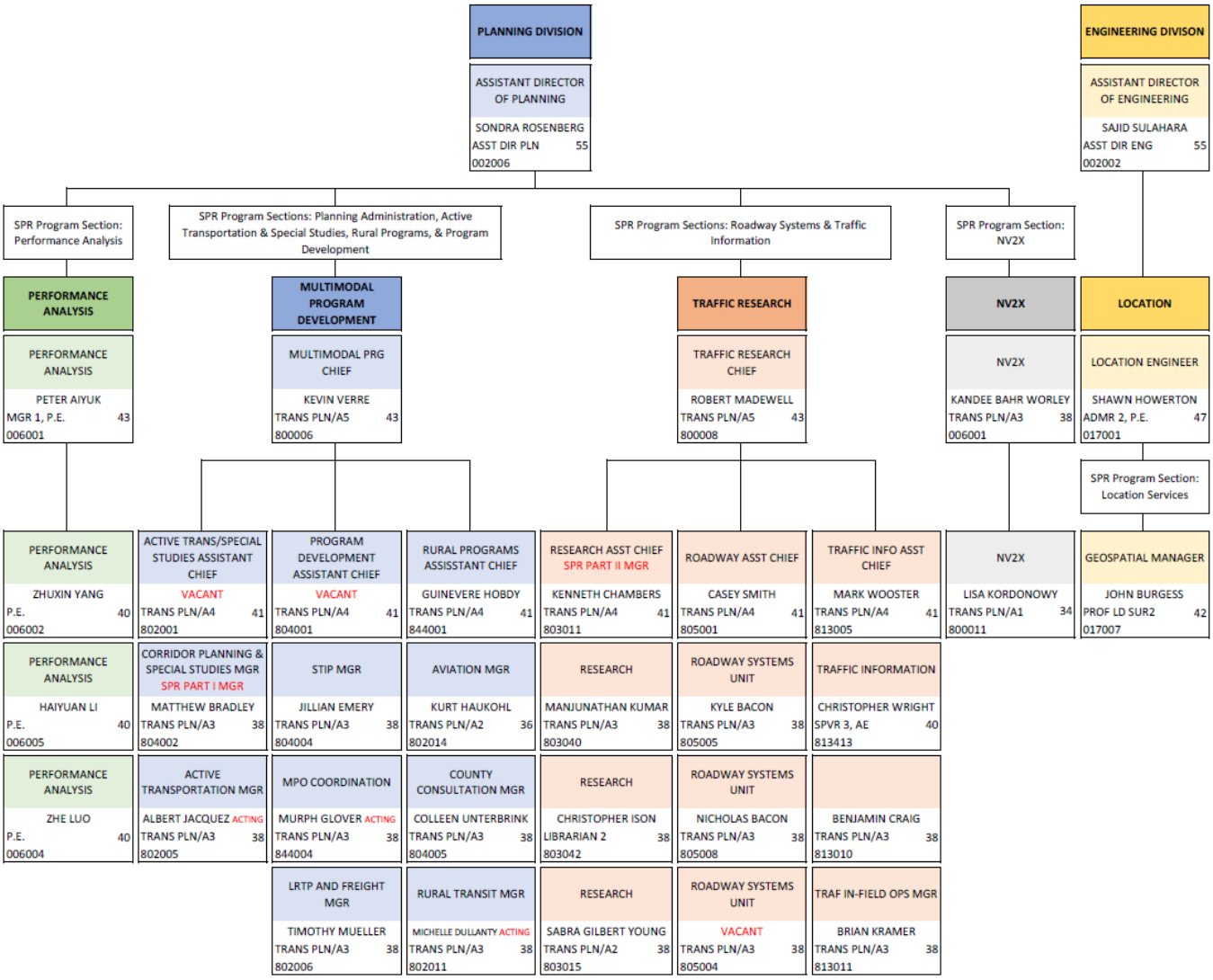
The State of Nevada Department of Transportation receives federal funding for the State Planning and Research (SPR) program through congressional authorizations and appropriations to the United States Department of Transportation (USDOT). Statewide and Metropolitan Planning funding is administered by the USDOT Federal Highway Administration (FHWA) through the FHWA – Nevada Division Office in Carson City and the Federal Transit Administration (FTA) through the FTA Region 9 Office in San Francisco, CA.

The State of Nevada Department of Transportation (NDOT) administers the SPR program through its Planning Division, Office of Multimodal Planning and Program Development.

Questions and inquiries about the NDOT SPR program may be addressed to:

Matthew Bradley
Corridor Planning & Special Studies Program Manager
Planning | Multimodal Program Development
Nevada Department of Transportation
o 775.888.7466 | f 775.888.7668
e mjbradley@dot.nv.gov| w dot.nv.gov

Planning Division Organization Chart



Part I: Program Budget Summary

Estimated Available FFY 2023 SPR Funding

Report: FMISW10A 05/04/22

2023 Apportionment

2023 Projected Apportionment (2021 federal allocation increased by 2%)	$6,684,463
2023 State Match	$1,671,116
Total FFY 2023 apportionment	$8,355,579

2021 Carryover

Statewide Planning MAP-21 EXT	$1,560,406
FTA state and Non-Metro PL Ext.	$269,190
Total Federal Carryover	$1,829,596
Total State Match	$457,399
Total Carryover	$2,286,995

Total Estimated Available FFY 2023 SPR Funding

	80%	$8,514,059
	20%	$2,128,515
		$10,642,573

FFY 2023 SPR Part I Budget and Pooled Funds Summary

Task	Activity	Title	Total Budget
		PLANNING ADMINISTRATION	
2301	1976	Internal Auditing - Federal	$5,400
2302	3601	Planning Program Management	$72,000
2303	3603	Research Library	$215,000
2304	3614	Planning and Environmental Linkages	$10,400
		Total Planning Administration Budget	**$302,800**
		NV2X	
2305	3609	Alternative Fuel Corridors	$322,300
2306	3611	Climate Planning	$274,900
2307	3616	Emerging Technology and Innovation	$130,900
		Total NV2X Budget	**$728,100**
		ROADWAY SYSTEMS	
2308	3607	Roadway Inventory	$264,000
2309	3608	Road Relinquishments -- Transfers	$45,200
2310	3610	Roadway Video and Lidar Imaging	$181,000
2311	3612	Mileposting	$93,700
2312	3653	Functional Classification & Boundary	$44,200
2313	3660	Highway Performance Monitoring System	$225,200
		Total Roadway Systems Budget	**$853,300**
		TRAFFIC INFORMATION	
2314	3623	Continuous Traffic Counts	$180,100
2315	3624	Short-Term Traffic Counts	$1,285,000
2316	3626	Vehicle Classification	$180,200
2317	3627	Special Traffic Studies	$112,650
2318	3632	Vehicle Weight	$270,050
2319	3982	Travel Demand Forecasting	$580,000
		Total Traffic Information Budget	**$2,608,000**
		PERFORMANCE ANALYSIS	
2320	3644	Fuel Tax Revenue Management	$197,500
2321	3650	Performance Management	$1,267,500
2322	3651	Mandated Reports	$70,000
2323	3655	Benefit-Cost Studies	$72,500
2324	3656	State Highway Preservation and Reporting	$45,000
2325	3659	Innovative Planning	$172,500
2326	3860	Alternative Funding (VMT)	$55,000
2327	3863	Nevada Construction Cost Study	$9,000
		Total Performance Analysis Budget	**$1,889,000**

FFY 2023 SPR Part I Budget and Pooled Funds Summary (continued)

ACTIVE TRANSPORTATION			
2328	3679	Active Transportation Planning	$419,500
2329	3970	Corridor Planning Program	$451,500
		Total Active Transportation Budget	**$871,000**

RURAL PROGRAMS			
2330	3602	Tribal Consultation	$161,750
2331	3955	County Consultation	$229,750
2332	3961	Public Transportation Planning	$157,270
		Total Rural Programs Budget	**$548,770**

PROGRAM DEVELOPMENT			
2333	3613	Multistate Coordination & Planning	$162,600
2334	3690	Freight Transportation Planning	$498,500
2335	3957	Nevada MPO/RTC Coordination	$149,000
2336	3979	eSTIP Consultant Support	$364,000
2337	3980	Statewide Long-Range Planning	$1,307,000
2338	3984	STIP / Work Program	$183,600
2339	3985	State Rail Plan Update	$0
2340	3997	Scenic Byway Program	$31,500
		Total Program Development Budget	**$2,696,200**

LOCATION SERVICES			
2341	3617	SPR Mapping	$180,000
2342	3728	Imagery	$4,500
		Total Location Services Budget	**$184,500**

Total FFY 2023 SPR Part I Budget	**$10,681,670**

POOLED FUNDS			
2337	3980	SPR Part I Pooled Funds TPF-5(456)	$5,000
		Total Part I Pooled Funds Budget	**$5,000**

Total FFY 2023 SPR Part I Pooled Funds	**$5,000**

Part I: Program Sections

Planning Administration

1976 Internal Auditing – Federal

TASK 2301
ACTIVITY 1976
OPERATIONAL SECTION Planning Administration
PROGRAM MANAGER Matt Bradley

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	5,400
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**4,320**
State (20%)	**$**	**1,080**
Total Requested Amount	**$**	**5,400**

PARTICIPATING AGENCIES FHWA, NDOT
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE
Provide internal auditing services for SPR program-funded agreements on an as-needed basis.

PLANNING EMPHASIS AREAS
- None

PREVIOUS RELATED WORK
- Annual, continuous, and ongoing activity

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS
- Internal auditing activities for SPR program-funded agreements on an as-needed basis.

3601 Planning Program Management

TASK	2302
ACTIVITY	3601
OPERATIONAL SECTION	Planning Administration
PROGRAM MANAGER	Matt Bradley

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	72,000
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**57,600**
State (20%)	**$**	**14,400**
Total Requested Amount	**$**	**72,000**

PARTICIPATING AGENCIES	FHWA, NDOT
FINANCIAL RESPONSIBILITY	FHWA, NDOT
FUNCTIONAL RESPONSIBILITY	NDOT

PURPOSE AND SCOPE

Provide technical and policy review of the Statewide Planning and Research Program (SPR). The Transportation Planning Advisory Committee (TPAC) will advise, solicit input, and interact with NDOT's Planning management team and staff on issues that affect transportation planning in Nevada.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Annual, continuous, and ongoing activity

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Ensure program compliance with federal, state, and local regulations
- Program development, oversight, refinement, reconciliation, and reporting, including FHWA Planning Emphasis Areas
- Collaborate with, and provide technical assistance to, the Planning Division
- Administration of Planning On-Call Program
- Compilation, review, and submission of Q4/Final report
- Schedule SPR Spring Meetings
- TPAC Q1 meeting
- Compilation, review, and submission of Q1 reports
- Provide Stewardship Performance Measures to Performance Analysis
- Conduct March Spring Meeting to discuss draft budgets and new unfunded needs for FFY 2024 SPR AWP
- TPAC Q2 meeting
- Compilation, review, and submission of Q2 reports
- Conduct April Spring Meeting to discuss draft budgets and draft activity tasks for FFY 2024 SPR AWP
- Conduct May Spring Meeting to discuss final budgets and final task edits for FFY 2024 SPR AWP
- Review and acceptance of final budget and task pages for FFY 2024 SPR AWP

- Preparation of draft FFY 2024 SPR AWP
- Review and approval of draft FFY 2024 SPR AWP by NDOT Executive Leadership Team (may include FHWA)
- Submission of Final SPR AWP to FHWA for review and approval
- TPAC Q3 meeting
- Schedule SPR funds
- Program Funds for Approved SPR AWP
- Publish FHWA-Approved FFY 2024 SPR AWP
- TPAC Q4 Meeting

3603 Research Library

TASK	2303
ACTIVITY	3603
OPERATIONAL SECTION	Planning Administration
PROGRAM MANAGER	Mitch Ison & Ken Chambers

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	90,000
Travel	$	-
Operating	$	125,000
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**172,000**
State (20%)	**$**	**43,000**
Total Requested Amount	**$**	**215,000**

PARTICIPATING AGENCIES	FHWA, NDOT, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY	FHWA, NDOT
FUNCTIONAL RESPONSIBILITY	NDOT

PURPOSE AND SCOPE

To provide access to the highest quality information possible regarding all facets of the transportation industry to all members of the Nevada Department of Transportation (NDOT), the Federal Highway Administration (FHWA), the Local Technical Assistance Program (LTAP), state and local governments, Nevada academic institutions, and the public. Information will be provided in research reports, monographs, periodicals, and reference materials. The Research Librarian is responsible for library operations, including:

- Maintaining a collection of library resources in print and electronic format
- Compiling usage records
- Assisting users seeking information on specific subjects
- Ensuring all incoming material is properly cataloged
- Monitoring and evaluating available materials for possible acquisition to ensure state-of-the-art research information is available for use.

PLANNING EMPHASIS AREAS

- Data in Transportation Planning

PREVIOUS RELATED WORK

- Managed ASTM Compass database subscription
- New reference materials were added to the collection
- Managed AASHTO electronic publications, including making publications available to NNDOT staff
- Additional electronic publications added to the NDOT website
- NDOT research reports are cataloged and made available in several places
- NDOT participation in the third iteration of the Library Pooled Fund project
- Assisted NDOT staff doing library research

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Continue developing and updating library collection
- Circulation of print materials

- Providing access to other library collections through interlibrary loan
- Cataloging and processing of new materials in accordance with Library of Congress standards
- Maintaining library's web-based catalog
- Updating library holdings in the international OCLC WorldCat database
- Promoting library services through the library website, intranet site, and email updates
- Continued stewardship of electronic databases, AASHTO publications, and other electronic resources
- Representing NDOT in the national library community
- Travel and training to support activities identified in this task *(travel funded outside of SPR Part I)*
- **Travel may be necessary to complete the activities within this task.**

3614 Planning & Environmental Linkages

TASK	2304
ACTIVITY	3614
OPERATIONAL SECTION	Planning Administration
PROGRAM MANAGER	Kevin Verre

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	5,400
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	5,000
Equipment	$	-
Federal (80%)	**$**	**8,320**
State (20%)	**$**	**2,080**
Total Requested Amount	**$**	**10,400**

PARTICIPATING AGENCIES	FHWA, NDOT
FINANCIAL RESPONSIBILITY	FHWA, NDOT
FUNCTIONAL RESPONSIBILITY	NDOT

PURPOSE AND SCOPE

Update guidelines and checklists to consider environmental, community, and economic needs early in the planning process. Use the information, analysis, and products developed during planning to inform the environmental review process to inform and improve project delivery timeframes. Updated guidelines will be tailored towards applicable NDOT and partner agency/stakeholder needs.

PLANNING EMPHASIS AREAS

- Planning and Environmental Linkages (PEL)
- Data in Transportation Planning

PREVIOUS RELATED WORK

- Development of Project Initiation Form (2014)
- Planning and Environment Linkages document and checklist (FY 2013)
- Project Development and Scoping Guidelines (2008)

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Task order development and onboarding of consultant to augment Department staff in updating/improvement of the PEL process, guidelines, and checklist
- Utilize developed PEL document on relevant planning studies
- Evaluate the effectiveness of the document/checklist
- Provide information on the PEL document/checklist to MPOs and other partners for their use
- Coordinate with One Nevada implementation process
- Provide sufficient support to each MPO to deliver statewide planning consistency to help better inform RTPs/long-range plan.
- **Travel may be necessary to complete the activities within this task.**

3609 Alternative Fuel Corridors

TASK 2305
ACTIVITY 3609
OPERATIONAL SECTION NV2X
PROGRAM MANAGER Kandee Bahr Worley

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	64,800
Travel	$	7,500
Operating	$	-
Capital Outlay (Consultant)	$	250,000
Equipment	$	-
Federal (80%)	**$**	**257,840**
State (20%)	**$**	**64,460**
Total Requested Amount	**$**	**322,300**

PARTICIPATING AGENCIES FHWA, NDOT, Governor's Office of Energy, Joint Office, MPOs
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

Alternative fuel vehicles will be promoted in Nevada through the alternative fuel vehicles program, aligning resources and expertise. As part of the program, electric vehicle chargers, zero-emission fueling infrastructure, and zero-emission transit and school bus research will be researched, planned, and deployed. The program will involve the adoption of alternative fuel vehicles, the reduction of emissions, and the creation of jobs for disadvantaged communities. Currently, the state is working on the required NEVI plan and following the standards provided by the Joint Office. We are conducting research and planning to establish an interconnected network to facilitate data collection, access, and reliability of electric vehicles.

PLANNING EMPHASIS AREAS

- Tackling the Climate Crisis – Transition to a Clean Energy, Resilient Future
- Data in Transportation Planning

PREVIOUS RELATED WORK

- Develop strategies for statewide electric vehicle charging infrastructure. The goal is to have the FHWA designate most of Nevada's roads as highways.
- Building capacity for alternative fuel vehicles in the western portion of the United States in partnership with key stakeholders and other states.
- Develop a five-year strategy and statewide plan for obtaining FHWA approval to access NEV infrastructure funds.
- Working with state utility providers to determine grid acceptance and needs.
- Identifying alternative fuel corridor project needs.
- Develop a vision for public outreach and education in the state.

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Field review of possible routes to identify sites where alternative fuels could be used
- Coordinate with the Joint Office the progress of the NEVI funds

- Plan and produce outreach materials with internal and external members.
- Bi-monthly meetings with key stakeholders for progress reporting and plan adjustments
- Continued development of the NEVI plan for the next four years. Our plan will meet the standards set by the Joint Office, but the targets will change annually.
- **Travel will be necessary to complete the activities within this task.**

3611 Climate Planning

TASK 2306
ACTIVITY 3611
OPERATIONAL SECTION NV2X
PROGRAM MANAGER Kandee Bahr Worley

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	23,400
Travel	$	1,500
Operating	$	-
Capital Outlay (Consultant)	$	250,000
Equipment	$	-
Federal (80%)	**$**	**219,920**
State (20%)	**$**	**54,980**
Total Requested Amount	**$**	**274,900**

PARTICIPATING AGENCIES USDOT, FHWA, FTA, NDOT, NDEP
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

For transportation to be greenhouse gas (GHG) emission-free, various strategies will probably be needed, including reducing vehicle miles traveled, focusing on zero-emission vehicles, and improving public transportation and perception. As GHG levels are reduced, air quality will improve, and climate change will be slowed. To achieve long-term sustainability of social, economic, and environmental systems, we must make long-term strategic decisions. The research and planning process will focus on identifying Nevada's short, medium, and long-term priorities to meet the state's goals. Analyze the most effective and cost-effective ways to reduce fossil fuel consumption. Statewide reductions in greenhouse gas emissions will be achieved by educating and engaging stakeholders. There will be a focus on identifying and expanding the sources of renewable fuels in the region.

PLANNING EMPHASIS AREAS

- Tackling the Climate Crisis – Transition to a Clean Energy, Resilient Future
- Data in Transportation Planning

PREVIOUS RELATED WORK

- This is a new initiative that NDOT planning will set focus on meeting new standards set by government regulations.

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Ensure consideration of long-term sustainable goals is better incorporated into public policy and decisions regarding transportation.
- Advance research on changing how we travel and transport goods using lower-carbon fuels
- Develop a statewide education program for steps of Eco-Driving
- Identify the various modes of transportation and contribution to climate change
- Build a carbon reduction state plan
- Identify and use technologies and strategies that can be used to reduce GHG emissions in planning
- Use technologies and strategies, develop monitoring data needs, and report building to submit changes in carbon reduction numbers
- **Travel will be necessary to complete the activities within this task.**

3616 Emerging Technology & Innovation

TASK	2307
ACTIVITY	3616
OPERATIONAL SECTION	NV2X
PROGRAM MANAGER	Kandee Bahr Worley

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	27,900
Travel	$	3,000
Operating	$	-
Capital Outlay (Consultant)	$	100,000
Equipment	$	-
Federal (80%)	**$**	**104,720**
State (20%)	**$**	**26,180**
Total Requested Amount	**$**	**130,900**

PARTICIPATING AGENCIES	FHWA, NDOT
FINANCIAL RESPONSIBILITY	FHWA, NDOT
FUNCTIONAL RESPONSIBILITY	NDOT

PURPOSE AND SCOPE

The information about conventional transportation technologies is quite abundant. Some technologies are operational, while others are under development, and some are still in the conceptual stage. The innovation team intends to serve as an information resource for NDOT planning. The development of transportation systems statewide to provide more efficient and effective service delivery, including the use of technology and enhancement of technology capability.

PLANNING EMPHASIS AREAS

- Tackling the Climate Crisis – Transition to a Clean Energy, Resilient Future
- Data in Transportation Planning

PREVIOUS RELATED WORK

- Collaborate with the Traffic Operations team by understanding, implementing, and utilizing the new technologies and aligning them with existing activities.
- An NDOT-specific hype cycle is developed.
- Actively researching smart mobility strategies and their relevance and functionality statewide. We are working with partner agencies to develop tools and concepts that will improve the efficiency and safety of travel in Nevada.
- Identify best practices and coordinate statewide changes, prioritizing safety as the top priority.
- To minimize barriers to innovation in transportation while maximizing travel convenience and mobility between neighboring states.

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Advocate for bringing smart growth practices to all Nevadan communities.
- Create an innovation roadmap. We will promote the deployment of innovative products within our infrastructure in a timely manner. We will prioritize solutions for reform.
- Incorporate new technologies into transportation policies and practices that advance environmental sustainability and foster equitable economic development.
- Communication with partners and stakeholders remains a priority, even beyond the agency. Monitor autonomous ride-hailing services being tested in Las Vegas.

- Continual research into the implementation of innovative technologies in the U.S. and internationally through webinars, meetings, and the TRB.
- Create a collaborative atmosphere and culture within the organization for intelligent transportation planning. Encourage the breaking down of administrative silos between agencies.
- Developing and deploying new and innovative ideas, practices, and approaches.
- **Travel will be necessary to complete the activities within this task.**

3607 Roadway Inventory

TASK 2308
ACTIVITY 3607
OPERATIONAL SECTION Roadway Systems
PROGRAM MANAGER Kaitlin Cortes/Kyle Bacon/Casey Smith

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	216,000
Travel	$	8,000
Operating	$	-
Capital Outlay (Consultant)	$	40,000
Equipment	$	-
Federal (80%)	**$**	**211,200**
State (20%)	**$**	**52,800**
Total Requested Amount	**$**	**264,000**

PARTICIPATING AGENCIES FHWA, NDOT, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

Inventories are maintained to provide a variety of roadway statistics. These inventories support management systems, including the addition and deletion of State routes, pavement management, asset management system, and the Highway Performance Monitoring System (HPMS) (23CFR, Part 420.105(b)). The inventories are used to support the statewide Geographic Information Systems (GIS) road centerline geometries, public road mile certification (23CFR, Part 460), and the development of Annual Vehicle Miles of Travel. In addition, this task is used for the submission of federal-aid highway system actions per 23CFR, Part 40, including interstate route designations, National Highway System (NHS) designations, National Truck Network designations, Indian reservation roads designations, and American Association of State Highway and Transportation Officials US route numbering actions. The Roadway Inventory activity also supports state highway system designation per NRS 408.285.

PLANNING EMPHASIS AREAS

- Data in Transportation Planning

PREVIOUS RELATED WORK

- Approximately 1,045 GIS road inventory updates were completed.
- The 2022 annual publication of The State Maintained Highways of Nevada was completed, and over 400 copies were distributed.
- 55 public and/or interagency road research requests were completed.
- Road inventory changes have been submitted to the Federal Systems section and documented in the HPMS attribute tables.

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Review, maintain and manage the State maintained road inventory to include processing As-Builts, retracements, new construction alignments, Right-Of-Way transactions, and Quality Control edits.
- Update and maintain road inventory data in the State Maintained Highways of Nevada hard copy and online

database.

- Administer and manage the State System route designations, including AASHTO approvals, assigning new route designations, recording route information, and Route Master edits.
- Research, document, and submit road history data to the NDOT Records Management office in accordance with the Public Records Act (NRS 239), and provide road history data to interagency personnel and outside entities as requested.
- Road inventory audits include frequent travel, discussions, and meetings with the City and County entities related to the public road mileage.
- Annual publication of *"The State Maintained Highways of Nevada"* and accurately documented the road inventory data.
- Prepare and submit AASHTO applications, document route designation changes in the Route Master, and electronic and hard copy files.
- Respond to road history research requests in a timely manner and as outlined in the NDOT Public Records guidelines.
- Schedule travel and road audit meetings and accurately document the road inventory data. Maintain the public road mile records.
- Locate, identify and list Indian/Tribal roads from start to finish measures that are state-owned within Nevada. Consultant to be paid from On-Call consultant agreement. Expected products from this are an updater and final report listing all Nevada state-owned roads approved for the IRR program (Indian Reservation Roads) for verification of public road miles reported by the FHWA.
- **Travel will be necessary to complete the activities within this task.**

3608 Road Relinquishments & Transfers

TASK 2309
ACTIVITY 3608
OPERATIONAL SECTION Roadway Systems
PROGRAM MANAGER Mark Wooster/Casey Smith

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	-
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**-**
State (20%)	**$**	**-**
Total Requested Amount	**$**	**-**

PARTICIPATING AGENCIES FHWA, NDOT, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

The State of Nevada has an active and aggressive Road Relinquishment/Transfer program. Transfers occur between the State and Local Governments which include Incorporated Cities and Counties. Nevada State Regulation NRS408.527 mandates the process for opening discussions, reviewing roads, and completing the road relinquishment process between agencies. Currently, these roads are accounted for in the annual Road Certification Mileage required under C.F.R. Title 23, Parts 460.1-460.3 and U.S.C. 23, Chapter 4, Section 402(c). Additionally, when these roads are transferred, they are reviewed for possible changes to the Federal Road Classification designation required under 23 CFR, Part 470.105 and further go through a process of removal from the State's Asset Management plan under MAP 21.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- SR147, Lake Mead Blvd in North Las Vegas was transferred in FY2022
- SR 574, Cheyenne-US95 to Decatur and SR596, Jones-Aberdeen to Smoke Ranch were transferred to the City of Las Vegas In FY2022
- SR613, Summerlin Parkway was transferred to the State from the City of Las Vegas in FY2022.
- IR215, Warm Springs to Stephanie was transferred to the State from Clark County in FY2022.
- FRWA49, Damonte Ranch Parkway, S. Virginia to Double R was transferred to the City of Reno in FY2022.
- Negotiations were opened with the City of Henderson for SR582, Boulder Highway in the corporate limits of the City of Henderson in FY2022.
- Offer to open discussions with the City of North Las Vegas for SR574, Cheyenne, Decatur to Pecos was made in FY2022.
- Discussions were opened with Washoe County for SR671 (Holcomb Ranch Road from South Virginia to Lakeside, Lakeside Road from Holcomb Ranch Road to Huffaker, and Huffaker Road, from Lakeside to Delmonte Lane.

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Initiate discussions and negotiate with local governments to transfer roads between agencies.

- Make the appropriate administrative changes to the state road inventory.
- Reconcile the relinquished mileage with the certified public road miles.
- Road Inventory audits include frequent travel, discussions/meetings with local governments, and field verifications related to road transfers.
- Some State roads will be acquired, and some will be transferred.
- Changes in the road inventory will be reflected in the Mile Post index, Route Master, ESRI line work, and annual publications.
- Scheduled travel and road audit meetings to accurately document the road inventory for transfer will be needed. Transfer data will be documented and saved.
- **Travel will be necessary to complete the activities within this task.**

3610 Roadway Video & Lidar Imaging

TASK 2310
ACTIVITY 3610
OPERATIONAL SECTION Roadway Systems
PROGRAM MANAGER Kyle Bacon/Casey Smith

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	171,000
Travel	$	10,000
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**144,800**
State (20%)	**$**	**36,200**
Total Requested Amount	**$**	**181,000**

PARTICIPATING AGENCIES FHWA, NDOT, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

Video and Lidar imagery (VLI) provides the department and other agencies with current and historic roadway imaging data for 1) State maintained roadways and 2) Local roads that receive Federal Aid (defined as roads functionally classified from FC 1 to FC 5 plus Urban Minor Collectors). Collected imagery data also provides a resource for geospatial asset data collection and accurate measurements of roadway features from the desktop.

Imagery data allows departmental personnel to view and analyze roadway conditions, characteristics, assets, and other objects. Using powerful viewer and analyzing software applications - the need for travel, interruption of service to the traveling public, and staff exposure to the safety hazards of conducting these activities in the field – are significantly reduced. This data is relied upon for approximately 50% of the HPMS (23 CFR, Part 420.105(b)) data requirements and 25% for Asset Management now required by MAP 21.

Funding for this fiscal year will be used to collect and process data from NDOT's VLI Data Collection vehicle. The data will then be post-processed, reviewed (QA/QC), and uploaded into NDOT's existing Mandli 'Roadview Explorer' and 'Workstation' applications. Collection for FY 2023 will focus on completing state-maintained roads and may include some important local route updates previously collected, as well as specific requests from other divisions. (Collection is planned on a rotational basis for state routes and other routes on a Tri-annual basis).

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Road video images have been collected in Carson City, Clark, Churchill, Douglas, Esmeralda, Humboldt, Lander, Lyon, Mineral, Nye, Storey, Washoe, and White Pine Counties.
- Data was updated and entered for the HPMS and Asset Management programs.
- Over 550 routes were video logged, and the data was uploaded to Roadview Explorer.
- The review of program procedures and the 3-year rotation schedule for functionally classified roads is ongoing.
- Data was collected, reviewed, and updated on all Federal-Aid functionally classified roads and will be used for HPMS

requirements, Roadview Explorer, and maps.

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Collect video images on all State maintained and functionally classified roads throughout Nevada.
- Provide VLI training and support to NDOT staff as needed.
- Maintain Mandli Workstation license records and ensure program compliance.
- Schedule travel related to the VLI program.
- Create a forward-facing software interface for the public to utilize our road imagery and lidar data.
- Continue extraction of road assets from collected data and imagery and continue to create a maintainable methodology for NDOT divisions to own and maintain respective extracted data, current and moving forward.
- **Travel will be necessary to complete the activities within this task.**

3612 Mileposting

TASK 2311
ACTIVITY 3612
OPERATIONAL SECTION Roadway Systems
PROGRAM MANAGER Kaitlin Cortes/Casey Smith

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	92,700
Travel	$	1,000
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**74,960**
State (20%)	**$**	**18,740**
Total Requested Amount	**$**	**93,700**

PARTICIPATING AGENCIES FHWA, NDOT, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

The Milepost Program provides office and field reference by providing a linear reference system for roadway-related data management on state-maintained highways. Mileposting is currently utilized for data collection and histories in the Pavement Management System, Maintenance Management System, right-of-way descriptions, encroachment permitting, construction contract Title Sheets, and crash data location, to name a few. Mileposts are also utilized by emergency response and law enforcement. This activity supports HPMS data collection requirements per 23CFR, Part 420.105(b), and assists with compliance with MUTCD guidelines and NRS 408.285.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Over 400 edits were made to the Milepost Index and Route Master.
- 50 Milepost Panel location requests for new projects were completed.
- 30 Enhanced milepost panels were requested for Interstate, US, and State routes.
- 70 Electronic Title Sheet and Location Sketch reviews were completed.
- 25 As-Built reviews were completed.
- ARCADIS has been working on the new Milepost Index and Route Master platforms.
- A reconciliation of the mileage in the State Maintained Highways of Nevada publication and the Milepost Index was completed.

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Review, maintain and manage the Milepost Index, ensure that the panel locations are accurate, engineer stations are current, and descriptions are accurate.
- Review, process, and document milepost panel requests, milepost panel replacements, and Title Sheet/Location Sketch reviews. Notify emergency response personnel when major changes have occurred to the milepost panel locations.
- GPS and mark milepost panel locations as requested by NDOT maintenance supervisors and district Engineers.

- Schedule travel to verify the accuracy of milepost panels and GPS locations.
- Research, document, and submit milepost history data to the NDOT Records Management office in accordance with the Public Records Act (NRS 239), and provide milepost history data to interagency personnel and outside entities when requested.
- Milepost Index accuracy to include current milepost locations, engineer stations, and route descriptions. Annual archival of the Milepost Index, publication on the NDOT SharePoint and Internet site.
- Timely review and approval of milepost panel replacements and milepost panel location requests. Notify emergency response personnel when major changes have occurred to the Milepost program.
- Complete research requests promptly and accurately document all records.
- Schedule travel and document GPS data.
- Provide responses to milepost panel history requests in a timely manner and accurate documentation of the results.
- **Travel will be necessary to complete the activities within this task.**

3653 Functional Classification & Boundary

TASK 2312
ACTIVITY 3653
OPERATIONAL SECTION Roadway Systems
PROGRAM MANAGER Nick Bacon/Casey Smith

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	43,200
Travel	$	1,000
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**35,360**
State (20%)	**$**	**8,840**
Total Requested Amount	**$**	**44,200**

PARTICIPATING AGENCIES FHWA, NDOT, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

All roadways statewide are cooperatively categorized, with local transportation officials and the FHWA, according to the trade-off between mobility and access per 23 CFR, Part 470.105. Functional classification of highway systems provides a basis for determining federal-aid eligibility and apportionment of Federal Highway funds. This activity also cooperatively establishes urbanized boundaries statewide, building on boundaries established by census data.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Functional Classification map reviews are ongoing and updated as needed.
- Urban boundary reviews are ongoing.
- A functional classification update was made to SR304 in Lander County, to extend the functional classification 5 to the end of the route.
- Road functional classification is being handled using remote meetings and the eventual creation of an application to allow local entities to download, verify and submit changes to their functional classification.

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Review existing functional classification maps for corrections and ensure the maps comply with the 10-year review requirement.
- Maintain and update spatial urban boundary data for the annual HPMS submittal.
- Perform ongoing functional classification reviews and accurately document the functional classification data.
- Schedule local government meetings related to urban boundaries and functional classification changes.
- Work on the development of an application to allow outside agencies to view current functional classification.
- **Travel will be necessary to complete the activities within this task.**

3660 Highway Performance Monitoring System

TASK 2313
ACTIVITY 3660
OPERATIONAL SECTION Roadway Systems
PROGRAM MANAGER Nick Bacon/Casey Smith

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	223,200
Travel	$	2,000
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**180,160**
State (20%)	**$**	**45,040**
Total Requested Amount	**$**	**225,200**

PARTICIPATING AGENCIES FHWA, NDOT, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

To provide the FHWA, NDOT, and the transportation community with essential data on highway condition, performance, usage, geometrics, etc., for all public roads statewide. This satisfies the reporting requirements set forth by 23 CFR, Part 42.105(b), within the guidelines and requirements defined by the Office of Highway Policy Information (OHPI).

PLANNING EMPHASIS AREAS

- Data in Transportation Planning

PREVIOUS RELATED WORK

- The 2021 (2020 data) HPMS data submittal was completed on time to the FHWA.
- HPMS sample adequacy is currently being reviewed.
- Multiple LRS edits were completed, and all event tables were updated on the changed routes.
- Work continues with local government agencies to develop a workflow collection plan for local road data.
- Continued workflow and Roads and Highways functionality.
- Completed the annual public road mile certification report and submitted it to FHWA.

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Annual HPMS data submittal and HPMS sample adequacy compliance.
- Update and maintain NDOT's LRS and linear event tables needed for HPMS submittal and continued roads and highways integration and functionality.
- Assist data partners in GIS-related issues and provide GIS data when requested.
- Prepare and submit the annual public road miles certification to FHWA.
- Prepare the annual vehicle miles of travel report.
- **Travel will be necessary to complete the activities within this task.**

3623 Continuous Traffic Counts

TASK 2314
ACTIVITY 3623
OPERATIONAL SECTION Traffic Information
PROGRAM MANAGER Mark Wooster

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	179,100
Travel	$	1,000
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**144,080**
State (20%)	**$**	**36,020**
Total Requested Amount	**$**	**180,100**

PARTICIPATING AGENCIES FHWA, NDOT, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

The purpose of the Continuous Traffic Counts Program is the development of seasonal factors used to expand short-term counts to Annual Average Daily Traffic (AADT). Continuous traffic count data provides monthly, daily, and hourly factors, as well as design hour volumes, directional splits, and seasonal trends.

Continuous count traffic statistics are used for populating the Federal Highway Performance Monitoring System (HPMS), Federal Highway's Travel Monitoring Analysis System (TMAS), and the State of Nevada's Pavement Management System (PMS) databases. Additionally, continuous count data are utilized in environmental studies, roadway design, urban and rural planning, and the development of the Vehicle Miles of Travel (VMT) Report. The continuous traffic counting program collects data statewide for rural and urban areas. The number and location of continuous count sites are based on the Federal Highway Administration's Traffic Monitoring Guide (TMG).

At the end of each calendar year, the continuous count data is compiled with the short-term count data to develop NDOT's Annual Traffic Report (ATR). The ATR has a summary page of statistical information regarding the traffic at each continuous count site. Maps are also provided in the ATR, and each short-term count site's factored AADT is also included.

PLANNING EMPHASIS AREAS

- Data in Transportation Planning

PREVIOUS RELATED WORK

- Annual, continuous, and ongoing activity

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Use Jackalope software to
    - calculate Annual Average Daily Traffic (AADT) statistics

    - calculate and update seasonal factors for the year
    - calculate hourly, daily, and monthly factors
    - calculate design hour (K) and directional (D) factors
- Update the Federal HPMS AADTs and K & D factors with information from the activities above.
- Submit traffic data monthly to Federal TMAS from continuous counters.
- Update the State of Nevada's PMS with AADTs from continuous counters.
- Update the State of Nevada's Traffic Information Access (TRINA) website with traffic statistics or continuous counters.
- Update the State of Nevada's Railroad Crossing Database System with AADTs for continuous counters.
- Supply current continuous counters' AADTs for use in the Nevada Traffic Accident Statistics Software.
- Supply current AADT items such as seasonal factors and traffic counts that may be from any point in time throughout the year to the Metropolitan Organization for updates to their Regional Travel Demand Models.
- Update the State of Nevada's Bridge Structure Database System with AADTs from continuous counters in such locations as continuous counters exist.
- Supply continuous counters AADTs for the development of the VMT Report.
- Purchase supplies to repair or replace continuous counters as needed and as the state budget allows.
- Data collection procedures are updated annually in the Nevada Department of Transportation's Traffic Monitoring System for Highways (TMS/H).
- Develop Nevada's Annual Traffic Report ATR Pages.
- Update FHWA's Traffic Volume Trends (TVT) Report.
- Process data from the new SR-160 continuous counter and other new volume data from various continuous counters.
- **Travel will be necessary to complete the activities within this task.**

3624 Short-Term Traffic Counts

TASK 2315
ACTIVITY 3624
OPERATIONAL SECTION Traffic Information
PROGRAM MANAGER Mark Wooster

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	765,000
Travel	$	15,000
Operating	$	5,000
Capital Outlay (Consultant)	$	500,000
Equipment	$	-
Federal (80%)	**$**	**1,028,000**
State (20%)	**$**	**257,000**
Total Requested Amount	**$**	**1,285,000**

PARTICIPATING AGENCIES FHWA, NDOT, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

Short-term count data provides Annual Average Daily Traffic (AADT) statistics used for populating the Federal Highway Performance Monitoring System (HPMS) and the State of Nevada's Pavement Management System (PMS) databases. Additionally, short-term count data are utilized in environmental studies, roadway design, urban and rural planning, and the development of the Vehicle Miles of Travel (VMT) Report. The short-term count program provides traffic volume statistics for all of Nevada's roadway systems. Short-term traffic counts are collected for all rural and urban areas.

PLANNING EMPHASIS AREAS

- Data in Transportation Planning

PREVIOUS RELATED WORK

- Annual, continuous, and ongoing activity

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Update the Federal HPMS AADTs for all short-term count sites.
- Update the State of Nevada's PMS AADTs for short-term count sites.
- Purchase an undisclosed number of short-term traffic counters as the state budget allows.
- Update the State of Nevada's Traffic Information Access (TRINA) website with traffic statistics for short-term count sites.
- Supply a special session of data for model calibration along a particular screen line AADTs to the Metropolitan Organization's Regional Travel Demand Models.
- Update the State of Nevada's Bridge Structure Database System with the Short-Term Count program where Short-Term counters exist.
- Update the State of Nevada's Railroad Crossing Database System with AADTs from short-term count sites.
- Supply current AADTs from short-term count sites for use in the Nevada Traffic Accident Statistics Software.
- Supply AADTs from short-term count sites for the development of the VMT Report
- Renew annual traffic data analysis software (Jackalope) license required for data processing.
- Data collection procedures for short-term sites are updated annually in the Nevada Department of Transportation's

Traffic Monitoring System for Highways (TMS/H)

- Nevada's Annual Traffic Report includes short-term count sites.
- Update Nevada's TRINA application to include statewide short-term traffic counts.
- Provide for a loop contract to repair non-functional short-term loop sites and add loops in new locations. Loop sites that fall into disrepair are either estimated (meaning that we do not have a traffic count for design, safety, or federal reporting), or they are collected with hose counters. Hose counts cost more material and expose NDOT personnel to significantly more time in the roadway to obtain the traffic count. Additionally, at many of these locations, it is not feasible to obtain a hose count.
    - These new loops sites will provide design data to support projects throughout the Department and local agencies statewide.
    - These new loops sites will provide greater data coverage for HPMS, MIRE, pavement analysis, and annual reporting.
- **Travel will be necessary to complete the activities within this task.**

3626 Vehicle Classification

TASK 2316
ACTIVITY 3626
OPERATIONAL SECTION Traffic Information
PROGRAM MANAGER Mark Wooster

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	178,200
Travel	$	2,000
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**144,160**
State (20%)	**$**	**36,040**
Total Requested Amount	**$**	**180,200**

PARTICIPATING AGENCIES FHWA, NDOT, Counties, & Local Public Agencies
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

The purpose of vehicle classification is to provide estimates of the composition of traffic by vehicle types. The classification counts provide design designation data in terms of Average Daily Traffic (ADT) Truck (T)% and Design Hour Volume (DHV) T%. The truck classification provides the percent of distribution by the various truck types to be matched with average weight by type to determine pavement base and surface requirements. Classification counts are also used in environmental assessments, pavement management programs, urban and rural transportation planning, Highway Performance Monitoring System (HPMS), Federal Highway's Travel Monitoring Analysis System (TMAS), and freight movement studies. This is a statewide program with counts in both rural and urban areas. The frequency and extent of coverage are based on the Federal Highway Administration's Traffic Monitoring Guide (TMG).

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Annual, continuous, and ongoing activity

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Calculate Annual Average Daily Truck (T%) Traffic statistics for use in HPMS and other annual reporting.
- Calculate Truck seasonal factors for use in HPMS and other annual reporting.
- Calculate DHV T% factors for use in HPMS and other annual reporting.
- Update the Federal HPMS truck traffic AADTs and K & D factors.
- Submit truck traffic data monthly to Federal TMAS.
- Update the State of Nevada's PMS truck traffic statistics.
- Supply current truck statistics to the Metropolitan Organization's Regional Travel Demand Models.
- Update the State of Nevada's Bridge Structure Database System with truck AADTs.
- Update the State of Nevada's Railroad Crossing Database System with truck AADTs.
- Supply current truck AADTs for use in the Nevada Traffic Accident Statistics Software
- Supply truck AADTs for the development of the VMT Report.

- Data collection procedures are updated annually in the Nevada Department of Transportation's Traffic Monitoring System for Highways (TMS/H).
- Produce the Vehicle Classification portion of Nevada's Annual Traffic Report.
- Update Federal Highway Administrations Traffic Volume Trends (TVT) Report with vehicle classification information.
- **Travel will be necessary to complete the activities within this task.**

3627 Special Traffic Studies

TASK 2317
ACTIVITY 3627
OPERATIONAL SECTION Traffic Information
PROGRAM MANAGER Mark Wooster

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	97,650
Travel	$	15,000
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**90,120**
State (20%)	**$**	**22,530**
Total Requested Amount	**$**	**112,650**

PARTICIPATING AGENCIES FHWA, NDOT, Statewide CPIMTU, & Local Public Agencies
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE
Provide special traffic information as needed to highway planners, engineers, top management, and other requesters. This data is used in developing speed studies, signal warrant studies, pedestrian studies, and various others.

PLANNING EMPHASIS AREAS
- Data in Transportation Planning

PREVIOUS RELATED WORK
- Signal warrant studies, passing sight distance studies, speed studies, curve speed studies, turning movement studies, delay studies, and pedestrian studies, as requested.

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS
- Conduct signal warrant studies.
- Conduct passing sight distance studies.
- Conduct speed studies.
- Conduct turning movement studies.
- Conduct delay studies.
- Conduct pedestrian studies.
- **Travel will be necessary to complete the activities within this task.**

Data collection procedures are updated annually in the NDOT's Traffic Monitoring System for Highways (TMS/H).

3632 Vehicle Weight

TASK 2318
ACTIVITY 3632
OPERATIONAL SECTION Traffic Information
PROGRAM MANAGER Mark Wooster

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	269,550
Travel	$	500
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**216,040**
State (20%)	**$**	**54,010**
Total Requested Amount	**$**	**270,050**

PARTICIPATING AGENCIES FHWA, NDOT
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

The purpose of the vehicle weight program is to provide truck weight and characteristics such as axle/gross vehicle weights, axle spacing, and vehicle dimensions for the statewide roadway network. Truck weights and related data are collected using Weigh-In Motion (WIM) systems. The data is used at the state and national levels in consideration of transportation policy, allocation of highway costs and revenue, size and weight regulations, the establishment of geometric design criteria, and a variety of special administrative, planning, design, and research studies. This is a statewide program with WIM systems in rural and urban areas. Frequency and extent of coverage are based on the Federal Highway Administration's Traffic Monitoring Guide (TMG).

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Revised NRS to match FAST Act.
- Quarterly Truck, Size, and Weight Quarterly Enforcement meetings established.
- Worked with NDOT's Multi-Modal Division on the Nevada State Freight Plan.
- Calibrated four WIM systems in Northern Nevada to ensure optimal accuracy of Nevada's truck weight data.

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Quarterly Truck Size and Weight meetings with NDOT, FHWA, NHP, and DMV.
- Completion of the required annual certification.
- Submit weight data quarterly to FHWA.
- Install WIM and truck weight and inspection infrastructure required for State Enforcement Plan (SEP) implementation.
- Provide monthly overweight reports to the Nevada Highway Patrol.
- Provide truck weight summaries to various counties, cities, and consultants.
- Data collection procedures are updated annually in the Nevada Department of Transportation's Traffic Monitoring System for Highways (TMS/H).

- Daily & monthly ESAL Reports.
- **Travel will be necessary to complete the activities within this task.**

3982 Travel Demand Forecasting

TASK 2319
ACTIVITY 3982
OPERATIONAL SECTION Traffic Information
PROGRAM MANAGER Mark Wooster

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	180,000
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	400,000
Equipment	$	-
Federal (80%)	**$**	**464,000**
State (20%)	**$**	**116,000**
Total Requested Amount	**$**	**580,000**

PARTICIPATING AGENCIES FHWA, NDOT, Counties, & Local Public Agencies
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

The purpose of this task is to conduct travel demand forecasting activities relevant to planning, transportation elements, and master plan development. This includes a review of consultant traffic modeling. The increased volume of recent projects (larger phased projects in particular) requires more time and more rounds of review per project. This activity also fulfills the oversight responsibilities outlined in the Stewardship Agreement between the Federal Highway Administration (FHWA) and NDOT for the Code of Federal Regulations Title 23.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Annual, continuous, and ongoing activity

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Develop travel demand forecasts and other traffic statistics for evaluating projects in accordance with FHWA and NDOT policy.
- Review travel demand methodologies and forecasts prepared by consultants and other entities in accordance with FHWA and NDOT policy.
- Work with Washoe County RTC and the City of Fernley to include the expanding Fernley area and their potential for industrial and other types of growth in the regional traffic model.
- Continue holding biannual meetings for the Nevada Forecasting Group to review travel demand forecasting issues in a collaborative manner with participating agencies statewide.
- Renew annual Trans CAD licenses for five NDOT employees.
- Upgrade the State of Nevada travel demand model to the latest version of TransCAD (TransCAD 8). This update is necessary to increase the accessibility and accuracy of the model. This project is projected to take five years and will include the following elements:
    - Update the model to the latest version of TransCAD to increase the efficiency of model operation.
    - Update population and employment files that now form part of the basis for project prioritization

throughout the Department.
    - Model update to include verifying and updating model network attributes to ensure they reflect current field conditions.
    - Provide consultant-led training related to the use of the TransCAD model. Technical training will enable staff to operate the newer software. Additional training intended for a wider audience will educate managers and decision-makers. If advanced functionality is identified as important to managers and decision-makers through this training, this task will investigate the potential for an on-call contract to perform complex model operations beyond the scope of normal Traffic Information staff capacity.
- Provide information, support, and participate in travel demand forecast activities conducted by the four MPOs.
- Support and participate in the Census Transportation Planning Products (CTPP) Technical Service Product.
- **Travel may be necessary to complete the activities within this task.**

3644 Fuel Tax Revenue Management

TASK 2320
ACTIVITY 3644
OPERATIONAL SECTION Performance Analysis
PROGRAM MANAGER Peter Aiyuk

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	45,000
Travel	$	2,500
Operating	$	-
Capital Outlay (Consultant)	$	150,000
Equipment	$	-
Federal (80%)	**$**	**158,000**
State (20%)	**$**	**39,500**
Total Requested Amount	**$**	**197,500**

PARTICIPATING AGENCIES FHWA, NDOT
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

- Study the implementation of the recommendations coming out of the first phase of the study of fuel and related data integration.
- Study will show how the current achieved fuel data can be efficiently accessed and integrated with the use of simple query functionality to add value to the data and other related data sets in analysis
- Develop and implement a robust sophisticated fuel tax revenue management and reporting system to help improve divisional efficiencies, reduce reporting errors, and streamline report delivery for on- time to receive federal reimbursement seamlessly
- Make compilation and the development of the FHWA 551 report easier and streamlined

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- First phase of the Fuel and related data project completed
- Developed a Scope of Work for the second phase of the project
- Identified and chronicled all the related data sets that could be integrated
- Prepared and submitted FHWA 551 reports

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Submit monthly fuel tax revenue statistics to the FHWA for reimbursement of expenses to the State Highway Fund.
- Review the recommendations from phase 1 of the fuel and related data project
- Develop RFA for phase 2 of the fuel and related data project
- Travel as necessary to attend training on developing and reporting on FHWA 551 reports
- Develop a roadmap for integrating fuel and other related data sets in value-added analyses

- Review deliverables from the Consultant on phase 2 of the fuel data project
- Continue the development of the roadmap of the fuel and related data integration, and engage with the EDAP program in discussions on architectural platforms to best utilize
- Develop trend analyses on County archived fuel data sets
- Study the feasibility of developing a data and reporting visualization platform
- Study a concept of a roadmap for the development of a fuel data management system that will be simple to implement with future room for expansion with the capability to handle revenue projections
- Hold meetings with the IT division and other stakeholders to discuss seamless fuel consumption and revenue collection data pipeline process from the DMV and other data supplying agencies
- Review final deliverables from the Consultant on the fuel and related data project
- Study new fuel data initiatives that will improve on the existing system
- Travel as necessary to learn more about reporting fuel consumption data to the FHWA
- Review all the work done during the previous three quarters related to this SPR activity, and make necessary adjustments
- Develop charts and graphs accompanied by statistical analyses depicting the trends in fuel consumption by Counties
- **Travel will be necessary to complete the activities within this task.**

3650 Performance Management

TASK 2321
ACTIVITY 3650
OPERATIONAL SECTION Performance Analysis
PROGRAM MANAGER Peter Aiyuk

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	67,500
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	1,200,000
Equipment	$	-
Federal (80%)	**$**	**1,014,000**
State (20%)	**$**	**253,500**
Total Requested Amount	**$**	**1,267,500**

PARTICIPATING AGENCIES FHWA, NDOT
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

Implement a next-generation system to comply effectively with the MAP-21/FAST ACT by tracking all related NPRM's and comments related to performance measures and targets development and reporting. Comply with the Governor's Performance Requirements along with coordinating and tracking Stewardship & Oversight Agreement performance measures. Develop a sophisticated system for monitoring, evaluating, and reporting our performance measures partly through initiation and innovation with FHWA Technical Service Programs as well as develop an electronic reporting platform. Collaborate with MPOs and other stakeholders as a Performance Management working group to develop a unified statewide approach to addressing performance measures and target setting for internal planning purposes and business process and outcome improvement.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- PEG Performance Management Group monthly collaboration meetings
- Produced the Mid-Period Performance Management Report for FHWA
- Produced the 2021 Annual Performance Management Report on NDOT's progress on performance management
- Developed Scope of Work and Request for Approach for a project to evaluate the maturity level of NDOT's performance management program
- Develop the NDOT/FHWA Stewardship indicators report

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Receive and review deliverables from the Consultant on the performance management project
- Start requesting and assembling data for the NDOT's 2022 Annual Performance Management Report
- Set up/coordinate the Bi-monthly performance management working group meetings with MPOs
- Attend Committee on Performance-based Planning meetings/webinars organized by FHWA and AASHTO
- Work with AASHTO and the CATT LAB to finalize the selection of TSP options and schedule payment
- Produce the NDOT/FHWA Stewardship indicators report

- Start developing NDOT baseline for the second performance period
- Start developing the end of the first full performance period progress report for FHWA
- Renew contract with INRIX to gain access to PM3 data, develop PM3 baseline and produce reports
- Start the compilation of the mid second period performance progress report
- Start requesting and assembling data for the NDOT's 2023 Annual Performance Management Report
- Review and comment on NPRM on GHG performance measure and AASHTO's response
- Renew contract with INRIX to gain access to PM3 data, develop PM3 baseline and produce reports
- Start the development of new initiatives for performance management
- Schedule and attend the NDOT annual Performance Champions meetings with the Director
- Request data and start compiling the Annual Performance Management Report
- Assess the maturity level of the NDOT Performance Management program

3651 Mandated Reports

TASK	2322
ACTIVITY	3651
OPERATIONAL SECTION	Performance Analysis
PROGRAM MANAGER	Zhuxin "Jocene" Yang

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	67,500
Travel	$	2,500
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**56,000**
State (20%)	**$**	**14,000**
Total Requested Amount	**$**	**70,000**

PARTICIPATING AGENCIES	FHWA, NDOT
FINANCIAL RESPONSIBILITY	FHWA, NDOT
FUNCTIONAL RESPONSIBILITY	NDOT

PURPOSE AND SCOPE

Develop and disseminate information concerning the state's ability to fund long-range transportation programs. Provide transparency on the State's and Local Transportations agencies capital outlay and maintenance activities on revenues and expenditures.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Production of FHWA reports annually:
  - 534
  - 536
  - 532
  - 551M
  - Motor fuel data report

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Request data from the Department of Motor vehicles and local agencies, and develop and submit monthly fuel tax reports
- Extract cost information from the NDOT and the Department of Motor Vehicles accounting systems for use in legislative and management reports
- Request data from all NDOT divisions and begin preparing reports, including the Department's Facts & Figures Report
- Start requesting and collecting revenue and expenditure data from local transportation agencies
- Coordinate with the NDOT Accounting division, Maintenance & Asset Management division, IT division, and Financial Management division to provide data and other support services used to prepare and report the State Highway Capital outlay & Maintenance Expenditure report to FHWA.
- Schedule fuel and other FHWA 500 series Reports meetings with respective NDOT divisions and other agencies to

ensure data accurately and timely submissions

- Request and collect revenue and expenditure data from local transportation agencies
- Continue coordination with the NDOT Accounting division, Maintenance & Asset Management division, IT division, and Financial Management division to provide data and other support services used to prepare and report the State Highway Capital outlay & Maintenance Expenditure report to FHWA.
- Work with NDOT Accounting division to submit documents in preparation of the Maintenance and Expenditure by State government report to make ascertain conformity with the FHWA 534 report.
- Submit draft reports to NDOT Multimedia division and to FHWA
- Continue the extraction of cost information from NDOT and the Department of Motor Vehicles accounting systems to use in preparing management reports
- Submit final draft reports to NDOT and FHWA
- **Travel will be necessary to complete the activities within this task.**

3655 Benefit-Cost Studies

TASK 2323
ACTIVITY 3655
OPERATIONAL SECTION Performance Analysis
PROGRAM MANAGER Haiyuan "Harry" Li

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	22,500
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	50,000
Equipment	$	-
Federal (80%)	**$**	**58,000**
State (20%)	**$**	**14,500**
Total Requested Amount	**$**	**72,500**

PARTICIPATING AGENCIES FHWA, NDOT
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

- Manage BCA projects and review BCA reports
- Assist other divisions and agencies for BC Analysis
- Assist BC analysis for grant programs

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Reviewed and studied the B/C analysis guidelines and previous reports
- Reviewed initial report and final report for Benefit-Cost Analysis studies
- Attended the I-15 South Phase 2 monthly team meetings
- Continued coordination and review of planning documents to compile the list of projects qualified for Benefit/Cost analyses
- Reviewed the BCA program for the MPDG BCA project and sent the comments
- Reviewed the Benefit-Cost Analysis Guidance for Discretionary Grant Programs revised on March 2022

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Review BC analysis guidelines
- Manage BC analysis projects and review BC analysis reports
- Coordinate and review the planning documents to compile the list of projects qualified for BC analyses
- Assist BC analysis for grant programs if needed

3656 State Highway Preservation & Reporting

TASK 2324
ACTIVITY 3656
OPERATIONAL SECTION Performance Analysis
PROGRAM MANAGER Zhuxin "Jocene" Yang

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	45,000
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**36,000**
State (20%)	**$**	**9,000**
Total Requested Amount	**$**	**45,000**

PARTICIPATING AGENCIES FHWA, NDOT
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

According to Nevada Revised Statute 408.203(3), the director of the Nevada Department of Transportation shall report to the Legislature by February 1 of odd-numbered years the progress being made in the Department's 10-year plan for the resurfacing of state highways. The report must include an accounting of revenues and expenditures in the preceding two fiscal years, a list of the projects completed, including mileage and cost, and an estimate of the adequacy of projected revenues for the timely completion of the plan.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Annual, continuous, and ongoing activity

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Start work on the 2023 State Highway Preservation Report with Structure Division, Pavement Division, and Multimedia Division
- Provide a final draft of the 2023 State Highway Preservation report for the Board's approval
- Submit the 2023 State Highway Preservation report to LCB
- Publish the 2023 State Highway Preservation report on NDOT website
- Respond to questions and requests about the 2023 State Highway Preservation Report

3659 Innovative Planning

TASK	2325
ACTIVITY	3659
OPERATIONAL SECTION	Performance Analysis
PROGRAM MANAGER	Peter Aiyuk

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	22,500
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	150,000
Equipment	$	-
Federal (80%)	**$**	**138,000**
State (20%)	**$**	**34,500**
Total Requested Amount	**$**	**172,500**

PARTICIPATING AGENCIES	FHWA, NDOT
FINANCIAL RESPONSIBILITY	FHWA, NDOT
FUNCTIONAL RESPONSIBILITY	NDOT

PURPOSE AND SCOPE

Collaborate with Multimodal Program Development (MPD) and other local planning agencies to inform and ensure a performance-driven, outcome-based planning and programming process is applied in the order that investment priorities contained in planning programming documents, including the STIP are linked to achieve performance targets. Utilization of a systematic approach in project selection and prioritization is utilized to the extent possible. Solicit Consultant services to help evaluate how NDOT could better leverage all the performance plans (TAMP, Freight, TSMO, etc.), performance management efforts into documented continuous performance outcomes

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Review of the One Nevada plan and other planning documents
- Study of NCHRP 804 for guidance on how to develop/implement a performance-based planning program
- Review other state DOTs performance management programs and how it synergizes with their program development section and project selection

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Review NCHRP report 804
- Review literature on implementing performance-based projects and other state DOT plans on selecting and implementing projects that improve performance
- Review and stay up to date with the One Nevada plan
- Review and stay updated with the STIP
- Collaborate with MPD and assist in implementing performance-based projects
- Develop a Scope of Work and RFA for a project to increase knowledge on selecting and implementing projects that help achieve performance targets goals
- Review project deliverables from the Consultant
- Research the latest tools that help in project selection and ranking

3860 Alternative Funding (VMT)

TASK 2326
ACTIVITY 3860
OPERATIONAL SECTION Performance Analysis
PROGRAM MANAGER Zhuxin "Jocene" Yang

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	45,000
Travel	$	10,000
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**44,000**
State (20%)	**$**	**11,000**
Total Requested Amount	**$**	**55,000**

PARTICIPATING AGENCIES FHWA, NDOT
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

Nevada, in collaboration with the Road Usage Charge (RUC) America, is establishing a broad national coalition to assess, evaluate, and identify a sustainable alternative funding mechanism for transportation with the potential to replace the existing fuel tax system. The study will include testing from simple odometer-based or annual registration- based VMT Fee system to High Tech system that will minimize privacy concerns and give users a choice to select from a variety of payment mechanisms the method that best meets the user's individual needs and preferences.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Automated/Connected vehicle RUC project
- RUC evasion study
- RUC rebranding efforts
- RUC West quarterly meetings
- RUC West Summit
- RUC Pilot projects

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Attend RUC America quarterly meetings
- Review reports from on-going pilots and other projects
- Develop problem statements and Scopes of Work for research projects on the docket
- Develop new initiatives to raise RUC maturity level nationwide and increase the knowledge of the funding model
- Travel as necessary to attend Steering Committee meetings, Summits, and other related activities
- **Travel will be necessary to complete the activities within this task.**

3863 Nevada Cost Construction Study

TASK 2327
ACTIVITY 3863
OPERATIONAL SECTION Performance Analysis
PROGRAM MANAGER Peter Aiyuk

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	9,000
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**7,200**
State (20%)	**$**	**1,800**
Total Requested Amount	**$**	**9,000**

PARTICIPATING AGENCIES FHWA, NDOT
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

- Investigate the most cost-effective method to develop a Nevada State-specific Construction Cost Index by evaluating existing tools and the proposed NDOT estimating software (Master Works) to determine the possibility of including an integration portal with the capability to produce NDOT specific construction cost index
- The index, when developed, will be used in gaging transportation revenues against construction costs, as well as inform the department's decision-makers the net effect of fuel tax indexing revenue and future transportation needs
- The scope will include tracking and "smoothing" out data of archived award prices of major construction items from NDOT road construction projects. Yearly maintenance (updates) will be performed to keep the Index current.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Extensive research on the National and other States' Construction Cost Indexes
- Identified current data sources and chronicled the major data sets that will be critical in the development of the Department's construction cost index
- Held meetings with the NDOT's Scoping section managing the development of the MasterWorks Application
- Had preliminary discussions with the Materials division, which is central in the data items that will feed into the system

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Deliver working concept of Nevada-specific construction cost index

3679 Active Transportation Planning

TASK 2328
ACTIVITY 3679
OPERATIONAL SECTION Active Transportation & Special Studies
PROGRAM MANAGER Albert Jacquez

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	139,500
Travel	$	5,000
Operating	$	-
Capital Outlay (Consultant)	$	275,000
Equipment	$	-
Federal (80%)	**$**	**335,600**
State (20%)	**$**	**83,900**
Total Requested Amount	**$**	**419,500**

PARTICIPATING AGENCIES FHWA, NDOT, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

To plan and initiate programs improving the mobility of bicyclists, pedestrians, scooters, or other micro-mobility devices. To promote bicycling and walking in Nevada using improved infrastructure and educational activities for people of all ages and abilities. Encourage the development of accessible and connected non-motorized infrastructure to build a functional multimodal system. To plan and initiate programs that promote the mobility of pedestrians and bicyclists, pedestrian and bicycle activities, and safety. Encourage the development of pedestrian facilities as part of the multimodal system by aiding with the framework to determine when elements of Complete Streets should be included within NDOT projects that meet our Complete Streets Policy.

PLANNING EMPHASIS AREAS

- Equity and Justice40 in Transportation Planning
- Complete Streets
- Public Involvement

PREVIOUS RELATED WORK

- Ongoing Project planning, scoping, and design review for complete street opportunities and determinations. Make recommendations and modifications needed to comply with the complete streets policy.
- Ongoing promotion and education of bicycling and walking in Nevada using improved infrastructure and educational activities for people of all ages and abilities.
- In 2022, NDOT began revising the TAP process to provide clarity and transparency to applicants. This project will continue in 2023.

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Develop the Scope of Work and advertise the RFP for the Statewide Active Transportation Plan
- Continued development of the TAP program through a consultant
- Promote Nevada Moves Day and International Walk to School Day as a mode shift target for stakeholders.

- Review and revise NDOT Rules and Procedures Manual as needed to match FHWA program guidance and rules and regulations
- Update the Bicycle Touring Map
- Coordination statewide of bike & walk school events with communities.
- Analysis, reviews, and revisions of the new TAP process for final acceptance.
- Presentations to the Nevada Bicycle and Pedestrian Advisory Board for recommendations to NDOT, as needed
- Review of Complete Streets concepts and FHWA framework
- Improve the accommodation of bicycles and pedestrians through construction zones in cooperation with the Design and Construction Divisions and agency divisions.
- Coordination with local entities and adjacent states to establish U.S. Bike Routes (USBR), USBR50 (US50 corridor), USBR 70 (I-15 corridor), and the USBR 79 (US93 corridor north of US50). Coordinate with the NDOT Roadway Systems Division to develop applications to the AASHTO Special Committee on Route Numbering for USBR designation. USBR 48 I-80 will be removed due to its high freight traffic and low cycling on the route.
- Participate as a member of the Technical Work Group and Critical Emphasis Area Groups for the Strategic Highway Safety Plan to improve bicycle and pedestrian safety.
- Coordination and participation with local bicycle committees and advisory boards
- As necessary, promote bicycling and walking in Nevada as a transportation mode by attending related events held in Nevada and adjoining state communities.
- Provide direct outreach at public events related to bicycle and pedestrian safety
- Project planning, scoping, and design review for complete street opportunities and determinations. Make recommendations and modifications needed to comply with the complete streets policy.
- Promotion and education of bicycling and walking in Nevada using improved infrastructure and educational activities for people of all ages and abilities.
- **Travel will be necessary to complete the activities within this task.**

3970 Corridor Planning

TASK 2329
ACTIVITY 3970
OPERATIONAL SECTION Active Transportation & Special Studies
PROGRAM MANAGER Matt Bradley

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	45,000
Travel	$	2,500
Operating	$	-
Capital Outlay (Consultant)	$	404,000
Equipment	$	-
Federal (80%)	**$**	**361,200**
State (20%)	**$**	**90,300**
Total Requested Amount	**$**	**451,500**

PARTICIPATING AGENCIES FHWA, NDOT, MPOs, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

To provide funding for transportation analysis of corridors within Nevada's multimodal transportation network. With the update of the Nevada Statewide Transportation Plan (One Nevada) underway, several major corridors for potential improvements are being studied and assessed at a high level for potential improvements. As a complement to the "One Nevada" Statewide planning process, there is a need for smaller scale and more refined corridor planning and study to identify potential areas of need for improvements, both for existing and new corridors within the state.

PLANNING EMPHASIS AREAS

- Tackling the Climate Crisis – Transition to a Clean Energy, Resilient Future
- Equity and Justice40 in Transportation Planning
- Complete Streets
- Public Involvement
- Strategic Highway Network (STRAHNET)/U.S. Department of Defense (DOD) Coordination
- Federal Land Management Agency (FLMA) Coordination
- Planning and Environmental Linkages (PEL)
- Data in Transportation Planning

PREVIOUS RELATED WORK

- One Nevada Transportation Plan and Prioritization Implementation
- I-15 and US 93 Critical Corridor Plans
- Boulder Highway Corridor Study, in coordination with RTC SNV
- SR-160/159 Corridor Study
- Mt. Rose Highway Corridor Study
- US-50 East Shore Corridor Management Plan

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- The following studies are scheduled to begin or continue during FFY 2023:
    - (continue) SR-160/159 Corridor Study

    - (continue) McCarran Blvd, in coordination with RTCWA
    - (continue) East William Street Feasibility Study, in coordination with CAMPO
    - (begin) US50 East Corridor Study from I-580/US50 interchange to Moundhouse, NV, in partnership with CAMPO
    - (begin) US395 S Corridor Study
- Provide technical assistance to districts, local communities, and federal agencies on the preparation of scope, schedule, and budget for corridor improvements.
- Manage, track, coordinate, and recommend review and approval of corridor planning studies.
- Develop, update, and utilize tools and methods to identify mobility needs, analyze safety data, and assess the costs and benefits of multimodal transportation improvement strategies within a corridor.
- Continue coordination with MPOs, RTCs, and local jurisdictions to identify transportation corridor improvement needs.
- Gather information on the history of previous planning efforts for each corridor.
- Describe and define the goal and scope for each planning study or corridor plan.
- **Travel will be necessary to complete the activities within this task.**

3602 Tribal Consultation

TASK 2330
ACTIVITY 3602
OPERATIONAL SECTION Rural Programs
PROGRAM MANAGER Guinevere Hobdy

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	51,750
Travel	$	10,000
Operating	$	-
Capital Outlay (Consultant)	$	100,000
Equipment	$	-
Federal (80%)	**$**	**129,400**
State (20%)	**$**	**32,350**
Total Requested Amount	**$**	**161,750**

PARTICIPATING AGENCIES FHWA, NDOT, Nevada Indian Commission, Tribal Governments, & Inter-Tribal Council
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

The Tribal Liaison coordinates with Nevada's 27 sovereign tribal nations during the planning process for projects and issues that may be of interest to, or impact, Tribal Nations. The Tribal Liaison participates in long-range transportation planning or meets with Tribal representatives as needed/requested throughout the year to discuss transportation needs, concerns, and challenges that intersect or align with our state facilities. Additional scope of work includes assisting NDOT staff with:

1. Meeting state laws, mandates, and requirements outlined in our guidelines and policies;
2. Provide guidance with TERO, sales tax, and resolving issues;
3. Coordination of annual reporting; and
4. Provide outreach and education to Tribes on Transportation planning, funding opportunities, and needs.

PLANNING EMPHASIS AREAS

- Tackling the Climate Crisis – Transition to a Clean Energy, Resilient Future
- Equity and Justice40 in Transportation Planning
- Complete Streets
- Public Involvement
- Strategic Highway Network (STRAHNET)/U.S. Department of Defense (DOD) Coordination
- Federal Land Management Agency (FLMA) Coordination
- Planning and Environmental Linkages (PEL)
- Data in Transportation Planning

PREVIOUS RELATED WORK

- Met with Tribes as needed for transportation needs.
- Developed Organizational Tribal Best Practices and Policy
- Developed reporting form to meet NRS 233A annual reporting requirements

- Met with FHWA and BIA regarding Tribal funding opportunities and programs
- Assisted NDOT staff with planning efforts and Tribal TERO needs related to transportation projects.

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Define Scope of Work and enter into an agreement with a consultant to develop Organizational Tribal Training Development for staff to meet requirements in NRS 233A
- Seek budget approval to fund two new dedicated staff positions to assist Tribes with Transportation needs
- Identify projects in the STIP and annual work program that could impact the tribes and set up meetings to discuss those impacts
- Strategize and Coordinate transportation projects in preparation for a letter of support
- Provide outreach and education on federal transportation funding opportunities and grants
- Recruit for approved staff positions to assist Tribes with Transportation needs
- Implementation of Organizational Tribal Training Development for staff to meet requirements in NRS 233A
- Train new staff to assist Tribes with Transportation needs.
- Attend Nevada Indian Commission meetings
- Attend quarterly State Tribal Liaison meetings
- Meet with tribal leaders and transportation staff to assist with transportation discussions and coordination of long-range planning for the tribe.
- **Travel will be necessary to complete the activities within this task.**

3955 County Consultation

TASK	2331
ACTIVITY	3955
OPERATIONAL SECTION	Rural Programs
PROGRAM MANAGER	Colleen Unterbrink

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	69,750
Travel	$	10,000
Operating	$	-
Capital Outlay (Consultant)	$	150,000
Equipment	$	-
Federal (80%)	**$**	**183,800**
State (20%)	**$**	**45,950**
Total Requested Amount	**$**	**229,750**

PARTICIPATING AGENCIES	FHWA, NDOT, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY	FHWA, NDOT
FUNCTIONAL RESPONSIBILITY	NDOT

PURPOSE AND SCOPE

County consultations are a necessary requirement to strengthen NDOT's statewide transportation planning and project delivery process by collaborating effectively with the 14 rural counties and local governments throughout rural Nevada. County consultations help foster stronger relationships between NDOT and our rural partners; in addition, they provide a platform for outreach and education with the general public and allow the opportunity for NDOT to share timelines and realistic expectations between local governments and the state. The NDOT Rural County Liaison serves as a point of contact for the state's rural partners, listening to concerns and ensuring rural concerns are forwarded to the appropriate divisions/staff at NDOT, finally following through on the concerns and communicating resolutions back to rural partners.

PLANNING EMPHASIS AREAS

- Tackling the Climate Crisis – Transition to a Clean Energy, Resilient Future
- Equity and Justice40 in Transportation Planning
- Complete Streets
- Public Involvement
- Strategic Highway Network (STRAHNET)/U.S. Department of Defense (DOD) Coordination
- Federal Land Management Agency (FLMA) Coordination
- Planning and Environmental Linkages (PEL)
- Data in Transportation Planning

PREVIOUS RELATED WORK

- The NDOT team conducted in-person rural county workshops from December 2021 through February 2022. NDOT team members presented each of the rural programs at NDOT to each county, sharing available resources and tools to counties (such as transit funding, Safe Routes to School funding, etc.).
- NDOT staff compiled the top priorities for each county based on feedback. Staff identified short, mid, and long-range priorities.
- Short-range priorities were entered into Zendesk and assigned to corresponding districts. This tool allows for tracking and to provide updates to the counties when the priority has been completed. Mid-range priorities were

identified by the Scoping Division, and items that could be combined with existing design/projects in the queue were added to the project for completion. The remaining long-range priorities (along with other mid-range priorities) will be vetted through the One Nevada needs assessment.

- The Rural County Engagement and Revitalization (RCER) project are underway, and the following items have been completed:
- Existing NDOT Process Review
- Peer Agency Review
- Outreach Strategy and Communications Plan
- Development of interactive GIS Tool

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Conduct County Tours (NDOT Director / Rural County Liaison)
- Internal Rural County Engagement Procedures Manual
- County Meetings Support
- ONTP Process Integration
- Roll out interactive GIS Tool to counties
- Implement Outreach Strategy and Communications Plan
- Development of County Presentations and Briefing Materials
- Review of Draft Revitalization Plan
- Review/Implement Recommendations Report
- Two workshops focused on education of short and long-range planning and One Nevada and enhanced County process
- Conduct targeted issue workshops on priority issues
- Conduct County Tours
- **Travel will be necessary to complete the activities within this task.**

3961 Public Transportation Planning

TASK	2332
ACTIVITY	3961
OPERATIONAL SECTION	Rural Programs
PROGRAM MANAGER	Michelle Dullanty

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	45,270
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	112,000
Equipment	$	-
Federal (80%)	**$**	**125,816**
State (20%)	**$**	**31,454**
Total Requested Amount	**$**	**157,270**

PARTICIPATING AGENCIES	FHWA, NDOT, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY	FHWA, NDOT
FUNCTIONAL RESPONSIBILITY	NDOT

PURPOSE AND SCOPE

Planning and research activities affecting the statewide rural transit program. Conducting research and feasibility studies related to public transportation.

PLANNING EMPHASIS AREAS

- Tackling the Climate Crisis – Transition to a Clean Energy, Resilient Future
- Equity and Justice40 in Transportation Planning
- Complete Streets
- Public Involvement

PREVIOUS RELATED WORK

- Annual, continuous, and ongoing activity

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Statewide Transit Plan development and review
- Transit staff will begin developing a “Request for Approach” for the following identified projects; Statewide Transit Association and Internal Program Review, Analysis, and Recommendations Plan to engage with one of the on-call consultants.
- Strategize and implement recommendations from Statewide Transit Plan
- On-call consultants will be selected, and work will begin for the Statewide Transit Association and Internal Program Review, Analysis, and Recommendations Plan

3613 Multistate Coordination & Planning

TASK 2333
ACTIVITY 3613
OPERATIONAL SECTION Program Development
PROGRAM MANAGER Kevin Verre

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	12,600
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	150,000
Equipment	$	-
Federal (80%)	**$**	**130,080**
State (20%)	**$**	**32,520**
Total Requested Amount	**$**	**162,600**

PARTICIPATING AGENCIES FHWA, NDOT, CalTrans, UDOT, ADOT, WYDOT, NDOT (NE)
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

Coordinate with neighboring states for planning and program development to plan beyond the boundaries for the state to facilitate consistency and efficiency among all modes between neighboring states. NDOT has a renewed focus on improving multistate efforts for continued cooperation and collaboration of transformative initiatives relative to interstates 15 and 80. NDOT is a member of two multistate partnerships: I-15 Mobility Alliance comprised of state departments of transportation and local jurisdictions within the states of California, Nevada, Arizona, and Utah, with a focus on reducing or eliminating congestion, improving interregional travel and reliability, and cultivating the safe movement of people and goods. I-80 Corridor Winter Coalition comprised of the western state departments of transportation from California, Nevada, Utah, Wyoming, and Nebraska, designed to provide better and more comprehensive I-80 corridor conditions information to both transportation agencies and to travelers. NDOT has numerous ongoing efforts associated with these multistate partnerships. Consultant firms will provide professional services to NDOT for the I-15 and I-80 Multi-State Coordination Program. This Master Services Agreement identifies the required Scope of Services that will be provided to deliver projects along these two corridors:

- I-80 Multi-State Corridor Operations and Management (MCOM) Grant
- I-80 Multi-State Coordination
- I-15 Multistate Mobility Alliance

PLANNING EMPHASIS AREAS

- Tackling the Climate Crisis – Transition to a Clean Energy, Resilient Future
- Equity and Justice40 in Transportation Planning
- Public Involvement
- Strategic Highway Network (STRAHNET)/U.S. Department of Defense (DOD) Coordination
- Federal Land Management Agency (FLMA) Coordination
- Planning and Environmental Linkages (PEL)
- Data in Transportation Planning

PREVIOUS RELATED WORK

- Continuous: Ongoing coordination with Arizona DOT, Utah DOT, and Caltrans regarding planning practices and opportunities for cooperation on initiatives, studies, or projects.
- I-15 Corridor System Master Plan (document completed March 2012, continued effort for ongoing coordination with California, Arizona, and Utah)
- I-15 Alliance Cooperative Agreement between Caltrans, NDOT, and UDOT (Agreement #R230-13- 800)
- I-11 & Intermountain West Corridor Study (Anticipated completion September 2014 - Agreement #P120-12-800)
- I-80 Corridor System Plan (California, Utah, Wyoming - Completed August 2014, continued effort for ongoing coordination with Stakeholder Network)
- I-15 Mobility Alliance and Multistate Corridor Operations and Management Program:
- Updated website for I-15 Mobility Alliance (FY 2015/16)
- I-15 Multistate
- Corridor Operations Concept of Operations Plan (FY 2017)
- I-15 Multistate Decision Support System Development (FY 2017)

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Regular meetings with the Neighboring States interested in coalition activities
- Coordination regarding corridor studies, regional plans, planned improvements, data sharing, and operational coordination
- Continue to collaborate with other states to adapt or create innovative planning practices
- Manage I-15 Alliance and MCOM Project
- Continue to provide information related to multistate efforts
- Continued work towards an agreement with I-80 Winter Coalition partners
- Ongoing work towards an agreement with Caltrans for further planning coordination on I-15
- Associated activities include:
    - Project 1. I-80 MCOM Grant
        - Federal grant funded project – not SPR funded
    - This project is a joint effort by the I-80 Corridor Coalition with the overall goal of improving freight mobility and safety, work will be performed to enhance communication between transportation system operators and commercial users of the I-80 Corridor. The I-80 MCOM grant identified that the I-80 project would build upon the platform and system developed for I-15 and add the required I-80 corridor elements, including an additional Caltrans District (District 3), Wyoming DOT, and Nebraska DOT. Data interfaces are already in place for Nevada and Utah and require those additional elements from the I-80 corridor be integrated. This project will be completed within 18 months from notice to proceed and will include the following tasks:
        - Task 1. Project Management
        - Task 2. System Inventory
        - Task 3. Concept of Operations/Requirements
        - Task 4. I-80 System Development and Integration with the I-15 project website
        - Task 5. Stakeholder Outreach
    - Project 2. I-80 Multi-State Coordination
    - State funded – not SPR funded
    - The Consultant will work with NDOT to coordinate a multistate agreement between the states of California, Nevada, Utah, Wyoming, and Nebraska to advance the I-80 corridor coalition's mission of establishing an institutional structure for coordinating operations in the western states.
        - Task 1. Project Management
        - Task 2. Multistate Coordination
        - Task 3. Establish I-80 Coalition charter/agreement
        - Task 4. Website Maintenance
        - Task 5. Grant Support (includes coordination of letters of support for individual states' applications from I-80 Coalition member agencies)
    - Project 3. I-15 Multi-State Mobility Alliance

        - Joint funded by Caltrans
            - CalTrans, CA - $300,000.00
            - NDOT, NV - $300,000.00 ($150,000 in SPR22 & $150,000 in SPR23)
    - The Consultant will work with NDOT and the I-15 Mobility Alliance to continue the multistate momentum to further the vision, mission, and objectives of the I-15 Mobility Alliance. This project will be completed over the next three years and will include the following tasks:
        - Task 1. Project Management
        - Task 2. Update I-15 Immediate Projects of Interregional Significance (IPIRS)
        - Task 3. Alliance Coordination/Master Plan Update
        - Task 4. Grant Proposal/Support
        - Task 5. Dynamic Mobility Project Support
        - Task 6. Coordination efforts between NDOT and LVCA on the Moves I-15 Regional effort
- **Travel may be necessary to complete the activities within this task.**

3690 Freight & Rail Transportation Planning

TASK 2334
ACTIVITY 3690
OPERATIONAL SECTION Program Development
PROGRAM MANAGER Tim Mueller

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	76,500
Travel	$	2,000
Operating	$	-
Capital Outlay (Consultant)	$	420,000
Equipment	$	-
Federal (80%)	**$**	**398,800**
State (20%)	**$**	**99,700**
Total Requested Amount	**$**	**498,500**

PARTICIPATING AGENCIES FHWA, FTA, FRA, NDOT, Nevada State Police, MPOs, Counties, & Incorporates Cities
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE
A consulting firm has been hired to craft the Nevada Freight Plan Update. This update will replace the existing 2017 Freight Plan. The plan will contain an update to the Freight Investment Plan and supply chain analysis and will be current with Federal Transportation Law contained in 49 USC 70202. Utilizing truck GPS data, this plan will help NDOT to make more informed freight improvement decisions. The Nevada Freight Advisory Committee (FAC) will continue to provide input into the freight planning process.

PLANNING EMPHASIS AREAS
- None

PREVIOUS RELATED WORK
- 2017 NDOT State Freight Plan
- 2018 One Nevada Transportation Plan
- 2019 Truck Parking Implementation Plan
- 2019 I-80 Freight Corridor Study
- 2019 Hazardous Commodity Flow Study
- 2021 I-15 Freight MEP-Truck Parking
- One Nevada Implementation Plan
- Freight Program Implementation project
- Nevada Strategic Highway Safety Plan (SHSP)
- 2021 Nevada State Rail Plan
- 2022 RTC Southern Nevada Freight Plan

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS
- Freight Advisory Committee Meetings
- Truck GPS Data Analysis
- Performance reporting and needs assessment

- Risk-based management
- Sustainable freight transportation
- Identify significant freight supply chains and trends, needs, and issues with respect to Nevada
- Stakeholder outreach and coordination
- Freight strategies and investment plan coordination, update, and tracking
- Review and acceptance of final updated Freight Plan
- Publish the final Freight Plan
- Freight Process Manual Update
- Coordinate drafting a rail charter with the Governor's Office of Economic Development (GOED)
- **Travel will be necessary to complete the activities within this task.**

3957 Nevada MPO & RTC Coordination

TASK 2335
ACTIVITY 3957
OPERATIONAL SECTION Program Development
PROGRAM MANAGER Melissa Chandler

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	72,000
Travel	$	2,000
Operating	$	-
Capital Outlay (Consultant)	$	75,000
Equipment	$	-
Federal (80%)	**$**	**119,200**
State (20%)	**$**	**29,800**
Total Requested Amount	**$**	**149,000**

PARTICIPATING AGENCIES FHWA, NDOT, Counties, & Incorporated Cities
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

A Metropolitan Planning Organization (MPO) is a federally mandated organization of representatives from local government and transportation agencies in urbanized areas with a population of 50,000 or more. MPOs provide a forum for local decision-making on transportation issues, and the planning process promotes consistency between transportation improvements and state and local planned growth and economic development patterns. MPOs cover an urbanized area only and receive federal funding supporting their planning efforts. Federal rules require NDOT to provide fiduciary oversight and stewardship for the MPOs. As the steward of federal metropolitan planning funding in Nevada, NDOT is responsible for overseeing and coordinating the work done by MPOs and RTCs. In partnership with the MPOs and RTCs, NDOT ensures. Federal law requirements (49 USC 5303, 23 USC 134, 23 CFR 420, 23 CFR 450, and 2 CFR 200) for continuing, cooperative and comprehensive planning efforts within the State of Nevada are followed. This section also identifies how NDOT will coordinate transportation planning activities with non-metropolitan planning partners.

PLANNING EMPHASIS AREAS

- Tackling the Climate Crisis – Transition to a Clean Energy, Resilient Future
- Equity and Justice40 in Transportation Planning
- Complete Streets
- Public Involvement
- Strategic Highway Network (STRAHNET)/U.S. Department of Defense (DOD) Coordination
- Federal Land Management Agency (FLMA) Coordination
- Planning and Environmental Linkages (PEL)
- Data in Transportation Planning

PREVIOUS RELATED WORK

- Annual, continuous, and ongoing activity

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Guide the work of each MPO/RTC and foster working relationships among all levels of government to ensure compliance with 23 CFR 450.

- Coordinating efforts between NDOT, MPOs, RTCs, and public transportation providers
- General oversight of and administrative support to MPOs (e.g., self-certification processes, boundary adjustments, agreement preparation, management, etc.)
- On-Call Project: MPO RTP Coordination – through consultant support, develop a process/coordination document to assist NDOT with its role in the development of Metropolitan Planning Organization's Regional Transportation Plans and NDOT's role in assisting in the development of other Transportation Master Plans.
    - Identify internal stakeholders/external stakeholders for participation in the development of the RTP process, establishing roles and responsibilities
    - Provide a process to engage and participate in the development of identified needs located on NDOT facilities
    - Demonstrate a process to evaluate identified needs as they relate to the One Nevada goals
    - Provide an internal process to review identified needs and approval steps
    - Provide a process that enables NDOT to report on RTP progress related to identified needs on NDOT facilities
- Review of quarterly reports and invoices
- Provide FHWA with quarterly MPO reports
- Agreement closeout for previous FFY
- Carryover memo to MPOs
- Provide Stewardship Performance Measures to Performance Analysis
- Schedule and conduct kick-off meetings with MPOs
- Review draft UPWPs
- Draft the annual MPO UPWP agreements
- Schedule funds for the yearly UPWP agreements
- Provide FHWA with the MPO board-approved UPWPs for approval along with an NDOT letter of recommendation
- Executed the yearly UPWP agreements
- Program Funds
- Provide MPOs with the Notice to Proceed (NTP)
- Cooperative agreement with RTCSNV to assist in the development of the Las Vegas Area MPO Travel Demand Model - PR198-22-063
    - Task 1 – Data Collection
    - Task 2 – Update CAMPO/RTVSNV TDM Base Year Scenario
    - Task 3 – Validate Updated CAMPO/RTCSNV TDM Base Year Scenario
    - Task 4 – Update CAMPO/RTCSNV TDM Future Year Scenarios
    - Deliverable – Prepare Model Update and Validation Memorandum
- MPO Agenda Memos
    - These memos will provide the NDOT Executive Leadership Team (ELT) with a summation of NDOT-specific topics the MPO is considering.
- Staff will review the potential impact and recommendations from current NDOT planning studies occurring within the MPO boundary. This information will be included in the memo and will help to provide additional context for the ELT.
- **Travel will be necessary to complete the activities within this task.**

3979 Statewide Transportation Improvement Program

TASK 2336
ACTIVITY 3979
OPERATIONAL SECTION Program Development
PROGRAM MANAGER Jillian Emery/Murph Glover

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	-
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	364,000
Equipment	$	-
Federal (80%)	**$**	**291,200**
State (20%)	**$**	**72,800**
Total Requested Amount	**$**	**364,000**

PARTICIPATING AGENCIES FHWA, FTA, EPA, NDOT, MPOs
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

The Statewide Transportation Improvement Program (STIP) is a fiscally constrained planning and programming document that encompasses Transportation Improvement Programs (TIPs) from each Metropolitan Planning Organization (MPO) across the State of Nevada. The eSTIP is an online, multi-level secure access software-as-a-service platform that allows each entity to input project data to be reviewed and approved by State and Federal agencies according to the Federally approved STIP process and in compliance with all CFRs. This scope of work accounts for the annual subscription and maintenance of the system, including the eSTIP, PLANA, and RTP interfaces, hosted by EcoInteractive. This is an ongoing contract for the subscription and maintenance of the eSTIP software-as-a-service platform hosted by EcoInteractive. The system features public and secure interfaces allowing all agencies to maintain and own the project-level data while also ensuring public transparency.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Annual, continuous, and ongoing activity

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Review and payment of quarterly invoices
- Provide FHWA with quarterly reports
- Schedule and conduct kick-off coordination and planning meetings for integration of enhanced eSTIP Project Tracker v2.0 platform
- Schedule and conduct training for enhanced eSTIP Project Tracker v2.0

3980 One Nevada Transportation Plan

TASK 2337
ACTIVITY 3980
OPERATIONAL SECTION Program Development
PROGRAM MANAGER Kevin Verre/Matt Bradley

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	5,000
Travel	$	2,000
Operating	$	-
Capital Outlay (Consultant)	$	1,300,000
Equipment	$	-
Federal (80%)	**$**	**1,045,600**
State (20%)	**$**	**261,400**
Total Requested Amount	**$**	**1,307,000**
SPR Part I Pooled Funds TPF-5(456)	**$**	**5,000**

PARTICIPATING AGENCIES FHWA, NDOT, MPOs, Local, State, & Federal Agencies
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

The One Nevada Transportation Plan (ONTP) provides a foundation for the formalized process through which the NDOT develops needs, concepts, and projects through performance-based and data-driven processes to coordinate project development. Continued development and implementation of the ONTP permits the NDOT to further refine the project prioritization process and create transparency for project selection and development.

PLANNING EMPHASIS AREAS

- Data in Transportation Planning

PREVIOUS RELATED WORK

- Task Order 1: Project Management Process, 09/2019 – 03/2020
  - Completed
- Task Order 2: Long-Range Process Development, 12/2019 – 12/2020
  - Completed
- Task Order 3: Mid-Range Process Development, 07/2020 – 12/2021
  - Completed
- Task Order 4: Short-Range Process Development and Prioritization, 07/2021 – 12/2022
  - In-Progress
- Task Order 5: Prioritization, Outreach, Development, & Project List Support, 09/2022 – 09/2023
  - In-Progress

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Conclude Task Order 4 activities in Q1.
- Redesign ONTP SharePoint
- Continue Task Order 5 activities through Q4.
- Prepare and execute an agreement for Task Order 6 in Q4.

- Conclude Task Order 5 activities in Q4.
- Begin Task Order 6 activities in Q4.
- **Travel will be necessary to complete the activities within this task.**

3984 Transportation Investment Program

TASK 2338
ACTIVITY 3984
OPERATIONAL SECTION Program Development
PROGRAM MANAGER Jillian Emery/Murph Glover

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	183,600
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**146,880**
State (20%)	**$**	**36,720**
Total Requested Amount	**$**	**183,600**

PARTICIPATING AGENCIES FHWA, NDOT, Counties, Cities, & State/Federal Agencies
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

This task is for the overall management of the department's NDOT STIP and Work Program. The STIP is a fiscally constrained planning and programming document created in cooperation with the four Metropolitan Planning Organizations (MPO) across the state and is inclusive of their Transportation Improvement Programs (TIP). NDOT Planning Staff will work with the MPOs to develop and review the RTPs/RTIPs to ensure federal compliance before incorporation into the STIP. The NDOT WP highlights elements from the STIP regarding projects administered and funded by the federal funds allocated to NDOT and the prioritization of projects utilizing the State Gas Tax. This objective complies with CFR 450.214 and NRS 408.233. These programs require regular meetings, staff time for consultation with the various MPOs and agencies across the state, and NDOT, internal staff.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- FY2016-FY2034 TSP

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Provide FHWA with a quarterly report
- Process major amendment in non-STIP adoption year
    - **or** Adopt a new fiscally constrained STIP & Work Program
- Process major amendment to clean up STIP & Work Program
- Process administrative modification to clean up STIP & Work Program
- Review of eSTIP live site to ensure accuracy with adopted STIP & Work Program
- Process quarterly amendments
- Process administrative modifications, as needed
- Coordination with One Nevada team to ensure alignment of project lists to be prioritized and harmonized with STIP & Work Program
- Coordination with internal NDOT divisions and MPO partners to verify and reconcile TIP, RTP & other project lists

- Maintain and manage all incoming and outgoing project changes, additions, deletions, corrections, amendments & modifications within the eSTIP Project Tracker platform
- Maintain and update fiscally constrained project lists for each MPO TIP
- Maintain and update a fiscally constrained project list, including MPO TIPs and Non-MPO projects, for the creation of a 4-year STIP
- Coordinate, review, and approve MPO TIPs in accordance with CFR
- Attend Project Status, Project Development, Project Countdown, and other coordination meetings necessary to maintain the most current, up-to-date project-level information and data
- Attend all coordination meetings for One Nevada project prioritization to ensure the accuracy of project-level information and data within the STIP and Work Program
- Coordinate, review, and comment on the development of MPOs Regional Transportation Plans (RTPs)
- Review funding apportionments from the Federal Management Information Systems (FMIS) to assist in maintaining the fiscal constraint
- Submit project data to MPOs for TIP and RTP calls for projects.
- Review the latest federal guidelines and transportation acts to update internal process fulfills federal requirements
- Continued coordination with MPOs to develop and integrate RTPs, specifically into the public-facing portion of the eSTIP
- **Travel may be necessary to complete the activities within this task.**

3985 State Rail Plan Update

TASK 2339
ACTIVITY 3985
OPERATIONAL SECTION Program Development
PROGRAM MANAGER Tim Mueller

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	-
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**-**
State (20%)	**$**	**-**
Total Requested Amount	**$**	**-**

PARTICIPATING AGENCIES FHWA, FRA, NDOT
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY FHWA, FRA, NDOT, Governor's Office of Economic Development

PURPOSE AND SCOPE

To provide a focus on the railroad from the state perspective and to participate in rail discussions across the state as needed. We have identified rail potential in the state rail plan, and we anticipate rail growth around the state to become more prominent in freight movement. There could be impacts on the transportation system as these projects are developed and opened. As these projects advance and transportation system enhancements are needed, we will add them to the One Nevada Plan for prioritization.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- 2021 Nevada State Rail Plan
- 2012 Nevada State Rail Plan

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- None for federal fiscal year 2023

3997 Scenic Byway Program

TASK 2340
ACTIVITY 3997
OPERATIONAL SECTION Program Development
PROGRAM MANAGER Tim Mueller

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	31,500
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**25,200**
State (20%)	**$**	**6,300**
Total Requested Amount	**$**	**31,500**

PARTICIPATING AGENCIES FHWA, BLM, USFS, NDOT, Nevada Division of Outdoor Recreation, & Nevada Commission on Tourism
FINANCIAL RESPONSIBILITY NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE
The Nevada Scenic Byways program will promote and enhance tourism and the understanding and appreciation of the state's heritage. This will be in concert with the preservation, protection, and enhancement of the state's archaeological, cultural, historical, natural, recreational, and scenic qualities. NDOT will identify potential members of the Scenic Byways Committee and begin the dialogue on the reestablishment of the program. Members of the committee will develop a Nevada Scenic Byways Guide that will showcase existing scenic byways in Nevada. NDOT will oversee the state scenic byways programs to create a committee and process to evaluate candidate projects.

PLANNING EMPHASIS AREAS
- None

PREVIOUS RELATED WORK
- Nevada Scenic Byways Program (NVSBP) prior to exhaustion of funding in 2012

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS
- NDOT has submitted a grant application to the 2022 National Scenic Byways Program for Grants and Technical Assistance.
    - If awarded, NDOT will solicit a consultant team through the NDOT RFP process to assist the Department in the re-establishment and revitalization of the NVSBP.
    - Personnel administration costs of the NVSBP will be SPR funded.
    - Capital outlay costs of the NVSBP will be grant funded.

Location Services

3617 SPR Mapping

TASK 2341
ACTIVITY 3617
OPERATIONAL SECTION Location Services
PROGRAM MANAGER John Burgess

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	180,000
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**144,000**
State (20%)	**$**	**36,000**
Total Requested Amount	**$**	**180,000**

PARTICIPATING AGENCIES FHWA, NDOT
FINANCIAL RESPONSIBILITY FHWA, NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

To create and distribute transportation maps and related cartographic/GIS information to meet NDOT planning requirements for Visualization, (CFR 450.210 (a)(v)), Functional Classification Mapping, (CFR 470.105 (2)), Corridor Studies, (CFR 450.318). Mapping and GIS Data additionally support Travel and Tourism to the public per (23 U.S.C 135 (d)(1)(J)).

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Annual, continuous, and ongoing activity

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Produce and update transportation maps utilizing standard digital photogrammetric, cartographic, and GIS techniques. Products include the Official Highway Map, Functional Classification Mapping, GIS Base Map and data, enlarged area/city maps, 30-minute planimetric Map Atlas series, Corridor Mapping support, State Maintained Highways of Nevada book, Traffic Count Station book, County Tour/STIP mapping and custom transportation maps and GIS data/mapping to support Tourism and Visualization products.
- Acquire, research, and generate cartographic/GIS data and related information
- Travel to project locations to collect and verify map features in the field
- Develop, maintain, and publish GIS databases, cartographic files, and archives
- Publish and distribute Transportation Planning Maps and act as a clearinghouse for geospatial digital data and hard copy map-related information
- Serve as the Nevada Department of Transportation representative and act as a liaison for various mapping-related activities
- **Travel may be necessary to complete the activities within this task.**

3728 Imagery

TASK	2342
ACTIVITY	3728
OPERATIONAL SECTION	Location Services
PROGRAM MANAGER	John Burgess

FUNDING FOR FFY2023 – ANNUAL REQUEST

Personnel Services (Staffing)	$	4,500
Travel	$	-
Operating	$	-
Capital Outlay (Consultant)	$	-
Equipment	$	-
Federal (80%)	**$**	**3,600**
State (20%)	**$**	**900**
Total Requested Amount	**$**	**4,500**

PARTICIPATING AGENCIES	FHWA, NDOT
FINANCIAL RESPONSIBILITY	FHWA, NDOT
FUNCTIONAL RESPONSIBILITY	NDOT

PURPOSE AND SCOPE

To acquire, adjust, synthesize, and distribute digital and hard copy images to provide "Visualization Products" for public consumption (CFR 450.210 (a)(v)). Aerial survey and imagery production will be utilized in the development of individual corridor planning efforts on an as-needed basis (CFR 450.318). The most significant portion of this project will be to support the aviation workgroup within the Planning Division. Products developed will enhance situational awareness and safety at our public airport facilities for aviation use. Additionally, The NDOT Aviation programs use of photography will also be utilized in future aviation system plans, economic impact, and land-use plans.

PLANNING EMPHASIS AREAS

- None

PREVIOUS RELATED WORK

- Annual, continuous, and ongoing activity

PROPOSED ACTIVITIES AND EXPECTED PRODUCTS

- Due to imagery equipment parts and aircraft availability, no activities are scheduled until further notice.
- **Travel may be necessary to complete the activities within this task.**

Part II: Program Budget Summary

FFY 2023 SPR Part II Budget Summary

Task	Title	Federal Funds ($)	State Match ($)	Total Budget
23-01	Research Development and Implementation	$246,960	$61,740	$308,700
23-02	Product Evaluation Program	$124,000	$31,000	$155,000
23-03	TPF-5(TBD) National Cooperative Highway Research Program (NCHRP), estimated	$498,000		$498,000
23-04	TPF-5(496) Transportation Research Board (TRB) Core Program Services for RD&T	$118,000		$118,000
23-05	TPF-5(487) Transportation Management Center (TMC) Pooled Fund Study	$25,000		$25,000
23-06	TPF-5(437) Technology Transfer Concrete Consortium (FFY20-24)	$12,000		$12,000
23-07	TPF-5(479) Clear Roads Phase III	$25,000		$25,000
23-08	TPF-5(444) Partnership for the Transformation of Traffic Safety Culture - Phase 2	$20,000		$20,000
23-09	TPF-5(492) 2023 through 2025 Biennial Asset Management Conference and Training on Implementation Strategies	$6,000		$6,000
23-10	TPF-5(394) Western Maintenance Partnership Phase 3	$15,000		$15,000
23-11	TPF-5(451) Road Usage Charge West	$25,000		$25,000
23-12	Solicitation 1573 International Conference on Ecology and Transportation (ICOET)	$4,000		$4,000
23-13	Agreement 302-19-803 Developing Lower Modulus Polymer Resin Binder Systems Specifications for High Friction Surface Treatment (HFST) on Asphalt Pavements in Nevada	$37,600	$9,400	$47,000
23-14	Agreement 676-19-803 Human-Augmented Technology Interaction (HATI) for Improving Construction Quality Control and Task Monitoring	$19,200	$4,800	$24,000
23-15	Agreement 399-20-803 Comparison and Evaluation of Roadside Animal Sensing and Driver Warning Systems	$136,000	$34,000	$170,000
23-16	Agreement 227-21-803: Develop a Study of Geosynthetic (Geogrid and Woven Geotextile) Materials for Reducing Pavement Section Thickness	$16,800	$4,200	$21,000
23-17	Agreement 142-21-803: Feasibility of Implementing Pedestrian Hybrid Beacon (PHB) Signals for Improving Safety and Mobility in Nevada	$88,000	$22,000	$110,000
23-18	Agreement 147-21-803: Investigating Implementation Potentials of Turbo Roundabouts in Nevada	$116,000	$29,000	$145,000
23-19	Agreement 296-22-803: Developing Quality-Controlled Datasets and Methods to Assess the Impact of Rain on Snow Events on Nevada's Highways	$56,000	$14,000	$70,000
23-20	Agreement TBD: Freeway and Arterial Performance Analysis with High-Resolution Vehicle Trajectory Data	$88,000	$22,000	$110,000
23-21	Agreement TBD: Drone Use in Vegetation Surveys for Milkweeds and Other Flowering Plants Necessary for the Monarch Butterfly	$80,000	$20,000	$100,000
	Part II Total	$1,756,560	$252,140	$2,008,700

Part II: Program Sections

3859 Research Development and Implementation

TASK	23-01
ACTIVITY	3859
OPERATIONAL SECTION	Research
PROGRAM MANAGER	Ken Chambers

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (80%)	$	246,960
State (20%)	$	61,740
Total Requested Amount	$	308,700

PARTICIPATING AGENCIES	NDOT
FINANCIAL RESPONSIBILITY	NDOT
FUNCTIONAL RESPONSIBILITY	NDOT

PURPOSE AND SCOPE

The purpose is to develop research projects and facilitate the implementation of research findings including technology transfer. The activities include, but are not limited to, identifying Department research needs, soliciting research problem statements, developing and reviewing research proposals, monitoring research project progress, conducting tests and demonstration projects, and disseminating research reports. Through these activities, research projects are initiated, and research results and new technologies are identified to solve problems and issues, or address Department needs for process improvement and deployment of technology and innovation to achieve its strategic goals.

PROPOSED ACTIVITIES

- Conduct solicitations of research problem statements from internal divisions and external research entities
- Write and edit research problem statements and proposals
- Issue requests for proposals and review them along with the affected divisions
- Prioritize the proposals with the Department's research advisory committee and approve research projects with the research management committee
- Develop project agreements and coordinate their executions
- Establish, coordinate, and chair research project panel meetings to review project progress and discuss potential problems
- Write, edit, and disseminate research reports
- Publish research results to provide information on research activities and recent technologies
- Coordinate or conduct workshops, pilot projects, and training on recent technologies/innovations
- Facilitate project budget formulations, budget revisions, agreement amendments, and payments for research work performed
- Participate in Transportation Research Board (TRB) and AASHTO research-related activities, including meetings, workshops, and webinars
- Travel and training to support the activities identified in this task

EXPECTED PRODUCTS

Administration of NDOT's Research Program, which consists of projects and tasks identified throughout this document.

3869 Product Evaluation Program

TASK	23-02
ACTIVITY	3869
OPERATIONAL SECTION	Research
PROGRAM MANAGER	Ken Chambers

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (80%)	$	124,000
State (20%)	$	31,000
Total Requested Amount	$	155,000

PARTICIPATING AGENCIES	FHWA, NDOT
FINANCIAL RESPONSIBILITY	NDOT
FUNCTIONAL RESPONSIBILITY	NDOT

PURPOSE AND SCOPE

Coordinate the meetings of the Product Evaluation Committee (PEC); facilitate the review of specifications and acceptance criteria, facilitate field testing, update the Qualified Product List (QPL), participate as a representative for NDOT in AASHTO NTPEP (National Transportation Product Evaluation Program) activities.

PROPOSED ACTIVITIES

Assist vendors to facilitate their application submissions; coordinate the quarterly meetings of the Product Evaluation Committee; facilitate field tests and coordinate reporting of the tests and update the QPL as needed (usually quarterly). Maintain databases which support the QPL categories' specifications and acceptance criteria. Activities include participating and contributing to AASHTO's related technical service programs such as: "National Transportation Product Evaluation Program (NTPEP)" and "Establish an AASHTO Manual for Assessing Safety Hardware (MASH)," subscriptions applicable to product evaluation and product evaluators including, but not limited to ASTM specifications and AASHTO standards. Participate in travel and training, meetings, and conferences, both in-person and virtually, with various local, state, and federal transportation stakeholders to address current and potential issues and topics regarding the Product Evaluation program.

EXPECTED PRODUCTS

- Facilitate review of products based on current specifications
- Maintain an accurate QPL
- Coordinate regular meetings of the Product Evaluation Committee.

National Cooperative Highway Research Program (NCHRP)

TASK 23-03
ACTIVITY N/A
OPERATIONAL SECTION Research
PROGRAM MANAGER Ken Chambers
National Pooled Fund Study: TPF-5(TBD)

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (100%)	$	498,000
State (0%)	$	-
Total Requested Amount	$	498,000

$498,000 estimated, will be determined based on actual federal apportionment

PARTICIPATING AGENCIES FHWA, AASHTO, NDOT
FINANCIAL RESPONSIBILITY NDOT
FUNCTIONAL RESPONSIBILITY TRB

PURPOSE AND SCOPE
Nevada's fiscal year 2023 contribution to the National Cooperative Highway Research Program (NCHRP).

PREVIOUS RELATED WORK
Ongoing program

PROPOSED ACTIVITIES
NCHRP's annual program.

EXPECTED PRODUCTS
A myriad of national research projects, publications, reports, and technology from every transportation-related arena.

Transportation Research Board (TRB) Core Program Services for RD&T

TASK 23-04
ACTIVITY N/A
OPERATIONAL SECTION Research
PROGRAM MANAGER Ken Chambers
National Pooled Fund Study: TPF-5(496)

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (100%)	$	118,000
State (0%)	$	-
Total Requested Amount	$	118,000

$118,000 estimated, will be determined based on actual federal apportionment

PARTICIPATING AGENCIES FHWA, NDOT, All other State DOTs
FINANCIAL RESPONSIBILITY NDOT
FUNCTIONAL RESPONSIBILITY TRB

PURPOSE AND SCOPE
Annual subscription to the Transportation Research Board of the National Academy of Science - National Research Council.

PREVIOUS RELATED WORK
Ongoing program

PROPOSED ACTIVITIES
- Participation in technical activities committees to share NDOT's current practices and learn other states' best practices
- Access to all information concerning past, current, and proposed research related to transportation from all possible sources

EXPECTED PRODUCTS
Availability of useful findings of research and other information by all feasible means including several TRB publication series, the output of the transportation information services, and through personal contacts during scheduled field visits by the TRB professional staff.

Transportation Management Center (TMC) Pooled Fund Study

TASK 23-05
ACTIVITY N/A
OPERATIONAL SECTION Research
PROGRAM MANAGER Rod Schilling
National Pooled Fund Study: TPF-5(487)

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (100%)	$	25,000
State (0%)	$	-
Total Requested Amount	$	25,000

PARTICIPATING AGENCIES NDOT, MRF Associates, PB Farradyne, Texas Transportation Institute, University of Virginia, I-95 Corridor Coalition, State DOTs: AL, CA, FL, GA, IA, IL, KS, MI, MN, MO, NC, NJ, NY, OH, PA, TN, TX, UT, VA, WA, and WI
FINANCIAL RESPONSIBILITY NDOT
FUNCTIONAL RESPONSIBILITY FHWA

PURPOSE AND SCOPE
Developing and enhancing business management of TMCs; developing and delivering roadway and travel condition information.

PREVIOUS RELATED WORK
- Configuration Management for Transportation Management Systems
- Transportation Management Systems Maintenance Concept and Plans
- Changeable Message Sign Operation and Messaging
- TMC Operator Requirements and Position Descriptions, Phase 1
- TMC Operator Requirements and Position Descriptions, Phase 2: Interactive Software
- Managing Travel for Planned Special Events
- Impacts of Dynamically Displaying Messages on Changeable Message Signs
- TMC Operations Manual
- Coordinated Freeway and Surface Street Operational Plans and Procedures
- TMC Staffing and Scheduling for Day-to-Day Operations
- TMC Clearinghouse Development and Initiation
- TMC Performance Monitoring, Evaluation and Reporting Handbook
- Developing and Using Concept of Operations in Transportation Management Systems
- Multi-State, Statewide and Regional TMC Concept of Operations and Requirements
- Recovery and Mitigations for TMCs
- Driver Use of Real-Time Enroute Travel Time Information
- TMC Human Factors Design Guidelines: Requirements Analysis
- Procuring, Managing, and Evaluating the Performance of Contracted TMC Services

PROPOSED ACTIVITIES
- Developing, training, hiring, and contracting for TMC staff and services
- Sharing of knowledge and information on 511, Freeway Service Patrol, Traffic Incident Management, and effective use of ITS devices such as DMS signs, cameras, RWIS stations, etc.

EXPECTED PRODUCTS
Exposure to best practices for developing traffic management centers and managing their evolution, as well as efforts to improve day-to-day operations of TMCs, 511, Freeway Service Patrol, Traffic Incident Management, and effective use of ITS devices such as DMS signs, cameras, and RWIS stations.

Technology Transfer Concrete Consortium (FY20-24)

TASK 23-06
ACTIVITY N/A
OPERATIONAL SECTION Research
PROGRAM MANAGER Charlie Pan
National Pooled Fund Study: TPF-5(437)

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (100%)	$	12,000
State (0%)	$	-
Total Requested Amount	$	12,000

PARTICIPATING AGENCIES FHWA, NDOT, State DOTs: AL, CA, CO, FL, GA, IA, ID, IL, IN, KS, LA, MI, MN, MO, NC, ND, NE, NY, OH, OK, PA, RI, SD, TN, TX, UT, WA, and WI
FINANCIAL RESPONSIBILITY NDOT
FUNCTIONAL RESPONSIBILITY Iowa DOT

PURPOSE AND SCOPE
The purpose is to identify, support, facilitate, and fund concrete research and technology transfer initiatives.

PREVIOUS RELATED WORK
Cooperative project that began in 2008.

EXPECTED PRODUCTS
- Identify and direct the development and funding of technology transfer materials such as tech brief summaries and training materials from research results
- Review the CP Road Map initiatives and provide feedback to the FHWA, industry, and the CP Tech Center on those initiatives
- Be part of the Track Team for the CP Road Map Mix Design and Analysis Track providing guidance to coordinating activities with the track
- Provide research ideas to funding agencies
- Identify and instigate needed research projects
- Include current activities and deliverables of the pooled fund on the CP Road Map project website
- Maintain pooled fund project website with current activities and deliverables
- Develop pooled fund research projects for solutions to concrete and concrete pavement issues
- Act as a technology exchange forum for the participating entities
- Contribute to a technology transfer newsletter on concrete pavement research activities every six months in cooperation with the CP Road Map activities
- Publish electronic quarterly reports following lead state guidelines
- Post quarterly reports to the website
- Submit a final report to participants that documents the results of the entire project

Clear Roads Phase III

TASK 23-07
ACTIVITY N/A
OPERATIONAL SECTION Research
PROGRAM MANAGER Anita Bush
National Pooled Fund Study: TPF-5(479)

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (100%)	$	25,000
State (0%)	$	-
Total Requested Amount	$	25,000

PARTICIPATING AGENCIES Minnesota DOT (Lead Agency), State DOTs: AK, AZ, CA, CO, CT, DE, IA, ID, IL, IN, KS, MA, Maryland DOT, MDOT SHA, ME, MI, MO, MT, ND, NE, NHDOT, NY, OH, OR, PA, RI, SD, TX, UT, VA, VT, WA, WI, WV, and WY
FINANCIAL RESPONSIBILITY NDOT
FUNCTIONAL RESPONSIBILITY FHWA

PURPOSE AND SCOPE
Winter operations is the second largest expenditure in NDOT's Maintenance Operations, second to Pavement Maintenance. We send on about $14+M per year on our Snow and Ice Control Program to keep the travelling public safe during and after winter storms. By increasing efficiencies in the winter maintenance operations, significant amount of money can be saved. Clear Roads is a national research consortium focused on rigorous testing of winter maintenance materials, equipment, and methods for use by highway maintenance crews. Since getting under way in 2004, Clear Roads has grown to include 34-member agencies, each contributing $25,000 annually to fund research and technology transfer.

PREVIOUS RELATED WORK
Phase II.

EXPECTED PRODUCTS
Representatives from the participating departments of transportation meet twice a year to discuss and prioritize projects, share effective practices, and review research results.

Partnership for the Transformation of Traffic Safety Culture – Phase 2

TASK 23-08
ACTIVITY N/A
OPERATIONAL SECTION Research
PROGRAM MANAGER Lacey Tisler
National Pooled Fund Study: TPF-5(444)

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (100%)	$	20,000
State (0%)	$	-
Total Requested Amount	$	20,000

PARTICIPATING AGENCIES Montana DOT (Lead Agency), State DOTs: CA, CT, IA, ID, IL, IN, LA, NH, TX, UT, VT, and WA
FINANCIAL RESPONSIBILITY NDOT
FUNCTIONAL RESPONSIBILITY FHWA

PURPOSE AND SCOPE
Stem a possible increase in crashes due to the use of marijuana.

PREVIOUS RELATED WORK
Phase I. This project also considers potential strategies for intervention.

EXPECTED PRODUCTS
Provide new ideas and mitigation strategies to reduce crashes and injuries.

2023 through 2025 Biennial Asset Management Conference and Training on Implementation Strategies

TASK 23-09
ACTIVITY N/A
OPERATIONAL SECTION Research
PROGRAM MANAGER Anita Bush
National Pooled Fund Study: TPF-5(492)

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (100%)	$	6,000
State (0%)	$	-
Total Requested Amount	$	6,000

PARTICIPATING AGENCIES NDOT, State DOTs: IA, PA, and TX
FINANCIAL RESPONSIBILITY NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE
Federal mandates regarding asset management are new, and the Maintenance and Asset Management Division desires to ensure that the Nevada Department of Transportation is in full compliance with the federal regulations.

PREVIOUS RELATED WORK
The study began in 2016 as TPF-5(335).

EXPECTED PRODUCTS
- Provide communication and information sharing among the member states
- Provide an opportunity and forum for discussion of research needs, and provided research ideas to TRB in order to conduct national research that benefits all states, but specifically Nevada
- Provide a technology and knowledge exchange forum to enhance the practical knowledge of member states concerning asset management implementation.

Western Maintenance Partnership Phase 3

TASK 23-10
ACTIVITY N/A
OPERATIONAL SECTION Research
PROGRAM MANAGER Anita Bush
National Pooled Fund Study: TPF-5(394)

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (100%)	$	15,000
State (0%)	$	-
Total Requested Amount	$	15,000

PARTICIPATING AGENCIES NDOT, Utah DOT (Lead Agency), State DOTs: CA, ID, MT, TX, and WA
FINANCIAL RESPONSIBILITY NDOT
FUNCTIONAL RESPONSIBILITY Utah DOT

PURPOSE AND SCOPE

Highway maintenance and preservation is one of the primary goals of the Department. The purpose of the Western Maintenance Partnership (WMP) is to provide a partnering forum for promoting effective maintenance strategies.

PREVIOUS RELATED WORK

In the 1980s, the Rocky Mountain Maintenance Tour established a highly effective forum for exchange of information, techniques, policies, and strategies for maintenance of highway systems. Since then, the WMP ran from 2006-2014 and again from 2015-2019 under separate Transportation Pooled Fund projects.

EXPECTED PRODUCTS

Provide a partnering forum for promoting effective maintenance strategies through:

- Annual meeting (WASHTO Committee on Maintenance) and a multi-day annual workshop/scan tour, for discussion and exchange of information and knowledge about each state's maintenance program
- Provide a forum to define, support, and share technology of mutual interest
- Provide funds for formal training presentations during the annual workshop
- Provide funds for management support of WMP
- Provide funds for special studies, investigations, research, and training

Road Usage Charge West

TASK 23-11
ACTIVITY N/A
OPERATIONAL SECTION Research
PROGRAM MANAGER Peter Aiyuk
National Pooled Fund Study: TPF-5(451)

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (100%)	$	25,000
State (0%)	$	-
Total Requested Amount	$	25,000

PARTICIPATING AGENCIES NDOT, Oregon DOT (Lead Agency), State DOTs: AK, AZ, CA, CO, HI, ID, KS, MT, ND, NE, NM, OK, PADOT, TX, UT, WA, and WY
FINANCIAL RESPONSIBILITY NDOT
FUNCTIONAL RESPONSIBILITY FHWA

PURPOSE AND SCOPE
Through the leadership of the Consortium, member states and provinces will have the research, technical expertise, operational understanding, and member support to be poised to initiate an effective interoperable Road Usage Charge (RUC) system investigation, demonstration, or implementation, if and when desired.

PREVIOUS RELATED WORK
Oregon, the lead state, has been actively developing and testing pilot efforts for alternatives for gasoline taxes for many years.

PROPOSED ACTIVITIES
- Explore the technical and operational feasibility of a multi-jurisdictional road usage charge system
- Investigate public and key decision maker criteria for acceptance and share experience and lessons learned to foster positive outcomes
- Develop standards and protocols for how road use charges could best be collected and remitted among the various jurisdictions
- Develop preliminary operational concepts for how a multi-jurisdictional road usage charge system could be administered
- Develop a model for regional cooperation and interoperability that can be used in the Western region and potentially across North America
- Engage the automotive manufacturing and technology sector to encourage the ability for mileage reporting to occur in conjunction with other products and services the sector provides in the marketplace
- Share knowledge to maximize the preparedness for and efficiency of policy and program development for road usage charging among the members

EXPECTED PRODUCTS
Subject to available Transportation Pooled Fund resources and separate funding from Consortium Members, the Work Plan will undertake select topics, research, projects, and activities that fall within the following areas:
- Legal and Institutional arrangements for implementing an RUC
- Public policy analysis and development
- Public Information/Communications
- Technical research and system development
- Consumer-oriented system design
- Identification of essential requirements to create a regional RUC system
- Multi-jurisdictional issues such as revenue allocation, cost sharing, compliance, enforcement, interoperability,

clearinghouse setup and operations, and dispute resolution

- Applicability and compatibility with federal programs, rules or laws including the directing and shaping of national guidelines based on the best practices developed by the Consortia
- Establishment of system standards and a certifications process that promotes and ensures:
    - Accuracy
    - Security
    - Tamper resistance
- Economic impacts
- Business models for program operations, including alternatives that optimize the use of private industry and marketplace forces to drive efficiencies and consumer acceptance
- National and/or federal RUC considerations.

International Conference on Ecology and Transportation (ICOET)

TASK 23-12
ACTIVITY N/A
OPERATIONAL SECTION Research
PROGRAM MANAGER Nova Simpson
National Pooled Fund Study: Solicitation 1573

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (100%)	$	4,000
State (0%)	$	-
Total Requested Amount	$	4,000

PARTICIPATING AGENCIES NDOT, State DOTs: AZ, TX, and WA
FINANCIAL RESPONSIBILITY NDOT
FUNCTIONAL RESPONSIBILITY Washington State DOT

PURPOSE AND SCOPE

The International Conference of Ecology and Transportation is the best conference for interaction of transportation, the biological sciences, and law. Environmental staff at NDOT attend this conference every two years when it is hosted in the United States but forgo the years it is hosted internationally. This conference is an opportunity to showcase the efforts NDOT has put into biological compliance and wildlife mitigation.

PREVIOUS RELATED WORK

NDOT is the lead agency for a related pooled fund study TPF-5(358) on reducing wildlife vehicle collisions. Many of the partners of that pooled fund study will be present at ICOET. This would allow for the partners to have an onsite meeting to discuss the status of that project, allowing for additional collaboration.

EXPECTED PRODUCTS

- NDOT representation on the Pooled Fund Technical Advisory Committee (TAC)
- NDOT involvement in the development of the conference and associated activities
- Networking, communication, teamwork, planning, and professional skills building
- Two free conference registrations, and savings on out-of-state travel funds
- Onsite meeting for the NDOT lead TPF-5(358) to allow for greater collaboration

3862 Developing a Lower Modulus Polymer Resin Binder Systems Specifications for High Friction Surface Treatment (HFST) on Asphalt Pavements in Nevada

TASK 23-13
ACTIVITY 3862
OPERATIONAL SECTION Research
PROGRAM MANAGER Ken Chambers

Agreement 302-19-803
Start Date: November 2019
End Date: December 2023

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (80%)	$	**37,600**
State (20%)	$	**9,400**
Total Requested Amount	$	**47,000**

Total Activity Cost for Agreement 302-19-803: $150,000

PARTICIPATING AGENCIES NDOT
FINANCIAL RESPONSIBILITY NDOT
FUNCTIONAL RESPONSIBILITY NDOT Materials Division & NDOT Traffic Safety Engineering Division

PURPOSE AND SCOPE

Thermal incompatibility between High friction surface treatments (HFST) and asphalt pavement is a primary contributor to early age failure of such treatments. HFST are thin applications of high quality, polish-resistant aggregates bonded to a pavement surface with a polymer resin of some type. The research needs will be addressed by identifying suitable polymer binders for use in HFSTs on asphalt surfaces under typical Nevada environmental conditions. Appropriate test methods and specification limits will be recommended.

PREVIOUS RELATED WORK

Although some research has been done to bring light to various contributors, nothing has been developed regrading test methods that connect how to properly off-set the thermal variances that contribute to early failures.

PROPOSED ACTIVITIES

- Task 1: Detailed Literature Search
- Task 2: Laboratory Testing of Polymer Resins
- Task 3: Laboratory Testing of HFSTs with Candidate Resins
- Task 4: Final Report

EXPECTED PRODUCTS

A detailed literature review on possible resins. Specifications for appropriate materials (polymer resins) for use in HFSTs in Nevada. Detailed implementation plan. A final report identifying the results of the study.

3862 Human-Augmented Technology Interaction (HATI) for Improving Construction Quality Control and Task Monitoring

TASK 23-14
ACTIVITY 3862
OPERATIONAL SECTION Research
PROGRAM MANAGER Ken Chambers

Agreement 676-19-803
Start Date: January 2020
End Date: December 2022

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (80%)	$	19,200
State (20%)	$	4,800
Total Requested Amount	$	24,000

Total Activity Cost for Agreement 676-19-803: $250,000

PARTICIPATING AGENCIES NDOT
FINANCIAL RESPONSIBILITY NDOT
FUNCTIONAL RESPONSIBILITY NDOT

PURPOSE AND SCOPE

Construction errors and quality inspections are significant problems that have negative impacts on many aspects of construction projects, including rework, schedule delay, increased cost, work related accident/injury and low productivity. The magnitude of this impact is significant as it accounts for approximately $2.5 billion per year of the total project cost. One of the biggest challenges is associated with human-based visual inspection, which is the very common method of inspection. Many literature studies point out that this technique is limited, subjective, and unreliable, and the engineers are aware of difficulty and consequences associated with the technique. With the advent in emerging media and sensing technology, these problems can be significantly mitigated, if it is applied properly in a way to reinforce the ability of inspectors through HATI. Therefore, NDOT has determined the need to explore the capability of HATI with technology implementation for more accurate and reliable inspection.

PREVIOUS RELATED WORK

In the last few years, construction researchers have adopted technological innovation and developed various automated (or semi-automated) tools for construction management and operation by using advanced technologies, such as building information modeling, wireless sensing systems, and various types of scanning systems. Although this movement has offered a paradigm shift in many aspects of construction, especially safety and planning of construction schedules, little research has explored the capability of HATI, leveraged by augmented and/or virtual reality technologies, to the extent which it can assist site managers in ensuring construction work and facilitating these processes.

PROPOSED ACTIVITIES

- Task 1: Define sure User Interface (UI) requirements for Augmented Reality (AR) to support NDOT needs
- Task 2: Build AR iterations to support field testing of AR for communication
- Task 3: Quantify benefits and drawbacks of using AR for NDOT communication
- Task 4: Identify best practices, and potential pitfalls for using AR to support project communication

EXPECTED PRODUCTS

An interim report documenting findings of the first year of the project. A final report documenting findings related to best practices and potential pitfalls for AR implementation, a detailed description of the process used for creating and applying computer codes to generate the AR application and supporting documentation for setting up additional AR devices if NDOT should choose to invest in this technology further based on the findings of this research.

3862 Comparison and Evaluation of Roadside Animal Sensing and Driver Warning Systems

TASK 23-15
ACTIVITY 3862
OPERATIONAL SECTION Research
PROGRAM MANAGER Ken Chambers

Agreement 399-20-803
Start Date: November 2020
End Date: December 2023

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (80%)	$	136,000
State (20%)	$	34,000
Total Requested Amount	$	170,000

Total Activity Cost for Agreement 399-20-803: $299,600

PARTICIPATING AGENCIES NDOT
FINANCIAL RESPONSIBILITY NDOT Research
FUNCTIONAL RESPONSIBILITY NDOT Environmental Services & NDOT District II

PURPOSE AND SCOPE

A past research study determined wild and domestic animals account for more than 500 crashes annually, costing the Nevada public more than $21 million and killing over 5,032 wild animals every year. These numbers are estimated to be 50% higher in unreported crashes, which indicate an even more serious problem that threatens the wildlife eco-system, hence direly calls for a solution. While safety crossings and fencing have proven very effective in saving thousands of wild animals, they are considered a static type of countermeasure that mainly focuses on establishing connectivity for animals to cross the roads. Additionally, these crossings and fencing measures may not be feasible in some locations because of institutional or funding issues usually associated with the fact that many of the rural roads are already built and carry fast moving traffic. This project aims to develop an animal detection platform that relies on combined detection technologies, edge computing for on-site fast processing and detection, and an advanced driver warning system to enable proactive measures to avoid vehicle-animal crashes.

This research aims to identify the optimal animal detection technology to improve safety on Nevada roads and preserve Nevada wildlife. The specific research objectives are to:

1. Establish a side-by-side comparison based on field tests between various animal detection technologies: (a) for accuracy and false detection, (b) for Net present value and Benefit- Cost Analysis, and (c) in various weather, visibility, and environmental conditions.
2. Develop an individual and/or multimodal sensor-based edge detection system for: (a) animal detection and tracking, (b)animal-vehicle event detection, (c) carcass detection in or near roadways.
3. Develop a driver warning system based on I2V communication, and
4. Test the animal detection and driver warning system in multiple test sites in Nevada.

PREVIOUS RELATED WORK

The state-of-the-practice in the US shows various field studies in the past two decades (2000~2020) on animal warning systems spread across the western states (CA, WA, AZ, WY, NM, and MN) who have largely deployed radar, infrared or laser beam, infrared sensors, body heat sensors, microwave sensors, and video-based motion sensing for animal detection. NDOT has completed two related projects. The first was on evaluation of wildlife warning systems and other countermeasures to reduce deer-vehicle crashes. Such countermeasures focused on grade separations, warning signs that are activated during deer migrations or during deer crossing, fencing, and roadside reflectors and roadway lighting, with focus on only two locations in Nevada (I-80 and US 93). The second study focused on identifying animal-vehicle

crash hotspots in Nevada based on animal migration patterns and many other factors. Based on these studies, NDOT implemented several countermeasures to preserve the wildlife and reduce crashes.

PROPOSED ACTIVITIES

- Task 1: Project management and communication
- Task 2: Implementation of roadside animal-sensing-warning system and controlled test
- Task 3: Deployment and maintenance of the ITS Trailer
- Task 4: Sensor data processing, validation, comparison, and integration
- Task 5: Proof-of-concept of connecting sensing platforms to driver warning
- Task 6: Development of roadside sensing deployment guidance and NDOT implementation plan
- Task 7: Final Report

EXPECTED PRODUCTS

Design and demonstration of the roadside platform and a protocol for testing. Raw data collected by multiple sensors at each proposed study site, trajectories extracted from roadside sensor data, and evaluation of accuracy of roadside trajectories. Case study reports of connectivity and communication. Roadside Animal Detection System Deployment Guidance. Final report.

3862 Develop a Study of Geosynthetic (Geogrid and Woven Geotextile) Materials for Reducing Pavement Section Thickness

TASK 23-16
ACTIVITY 3862
OPERATIONAL SECTION Research
PROGRAM MANAGER Ken Chambers

Agreement 227-21-803
Start Date: June 2021
End Date: December 2022

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (80%)	$	16,800
State (20%)	$	4,200
Total Requested Amount	$	21,000

Total Activity Cost for Agreement 227-21-803: $101,478

PARTICIPATING AGENCIES NDOT
FINANCIAL RESPONSIBILITY NDOT Research
FUNCTIONAL RESPONSIBILITY NDOT Materials Division, NDOT Maintenance and Asset Management Division, & NDOT Construction Division

PURPOSE AND SCOPE

The objective of this research is to develop a study to evaluate and quantify any pavement structural benefits resulting from the use of geosynthetics placed in or under the aggregate base layer under real-world conditions. If a benefit is observed, this research could then be used as the basis for future modifications to NDOT's pavement design policies and practices. The detailed objectives include:

1) Develop a plan to place multiple test sections, including one or more control sections without geogrid, which address the relevant variables that might be expected based on review of the literature and other agency experience;
2) Develop an evaluation and testing plan for the test sections including before, during and after construction; and
3) Develop construction guidelines for the test sections and draft specifications for the geosynthetics to be utilized.

PREVIOUS RELATED WORK

Surrounding states have been reported to be using geogrids to reduce structural sections for new construction. Additionally, in 2014 FHWA performed a study titled "Performance of Geosynthetics for Use as Subgrade Stabilization," however additional study is needed to determine effectiveness in areas of elevated temperature, which will be covered in this research project.

PROPOSED ACTIVITIES

- Task 1: Literature Review
- Task 2: Experimental Design
- Task 3: Testing Plan
- Task 4: Specifications and Construction Guidelines
- Task 5: Report

EXPECTED PRODUCTS

A Final report documenting all findings and recommendations from the project will serve as the guide for building test sections, documenting design inputs and as-built information, testing and monitoring, and will be a reference for future data analysts. It will also include an implementation plan for the future three phases (construction, data collection, and analysis) of the overall field study including a preliminary cost estimate.

3862 Feasibility of Implementing Pedestrian Hybrid Beacon (PHB) Signals for Improving Safety and Mobility in Nevada

TASK 23-17
ACTIVITY 3862
OPERATIONAL SECTION Research
PROGRAM MANAGER Ken Chambers

Agreement 142-21-803
Start Date: April 2021
End Date: July 2023

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (80%)	$	88,000
State (20%)	$	22,000
Total Requested Amount	$	110,000

Total Activity Cost for Agreement 142-21-803: $225,823

PARTICIPATING AGENCIES NDOT
FINANCIAL RESPONSIBILITY NDOT Research
FUNCTIONAL RESPONSIBILITY NDOT Traffic Operations Division & NDOT Traffic Safety Engineering Division

PURPOSE AND SCOPE

Investigate the feasibility and effectiveness in deploying and operating PHB signals for improving traffic safety and efficiency in Nevada's urban transportation systems. Deployment guidelines need to be developed, which would identify needs for PHB signal installations, provide methods to estimate costs and benefits, and direct the development of PHB signal timing. In particular, this research will study the strengths and weaknesses of the PHB signals compared to other treatments that are widely used in Nevada and seeking to identify potential improvements by adopting the PHB signals upon the existing facilities.

PREVIOUS RELATED WORK

PHB signals were developed in the late 1990s. The latest MUTCD included PHB signals as a special installation to facilitate pedestrian crossings, and now PHB signals have been widely adopted nationwide. Nevertheless, research has been insufficient regarding the implementations and operations of PHB signals. Operational improvements of PHB signals were mentioned in some studies; however, investigations are still needed in order to achieve such improvements, e.g., developing coordination between a PHB signal and adjacent signals to minimize the interference with traffic progression.

PROPOSED ACTIVITIES

- Task 1: Develop Technical Advisory Committee
- Task 2: Literature Review, Surveys, and Interviews
- Task 3: Analyze Nevada Pedestrian-Involved Crashes
- Task 4: Preliminary Treatment Selection Guide for Pedestrian Crosswalk Treatments
- Task 5: Preliminary Timing Recommendations
- Task 6: Microsimulation Models
- Task 7: Stakeholder Webinar
- Task 8: Final Models, Selection Tool, and Timing Criteria
- Task 9: Stakeholder Webinar
- Task 10: Final Report

EXPECTED PRODUCTS

A final report containing guidelines for the installation of PHBs and recommendations for PHB signal operations and

timing. Results can immediately be used to identify locations for PHBs, as well as implement PHBs that are coordinated with the adjacent traffic signals to allow for mobility of both pedestrians and vehicles on the roadway network.

3862 Investigating Implementation Potentials of Turbo Roundabouts in Nevada

TASK 23-18
ACTIVITY 3862
OPERATIONAL SECTION Research
PROGRAM MANAGER Ken Chambers

Agreement 147-21-803
Start Date: August 2021
End Date: July 2023

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (80%)	$	116,000
State (20%)	$	29,000
Total Requested Amount	$	145,000

Total Activity Cost for Agreement 147-21-803: $254,102

PARTICIPATING AGENCIES NDOT
FINANCIAL RESPONSIBILITY NDOT Research
FUNCTIONAL RESPONSIBILITY NDOT Traffic Operations Division & NDOT Traffic Safety Engineering Division

PURPOSE AND SCOPE

Turbo roundabouts are a new type of roundabout that provides a spiraling flow of traffic with mountable raised lane dividers that control the traffic path and speed, requiring drivers to choose their direction before entering the roundabout. This research will investigate the implementation potentials of turbo roundabouts in Nevada through evaluations of applicable conditions, safety benefits, operational performances, costs, etc. The results can be used by transportation agencies in Nevada or other jurisdictions in order to implement and operate turbo roundabouts in the future.

PREVIOUS RELATED WORK

No previous work in Nevada. Turbo roundabouts were first built in the Netherlands in 2000. As of today, there have been 390 turbo roundabouts installed worldwide, mostly in European countries. The research related to the implementation of turbo roundabouts in the U.S. is scarce. FHWA published two reports—in 2019 and 2020—providing information primer about turbo roundabouts; however, additional research efforts are still required.

PROPOSED ACTIVITIES

- Task 1: Hold Project Start-up Meeting
- Task 2: Review Pertinent Existing Literature and Best Practices
- Task 3: Perform Micro-simulation Assessment
- Task 4: Perform Human Factors (or Driver Experience) Assessment
- Task 5: Develop a Selection Procedure for Turbo Roundabouts as an Intersection Control Option
- Task 6: Develop Educational Resources and Conduct Effectiveness Analysis
- Task 7: Develop an Implementation Plan
- Task 8: Develop Recommendations and Final Project Report
- Task 9: Conduct Project Management Tasks

EXPECTED PRODUCTS

A procedure (e.g., warrant analysis) and evaluation tool to assist Nevada with further evaluation of turbo roundabout installation.

3862 Developing Quality-Controlled Datasets and Methods to Assess the Impact of Rain on Snow Events on Nevada Highways

TASK 23-19
ACTIVITY 3862
OPERATIONAL SECTION Research
PROGRAM MANAGER Ken Chambers

Agreement 296-22-803
Start Date: July 2022
End Date: October 2023

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (80%)	$	**56,000**
State (20%)	$	**14,000**
Total Requested Amount	$	**70,000**

Total Activity Cost for Agreement 296-22-803: $99,952

PARTICIPATING AGENCIES NDOT
FINANCIAL RESPONSIBILITY NDOT Research
FUNCTIONAL RESPONSIBILITY NDOT Design/Hydraulics Division & NDOT Districts

PURPOSE AND SCOPE

Major winter floods and extreme runoff in Nevada often result from mid-winter rain-on-snow (ROS) events. Nevada's most notable recent floods occurred in February 1986, January 1997, January 2006, and January and February 2017, however snowmelt-induced slope failures, such as on Slide Mountain, also pose hazards to downstream roads and communities. The 1997 New Year's flood resulted around $1 billion worth of damage in the Reno-Sparks region. In January 2017, the Sparks industrial area and land south of Interstate 80 flooded as multiple inches of rainfall fell in the foothills and areas in the snow-covered Carson City Range, west of Interstate 580 and U.S. 395. While there is some information about the meteorological factors that create flooding, the role of the snowpack on flood-producing runoff is less well-understood. The ROS flooding problem presents an opportunity to improve the understanding of (1) ROS runoff potential that could be integrated into transportation infrastructure design and (2) identification of high-risk weather and antecedent snowpack conditions that could provide additional lead time when staffing or staging equipment for high-impact events. ROS floods are projected to become more frequent and with larger flood volumes in the future. By identifying roadways at-risk for ROS flood damages and developing a method for using NDOT RWIS and other weather data or information (e.g., National Weather Service forecasts, FEMA reports) to assess flood risk, NDOT can better prepare for and respond to extreme weather events.

PREVIOUS RELATED WORK

Current snowmelt models assume a uniform wetting front, do not account for preferential flow, and require snowmelt to occur to calculate terrestrial water input (TWI) as a product of snowmelt. Despite growing research on the hydrological impact of ROS events in the Sierra Nevada, there is little research on the direct impact of ROS or other snowmelt flood events on Nevada's road infrastructure elsewhere in the state.

PROPOSED ACTIVITIES

- Task 1: Identify high-risk winter season flood impact study area(s).
- Task 2: Develop/improve automated data download methods and semi-automated quality control methods for the various data sources and identify the climate and snowpack elements most predictive of ROS runoff by linking various data sources to stream flow responses.
- Task 3: Develop return interval estimates of water flow due to ROS snowmelt runoff suitable for NDOT HEC-HMS modeling. Use extreme value estimates to conduct a risk analysis of current NDOT waterway design standards based on the extreme ROS events and recommend updates to design requirements as needed.

- Task 4: Create a website, hosted by the Utah Climate Center, that provides real-time maps that couple 7-day meteorological forecasts with high-risk antecedent snowpack conditions (identified in Objective 2) at a 4km resolution.
- Task 5: Create a final report that describes research findings and provides instructions on how to use the data and website products created by this research project

EXPECTED PRODUCTS

An open-source R program for automated data download of historical and near real-time data. A set of historical weather data subject to rigorous QA/QC measures suitable for extreme scenario analysis. An extreme ROS scenario data set which includes values estimated streamflow surges at various return intervals. A set of recommendations for changes to design requirements in relevant NDOT infrastructure. A website that provides 1-week forecasts of snowpack risk for ROS runoff.

3862 Freeway and Arterial Performance Analysis with High-Resolution Vehicle Trajectory

TASK 23-20
ACTIVITY 3862
OPERATIONAL SECTION Research
PROGRAM MANAGER Ken Chambers

Agreement *TBD*
Start Date: *TBD*
End Date: January 2025

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (80%)	$	**88,000**
State (20%)	$	**22,000**
Total Requested Amount	$	**110,000**

Total Activity Cost for this Agreement: $471,340

PARTICIPATING AGENCIES City of Reno, RTC of Washoe County, RTC of Southern Nevada
FINANCIAL RESPONSIBILITY NDOT Research
FUNCTIONAL RESPONSIBILITY NDOT Traffic Operations Division

PURPOSE AND SCOPE

Performance analysis has been a vital part of transportation management for freeways and arterials. High-resolution vehicle trajectory data, as an emerging source, provides detailed measures that reflect freeway and arterial performance in terms of operational and safety characterizations. This research focuses on three major objectives: 1. Leverage high-resolution trajectory data to develop traffic operational and safety performance measures tailored to the needs of transportation agencies in Nevada; 2. Conduct case studies and develop implementation guidelines for using high-resolution trajectory data to enhance freeway and arterial performance analyses; and 3. Develop an easy-to-use software tool that can extract and visualize trajectory data.

PREVIOUS RELATED WORK

Aggregated traffic data is integrated in current freeway and arterial performance measuring activities where third-party data platforms are usually employed. These platforms typically provide information only for roadway segments and practitioners cannot access raw data.

In recent years, high-resolution trajectory data becomes a newly available transportation data source as the data quality and penetration has significantly improved. Although trajectory data attracts significant interests, the related research efforts and applications are still very limited. Some pilot studies and testing have proven that high-resolution trajectory data offers a potential for measuring traffic signal performance. Research is needed for further discovering the value of high-resolution trajectory in the context of integrated freeway and arterial systems.

PROPOSED ACTIVITIES

- Literature review;
- Development of performance measures;
- Software tool development;
- Compile findings and develop final report

EXPECTED PRODUCTS

Comprehensive literature review report. Performance measures (PM) interim report based on methodologies for obtaining freeway and arterial PMs with trajectory data, along with comparative studies between agencies' existing PMs and trajectory-based PMs. Software tool capable of trajectory extraction and visualization, manageable and scalable data analytics, and integration with agencies' existing tools and data sources. Case study report. Final report.

3862 Drone Use in Vegetation Surveys for Milkweeds and Other Flowering Plants

TASK 23-21
ACTIVITY 3862
OPERATIONAL SECTION Research
PROGRAM MANAGER Ken Chambers

Agreement *TBD*
Start Date: *TBD*
End Date: January 2025

FUNDING FOR FFY2023 – ANNUAL REQUEST

Federal (80%)	$	**80,000**
State (20%)	$	**20,000**
Total Requested Amount	$	**100,000**

Total Activity Cost for this Agreement: $290,449

PARTICIPATING AGENCIES NDOT Environmental & NDOT Location
FINANCIAL RESPONSIBILITY NDOT Research
FUNCTIONAL RESPONSIBILITY NDOT Environmental

PURPOSE AND SCOPE

The monarch butterfly is a "candidate" species for federal protection under the Endangered Species Act and is scheduled for listing in December 2023. In an effort to document suitable habitat and identify potential protection areas, NDOT needs to perform surveys to count milkweeds and other flowering plants. Traditional survey methods require a biologist to walk the site and document the plants, but this is labor intensive and must be completed during the appropriate growing seasons. Since the growing seasons in Nevada are very short, we need to investigate new technologies that will help staff complete the required surveys in a relatively short timeframe. This project intends to determine the feasibility and effectiveness of using drones for mapping milkweeds and flowering plants and investigate other potential technologies to save time and effort while still ensuring habitat health.

PREVIOUS RELATED WORK

Although drones have been used in various survey techniques, it is unknown if they have been or are currently used for identification and counting of milkweeds or other flowering plants, especially as they relate to monarch butterflies or other pollinator species.

PROPOSED ACTIVITIES

- Literature review;
- Identification of study areas;
- Full factorial experiment covering 3 levels of flight, 3 levels of side overlap, and 3 growing times;
- Develop vegetation maps to quantify vegetation cover;
- Conduct ground surveys for monarch caterpillars;
- Compile findings and develop final report

EXPECTED PRODUCTS

Drone flight R code and/or methodology report. Vegetation maps to quantify milkweed cover, floral density, other vegetation, as well as cover types. AI tool and code which will be able to autonomously identify vegetation. Final report.

End of Nevada Department of Transportation 2023 State Planning & Research Annual Work Program